

Our ref: 1000-060-660
Your ref: SSD 10418
Partner: Mark Brennan



4 July 2022

BY EMAIL: Brad James, Phoebe Jarvis

Professor Alice Clark
Commissioner and Panel Chair
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The Ashurst logo, consisting of the word "ashurst" in a lowercase, bold, sans-serif font.

Dear Professor Clark

Mount Pleasant Optimisation Project SSD 10418

We act for MACH Energy Australia Pty Ltd (the **Applicant**) in relation to the development application for the Mount Pleasant Optimisation Project (SSD 10418) (the **Project**).

On behalf of our client, we have prepared the **attached** submission on GHG emissions and climate change.

In particular:

- Part A addresses the law regarding the consideration of climate change and GHG emissions in determining a development application under the *Environmental Planning and Assessment Act 1979*;
- Part B addresses international, national and NSW climate change law and policy; and
- Part C addresses the future demand for coal and the quality of the Project's product coal.

An executive summary is set out on pages 2-5 of the submission.

Our client requests that the Panel has regard to this submission in determining the development application for the Project.

Yours sincerely



Ashurst

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**MOUNT PLEASANT OPTIMISATION PROJECT
(SSD-10418)**

SUBMISSION TO THE INDEPENDENT PLANNING COMMISSION
ON GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

04 JULY 2022



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GLOSSARY

ACCUs	Australian carbon credit units
Applicant	MACH Energy Australia Pty Ltd
BAU	business-as-usual
CCUS	carbon capture, utilisation and storage
CFI Act	<i>Carbon Credits (Carbon Farming) Act 2011 (Cth)</i>
COP	Conference of the Parties
CO ₂ -e	carbon dioxide equivalent
CV	calorific value
Economic Assessment	Economic Assessment by AnalytEcon Pty Ltd dated January 2021, which is Appendix O to the EIS for the Project
EIS	Environmental Impact Statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
ERF	Emissions Reduction Fund
ESD	ecologically sustainable development
ETS	emissions trading scheme
Expected Export Countries	The countries to which the Project's coal is expected to be exported: Japan, India, South Korea, China, Taiwan, Vietnam, Malaysia and Thailand
GHG	greenhouse gas
GHG Assessment	Greenhouse Gas Assessment which is Appendix S to the EIS for the Project and contains the Greenhouse Gas Calculations by Todoroski Air Sciences Pty Ltd dated 11 January 2021
IEA	International Energy Agency
INDC	Intended Nationally Determined Contribution

IPC	Independent Planning Commission
IPCC	Intergovernmental Panel on Climate Change
kcal/kg	kilocalorie per kilogram
LULUCF	land use, land-use change and forestry
Resources SEPP	<i>State Environmental Planning Policy (Resources and Energy) 2021</i>
Mt	million tonnes
Mtce	million tonnes of coal equivalent
Mount Pleasant Operation	Mount Pleasant open cut coal mine and associated infrastructure approved under the EP&A Act on 22 December 1999 (DA92/97) as modified
NDC	Nationally Determined Contribution
NAR	net as received
Net Zero Plan Stage 1	NSW Department of Planning, Industry and Environment's Net Zero Plan Stage 1: 2020–2030 (March 2020)
NGER Act	<i>National Greenhouse and Energy Reporting Act 2007 (Cth)</i>
Project	Mount Pleasant Optimisation Project (SSD-10418)
<i>Rocky Hill</i>	<i>Gloucester Resources Limited v Minister for Planning (2019) 234 LGERA 257</i>
ROM	Run-of-mine
Strategic Statement on Coal	NSW Government's Strategic Statement on Coal Exploration and Mining in NSW (June 2020)
WEO	World Energy Outlook

SUBMISSION TO THE INDEPENDENT PLANNING COMMISSION

INTRODUCTION

1. MACH Energy Australia Pty Ltd (the **Applicant**) has applied for development consent under the *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**) to extract additional coal reserves and increase the rate of extraction at the Mount Pleasant Operation (the **Project**).
2. The Mount Pleasant Operation is an open cut coal mine currently approved (DA92/97) under the EP&A Act to extract up to 10.5 million tonnes (**Mt**) of run-of-mine (**ROM**) coal per calendar year until 22 December 2026.
3. Without significantly increasing the mine's disturbance footprint, the Project will:
 - a. extract approximately 406 Mt of ROM coal, including approximately 364 Mt of additional ROM coal over the 22 year extension period from 2027 to 22 December 2048;¹
 - b. increase the rate of extraction of ROM coal up to 21 Mt per calendar year;
 - c. produce thermal coal, most of which will be exported; and
 - d. extend the life of the mine to 22 December 2048.
4. This is the Applicant's submission on GHG emissions and climate change issues that may be relevant to the Independent Planning Commission's (**IPC**) assessment and determination of the development application for the Project.
5. This submission provides updated information about the climate change policy frameworks mentioned in the Greenhouse Gas Assessment at Appendix S of the EIS.

¹ Mount Pleasant Optimisation Project Environmental Impact Statement, Table 3-2.

EXECUTIVE SUMMARY

Part A: The law regarding the consideration of GHG emissions and climate change in determining the development application under the EP&A Act

6. Pursuant to s 4.15(1) of the EP&A Act, the IPC must consider, among other things:
 - a. the provisions of the *State Environmental Planning Policy (Resources and Energy) 2021 (Resources SEPP)*, including the aims of Chapter 2 and cl 2.20;
 - b. the likely impacts of the Project, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality; and
 - c. the public interest.
7. The aims of Chapter 2 of the Resources SEPP include: to facilitate the orderly and economic use and development of land containing mineral resources, and to promote the development of significant mineral resources.
8. Clause 2.20(2) of the Resources SEPP requires the IPC to consider an assessment of the GHG emissions (including downstream emissions) of the Project.
9. The NSW Land and Environment Court has said that the obligation to consider the public interest includes the principles of ecologically sustainable development (**ESD**) in cases where issues relevant to those principles arise. The principle of intergenerational equity and the precautionary principle can, in turn, involve the consideration of GHG emissions.
10. However, GHG emissions and climate change are not the only considerations that may inform the public interest. The public interest is broad and captures not only environmental considerations, but also the social and economic benefits associated with the Project for the wider community and the State.
11. As recognised by the NSW Court of Appeal, ESD is just one of many objects of the EP&A Act, including:
 - a. to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources, and
 - b. to promote the orderly and economic use of land.²

² EP&A Act, s 1.3(a) and (c); *Minister of Planning v Walker* (2008) 161 LGERA 423 at [52].

12. The IPC must consider and determine the development application for the Project on its own merits, taking into account both the positive and negative impacts of the Project and all of the relevant considerations under the EP&A Act.

Part B: International, national and NSW climate change law and policy

13. Almost all of the Project's Scope 3 emissions will be counted under the *Paris Agreement* as the Scope 1 GHG emissions of the Expected Export Countries in which the coal is used. Any mitigation in relation to the use of coal in electricity generation in those countries will count towards their Nationally Determined Contributions (**NDCs**) under the *Paris Agreement*.
14. The Expected Export Countries are parties to the *Paris Agreement* (save for Taiwan) and have announced or adopted domestic laws and policies to achieve their GHG emissions targets as set out in their NDCs (or Intended Nationally Determined Contribution (**INDC**) in the case of Taiwan).³
15. Neither the Australian Government nor the NSW Government have indicated that the development of new coal mines, or expansion of existing coal mines, is to be prohibited or restricted in any way for the purpose of achieving Australia's updated NDC.
16. It is the NSW Government's policy:
 - a. as embodied in the *Mining Act 1992* (NSW) and the Resources SEPP, that mineral resources in NSW continue to be developed in recognition of the significant social and economic benefits to NSW that result from the efficient development of mineral resources. The IPC is required by s 4.15 of the EP&A Act to take into consideration the aims of Chapter 2 of the Resources SEPP;
 - b. as stated in its *Net Zero Plan Stage 1: 2020–2030* (March 2020) (**Net Zero Plan Stage 1**) (at 22):

New South Wales' \$36 billion mining sector is one of our biggest economic contributors, supplying both domestic and export markets with high quality, competitive resources. Mining will continue to be an important part of the economy into the future and it is important that the State's action on climate change does not undermine those businesses and the jobs and communities they support.

and

³ There may be other countries to which the Project's coal is exported from time-to-time. Nevertheless, the *Paris Agreement* has been adopted almost universally having been ratified by 193 countries. 194 countries have submitted at least one NDC (Eritrea has submitted an NDC but is not yet a party to the *Paris Agreement*).

- c. to support responsible coal production in areas that are suitable for mining, in line with the NSW Government's *Strategic Statement on Coal Exploration and Mining in NSW* (June 2020) (**Strategic Statement on Coal**).

Part C: Future demand for coal and the quality of the Project's product coal

17. The International Energy Agency's (IEA) *World Energy Outlook 2021 (WEO 2021)* projects global energy demand and supply under three main scenarios:
 - a. the Stated Policies Scenario (**STEPS**): looks at existing policy measures, as well as specific policy initiatives that have been announced and are under development;
 - b. the Announced Pledges Scenario (**APS**): considers all announced pledges (including of more than 50 countries, and the European Union, that have pledged net zero emissions targets) and assumes that all pledges will be met fully and on time; and
 - c. the Net Zero Emissions by 2050 Scenario (**NZE**): assumes global net zero emissions by 2050 and the achievement of other energy-related United Nations Sustainable Development Goals, such as universal energy access. The NZE is consistent with limiting the global temperature rise to 1.5°C.
18. In each scenario, the IEA projects that global demand for coal will decline to 2050, with the rate of decline varying by scenario. The rate of decline, particularly in the STEPS and APS, is faster in advanced economies, which have older coal power plants, than in emerging market and developing economies.
19. Younger plants, mostly in Asia, currently account for two-thirds of global coal-fired capacity. The IEA projects that the construction of new coal-fired power continues in emerging market and developing economies, mainly in China, India and Southeast Asia in the STEPS and APS. Younger and more efficient facilities are the best candidates for retrofitting with carbon capture technologies, and younger plants fitted with such technologies are projected to be the only kinds of facilities still in operation in the NZE in 2040.
20. The IEA's *Coal 2021: Analysis and forecast to 2024 (Coal 2021)* categorises high-CV coal as coal greater than 5,700 kcal/kg and low-CV coal as coal less than 4,500 kcal/kg and states that in 2020:
 - a. high-CV coal (>5,700 kcal/kg) made up less than half of thermal coal exports in the Asia Pacific region with Australia holding the largest market share (44%), with approximately 86% of its thermal coal exports being high-CV; and

- b. low-CV coal (<4,500 kcal/kg) represented about one-quarter of coal exports to the Pacific Basin with Indonesia being the largest exporter accounting for 96% of global low-CV thermal coal exports.
- 21. The Project is expected to produce up to three thermal coal product types: 5000 kcal/kg net as received (**NAR**), 5,500 kcal/kg NAR, and 6,000 kcal/kg NAR. Most of the Project's product coal is expected to be in the 5,500 kcal/kg category. This means that none of the Project's product coal is low-CV and most of the Project's coal is either high-CV or at the higher end of the range of intermediate-CV coal. Clearly it is preferable that high-CV coal and intermediate-CV coal (particularly at the higher end), rather than low-CV coal, is available for and used by Asian coal-fired power stations.

PART A: CONSIDERING CLIMATE CHANGE AND GHG EMISSIONS IN DETERMINING A DEVELOPMENT APPLICATION UNDER THE EP&A ACT

22. The exercise of the IPC's discretion under the EP&A Act is governed by the scope and subject matter of the EP&A Act. The objects of the EP&A Act relevantly include:
- a. to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources (s 1.3(a));
 - b. to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment (s 1.3(b));
 - c. to promote the orderly and economic use and development of land (s 1.3(c)); and
 - d. to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State (s 1.3(i)).
23. In determining a development application, s 4.15 of the EP&A Act requires the consent authority to take into consideration certain matters as are of relevance to the development, including:
- a. the provisions of any relevant environmental planning instrument (s 4.15(1)(a)(i));
 - b. "the likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality" (s 4.15(1)(b)); and
 - c. the public interest (s 4.15(1)(e)).
24. The main environmental planning instrument of relevance to the Project is the *State Environmental Planning Policy (Resources and Energy) 2021 (Resources SEPP)*. The aims of Chapter 2 of the Resources SEPP "in recognition of the importance to New South Wales of mining, petroleum production and extractive industries" include:
- a. to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State (cl 2.1(a));

- b. to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources (cl 2.1(b));
- c. to promote the development of significant mineral resources (cl 2.1(c)); and
- d. to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources (cl 2.1(d)).

25. Clause 2.20 of the Resources SEPP relevantly states:

2.20 Natural resource management and environmental management

- (1) Before granting consent for development for the purposes of mining... the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following—

...

- (c) that greenhouse gas emissions are minimised to the greatest extent practicable.

- (2) Without limiting subclause (1), in determining a development application for development for the purposes of mining... the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.

26. The following should be noted in respect of s 4.15 of the EP&A Act and cl 2.20(2) of the Resources SEPP:

- a. statutes are always read as being prima facie restricted in their operation within territorial limits.⁴ This principle of interpretation is reflected in s 12(1) of the *Interpretation Act 1987* (NSW) which states that in any Act or instrument "a reference to a locality jurisdiction or other matter or thing is a reference to such a locality, jurisdiction or other matter or thing in and of New South Wales." This applies unless a contrary intention appears in the Act or instrument concerned;⁵
- b. the starting point to interpreting s 4.15 of the EP&A Act is that the impacts of the development (both direct and indirect) that are to be considered are impacts of the development in and of NSW;

⁴ *Jumbunna Coal Mine NL v Victorian Coal Miners' Association* (1908) 6 CLR 309, 363 (O'Connor J).

⁵ *Interpretation Act 1987* (NSW), s 5(2).

- c. clause 2.20(2) of the Resources SEPP requires a consideration of an assessment of the GHG emissions (including downstream emissions), being prima facie GHG emissions in and of NSW;⁶
 - d. the expression "public interest", when used in a statute like the EP&A Act, imports a discretionary value judgment to be made by reference to undefined factual matters and is unconfined except by the scope and subject matter of the EP&A Act;⁷
 - e. the public interest is, as a result, broad and captures not only environmental considerations associated with the Project, but also the social and economic benefits associated with the Project for the wider community and the State;
 - f. the NSW Land and Environment Court has said that the obligation to consider the public interest under s 4.15(1)(e) of the EP&A Act obliges the consent authority to have regard to the principles of ESD in cases where issues relevant to those principles arise;⁸
 - g. as acknowledged by the NSW Court of Appeal, ESD is just one of many objects of the EP&A Act, including:
 - i. to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources, and
 - ii. to promote the orderly and economic use of land;⁹ and
 - h. there is authority that consideration of the public interest and principles of ESD can involve consideration of Scope 3 GHG emissions.¹⁰
27. The Applicant accepts that the IPC can consider, as part of the public interest, the GHG emissions of the Project (including Scope 3 emissions), and the Project's contribution to climate change insofar as that contribution is likely to impact NSW. However, climate change and GHG emissions are not the only considerations

⁶ This is supported by the *Guidelines for the economic assessment of mining and coal seam gas proposals* (dated December 2015), in which the assessment of the economic aspects of a given project are to be considered at local, regional and State scale, but not at a higher scale.

⁷ *The Pilbara Infrastructure Pty Ltd v Australian Competition Tribunal* (2012) 246 CLR 379 at [42] per French CJ, Gummow, Hayne, Crennan, Kiefel and Bell JJ.

⁸ *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256 at [121]-[124], cited with agreement in *Minister of Planning v Walker* (2008) 161 LGERA 423 per Hodgson J at [42]-[43]. However, the NSW Court of Appeal has been more circumspect at least in respect of decisions under Part 3A of the EP&A Act, stating that the principles of ESD "are likely to come to be seen as so plainly an element of the public interest, in relation to most if not all decisions, that failure to consider them will become strong evidence of failure to consider the public interest": *Minister of Planning v Walker* (2008) 161 LGERA 423 per Hodgson J at [56].

⁹ EP&A Act, s 1.3(a) and (c); *Minister of Planning v Walker* (2008) 161 LGERA 423 at [52].

¹⁰ See, e.g., *Gray v Minister for Planning* (2006) 152 LGERA 258 at [126], [135].

that inform the public interest and, certainly, are not the sole mandatory or permissible considerations.

28. Additionally, the IPC's approach to considering and weighing the relevant factors is not prescribed, dictated or restricted by the decision in *Gloucester Resources Limited v Minister for Planning* (2019) 234 LGERA 257 (**Rocky Hill**). The Court's decision in *Rocky Hill* was the determination of a merit appeal whereby the Court "stands in the shoes" of the consent authority and determines the merits of a development application. The Court's decision is, therefore, not legal precedent that the IPC is obliged to follow.
29. In any event, climate change impacts and GHG emissions were not the essential reasons for the refusal of the Rocky Hill Coal Project, as the Court made clear in *Rocky Hill* at [556] that the significant and unacceptable planning, visual and social impacts of the proposed project were sufficient reasons alone for refusing the development application for the Rocky Hill Coal Project.
30. The IPC is obliged to consider and determine the development application for the Project on its own, individual merits, having regard to the environmental assessment material and information that is before it and all of the relevant considerations under the EP&A Act, which involves an "intuitive synthesis of the relevant factors".¹¹
31. The Applicant submits that the IPC can be satisfied that the climate change impacts and GHG emissions generated by the Project or the combustion of the Project's coal by other developments do not outweigh the significant social and economic benefits that the Project will deliver at a local, regional and State level (which are addressed in other documents already before the IPC).

¹¹ *Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure* (2013) 194 LGERA 347 at [41]–[42].

PART B: INTERNATIONAL, NATIONAL, AND STATE CLIMATE CHANGE LAW AND POLICY

The international climate change framework

32. The international climate change framework comprises:
- a. the *United Nations Framework Convention on Climate Change (UNFCCC)*;
 - b. the *Kyoto Protocol*;
 - c. the *Paris Agreement*; and
 - d. associated decisions by the Conference of the Parties serving each of the above instruments.
33. The UNFCCC was adopted in 1992 and contains the overarching objective of stabilising GHG concentrations in the atmosphere at a level that would prevent "dangerous anthropogenic interference with the climate system". The *Kyoto Protocol* was adopted in 1997 and imposed limits on GHG emissions to be met by developed countries, both individually and collectively, during the first commitment period from 2008 to 2012 and the second commitment period from 2013 to 2020.
34. The *Paris Agreement* aims to strengthen the global response to climate change by holding the increase in global average temperatures to "well below 2°C" and "pursuing efforts to limit the temperature increase to 1.5°C" above pre-industrial levels (Article 2(a)). To achieve this goal, the parties aim to reach peak global GHG emissions "as soon as possible" and then undertake rapid reductions to "achieve a balance between anthropogenic emissions by sources and removals by sinks in the second half of this century" (Article 4.1).
35. In contrast to the approach of the *Kyoto Protocol*, which imposed limitation or reduction commitments on certain parties, one of the key features of the *Paris Agreement* is the use of NDCs. NDCs are unilateral, high-level policy plans that set out the contribution each country is nationally determined to make towards the global "well below 2°C" goal. Parties to the *Paris Agreement* must submit new or updated NDCs every five years. 194 countries have submitted their first NDC and most of those countries have submitted updated or second NDCs.¹²
36. All of the countries that are expected to be the export destinations for the vast majority of the Project's coal, being Japan, India, South Korea, China, Taiwan, Vietnam, Malaysia and Thailand (**Expected Export Countries**) are parties to the *Paris Agreement* (except Taiwan) and either have or are in the process of

¹² UNFCCC Nationally Determined Contributions Registry: <https://unfccc.int/NDCREG>

adopting domestic laws, policies, and measures to implement and achieve their NDCs.

37. Taiwan is not recognised as an independent sovereign nation and therefore is not a member of the United Nations and consequently is not a party to the *Paris Agreement*. Nonetheless, it has put forward an INDC.

Each Expected Export Country's domestic efforts to achieve their NDC (or INDC) targets are detailed in **Appendix B** to this submission. Notably, Japan and Korea have set goals of net-zero emissions by 2050, Vietnam has announced its intention to reach net zero by 2050, China aims to achieve carbon neutrality by 2060, and India has announced its intention to reach net-zero by 2070.

38. Under the international framework described above, countries account for and report on Scope 1 emissions which are direct emissions from sources within the country.
39. Almost all of the Project's Scope 3 emissions will be generated by the burning or combustion of coal by the end-user of the coal. As most of the coal from the Project is planned to be exported, the generation of Scope 3 emissions will largely occur outside of Australia. In this regard, the Scope 3 emissions of the Project would count as Scope 1 emissions in the relevant Expected Export Countries.

Australia's NDC and national climate change laws and policies

40. Neither the *Paris Agreement* nor Australia's NDC are part of the law of Australia except to the extent that legislation has been passed to give effect to those documents within Australia.

Australia's NDC

41. On 16 June 2022, the Australian Government submitted a further updated NDC increasing the ambition of its 2030 target by committing to reduce GHG emissions 43% below 2005 levels by 2030.¹³ The target previously submitted in October 2021 was to reduce GHG emissions by 26 to 28% below 2005 levels by 2030. Australia's NDC is summarised in the following table.

Summary of Australia's NDC	
Emissions reduction target	<ul style="list-style-type: none"> • Net zero emissions by 2050 • Reduce greenhouse gas emissions by 43% below 2005 levels by 2030.
Coverage	Economy-wide

¹³ <https://unfccc.int/sites/default/files/NDC/2022-06/Australias%20NDC%20June%202022%20Update%20%283%29.pdf>

Scope	<ul style="list-style-type: none"> • Energy • Industrial processes and product use • Agriculture • Land-use, land-use change and forestry • Waste
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ and NF ₃

42. Australia's new policies to achieve the NDC include:
- a. a \$20 billion investment in Australia's electricity grid to accelerate decarbonisation of the grid;
 - b. investment of up to \$3 billion to support renewables manufacturing and the deployment of low emissions technologies; and
 - c. the introduction of declining emissions baselines for Australia's major emitters under the existing Safeguard Mechanism.
43. The Australian Government has not, in any announced policy or law, indicated that the development of new coal mines or extensions of existing coal mines are to be prohibited or restricted in any way for the purpose of achieving Australia's new NDC.
44. The current mechanisms for Australia to achieve its NDC (including the Safeguard Mechanism) are set out in **Appendix A**.

The NSW Climate Change Policy Framework, Net Zero Plan Stage 1, and Strategic Statement on Coal

45. The NSW Climate Change Policy Framework (October 2016) seeks to provide aspirational goals and broad policy directions to attain NSW's objective of achieving net-zero emissions by 2050 and ensuring that NSW is more resilient and responsive to climate change. Its other aspirational objectives include the implementation of policies consistent with the Commonwealth's plan for long-term emissions savings, to reduce emissions in government operations, and to advocate for Commonwealth, COAG and international action consistent with the *Paris Agreement*.
46. Under the NSW Climate Change Policy Framework, NSW has committed to both follow the *Paris Agreement* and to work to complement national action. The key policy directions under the NSW Climate Change Policy Framework and their rationales are summarised in the table below:

Policy Direction	Rationale/Goals
Create a certain investment environment by working with the Commonwealth to manage transition	Energy will be transformed and investment/job opportunities will be created in emerging industries of advanced energy, transport and carbon farming and environmental services
Boost energy productivity, put downward pressure on household and business energy bills	Boosting energy and resource productivity will help reduce prices and the cost of transitions to net-zero emissions
Capture co-benefits and manage unintended impacts of external policies	There will be positive co-benefits from emissions savings efforts, such as improved health from reduced air pollution. These benefits can be an important consideration in the design of emissions savings actions
Take advantage of opportunities to grow new industries in NSW	Capitalising on the competitive advantage and growth of industries in professional services, advanced energy technology, property management and financial services
Reduce risks and damage to public and private assets arising from climate change	Embed climate change considerations into asset and risk management as well as support the private sector by providing information and supportive regulatory frameworks for adaptation
Reduce climate change impacts on health and wellbeing	Recognise the increased demand for health and emergency services due to climate change and identify ways to better support more vulnerable communities to health impacts
Manage impacts on natural resources, ecosystems and communities	Coordinate efforts to increase resilience of primary industries and rural communities as climate change impacts water availability, water quality, habitats, weeds and air pollution

47. The Policy Framework is being delivered through:
- a. the Climate Change Fund;
 - b. the development of a value for emissions savings that will be applied consistently in government economic appraisals;
 - c. embedding climate change mitigation and adaptation across government operations including service delivery, infrastructure, purchasing decisions and regulatory frameworks;
 - d. building on NSW's expansion of renewable energy; and
 - e. developing action plans and strategies, including on advanced energy, energy efficiency, climate change adaptation, energy productivity, fugitive emissions, primary industry emissions and adaptation and health and wellbeing.
48. In March 2020, the Department of Planning, Industry and Environment published the Net Zero Plan Stage 1, which sets out how the NSW Government will deliver on its objective of achieving net zero emissions by 2050, and over the next decade to 2030, including by reducing emissions by 35% by 2030 compared to

2005 levels. The Net Zero Plan Stage 1 sets out GHG emission mitigation measures in relation to electricity generation, transport, agriculture, stationary energy (excluding electricity generation), fugitive emissions from mining, industrial processes, waste, and land use. Significantly, for the IPC's consideration of the Project, the Net Zero Plan Stage 1 states (at 22) (underline added):

New South Wales' \$36 billion mining sector is one of our biggest economic contributors, supplying both domestic and export markets with high quality, competitive resources. Mining will continue to be an important part of the economy into the future and it is important that the State's action on climate change does not undermine those businesses and the jobs and communities they support.

49. In June 2020, the NSW Government published its Strategic Statement on Coal which, in light of the fact that the NSW coal industry provided over 22,000 direct jobs, around 89,000 indirect jobs and approximately \$2 billion in royalties in 2018-19, sets out:
- how the NSW Government is taking a responsible approach to the global transition to a low carbon future, consistent with Australia's ambition under the Paris Agreement, and is planning to manage the impact for coal-reliant communities.
50. The Strategic Statement states that the NSW Government will act in four areas:
- a. improving certainty about where coal mining should not occur;
 - b. supporting responsible coal production in areas deemed suitable for mining, including by:
 - i. prohibiting conditions on the grant of development consents that relate to coal exports;
 - ii. continuing to consider responsible applications to extend the life of current coal mines; and
 - iii. streamlining the process for exploring new areas and areas adjacent to current mining operations to deliver a better economic return to NSW;
 - c. addressing community concerns about the impacts of coal mining; and
 - d. supporting diversification of coal-reliant regional economies to assist with the phase-out of thermal coal mining.

PART C: FUTURE DEMAND FOR COAL AND THE QUALITY OF THE PROJECT'S PRODUCT COAL

Introduction

51. This **Part C** of the submission:
- a. explains the global demand for coal in the WEO 2021;
 - b. briefly discusses the IEA's analysis and forecast of coal demand and supply to 2024 in *Coal 2021: Analysis and forecast to 2024 (Coal 2021)*; and
 - c. provides commentary on the quality of the Project's product coal, the likelihood of coal market substitution, and the environmental consequences of coal market substitution.

Global demand for coal to 2050 in the WEO 2021

52. The IEA's World Energy Outlook (**WEO**) series does not make predictions about or forecast the future. Instead, it sets out what the future of global energy could look like in different policy scenarios, each based on a set of assumptions.
53. The WEO 2021 was published in October 2021 and presents three main policy scenarios. Those three scenarios, plus the Sustainable Development Scenario (**SDS**), are described in the WEO 2021 (at 94 to 95):

This World Energy Outlook 2021 assesses three main scenarios. One is normative, in that it is designed to achieve a specific outcome and shows a pathway to reach it. Two scenarios are exploratory, in that they define a set of starting conditions and then see where they lead...

The scenarios are:

- The **Net Zero Emissions by 2050 Scenario (NZE)**. This is a normative IEA scenario that shows a narrow but achievable pathway for the global energy sector to achieve net zero CO₂ emissions by 2050, with advanced economies reaching net zero emissions in advance of others. This scenario also meets key energy-related United Nations Sustainable Development Goals (SDGs), in particular by achieving universal energy access by 2030 and major improvements in air quality. The NZE does not rely on emissions reductions from outside the energy sector to achieve its goals, but assumes that non-energy emissions will be reduced in the same proportion as energy emissions. It is consistent with limiting the global temperature rise to 1.5°C without a temperature overshoot (with a 50% probability).

- The **Announced Pledges Scenario (APS)** appears for the first time in this *WEO*. It takes account of all of the climate commitments made by governments around the world, including NDCs as well as longer term net zero targets, and assumes that they will be met in full and on time. The global trends in this scenario represent the cumulative extent of the world's ambition to tackle climate change as of mid-2021. The remaining difference in global emissions between the outcome in the APS and the normative goals in the NZE or the Sustainable Development Scenario shows the "ambition gap" that needs to be closed to achieve the goals agreed at Paris in 2015.
- The **Stated Policies Scenario (STEPS)** provides a more conservative benchmark for the future, because it does not take it for granted that governments will reach all announced goals. Instead, it takes a more granular, sector-by-sector look at what has actually been put in place to reach these and other energy-related objectives, taking account not just of existing policies and measures but also of that are under development... The STEPS explores where the energy system might go without a major additional steer from policy makers. As with the APS, it is not designed to achieve a particular outcome.

An additional scenario referenced in the text is the Sustainable Development Scenario (SDS). As a "well below 2°C" pathway, the SDS represents a gateway to the outcomes targeted by the Paris Agreement. Like the NZE, the SDS is based on a surge in clean energy policies and investment that puts the energy system on track for key SDGs. In this scenario, all current net zero pledges are achieved in full and there are extensive efforts to realise near-term emissions reductions; advanced economies reach net zero emissions by 2050, China around 2060, and all other countries by 2070 at the latest. Without assuming any net negative emissions, this scenario is consistent with limiting the global temperature rise to 1.65°C (with a 50% probability). With some level of net negative emissions after 2070, the temperature rise could be reduced to 1.5°C in 2100.

54. Unlike previous WEO reports, the SDS is only selectively referenced in the text of the WEO 2021 in relation to projected CO₂ emissions and temperature rises. The SDS is in line with the *Paris Agreement* objective of "holding the increase in the global average temperature to well below 2°C", while the NZE goes further to limit the temperature increase to 1.5°C (the *Paris Agreement* aims to pursue efforts to limit the temperature increase to 1.5°C). The NZE presented in the WEO 2021 was first published by the IEA in May 2021 in *Net Zero by 2050: A Roadmap for the Global Energy Sector*.

55. In the WEO 2021, the global demand for thermal coal declines under all scenarios. Global unabated coal use in the energy system falls by around 5% to 2030 in the STEPS, by 10% in the APS, and by 55% in the NZE.¹⁴
56. In the STEPS, global coal demand rises slightly to 2025 and then starts a slow decline to 2050 when it is around 4,000 Mtce (25% lower than in 2020).¹⁵ Between 2025 and 2030, total coal demand in China starts to fall and there are large reductions in coal use in advanced economies, mainly as a result of lower demand for coal in the power sector.¹⁶
57. In the APS, global coal demand in 2030 is only 6% lower than in the STEPS as coal is phased out of the power sector in countries with net zero pledges. More than 80% of coal demand today comes from emerging market and developing countries which do not have net zero pledges or aim only to reduce emissions after 2030.¹⁷ Their demand for coal increases through to 2030 in the APS.¹⁸ However, global coal demand in the APS declines more rapidly after 2030 and global demand in 2050 is 2,650 Mtce (half what it was in 2020).¹⁹
58. In the NZE, global coal demand drops by 55% to 2,500 million tonnes of coal equivalent (Mtce) in 2030 and by 90% to 2050; in 2050, 80% of the remaining amount of coal still being used is equipped with carbon capture, utilisation and storage (**CCUS**) technology.²⁰ This is illustrated by **Figure 5.27** of the WEO 2021 extracted below.

¹⁴ WEO 2021, 57.

¹⁵ WEO 2021, 74, 244.

¹⁶ WEO 2021, 74.

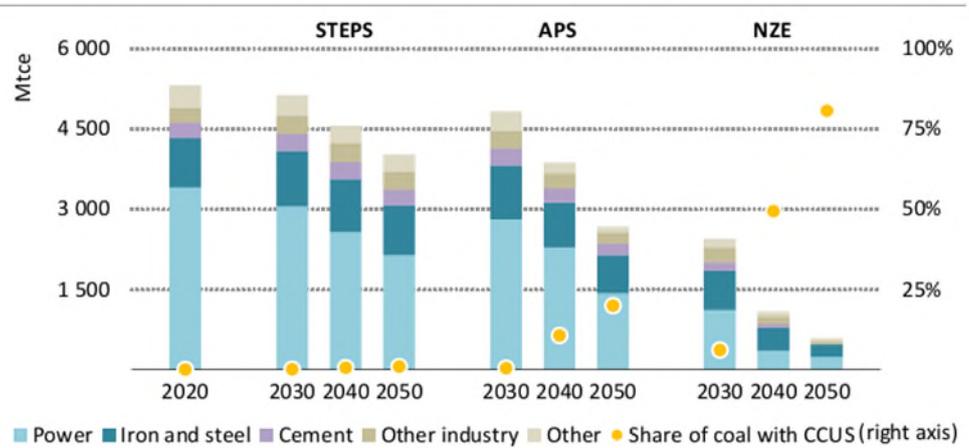
¹⁷ WEO 2021, 74, 212, 240.

¹⁸ WEO 2021, 241.

¹⁹ WEO 2021, 74, 245.

²⁰ WEO 2021, 74, 111, 212, 245.

Figure 5.27 ▶ Global coal demand by sector to 2050



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Coal use in the power sector falls to the largest extent in the STEPS and APS. Coal use is much lower in the NZE across all sectors and 80% of coal use in 2050 is paired with CCUS

59. In the SDS, global coal demand declines by approximately 29% from 5,317 Mtce in 2020 to 3,786 Mtce in 2030 and 78% to 1,189 Mtce in 2050 as shown in **Table A.14** from Annexure A of the WEO 2021 extracted below. More than 80% of the remaining global demand for coal in 2030 and 2050 in the SDS is in the Asia Pacific (Table A.14).

Table A.14: Coal demand (Mtce)

	Historical			Stated Policies		Announced Pledges		Sustainable Development	
	2010	2019	2020	2030	2050	2030	2050	2030	2050
World	5 221	5 536	5 317	5 132	4 020	4 828	2 672	3 786	1 189
North America	768	430	346	192	59	84	35	79	28
United States	716	393	318	177	47	71	24	71	24
Central and South America	37	47	44	42	49	27	25	23	16
Brazil	21	22	19	24	31	15	12	15	12
Europe	538	385	330	197	151	157	124	116	54
European Union	360	250	204	96	48	57	22	57	22
Africa	155	168	156	168	159	139	72	118	29
Middle East	3	5	4	11	15	11	15	5	3
Eurasia	203	234	221	221	211	221	211	137	46
Russia	151	178	168	166	147	166	147	107	40
Asia Pacific	3 516	4 268	4 216	4 301	3 375	4 189	2 191	3 310	1 014
China	2 567	2 968	2 986	2 847	1 980	2 814	879	2 389	614
India	399	597	557	729	691	728	688	468	215
Japan	166	165	153	116	72	107	46	107	46
Southeast Asia	122	255	257	338	393	338	388	214	79

60. Much of the decline in demand for coal in the STEPS and APS occurs in advanced economies which have older coal power plants. Decline in advanced economies will be partly offset by growth in emerging market and developing economies to 2030 where the construction of new coal-fired power will continue,

mainly in China, India and Southeast Asia.²¹ Global unabated coal-fired electricity generation falls by around 15% from 2020 to 2030 in the APS while in advanced economies, unabated coal-fired generation falls by three quarters from 2020 to 2030, led in particular by the United States and European Union.²²

61. In 2020, the average age of coal power plants in Southeast Asia, India and China was 13 years, approximately one third to a quarter of the average age of coal power plants in Europe, Russia and the United States. Japan and South Korea also have younger coal power fleets. This is illustrated by **Figure 1.17** of the WEO 2021 extracted below. Younger plants, mostly in Asia, currently account for two-thirds of global coal-fired capacity.²³ Younger and more efficient facilities are the best candidates for retrofitting with carbon capture technologies, and younger plants fitted with such technologies are the only kinds of facilities still in operation in the NZE in 2040.²⁴
62. In the APS, coal-fired plants in emerging market and developing economies are retired on average when they are 35 years old and in the NZE they are retired 10 years earlier, when they are around 25 years old. Whereas, in advanced economies, the average age of coal power plant fleet is almost 35 years, and they are retired on average in eight years in the APS and in five years in the NZE.²⁵ The APS and NZE scenarios are therefore predicated on coal-fired plants being retired at a significantly younger age in emerging market and developing economies than in advanced economies.

²¹ WEO 2021, 57, 59. Demand for fossil fuels in advanced economies falls in the APS, but announced pledges do not bend projected demand trends across much of the developing world: at 44. See also Figure 5.25.

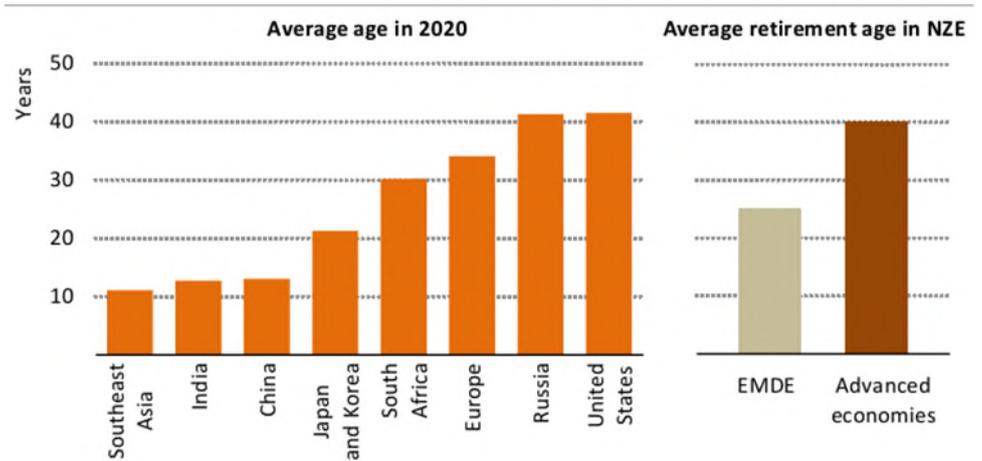
²² WEO 2021, 126.

²³ WEO 2021, 59.

²⁴ WEO 2021, 130.

²⁵ WEO 2021, 59-60.

Figure 1.17 ▶ Average age of existing coal power plants in 2020 in selected regions and average age at retirement in the Net Zero Scenario



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Existing coal-fired power plants in emerging market and developing economies are relatively young, and in the NZE they retire when they are less than 25 years old

Note: EMDE = emerging market and developing economies.

63. Currently, there is 140 GW of coal-fired power capacity under construction and over 430 GW at the planning stage globally.²⁶ In the NZE, there are no new investment decisions for the construction of coal-fired power, and no new coal mines or extensions are required.²⁷ However, as much as 200 GW of coal-fired power receive the go-ahead and are completed by 2030 in the APS, mainly in China, India and Southeast Asia, and over 215 GW are approved and built by 2030 in the STEPS, and more go ahead after 2030 in both scenarios.²⁸ Additionally, rapid growth in low-carbon generation is required just to keep up with rising electricity demand in emerging market and developing economies, which limits the scope to displace existing coal-fired power.²⁹
64. **Figure 4.15** of the WEO 2021 extracted below shows energy supply and demand by fuel and sector in 2020 and in 2050 in each of the three main scenarios.

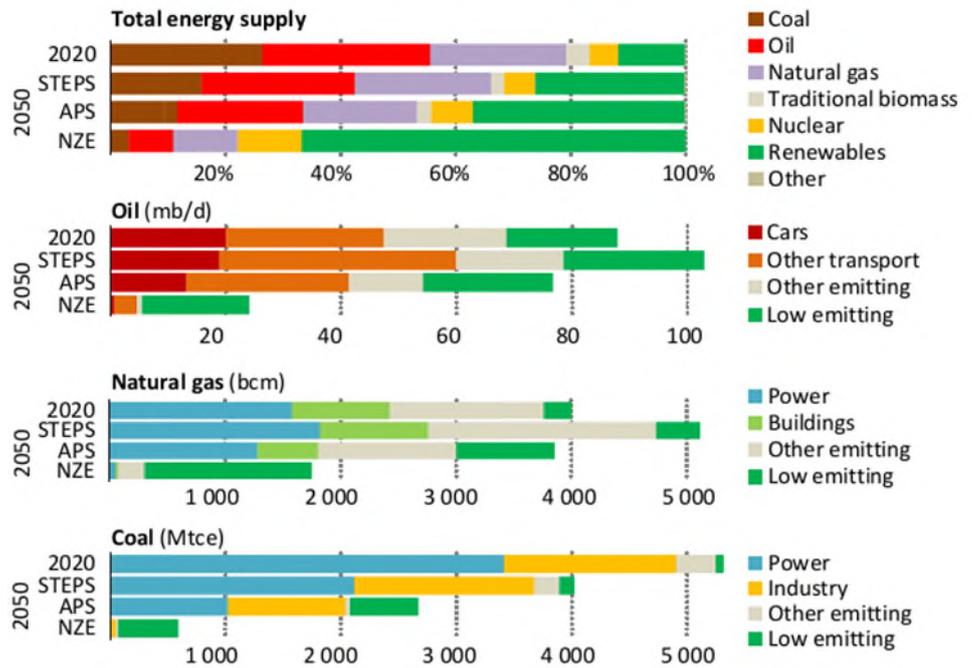
²⁶ WEO 2021, 200.

²⁷ WEO, 33, 102, 111.

²⁸ WEO 2021, 57.

²⁹ WEO 2021, 61.

Figure 4.15 ▶ Energy supply and demand by fuel and sector, 2020 and 2050

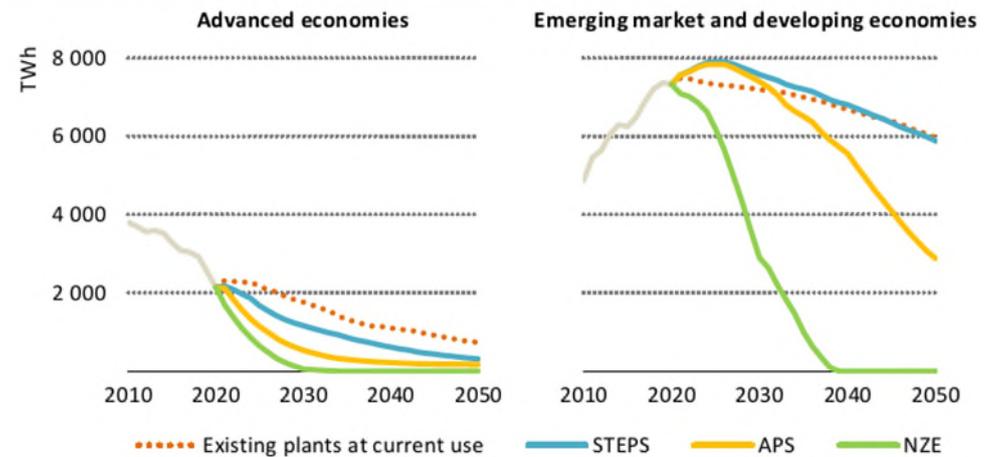


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Announced pledges drive the share of unabated fossil fuels in the APS 17 percentage points lower than the STEPS in 2050; demand for all fossil fuels declines relative to today

65. **Figure 4.25** of the WEO 2021 extracted below shows unabated coal-fired electricity generation by scenario from 2010 to 2050 in advanced economies and emerging market and developing economies.

Figure 4.25 ▶ Unabated coal-fired electricity generation by scenario, 2010-2050

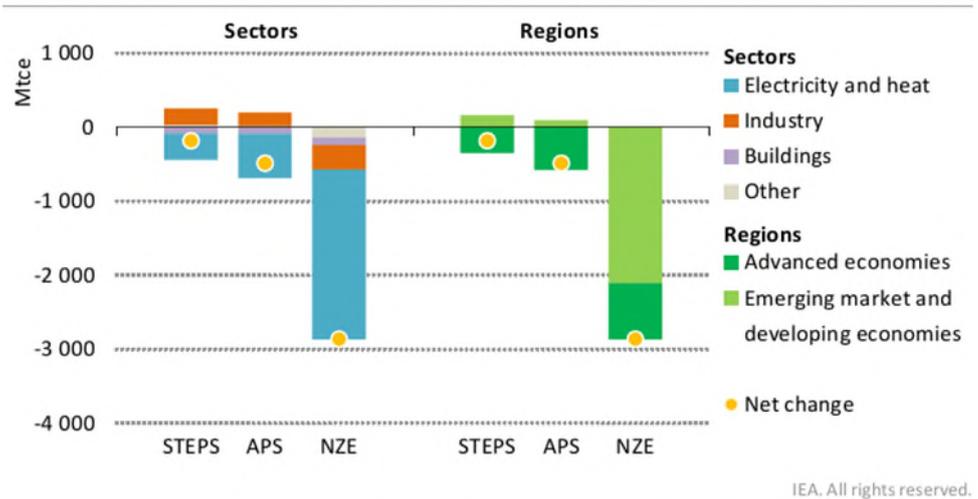


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Unabated coal is set to decline, but even in the APS it continues to be used widely: this puts the world off track to reach net zero emissions by 2050

66. **Figure 5.25** of the WEO 2021 extracted below shows the change in coal demand (in Mtce) by scenario between 2020 and 2030 for advanced economies and emerging market and developing economies.

Figure 5.25 ▶ Change in coal demand by scenario between 2020 and 2030



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The 55% drop in coal demand in the NZE stems mainly from large reductions in coal use in power generation around the world; coal use in industry varies across the scenarios

Note: Mtce = million tonnes of coal equivalent.

67. China is both the consumer and producer of more than half of the world's coal today and holds the key to future global coal trends.³⁰ More than 90% of coal demand in China is supplied with domestic production, but imports play an important role in setting prices through arbitrage, especially in coastal regions, and in filling some gaps. In the STEPS, domestic coal production in China moves broadly in line with changes in demand; imports fall slightly to 180 Mtce in 2030 and to 100 Mtce in 2050.³¹
68. In India (the second largest producer and consumer), domestic coal production, which faces challenges associated with the low quality of large portions of domestic coal production, expands broadly in line with the increase in demand to 2030 and so India continues to import around 200 Mtce of coal in 2030 (similar to current levels), mainly in the form of coking coal for use in blast furnaces and high quality thermal coal for use in some coastal power plants in the STEPS.³² Between 2030 and 2050, coal use in India for electricity generation declines by around 35%, but most of this reduction is offset by increases in coal use in the industry sector and imports rise to 140 Mtce in 2050.³³

³⁰ WEO 2021, 242.

³¹ WEO 2021, 242, 244.

³² WEO 2021, 242.

³³ WEO 2021, 244.

69. In relation to the global export market, the WEO 2021 states that:
- a. in the Pacific market, Australian coal exports often compete with Indonesian exports;
 - b. in the STEPS, Australia remains the largest exporter of coal and Australian thermal coal displaces some Indonesian exports which fall by more than 10% to 2030, although Australian exports fall by around 5% to 340 Mtce in 2030;
 - c. in the STEPS, Russia and Australia both see a small increase in coal exports after 2030;
 - d. in the APS, exports from Russia fall by around 15% to 2030 while Australian exports fall by 25%; and
 - e. in the NZE, global trade drops by more than 50% to 2030.³⁴

IEA's analysis and forecast of coal demand and supply to 2024

70. In December 2021, the IEA published *Coal 2021: Analysis and forecast to 2024 (Coal 2021)*. Although Coal 2021 does not provide a long-term forecast, it does provide insight into coal quality and current and short-term market trends.
71. In relation to demand, Coal 2021 states that:
- a. based on current trends, global coal demand is set to rise to an all-time high of 8,025 Mt in 2022 and to remain there through 2024;³⁵
 - b. Asia dominates the global coal market, with China accounting for more than half of global demand (53%), or two-thirds, if India (12%) is included. These two economies – dependent on coal and with a combined population of almost 3 billion – hold the key to future coal demand;³⁶
 - c. the increase in demand will be driven by China, India and Southeast Asia, with declines in the United States and the European Union.³⁷
72. In relation to production (supply) and trade, Coal 2021 states:

³⁴ WEO 2021, 242–244.

³⁵ Coal 2021, 7.

³⁶ Coal 2021, 8, 10.

³⁷ Coal 2021, 11.

- a. in response to coal supply shortages, large coal-producing countries such as China, India, Indonesia and Russia are expected to boost efforts to expand their output;³⁸
 - b. Australian coal exports to China vanished in 2021 due to China's unofficial ban on Australian coal. Since then, global trade flows have largely been rebalanced with other importing countries such as India and Korea filling the gap;³⁹
 - c. Australia's thermal coal industry is expected to shrink slowly as mine closures outpace capacity additions. Additionally, as Russia's infrastructure improves it will give Australia more competition in high-calorific-value coal. Russia is developing new coal fields and expanding export facilities;⁴⁰
 - d. in 2021, Indonesia remains the world's largest exporter of coal (by weight), with total exports of 405 Mt in 2020. Australia ranked second, at 372 Mt, although it remains at the top in terms of energy and economic value, indicating the high quality (in terms of calorific value and therefore energy output) of Australian coal exports;⁴¹ and
 - e. most seaborne thermal coal trade occurs in the Asia Pacific region. In 2020, Indonesia provided 41% of globally traded thermal coal. Australia ranked second with 20%. Other important exporters are Russia, South Africa, Columbia and the United States.
73. The following figure from Coal 2021 shows regional and global coal production changes from 2019 to 2024.

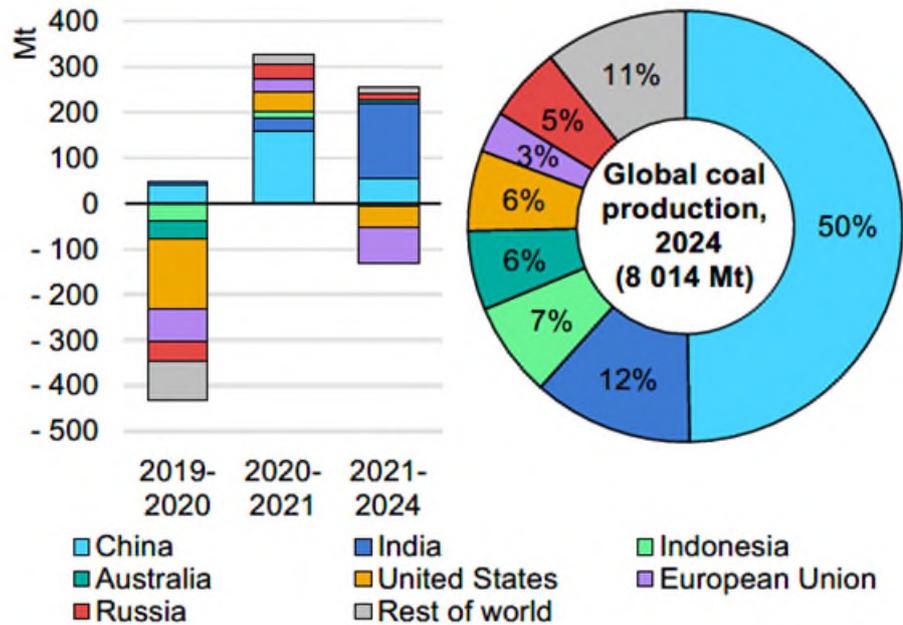
³⁸ Coal 2021, 35.

³⁹ Coal 2021, 44.

⁴⁰ Coal 2021, 45, 48.

⁴¹ Coal 2021, 52.

Regional and global coal production changes, 2019-2024



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74. The likelihood of coal market substitution if the Project is not approved is demonstrated by the effect of China's import ban on Australian coal that commenced in 2020. China filled the Australian coal gap partially with coal from other exporting countries, which principally benefitted Indonesian producers (Indonesia is expected to register the largest increase in thermal coal exports) and opened up opportunities for Colombian and US producers in other markets.⁴²

Coal quality

75. Thermal coal can be categorised in terms of quality by its calorific value (**CV**). CV refers to the energy density of the coal and determines the volume of coal that is required to generate a certain amount of electricity. The higher the calorific value of the coal, the less coal is needed to generate a unit of electricity. The less coal burned, the less CO₂ is released into the atmosphere. Therefore, the use of high-CV coal for electricity generation can generally provide the most efficient energy production per tonne of CO₂ and reduce the amount of CO₂ that is released into the atmosphere per unit of electricity produced, compared to coal of lower CV.

76. Coal 2021 states that:

Thermal coal, traded in the Pacific Basin, can be categorised by its calorific value (CV). Although there is potential for substitution among the various coal qualities, their differences designate separate market segments.

⁴² Coal 2021, 57, 60.

77. Coal 2021 categorises high-CV coal as coal greater than 5,700 kcal/kg and low-CV coal as coal less than 4,500 kcal/kg.⁴³
78. Coal 2021 states that in 2020:
- a. high-CV coal (>5,700 kcal/kg) made up less than half of thermal coal exports in the Asia Pacific region with Australia holding the largest market share (44%), with approximately 86% of its thermal coal exports being high-CV; and
 - b. low-CV coal (<4,500 kcal/kg) represented about one-quarter of coal exports to the Pacific Basin with Indonesia being the largest exporter accounting for 96% of global low-CV thermal coal exports.⁴⁴
79. The Project is expected to produce up to three thermal coal product types: 5000 kcal/kg net as received (**NAR**), 5,500 kcal/kg NAR, and 6,000 kcal/kg NAR. Most of the Project's product coal is expected to be in the 5,500 kcal/kg category.⁴⁵ This means that none of the Project's product coal is low-CV and most of the Project's coal is either high-CV or at the higher end of the range of intermediate-CV coal. Clearly it is preferable that high-CV coal and intermediate-CV coal (particularly at the higher end), rather than low-CV coal, is available for and used by Asian coal-fired power stations.

Department of Industry, Science, Energy and Resources advice

80. In 2021, the Federal Department of Agriculture, Water and the Environment (**DAWE**) sought advice from the Department of Industry, Science, Energy and Resources (**DISER**) about the extent to which, if at all, the approval of four coal projects in NSW under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) would affect the global consumption of coal in possible future scenarios (**DISER Advice**).⁴⁶
81. In summary, the DISER Advice stated that any decision of the Minister for Environment to approve under the EPBC Act one or more of the coal mining projects was not expected to materially affect the amount of coal consumed globally, including because;

⁴³ Coal 2021, 76.

⁴⁴ Coal 2021, 76.

⁴⁵ Mount Pleasant Optimisation Project Economic Assessment prepared for MACH Energy Australia Pty Ltd dated January 2021, 7–8.

⁴⁶ The four projects were the Russell Vale Revised Underground Expansion Project, the Vickery Extension Project, the Tahmoor South Coal Project, and the Mangoola Coal Continued Operations Project. The DISER Advice was released in response to a freedom of information request (FOI ref 24782).

- a. there are many alternative sources of coal both within Australia and overseas. There is enough known coal reserves to last for 200 years at current production levels;
 - b. the speed at which trade has recently realigned in response to trade disruptions shows that regional coal markets are highly integrated;
 - c. regardless of any feasible scenario of future global demand, the small fraction of global supply that the annual output of the coal mining projects represent, combined with the competitiveness of global coal markets, indicate that alternative sources of coal are readily substitutable for any coal that might be produced by those projects;
 - d. the decision of the Minister under the EPBC Act to approve one or more of the coal mining projects effects none of the demand factors for coal, such as price, demand for energy, and the cost of alternative energy products;
 - e. limiting supply of a product will, in standard markets, lead to higher prices and lower demand if there are no readily available substitutes to replace this supply. If on the other hand, there are readily available substitutes to replace that supply, i.e. if markets are competitive, then there is not expected to be any meaningful impact of reduced supply on price or demand. The coal market is a highly competitive global market;
 - f. the recent experience of trade disruptions associated with Covid-19 and China's informal trade restrictions has shown that geography is not a key consideration for coal end-users;
 - g. over the last 10 years, competition has increased in the seaborne market for coal, as lower-cost supply has entered the market and production costs at existing mines have declined. Reflecting this, globally over the past decade, unit production costs have become more uniform over a wider range of production levels; any increase in coal price is expected to be met with a greater increase in supply; and
 - h. regardless of any feasible scenario of future global demand, the small fraction of current global coal supply that the projects represent, combined with the relatively flat global seaborne coal cost curves indicates that the Minister's decision under the EPBC Act would not have any discernible impact on global coal prices.
82. In relation to the environmental consequences of coal market substitution, the DISER Advice states:
- a. it is not possible to identify specific mine sources that would be the alternative sources of coal in the event the projects were not approved.

This makes it not possible to conclude that any decision under the EPBC Act to approve the projects would necessarily increase GHG emissions associated with coal consumption;

- b. the coal from the projects is of relatively high calorific value. Other things being equal, where coal from these projects is replaced by coal of lower calorific value, emissions from consumption of this alternative source of coal will tend to be higher;
 - c. it could be concluded that consumption of thermal coal from Indonesia rather than thermal coal from Australia could be expected to result in slightly more CO₂ emissions;
 - d. the calorific value of coal has implications for related transport emissions. That is, the lower the calorific value (energy content) of coal, the greater mass of coal required to produce a given level of electricity. It follows that – for a given electricity requirement – supplying coal with lower thermal efficiency would result in higher transport related emissions per kilometre travelled compared to supply coal with higher thermal efficiency due to the greater mass of coal to be transported.
83. At the time of preparing the DISER Advice, the DISER did not have the benefit of the IEA's Coal 2021 publication which was published in December 2021. As discussed in paragraph 78 above, according to Coal 2021, in 2020 high CV coal (>5,700 kcal/kg) made up less than half of thermal coal exports sold in the Asia Pacific region.

APPENDIX A

MECHANISMS TO ACHIEVE AUSTRALIA'S NDC

The CSF/ERF

1. A key component of the Australian Government's policy is the Climate Solutions Fund (**CSF**)/Emissions Reduction Fund (**ERF**), which is complemented by the Safeguard Mechanism, the Renewable Energy Target (which requires 33,000 Gwh of electricity generation (or approximately 18.54% of total generation) to be produced from renewable resources annually), improvements in energy efficiency under the National Energy Productivity Plan, phasing out of synthetic GHGs and direct support for investment in low emissions technologies and practices.
2. The ERF was established in 2014 as a \$2.55bn fund to purchase least cost emission reductions and abatement through a Commonwealth government procurement process, including reverse auctions.
3. In 2019, the Australian Government announced the Climate Solutions Package, which is a \$3.5 billion plan to deliver Australia's 2030 emissions reduction target. As part of the package, the CSF was established to continue the work of the ERF with an additional \$2 billion investment over 10 years. The CSF is also designed to be a fund that will partner with businesses, local communities and farmers in emissions reduction programs.
4. The CSF/ERF is underpinned by the *Carbon Credits (Carbon Farming) Act 2011 (CFI Act)* which creates a legislative framework for the development of offset projects and the creation of Australian carbon credit units (**ACCUs**). The CFI Act was initially enacted to support activities in the land sector but has been amended to now support a wider range of projects related to energy, transport and industry.

The Safeguard Mechanism

5. The Safeguard Mechanism, established in 2014 under the *National Greenhouse and Energy Reporting Act 2007 (NGER Act)*, aims to ensure that emission reductions purchased by the Australian Government through the CSF/ERF are not undermined by increases in emissions elsewhere in the economy.
6. The Safeguard Mechanism sets a baseline on emissions for facilities that directly emit over 100,000 tonnes of CO₂-e per year. Initially, baselines were set for existing facilities at the highest level of reported emissions under the NGER Act over the period 2009-10 to 2013-4. These baselines could be adjusted to accommodate economic growth, natural resource variability and other circumstances where historical baselines did not represent business-as-usual

emissions. Baselines for new facilities were based on an audited emissions forecast provided by the facility operator, with a reconciliation of the estimate against the actual performance of the facility at the end of the forecast period (calculated baseline).

7. For new or significantly expanded facilities completed after 1 July 2021, baselines are set to encourage facilities to achieve and maintain best practice in emissions intensity (known as benchmark baselines).⁴⁷ Baselines for existing facilities were transitioned to calculated baselines between 2018 and 2020. Both types of baseline can be updated annually for annual production (known as a production-adjusted baseline), but facilities transitioning from a benchmark baseline must use the same emissions intensity that was used in the benchmark baseline.
8. If a facility exceeds its baseline, it is generally required to surrender a number of ACCUs equivalent to the exceedance. There are other mechanisms by which a facility can manage baseline exceedance, including applying for multi-year monitoring periods and exemptions for exceptional circumstances (i.e. natural disasters or criminal activity unrelated to the liable entity).
9. For example, if a facility has a baseline of 1,000,000 tonnes CO₂-e and reported emissions of 1,500,000, the company with operational control of that facility would have to surrender 500,000 ACCUs, or be liable to the penalty under section 22XF of the NGER Act.

NGER Act

10. The NGER Act is a national system for reporting GHG emissions, energy production and consumption by corporations. The data gathered under the NGER Act assists with compiling Australia's national GHG inventory in order to meet Australia's reporting obligations under the UNFCCC.
11. Corporations that have operational control of facilities that emit more than a specified amount must report on the type of the source of their emissions, the methods used to estimate emissions and the amount of GHG emitted (in CO₂-e). The reporting requirements under the NGER Act apply to:
 - a. an individual facility that emits 25kt or more of CO₂-e or produces or consumes 100tJ or more of energy; or

⁴⁷ Australian Government (2018) Consultation on amendments to the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2017, available at: <https://publications.industry.gov.au/publications/climate-change/climate-change/government/emissions-reduction-fund/consultation/safeguard-mechanism-legislative-amendments-2018.html>

- b. an individual facility and other facilities under the operational control of the same corporate group that together emit 50kt or more of CO₂-e or produce or consume 200tJ or more of energy.
- 12. Failure to comply with these reporting obligations is a breach of the legislation and can result in the imposition of civil penalties on companies and executive officers.
- 13. Reporting requirements cover both Scope 1 and Scope 2 emissions. The NGER Act does not cover Scope 3 emissions.

APPENDIX B

POLICIES AND MEASURES OF EXPECTED EXPORT COUNTRIES

COUNTRY	SUMMARY OF DOMESTIC LAW AND POLICIES						
JAPAN	<p data-bbox="389 584 450 611">NDC</p> <p data-bbox="389 647 1998 767">Japan's first NDC included an emissions reduction target of 26% below 2013 levels in 2030. This equates to emissions of approximately 1.042 billion tCO₂-e in 2030. Japan submitted its updated NDC on 22 October 2021.⁴⁸ The updated NDC increases reduction in greenhouse gas emissions of 46% by 2030 from 2013 levels, with a long-term goal of achieving net-zero by 2050. The table below sets out further information relating to Japan's updated NDC:</p> <table border="1" data-bbox="389 802 1471 917"> <tbody> <tr> <td data-bbox="389 802 745 858">Emissions reduction target</td> <td data-bbox="745 802 1471 858">Emission reductions of 46% below 2013 levels in 2030. Net-zero by 2050.</td> </tr> <tr> <td data-bbox="389 858 745 885">Coverage</td> <td data-bbox="745 858 1471 885">100% (economy-wide)</td> </tr> <tr> <td data-bbox="389 885 745 917">Gases</td> <td data-bbox="745 885 1471 917">CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ and NF₃.</td> </tr> </tbody> </table> <p data-bbox="389 952 618 979">Domestic policies</p> <p data-bbox="389 1015 965 1042"><u>Long-term Strategy under the Paris Agreement⁴⁹</u></p> <p data-bbox="389 1077 1998 1136">The <i>Long-term Strategy under the Paris Agreement</i> was adopted by the Cabinet of Japan on 11 June 2019. The Strategy covers the period 2018 to 2050. The Strategy was updated in October 2021 and included the revised target of net zero by 2050.</p> <p data-bbox="389 1171 1998 1230">As the Strategy identifies, "[e]nergy-related CO₂ accounts for over 80 % of Japan's GHG emissions". As a consequence, much of Japan's decarbonisation requires transformation of the energy sector.</p>	Emissions reduction target	Emission reductions of 46% below 2013 levels in 2030. Net-zero by 2050.	Coverage	100% (economy-wide)	Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ and NF ₃ .
Emissions reduction target	Emission reductions of 46% below 2013 levels in 2030. Net-zero by 2050.						
Coverage	100% (economy-wide)						
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ and NF ₃ .						

⁴⁸ [https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Japan%20First/JAPAN_FIRST%20NDC%20\(UPDATED%20SUBMISSION\).pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Japan%20First/JAPAN_FIRST%20NDC%20(UPDATED%20SUBMISSION).pdf)

⁴⁹ Japan Government (2021) *Long Term Strategy under the Paris Agreement* https://unfccc.int/sites/default/files/resource/Japan_LTS2021.pdf

In relation to energy, the Strategy sets out a "future vision" low-carbon energy sources, electrification of demand and an increase in energy efficiency all contribute to decarbonising the sector.

For areas that are hard to decarbonise, Japan proposes to rely on CCUS, specifically "Direct Air Carbon Capture and Storage (DACCS), Bio- Energy with Carbon Capture and Storage (BECCS), and forest sink measures".

Japan has no end date for domestic coal, and while the Government has indicated support for the closure of inefficient coal power plants by Japan continues to rely on coal power and supports the building of new plants.

Global warming tax⁵⁰

Japan was an early adopter of economic policy measures to achieve emissions reduction:

- in 1998, Japan passed the 'Law concerning Promotion of Measures to cope with Global Warming promoting emissions reduction on a voluntary basis;
- in 2005, Japan introduced the Voluntary Emissions Trading Scheme (now superseded).

Both policies did not see effective reductions in carbon emissions.

In 2012, the Government introduced a tax at a rate of JPY 2,89/t-CO₂. The tax aims to reduce 80% of Japan's greenhouse gas emissions by 2050. The tax applies to coal and is calculated on the carbon content. Tax generated is recycled into renewable energy projects and energy efficiency programs.

Plan for Global Warming Countermeasures

The *Plan for Global Warming Countermeasures* was adopted by the Cabinet of Japan on 13 May 2016 and amended in October 2021.⁵¹ The Plan incorporates the emissions reduction target and the sectoral targets and measures set out in Japan's updated NDC. It also emphasises the key role of technology, which the Government is promoting through its "Environmental and Energy Technology Innovation Plan" and its "National Energy and Environment Strategy for Technological Innovation towards 2050".

⁵⁰ Government policy announcement https://www.env.go.jp/en/earth/ets/mkt_mech/scheme-emissions_trading.pdf; Hemangi Gokhale, Japan's carbon tax policy: Limitations and policy suggestions, *Current Research in Environmental Sustainability*, 2021(3).

⁵¹ [https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698023/EPRS_BRI\(2021\)698023_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698023/EPRS_BRI(2021)698023_EN.pdf)

Joint Crediting Mechanism⁵²

Japan has introduced a Joint Crediting Mechanism (**JCM**), through which it cooperates with developing countries to achieve a reduction in greenhouse gas emissions through the distribution and uptake of low-carbon technologies. Although commencing before the *Paris Agreement*, the JCM reflective of article 6 of the *Paris Agreement*.

The JCM's partnership document has been signed by 17 countries. Credits generated from emission reductions under the JCM will be allocated according to agreed terms between the participating countries.

Under the JCM, Japan aims to secure accumulated emission reductions and removals by partner countries at the level of approximately 100 million t-CO₂ by fiscal year 2030. Japan will appropriately count the acquired credits to achieve its NDC.

INDIA

NDC

In November 2021, India announced its intention to reach net-zero by 2070. India has not yet submitted a long-term strategy to the UNFCCC. India's NDC includes the following targets:⁵³

Emissions reduction target	Emission reductions of 33-35% below 2005 levels in 2030. Net-zero by 2070.
Coverage	100% (economy-wide)
Additional commitments	<p>4. To achieve about 40 percent cumulative electric power installed capacity from non-fossil-fuel-based-energy resources by 2030 with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).</p> <p>5. To create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030.</p>

Domestic policies

Perform, Achieve and Trade Scheme

⁵² <https://www.jcm.go.jp/about>

⁵³ The Indian NDC does not specify which sectors or gases are covered by its NDC.

India has a Perform, Achieve and Trade Scheme which reduces energy consumption in energy intensive industries. The scheme involves the trading of energy saving certificates and operates as a market based mechanism.

National Action Plan on Climate Change

In 2006, India introduced the National Environment Plan. India's National Action Plan on Climate Change (**NAPCC**), introduced in 2008, outlines priorities for mitigating and adapting to climate change. NAPCC established "missions" to develop mitigation and adaptation policies. Localised policies are also developed through the State Action Plan on Climate Change.

Clean Environment Cess

In 2010, India introduced a "carbon tax equivalent" on local and imported coal to feed into the National Clean Energy and Environment Fund.

The introduction of the Goods and Service Tax in India in 2017 abolished by the cess. A new cess on coal production, called the GST Compensation Cess, was put in its place at the same rate of 400 rupees per tonne.

National Electricity Plan

In April 2018, India released its National Electricity Plan (**NEP**), which is valid to financial year 2026/27. The NEP provides electricity demand forecasts for the period 2017-2026/27, calculates installed capacities from conventional and renewable energy sources needed to meet that demand and describes relevant policies.

During the period 2017-22, no additional capacity of coal will be added (except for the coal power plants currently under construction). Instead, demand growth will be met by additional installed capacities in gas, hydro, nuclear and renewables. A share of 56.5% of installed capacity is expected to come from non-fossil sources by 2027. In 2027 the country aims to have 275GW installed capacity of solar and wind, 72GW of hydro and 15GW of nuclear. The Central Electricity authority estimates that this means that no additional coal capacity is needed until at least 2027.

Draft National Energy Policy

According to India's *Draft National Energy Policy*, published in 2017, coal based power generation capacity is likely to increase to more than 330-441GW by 2040 (from 192GW in FY 2017). The Draft Policy indicates India's preference for demand to be met by domestic coal, however the percentage of coal that is imported is likely to remain high unless domestic production increases rapidly.

According to India's NDC, coal will continue to dominate power generation in the future. The Government has introduced the following initiatives to improve the efficiency of coal-fired power plants:

- all new, large coal-based generating stations have been required to use highly efficient supercritical technology;
- renovation, modernisation and life extension of existing old power stations is being undertaken in a phased manner;
- approximately 144 old thermal stations have been assigned mandatory targets for improving energy efficiency; and
- the introduction of ultra-supercritical technology, as and when commercially available is part of future policy.

SOUTH KOREA

NDC

In December 2021, South Korea submitted an update to its first NDC, increasing its 2030 target from the previous 24.4% reduction on 2017 levels to 40% below 2018 levels. The updated NDC is summarised in the following table.⁵⁴

Emissions reduction target	Reduction of 40% from 2018 level by 2030. Net zero by 2050.
Coverage	Economy-wide (100%)
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ .

Domestic policies

Carbon Neutrality Act 2021

In September 2021, Korea enacted the *Framework Act on Carbon Neutrality and Green Growth for Climate Crisis Response* which enshrined the 2050 net zero goal and set a minimum emissions reduction target 35% below 2018 levels by 2030. Various policy options are included in the Act including requiring climate impact assessment for projects.

Korean New Deal

Under the Korean New Deal, the recovery from the coronavirus pandemic is through the lens of supporting a "structural transition towards a digital and green economy". The overarching goals of the policy are achieving a universal employment insurance system and setting the national path towards net-zero emissions. The policy pillars of the Green New Deal are a green transition of infrastructure, low-carbon and decentralised energy systems, and innovation in the green industry.

Ninth Electricity Plan

⁵⁴ https://unfccc.int/sites/default/files/NDC/2022-06/211223_The%20Republic%20of%20Korea%27s%20Enhanced%20Update%20of%20its%20First%20Nationally%20Determined%20Contribution_211227_editorial%20change.pdf

The 9th Basic Plan for Long-term Electricity Supply and Demand 2020-2034 introduced in December 2020 updates the domestic energy mix project for 2030 to include 30% coal (from 40% in Eighth Plan), 25% nuclear, 23% LNG, 21% renewables, and 1% from other sources. Coal will also peak in 2024 before phasing down to 2054.

Act on the Allocation and Trading of Greenhouse Gas Emission Permits

South Korea enacted the *Act on the Allocation and Trading of Greenhouse Gas Emission Permits* in 2012 and launched an ETS on 1 January 2015. It currently has a price of approximately US\$20/tCO₂e. The ETS covers 68% of Korea's emissions, including emissions from the industry, power, aviation, building and waste sectors. Liable emitters comprise companies and factories in the relevant sectors which produce over 125,000 tons of CO₂ per year and 25,000 tons of CO₂ per year (respectively). This represents approximately 600 companies, including 5 domestic airlines.

During the first phase of the scheme (2015-2017), only domestic offset credits could be used for compliance. Certified Emission Reductions generated from domestic Clean Development Mechanism projects and Korean Offset Credits were allowed. These credits had to be converted to Korean Credit Units before being used for compliance. Offsets could only be used for up to 10% of each entity's compliance obligation.

During the second phase of the scheme (2018-2020), Certified Emission Reductions generated from international Clean Development Mechanism projects developed by domestic companies can be used for compliance (up to 5% of each entity's emission volume).

During the third phase of the scheme (2021-2025), credits of up to 10% of each entity's compliance obligation with a maximum of 5% coming from international offsets will be allowed.

CHINA

NDC

In October 2021, China updated its NDC the details of which are set out below.⁵⁵

Emissions reduction target	Reduction of emissions by 65% by 2030 based on 2005 levels. Net zero by 2060 with emissions peaking before 2030.
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Domestic policies

⁵⁵ The Chinese NDC does not specify whether the NDC is economy wide, which sectors it applies and what gases it covers. See 2021 NDC submission here <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China%E2%80%99s%20Achievements,%20New%20Goals%20and%20New%20Measures%20for%20Nationally%20Determined%20Contributions.pdf>

China's Long-term low Greenhouse Gas Emission Development Strategy⁵⁶

In 2021 China also submitted its *Long-term low Greenhouse Gas Emission Development Strategy*. The Strategy has 10 strategic priorities. Priority 2 is to build a clean, low-carbon, safe and efficient energy system. This includes promoting clean utilisation of coal and control the growth of coal consumption during the “14th Five-Year Plan” (14th FYP, 2021-2025) period, and gradually reduce it during the 15th FYP period (2026-2030).

14th Five-Year Plan⁵⁷

China published its *14th Five-Year Plan* in March 2021. The Plan sets out the pathway for development over the next five years.

Specifically on sustainability, the Plan supports the updated NDC aiming for peak emissions before 2030 will put enormous pressure on the economy to reach carbon neutrality by 2060. During 2021–2025, energy and carbon intensity are targeted to decline by 13.5% for energy and 18% for carbon intensity per unit of GDP.

While coal consumption will continue during this five year plan, it is expected that over the *15th Five-Year Plan* it will be phased down with fossil fuel consumption peaking in 2030.

National emissions trading scheme⁵⁸

In July 2021 China launched the national carbon emission trading market and is initially focussed on the power generation sector. It is considered the largest carbon market worldwide. The national ETS will also gradually be expanded to include another seven sectors: aviation, building materials, chemicals, iron and steel, non-ferrous metals, pulp and paper, and petrochemicals. Offsets will eventually be available to be used in the ETS, it is expected that domestic offsets that have been used in China's existing regional ETS pilots will be able to be used.

China has seven regional pilot ETSS which have operated as example markets since 2011. The trading price is mainly maintained in the range of 20 to 70 yuan per ton and affect various sectors.

⁵⁶ <https://unfccc.int/sites/default/files/resource/China%E2%80%99s%20Mid-Century%20Long-Term%20Low%20Greenhouse%20Gas%20Emission%20Development%20Strategy.pdf>

⁵⁷ <https://www.adb.org/sites/default/files/publication/705886/14th-five-year-plan-high-quality-development-prc.pdf>

⁵⁸

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China%E2%80%99s%20Achievements,%20New%20Goals%20and%20New%20Measures%20for%20Nationally%20Determined%20Contributions.pdf>

Energy Supply and Consumption Revolution Strategy (2016– 2030)⁵⁹

The *Strategy* was released in 2016 and sets out the plan for improving energy efficiency, diversifying energy, embracing new technologies and cooperating with other countries in improving energy security.

China is still relying on coal in its energy mix although is seeing an uptake in renewables. Coal power that is still operational is increasingly relying on high quality development of coal power with the aim that ultra-low polluting coal-fired power should represent more than 80% of the fleet.

Carbon Capture and Storage Demonstration Project

China supports CCUS and has several ongoing pilot projects including:

PROJECT	LOCATION	SCALE	CONTENT
Research and Demonstration of CO ₂ -EOR in PetroChina Jilin Oilfield	Jilin Oilfield	300,000 tons / year	CCUS-EOR
Shanghai Shidongkou CO ₂ Capture and Storage Demonstration Project of Huaneng Group	Shidongkou, Shanghai	120,000 tons captured per year	Post-combustion capture
Coal-to-Liquids CO ₂ Capture and Storage Demonstration of Shenhua Group	Ordos, Inner Mongolia	100,000 tons captured and stored per year	Coal liquefaction plant + saline aquifer
CO ₂ Capture from Coal Chemical Industry and CO ₂ Flooding Demonstration of Yanchang Petroleum Group	Yulin, Shaanxi	300,000 tons captured per year	CO ₂ CCUS-EOR from coal chemical industry
EOR Demonstration in Sinopec East China Oilfield	Dongtai, Jiangsu	160,000 tons captured per year, Accumulated 700000 tons	EOR

TAIWAN

NDC

Taiwan is not recognised as an independent sovereign nation and therefore is not a member of the United Nations and consequently cannot be a party to the *Paris Agreement*. Nonetheless, it has put forward an INDC and is also implementing measures to achieve its

⁵⁹

<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China%E2%80%99s%20Achievements,%20New%20Goals%20and%20New%20Measures%20for%20Nationally%20Determined%20Contributions.pdf>

INDC. In March 2022, Taiwan published “Taiwan’s Pathway to Net-Zero Emissions in 2050” and has since taken steps towards amending its Greenhouse Gas Reduction and Management Act 2015 to include the goal of net zero emissions by 2050. Taiwan’s INDC is summarised in the following table.

Emissions reduction target	An emissions reduction target of 50% from the BAU level by 2030.
Coverage	Economy-wide
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ and NF ₃ .

Domestic policies

Greenhouse Gas Reduction and Management Act 2015

Taiwan enacted its *Greenhouse Gas Reduction and Management Act* on 1 July 2015. Key features of the Act are:

- Article 4 of the Act sets a goal to reduce GHG emissions to no more than 50% of 2005 emissions by 2050;
- Article 5(1) requires the Government to draft mid- to long-term strategies for gradually reducing dependence on fossil fuels, with a mid-to long-term aim of improving renewable energy policies, and the gradual realization of a nuclear-free homeland;
- Article 5(3)-(4) recommends that the Government implement tax mechanisms on imported fossil fuels based on their CO₂-e emissions, and actively help traditional industries achieve energy conservation and carbon reduction or transition, develop green technology and green industry, create new employment opportunities and green economies, and promote a low-carbon, green growth plan for Taiwan’s infrastructure;
- Article 8 requires relevant government agencies to promote GHG reduction and climate change adaptation through, relevantly, development of renewable energy and energy technology, reduction in GHG emissions by industrial sectors, establishment of GHG cap-and-trade scheme and facilitation of international emission reduction cooperation mechanism, and research, development and implementation of GHG reduction technologies; and
- Article 18 requires Taiwan’s Environmental Protection Administration to implement a domestic cap and trade scheme, and Article 20 outlines matters to be considered in the development of the scheme, including trade intensities of various sectors, avoiding carbon leakage and overall national competitiveness.

National Climate Change Action Guideline/GHG Reduction Action Plan

The *Greenhouse Gas Reduction and Management Act* also required the Government to develop the *National Climate Change Action Guideline* and a *GHG Reduction Action Plan*.⁶⁰

The *National Climate Change Action Guideline* is to include periodic regulatory goals, implementation timetables, implementation strategies and an evaluation mechanism.⁶¹

Under the *GHG Reduction Action Plan*, the authorities responsible for the Taiwan's energy, manufacturing, transportation, residential, commercial, and agriculture sectors are required to formulate GHG Emission Control Action Programs. These Action Programs must include GHG emissions targets, timetables and economic incentive measures. These Action Programs are to be regularly reviewed and revised and are to propose improvement plans if sectors are failing to meet their emission targets.

Multiple subsidiary regulations have been introduced, including the:

- Regulations Governing Incentives for Landfill Sites to Reduce Greenhouse Gas Emissions (announced 25 December 2015).
- Regulations Governing Greenhouse Gases Offset Program Management (announced 31 December 2015).
- Management Regulations Governing Greenhouse Gas Emission Inventories and Registration (announced 5 January 2016).
- Greenhouse Gas Reduction and Management Enforcement Rules (announced 6 January 2016).
- First Batch of Emission Sources Required to Report Greenhouse Gas Emission Inventory and Registration (announced 7 January 2016).
- Greenhouse Gas Management Fund Revenues and Expenditures, Safekeeping, and Utilization Regulations (announced 30 January 2016).

Electricity Act 2017

Taiwan passed the *Electricity Act* in January 2017. The objects outlined in Article 1 relevantly include:

- developing effectively managing the national electric power resources;

⁶⁰ Taiwan, *Greenhouse Gas Reduction and Management Act*, Article 9.

⁶¹ Taiwan, *Greenhouse Gas Reduction and Management Act*, Article 9.

- regulating electricity supply;
- facilitating the transformation of energy production;
- reducing carbon emissions; and
- promoting the supply diversification of the electricity industry.

National CCUS Strategic Alliance

Taiwan's EPA established a national CCUS strategic alliance in 2011. This alliance brings together domestic experts from government, academia and industry, for the purpose of developing the technology and regulatory framework required for the commercial use of CCUS technology, with the ultimate goal of achieving widespread use of CCUS technology by 2020. Through the alliance, the Taiwan Cement Corporation (in partnership with the Industrial Technology Research Institute) commissioned the world's first CCUS pilot project in the cement industry in 2013, with the two entities agreeing in 2016 to extend their cooperation on the project.

VIETNAM

NDC

In 2021, Vietnam announced its intention to reach net zero by 2050. That goal is not contained in Vietnam's updated NDC submitted in July 2020, which is summarised below.

Emissions reduction target	Unconditional target of reducing GHG emissions by 9% compared to BAU by 2030 and conditional target of reducing GHG emissions by 27% compared to BAU by 2030.
Coverage	Economy-wide (100%)
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ .

Domestic policies

Power Development Plan

Vietnam's current power plan (revised PDP7) continues to rely on fossil fuels. Of the total 129.5 GW capacity plan for 2030, only 21% will be from renewables (excluding large hydro), whereas 43% will be from coal and 15% from natural gas. Coal currently represents 51% of the total primary energy supply.

The draft PDP8 doubles the current coal capacity to around 40 GW by 2030. This reflects development of new coal plants. Currently 21 GW of capacity are in operation, 19 GW are announced, pre-permitted and permitted, and an additional 8.6 GW are under construction.

Law on Environmental Protection⁶²

From 2022, Vietnam will introduce a domestic emissions trading scheme requiring emitting parties to offset emissions through the purchase of carbon credits. High emitting industries will be first affected by the scheme before reaching further smaller scale entities.

Resolution No 55NQ/TW on the orientation of the National Energy Development Strategy of Vietnam to 2030

On 11 February 2020, this Resolution established the *National Energy Development Strategy*. The Resolution focuses on incentivising renewables in the energy mix with a goal of 15-20% proportion of renewables in the energy mix by 2030, reaching 25-30% by 2045. This is related to a requirement to reduce greenhouse gas emissions by 15%. This goal is supported by preferencing large-capacity and high-efficiency coal-fired thermal power generating units. Where technological upgrades of power producers are not completed or not possible, retirement of those plants will occur.

National Energy Efficiency Program 2019-2030 (VNEEP3)

In 2018, the national Government adopted the third VNEEP. The first VNEEP was developed in 2006. By 2015 energy supply required in Vietnam grew from 29.171 to 70.588 million of tonnes of oil equivalent when compared to 2000. Supply of coal as an energy source has grown eight times across that same period. Forecasts for the period covered by the VNEEP3 expect an average increase of 8.7% per year. The VNEEP3 forecasts an average increase in total power demand domestically of 8.7% per year to 2030.

The focus on energy efficiency by the Vietnamese Government is due to the high potential for economic and emissions savings. For example, the efficiency of coal power plants is 10% below the standard performance of developed countries. The VNEEP3 sets out specific objectives to achieve energy efficiency.

The National Climate Change Strategy and Green Growth Strategy

Developed in 2011, and designed to be a "living" document, the *National Climate Change Strategy* has broad objectives linked to sustainable development and GHG mitigation. The National Climate Change Strategy had an immediate focus on the period 2011-2015, however also sets plans for 2016–2025 as well as objectives for 2050, with a vision to 2100 which are economy-wide including advanced energy technologies, improved energy efficiency.

Vietnam's *Green Growth Strategy* was introduced in 2012 and aims to work with the *National Climate Change Strategy*. Key to the Strategy is the access to new and "green technology" and improving energy efficiency through the introduction of market-based instruments.

⁶² <https://www.worldbank.org/en/news/feature/2021/11/11/carbon-pricing-aids-vietnam-s-efforts-towards-decarbonization>

MALAYSIA NDC

In July 2021, Malaysia submitted an updated NDC. Malaysia's NDC now has the unconditional target to reduce its GHG emissions by 45% by 2030 relative to 2005 levels. In September 2021, the Prime Minister of Malaysia announced Malaysia's the target of net zero by 2050. That goal is not contained in Malaysia's updated NDC submitted in July 2021, which is summarised below.

Emissions reduction target	Emission reductions of 45% by 2030
Coverage	Economy-wide (100%)
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ and NF ₃ .

Domestic policiesTwelfth Malaysia Plan

The Twelfth Malaysia Plan was announced on 27 September 2021. The Plan sets out Malaysia's recovery from the coronavirus and development goals over the next five years. This includes a key theme of sustainability moving towards low-carbon and encouraging net-zero domestic businesses. The Plan indicates the aspirational goal of net-zero by 2050 and not building further coal-fired power plants. Key policies to be implemented include:

- preparing a NDC Roadmap setting out sectorial based emissions reductions;
- considering an appropriate carbon pricing scheme; and
- considering carbon offsetting market scheme.

Green Technology Master Plan 2017-2030⁶³

The Plan sets out various strategic plans across various sectors to achieve their NDC.

In relation to coal, new advanced thermal power generation are expected to become a requirement for new coal-fired plants. No new major coal-fired power plants established post 2020. Further, the Government noted while there is intention to scale up renewable energy, coal-fired power plants are expected to continue to be used while waiting for existing power plant contracts to expire and new gas and renewable energies to scale up.

National Renewable Energy Policy

⁶³ <https://www.pmo.gov.my/wp-content/uploads/2019/07/Green-Technology-Master-Plan-Malaysia-2017-2030.pdf>

The Malaysian Government has set a renewable energy target of 20% by 2025. Additionally, 31% by year 2025, and 40% by 2035.

National Energy Efficiency Action Plan

The Plan covers 2016–2025 supports consistent energy supply and demand. It focuses on three main initiatives which are the Equipment Programme Initiatives, Industrial Programme Initiative, and Buildings Programme Initiative.

THAILAND NDC

Thailand submitted its updated NDC on in October 2020. The table below sets out further information relating to Thailand's updated NDC:

Emissions reduction target	An unconditional target of 20% below BAU by 2030. Increased up to 25% reduction conditional on enhanced access to technology and financial resources.
Coverage	Economy-wide excluding LULUCF
Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, and SF ₆ .

Domestic policies

In 2021, Thailand announced that it is aiming for carbon neutrality by 2065 to 2070. Thailand is now in the process of drafting a Climate Change Act and updating national plans and strategies to reflect that goal.