

# Submission to the Joint Standing Committee on Trade and Investment Growth's Inquiry into Australia's transition to a green energy superpower

**The Department of Climate Change, Energy, the Environment and Water**

## Table of Contents

<b>Introduction .....</b>	<b>2</b>
Harnessing Australia's renewable opportunity.....	2
Global trends.....	4
The role of trade and investment .....	6
<b>The Department's role in the transition .....</b>	<b>8</b>
Managing the transformation to renewable energy .....	8
Developing the clean energy industries of the future .....	10
Sharing benefits and sustainable development.....	13
Driving climate action .....	14
<b>References.....</b>	<b>16</b>

# Introduction

Action on climate change is in Australia's national interest. As noted by the Minister for Climate Change and Energy, the world's climate emergency is Australia's job opportunity.<sup>1</sup>

Australia's abundant renewable energy potential, highly skilled workforce, reputation as a trusted and reliable energy partner, and proximity to key markets provides advantages that position us to become a renewable energy superpower. This would see Australia's economy powered by renewable energy and new industries created to export renewable energy, energy carriers such as hydrogen, value-added energy-intensive products (such as green iron ore and steel), critical materials, and renewable services and technology.

Achieving this transformation would contribute to domestic and global decarbonisation efforts, increase energy security for Australia and our international partners, and create new domestic economic opportunities, particularly for our regions. Trade and investment settings will be critical to facilitate capital and investment, develop markets, and secure key inputs such as skills and supply chains.

This submission focuses on how the Department of Climate Change, Energy, the Environment and Water (the Department) is supporting Australia's transformation to become a renewable energy superpower.

This submission uses the term *renewable energy superpower*. This reinforces that the foundation of this transformation is building and integrating enough renewable energy generation to power Australia and underpin the export of clean energy, products and related services.

## **Harnessing Australia's renewable opportunity**

The Australian Government has legislated targets to reduce greenhouse gas emissions by 43 per cent on 2005 levels by 2030 and reach net zero emissions by 2050. Legislating these targets provides certainty of Australia's commitment to decarbonise our economy to business and the community.

Meeting these targets will require Australia to transform our economy, particularly our energy system. An essential part of this is integrating increased levels of renewable energy generation capacity and storage into the system. Renewables accounted for approximately 32 per cent of generation in the National Electricity Market in 2021-22 and the Australian Government has committed to an 82 per cent national renewable electricity target by 2030.<sup>2</sup> This will require substantial new generation capacity, as well as transmission networks and storage capacity.

Deploying renewable energy, coupled with increased electrification of sectors such as buildings and transport, will play a major role in reducing Australia's emissions and putting us on the path to become a renewable energy superpower.

---

<sup>1</sup> (Bowen, 2022)

<sup>2</sup> (DCCEEW, 2022)

A significant scale-up in renewable energy will be required to underpin clean energy export industries. In the Hydrogen Superpower scenario of its 2022 Integrated System Plan, AEMO forecasts that to reach Australia's full storage and export potential, the National Electricity Market would need to deliver eight times its current electricity production of 180TWh per year by 2050.<sup>3</sup> Under Net Zero Australia's preliminary modelling, over 460 GW of wind and solar generation would be required by 2050 if Australia was to become a major producer and exporter of green iron, hydrogen and other products – around twenty times the 22 GW of wind and solar capacity in operation in 2020.<sup>45</sup>

In addition, continued technological innovation and development is required. Clean energy technologies, such as hydrogen, will be necessary to decarbonise hard-to-abate sectors such as heavy transport and industry which can't be easily electrified. Export industries of the future like green iron and steel production and green alumina and aluminium production require continued innovation and research into new methods of production and transportation, including the use of hydrogen. Many of these technologies are at early stages and further investment is required for development and commercial deployment.<sup>6</sup>

A range of other key enablers are essential to support the scale-up of renewable energy and facilitate the development of potential new export industries. These include:

- **Infrastructure:** New clean energy industries will rely on leveraging existing assets and building new infrastructure, including investment in new common-use facilities. The National Hydrogen Infrastructure Assessment is currently under development and will outline infrastructure required to develop a hydrogen industry, including for export.
- **Supply chains:** Access to secure and reliable supply chains for materials, products and inputs is fundamental to building large-scale renewables and developing new export industries. Some supply chains are increasingly concentrated – for example, China has over 80 per cent market share of the solar manufacturing stages from the production of polysilicon to panels.<sup>7</sup>
- **Investment:** Building the energy generation and other facilities necessary to transform our economy to export renewable energy and related products will require unprecedented investment. For example, Deloitte estimated that \$420 billion in additional new investment would be required to transition Australia's economy to net zero by 2050.<sup>8</sup>
- **Skills:** Australia will need to ensure access to a skilled workforce to support the significant growth in deployment of clean energy and development of new industries. Some estimates predict renewable energy exports and related opportunities could add 395,000 new jobs to

---

<sup>3</sup> (AEMO, 2022)

<sup>4</sup> (Net Zero Australia, 2022) p. 68

<sup>5</sup> (DCCEEW 2022) p. 26

<sup>6</sup> (IEA, 2020)

<sup>7</sup> (IEA, 2022)

<sup>8</sup> (Deloitte Access Economics, 2022)

Australia's economy by 2040.<sup>9</sup> However, shortages are already being reported, particularly for engineers and electricians.<sup>10</sup>

- **Community support and benefit** – renewable export industries will need community support and social licence to operate. Positive and genuine community engagement, including with First Nations peoples, is essential to ensure communities share in the benefits of new industries. The net zero transformation will require changes in how land is used. Ensuring new developments drive environmental as well as economic outcomes will also be essential for the transformation to deliver for Australia.

## Global trends

### *Accelerating deployment of renewables*

There are a number of drivers accelerating the transition to renewables, the most significant being the cost of energy. For Australia, solar and wind are now the cheapest forms of new electricity generation, displacing fossil fuel generation as it becomes uneconomical and facilities reach retirement age.<sup>11</sup><sup>12</sup> The cost of renewables is continuing to drop, with the International Energy Agency (IEA) confirming wind and solar represent the cheapest source of new power capacity in most markets. This is the case even without considering the high prices for coal and gas in 2022.<sup>13</sup>

This trend has been accelerated by recent global energy shocks like the COVID-19 pandemic, which put global energy supply and demand out of balance, resulting in higher global energy prices.<sup>14</sup> This has been further exacerbated by the war in Ukraine, resulting impacts on Russian energy supply, and issues with shipping and commercial insurances and loan arrangements.

### *Global decarbonisation driving demand for renewable energy exports*

While renewable energy will play a major role in global efforts to reach net zero emissions, renewable resources are not evenly distributed around the world, and many of Australia's major trading partners have more limited or expensive renewable energy opportunities. Demand is growing around the world for clean energy, driven by decarbonisation efforts of Australia's major trading partners, the international shipping industry and the global energy crisis.

Opportunities are emerging for Australia to export energy, either directly by cable or using an energy carrier such as hydrogen or ammonia. Australia is well positioned to take advantage of emerging demand, with 262,000 square kilometres of land (3 per cent of Australia's total land area) classified as 'highly suitable' for hydrogen production using renewable electricity.<sup>15</sup> Accenture

---

<sup>9</sup> (Accenture, 2021)

<sup>10</sup> (Clean Energy Council, 2022)

<sup>11</sup> (International Energy Agency, 2022) p. 306

<sup>12</sup> (Graham, et al., 2022)

<sup>13</sup> *ibid.*

<sup>14</sup> (Molnar & Alvarez, 2022)

<sup>15</sup> (COAG Energy Council, 2021)

estimates Australia's renewable hydrogen exports could be worth \$28.9 billion per annum in 2040 and create around 33,000 direct and indirect jobs by that time.<sup>16</sup>

Existing trade partners like Japan, the Republic of Korea and Germany are setting the pace of hydrogen export development. Japan's Green Growth Strategy states Japan expects to use up to 3 million tonnes of hydrogen and ammonia domestically by 2030, rising to 20 million tonnes by 2050.<sup>17</sup> Japan is investing in the development and commercialisation of clean hydrogen supply chains to support these needs, including through its ¥2 trillion Green Innovation Fund.<sup>18</sup> The Republic of Korea plans on importing 1.96 million tons of clean hydrogen per year from 2030 rising to 5.3 million tons by 2040, while Germany is working closely with Australia to build a global hydrogen industry with deep and robust supply chains and accelerate pathways to achieve net zero emissions as soon as possible. Germany has also announced their €4 billion H2Global initiative which will bridge the cost gap between renewable hydrogen imports from non-EU countries and domestic buyers.<sup>19,20,21</sup> By meeting these needs, Australia can contribute to global decarbonisation goals.

#### *Clean energy supply chains for energy security*

Energy security is now firmly linked to the energy transition, with major economies taking significant steps to shore up their energy security and resilience, and reduce emissions at the same time. Clean energy, particularly in the form of renewables, is seen as a way to achieve both of these aims. However, clean energy technologies and products have supply chain vulnerabilities which require action to ensure the security advantages of renewable generation aren't undermined.

The drive towards renewables has highlighted vulnerabilities in global supply chains for technologies such as solar PV and batteries that are critical for the energy transition. Currently, some clean energy supply chains are highly concentrated which increases the risk local supply chain disruptions have global impacts on supply, and subsequently price.<sup>22</sup> In other supply chains, such as electrolyzers used in renewable hydrogen production, an emerging industry is being stretched by rapidly growing global demand.<sup>23</sup> Major economies are looking to improve the resilience of these supply chains by identifying and scaling diverse, innovative and alternative sources of clean technology components.

As an open and engaged international trading nation, Australia supports the free and open rules-based system and the opportunities it promotes. As part of this, the Government is committed to working with international partners to meet our global aims in achieving net zero emissions and transforming our economies. The Sydney Energy Forum, co-hosted by the Australian Government and the International Energy Agency in July 2022, is an example of how governments and industry

---

<sup>16</sup> (Accenture, 2021)

<sup>17</sup> (METI, 2021)

<sup>18</sup> <https://green-innovation.nedo.go.jp/en/about/>

<sup>19</sup> (Austrade, 2022)

<sup>20</sup> (DCCEE, 2022)

<sup>21</sup> (IEA 2022)

<sup>22</sup> (IEA, 2022)

<sup>23</sup> (IEA, 2022)

can come together to drive the transition to a clean energy system while developing and maintaining diverse and reliable clean energy supply chains.

These supply chains are essential parts of transforming the energy system. Australia is well-placed to help our international partners access the critical minerals and predecessors necessary for building renewable technologies. The Department is collaborating closely with the Department of Industry, Science and Resources as they lead the Government's agenda on building secure and diverse critical mineral and resources supply chains.

#### *Rise in Government support measures*

Other governments are increasing their investment in and support for renewable skills and supply chains and for clean energy technology development and deployment. On August 16 2022, the United States President Joe Biden signed the Inflation Reduction Act (IR Act) into law. The IR Act is the US' largest commitment to combat climate change and drive the clean energy transition. Costing close to half a trillion Australian dollars, it offers incentive-based investments focussed on clean technologies and energy.

The IR Act is fundamentally reshaping the US tax system to incentivise the manufacturing industry and clean energy generation critical to achieving net zero emissions by 2050, transforming the operating context for business at an economy-wide level. It is an historic inflection point in the global energy transformation. The investments touch on innovation through to deployment. The IR Act is expected to re-align global clean energy supply chains, drawing labour, capital and technology to the US. The implications of the world's largest economy pivoting towards net zero will accelerate the growth of the global clean energy market, opening up new trade flows.

Other countries are also heavily investing in the transition to renewable energy and net zero emissions. The EU has announced the REPowerEU Plan to phase out dependence on fossil fuels and accelerate the rollout of renewable energy. The Plan will require an additional €210 billion between now and 2027 on top of existing funding, such as the €225 billion available in loans under the Recovery and Resilience Facility.<sup>24</sup> The Plan will reduce energy use through energy efficiency measures, accelerate the roll-out of renewables, develop a hydrogen supply chain by setting a target for 10 million tonnes of hydrogen imports by 2030, and various other measures. Canada has announced a 40 per cent refundable tax credit for low emissions hydrogen and a 30 per cent refundable investment tax credit for clean technology, as well as CA\$2.2 billion to implement their Indo-Pacific Strategy, part of which aims to position Canada as a reliable supplier of clean energy in the region.<sup>25</sup> These commitments demonstrate how other countries are investing in their own renewable energy transformation.

---

<sup>24</sup> [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_3131](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_3131)

<sup>25</sup> <https://www.international.gc.ca/transparency-transparence/indo-pacific-indo-pacifique/index.aspx?lang=eng>

## The role of trade and investment

Global trade provides Australian businesses with crucial access to plant, equipment, labour and various inputs unavailable or in short supply in Australia, as well as a market for our exported minerals, renewable energy and energy-intensive products created using renewable energy.

Foreign investment has a role in bringing capital to decarbonise Australia's economy, and scale new industries. While domestic capital and investment will play a central role in funding Australia's energy transformation, the scale of investment needed for Australia to reach net zero and build new export industries means we will need to draw on the pool of global capital looking for clean energy investment opportunities. Australia will be competing for these funds in the context of a global energy transition and decarbonisation effort. Global renewable energy investment of around USD \$667 billion (AUD \$1.03 trillion) per year is needed in the next three years to put the world on track to achieve net zero, and could double or triple again for the period 2026 to 2030.<sup>26</sup>

International markets mean Australian companies can invest and scale beyond the opportunities offered by the domestic market. Indeed, many of our existing profitable industries like iron ore and LNG export significant volumes while meeting domestic demand. Australia's future renewable energy industries, like the nascent hydrogen sector, have potential to replicate this trend. Australia comprises a significant proportion of planned global low emission hydrogen exports by 2030, with 2.7Mt hydrogen per year expected to be produced in Australia out of the planned 12Mt in low emissions hydrogen per year globally.<sup>27</sup> Effective international cooperation and engagement is essential for attracting investment and for ensuring trade settings are efficient while protecting Australia's national interests and domestic energy security.

The Department of Foreign Affairs and Trade's submission to the Inquiry provides further detail on how the Government is positioning Australia to benefit from open rules-based trade systems while developing clean energy industries.

---

<sup>26</sup> (BloombergNEF, 2022) p. 14.

<sup>27</sup> (IEA Global Hydrogen Review 2022) p. 72.

# The Department's role in the transition

The Department of Climate Change, Energy, the Environment and Water is responsible for driving climate action, science, and innovation; building a secure and sustainable energy system; and improving stewardship and sustainable management of Australia's environment and water systems.

This section focuses on the Department's role in implementing policies which support Australia's path to become a renewable energy superpower, and therefore does not cover all climate and energy initiatives led by the Department.

## Managing the transformation to renewable energy

The Department has primary responsibility for managing the transformation of Australia's energy system towards net zero, including ensuring that Australians have access to affordable and reliable energy.

### *National Energy Transformation Partnership*

The Department, on behalf the Commonwealth, is working with officials from state and territory governments to implement and administer the National Energy Transformation Partnership (the Partnership). The Partnership is an 'umbrella' framework for the short, medium, and long-term actions that governments must take to support the sustainable transformation of Australia's energy system to net zero and maximise the economic opportunities offered by the transformation.

The Partnership is structured around six priority themes that are considered critical to the successful transformation of Australia's energy system:

- Accelerate delivery of priority transmission
- Plan for generation and storage adequacy
- Understand demand evolution
- Coordinate gas and electricity planning
- Addressing enabler requirements
- Enhance energy security management.

Against these priority themes, governments will deliver a series of interrelated and evolving work streams to support the energy transformation. This includes the development of a new Commonwealth revenue underwriting mechanism – the *Capacity Investment Scheme* - that will accelerate investment in clean dispatchable power to help reduce investment uncertainty and result in lower prices over the medium to long term.

Another action underway under the NETP is the development of the National Renewable Energy Supply Chain Action Plan, due by the end of 2023. This will improve visibility of the renewables pipeline, identify potential opportunities to alleviate supply chain pressures, address vulnerabilities in national capacities and explore opportunities to support local economies, among other roles.



### *Renewable Energy Target*

Investment in renewable energy is driven by a number of measures including the Renewable Energy Target (RET), an Australian Government scheme which provides financial incentives to households and businesses to invest in, and generate, renewable energy.

The RET includes the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). The LRET provides support for eligible renewable power stations such as hydro-electric plants, solar farms and wind farms. Renewable energy power stations that meet the eligibility criteria and become accredited under the LRET are entitled to create large-scale generation certificates – which can be sold to off-set the cost of investment. In 2021, eligible generation under the LRET was 39,000 GWh, exceeding the legislated target by 6,000 GWh. The SRES provides a financial incentive for households, small businesses and community groups to install eligible small-scale renewable energy systems such as solar photovoltaic (PV) systems and solar water heaters. To date, 18.4 gigawatts of small-scale solar PV have been deployed under the SRES.

### *Rewiring the Nation*

Rewiring the Nation will invest \$20 billion through low-cost finance to rebuild and modernise Australia's electricity grids. Rewiring the Nation will invest in projects that support grid transformation including projects across the National Electricity Market (NEM) such as those listed in the Australian Energy Market Operator (AEMO)'s Integrated System Plan (ISP), and projects in Western Australia and the Northern Territory.

The new Rewiring the Nation Office in the Department will deliver Rewiring the Nation in partnership with the Clean Energy Finance Corporation (CEFC), providing financing that enables transmission to be built faster and cheaper. The savings realised through low-cost financing will be passed on to consumers.

Rewiring the Nation will accelerate new transmission projects, enabling greater interstate electricity flows, and increasing the availability of lower cost renewable generation and storage. This is consistent with the 'Step Change' scenario in the AEMO's 2022 ISP, which assumes renewables generate 83 per cent of National Electricity Market energy by 2030-31. Rewiring the Nation is already supporting additional access to renewable energy through projects like Marinus Link, VNI West, and Battery of the Nation, and financing for renewable energy zones in Victoria including offshore wind projects.

### *Managing the electricity network*

The Department works closely with AEMO as the NEM network planner, the Australian Energy Market Commissioner as the rule maker for Australian electricity markets, and the Australian Energy Regulator to support the delivery and effective operation of the transmission and storage needed for the energy transition, in partnership with states and territories.

### *Energy Security*

The Department leads on international and domestic energy security issues. Ensuring Australia's domestic energy security and resilience will enable Australia to fully realise its ambition to be a renewable energy superpower.

The Department is proactively managing global risks to Australia's energy security as we transition from a centralised thermal-generating based grid to one that is highly decentralised and driven by variable renewable energy generation. The Department is working to promote Australia's national interests while supporting domestic energy security through international engagement in multilateral energy fora such as the G20 Energy Transitions meetings, APEC Energy Working Group and East Asia Summit, and strategic bilateral engagements.

The Department also works with other agencies to ensure the energy transformation happens securely. We work with the Department of Home Affairs on the appropriate security posture for critical infrastructure in the clean energy sector. We also work with the Treasury to balance the need for foreign investment in clean energy with national security and other concerns.

### **Developing the clean energy industries of the future**

The Department is developing the clean energy industries that will underpin future exports of renewable energy, energy carriers such as hydrogen, and value-added energy-intensive products.

#### *Technology innovation and deployment*

The Department plays an important role in supporting the development of clean energy technologies including working closely with the Australian Renewable Energy Agency (ARENA) and the Clean Energy Finance Corporation (CEFC), the two key agencies driving technology innovation and deployment in Australia.

ARENA plays a key role in innovation investment. It supports pilot, demonstration, and pre-commercial renewable energy technologies and projects across various sectors. The Government has expanded ARENA's mandate to support energy efficiency and electrification technologies that can reduce emissions.<sup>28</sup> To date, ARENA has committed \$1.96 billion to 632 projects across Australia. For every \$1 invested by ARENA, there has been \$3.48 of co-investment resulting in total investment of \$8.81 billion. Recently announced projects include AGL's feasibility study into integrating thermal energy storage into the Torrens B Power station, Yuri SPV's deployment of a 10MW hydrogen electrolyser powered by renewable energy in Karratha, and Alcoa's pilot program testing the technical and commercial feasibility of electrifying alumina refining through calcination.

As a specialist investor and a world leading example of a green bank, the CEFC supports investment across solar, energy storage, bioenergy and wind. The CEFC operates with a national focus to deliver finance that fills market gaps for pre-commercial and commercial-ready projects.<sup>29</sup> Over its 10 years of operation, the CEFC has made over \$10.76 billion in lifetime commitments, with a lifetime private sector leverage of \$2.42 for every \$1 in CEFC funding spent. Recently announced projects include

---

<sup>28</sup> <https://arena.gov.au/>

<sup>29</sup> <https://www.cefc.com.au/>

\$175 million for Stage 1 of the Golden plains Wind Farm, \$160 million in financing for the Southern Downs Renewable Energy Zone, and a further \$10 million investment in Australian advanced electrolyser technology company Hysata, following an initial \$750,00 investment in 2021.

### *Powering the Regions Fund*

The Department administers the \$1.9 billion Powering the Regions Fund which supports regional Australia's transition towards net zero emissions. It will provide dedicated funding to ensure traditional and new industries in regional Australia can harness the economic opportunities of decarbonisation. This Fund will support new jobs and long-term international competitiveness. One of the Fund's objectives is supporting the development of new clean energy industries to help the regions contribute to Australia's emission reduction targets while growing the industries, jobs and export markets of the future. The Department is currently undertaking the consultation necessary to design this program.

### *Hydrogen*

The Department leads the implementation of the National Hydrogen Strategy, working closely with state and territory governments. The strategy is focused on actions that remove market barriers, efficiently build supply and demand, and accelerate the global cost-competitiveness of Australia's hydrogen industry. On behalf of all jurisdictions, the Department is:

- reviewing legislation relevant to hydrogen industry development
- delivering an annual State of Hydrogen report
- reviewing the integration of hydrogen in gas networks
- undertaking a national infrastructure assessment
- working with the Department of Employment and Workplace Relations (DEWR) on a hydrogen skills and training mapping exercise
- producing community information resources.

The Department is also working bilaterally and through multilateral institutions to build the foundations for an Australian hydrogen export industry with key markets. Part of this is leading work to align international efforts through the International Partnership on Hydrogen and fuel Cells in the Economy (IPHE). This aims to develop a common approach to measuring emissions from hydrogen production. The Government is consulting on a proposed design for a domestic Guarantee of Origin scheme that will provide transparency and certainty over claims of renewable electricity and the emissions associated with hydrogen production. The scheme could be extended to other products over time. It aligns with the work of IPHE and we are engaging with key trading partners to ensure acceptance of the scheme.

We are working with industry to support projects, trials and demonstrations so that we can meet Australia's domestic hydrogen needs and, with time, become a large-scale exporter of hydrogen to our region and beyond. The Government has committed \$525 million to establish hydrogen hubs and to support the growth of Australia's clean hydrogen industry in places such as Gladstone, Townsville, the Hunter Valley, Bell Bay, and the Pilbara. Hubs will co-locate hydrogen users, producers and potential exporters.

### *Developing offshore wind*

The rapid development of an offshore renewable energy sector is crucial to ensure Australia's energy security in the face of an accelerating exit of energy providers from carbon intensive electricity generation. Offshore wind is a particularly reliable form of electricity, with the ability to generate power almost all the time. The scale of potential offshore renewable energy projects also heralds the potential to provide industrial scale decarbonisation of heavy industries with high electricity demands such as smelters and refineries. In addition, excess energy produced by offshore renewables during off peak periods and times of low grid demand can be diverted to the production of hydrogen and support new resource export opportunities.

In June 2022, the *Offshore Electricity Infrastructure Act 2021* (OEI Act) commenced, establishing the legislative framework required to enable the development of offshore wind, and all other types of offshore renewable energy projects, in Australia's Commonwealth waters. The Department is responsible for the ongoing development, implementation and operation of the legislative framework.

Offshore wind turbines are not subject to the same restrictions as their land-based alternatives and have seen vast increases in the economic efficiency of turbines driven by increases in size and output. The current leading turbine has a maximum capacity of 16 MW compared to the first offshore wind farms operating internationally that had a capacity of 4.95 MW. As a result of the increasing economic efficiency and maturing proficiency of the global offshore wind developers, the international offshore wind market has also seen rapid growth. Despite not being an early mover, Australia's extensive coastline, abundant offshore wind resources, urban coastal demographic, and keen industry interest create a nexus of potential for Australia to rapidly become a global leader in offshore wind energy.

In August 2022, the Minister for Climate Change and Energy proposed an area offshore from Gippsland as the first of six priority areas potentially suitable for the development of an offshore renewable energy industry. The declaration of the Gippsland area provides investment certainty to international developers and support Victoria's ambitious clean energy target which looks to establish 9 GW of offshore renewable energy supply by 2040. Other priority areas will be assessed over the next 18 months. As these areas are declared, this will open up Australia's marine estate for the clean energy industry development with the potential to scale rapidly and address Australia's energy security and the development of new renewable energy exports.

### *Carbon Capture, Utilisation and Storage (CCUS)*

The IEA and the Intergovernmental Panel on Climate Change (IPCC) recognise CCUS as essential to reaching global net zero by 2050 targets.<sup>30</sup> The IEA's Net Zero Emissions by 2050 scenario finds that carbon capture, utilisation and storage (CCUS) capacity needs to increase from the current 40 million tonnes of carbon dioxide (Mt CO<sub>2</sub>) per year to 1.6 billion tonnes of CO<sub>2</sub> per year in 2030. In addition, direct air capture technologies will need to capture around 980 Mt of CO<sub>2</sub> in 2050.

---

<sup>30</sup> (IEA 2022)

Australia is well-suited to large-scale deployment of CCUS to facilitate domestic CO<sub>2</sub> abatement and to support emissions reductions in our region. In March 2022, the Oil and Gas Climate Initiative estimated Australia to possess 31.4 gigatonnes Gt of sub-commercial CO<sub>2</sub> storage resources with a further 471 Gt of geological resources yet to be discovered.<sup>31</sup>

The Government is focusing public investment in CCUS to where there is the best case for government support, for example emissions reductions for hard-to-abate industry sectors (such as cement manufacturing) and carbon dioxide removal (including direct air capture). The Government is introducing a new \$130 million Carbon Capture Technologies Program to accelerate research, development and demonstration of novel and emerging CO<sub>2</sub> capture technologies and CO<sub>2</sub> utilisation technologies.

Australia can play a role in developing a regionally cooperative approach toward CCUS commercialisation and deployment in the Asia-Pacific region. Australia is working with like-minded nations to help accelerate deployment of CCUS, including supporting knowledge exchange; research and development to support technical advances and reduce costs; and driving regional CCUS policy and regulatory framework development.

## **Sharing benefits and sustainable development**

The Department is working to ensure communities share in the benefits of the energy transformation, especially First Nations people and regional communities.

### *First Nations engagement*

As part of the National Energy Transformation Partnership, the Department, on behalf of the Commonwealth, is working with states and territories to co-design a First Nations Clean Energy Strategy. The Strategy, and other initiatives like the First Nations Community Microgrids Program administered by ARENA, aims to enable First Nations communities to influence and access the benefits of Australia's renewable energy transformation.

### *Environmental protection and approvals*

Australia's high environmental standards and regulatory regime give investors certainty they are making responsible investments in projects. Through the administration of the *Environment Protection and Biodiversity Conservation Act 1999*, the Department plays a role in ensuring the protection of matters of national environmental significance, including for the renewables industry. Currently, the Department is focussing on the onshore and offshore wind farm sector, including working with the National Offshore Petroleum Safety and Environmental Management Authority to prepare guidance for the offshore wind sector. This work will include engagement with industry and the research community to ensure assessments and approvals can be conducted efficiently and effectively.

The Government has announced environmental reforms in response to the findings of the Final Report of the Independent Review of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (the Samuel Review). Early priorities include improving environmental data, regional

---

<sup>31</sup> (Oil and Gas Climate Initiative, 2022) p. 6

planning and new national environmental standards. The Government has also committed to establishing an independent National Environment Protection Agency (EPA), which will improve trust and transparency in Australia's national environmental laws.

## **Driving climate action**

International cooperation is essential to addressing climate change and critical to securing the investment Australia needs to power our industrial transformation. There is an opportunity for Australia to be among the first movers and gain early advantages in renewable energy and clean technology sectors.

### *Leading international climate and energy engagement*

The Department leads on Australia's international climate engagement and negotiations. International cooperation is essential to address global emissions and critical to drive the investment and collaboration necessary to develop new clean industries. In 2022, the Government pledged Australia's new Nationally Determined Contribution under the Paris Agreement, committing to lowering our greenhouse gas emissions by 43 per cent on 2005 levels by 2030. This target, and Australia's existing net zero by 2050 target, were subsequently legislated. This is a significant increase from our previous commitment and a clear statement of real action on climate change. These actions, alongside other efforts, such as bidding to host COP31 in partnership with Pacific nations, are important steps to enhance Australia's international standing on climate action.

Australia's participation in multilateral forums is how we contribute to the global conversation, and shape international cooperation. The Department collaborates internationally on clean energy innovation through forums including Mission Innovation, the Clean Energy Ministerial, Breakthrough Agenda and the Leadership Group for Industry Transition. Participating in these international collaborative efforts is a way for Australia to attract the investment needed to deploy clean energy technologies and strengthen research and international partnerships.

The Department also leads on the implementation of clean energy partnerships with Germany, India, Japan, the Republic of Korea, Singapore, the United Kingdom and the United States.<sup>32</sup> Work through the Partnerships aims to deepen cooperation on technology development, support regional and global energy transformation, build new clean energy trade opportunities for Australia and increase and diversify clean energy supply chains. The Partnerships are backed with \$500 million in funding for joint projects in areas such as development and deployment of hydrogen, hydrogen supply chains, solar PV manufacturing, and green iron ore and steel.<sup>33</sup> The Department also works jointly with DFAT to implement the Government's \$200 million climate and infrastructure partnership with Indonesia.

### *Safeguard Mechanism*

---

<sup>32</sup> <https://www.dcceew.gov.au/climate-change/international-commitments/international-partnerships>

<sup>33</sup> (DCCEEW, 2022)

The Department plays an important role in developing domestic emissions reduction policies that establish the framework for decarbonisation and encourage investment certainty. One example is the Safeguard Mechanism, which will provide a legislated framework that limits the emissions of large industrial facilities producing more than 100,000 tonnes of carbon dioxide equivalent (t CO<sub>2</sub>-e) each year, covering around 215 facilities.

The Government's reforms to the Safeguard Mechanism will gradually and predictably decline emissions limits, known as "baselines", on a trajectory to net zero by 2050. Facilities will also be able to earn credits when they emit below their baseline, which they can sell to other facilities that need to reduce their emissions. These reforms will drive the decarbonisation of Australia's large industrial sector by providing both a signal and incentive to reduce emissions over time.

The Safeguard Mechanism has been in place since 2016. Businesses are familiar with the scheme. Building on the current framework promotes policy certainty and stability and is supported by business and industry groups as the preferred approach to provide policy certainty for large industrial emitters. Gradually and predictably reducing baselines under the Safeguard Mechanism creates a clear signal to guide business decisions about the deployment of renewable energy and low emissions technologies at industrial facilities.

By establishing a stable and predictable framework to drive emissions reductions, the reforms to the Safeguard Mechanism will strengthen the international competitiveness of our industry as the global economy decarbonises. The active management of Safeguard emissions will spur investment in new clean energy technologies at industrial facilities, creating the opportunity to build new clean export industries.

Reducing emissions will also help to protect Australian industry against transition risks arising from global climate action. These include potential trade measures, such as the European Union's proposed Carbon Border Adjustment Mechanism, and reduced access to private capital due to investors limiting their own exposure to carbon risk.

### *Transport*

Transport is one of Australia's largest sources of emissions, constituting almost 20 per cent, with most being from road vehicles. Passenger cars alone make up almost 10 per cent of Australia's emissions.<sup>34</sup> Improving choice, affordability, and access to infrastructure for electric vehicles (EVs) is critical for reaching net zero emissions by 2050.

As part of the Powering Australia plan, the Department is leading on the development of a National Electric Vehicle Strategy that will help make Australia a globally competitive market for EVs and increased industry development. Governments and industry could unlock further growth and innovation in the full lifecycle of the EV value chain, which could include expanding extraction, processing and refining of critical minerals for global demand, and developing, designing and manufacturing EV components, control systems and batteries.

---

<sup>34</sup> (DCCEEW, 2022)

# References

Accenture, 2021. *Sunshot: Australia's opportunity to create 395,000 clean export jobs*. s.l.:s.n.

AEMO, 2022. *2022 Integrated System Plan*, s.l.: s.n.

Austrade, 2022. *Korean Hydrogen Market Update 2022*.

<https://www.austrade.gov.au/news/publications/korean-hydrogen-market-update-2022>

BloombergNEF, 2022. *Energy Transition Investment Trends 2022*.

<https://assets.bbhub.io/professional/sites/24/Energy-Transition-Investment-Trends-Exec-Summary-2022.pdf>

Bowen, C., 2022. *Climate and Energy Jobs Summit to boost the clean, green and secure jobs of today and tomorrow*. <https://minister.dcceew.gov.au/bowen/media-releases/climate-and-energy-jobs-summit-boost-clean-green-and-secure-jobs-today-and-tomorrow>

Clean Energy Council, 2022. *Skilling the Energy Transition*, s.l.:

[https://assets.cleanenergycouncil.org.au/documents/CEC\\_Skilling-the-Energy-Transition-2022.pdf](https://assets.cleanenergycouncil.org.au/documents/CEC_Skilling-the-Energy-Transition-2022.pdf).

COAG Energy Council, 2021. *Australia's National Hydrogen Strategy*, s.l.: s.n.

DCCEEW, 2022. *Australia's international clean energy partnerships*.

: <https://www.dcceew.gov.au/climate-change/international-commitments/international-partnerships>

DCCEEW, 2022. *Australia's emissions projections 2022*, s.l.: s.n.

Deloitte Access Economics, 2022. *All Systems Go*, s.l.: <https://news.nab.com.au/news/opportunity-in-low-emissions-world> .

IEA (2022), *World Energy Outlook 2022*. <https://www.iea.org/reports/world-energy-outlook-2022>

IEA (2022), *Global Hydrogen Review 2022*, IEA, Paris <https://www.iea.org/reports/global-hydrogen-review-2022>

IEA (2020), *CCUS in Clean Energy Transitions*, IEA, Paris <https://www.iea.org/reports/ccus-in-clean-energy-transitions>,

IEA (2020), *Energy Technology Perspectives 2020*, IEA, Paris <https://www.iea.org/reports/energy-technology-perspectives-2020>

IEA (2022), *Securing Clean Energy Technology Supply Chains*, IEA, Paris <https://www.iea.org/reports/securing-clean-energy-technology-supply-chains>

IEA (2022), *Electrolysers*, IEA, Paris <https://www.iea.org/reports/electrolysers>

IEA (2022), *Solar PV Global Supply Chains*, IEA, Paris <https://www.iea.org/reports/solar-pv-global-supply-chains>



IEA (2022), *Renewables 2022*, IEA, Paris <https://www.iea.org/reports/renewables-2022>

METI, 2021. *Green Growth Strategy Update*.

[https://www.meti.go.jp/english/policy/energy\\_environment/global\\_warming/ggs2050/pdf/02\\_hydrogen.pdf](https://www.meti.go.jp/english/policy/energy_environment/global_warming/ggs2050/pdf/02_hydrogen.pdf)

Molnar, G. & Alvarez, C. F., 2022. *What is behind soaring energy prices and what happens next?*

<https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next>

Net Zero Australia, 2022. *Interim Results*, s.l.: s.n.

Oil and Gas Climate Initiative, 2022. *CO2 Storage Resource Catalogue Cycle 3 Report Appendix E Oceania*, s.l.: s.n.

Graham, Paul; Hayward, Jenny; Foster, James; Havas, Lisa, 2022: *GenCost 2021-22: Final report*,

CSIRO <https://publications.csiro.au/publications/publication/Plcsirop:EP2022-2576>