AUSTRALIAN HYDROGEN COUNCIL

Securing Australia's hydrogen future

The world has changed since the release of the National Hydrogen Strategy in November 2019. With the pandemic and the war in Ukraine we have seen the vulnerability of supply chains and a new focus on building national capabilities and resilience to shock. These factors have amplified the arguments for clean energy and for hydrogen, both for countries to make their own and to partner with others they can trust to supply what they need.

Globally, competition for hydrogen projects is fierce. Significant financial incentives have been announced by various countries, with each jostling for first mover advantage. The international funding and policy approaches announced to date demonstrate governments' recognition that a profound restructuring of the energy system is required and that this is about maintaining economic prosperity for their nations.

The standout policy is the US Inflation Reduction Act (IRA),[1] which is part of a suite of new legislation aimed at increasing US capacity and competitiveness in new and emerging industries. With new government spending of over US$200 billion a year for the next ten years (across the US policies) private sector co-investment is inevitable for both large scale infrastructure projects and smaller, high risk technology commercialisation.

With this legislation, the US government has demonstrated that it seeks to be a market creator, mobilising significant public and private capital and spurring the development of similar schemes globally.[2]

What, then, is Australia's value proposition and competitive offering? And what is the Australian Government's role in reducing project and investment risk and in increasing the relative attractiveness of investment and projects in Australia?

Australia has significant hydrogen export potential, but the potential Australian domestic market is smaller than that in the US. Our distance from our export base adds additional cost and risk (technological and financial) to projects. Further, many, if not all, of the things that are part of Australia's value proposition – such as abundant solar and wind resource, stable government and

[1] Appendix A presents an overview of the key components of the IRA relevant to clean energy in general and the production of hydrogen in particular.

[2] The Indian policy response to the IRA creates offtake demand, whilst RePower EU has a combination of subsidies for production and end use of hydrogen. The Canadian government's newly created investment fund is tasked with de-risking project financing via a range of options, including provision of price certainty and Contract for Difference (CfD) contracts negotiated on a project-by-project basis. China is incentivising development across the value chain, producing hydrogen from a variety of feedstocks, as well as supporting the development and deployment of new technology (such as electrolysers, fuel cells, and vehicles). Appendix B summarises the approaches taken by these jurisdictions.

laws, and highly skilled workers across a range of skills – are present in the main competitor jurisdictions.

The challenges and competition for global investment seem unlikely to be met by Australia attempting to outspend the larger jurisdictions. Without an existing sizeable domestic offtake or manufacturing base, and with our relatively small economy, the Australian response to the IRA must be strategic and targeted, and policy needs to consider and support elements of project development not necessarily reliant on direct cash incentives.

There are several important themes that should underpin future Australian hydrogen policy, as follows.

1. **Energy policy is industrial policy.** Incentives to deliver increased generation and lower power costs inevitably increase the pace of manufacturing investment. We can also grow sovereign capabilities across a range of sectors, which provides both growth opportunities and a degree of economic resilience to external shock.
2. **Cost competitiveness with fossil fuels will not happen without extensive government policy and subsidies.** Governments must be market creators at this stage of the energy transition. This means levelling the playing field with fossils fuels, using an appropriate mix of policy and funding levers. This is not only about funding for pilots but also about major infrastructure investment in the public interest.
3. **Government must help investors see value.** The complexity and uncertainty of the investment environment and the overall ecosystem (multiple states, regulatory differences, permitting within states) is making investors' decisions unnecessarily difficult. Government thus has a role to direct investors' attention to the opportunities; to help create value propositions that investors recognise. This is also about packaging up opportunities to support regional projects, such as port re-developments with onshore or offshore renewable energy zones, pre-approvals for nearby industrial zones, and supporting or co-funding additional transmission or pipeline infrastructure as required.

This paper outlines what the Australian Hydrogen Council (AHC) sees as the necessary minimum steps to respond to the IRA and other international incentives. This should be read within the context of the range of demand initiatives and policy responses that AHC has previously released, including our White Paper of September 2021 and submissions on the issues of hydrogen certification, electric vehicle policy, the safeguard mechanism and other demand-side policy to support the emerging hydrogen industry.

Immediate actions

Ideally there would be a revised strategy and plan to enable the hydrogen sector, within a broader net zero plan. This is still required, but there isn't time to develop this through usual government processes if Australia is to be competitive with other jurisdictions for hydrogen investment dollars, equipment and a mobile workforce. The market urgently requires a signal to show Australia is serious.

Fortunately, there are low regrets policy actions to take in the immediate term. Hydrogen is already used as a feedstock for fertiliser to make ammonia, and for critical chemicals production (such as methanol). Decarbonising these sectors with clean and green hydrogen is clearly going to be

necessary. Similarly, the world is looking to Australia to be a future producer of decarbonised fuel for intercontinental shipping and aviation, which will also grow the ammonia and methanol markets at the least.

There are also cases being made for hydrogen to replace fossil fuels in the production of alumina from bauxite, and to produce direct reduced iron for steelmaking. These are challenging industries to decarbonise given their scale and the cost of long-lived assets, and they need clear government support given that hydrogen is far from cost-competitive with fossil fuel use in these industries.

We recommend that the Australian Government underwrites demand for these strategically important and hydrogen-dependent industries. This could be for a ten-year period, provided that projects are online by 2033. This sort of mechanism is in line with the support packages under the IRA and in Canada. To mitigate and reduce the costs associated with project development (such as transmission costs), the Australian and state governments could collaborate to further incentivise co-location of chemical production within hydrogen hubs, within proximity to other industrial infrastructure such as ports or to REZs.

Recommendation 1: Underwrite demand through a revenue support mechanism (such as contract for difference) intended to incentivise domestic production of critical chemicals and metals that are of strategic and economic importance to Australia, such as iron, alumina, ammonia, urea, methanol and key derivatives.

Recommendation 2: Increase and expand ARENA funding for trials and demonstrations looking at decarbonisation of the production processes for carbon intensive, trade exposed industries such as aluminium and iron ore refineries.

In addition to the significant policy and investment work proposed above, the Australian Government has a key role in developing the export supply chains such as those proposed between Australia and Japan, Korea, Germany and the Netherlands.

The size, scale and complexity of the first large scale hydrogen export projects will require bilateral agreements between governments for bespoke joint support packages. These will need to meet the specific strategic and economic interests of each party, as well as allocate appropriate levels of risk across private and public sector partners. The agreements are likely to include significant expenditure on the required infrastructure, as well as provision of underwriting support for the trade itself.

Recommendation 3: Develop bespoke joint support packages between Australia and its trading partners that underwrite trade and support necessary infrastructure.

Beyond the next 12 months

It is time for a revision of the hydrogen strategy. This provides an opportunity to respond to the local and global changes since 2019, to provide a plan for the transition (or at least clarify hydrogen within a net zero plan) and to reconsider the best range and combination of long-term economic mechanisms to develop the industry, including grants, debt and underwriting.

Refreshing Australia's hydrogen strategy provides an opportunity to shift the focus to job creation, retention of manufacturing capability, and assisting heavy industry to decarbonise. It can usefully shape the planning and regulatory environment and help in the development of investable propositions to attract a range of co-investors. It also provides an opportunity to consider a skills plan that is responsive to project needs.[3]

This cannot be left to chance, or to the whims, complexities, and uncertainties of a nascent market.

The energy and industry transition will be materials intensive, as well as capital intensive. It will connect complex systems and require fundamental change, planning and creativity across sector, departmental and political boundaries. Ideally, a state by state, sector by sector, commodity by commodity analysis would be undertaken, to assess relative strengthens and identify gaps in order to inform development of infrastructure and project investment propositions. Net Zero Australia's[4] modelling provides a framework for consideration of the size and scale of investment required to replace existing fossil generation and for potential location of the additional industry investments.

However, this is perhaps a multi-year and staged project. The refresh of the National Hydrogen Strategy can be completed more quickly if it is focused on alignment with broader energy and decarbonisation policies and seeks to embed hydrogen value chains within other industry and manufacturing packages.

Recommendation 4: Develop a revised hydrogen strategy to *at the very least* address funding criteria to incentivise the production of hydrogen in areas where Australia has a competitive advantage, such as in the production of iron. Funding could be matched by the states and territories for key projects, and perhaps split so that one funding stream defrays capital costs and the other provides long term underwriting for contracts.

It is also vital to plan for the industry's development on the ground, and support supply chains. The need for a hydrogen equipment, technology and services (HETS) sector[5] across Australia (and particularly the regions) cannot be underestimated.

Support for a HETS sector also does not need to rely on major direct subsidy. Unlike the US IRA package, which needed to deliberately financially incentivise investors to train apprentices and pay workers appropriately, Australian governments can target employment and training programs to ensure workers and apprentices are appropriately reskilled and retooled to engage in emerging opportunities. Government can also seek to encourage project developers (government and industry) to reassess procurement models and guidelines to review how decarbonised and locally sourced services and equipment are prioritised.

Technology providers note the lack of regulatory consistency for the import of new technologies, such as electrolysers to Australia. Inconsistencies exist not only between Australia and other countries, but also between Australian states. The Australian Government should consider the creation of soft common user infrastructure – such as testing and prototyping facilities and shared office space – that can facilitate growth through reducing barriers to market for emerging technologies.

[3] For example, the location of many projects is likely to be in regional and remote Australia, making worker attraction difficult and costly and potentially adding to the overall cost of projects, including operational costs.
[4] https://acee.princeton.edu/wp-content/uploads/2022/08/Net-Zero-Australia-interim-results-public-version-25-August-22.pdf
[5] Akin to Australia's successful mining equipment, technology and services (METS) sector.

Recommendation 5: A revised hydrogen strategy should explicitly value and support the development and commercialisation of new technologies and industries, to ensure a pipeline of technologies and researchers in Australia. Alignment should be sought with other support for Australian innovation such as that provided through the Commercialisation Action Plan and National Reconstruction Fund, as well as include dedicated funding for attraction of cleantech scale ups looking to expand to Australia, particularly from the Asia Pacific region.

Common testing and prototyping infrastructure should also be enabled, to allow product testing and optimisation to occur alongside regulatory reform.

Finally, the nascent nature of the hydrogen industry requires deals over at least the next five years to have bespoke construction of financial and non-financial support packages. A range of funding support packages and programs have already been announced by Australian governments, aimed at supporting renewable energy projects, potential hydrogen projects, and targeted industry and skills development. There is currently no mechanism for a streamlined approach to applying for programs, coordinated regulatory approvals or applications for funding that can combine grant and loan applications.

Recommendation 6: The Australian Government should consider establishing a case manager approach within government to assist project developers and funders to tie all potential sources of support together, as well as assist in the coordination of planning and approvals.

Appendix A: The Inflation Reduction Act

The US signed the Inflation Reduction Act (IRA) into law in August 2022.[6] The IRA directs federal funding towards the reduction of carbon emissions, as well as includes measures aimed at reducing healthcare costs and increasing taxpayer compliance. The IRA seeks to incentivise investments into domestic, US based manufacturing capacity and commercialisation of clean technologies such as carbon capture, hydrogen production and procurement of critical supplies to drive the energy transition.

The IRA is part of a suite of new legislation aimed at increasing US capacity and competitiveness in new and emerging industries:

- The Bipartisan Infrastructure Law (BIL)[7] passed in November 2021 provides significant public investment in transportation networks, broadband and public works projects, including US$70 billion in clean energy technology and demonstration projects.
- The CHIPS and Science Act[8] passed in August 2022 focuses on investment in superconductor manufacturing capacity as well as funding R&D in a suite of technologies such as quantum computing, AI, nanotechnology, and clean energy.

Together, these laws – IRA, BIL and CHIPS – introduce over US$2 trillion in new US government spending over the next ten years – US$200 billion per year. The US policies explicitly encourage private sector co-investment in both large scale infrastructure projects and smaller, high risk technology commercialisation, appealing to investor risk appetites across the spectrum – from venture capital to private equity, banking and institutional investors.

Components of the IRA

The IRA sets a target of cutting an additional 1 billion tonnes of emissions by 2030, in order to progress towards the 50 to 52 percent emissions reduction target by 2030, and 100 percent carbon pollution free electricity by 2035 targets set by President Biden in 2021.

The clean energy provisions of the Act focus on the reduction in carbon as opposed to the technology used – with regard to hydrogen production, the IRA makes no differentiation between hydrogen produced from electrolysis using renewable sources or from nuclear, or fossil fuel + CCS derived hydrogen.

The IRA allocates US$5.8 billion to the Office of Clean Energy Demonstration (OCED) to create a program (available until September 2026) to invest in projects aimed at reducing emissions in hard to abate sectors and industries (steel, cement, iron, chemicals etc) and includes provisions for the retrofitting of existing facilities.

The IRA also allocates $11.7 billion for the Department of Energy Loans Program Office (LPO) to support issuance of new loans. It also increases the existing loan program authority by $100 billion and appropriates $5 billion for a new loan program – the Energy Infrastructure Reinvestment Program – for up to $250 billion in loans to both new clean energy projects and the retrofitting of existing infrastructure. The LPO is intended to provide access to debt and loan guarantees to

[6] https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/
[7] https://www.whitehouse.gov/bipartisan-infrastructure-law/
[8] https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/09/fact-sheet-chips-and-science-act-will-lower-costs-create-jobs-strengthen-supply-chains-and-counter-china/

innovative, potentially high-impact energy technologies that are not deemed bankable by existing lenders.[9]

The IRA incentivises projects to seek dedicated power sources and allows project developers to combine the investment tax credits (ITC) and production tax credits (PTC) for solar and wind generation projects with the ITC and PTC for hydrogen production.[10] In addition, the IRA also includes an option for direct payment of the tax credit for which the project would be eligible, in place of a tax credit.[11]

Under Section 45V,[12] the base tax credit amount that can be claimed is set to US$0.60 per kilogram of clean hydrogen, increasing to $3 per kilogram when the lifecycle emissions are between zero and 0.45 kilograms of CO2 equivalent per kilogram of hydrogen, alongside employment, wages and apprenticeship requirements. In order to benefit from the full suite of rebates, employment, wages and apprenticeships/training must be part of the project planning.

In addition to the PTCs for clean hydrogen, the IRA creates a 30 percent credit for energy storage technology constructed before 1 January 2025. Clarity around eligibility for this scheme is forthcoming, though it is widely expected to also cover hydrogen related storage. The existing renewable energy ITCs for facilities constructed before 1 Jan 2025 remain and include rebates for solar and wind generation and fuel cell manufacture. If the energy storage project is constructed before 1 January 2025, it will attract a 30 percent credit and in addition, a 10 percent bonus if the project is located in an existing designated energy hub.[13,14]

The IRA also amends the existing section 45Q[15] to provide additional tax credits for the construction of carbon capture facilities. Any carbon capture, direct air capture or carbon utilisation project that begins construction before 1 January 2033 will be eligible for the tax credit. Electricity plants that use carbon capture to reduce emissions by at least 75 percent are also eligible for the 45Q tax credit. As with the hydrogen production tax credits, the maximum credits are achieved only if worker or trainee wages and conditions are met.

The potential to access a US$3 tax credit or direct payment for each kilogram of low-carbon hydrogen produced over a ten year period is revolutionary for the emerging hydrogen sector, with some analysts claiming that green hydrogen costs may reduce to as low as US$0.73 per kilogram in the US Northwest,[16] making green hydrogen cheaper than traditional, unabated hydrogen production at US$3.73/kg. Sourced at this price, green hydrogen could increase the cost competitiveness of green steel and spur demand in other hard to decarbonise sectors such as cement and glass manufacture.

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[9] https://www.energy.gov/lpo/loan-programs-office

[10] This doesn't hold true for hydrogen produced using fossil fuels + CCS - for producers looking to retrofit carbon capture to existing production facilities and to receive the 45Q carbon capture incentive payments, the clean hydrogen credit can't also be accessed.

[11] https://www.shearman.com/en/perspectives/2022/08/inflation-reduction-act-key-green-and-blue-hydrogen-and-ccus-provisions

[12] In the US Internal Revenue Code of 1986

[13] https://www.shearman.com/en/perspectives/2022/08/inflation-reduction-act-key-green-and-blue-hydrogen-and-ccus-provisions

[14] https://www.energy.gov/oced/regional-clean-hydrogen-hubs

[15] In the US Internal Revenue Code of 1986

[16] https://reglobal.co/top-global-renewable-energy-markets/

Appendix B: Responses from other jurisdictions

Deloitte recently released a report titled *Hydrogen: Making it Happen*[17] which looks at the range of conditions required for the large-scale production and deployment of clean hydrogen.

Deloitte outlines a range of conditions for consideration:

- Natural Demand (demand emerging without regulatory support in specific sectors) – aggregation of off-takers.
- Regulation – joined-up regulations across supply and demand.
- Assets, infrastructure, and supply – Faster asset cycles, coupled with infrastructure reuse where possible, complemented by large-scale investment in renewable capacity, grids, and infrastructure.
- Collaboration –new commercial and business models to address systemic challenges and inertia.

The table below is a summary of the policy and regulatory levers deployed across a range of jurisdictions.

Main regulatory archetype	**Demand and supply driven**	**Supply-driven**	**Export-driven**	**Testing**
	EU, Japan & South Korea	**US**	**Australia, Middle East, LATAM**	**China & India**
Supply	• **IPCEI (EU) (~$10bn p.a.):** State aid • **H2Global (DE/NL) (~$4bn):** Auction-based mechanism to match supply and demand • **European Hydrogen Bank (EU) (~$3bn):** Market making mechanism • **GI[II] Fund (J) (~$3bn):** Subsidy for R&D regarding large-scale electrolysis	• **IRA[IV]:** Max. ~$3.0/kg hydrogen tax credit for clean hydrogen • **IRA:** Tax credit for CCUS • **IIJA[V]:** Subsidy to support regional clean hydrogen hubs and electrolyzer development	• **Subsidies (AU) (~$1bn)** for production, supply chain development and hubs; NSW tax credits for electricity dedicated to green hydrogen production • **ETS (MX):** Piloting and implementing a carbon tax scheme • **Tax incentives (COL / DR):** Tax incentives for hydrogen production and power generation with renewable energy sources	• **Green H_2 policy (IN):** Mechanism for consolidated procurement of green hydrogen/ammonia; banking of renewable power is promoted to enhance utilization factors of electrolyzers • **National Hydrogen Mission (IN):** Subsidy of ~$2.4bn towards green hydrogen production, electrolyzer manufacturing, R&D and pilot projects
Distribution	• **CEF[III] for Energy (EU) (~$6bn):** Subsidy fund • **State plan (SK):** Building ammonia and liquid hydrogen receiving terminals	• **IRA:** Tax credit for storage		• **Exemption (IN)** of several transmission and distribution charges – specifically for electricity dedicated towards hydrogen production
Demand	• **RED III (EU):** 50% RFNBO mandate for industry and 2.6% RFNBO mandate for mobility in '30 • **EU-ETS (EU):** Carbon tax • **Subsidies (J&SK):** to support FCVs and hydrogen refueling stations • **Carbon Border Adjustment Mechanism (CBAM):** mechanism that helps to reduce the risk of carbon leakage by encouraging producers in non-EU countries to green their production processes	• **IRA:** Tax credit for use in motor vehicles		• **Subsidies (CN)** to support fuel cell vehicles (FCVs) and hydrogen refueling stations

Source: Figure 12, *Hydrogen: Making it happen*; Deloitte

Canada

- In November 2022, the Canadian government announced several initiatives, including three refundable investment tax credits – one for carbon capture, utilisation and storage, one for

[17] https://www2.deloitte.com/nl/nl/pages/energy-resources-industrials/articles/hydrogen-report.html

clean technologies and one for clean hydrogen – in response to the measures announced in the IRA.

- In particular, CA$15 billion was allocated to the Canadian Growth Fund (CGF),[18] an independently managed investment fund focused new energy and cleantech investments. Initially established as a subsidiary of the Canada Development Investment Corporation (CDEV),[19] the fund is expected to spin out as an independent entity in the first half of 2023.
- According to policy documents, in addition to standard equity or debt financing, the fund will offer CfD or other price assurance contracts, as well as underwrite offtake where demand from prospective buyers is still developing.

India

US$2 billion in subsidies to develop green hydrogen production capacity of 5 million tonnes a year by 2030,[20] as well as a suite of measures to drive demand:

- The state-run Shipping Corp of India will retrofit at least two ships to run on green hydrogen-based fuels by 2027.
- All the state-run oil and gas companies that charter 40 vessels for fuel transport will also have to hire at least one ship powered by green hydrogen each year from 2027 to 2030.
- Green ammonia bunkers and refuelling facilities will be set up at least at one port by 2025 and at all major ports by 2035.
- India aims to end imports of ammonia-based fertiliser by 2034 to 2035, replacing them with local production.
- The government will also invite bids to set up two domestic green hydrogen-based urea and diammonium phosphate plants.
- The policy also requires new steel plants to be capable of operating on green hydrogen.

Japan

- New policy announcement, Green Transformation GX, intended as a successor to the Green Innovation Fund (GIF).[21,22] METI funding under the GIF (matched with industry contributions) for the establishment of hydrogen supply chains (approximately US$70 billion) has yet to be announced, through is expected in early 2023.
- Of key interest is the issuing of green bonds to fund massive industrial and energy generation projects. Voluntary carbon trading has also been proposed, though industry has expressed a high level of concern of decreasing Japanese industrial competitiveness. With the passing of the IRA this issue will need to be reassessed.

[18] https://www.budget.canada.ca/fes-eea/2022/doc/gf-fc-en.pdf
[19] https://www.cdev.gc.ca/home/
[20] https://www.reuters.com/business/energy/india-sets-hydrogen-ammonia-consumption-targets-some-industries-govt-2023-01-13/
[21] https://www.keidanren.or.jp/en/policy/2022/043_point.pdf
[22] https://www.bakermckenzie.com/en/insight/publications/2022/04/green-innovation-fund

EU

- Suite of subsidies and policies released as part of Repower EU, EU210 billion committed in 2022.[23] The *REPowerEU* plan's ambition is to produce 10 million tonnes and import 10 million tonnes of renewable hydrogen in the EU by 2030.
- Options development and analysis focused on:
    - Speed of deployment
    - Minimising the continued use of fossil fuels
    - Cost efficiency (in order to achieve the higher order aim of energy independence and CO2 reduction)
    - Future proofing to the extent possible, in order to decrease financial asset risk.
- The Green Deal Industrial Plan, announced in January 2023,[24] contains no new funding and will focus initially on speeding up regulatory approval for clean tech industrial projects.
- The *Green Deal Industrial Plan*[25] announced in February 2023, outlines a decade of funding and reform based on four pillars:
    - a predictable and simplified regulatory environment;
    - faster access to sufficient funding;
    - skills; and
    - open trade for resilient supply chains.
- The EU proposes to put forward a Net-Zero Industry Act to underpin industrial manufacturing of key technologies in the EU, with a simplified regulatory framework for products that are key to meeting climate goals, such as batteries, windmills, heat pumps, electrolysers, carbon capture and storage technologies.
- The Net-Zero Act proposes to create simple operational criteria for identifying net-zero supply chain projects of strategic interest, the intention being to promote strategic projects, including multi-country projects, with accelerated permitting procedures.
- The EU is also investigating the establishment of regulatory sandboxes to allow for rapid experimentation and disruptive innovation to test new technologies, with the intention of simplifying the process of authorisation/certification for bringing products to market.
- Under *NextGenerationEU*, the 27 national recovery and resilience plans funded by the Recovery and Resilience Facility (RRF) make available EUR 250 billion for green measures, including investments supporting the decarbonisation of industry. Horizon Europe allocates an additional EUR 40 billion to Green Deal research and innovation, also in partnership with

[23] https://www.pubaffairsbruxelles.eu/eu-institution-news/repowereu-joint-european-action-for-more-affordable-secure-and-sustainable-energy/
[24] https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/electric-power/011823-eu-to-counter-us-climate-plan-with-new-green-industry-law-clean-tech-funding
[25] https://commission.europa.eu/system/files/2023-02/COM_2023_62_2_EN_ACT_A%20Green%20Deal%20Industrial%20Plan%20for%20the%20Net-Zero%20Age.pdf

industry. The Cohesion Fund[26] makes around EUR 100 billion available for green transition, including the Just Transition Fund. The Commission will further facilitate the swift mobilisation of Cohesion investments in support of the Net-Zero Industrial Plan, including by speeding up the design and reimbursements of energy efficiency and renewable projects through standard reimbursement schemes.

- Reform of EU grant giving is proposed (in particular the Temporary Crisis and Transition Framework, TCTF), including the possibility of granting higher aid to match the aid received for similar projects by competitors located outside of the EU while ensuring the proportionality of such aid.
- The InvestEU Fund,[27] through the European Investment Bank, the European Investment Fund, the European Bank for Reconstruction and Development and 14 other implementing partners, supports public and private investments in net-zero tech and industrial innovation, mobilising upwards of EUR 372 billion of financing.
- The Innovation Fund[28] allocates an additional EUR40 billion and in June 2023, plans to have an EUR800 million auction for renewable hydrogen. Winners of this auction will receive a fixed premium for each kg of renewable hydrogen produced over a period of 10 years. This pilot auction will be followed by further auctions or other forms of support for hydrogen production and use that contribute towards the REPowerEU hydrogen targets, thereby covering the EU domestic part of the Hydrogen Bank.

China

- Largest hydrogen producer in the world, one third of the global output – 33 million tonnes in 2020. Two thirds of production is derived from coal with only 1% from renewable energy. [29]
- Major producer of clean technologies, including solar panels, electrolysers and fuel cells, as well as electric vehicles.
- Mid and Long Term Hydrogen Industrial Development Plan was issued in March 2022. It sets a target of 100,000 - 200,000 tonnes of renewable hydrogen per year by 2025, primarily to replace grey hydrogen in ammonia and methanol production and in refineries.
- Proposes supportive electricity prices for green hydrogen production in the four key hydrogen clusters.
- The policy also incentivises innovation and industrial development – fuel cells, fuel cell vehicles, electrolysers and materials for hydrogen storage.
- Support for investors is thought to be in the form of preferential loans, subsidies, industrial funds, green bonds, and financial incentives via the carbon trading market.

[26] https://ec.europa.eu/regional_policy/funding/cohesion-fund_en
[27] https://investeu.europa.eu/what-investeu-programme/investeu-fund_en
[28] https://cinea.ec.europa.eu/programmes/innovation-fund_en
[29] https://publications.iass-potsdam.de/pubman/faces/ViewItemOverviewPage.jsp?itemId=item_6002649