GLOBAL CCS INSTITUTE

Valuing emissions reduction: AER draft guidance

CONSULTATION SUBMISSION

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Global CCS Institute

PO Box 23335, Docklands, VIC 8012

www.globalccsinstitute.com

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About the Global CCS Institute

The Global CCS Institute (the Institute) is an international think tank whose mission is to accelerate the deployment of carbon capture and storage (CCS), a vital technology to tackle climate change. Our team drives the adoption of CCS as quickly and cost-effectively as possible by sharing expertise, building capacity, and providing advice to enable this technology to play its part in a net-zero future. The Institute is headquartered in Melbourne, Australia with offices in Washington DC, Brussels, Beijing, London, Abu Dhabi and Tokyo.

The Global CCS Institute welcomes the opportunity to provide its views as part of the Australian Energy Regulator's consultation process on its draft guidance for valuing emissions reductions (VER). Alongside other policies to address the barriers to CCS deployment, the VER could provide a clear price signal that is needed to incentivise investment in CCS projects in Australia.

This submission is separated into two sections. Section 1 describes the essential role of CCS in achieving emissions reductions in Australia and the role of placing a value on carbon emissions. Section 2 discusses the effectiveness of the VER for incentivising the technology and its implications for incentivising CCS deployment in Australia.

1. Introduction

The Institute believes that the adoption and scale-up of CCS technology, particularly by heavy emitters in Australia's hard-to-abate industries, can support the government in achieving its emissions reduction commitments, provided there is sufficient incentive for industry to decarbonise.

CCS provides a proven suite of technologies that will enable companies to lower their emissions. In the long-term, CCS also supports Australia's broader decarbonisation goals, adding to the concerted efforts needed to meet net-zero commitments.

1.1 The role of CCS in achieving emissions reductions

CCS technologies involve capturing CO_2 emissions from large industrial plants like steel mills, cement plants, coal and natural gas fired-power plants, and refineries, compressing it for transportation and then injecting it deep underground into carefully selected and safe geological storage sites, where it is permanently stored. There are currently 43 operational CCS facilities around the world capturing up to 50 million tonnes of CO_2 per year.

Numerous studies, including the IPCC 1.5°C Special Report and reports by the International Energy Agency, have consistently highlighted the critical role of CCS in facilitating the global transition to a net zero emissions economy. Three out of the four pathways modelled by the IPCC for limiting temperatures to 1.5 degrees by 2050 incorporate a significant role for CCS and require its widespread adoption. Moreover, in an analysis of a range of scenarios for reaching 450 ppm, the IPCC has also concluded that without CCS, the cost of reaching 450 ppm is expected to be 138% more expensive (in the range of 29%-297%) than achieving 450 ppm with CCS(Global CCS Institute, 2023b).

In Australia, studies such as the Net Zero Australia Mobilisation report, which analyses potential methods and strategies to mobilise Australia's transition to net zero, highlights that CCS will need to be a crucial component of Australia's net zero strategy. Across all the scenarios modelled in the report, CCUS increases to high levels, up to 80-1000 Mtpa of CO_2, as a core application to support decarbonisation with renewables and to maximise clean energy export opportunities (Net Zero Australia, 2023).

1.2 The role of carbon valuation in incentivising CCS

A value on carbon provides a clear price signal and an incentive to reduce emissions with the premise that governments are committed to a lower-carbon future. The challenge for large-scale capital-

intensive infrastructure projects, like CCS with the sole objective of emissions abatement, is one of maintaining a stable, long-term revenue stream. In the absence of a financial consequence for storing CO_2 or reducing emissions, the private sector is not incentivised to make the required investments to deploy CCS at scale. Therefore, a value on carbon is necessary to secure the business case for large-scale deployment. To this end, analysis by the IEA has estimated that as much as 450 million tonnes of CO_2 could be captured and stored globally with a commercial incentive as low as USD40/t of CO_2 by deploying CCS on the many low-cost opportunities available (Global CCS Institute, 2019; World Economic Forum, 2019).

In Australia, the primary mechanisms incentivising emissions reductions in various sectors is the ACCU Scheme and the Safeguard Mechanism. The ACCU Scheme, incentivises entities to reduce their emissions by enabling the generation of one ACCU per tonne of CO_2 (tCO_2-e) avoided or permanently stored. ACCUs accrued can subsequently be sold on the secondary market or to the Australian Government(Clean Energy Regulator, 2024). CCS is currently included in the list of projects that are eligible to generate ACCUs. Santos' Moomba project has become the first approved project to receive ACCU for the geological storage of CO_2(Santos, 2021).

The Safeguard Mechanism requires covered facilities to limit their emissions below a baseline level. Covered facilities include those facilities that emit over 100,000 tons of CO_2 equivalent (tCO_2-e), which covers facilities in the mining, oil and gas production, manufacturing, transport and waste sectors. The government recently introduced amendments to the Safeguard mechanism, establishing strengthened baselines that covered facilities must not emit beyond and that decrease over time. Notably, in the context of grid-connected electricity generators, the Safeguard Mechanism amendments impose a collective baseline, as the power generation sector is considered a single entity in which output is centrally coordinated to meet demand. The new amendments allow for the generation of Safeguard Mechanism Credits (SMCs), triggered only when a covered facility's GHG emissions go below the baseline level, and which can be traded between other covered facilities. Covered facilities could utilise carbon capture technology on site to meet their baselines and generate tradeable SMCs. Therefore, the Safeguard Mechanism's new amendments provide an incentive for CCS applications.

However, these mechanisms alone may not be sufficient to deliver the deployment of CCS at the scale required to achieve Australia's mid and long-term emissions reduction targets. For example, costs for the Santos Moomba project, which became the first CCS project approved to receive ACCUs, are relatively low, estimated to be less than AUD 30/t CO_2 abated. However, the costs for CCS are typically expected to be much higher and largely depend on the location, geology and the CO_2 source[1]. The 2024 spot price for credits under the ACCU scheme has been between \$30 - \$35/tCO_2, making sense for Santos to deploy CCS. However, as emissions reduction targets become more stringent, the price of ACCUs is likely to increase. In order to incentivise CCS deployment at scale, the VER must remain at a level higher than the cost of deploying CCS, and higher than the ACCU price at the time.

As such, at current prices, the ACCU Scheme is unlikely to provide sufficient incentive to scale up CCS. In addition, current ACCU prices are lagging behind when compared with the prices currently incentivising CCS under international schemes such as the EU ETS, Norway's CO_2 taxes and the USA's 45Q tax credit. A discussion of these global carbon pricing/valuation mechanisms is provided below.

1.3 Global examples of carbon pricing/valuation and how emissions reductions are incentivised

Globally, CCS is incentivised in various countries under a range of policy mechanisms that establish a value on carbon, including tax credits, emissions trading schemes, CO_2 taxes and grant funding, among

[1] A discussion of how CCS costs can vary is provided below.

others. Government support of CCS in countries such as the United States, Canada, Norway, the UK and the Netherlands, has been substantial – amounting to, on a per tonne basis, generally in the US$70-90 range(Global CCS Institute, 2023b).

In the US, for example, the promulgation of the Inflation Reduction Act (IRA) in 2022 and the Bipartisan Infrastructure Law (BIL) in 2021 is commonly attributed to the increased momentum for CCS in the country. The tax incentives included in the IRA to deploy CCS and direct air capture technologies complement funding provided in the BIL. The IRA provides billions of dollars to help decarbonise existing industrial facilities and includes an enhanced Internal Revenue Service (IRS) Section 45Q federal corporate income tax credit that lowers carbon capture thresholds, increases the dollar value of tax credits ($85/t$CO_2$ captured from power and industrial sources and stored in dedicated geological storage resources), and adds provisions for direct pay and tax credit transferability. Analysis suggests the IRA could increase the deployment of carbon capture in the US by as much as 13-fold by 2030(Global CCS Institute, 2023b, 2023c).

In Europe, the EU ETS remains the main mechanism incentivising emissions reductions at the EU level and includes Norway, Iceland and Liechtenstein. The EU ETS price, which is currently at €73 (USD 78) per tonne of CO2, reached a new high of €100 in February 2023, contributing to an improved business case for CCS projects in some sectors. To increase the impact on emissions reductions, the ETS was recently revised to achieve a target of a 55% reduction of GHG emissions by 2030 compared to 1990 levels. In addition to expanding its scope to include the maritime sector, the revisions include a significant acceleration in the annual reduction of allowances. Specifically, the rate of reduction has been increased from 2.2% to 4.3% for the years 2024 to 2027, and further to 4.4% for the years 2028 to 2030. Moreover, the revisions incorporate one-off absolute reductions in the cap of 90 million allowances in 2024 and 27 million allowances in 2027, to lower the total number of allowances available, thereby driving a more rapid decrease in emissions(Global CCS Institute, 2023b, 2023c).

The EU's recently introduced Carbon Border Adjustment Mechanism is a further component of a comprehensive suite of policies to address carbon leakage. This tool aims at putting a fair price on the carbon emitted during the production of goods entering the EU market, creating a level playing field for European industries subject to the EU ETS and cheaper imported goods, stimulating de facto cleaner production processes in countries without a carbon price/value(Global CCS Institute, 2023a).

These examples highlight the critical role that government plays in establishing a sufficient value on CO_2 to incentivise emissions reductions through CCS and the role of varying and complementary policies in creating market conditions that facilitate investment in CCS technologies.

2. The VER and its significance in achieving Australia's emissions reduction objectives

In this context, the recent announcement of the interim value of emissions reductions (VER) by the Australian Energy Market Commission (AEMC) is significant. Following changes to Australia's national energy laws, emissions reduction is now incorporated into Australia's national energy objectives. Notably, this interim VER, which starts at $70/t$CO_2$ is double the current prices under the ACCU scheme, which, as one of the primary mechanisms incentivising emissions reductions in Australia, is currently insufficient to deliver the scale of emissions reduction necessary to achieve Australia's national emissions reduction targets.

2.1 Sectors covered and implications for industry

The Institute notes that the interim VER was established to operationalise the emissions reduction component of the national energy objectives and will be used by various market bodies, such as the

Australian Energy Regulator, when making decisions relating to the application of national energy objectives. The Australian Energy Ministers' (MCE) statement establishing the VER refers to the key energy processes that are likely to incorporate the VER, such as the Integrated Systems Plan, revenue determinations and regulatory investment tests which are critical components influencing decision making in the context of planning and developing Australia's future energy infrastructure. The VER will thus extend to a broad range of facilities in the electricity infrastructure sector, potentially beyond those covered by the Safeguard Mechanism, thereby facilitating a larger segment of the Australian energy sector to undertake emissions reductions.

To this end, the Institute notes that the current consultation by the Australian Energy Regulator, providing guidance about incorporating the VER when electricity network infrastructure providers conduct their mandatory regulatory investment tests prior to development, exemplifies the first steps towards incorporating the VER in national energy planning. Thus, the establishment of the VER represents a key addition to the suite of policy mechanisms incentivising large-scale greenhouse gas emissions reductions in Australia and signals a commitment to adopt a multi-faceted approach to incentivising economy-wide emissions reduction in line with national targets.

2.2 Implications for CCS

As the VER is set to become a key component of energy infrastructure planning, the Institute envisages that the mechanism holds key implications for incentivising CCS deployment in Australia. This is because of the significant emissions reduction potential of CCS technologies when applied to the electricity sector, which can facilitate decarbonisation of the sector while ensuring energy reliability during Australia's transition to renewable energy. By financially valuing the reduction of greenhouse gases, the VER could enhance the economic viability of CCS projects and incentivise investments in the technology.

3. Implications of the VER methodology and pricing considerations for CCS

The methodology underpinning the VER, combining both market-based and scientifically derived cost projections presents a significant step towards incentivising emissions reductions, potentially including CCS, in the Australian economy. The growth trajectory of the VER may also incentivise further investments in the technology.

However, if the VER is to play a role in incentivising CCS at the scale required to achieve Australia's emissions reduction targets, the VER should be adequate to reflect the costs of capturing and storing CO_2, which can vary based on the application of the technology and on CO_2 storage site conditions, transport distance and volumes. For example, the IEA has estimated that for CCS applied to industrial processes producing highly concentrated CO_2 streams (such as ethanol or natural gas processing) the cost can range from USD 15-25/t CO_2 and to USD 40-120/tCO_2 for processes that produce diluted CO_2 streams such as cement production (International Energy Agency, 2021).

Based on this, the VER's current prices may provide a foundation for incentivising CCS deployment in Australia. However, modelling by the Institute and comparative analysis of international carbon prices, encompassed by mechanisms such as the EU ETS, Norway's carbon tax and US's 45Q tax credit, and which currently yield CO2 prices between USD $70 – 90 per ton of CO2, suggests that the VER is unlikely to unlock the significant investments required to deploy CCS at scale within the Australian energy sector until further into the future. However, any pricing mechanism should also be cognisant of pass-through rules, to ensure the electricity consumer is not negatively affected.

4. Conclusion

The VER represents a key additional component of Australia's policy framework for incentivising emissions reductions and an important foundation for incentivising a variety of least-cost emissions abatement options, including CCS. To this end, the Institute supports the inclusion of the table of interim VERs derived from the methodology in the AER's draft guidance, as it is not only a clear representation of the VER's trajectory from 2024 to 2050 but will provide transparency and certainty for stakeholders to accurately assess and plan their compliance obligations and investment decisions. For CCS project proponents in particular, the visibility of the VER's escalation over time will be useful for long-term financial and operational planning and for decision-making and securing investments.

However, the Institute also submits that the proposed 2024 value does not provide a sufficient price signal to incentivise the scale of emissions reductions that CCS is capable of delivering for Australia. To achieve this, the Institute suggests that the VER should be effectively integrated with existing policy measures and financial mechanisms, such as the ACCU scheme or the Safeguard Mechanism, that improve the business case for CCS in Australia. This approach aligns with international policy frameworks worldwide that have adopted a combination of complementary measures to drive substantial investment in and deployment of CCS technologies.

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