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30 September 2024

Committee Secretary  
Senate Standing Committees on Environment and Communications  
PO Box 6100  
Parliament House  
Canberra ACT 2600

**ANU submission to "Inquiry into the Future Made in Australia (Guarantee of Origin) Bill 2024 and related bills"**

Dear Committee Secretary,

On behalf of the ANU Zero-Carbon Energy for the Asia-Pacific (ZCEAP) grand challenge initiative, we are pleased to provide the following submission to help inform the Senate Standing Committees on Environment and Communications on the Inquiry into the Future Made in Australia (Guarantee of Origin) Bill 2024 and related bills.

This submission was prepared by an interdisciplinary team of experts in our ZCEAP team. We hope it is useful to the Committee through research-based insights. The submission draws on published research by ZCEAP, all available at [anu.edu.au/zerocarbon](https://anu.edu.au/zerocarbon), and on various policy briefings by ZCEAP. We will be happy to provide further information to the Committee.

Sincerely,

A handwritten signature in blue ink that reads "Emma Aisbett".

A/Prof Emma Aisbett  
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# **Future Made in Australia (Guarantee of Origin) Bill 2024 [Provisions] and related bills**

**Submission to the inquiry by ANU Zero-Carbon Energy for the Asia-Pacific (ZCEAP)**

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# Comments by A/Prof. Emma Aisbett and Dr. Lee White

## Principles-based approach and explicit statement thereof

### Praise:

Australia's Guarantee of Origin scheme Policy position paper (December 2022) proposed a set of five principles to guide the design of the scheme. There is much to like about this set of principles and their role in guiding design and implementation of the scheme.

1. Trustworthy – The scheme has high integrity and the information provided is trusted.
2. Transparent – The scheme clearly articulates relevant emissions information to scheme and market participants.
3. Practical – The scheme is practical for scheme participants, being commercially effective to interact with and minimising regulatory burden.
4. Consistent – The scheme is able to be recognised by domestic and international schemes and markets.
5. Flexible – The scheme can evolve with changing consumer needs, technology, and international market developments.

### Further considerations:

It is standard practice among leading emissions accounting frameworks such as the GHG Protocol and ISO to contain an explicit statement of principles (White et al, 2024). Principles are important in guiding the development of regulation when the situation is too complex or changing to rely solely on statements of rules. Principles are particularly important in situations such as the proposed legislation, where much of the detail which will determine the ultimate impact is not contained in the legislation itself, but will be contained in subsequent regulation and rule determinations which may be subject to less public scrutiny and accountability, and for which only a small number of people have the necessary technical expertise to judge.

The legislation could be substantially improved by inclusion of an explicit statement of guiding principles. The five principles from the Discussion Paper (Dec 2022) would be a good starting point. The Government may also wish to consider some, or all, of the eight principles proposed by White et al. (2024). These principles for embedded emissions accounting frameworks to support trade-related climate policies were rigorously synthesised from a systematic review of both carbon accounting and trade law literatures, as well as a targeted review of carbon accounting practice. The principles are:

**Accuracy:** True embedded emissions should neither be under-estimated nor over-estimated.

**Conservativeness:** The reported reduction of emissions should not be over-estimated, or at least the risk of over-estimation should be minimised.

**Least restrictive means:** Embedded emissions accounting systems should have the least trade restrictive impacts possible.

**Monotonicity:** A reporting entity should not be able to reduce their reported emissions while increasing total emissions. Not only is this principle important for the scheme's integrity, but it is critical to achieving a trustworthy and credible scheme.

**Non-discrimination:** Non-discrimination is a core principle of the World Trade Organisation that requires that like products be treated alike, and in many cases this extends to environmental attributes of products. Embedded emissions accounting systems should not generate explicit or

implicit advantage or disadvantage for like products, where ‘like’ includes true environmental impacts.

Relevance: Embedded emissions accounting systems should be designed to support the needs of the intended uses and users.

Subsidiarity: What can be done as well or better at a lower level should be done at the lower level of governance or control.

Transparency: There should be clear documentation that allows independent parties to understand how estimates are compiled and to determine whether this meets good practice requirements.

See ANU Policy Brief: [Eight principles to design certification for embedded emissions in major export products](#) and White et al. (2024) for further details.

## Boundary and Methodology determinations

### Praise:

It is excellent to note that the Government/Minister will determine both the accounting boundaries and the Methodologies for accounting within those boundaries. There is extensive evidence that variation among different embedded emissions accounting approaches can have dramatic impact on the results obtained. Determination of the exact boundaries and methodologies to be used under the scheme is therefore crucial to ensuring the integrity and trustworthiness of the GO scheme.

### Further considerations:

Boundary and methodology determinations will determine the performance of the GO Scheme. It is infeasible for them all to be contained in the legislation. However, at a minimum, principles that will guide these determinations should be included. An explicit statement of principles will not only guide the Government, but also provide a basis for stakeholders to hold them accountable during this process.

## Modular approach to emissions boundaries

### Praise:

The GO Bill does an excellent job of implementing a modular approach to emissions accounting boundaries, consistent with the recommendations of ANU in previous submissions and academic publications (White et al, 2021, Reeve & Aisbett, 2022). We concur with the flexible approach taken to defining the overall boundary covered by the “production”, “delivery” or “consumption” profiles associated with a given product certificate. This flexibility will help to ensure that all environmentally and market-significant components of the supply chain for a given product can be covered, without raising the scheme’s costs by covering the equivalent supply chain components for products for which those elements are of little environmental or market significance.

### Further considerations:

As the PGO scheme develops and more products are added, it will be important to ensure that any variation in accounting boundaries between products does not leave openings for greenwashing, incentivize emissions-raising behaviour, or lead to unfair comparisons between products that can be considered substitutes.

## Treatment of biomass

### Praise:

Another praiseworthy element of the GO Bill is the exclusion of electricity produced from biomass derived from native forests from the definition of renewable energy. This exclusion is important to the environmental integrity of the Bill.

### Further considerations:

The inclusion of electricity from other sources of biomass (such as agricultural waste) in the definition of renewable energy implies that the use of these sources – even for combustion – leads to zero emissions. To be consistent between the REGO and PGO schemes, a similar approach will need to be taken to biofuels derived from these sources. This issue is of immanent relevance given the legislation notes the proposed scheme expansion to include low-carbon liquid fuels. If the market for these fuels scales, there is a danger of perverse incentives and adverse outcomes which contradict the principle of monotonicity and may undermine the scheme's integrity. Going forward, the definition of allowable sources of biomass for the generation of renewable electricity or production of fuels may need further refinement.

## Explicit exclusion of offsets

### Praise:

Australia's Guarantee of Origin scheme Policy position paper (December 2022) and Australia's Guarantee of Origin Scheme Design Policy paper (September 2023) both explicitly exclude offsets (including ACCUs) from being used to lower embedded emissions of a product in the PGO. "Carbon offsets from third parties will not be recognised within the GO scheme. This includes Australia Carbon Credit Units (ACCUs) issued for emissions reductions outside of the system boundary and international offsets." (p.10, 2023). This exclusion is essential if the scheme's integrity and trustworthiness is to be maintained.

### Further considerations:

Currently the legislation makes no mention of offsets or ACCUs. To guard against potential future backsliding on this important design feature, the legislation should state that offsets cannot and will not be allowed to be used to lower product embedded emissions in the PGO.

The Sept 2023 policy paper makes no mention of offsets generated by the reporting entity (i.e. first party offsets). The Dec 2022 policy position paper explicitly says that first party offsets, including ACCUs will be able to be used. It notes only that if they are used they must be surrendered to the Government and cannot be sold to a third party. Allowing offsets of any kind to be used in calculating product embedded emissions in the PGO is deeply problematic and could seriously compromise the integrity, trustworthiness and international compatibility of the entire scheme. Problems with allowing internally produced offsets to be used include:

1. Introduction of an arbitrary distinction between actions which have the same emissions consequences purely on the basis of fungible "ownership" classification or location. In addition to being unfair, this could result in perverse incentives.
2. Fundamental compromise of the underlying logic and integrity of the scheme which cause it to be incompatible with international approaches. Product embedded emissions accounting frameworks are designed to account for the absolute emissions resulting from product supply chains. They have nothing to do with emissions relative to previous emissions (baselines). ACCUs, however, can be generated for reductions relative to baselines.

Instead of allowing internal ACCUs to be counted in the PGO scheme, avoidance of double counting can be achieved by preventing any processes which are covered by a PGO profile for a given reporting entity to be excluded from being used towards the generation of ACCUs.

## Comments by Prof. Ken Baldwin and Dr. Lee White

### Alignment

It will be important to ensure alignment of the detailed policy development following from Australia's Guarantee of Origin legislation with corresponding schemes in other jurisdictions. As international trade in hydrogen emerges, misalignment between certification schemes being developed in different jurisdictions could represent a barrier to the growth of hydrogen-based export industries (White et al., 2021, 2024a). Differing definitions and differing accounting boundaries for low emissions hydrogen represent possible sources of misalignment, and hydrogen produced through electrolysis may face additional challenges since certification processes for electricity guarantees of origin have developed distinctly in different jurisdictions. In the face of unclear certification interoperability, investors may fear locking development into a technological pathway that could become unviable in future export markets as certification evolves.

The EU is a case in point. For example, the EU has recently codified the methodology for considering grid-based hydrogen as 'fully renewable' and represents the strictest and most advanced accounting system to date. This methodology is the Delegated Regulations 2023/1184 and 2023/1185 required by Article 27 of RED II, specifically relating to renewable fuels of non-biological origin for use in transport, and these acts codify the requirements for additionality, temporal correlation, and geographic correlation of electricity generation used for hydrogen production that are alluded to in RED II's Recital 90.

Australia's proposed Renewable Electricity Guarantee of Origin (REGO) mechanism reports the commissioning date of the power station, the location of the power station, and a time stamp reflecting the hour in which the electricity was dispatched by the power station (DCCEEW, 2023b). These REGOs are expected to enter into use in 2025 and will potentially support alignment of 'renewables based' credentials of Australian hydrogen for export to Europe and other markets that may develop similarly stringent rules in future.

### Timeliness

It will be important given the alignment considerations above to quickly implement the policies supporting the Guarantee of Origin in order to provide Australian industry not only with the certainty needed to invest, but also to ensure that Australian exports are able to compete and have first mover advantage in overseas markets.

For example, our modelling shows (White et al. 2024b) that hydrogen produced in Australia from electrolysis using only off-grid renewable electricity is projected to be lower in cost compared to on-grid in almost all locations and scenarios post-2030, and has the added advantage of not relying on difficult-to-predict wholesale electricity market prices and equally uncertain markets for renewable electricity certificates. On these later timeframes, certification alignment will therefore not be an issue since off-grid hydrogen will most likely be produced entirely using renewable electricity, and will be the cheapest production for export.

However, in the near-term (pre-2030), modelling identifies a window where hydrogen is cheaper to produce with on-grid rather than off-grid renewable electricity in some locations (e.g.



Queensland and Tasmania). Demand modelling shows that EU demand for Australian hydrogen could be reduced by 10-20% in the near term (pre-2030) if producers are constrained to use more expensive off-grid renewable electricity in order to be certified as ‘renewable-based’ under EU rules. On this pre-2030 timeframe, Australian exporters would benefit from aligned certification schemes, which would create a larger set of options for hydrogen generation, enabling the use of both on- and off-grid renewable energy capacity.

Our findings therefore suggest that by creating an early and aligned certification system, Australia could provide more regulatory certainty to investors. Importantly, this could also open up more (on-grid) options by ensuring alignment in the 2025 - 2030 timeframe: a critical period for emerging hydrogen markets.

## Comments by A/Prof. John Pye

### Considering energy storage in GO certification

The legislation may have a potential loophole or perverse outcome in relation to energy storage operators. For example, consider a pumped hydroelectric power system operator. The operator might sometimes or always charge their storage using electricity from coal power plants. The operator could then also purchase REGOs from variable renewable energy providers, such as domestic PV system owners (arising from daytime electricity generation only) corresponding to the coal-based electricity they had used. The operator would then appear to legitimately sell their pumped hydro power output as 100% certified green power. A producer buying power from the operator would then certify their product as 100% green powered, when it clearly is not, since the upstream operator has enjoyed cost savings associated with the use of coal power.

There are strong financial incentives to operate production processes as close to continually as possible. At the same time REGOs are issued without any regard to the time of generation of the power (even though the market price of that same power varies astronomically). It can be expected that any potential loopholes that allow producers to enjoy the benefits of green accreditation without bearing the cost of energy storage for a genuinely green end-to-end solution, will be carefully identified and exploited.

Energy storage is a key piece of the upcoming energy transition, and it is very important that there be no intended perverse incentives in the proposed legislation.

### Considering the case of target markets with any-CCS policies

It is readily conceivable that future laws may be enacted in overseas markets that rule out the use of fossil fuel as any input in any production process. In such case, the PGO legislation should ‘future proofed’ by ensuring that products reliant on CCS are transparently captured and differentiated from those that are not reliant on CCS.

### Considering completeness of ‘production pathways’

Section 29 seems to leave flexibility to the minister to decide which process steps are included and not included in the definition of a process pathway. It should perhaps be expressed in the legislation that such production pathways should be so far as possible complete, and all relevant production emissions should be within the scope, including fugitive emissions in extraction (including gas field emissions), all pre-production transport, all production process steps and all delivery process steps. Also, some clarity regarding the approach to be taken to CCS in particular could be considered, especially noting the potential need mentioned above.

## Considering the expansions to the legislation to tackle greenwashing

The present legislation is relatively narrowly focussed on providing a guarantee of origin (somehow the 'quantified greenness') of limited products. This legislation could be considered for expansion to include provisions that limit the use of aligned terms such as "clean" and "green" in marketing Australian energy-intensive products. Provisions could be considered that disallow any suggestion of low emissions products except where PGO-certification has been sought (for products covered by the PGO). Currently, PGO certification is only required in cases where a producer needs it or wants it in order to participate in markets where they are active. This expansion would make PGO-certification applicable to anyone wanting to make claims about lowered emissions. This would be a potent tool in eliminating greenwashing, but forcing the use of assessed production pathways to deliver accounting of the true emissions associated with specific end-products.

## Considering novel products such as green iron

In order to ensure that truly low-emissions products are able to benefit from the PGO, it will be important to ensure that novel production pathways are added to the scheme in time for them to become commercially relevant. One example is pre-treatment of iron ores, such as dehydroxylation, using direct solar-thermal energy input. Other example would be the extremely hypothetical grinding of ores using mechanical windmills rather than electricity-producing wind turbines.

## Considering time-varying production processes

It is likely that, in their efforts to manage variability of energy inputs, producers will need to run their processes in different modes at different times. It will be important, when developing methods for PGO certification, that off-design operating states and potentially highly varying emissions intensity with time are captured. Measures need to be put in place to identify when variable processes are being used, and live in-the-field sensing of point emissions may be necessary in some cases.

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