

Carbon-Credit Integrity in the ACCU Market

A Geospatial Analysis of ARR Projects

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Executive summary

Since 2023, the Australian Carbon Credit Unit (ACCU) Scheme has been evolving rapidly, strengthening its integrity framework and building greater global legitimacy. Reforms to the Safeguard Mechanism have accelerated this transition, introducing a new wave of compliance demand and reshaping market dynamics.¹

Compliance markets are often assumed to produce relatively uniform credits, yet integrity differentiation remains critical. Without robust analysis, market participants may face exposure to low-quality credits, over-crediting risk or reputational concerns. Afforestation, reforestation and revegetation (ARR) projects illustrate this clearly. While they are among the most in-demand credit types due to their nature-based removal profile, they nonetheless exhibit significant variation in integrity outcomes.

Historically, limited public disclosure of project-level data within the ACCU Scheme has constrained independent scrutiny of these risks. MSCI's in-house geospatial analysis addresses this gap by applying a structured, data-driven framework to assess the factors that define and differentiate project quality. This approach brings greater transparency to a market historically characterized by limited public visibility.

From this analysis, MSCI Carbon Markets has identified three key takeaways for the ACCU market:

1. Integrity premiums are observable in the ACCU market

Environmental Plantings credits associated with higher additionality and stronger co-benefits command sustained price premiums. This indicates that buyers are willing to pay for demonstrable integrity, even within a regulated compliance framework.

2. Integrity outcomes vary materially at the individual project level

Projects applying the same ACCU methodologies exhibit significantly different integrity profiles. This variation is primarily driven by differences in carbon stock outcomes, exposure to quantification and permanence risk, and execution quality. The findings underscore the importance of project-level assessment rather than reliance on methodology alone.

3. Methodological design choices widen the distribution of project-level risk

While the ACCU scheme benefits from strong legal and regulatory oversight, its reliance on model-based quantification and limited public disclosure of project-level data results in a wider range of quantification and permanence risk compared with other major ARR standards. These features increase the dispersion of integrity risk across projects, even where average quality remains relatively high.

¹ The Australian Safeguard Mechanism is a mandatory regulatory framework requiring over 200 of Australia's largest industrial emitters (>100,000 tCO₂e/year) to cap Scope 1 emissions, with baselines declining by annually until 2030.

Introduction

The ACCU Scheme is among the most established carbon-crediting frameworks globally, with legislative foundations dating back to the Carbon Farming Initiative in 2011. As jurisdictions worldwide increasingly explore mechanisms that bridge compliance and voluntary carbon markets, the ACCU Scheme provides a relevant case study for understanding how credit-integrity frameworks must evolve to meet the needs of both demand segments.

Nature-based credits in the ACCU market

Nature-based credits account for more than 65% of total ACCU issuances and have historically been dominated by Human-Induced Regeneration (HIR) projects (MSCI, 2026). However, the discontinuation of HIR methodologies in September 2023 is driving a structural shift in supply composition. While HIR credits continue to represent the majority of monthly vegetation-based issuances, demand is increasingly shifting toward higher-integrity removal methodologies, particularly Environmental Plantings and Soil Carbon projects.

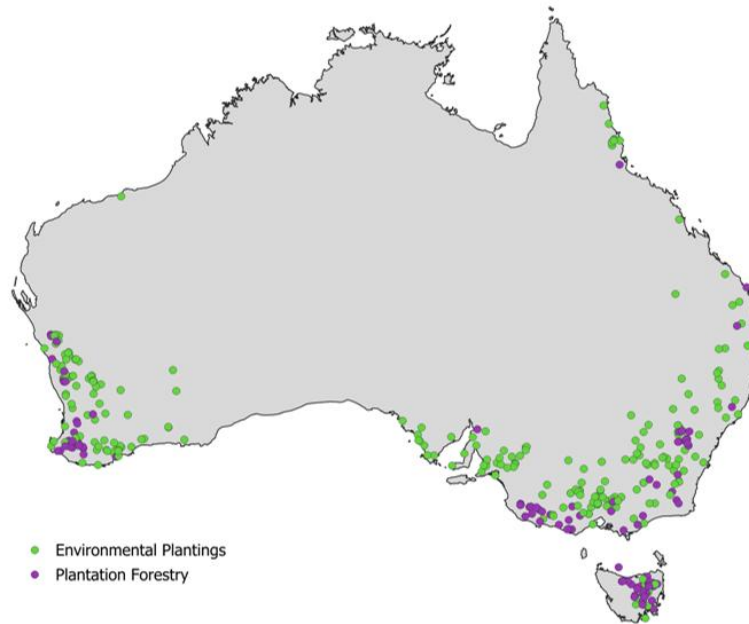
Australia's decarbonization commitments reinforce the strategic importance of these project types. The 2030 Nationally Determined Contribution (NDC) targets a 43% reduction in emissions below 2005 levels, while the recently announced 2035 target commits to a 62–70% reduction (Australian government, 2025). The land use, land use change and forestry (LULUCF) sector is expected to function as a net carbon sink and could offset approximately 15% of Australia's emissions in 2035. This underscores the importance of nature-based removals in Australia's pathway to net zero.

ARR projects represent approximately 22% of registered ACCU projects but account for only 2.6% of total issuances to date (Clean Energy Regulator, 2025). The gap between registration and issuance reflects a substantial pipeline of future supply. In Q3 2024, project registrations accelerated ahead of the release of the streamlined Reforestation by Environmental or Mallee Plantings 2024 methodology. Of the 182 newly registered ACCU projects during the quarter, 57 were Environmental Plantings ARR projects (Clean Energy Regulator, 2024).

Within the ARR pipeline, the ACCU market is primarily characterized by two project types:

- **Environmental Plantings (EP)**, which establish permanent, non-harvest native forests on land that has been cleared for at least five years.
- **Plantation Forestry (PF)**, which involves the establishment and management of softwood and hardwood plantations, typically for commercial timber production. Only projects establishing new plantations under Schedule 1 of the PF methodology are classified as ARR by MSCI Carbon Markets; projects under other schedules are treated as Improved Forest Management.

Map of ACCU ARR projects in Australia



Data as of Feb. 28, 2026. Source: MSCI Sustainability & Climate geospatial analysis. MSCI Sustainability & Climate products and services are provided by MSCI Solutions LLC in the United States, MSCI Solutions (UK) Limited in the United Kingdom and certain other related entities.

Report scope

The analysis in this report is structured using the [MSCI Carbon Project Ratings](#) framework, which assesses carbon-credit integrity across six core criteria. These include additionality, quantification and permanence, which capture emissions-impact integrity, as well as co-benefits, legal and ethical risks, and delivery risks, which together capture implementation integrity. As of February 2026, the MSCI Carbon Project Ratings ARR methodology has been applied to more than 150 ARR projects globally.

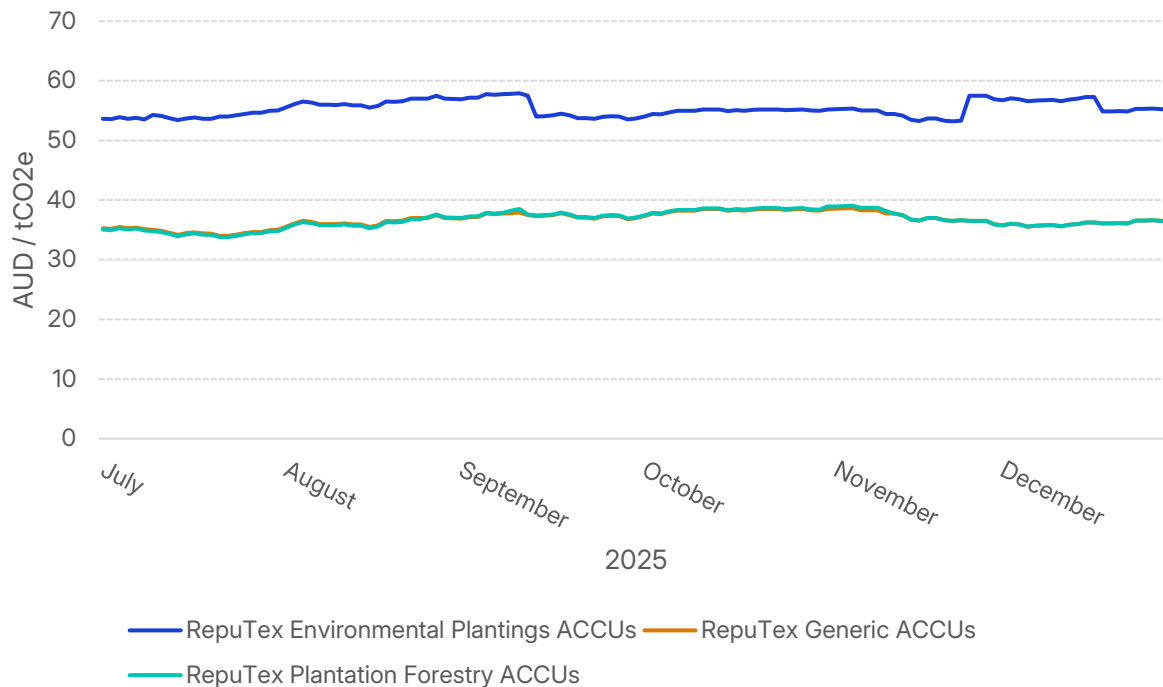
This paper applies geospatial and third-party data components of that framework to evaluate the integrity of 52 ACCU projects across EP and PF methodologies. Further methodological detail is provided in the Appendix. Broader context on the ACCU market can be found in MSCI Carbon Markets’ Australia country profile.

Results: Key implications

Integrity premiums are clearly observable in the ACCU market

Our analysis indicates that EP projects generally achieved higher integrity scores than PF projects. These integrity differences are reflected in current market pricing (as of February 2026). Using Reputex Energy’s ACCU pricing data, the average price for EP credits over the last year (January 2025 to January 2026) was AUD 56 per tonne, compared with a generic ACCU price of AUD 37 per tonne. PF credit prices have aligned closely with the generic benchmark. This pricing pattern suggests that buyers are differentiating credits based on underlying integrity characteristics, even within a regulated compliance market.

ACCU spot price by credit type



Data as of February 2026. Source: Reputex Energy

Two structural factors appear to explain both the integrity differential and the associated price premium.

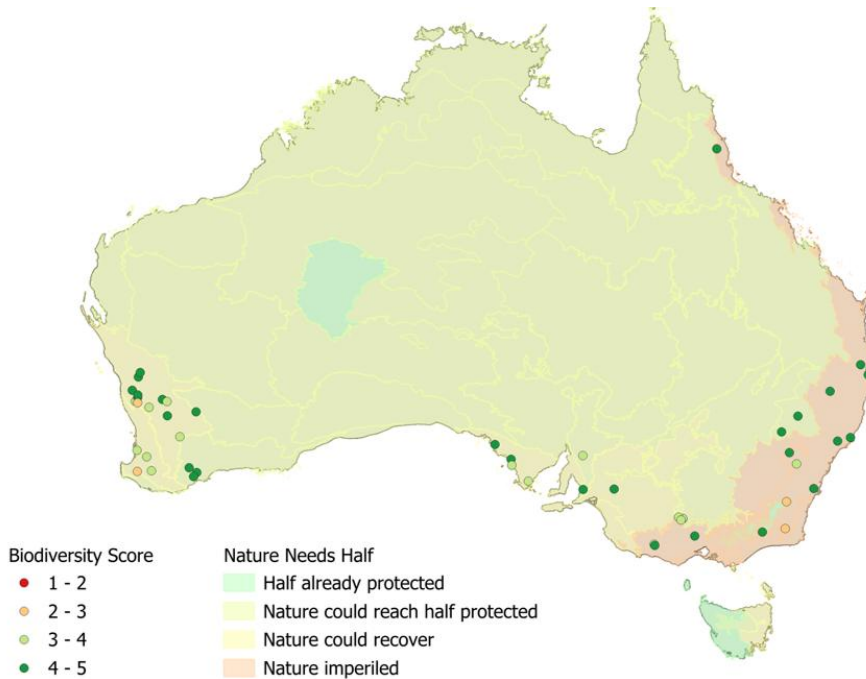
Firstly, additionality tends to be stronger for EP projects. PF projects often benefit from national and state-level policy support for timber and wood products, which can improve project economics independent of carbon revenues. In contrast, EP projects are structurally more dependent on carbon revenues to remain financially viable.

Second, biodiversity outcomes differ materially between the two project types. EP methodologies mandate the use of native species, supporting higher ecological diversity and habitat provision. PF projects are commonly established as monocultures of commercial species, resulting in more limited

biodiversity co-benefits. Native species plantings also tend to exhibit greater resilience to fire than plantation monocultures — an increasingly relevant consideration given Australia’s bushfire-risk profile.

These structural differences are reflected in integrity scoring. On average, EP projects receive a co-benefits score of 3.5, compared with 3.0 for PF projects. The distribution of biodiversity scores across rated ACCU projects is shown below.

Biodiversity scores across rated ACCU projects compared to Nature Needs Half



Data as of Feb. 28, 2026. Source: MSCI Sustainability & Climate geospatial analysis

Biodiversity scores are generally higher in regions where ecosystems are fragmented or subject to significant anthropogenic pressure, particularly within “nature imperiled” and “nature could recover” zones under the Nature Needs Half framework.² In these landscapes, remaining natural habitats are often limited, increasing the relative ecological value of intact or restorable land. As a result, incremental conservation or restoration activities are more likely to generate comparatively larger marginal biodiversity gains than similar interventions in well-protected areas.

Across these zones, EP projects consistently score higher than PF projects, including where both operate within the same ecological classification. This reflects the greater habitat diversity and restoration potential associated with mixed native species plantings relative to monoculture systems.

² Nature Needs Half is a global conservation initiative advocating the protection of 50% of land and oceans to sustain biodiversity and ecosystem function. It provides a framework for identifying areas where conservation and restoration can deliver the greatest ecological benefit.

Within the Nature Needs Half framework, “half already protected” regions are characterized by relatively high existing levels of conservation effectiveness, meaning opportunities for transformative biodiversity gains are more limited. Projects in these regions may still deliver biodiversity benefits, but these are more likely to be incremental and focused on maintenance rather than recovery. Nevertheless, EP projects continue to score higher on average even within these more protected zones. This suggests that species diversity and ecological complexity materially influence biodiversity outcomes, irrespective of baseline protection status.

Overall, native, mixed-species systems demonstrate consistently stronger co-benefit performance than plantation monocultures across all landscape contexts. The observed price premium for EP credits suggests that the market is recognizing these integrity and co-benefit differentials.

There is a wide variation in integrity

Within the ACCU marketplace, EP projects are widely regarded as higher integrity, as demonstrated by the premium they command (MSCI, 2026). However, project quality is not homogeneous. Integrity outcomes vary given Australia’s diverse geographies and climatic conditions, as well as differing state-level policy governing forestry targets.

Our analysis reveals significant variation in integrity across ACCU ARR projects. This project-level dispersion is most evident in quantification and permanence risks, which are explored in more detail below.

Carbon stock quantification

Carbon quantification under the ACCU scheme is highly standardized, with ARR methodologies relying on FullCAM, Australia’s national greenhouse gas inventory model. This differs from other major ARR methodologies, which typically require project-level field sampling and increasingly integrate geospatial biomass or land-use change data explicitly.

The ACCU approach promotes methodological consistency and reduces project-level discretion. However, standardization does not imply homogeneity of outcomes. In practice, carbon sequestration varies substantially at the site level due to differences in climate, soils, species selection, fire exposure and execution quality. As a result, projects applying identical methodologies can exhibit materially different carbon-stock trajectories and risk profiles.

Our analysis indicates that EP projects generally score lower on quantification relative to PF projects, which are more closely aligned with the global ARR average. In aggregate, EP projects have credited volumes that exceed observed above-ground biomass (AGB) accumulation to date, while PF projects show closer alignment between credited volumes and observed carbon storage. This may suggest that FullCAM modeling is more closely calibrated to monoculture plantation systems than to mixed native-species plantings, where growth dynamics are more complex and heterogeneous.

Both EP and PF projects credit carbon across multiple pools beyond AGB, including below-ground biomass, litter, deadwood and soil organic carbon. By comparison, VM0047, Verra’s ARR methodology, applies a narrower pool scope. These additional pools are subject to greater measurement uncertainty and higher reversal risk. However, approximately 15% of assessed projects display an AGB removal-to-

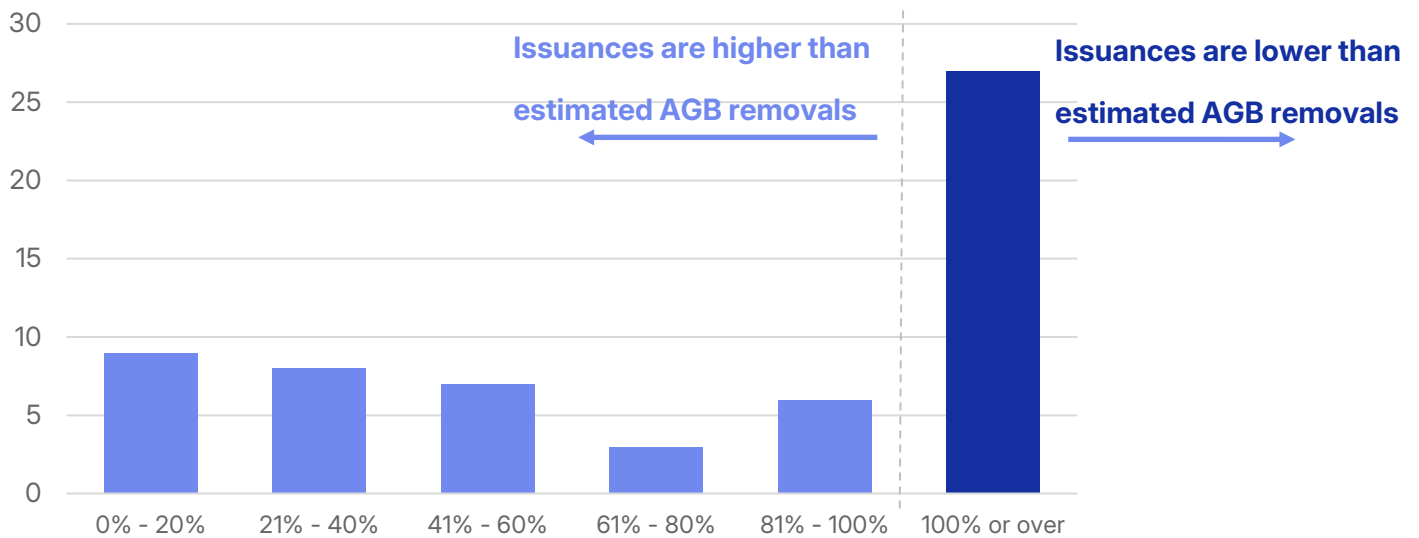
issuance ratio of 0–20%, as shown in the chart below. The gap between issued volumes and observed above-ground carbon accumulation appears too large to be explained solely by unobserved pools.

Part of this divergence may reflect slow early-stage growth rates and the inherent difficulty of detecting sparse canopy in young plantations. Nonetheless, this uncertainty itself is indicative of underlying quantification risk. It is also notable that EP projects exclude harvested wood products (HWPs), whereas PF projects include them. Although HWPs are modeled within FullCAM using region- and species-specific parameters, long-term end-of-life outcomes remain inherently uncertain.

Given the limited public disclosure of project-level data under the ACCU Scheme, a comprehensive bottom-up quantification risk assessment is not feasible. However, comparing cumulative issuances with observed changes in AGB since project inception illustrates the variability in quantification risk across projects applying identical methodologies.³

Carbon stock accumulation varies materially across projects, even within the same methodology, as shown in the chart below. Comparing carbon accrual with issuance volumes highlights patterns consistent with over- or under-crediting.

Percentage of projects by ratio of geospatial AGB removals to issuance ratios



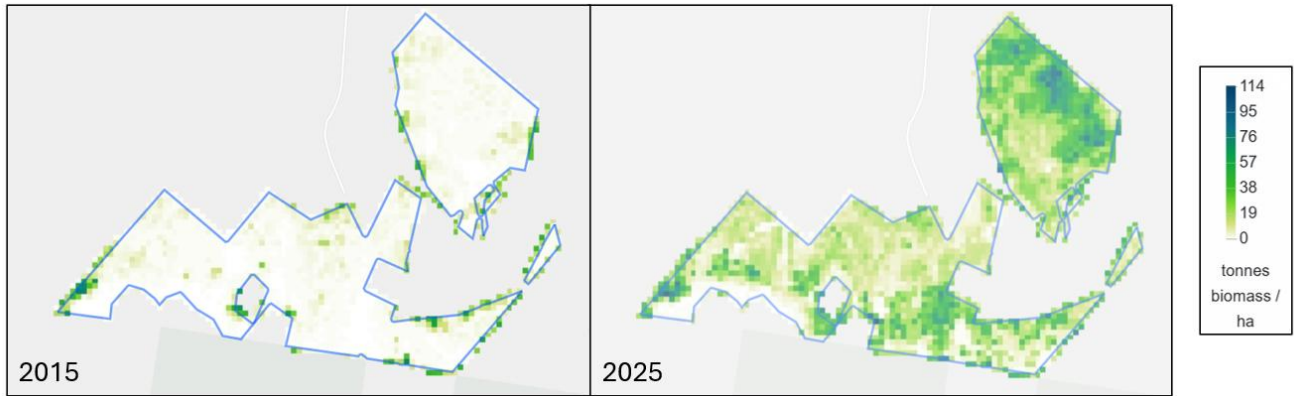
Data as of February 2026. Source: MSCI Carbon Markets and Chloris Earth

For example, the map and chart below illustrate this in a particular project, ACC101132, which establishes permanent native tree plantings on land previously used for agriculture (Clean Energy Regulator, 2026). Geospatial AGB estimates from Chloris Earth indicate that forest carbon stock increased from 96 tonnes

³ This analysis considers changes in AGB only and does not account for other carbon pools, including below-ground biomass, deadwood, litter or soil organic carbon. In afforestation and revegetation projects, these additional pools can collectively represent approximately 30–50% of total long-term carbon stock change, depending on species, soils and climatic conditions. MSCI adjusts the issuances accordingly for the analysis, assuming that 70% of issuances come from AGB.

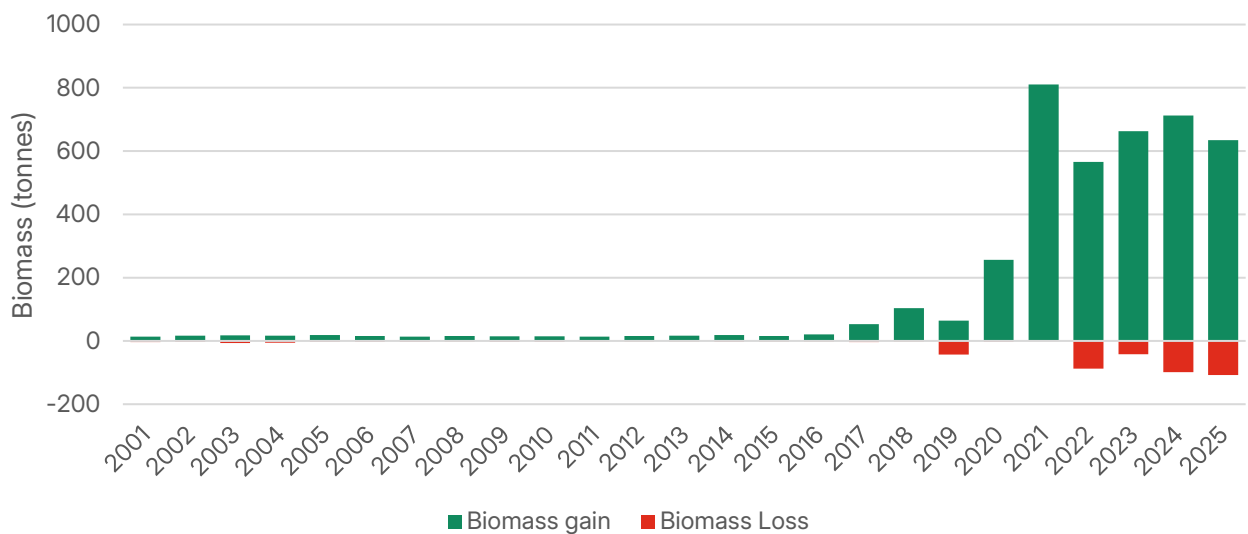
of biomass at project commencement in 2015 to 2,700 tonnes in 2025. This exceeds the 75 tonnes of biomass associated with 137 issued credits, suggesting that the project has issued credits conservatively and faces relatively low risk of overestimation.

Change in AGB stock for the Sunday Morning Hills Revegetation (ACC101132) from project start date (2015) to 2025



Data as of February 2026. Source: Chloris Earth

Annual AGB gain and loss in the Sunday Morning Hills Revegetation (ACC101132) project area



Data as of February 2026. Source: Chloris Earth

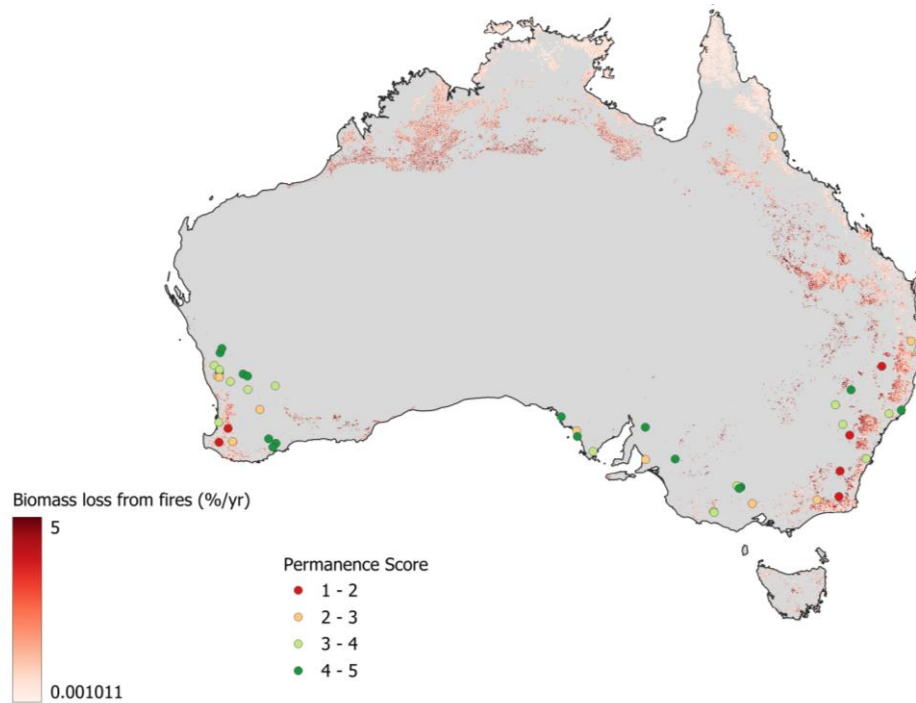
Permanence risk from fire

Fire risk is unevenly distributed across Australia and represents one of the most material permanence risks for ACCU ARR projects, alongside drought, cyclones and, in some locations, landslide exposure. Risk varies significantly by region, driven by differences in climate and landscape characteristics, resulting in divergent long-term reversal risk profiles across projects.

Project design can influence this exposure. The use of native species in EP projects may partially mitigate fire-related permanence risk, as native ecosystems are often better adapted to local fire regimes and may exhibit greater post-fire resilience.

These dynamics are reflected in permanence outcomes across the ACCU ARR portfolio. As illustrated in the map below, projects with the lowest permanence scores appear to be concentrated in regions with higher observed rates of biomass loss due to fire and are predominantly PF projects. While extended crediting periods of up to 100 years can support stronger permanence outcomes in some cases, longer duration alone does not fully offset elevated fire risk where landscape characteristics and species composition increase susceptibility to large-scale reversals.

Fire risk varies significantly across Australia, creating uneven permanence risk for ACCU ARR projects score



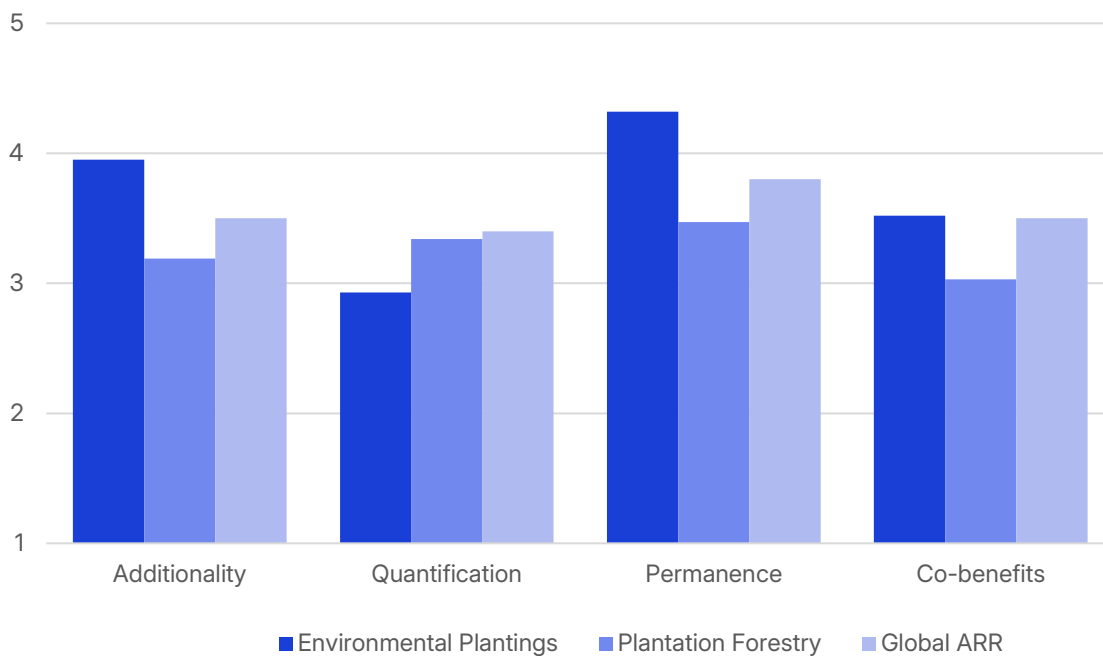
Data as of February 2026. Source: MSCI Geospatial analysis

ACCU projects are of similar quality to the rest of global ARR integrity

Relative to many global ARR standards, ACCU ARR projects demonstrate several structural features that support stronger integrity outcomes in certain dimensions. For example, conservation-focused EP projects tend to score more strongly than the global ARR average on additionality. Furthermore, afforestation activities in Australia are typically not considered common practice and regulatory incentives have historically been limited, although this varies by project start year.

Similarly, the prohibition on harvesting within EP projects supports stronger permanence outcomes. EP projects must either commit to a 100-year legal permanence obligation or apply a 25% permanence discount for projects with a 25-year permanence period. This regulatory structure provides comparatively robust long-term safeguards against reversal risk.

EP projects score higher on additionality and permanence than PF



Data as of February 2026. Source: MSCI Carbon Markets

However, higher risks appear in other dimensions, particularly quantification. These differences do not arise solely at the project level. A significant portion of the divergence from global ARR standards reflects underlying methodological design choices. Compared with some global ARR standards, ACCU methodologies rely more heavily on model-based quantification, with limited requirements for project-level field sampling and relatively constrained public disclosure of modeling assumptions and monitoring data.

Key differences between ACCU afforestation methodologies and VCM standards

Criterion	Environmental Plantings (ACCU)	Plantation Forestry (ACCU) Schedule 1	VM0047 (Verra ARR)	Gold Standard A/R Standard	
Additionality	Harvesting permitted?	No (seed harvest limited in 2024 method)	Yes (commercial harvest allowed with accounting)	Limited (timber harvest restricted; area must not have been managed for wood products for 10 years)	No
	Baseline scenario assumption	Static	Static	Dynamic	Static
	Reference region control plots		No	Yes – based on analysis of control plots	No
	Baseline updated during crediting period?		No	Yes – based on analysis of control plots	No
Quantification	Model used?	FullCAM (Australia's national inventory model)	FullCAM (incl. harvested wood products treatment)	ARR carbon stock models (dynamic baselines; model + census options)	Project-specific growth models aligned with GS guidance
	In-person sampling?	Not included (model-based, with audits)	Not included (model-based, with audits)	Included (field measurements or census approach required)	Included (field sampling mandatory)
Permanence	Permanence period?	25 years or 100 years	25 years or 100 years	Minimum 40 years	Minimum 30-50 years
	Reversal risk management	Permanence obligation + regulatory enforcement	Permanence obligation + harvested wood product accounting	Central buffer pool contributions	Buffer / risk reserve required
	Buffer contribution	100-year= 5% reversal buffer 25-year = 20% permanence discount+ 5% reversal buffer	100-year= 5% reversal buffer 25-year = 20% permanence discount+ 5% reversal buffer	10-20%	20%

Source: ACCU (2024), ACCU (2022), Verra (2025), Gold Standard (2024)

While standardization promotes methodological consistency, it also places greater weight on ex-ante baseline setting and model inputs, increasing sensitivity to site-specific conditions and project execution. Our carbon stock assessment suggests that this structure may create scope for over-crediting, particularly in the early years of a project's crediting period. Where issuances materially exceed observed AGB accumulation, credits are effectively being monetized ahead of realized sequestration. This increases quantification risk, as early issuances cannot fully account for establishment failure, drought impacts or future reversal events.

Baseline additionality presents a related concern. Based on a dynamic baseline analysis of vegetation growth in control plots, we observe that 15 projects exhibit elevated baseline risk, with significant vegetation growth occurring in similar control plots. This includes cases where sites showed substantial native vegetation cover even two years prior to project start.

These findings underscore the importance of assessing project-level conditions rather than assuming homogeneous outcomes simply because projects apply the same FullCAM methodology. The analysis highlights that methodological standardization does not eliminate project-level variability. Greater transparency and data availability would materially improve the ability to assess quantification and additionality risks across the ACCU Scheme.

Conclusion

The findings of this analysis offer insights not only into the ACCU ARR market, but also into how integrity is priced within compliance carbon markets more broadly. Contrary to the common assumption that compliance credits trade as largely interchangeable units, the ACCU market demonstrates clear and persistent price differentiation aligned with underlying integrity characteristics.

Observed price premiums for EP credits appear structurally justified. Pricing differences are closely linked to project design features that influence integrity outcomes, particularly additionality and biodiversity co-benefits. This suggests that even within a regulated framework, market participants are able to differentiate between credits based on perceived integrity and are willing to pay higher prices where integrity risks are lower or co-benefits are stronger.

At the same time, the analysis highlights that integrity within ARR project categories is not uniform. Significant variation exists at the individual project level, including among projects widely regarded as higher integrity. Differences in quantification outcomes and exposure to permanence risks, particularly those related to geography and fire, create a broad distribution of project-level risk that is not fully captured by methodology or project type alone.

Comparison with other ARR standards also indicates that the ACCU framework combines notable strengths with important trade-offs. Strong governance, legal and ethical safeguards and, in many cases, favorable biodiversity outcomes support robust integrity outcomes relative to global peers. However, greater reliance on model-based quantification and variability in baseline additionality assumptions contribute to wider dispersion of quantification and additionality risk. These structural features do not imply lower overall integrity, but they do increase the importance of transparency and project-level assessment in evaluating risk.

Overall, the ACCU ARR market illustrates that integrity-based price differentiation can emerge in compliance markets. Strengthening data disclosure and transparency could further support this differentiation, enabling buyers to more consistently align price with integrity and contributing to the continued development of high-integrity compliance carbon markets.

Appendix

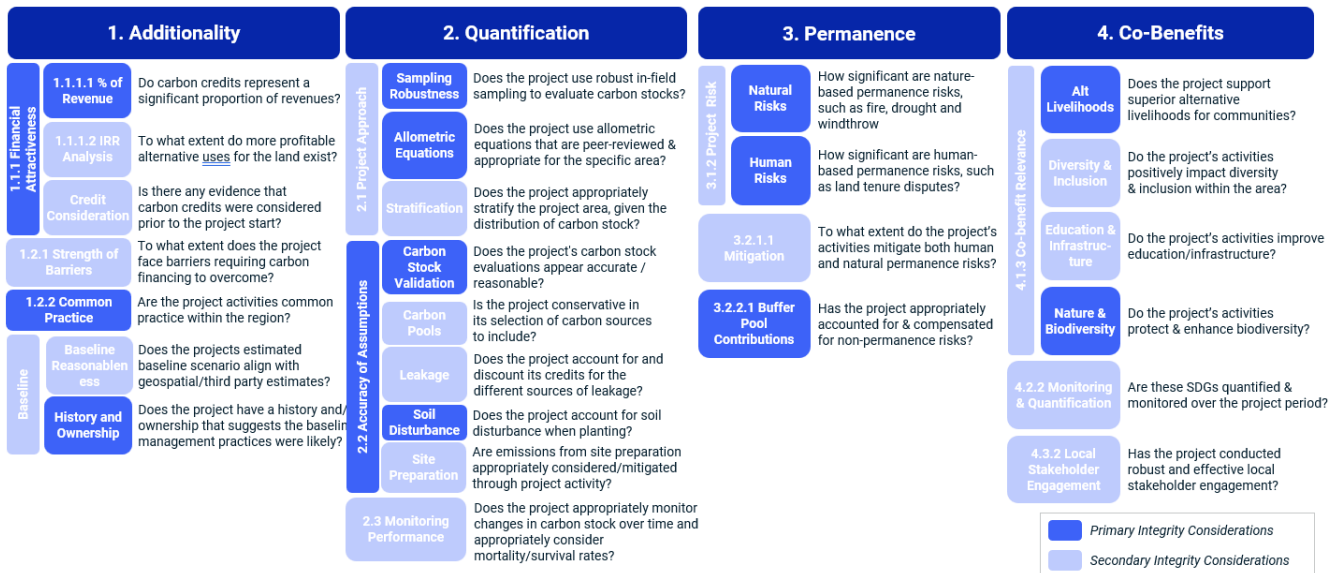
MSCI Carbon Project Ratings ARR Methodology

MSCI Sustainability and Climate’s assessment of ARR projects builds on the broader MSCI Carbon Project Ratings methodology to provide more detailed analysis of ARR projects. This project-type-specific assessment incorporates additional sub-criteria and modifies certain the sub-criteria used in the overall methodology, as outlined below.

These project-type-specific sub-criteria evaluate a deeper set of questions focused on the key drivers of integrity for ARR projects. Assessments are conducted at the individual project level and include a review of project-specific data and underlying assumptions. As a result, they provide a more granular evaluation of ARR projects than would be possible using the overall methodology alone.

In total, MSCI Sustainability and Climate assesses 12 sub-criteria and 24 metrics under this ARR-specific methodology that are either not included in, or are assessed differently from, the overall methodology, as illustrated below. These sub-criteria focus on the primary drivers of integrity for ARR projects. Each aligns with, and replaces, corresponding sub-criteria scores in the overall MSCI Carbon Project Ratings methodology.

ARR assessment topics



Source: MSCI Sustainability and Climate

Application of geospatial analysis to ACCU preliminary assessments

The ACCU project register provides limited public disclosure of project-level data, which constrains the application of the full MSCI Carbon Project Ratings ARR methodology. In the absence of sufficiently detailed project documentation, MSCI Sustainability and Climate applies a geospatially driven subset of the ARR framework to assess key integrity risks across ACCU ARR projects.

This geospatial approach does not constitute a full project rating. Rather, it focuses on a defined set of integrity-relevant indicators that can be assessed consistently across projects using spatial data and third-party datasets. These indicators are selected because they capture key drivers of additionality, quantification, permanence and co-benefits, even where direct project-level inputs are unavailable.

In total, the ACCU assessment draws on 12 geospatial and spatially derived indicators, grouped across five integrity dimensions:

- **Baseline analysis:** Prior land use and recent land cover change, used to assess the plausibility of counterfactual land-use assumptions, alongside dynamic baseline assessment based on similar areas.
- **Common practice:** Surrounding land-use patterns and landscape-level vegetation characteristics, used to evaluate whether project activities differ meaningfully from prevailing practice.
- **Carbon stock and quantification:** Changes in ABG observed within the project area over its lifetime.
- **Permanence risk:** Exposure to natural hazards such as fire, drought and other disturbance risks.
- **Biodiversity:** Indicators including forest fragmentation, proximity to waterways and ecosystem condition and scarcity.

The exact data sets and spatial layers used are documented in the MSCI Sustainability and Climate ARR methodology.

Together, these spatial indicators provide a consistent basis for identifying relative differences in integrity risk across ACCU ARR projects, particularly with respect to quantification and permanence outcomes.

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