A Critique of the ACCU Scheme Landfill Gas Method Reform Proposals

Andrew Macintosh, Dean Ansell, Marie Waschka and Don Butler
The Australian National University
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Executive summary

In May 2024, the Department of Climate Change, Energy, the Environment and Water (Department) published a reform options paper on the ACCU scheme's landfill gas methods.[1] The paper proposes five changes to the methods.

1. Extend the crediting periods of existing landfill gas projects for an undefined period, subject to 5-yearly baseline reviews. Most of the large landfill gas sites have been receiving carbon credits for 15-20 years. The proposal is seemingly to provide credits to the sector on an ongoing basis.
2. Reset the default baseline proportion for generation and flaring-only projects to 36%, with the exception of upgrade projects with baselines ≥36%.
3. Increase the default baseline proportion by 1.9% per year (inflation factor), with 5-yearly reviews of the baseline proportion and inflation factor. The application of the inflation factor would mean the 36% default baseline proportion would increase to 37.9% in the 2nd year after it comes into effect, then 39.8% in the 3rd year and so on over time, unless adjusted in the 5-yearly reviews.
4. Upgrade projects with baselines ≥36% will be required to continue to use these higher baselines until the increasing default baseline proportion reaches their baseline. At this point, their baseline will increase in line with the default baseline proportion.
5. Introduce a requirement for projects to measure the methane (CH_4) proportion of captured biogas, with the exception of flaring-only projects at closed landfills, which would be allowed to use a default CH_4 proportion of 30%. This proposal is not controversial.

Due to the repeated grandfathering of historic baselines, the baselines for the largest projects that have not been upgraded are generally either 0% or 24%, below the existing default of 30%. Most smaller and newer projects have 30% baselines. The weighted average baseline across all existing projects is around 22%-24%. It is not possible to calculate this amount precisely because the relevant data are not publicly available. While noting this uncertainty, if implemented, the Department's proposal would result in existing projects with low concessional baselines being moved into a higher 36% baseline, which would then increase through time. However, the reform options paper does not indicate when the changes will come into effect, giving rise to the possibility that existing projects with concessional <30% baselines will continue to be able to use these baselines for the remainder of their current crediting periods. This will result in the continued issuance of credits for non-additional abatement.

[1] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra.

The reform proposals are deeply flawed on multiple levels and pose a serious credibility risk, both to the Department and the ACCU scheme more broadly. At a fundamental level, the reforms are based on the false premise that reductions in biogenic CH_4 emissions can be used to offset the warming associated with fossil CH_4 and fossil carbon dioxide (CO_2) emissions. It is now well-established that the warming effects of biogenic CH_4 emissions are not comparable with those associated with fossil CH_4 and fossil CO_2. The differences are a product of the short atmospheric lifetime of CH_4 relative to CO_2 and the lifecycle of biogenic CH_4 (i.e. biogenic CH_4 emissions start and end their lifecycle as atmospheric CO_2, meaning they only contribute to warming while in their short CH_4 phase and do not add to the stock of CO_2 in the atmosphere, unlike fossil CH_4 emissions). Because of the differences in the atmospheric lifetimes and lifecycles of biogenic CH_4 compared to fossil CH_4 and fossil CO_2, the net effect of issuing offsets for reductions in biogenic CH_4 emissions will be to increasing global warming. While inconvenient, the science on this issue should not be ignored. In short, ACCUs should not be used to incentivise landfill gas capture. To the extent that additional financial incentives are needed to ensure the ongoing capture and combustion of CH_4 emitted from landfills, the government should use subsidies. The simplest way of doing this for generation projects is by offering them long-term power purchase agreements that provide a base price sufficient to ensure the ongoing viability of an efficient operation. Similar mechanisms could be used for flaring-only projects.

If it is boldly assumed that biogenic CH_4 emissions are fungible with fossil CH_4 and CO_2 emissions, the main problem with the reform proposal concerns the 36% starting default baseline proportion. The argument put forward to justify the 36% baseline proposal is illogical and indefensible. There are seven main problems.

Problem 1: The Department has not applied the correct legal test when seeking to determine the appropriate baseline. The applicable offsets integrity standard requires that 'the method should result in carbon abatement that is unlikely to occur in the ordinary course of events, disregarding the effect of this Act'.[2] This requires the baseline to be set at a level that ensures the substantial majority of the abatement likely to be credited under the method would not occur in the absence of the incentive provided by the scheme.[3] Despite this being well-established, the Department has sort to justify the proposed 36% starting default baseline proportion using a newly invented 'common practice in the absence of the ACCU Scheme' test,[4] which is inconsistent with the required statutory additionality standard.

Problem 2: Putting aside the issues associated with Problem 1, if it is assumed that the baseline should seek to reflect the 'quantity of methane abatement that [would] occur without incentives

[2] *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act), s 133(1)(a).

[3] ERAC (2021) Information Paper: Committee considerations for interpreting the Emissions Reduction Fund's offsets integrity standards. Commonwealth of Australia, Canberra, p 6.

[4] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 18. See also DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 22.

from the ACCU Scheme',[5] the proposed 36% baseline is wrong because the Department has failed to convert the common practice estimate into a baseline equivalent proportion. The Department devised the proposed 36% baseline proportion using an estimate of the sector wide capture efficiency (methane captured at generation sites divided by total methane generated from all landfills), after removing the CH_4 captured and combusted at flaring-only projects and making an adjustment for oxidation. If the baseline proportion in the method is intended to reflect the quantity of methane captured and combusted in 'common practice', the sector-wide capture efficiency estimate must be converted into a baseline equivalent proportion. This is because the baseline equivalent proportion is not the same as the capture efficiency. The capture efficiency is the amount of methane captured as a proportion of total methane produced. The baseline proportion is applied to the amount of CH_4 captured at each project, which is typically ~75% of the CH_4 generated in landfills with gas capture systems. Using the adjusted sector-wide capture efficiency as the baseline proportion will not result in the cumulative baseline deductions reflecting the 'common practice' quantity of methane capture that would otherwise occur. The amounts deducted will be too low. To avoid this, the sector-wide capture efficiency must be converted into a baseline equivalent proportion, which is most easily done by multiplying it by ~1.33 (i.e. 1/0.75) to reflect the fact that the amount of CH_4 captured is necessarily less than the total amount of CH_4 generated at any particular landfill site. This means that, if the Department's common practice logic is accepted, the minimum baseline proportion for the method should be 48%, not 36%.

Problem 3: The Department's 'common practice in the absence of the ACCU Scheme' test assumes that, if ACCUs are withdrawn from flaring-only projects, the capture efficiencies at these sites will fall to zero. This conflicts with the basic assumption that underpins the existing 30% default baseline – that is, in the absence of ACCUs, sites would still be required to capture a certain amount of CH_4 because of state and territory regulatory requirements. There is no evidence to support the jettisoning of this assumption, which has been accepted by the industry since 2011-12.

Problem 4: The Department's 'common practice in the absence of the ACCU Scheme' test conflicts with the logic that underpins the baseline provisions that apply to upgrade projects. The logic that underpins the upgrade project baseline provisions is that, if projects stop receiving ACCUs, their capture efficiencies will not decline; they will remain as they were while the original project was still receiving ACCUs during its crediting period. The upgrade project then receives ACCUs calculated against this historic baseline. This approach is in direct conflict with the logic that underpins the Department's common practice test, which assumes that, in the absence of ACCUs, the capture efficiencies at generation projects will fall to the industry-wide average and that the capture efficiencies at flaring-only projects will fall to zero. This is illogical and indefensible.

Problem 5: An unavoidable consequence of the Department's common practice test is that it does not focus the inquiry on the largest projects, which account for the overwhelming majority of the abatement that has been, and is likely to be, credited under the method. This is illogical and conflicts

[5] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 18. See also DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 22.

with the statutory requirements under the CFI Act. The available data suggest that, at a minimum, the starting default baselines for large projects should be ~70%-80%.

Problem 6: The proposal to have a single starting default baseline that applies to all projects other than upgrades ignores the variability in the factors that determine the amount of gas capture and combustion that would occur in the absence of the incentive associated with ACCUs. The offsets integrity standards require all assumptions in methods to be conservative. The development of conservative baselines for landfill projects requires consideration of the factors that influence the levels of gas capture that would occur in the absence of ACCUs and how they apply to projects in different locations and with different characteristics. The three most relevant factors that influence the likely counterfactual capture efficiency are: (a) the size of the landfill site (i.e. the amount of waste it receives and amount of CH_4 it produces); (b) whether it is a generation or flaring-only project; and (c) the jurisdiction in which it is located and the stringency of the applicable state/territory regulatory requirements that apply to landfills. The proposal to have a single starting default baseline that applies to all projects other than upgrades ignores the material influence these factors have on the counterfactual capture efficiency at individual sites. This is inconsistent with the conservatism integrity standard. If a single baseline is going to be used, it would need to be set at the levels that reflect the counterfactual capture efficiencies at the largest sites because those sites generate the majority of ACCUs (i.e. at or above ~70%-80%).

Problem 7: The data relied on to estimate industry-wide capture efficiency are unreliable and the calculations therefore do not provide clear and convincing evidence that the 36% suggested is conservative, as required by the offsets integrity standard. The site-specific data presented in the reform options paper are no less reliable than the industry wide data form the national inventory, and clearly suggest average capture efficiencies at most relevant landfills are well in excess of 36%.

It is difficult to explain the logical inconsistencies in the Department's reform proposals without reference to politics. The best explanation seems to be that the reforms are designed to ensure there is a healthy ongoing supply of cheap ACCUs to suppress the carbon price faced by large polluters covered by the Safeguard Mechanism and reduce the risk of the cap price binding. This is essential to the Australian Government's *Future Gas Strategy*, which intended to support gas production and development 'through to 2050 and beyond'.[6] ACCUs are the enabler of this vision, but only if their supply is sufficiently plentiful and the price is sufficiently low to ensure fossil-intensive projects remain viable. Mindful of the implications for the gas strategy, the Department has seemingly tried to construct arguments to justify a political decision to ensure the supply and price of ACCUs remains within acceptable bounds.

It should be noted that the reform proposal is the product of an almost 18-month, closed door process involving a 'technical working group' handpicked by the Department, which was dominated by proponents of landfill projects. The Department has then given members of the public one month to respond to the reform paper and refused to release key data on landfill projects, which is needed to properly scrutinise additionality risks. For the ACCU scheme to evolve into an effective policy, and the public to have faith it is being administered in the public interest, the Department needs to engage more openly with financially disinterested stakeholders and experts.

[6] Australian Government (2024) Future Gas Strategy. Commonwealth of Australia, Canberra, p 17.

1. Introduction

Landfill gas projects capture the biogas emitted from landfills and combust the methane (CH_4) component of the gas using either a flare or an electricity generator. Burning methane converts it to carbon dioxide and water, neutralising its warming effects. These projects have received almost 40 million Australian carbon credit units (ACCUs) to date, making them the ACCU scheme's second largest project type by credit issuances. There are 144 registered projects. However, these include duplicates and upgrades. The true number of projects, defined as landfills with collection systems managed by a single operator, is approximately 115.

The landfill gas sector is highly concentrated. The 10 largest projects account for more than 50% of the total number of ACCUs issued to landfill projects. The 20 largest projects account for almost 70% of issued ACCUs. All of these projects are generation projects (i.e. they combust the CH_4 component of biogas using an electricity generator, meaning they receive revenues from the sale of electricity, renewable energy certificates and ACCUs). The highly concentrated nature of the sector means that, in assessing the integrity of any method changes, the primary focus should be on how they apply to the largest projects.

There were two original landfill gas methods under the Carbon Farming Initiative: *Carbon Farming (Capture and Combustion of Methane in Landfill Gas from Legacy Waste) Methodology Determination 2012*; and *Carbon Credits (Carbon Farming Initiative) (Capture and Combustion of Methane in Landfill Gas from Legacy Waste: Upgrade Projects) Methodology Determination 2012*. Both of these methods were repealed in July 2015 and replaced with the *Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination 2015*. In late 2021, a new landfill gas method was made, known as the *Carbon Credits (Carbon Farming Initiative—Electricity Generation from Landfill Gas) Methodology Determination 2021*. All existing landfill projects are now registered under either the 2015 or 2021 method.

In May 2024, the Department of Climate Change, Energy, the Environment and Water (Department) published a reform options paper on the ACCU scheme's landfill gas methods.[7] The paper proposes five changes to the methods.

1. Extend the crediting periods of existing landfill gas projects for an undefined period, subject to 5-yearly baseline reviews. Most of the large landfill gas sites have been receiving carbon credits for 15-20 years. The proposal is seemingly to provide credits to the sector on an ongoing basis.

2. Reset the default baseline proportion for generation and flaring-only projects to 36%, with the exception of upgrade projects with baselines ≥36%.

[7] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra. https://app.converlens.com/climate-au/reform-options-for-accu-scheme-landfill-gas-methods [accessed 5 June 2024]

3. Increase the default baseline proportion by 1.9% per year (inflation factor), with 5-yearly reviews of the baseline proportion and inflation factor. The application of the inflation factor would mean the 36% default baseline proportion would increase to 37.9% in the 2nd year after it comes into effect, then 39.8% in the 3rd year and so on over time, unless adjusted in the 5-yearly reviews.

4. Upgrade projects with baselines ≥36% will be required to continue to use these higher baselines until the increasing default baseline proportion reaches their baseline. At this point, their baseline will increase in line with the default baseline proportion.

5. Introduce a requirement for projects to measure the CH_4 proportion of captured biogas, with the exception of flaring-only projects at closed landfills, which would be allowed to use a default CH_4 proportion of 30%. This proposal is not controversial.

Due to the repeated grandfathering of historic baselines, the baselines for the largest projects that have not been upgraded are generally either 0% or 24%, below the existing default of 30%. Most smaller and newer projects have 30% baselines. The weighted average baseline across all existing projects is around 22%-24%. It is not possible to calculate this amount precisely because the relevant data are not publicly available. While noting this uncertainty, if implemented, the Department's proposal would result in existing projects with low concessional baselines being moved into a higher 36% baseline, which would then increase through time. However, the reform options paper does not indicate when the changes will come into effect, giving rise to the possibility that existing projects with concessional <30% baselines will continue to be able to use these baselines for the remainder of their current crediting periods. This will result in the continued issuance of credits for non-additional abatement.

The remainder of this paper provides a critique of the proposed landfill gas method reforms. Section 2 raises questions about the rationale for issuing carbon credits for the abatement of biogenic CH_4 emissions. Section 3 steps through the faulty logic and lack of evidence supporting the adoption of rolling crediting periods and a starting default baseline proportion of 36%.

The paper argues the proposed reforms do not meet the statutory offsets integrity standards and that, if adopted, they will result in the largest landfill projects continuing to receive large numbers of ACCUs for abatement that would occur anyway, without the incentive provided by the scheme (i.e. non-additionality). The reforms seem designed to ensure there is a healthy ongoing supply of cheap ACCUs to suppress the carbon price faced by large polluters covered by the Safeguard Mechanism and reduce the risk of the cap price binding.

2. Fungibility between biogenic methane and fossil CO_2 and CH_4

The objective of Australia's greenhouse gas mitigation policies should be to help slow, stop and ultimately reverse the warming associated with the post-industrial increase in the atmospheric concentration of greenhouse gases. This means the focus of policy-making should be on the implications of policy changes on warming, not simply emissions of carbon dioxide equivalents (CO_2-e) calculated using 100-year global warming potentials (GWPs). Focusing solely on CO_2-e emissions

can result in illogical outcomes that run counter to the aim of controlling warming. The issuances of carbon credits for reductions in biogenic CH_4 emissions illustrates this risk, showing how a focus on CO_2-e emissions can run directly counter to the objective of climate policy by increasing warming.

Consistent with international accounting practices, the ACCU scheme treats biogenic CH_4 as fungible with fossil carbon dioxide (CO_2) and CH_4 through the use of 100-year GWPs. However, the warming characteristics of 1 tonne of biogenic CH_4 emissions is not the same as 1 tonne of fossil CH_4 or 1 tonne of fossil CO_2 emissions (when the CH_4 is converted to CO_2-e). Other than CH_4 being a more potent greenhouse gas than CO_2, the key differences relate to the atmospheric lifetime of CH_4 relative to CO_2 and the lifecycle of biogenic CH_4.

CH_4 is a relatively short-lived gas, meaning its warming effects on the Earth's atmosphere are likewise relatively short when compared to CO_2. CH_4 has an atmospheric lifetime of 8 to 10 years,[8] compared to CO_2, which stays in the atmosphere for hundreds to thousands of years. The difference in the atmospheric lifetimes of CH_4 and CO_2 means their impacts on the Earth's energy balance are vastly different. A pulse of CH_4 released into the atmosphere has an acute short-term effect, resulting in a sharp increase in warming over a 10-15 year period. CO_2 has a chronic long-term effect, resulting in a more muted but essentially permanent (on human timescales) increase in warming.

In addition to the differences in the intensity and duration of the warming effects, there are significant differences in the lifecycle of biogenic CH_4 compared to fossil CO_2 and CH_4. All biogenic CH_4 emissions start as atmospheric CO_2. The atmospheric CO_2 is then sequestered into organic materials through photosynthesis and subsequent processes. CH_4 is emitted into the atmosphere when these organic materials decompose in the absence of oxygen (e.g. underground or in the rumen of bovines). When in the atmosphere, the CH_4 breaks down into CO_2 via a series of chemical reactions. This means that, at the start and end of their CO_2-CH_4-CO_2 lifecycle, biogenic CH_4 emissions do not add to warming. The warming effects arise during the CH_4 phase of the lifecycle because CH_4 captures and re-radiates substantially more heat than CO_2.

This contrasts with fossil CO_2 and CH_4, where they start in a stable form in geological deposits, out of the atmosphere, and are then liberated into the atmosphere through human activities. This adds to the atmospheric concentration of CO_2 and CH_4. Moreover, in the case of fossil CH_4, it has an elevated warming effect in the CH_4 phase of its lifecycle and, when it breaks down, it also adds to the atmospheric concentration of CO_2.

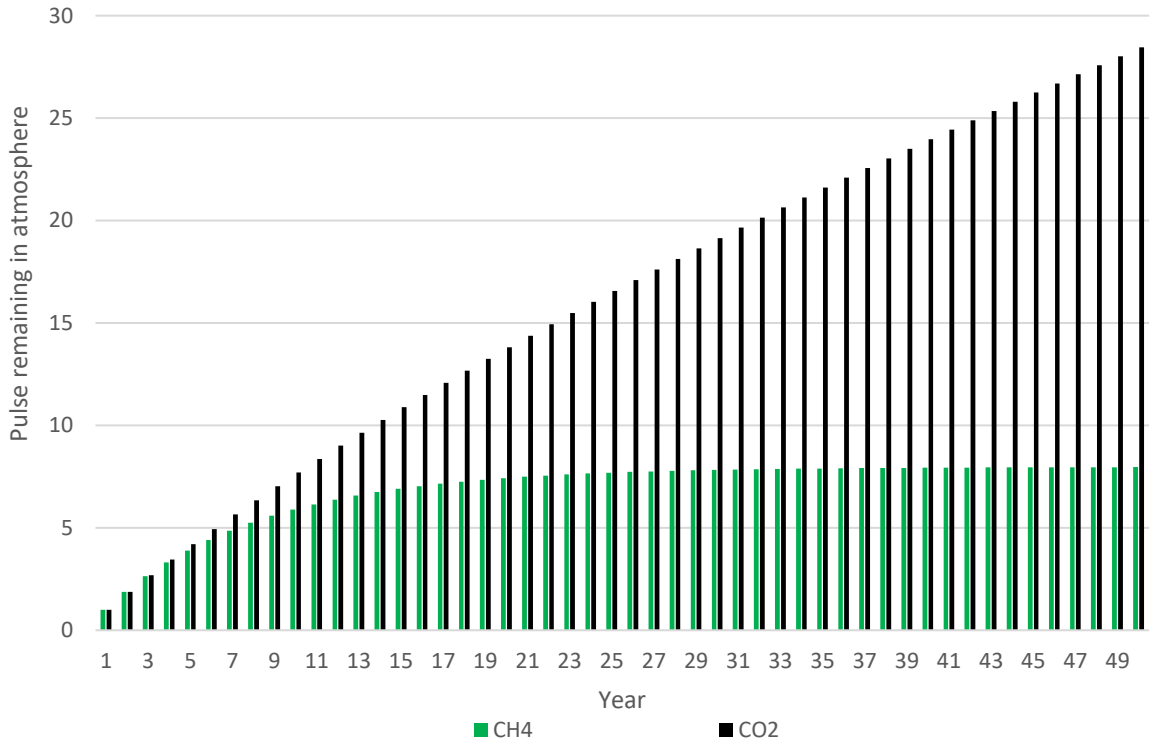
The combined effect of these two factors means that, if biogenic CH_4 emissions from a particular source are stable over time, and positive feedback loops are ignored, then the ongoing annual emissions from the source should not add to further warming.[9] This is illustrated in Figure 1, which

[8] Szopa, S. et al. (2021) Short-Lived Climate Forcers. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V. et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 817–922, at 836.

[9] Allen, M. et al. (2018) A solution to the misrepresentations of CO2-equivalent emissions of short-lived climate pollutants under ambitious mitigation. Climate and Atmospheric Science (2018) 1:16; Lynch, J. et al. (2020) Demonstrating GWP*: a means of reporting warming-equivalent emissions that captures the contrasting impacts of short- and long-lived climate pollutants. Environmental Research Letters 15, 044023.

shows a hypothetical new source of biogenic CH_4 emissions over a 50-year period, where 1 tonne of CH_4 emissions are emitted each year. After roughly 10-20 years, the proportion of biogenic CH_4 in the atmosphere stabilises because of the speed at which it breaks down. Essentially, each additional tonne of CH_4 that is emitted to the atmosphere replaces 1 tonne of CH_4 that is removed through chemical processes. Once this level is reached, the warming effect of the emissions source is essentially stable – the source has resulted in historic warming but the ongoing emissions do not add to further warming. This contrasts sharply with fossil CO_2 and CH_4 emissions, where each additional tonne of emissions adds to further warming. A further notable aspect of this dynamic is that when emissions from a previously stable source of biogenic CH_4 are permanently reduced, it should have a cooling effect. In contrast, reductions in fossil CO_2 and CH_4 emissions simply do not add to further warming.

Figure 1. Hypothetical new biogenic CH_4 and new fossil CO_2 emission source of 1 tonne per annum, amount of gas remaining in atmosphere



Source: Forster, P et al. (2007) Changes in Atmospheric Constituents and in Radiative Forcing. In: Solomon, S. et al. (eds.), Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, p 213.

These characteristics of the gases mean that biogenic CH_4 is not fungible with fossil CO_2 and CH_4. The effects of the gases are not the same. This reality explains why biogenic CH_4 emissions do not need to be reduced to zero to stabilise the atmospheric concentration of greenhouse gases and global temperatures.[10] It also provides the rationale for the argument that red meat producers should be

[10] Riahi, K. et al. (2022) 2022: Mitigation pathways compatible with long-term goals. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment

able to offset their ongoing enteric fermentation CH_4 emissions through a one-off removal of a prescribed amount of CO_2.[11] The differences in the warming effects of biogenic CH_4 are also behind the push for Australia's red meat industry to adopt a 'climate neutral' rather than a 'carbon neutral' objective, based on the scientific reality that stable annual enteric fermentation CH_4 emissions from bovines do not add to further warming.[12] However, the logic applies in reverse. Allowing biogenic CH_4 offsets to be used to facilitate increases in fossil CO_2 and CH_4 involves swapping a reduction in a short-lived gas that generally replaces warming for a long-lived gas that always adds to warming. Because of the differences in the atmospheric lifetimes and lifecycles of biogenic CH_4 compared to fossil CH_4 and fossil CO_2, the net effect of issuing offsets for reductions in biogenic CH_4 emissions will be to increasing global warming.

Due to this, extending the crediting periods of landfill projects for the 4th or 5th time to enable the projects to continue to receive ACCUs will undermine the policy objective of mitigating warming. Most of the ACCUs that are issued will be used by facilities covered by the Safeguard Mechanism to offset fossil CO_2 and CH_4 emissions, particularly from the gas and coal mining sectors. The Department justifies this proposal on the basis that, if ACCUs were withdrawn, CH_4 emissions from landfills would increase. Based on the proposed 36% starting default baseline proportion, the suggestion is that, if ACCUs are withdrawn, emissions from landfills will increase by ~2 million tonnes of CO_2-e yr^{-1}, based on 100-year GWPs. Even if this is accepted, the avoidance of the short-term warming associated with the increase in emissions is not comparable to the long-term warming enabled by the issuance of the credits. Put another way, by using carbon credits to incentivise landfill gas capture, the ACCU scheme effectively ensures landfill gas companies are net contributors to climate change, not net contributors to the mitigation of global warming.

This fact is one of the reasons why the issuance of ACCUs to incentivise landfill gas capture is poor climate policy. To the extent that additional financial incentives are needed to ensure the ongoing capture and combustion of CH_4 emitted from landfills, the government should use subsidies. The simplest way of doing this for generation projects is by offering them long-term power purchase agreements that provide a base price that ensures the ongoing viability of an efficient operation. Similar mechanisms could be used for flaring-only projects. This approach has two benefits. Firstly, it avoids issuing ACCUs that perpetuate warming because of the biogenic CH_4 fungibility fallacy. Secondly, it would provide long-term certainty to landfill gas operators and avoid the need to make repeated complex judgments about additionality, in a context where errors result in worse climate

Report of the Intergovernmental Panel on Climate Change [P.R. Shukla et al. (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp 295-408.

[11] Lauder, A. et al. (2013) Offsetting methane emissions — An alternative to emission equivalence metrics. International Journal of Greenhouse Gas Control 12 (2013) 419–429.

[12] Lauder. A. (2023) CN30 was a poor decision and should be replaced with Climate Neutral. Beef Central, 30 August 2023 (available at: https://www.beefcentral.com/news/opinion/opinion-cn30-was-a-poor-decision-and-should-be-replaced-with-climate-neutral/); Strong, J. (2023) MLA: Productivity, profitability and sustainability – delving deeper into the CN30 goal. Beef Central, 31 August 2023 (available at: https://www.beefcentral.com/carbon/mla-productivity-profitability-and-sustainability-delving-deeper-into-the-cn30-goal/).

outcomes (i.e. because the issuance of ACCUs that do not represent additional abatement increases emissions), even if the CH_4 fungibility fallacy is ignored.

3. Starting default baseline of 36%

Apart from the above issues concerning the fungibility of biogenic CH_4 with fossil CO_2 and CH_4, the primary integrity concern with the landfill methods has always centred on the additionality of the abatement: would the credited abatement have occurred anyway without the incentive associated with the ACCU scheme?[13]

Under the ACCU scheme, additionality risks are supposed to be addressed through a combination of the project-level registration rules and method rules concerning eligibility and the measurement of abatement. For projects to be registered under the ACCU scheme, they are meant to meet three project-level registration rules:

- the newness requirement – the project must not have commenced prior to registration;
- the regulatory additionality requirement – the project must not be required to be carried out by or under a law of the Commonwealth, a State or a Territory; and
- the government program requirement – the project must not be likely to be carried out under another government program or scheme in the absence of the ERF.

These results are meant to shield out non-additional projects.

On a cursory reading, these project-level registration rules should exclude most landfill gas projects. Projects that existed prior to when the scheme started, which includes most of the large projects, should fall foul of the newness requirement. All medium to large landfills, and most small landfills, are required by law to control biogas emissions for health and safety reasons, meaning they should fall foul of the regulatory additionality requirement. Further, most generation projects receive large-scale generation certificates (LGCs) under the Renewable Energy Target scheme, meaning they should fall foul of the government program requirement. However, these additionality requirements are only triggered by registration and projects can be exempt from these requirements through the operation of what are known as 'in lieu' requirements contained in the methods or the *Carbon Credits (Carbon Farming Initiative) Rule 2015* (CFI Rule).

- Newness requirement. Under the landfill gas methods, projects that existed before the scheme commenced are largely exempt from the newness requirement because it only applies to projects seeking registration. Projects that operated under the NSW Greenhouse Gas Abatement Scheme (GGAS) and Greenhouse Friendly were allowed to transition into the Carbon Farming Initiative (CFI) and, once registered under the CFI, they did not have to re-register when the scheme was renamed the Emissions Reduction Fund (ERF) or, more

[13] Baxter, T., Gilligan, G. (2017) Verification and Australia's emissions reduction fund: integrity undermined through the landfill gas method? *Australian Journal of Environmental Law* 4, 1-29.

recently, when it was renamed again to the ACCU scheme. Without a requirement to register, none of the additionality requirements are triggered. The landfill gas methods also contain an in lieu provision that applies to recommencing projects – those that previously operated, closed and then restarted – that exempts them from the newness requirement.

- Regulatory additionality requirement. The CFI Act's regulatory additionality requirement does not apply to any landfill gas project – regardless of when it was established – because of an in lieu requirement that merely provides that 'a requirement in lieu of the regulatory additionality requirement is that the project is a landfill gas project'.[14]

- Government program requirement. Landfill gas projects are largely exempt from the government program requirement because the nature of the requirement has been altered by an in lieu requirement in the CFI Rule. This provision does away with the broadly cast requirement in the Act and substitutes a list of government programs. Only government programs that are included on the list in section 21 of the CFI Rule trigger the government program requirement. This list currently includes projects that involve the operation of an accredited power station within the meaning of the *Renewable Energy (Electricity) Act 2000* (i.e. the Renewable Energy Target), 'except if the project is an emissions avoidance project that primarily involves the avoidance of methane emissions'.[15]

The exemption of landfill gas projects from these requirements means the main mechanism that is used to address additionality risks is the 'baseline' that applies in the calculation of a project's net abatement amount. The baseline is a prescribed proportion of the CH_4 captured and combusted at each project.[16] ACCUs are not issued for this baseline proportion – it is deducted from the total amount of CH_4 combusted at the site when calculating the credited abatement. For example, if a project has a 30% baseline and combusts 100 tonnes of greenhouse gases, it will be credited for 70 tonnes.

Under the CFI Act, methods must satisfy each of the six offsets integrity standards.[17] Three of these standards are of particular relevance to the baseline provisions of the landfill methods.

1. **Additionality (s 133(1)(a)):** The method should result in carbon abatement that is unlikely to occur in the ordinary course of events, disregarding the effect of this Act. This is interpreted

[14] *Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination 2015*, s 13(2).
[15] *Carbon Credits (Carbon Farming Initiative) Rule 2015*, s 21(2).
[16] In upgrade projects, baselines are calculated by dividing the capture efficiency (i.e. CH_4 captured divided by total CH_4 emitted) from a historic period before the upgrade (the average from either a 2- or 4-year period before the upgrade) by the capture efficiency for the 12-month period after the upgrade. This approach assumes that, if the upgrade project was not undertaken, the capture efficiency of the sites would remain as they were under the old project. *Carbon Credits (Carbon Farming Initiative—Landfill Gas) Methodology Determination 2015*, s 29 and *Carbon Credits (Carbon Farming Initiative— Electricity Generation from Landfill Gas) Methodology Determination 2021*, s 32.
[17] CFI Act, s 133(1).

as requiring that 'the substantial majority of the abatement likely to be credited under the method would not occur in the absence of the incentive provided by the scheme'.[18]

2. **Evidence-based (s 133(1)(d)):** The method should be supported by clear and convincing evidence. This standard is interpreted as requiring there to be clear and convincing evidence of: (i) the impact of the abatement activity on emissions and removals; (ii) the robustness of the approach to the exclusion of non-additional projects and non-additional abatement; (iii) the robustness of the approach to measurement and verification; and (iv) the robustness of the approach to the treatment of project emissions and leakage.[19]

3. **Conservativism (s 133(1)(g)):** Estimates, projections and assumptions used in or under the method should be conservative. This standard is interpreted as requiring all estimates, projections and assumptions that have an influence on the calculation of the net abatement amount to be conservative.[20]

There are two main factors that would incentivise the capture of CH_4 at landfills in the absence of ACCUs: state and territory regulations that apply to the operation of landfills; and the ability for landfill gas operators at generation sites to earn profits through the sale of electricity and LGCs. Given the above statutory requirements, the baseline should reflect these two factors. The failure to fully consider both of these factors will result in baselines that are not sufficiently conservative or supported by clear and convincing evidence, with the consequence that the substantial majority of the abatement likely to be credited under the method is unlikely to be additional.

The baselines that apply under the current landfill methods do not fully reflect these two factors. The problems stem from two main issues.

1. Most of the largest landfill gas projects have 0% or 24% baselines, which is below the current 30% default. The 30% default stems from a deal between the landfill gas industry and government in 2011-12, when the first CFI landfill gas methods were being made. The industry and government agreed that 30% would be the default minimum baseline proportion under the method, based only on state and territory regulatory requirements.[21] Projects would use the higher of the default 30% or any specific proportion set under the applicable state/territory laws. However, industry and government also struck a side deal, where projects registered under older offset schemes (NSW GGAS and Greenhouse Friendly) were allowed to grandfather their old baselines into the CFI. These old projects, which

[18] ERAC (2021) Information Paper: Committee considerations for interpreting the Emissions Reduction Fund's offsets integrity standards. Commonwealth of Australia, Canberra, p 6.

[19] ERAC (2021) Information Paper: Committee considerations for interpreting the Emissions Reduction Fund's offsets integrity standards. Commonwealth of Australia, Canberra, p 13.

[20] ERAC (2021) Information Paper: Committee considerations for interpreting the Emissions Reduction Fund's offsets integrity standards. Commonwealth of Australia, Canberra, p 16.

[21] SMEC (2018) *Analysis of Waste Sector Projects and Methods. DELIVERABLE 2: Performance of the landfill gas method against the offsets integrity standards*. Report for the Department of the Environment and Energy. SMEC Australia Pty Ltd, North Sydney, Australia.

include almost all of the large projects, were then allowed to grandfather over the baselines into the Emissions Reduction Fund in 2015 when they received a 7-year extension to their crediting periods, and then to grandfather them over again in the 2021 landfill method when they received another 5-year extension to their crediting periods. This has meant the largest landfill projects, which are responsible for most of the ACCUs, have had concessional baselines for the better part of 20 years. The application of these concessional baselines to larger sites means they have been significantly over-credited – a fact that is not even contested by the industry.[22]

2. The baseline proportion in the landfill gas methods is designed only to address the risks associated with 'regulatory additionality' – whether abatement would occur anyway because of the requirements that apply to landfills under state/territory environmental laws. The baseline is not designed to mitigate the risks associated with 'financial additionality' – whether abatement would occur anyway because it is profitable to capture and combust the gas for the sale of electricity and LGCs, without ACCUs. In essence, the methods are based on the assumption that larger generation sites cannot make a profit with baselines above 30%, or above what they are required to capture and combust under state/territory environmental laws. There is ample evidence this is not true.[23]

Following the Independent Review of the ACCU scheme, the Department is now proposing to reset default baseline factors to 36%. The proposal is to offer all projects another crediting period of an unspecified duration (and potentially ongoing) and require projects that take up the opportunity to adopt a starting default baseline proportion of 36%. The baseline will then increase by 1.9% per year. The only exception is upgrade projects that currently have baselines above 36%. These projects will be required to stay on their current baselines until the default reaches their baseline, after which their baseline will increase in line with the standard inflation factor (i.e. 1.9% per year or another rate if set through the review process).

According to the consultation documents, the 36% starting default baseline is intended to reflect 'common practice for managing landfill gas in the absence of the ACCU Scheme'.[24] The use of a 'common practice' test was apparently based on the recommendations of the Independent Review

[22] Butler, D. et al. (2022) Australian National University (ANU)-University of New South Wales (UNSW) ERF research team submission to the Chubb Review. DCCEEW, Canberra.

[23] Undisclosed author (2017) *Financial feasibility of landfill gas flaring and electricity generation in the context of ACCUs*. Report to the Commonwealth Department of Environment and Energy; SMEC (2018) *Analysis of Waste Sector Projects and Methods. DELIVERABLE 2: Performance of the landfill gas method against the offsets integrity standards*. Report for the Department of the Environment and Energy. SMEC Australia Pty Ltd, North Sydney, Australia; Emissions Reduction Assurance Committee (2020) *2019-2020 Re-evaluation of Electricity Generation Projects under the Landfill Gas Method*. Commonwealth of Australia, Canberra; Macintosh, A. (2022) The Emissions Reduction Fund's Landfill Gas Method: An Assessment of its Integrity. The Australian National University, Canberra.

[24] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 17. See also DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra.

of the ACCU scheme.[25] The 36% common practice estimate was apparently derived from 'industry-average data from the National Inventory'.[26] The logic behind the approach is explained in the following paragraph from the reform options paper.[27]

> Given the stronger technological and economic drivers for generation and flaring projects (compared to flaring-only projects), the average sectoral capture efficiency of Australian landfills where flaring only projects do not occur could be used as a rough benchmark for common practice. This is almost equivalent to assuming all abatement from electricity generation and flaring projects would occur without ACCUs. While this assumption is too conservative to determine project eligibility, it provides a simple and pragmatic starting point to determine baseline abatement. Given the totality of evidence indicates ACCUs are driving capture efficiency improvements at methane management projects involving electricity generation, common practice abatement is likely to be somewhat lower than 36 per cent.

Capture efficiency is defined for these purposes as:

$$Capture\ efficiency = \frac{Methane\ captured}{Total\ methane\ generated}$$

Reflecting this approach, the 36% starting default baseline proportion was derived using a three-step method.

> **Step 1:** The average capture efficiency of all Australian landfills over the past five years was calculated based on National Inventory Report (NIR) data (45%).
>
> **Step 2:** To account for incentives, the five-year average CH_4 captured at flaring only sites was deducted from the numerator in the above CE equation, which reduced the estimated average capture efficiency by 5% (i.e. 45%-5%=40%). The amount of CH_4 captured and flared by flaring-only projects was calculated using data on ACCU issuances, adjusted using their existing baselines.
>
> **Step 3:** The common practice estimate was reduced by a further 4% to account for oxidation (i.e. 40% - 4%=36%). This is necessary to avoid double counting oxidation in the baseline,

[25] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 14.

[26] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 18.

[27] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 18. See also DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 22.

because an oxidation adjustment is required in calculating the net abatement amount under the method.

Hence, the method of deriving the common practice estimate can be represented by the equation:

$$CP = \frac{(MCG - MCF) * 0.9}{TLE}$$

Where:

CP means common practice in the absence of the issuance of ACCUs to landfill gas projects;

MCG means total methane captured at generation sites;

MCF means total methane captured at flaring-only sites; and

TLE means total methane generated by all landfill gas sites in Australia.[28]

The department asserts that 36% starting default baseline factor 'best represents the conservative quantity of methane abatement that [would] occur without incentives from the ACCU Scheme'.[29]

There are seven main problems with the approach used by the Department to derive the 36% starting default baseline factor.

Problem 1: The Department has not applied the correct legal test when seeking to determine the appropriate baseline.

As noted above, the applicable offsets integrity standard requires that 'the method should result in carbon abatement that is unlikely to occur in the ordinary course of events, disregarding the effect of this Act'. In this context, this requires the baseline to be set at a level that ensures the substantial majority of the abatement likely to be credited under the method would not occur in the absence of the incentive provided by the scheme. The 'common practice in the absence of the ACCU Scheme' test is not the same as the required statutory additionality standard. The proposed common practice test looks at standard practice, defined in terms of capture efficiencies, across the landfill sector as a whole. The statutory additionality standard requires the ERAC and Minister to ask whether the method requirements will ensure that most of the abatement credited under the method is additional. This necessitates consideration of the regulatory requirements that apply to existing projects, and the financial incentives associated with the ability for generation sites to earn profits from the sale of electricity and LGCs, with a particular focus on large projects because they are likely

[28] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 24.

[29] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 18. See also DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 22.

to account for the vast majority of the abatement credited under the method. In this context, 'common practice' – in the sense of capture efficiencies across the whole landfill sector – is legally irrelevant or, at best, a distraction. The material included in the reform options paper on capture efficiencies in other countries is irrelevant, having no bearing on the matters that are legally required to be considered when applying the additionality standard.

Problem 2: The Department has failed to convert the common practice estimate into a baseline equivalent proportion.

Putting aside the issues associated with Problem 1, if it is assumed that the baseline should seek to reflect the 'quantity of methane abatement that [would] occur without incentives from the ACCU Scheme',[30] it is necessary to convert the estimated sector wide capture efficiency into a baseline equivalent proportion for the purposes of the method. This is because the baseline equivalent proportion is not the same as the capture efficiency. The capture efficiency is the amount of methane captured as a proportion of total methane produced. The baseline proportion is applied to the amount of CH_4 captured at each project. Using the adjusted sector-wide capture efficiency as the baseline proportion will not result in the cumulative baseline deductions reflecting the 'common practice' quantity of methane capture that would otherwise occur. The amounts deducted will be too low. To avoid this, the sector-wide capture efficiency must be converted into a baseline equivalent proportion, which is most easily done by multiplying it by ~1.33 (i.e. 1/0.75) to reflect the fact that the amount of CH_4 captured is necessarily less than the total amount of CH_4 emitted at any particular landfill site.[31] This means that, if the Department's common practice logic is accept, the minimum baseline proportion for the method should be 48%, not 36%.

Problem 3: The Department's 'common practice in the absence of the ACCU Scheme' test assumes that, if ACCUs are withdrawn from flaring-only projects, the capture efficiencies at these sites will fall to zero.

This conflicts with the basic assumption that underpins the existing 30% default baseline – that is, in the absence of ACCUs, sites would still be required to capture a certain amount of CH_4 because of state and territory regulatory requirements. There is no evidence to support the jettisoning of this assumption, which has been accepted by the industry since 2011-12.

[30] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 18. See also DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 22.

[31] SMEC (2018), Analysis of Waste Sector Projects and Methods: Deliverable 2—Performance of the landfill gas method against the offsets integrity standards. Report for Department of the Environment and Energy; ERAC (2019) Review of the Landfill Gas Method. Commonwealth of Australia, Canberra. Assumed collection efficiency limits under the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* for landfill sites with gas collection systems are 60%, 75% and 95% depending on the type of caps and gas collection (s 5.15C).

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Problem 4: The Department's 'common practice in the absence of the ACCU Scheme' test, which is proposed as the basis for determining a single method-wide default starting baseline proportion, conflicts with the logic that underpins the baseline provisions that apply to upgrade projects.

In upgrade projects, baselines are calculated by dividing the capture efficiency (i.e. CH_4 captured divided by total CH_4 emitted) from a historic period before the upgrade (the average from either a 2- or 4-year period before the upgrade) by the capture efficiency for the 12-month period after the upgrade. This proportion is treated as the counterfactual – the amount of CH_4 that would have been captured if the project stopped receiving ACCUs and the upgrade was not undertaken. The logic that underpins the upgrade project baseline provisions is that, if projects stop receiving ACCUs, their capture efficiencies will not decline. They will remain as they were while the original project was still receiving ACCUs during its crediting period. The upgrade project then receives ACCUs calculated against this historic baseline. This approach is in direct conflict with the logic that underpins the Department's 'common practice in the absence of the ACCU Scheme' test, which assumes that, in the absence of ACCUs, the capture efficiencies at generation projects will fall to the industry average and that the capture efficiencies at flaring-only projects will fall to zero. The Department's rationale is contorted further by the proposed requirement that upgrade projects with ≥36% baselines continue to use them. Apparently, the capture efficiencies at projects that have invested in upgrades will not decline in the absence of ACCUs, while the capture efficiencies at projects that have not done so will plummet in the absence of ACCUs. This is illogical and indefensible.

Problem 5: An unavoidable consequence of the Department's 'common practice in the absence of the ACCU Scheme' test is that does not focus the inquiry on the largest projects, which account for overwhelming majority of the abatement that has been, and is likely to be, credited under the method.

As Table 1 shows, the 10 largest projects account for 51% of issued ACCUs and the 15 largest account for 60%. All of these projects have significant installed generation capacity. The focus of the baseline setting process should be on what the capture efficiencies at these sites would be in the absence of ACCUs.

The data presented in the Department's reform options technical report suggests the capture efficiencies at large sites are very high, at least when total site emissions are calculated using the IPCC first order decay model. According to Table 6 in the technical report, the average capture efficiency in the undefined 'medium and large' site category is 126%, with a median of 79% (Table 6 is reproduced below).

Table 1. Installed generation capacity (MW) and proportion of ACCUs issued to 15 largest landfill projects, to end FY 2023

No.	Project	Installed generation (MW)	% of ACCUs	Cumulative % of ACCUs
1	Lucas Heights	19.55	9.8%	10%
2	Melbourne Regional Landfill	8.80	6.8%	17%
3	Hallam	8.98	6.6%	23%
4	Wollert	7.86	5.6%	29%
5	Rochedale	4.49	4.8%	34%
6	Eastern Creek 2	6.74	4.7%	38%
7	South Cardup	3.40	3.7%	42%
8	Woodlawn	7.46	3.1%	45%
9	Swanbank	1.51	2.8%	48%
10	Mugga Lane	4.24	2.6%	51%
11	Wyndham	2.90	2.6%	53%
12	Ti Tree	3.30	1.9%	55%
13	Rockingham	2.67	1.9%	57%
14	Wyong	2.25	1.8%	59%
15	Kemps Creek	2.80	1.7%	60%

Note: For these purposes, upgrades and original projects at the same sites have been treated as one project. Landfill sites with two projects operated by the same landfill gas company have also been treated as one project.

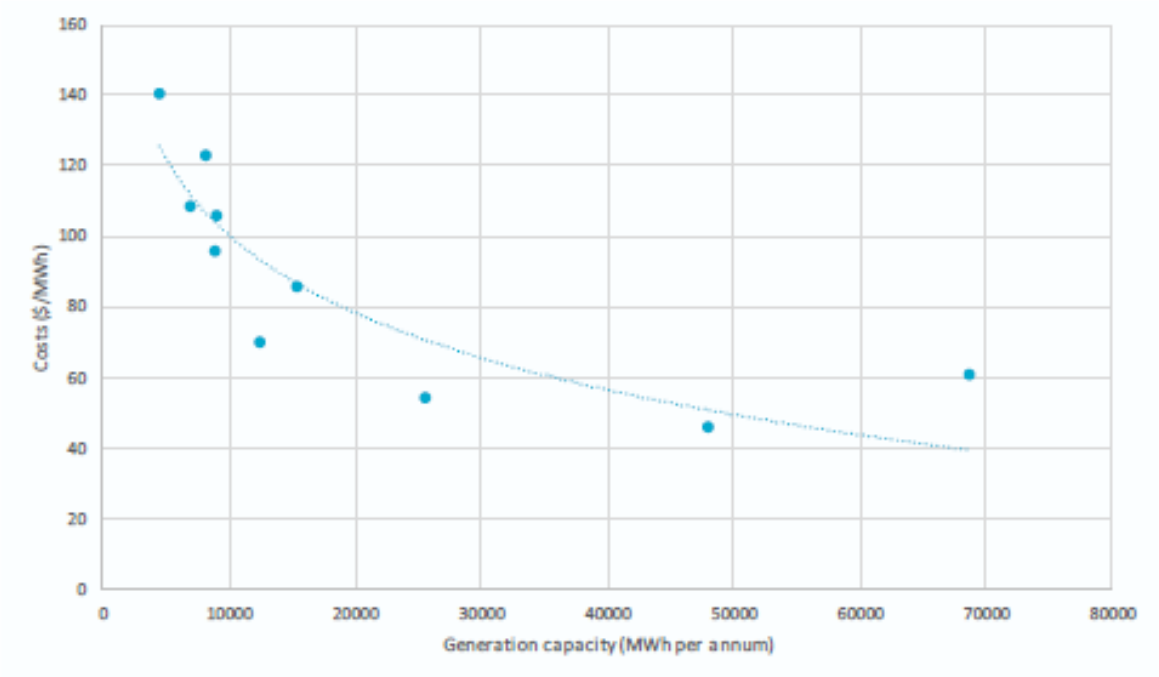
Table 2. Capture efficiency by category of project [reproduction of Table 6 from the Technical Report]

Project Category	Mean	Median	Standard Deviation
Generation And Flaring[12]	116%	70%	127%
Small	107%	79%	135%
Medium and Large	126%	79%	115%
Flaring Only	71%	45%	72%
All Projects	97%	58%	111%

Source: DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 16.

One of the main reasons for the high capture efficiencies at large sites is that they are generally the most profitable to operate. The higher profitability of larger sites stems from the economies of scale associated with generation-based landfill gas projects, meaning the cost per unit (MW) of electricity generated are lower in larger projects (Figure 2). The lower unit costs and consequent higher potential returns per unit of gas combusted incentivises more gas capture. The higher profitability of larger sites also makes them less dependent on ACCU revenues for their financial viability.

Figure 2. Relationship between average costs and annual electricity generation capacity in Australian landfill gas projects



Source: ERAC (2020) 2019-2020 Re-evaluation of Electricity Generation Projects under the Landfill Gas Method. Commonwealth of Australia, Canberra, p 9.

The other factor that is relevant to the capture efficiencies at large sites, and whether they would decline significantly if ACCUs were withdrawn, is that large sites tend to be subject to higher regulatory standards and scrutiny. This is particularly the case for larger sites located in populated areas. As SMEC stated in a 2018 report:

> Large landfills close to highly urbanised areas are at higher risk of giving rise to odour complaints, and are consequently likely to be subject to stricter levels of regulatory enforcement.[32]

The combination of these factors means it is unlikely that the large projects that are reasonable for the majority of the credits issued under the landfill methods will substantially reduce their capture efficiencies if ACCUs are withdrawn. Capture efficiencies may decline slightly overtime but a marked reduction is unlikely to occur at any of the sites. This is attributable to the financial viability of the sites in the absence of ACCUs, the regulatory requirements that apply to the sites and the likelihood of policy changes in the event of a substantial decline in the capture efficiencies at any of the sites.

Moreover, there is very little chance these sites would significantly reduce their capture efficiencies if the starting default baseline proportion was set at or above ~70%-80%. This conclusion is

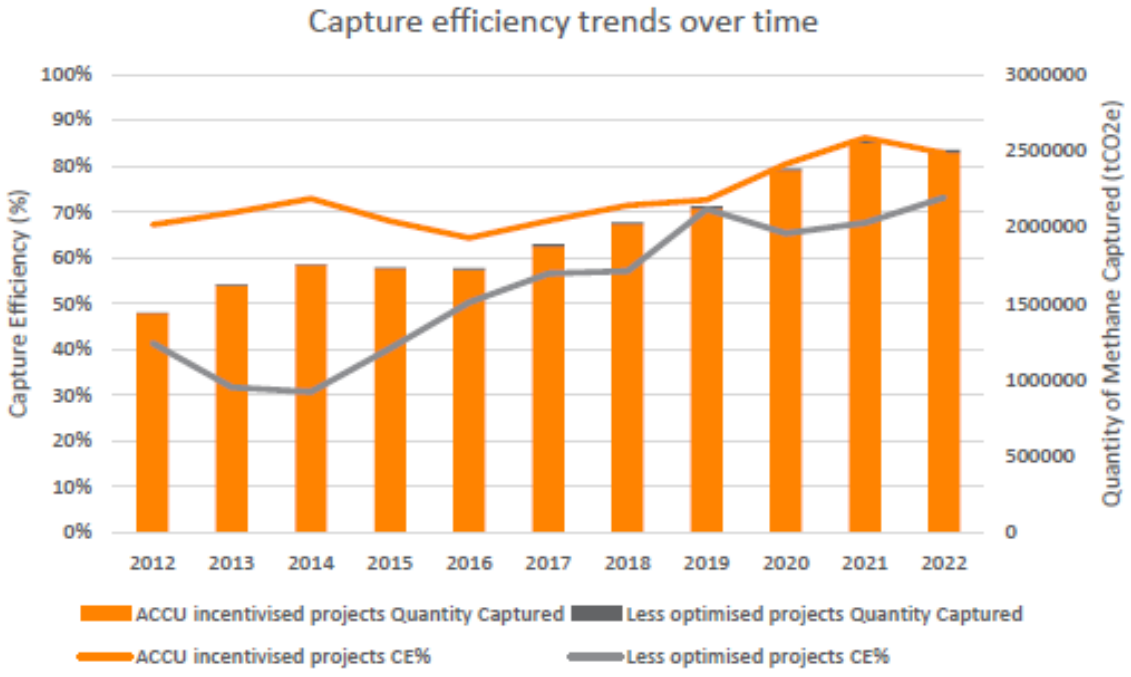
[32] SMEC (2018) Analysis of Waste Sector Projects and Methods. DELIVERABLE 2: Performance of the landfill gas method against the offsets integrity standards. Report for the Department of the Environment and Energy. SMEC Australia Pty Ltd, North Sydney, Australia, p 16.

supported by the evidence in the Department's reform options technical paper concerning the capture efficiencies at sites that do not receive ACCUs. As the paper states:

> TWG members provided site-level data for some landfill gas projects that achieved an average capture efficiency of 66 per cent, where the proponent does not receive ACCU incentives.[33]

Consistent with this statement, the data presented in the report show that average capture efficiencies at sites where proponents do not receive ACCUs are high (>70%) and have increased significantly over the past decade (from 30-40% in 2012-2014 to 65-73% in recent years) (Figure 3 & Table 3).

Figure 3. Capture efficiency trends for projects at open sites, comparing projects where proponents receive ACCUs (called 'optimised projects') with projects where proponents do not receive ACCUs ('less optimised projects') [reproduction of Figure 5 from the Technical Report]



Source: DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 20.

[33] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Implementing recommendation 10 of the ACCU Review. Commonwealth of Australia, Canberra, p 17. Note, a capture efficiency of 66% equates to ~85%-90% baseline proportion.

Table 2. Capture efficiency trends for projects at open sites, projects where proponents receive ACCUs (called 'optimised projects') and projects where proponents do not receive ACCUs ('less optimised projects') [reproduction of Table 10 from the Technical Report]

Year	Capture Efficiency %		Number of projects	
	Proponents receive ACCUs	Proponents do not receive ACCUS (less optimised)	Proponents receive ACCUs	Proponents do not receive ACCUs (less optimised
2012	67%	41%	19	3
2013	70%	32%	21	3
2014	73%	31%	25	4
2015	68%	40%	28	5
2016	64%	50%	30	5
2017	68%	56%	30	5
2018	71%	57%	32	7
2019	73%	71%	33	7
2020	80%	65%	35	7
2021	86%	68%	35	7
2022	83%	73%	35	7

Source: DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 21.

The case of the Mugga Lane project provides additional support for the notion that starting default baselines for large sites should be ~70%-80%. LGI Ltd is the only operator that has published information on its baselines. For Mugga Lane, the baseline for the current upgrade project is 66%. The published accounts of LGI Ltd show the company as a whole is profitable and it has given no indications to the market, as required by law, that there is any threat to the continued operation of the site with its current baseline. Given the above evidence, the proposal to adopt a starting default baseline of 36% is illogical and runs contrary to the approach that is required to be applied to meet the additionality standard in the CFI Act.

Problem 6: The proposal to have a single starting default baseline that applies to all projects other than upgrades ignores the variability in the factors that determine the amount of gas capture and combustion that would occur in the absence of the incentive associated with ACCUs.

The offsets integrity standards require all assumptions in methods to be conservative. The development of conservative baselines for landfill projects requires consideration of the factors that influence the levels of gas capture that would occur in the absence of ACCUs and how they apply to projects in different locations and with different characteristics. The three most relevant factors that influence the likely counterfactual capture efficiency are:

(a) the size of the landfill site (i.e. the amount of waste it receives and amount of CH_4 it produces);

(b) whether it is a generation or flaring-only project (which is influenced by (a)); and

(c) the jurisdiction in which it is located and the stringency of the applicable state/territory regulatory requirements that apply to landfills.

The proposal to have a single starting default baseline that applies to all projects other than upgrades ignores the influence these factors have on the counterfactual capture efficiency at individual sites. This will necessarily result in the over-crediting of large generation projects, particularly in jurisdictions like Victoria, which has more stringent regulatory requirements concerning the treatment of biogas emissions from landfills.[34] Four of the largest landfill projects – Melbourne Regional Landfill, Hallam, Wollert and Wyndham are all in Victoria (Table 1), where there is strong evidence the minimum regulatory capture rate for landfills is more than 50%. These four projects are likely to have existing baselines that are less than 30% and the proposed starting default would not even increase their baselines to the state regulatory minimum.

As discussed in the context of Problem 5, the size of the landfills, and whether they have a generator, also has a significant influence on the financial returns from projects and whether they are likely to be viable if ACCUs are withdrawn or significantly reduced. This was explicitly noted in the 2020 ERAC report that re-evaluated generation projects, where it stated:

> Given the results of the analysis, the government could consider extending the crediting period of existing (or all) generation projects to ensure there was sufficient incentive to maintain existing collection efficiencies. The difficulty with this approach is it would lead to the issuance of a significant number of ACCUs for abatement that is likely to occur in the absence of the incentive provided by the scheme. Most of the ACCUs issued under the Landfill Gas Method to date have been allocated to a relatively small number of large generation projects. These projects are likely to have the lowest costs, meaning they are likely to maintain reasonably high collection efficiencies without ACCUs.[35]

The use of the single starting default baseline has the reverse effect on the smallest projects, particularly prospective greenfield flaring-only sites. In some cases, the 36% starting baseline will result in under-crediting. However, the under- and over-crediting do not balance each other out across the method because of the concentration of the landfill sector and the large proportion of ACCUs that accrue to the largest projects.

[34] SMEC (2018) Analysis of Waste Sector Projects and Methods. DELIVERABLE 2: Performance of the landfill gas method against the offsets integrity standards. Report for the Department of the Environment and Energy. SMEC Australia Pty Ltd, North Sydney, Australia, p 16.

[35] ERAC (2020) 2019-2020 Re-evaluation of Electricity Generation Projects under the Landfill Gas Method. Commonwealth of Australia, Canberra, p 9.

Due to these issues, the use of the single starting default baseline of 36% is not consistent with the offset integrity standard's requirement for the use of conservative assumptions. If a single baseline is going to be used, it would need to be set at the levels that reflect the counterfactual capture efficiencies at the largest sites (and converted into a baseline equivalent proportion). The preferable approach would be to use differentiated incentives, where the size of the incentive is calibrated to account for the factors that influence the counterfactual capture efficiencies. If the Australian Government insists on giving effect to this through the issuance of ACCUs, the simplest solution is to have differentiated baselines, based on the sites of the landfills and whether they combust the CH_4 using a generator.[36]

Problem 7: There is not clear and convincing evidence that 45% represents a conservative estimate of the industry-wide average capture efficiency, as required by the offsets integrity standards.

The Department has data on the reported capture efficiencies of projects, calculated using the IPCC first order decay model. These data suggest the capture efficiencies at most projects are very high, with a mean of 97% (median 58%) (Table 2).[37] The Department rejected these data for this purpose on the basis the data are unreliable because the estimated capture efficiencies of a significant number of sites were unrealistically high. However, it then asserts that the data reported in the NIR on capture efficiencies is sufficiently robust to support the determination of baselines, even though the NIR landfill emissions are estimated using the same IPCC first order decay model and the same waste activity data for sites covered by the National Greenhouse and Energy Reporting Scheme (NGERS). This makes no sense.

Seemingly, the only material difference in the approach used to estimate the capture efficiencies at individual projects and the capture efficiency across the sector relates to the collection efficiency limit that is applied under the NGERS scheme to adjust the outputs of the first order decay model.[38] This was not applied in the Department's calculations of the capture efficiencies of individual landfill projects, which are presented in the report (if they were, no capture efficiencies could exceed 95%). Although not detailed in the description of its methods, presumably a similar adjustment is made in applying the first order decay model for the purposes of the NIR. In the 20-minute consultation we had with the Department over the reforms, the Departmental officers suggested the NIR uses the reported emissions estimates for NGERS sites. This conflicts with the description of the method in the NIR. It even conflicts with the description of the NIR method in the reform options proposal paper, where it states:

[36] This was proposed in: ERAC (2020) 2019-2020 Re-evaluation of Electricity Generation Projects under the Landfill Gas Method. Commonwealth of Australia, Canberra; and Macintosh, A. (2022) The Emissions Reduction Fund's Landfill Gas Method: An Assessment of its Integrity. The Australian National University, Canberra.

[37] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 16.

[38] *National Greenhouse and Energy Reporting (Measurement) Determination 2008*, ss 5.4 and 5.15C.

To estimate net emissions ($CH4_{net}$), the NIR uses reported data to determine methane captured at landfills, and the International Panel on Climate Change (IPCC) First Order Decay Model to model emissions produced at landfills through decomposition.[39]

The NIR reports that net emissions are calculated using:

- NGERS activity data combined with state/territory activity data;
- the first order decay model with the activity data to estimate total emissions; and
- NGERS reported capture volumes from NGERS projects.[40]

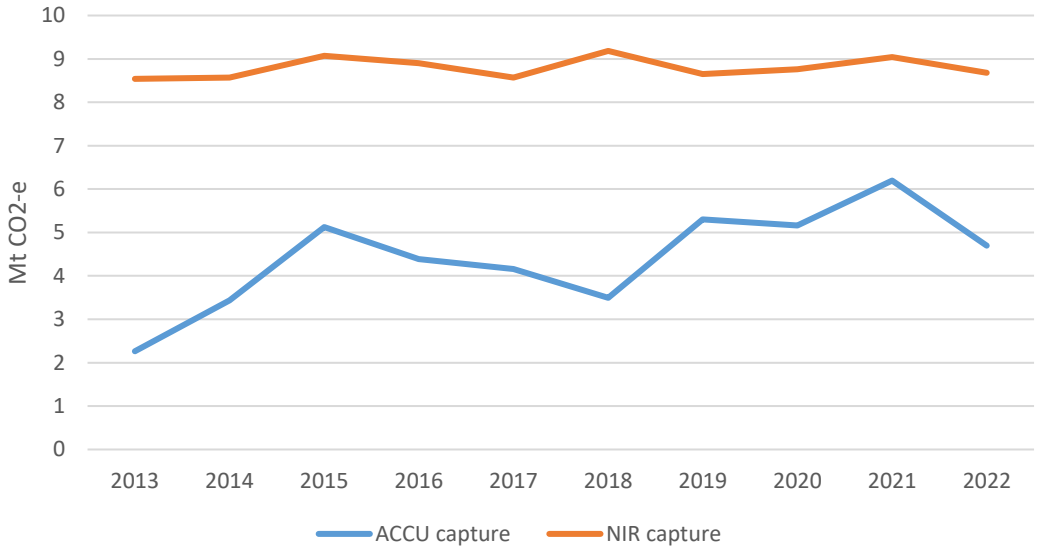
Given this, there is a material amount of uncertainty regarding the true industry-wide average capture efficiency. The uncertainties associated with the application of the first order decay model to individual projects apply equally to the data reported in the NIR. Further, if the application of the first order decay model to individual sites is unreliable, why is it used to estimate baselines for upgrade projects? There is a marked lack of consistency in the approach adopted by the Department.

An additional issue associated with the estimates of the industry-wide average capture efficiency is an apparent discrepancy in the amount of methane captured at landfills, which is reported in the NIR. As shown in Figure 4, the amount of methane captured at landfills that is reported in the NIR is substantially above the amount calculated based on ACCU issuances. This can be partly explained by the fact that not all landfills with capture and combustion systems are registered under the ACCU scheme. There is also uncertainty about the average baseline that applies to ACCU projects, which affects the resulting capture estimates. However, these issues are unable to explain the magnitude of the difference. To date, the Department has not provided an adequate explanation for this discrepancy, highlighting the uncertainty in the data relied on to calculate the industry-wide average capture efficiency.

[39] DCCEEW (2024) Reform options for ACCU Scheme landfill gas methods: Supporting Technical Report. Commonwealth of Australia, Canberra, p 22.

[40] DCCEEW (2024) National Inventory Report 2022: The Australian Government Submission to the United Nations Framework Convention on Climate Change. Commonwealth of Australia, Canberra, section 7.2.

Figure 4. Methane capture at solid waste disposal sites, National Inventory Report vs derived from ACCU issuances, in Mt CO_2-e



Source: DCCEEW (2024) 'Australia's National Greenhouse Accounts', available at: https://greenhouseaccounts.climatechange.gov.au/; and Clean Energy Regulator (2024) 'ACCU project and contract register', available at: https://cer.gov.au/markets/reports-and-data/accu-project-and-contract-register?view=Projects.