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Additionality of NZ energy related projects

Report

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The findings in this report have been formed on the above basis.

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EECA FOREWORD

EECA administers Government funds, such as GIDI (Government Investment to Decarbonise Industry)[1], to decarbonise industrial processes and process heat through energy efficiency, the application of innovative technologies, and fuel switching.

Through our work with some of the largest energy users in New Zealand, we believe tools and technologies exist to unlock further emissions reductions. There are untapped cost-effective domestic opportunities, especially in clean and clever energy use.

In 2020, we collaborated with Motu Economic Research to kick-start collective thinking about practical solutions for boosting a voluntary carbon market. Motu brought together a group of cross-sector experts and stakeholders to draft a proposal (*Boosting voluntary climate action in Aotearoa New Zealand)* for a thriving voluntary carbon market, which could scale up, and be a key part of a fair energy transition in New Zealand[2].

In this latest report commissioned by EECA, Point Advisory has provided an overview of existing international carbon market frameworks that could be adapted to establish a dynamic domestic scheme, enabling voluntary contribution to emission reductions.

This report is part of a worldwide conversation about what future voluntary carbon markets could look like and how they can scale effectively and fund further climate change mitigation activities.

Point Advisory was asked to test the additionality of some of EECA's co-funded mitigation projects, according to the most relevant international schemes. The Point Advisory findings indicate the sample of EECA energy-related projects assessed was additional, as these projects (and the resulting emissions reduction) would not have happened without the funding provided by EECA.

This demonstrates that, within a scheme allowing organisations to contribute to New Zealand's transition effort, private funding channelled through the voluntary carbon market could unlock further emissions reductions, while driving transformative change in New Zealand and associated co-benefits.

EECA projects assessed by Point Advisory reflect untapped opportunities across a range of technologies and sectors, from energy efficiency to fuel switching, horticulture, wood or food industry; from tried-and-true solutions to the most innovative technologies.

Kate Kolich
Manager Evidence Insights and Innovation

EECA TE TARI TIAKI PŪNGAO ENERGY EFFICIENCY & CONSERVATION AUTHORITY

[1] Link About the Government Investment in Decarbonising Industry Fund | EECA

[2] Link: https://www.motu.nz/our-research/environment-and-resources/emission-mitigation/voluntary-mitigation-nz

EXECUTIVE SUMMARY

A sample of decarbonisation projects was examined for their potential to issue credible carbon credits based on emissions reductions achieved and suitability for use in the voluntary carbon market in New Zealand. Based on the project documentation provided, the projects were found to be compatible with methodologies, including additionality criteria, normally accepted under a range of international carbon crediting schemes.

Specific research questions on the decarbonisation projects were addressed:

- While decarbonisation projects can be funded up-front subject to eligibility requirements, carbon credits should not be issued until the emission reduction has been achieved and verified.
- The amount of emission reduction used for the funding decision by the sample decarbonisation projects was found to be a credible initial approximation. To be credible for emissions trading, emissions reduction volumes will need to be verified against a project methodology that includes eligibility criteria, project baseline, emission calculation methodology and monitoring, reporting and record-keeping requirements.
- International schemes were reviewed for best practice and operational limitations. Four were identified that meet International Carbon Reduction & Offset Alliance best practice requirements and had the potential to act as a reference model for a potential New Zealand carbon crediting scheme, as summarised below.

Scheme	Comment
• **Australian Emissions Reduction Fund** • **British Columbia Offset Portfolio**	• are domestic regulatory schemes operated by government • are credible schemes that issue carbon credits to eligible projects • are used in both compliance and voluntary domestic carbon markets
• **The Gold Standard** • **Verified Carbon Standard**	• large internationally recognised schemes operated by private entities • have a wide range of project methodologies • include requirements not directly relevant to domestic New Zealand decarbonisation projects • the schemes would restrict the financial viability of a domestic New Zealand carbon market

The Australian Emissions Reduction Fund is recommended as the most suitable reference model for developing a New Zealand domestic scheme.

The Emissions Reduction Fund has energy- and technology-related methodologies that can be adapted for New Zealand decarbonisation projects and a robust framework of well documented requirements for verification of emission reductions and issue of carbon credit units into a public registry. A potential

framework for a scheme to issue carbon credit units for New Zealand decarbonisation projects is outlined based on the parts of the Emissions Reduction Fund scheme that are relevant for a New Zealand domestic scheme.

Carbon credit units from NZ decarbonisation projects could be used for many different voluntary offsetting purposes and have a significant role in a New Zealand domestic voluntary carbon market. Finalisation of the design of this market, and how it will interact with the international voluntary carbon market, will provide clarity about the potential decarbonisation project types.

BACKGROUND TO THIS REPORT

The Paris Agreement has the effect of resetting voluntary carbon markets (VCM) set up under the Kyoto protocol and raises important questions, such as how to address shortcomings of the Kyoto Protocol and how to scale voluntary mitigation 100-fold. Past approaches to voluntary mitigation have not been optimal, with policy uncertainty and doubts about environmental integrity slowing progress and creating risk.

Based on long experience, the Energy Efficiency and Conservation Authority (EECA) believes that the tools and technologies exist to scale voluntary mitigation in untapped cost-effective domestic opportunities, especially in clean and clever energy use. Trust is key to the success of any voluntary action, and a transparent domestic voluntary carbon market would improve trust by bringing the outcomes of spending on third-party mitigation closer to New Zealanders.

In New Zealand (NZ), any voluntary energy-related greenhouse gas (GHG) mitigation action would interact with the economy-wide Emissions Trading Scheme (ETS), which is one the key tools used by the NZ Government to achieve its Nationally Determined Contribution (NDC).

Therefore, energy-related mitigation would not be considered additional under the Kyoto Agreement standard practices for voluntary mitigation. However, this assumes that:

- Governments will achieve their targets, which have proved wrong in most cases in the last 20 years.
- The ETS price signal would be enough to unlock emissions savings opportunities.

EECA invests in energy projects to overcome the non-cost barriers that prevent cost-efficient projects happening quickly and at scale. These are projects which are not responsive to an ETS price signal and where capital funding is an effective way of unlocking these opportunities. EECA seeks to understand if government investment in energy projects can be augmented by private capital via voluntary mitigation activity. In assessing this possibility, it is critical to understand whether such action would be considered additional or not by the voluntary market. It is possible under current rules that voluntary domestic mitigation would contribute to the NDC and be additional. Under proposed rules, purchasing third-party reductions overseas to offset domestic emissions would require a corresponding adjustment (CA) to be made by the project's host country.

Appendix 1 provides further background on NZ carbon credit schemes and Appendix 2 explains the relationship between the ETS and reporting under the Paris Agreement.

Project objective

The overall objective is to determine the level of credibility (transparency, additionality, reality, measurability, permanence, verifiability) of a sample of projects funded by EECA under one of its decarbonisation funds. Double claiming is considered by looking at how a sample of other jurisdictions manage this accounting issue.

USING CARBON CREDITS IN NEW ZEALAND

Context

There is a growing demand from NZ organisations for carbon credits that can be used for voluntary offsetting. Currently, the only domestic carbon credits available to meet this demand are New Zealand Units (NZUs) issued to participants in the Permanent Forest Sinks Initiative (PFSI). This demand will be significantly increased with the implementation of the Carbon Neutral Government Programme (CNGP)[3] which requires over 120 government departments and agencies to be carbon neutral by the end of 2025 and to maintain this status year-on-year after that. The PFSI has been discontinued and will be replaced by the Permanent Post 1989 Forest Activity (PP89) in 2023. Apart from some technical changes to the accounting methodology, the PP89 will operate in a similar manner to the PFSI. Most PFSI projects are expected to migrate to the PP89. However, new projects in the PP89 are unlikely to provide sufficient carbon credits to meet the demand of the domestic VCM for 15 to 20 years and there is some uncertainty about whether these units can be used for voluntary offsetting under the Paris Agreement.

Addressing this prospective shortfall requires a new approach, and potentially a new domestic carbon crediting scheme based on decarbonisation projects that can deliver carbon credits for the VCM in the short-term.

Creating a new carbon crediting scheme suitable for the NZ VCM could be a major undertaking due to the need to develop a scheme and registry infrastructure - e.g., certification rules, systems to train and approve auditors and a registry system. However, there are well-established credible international carbon crediting schemes (voluntary and governmental) that could be used as models for developing a NZ domestic scheme.

This report reviews relevant international best practice and describes a possible structure for a NZ domestic voluntary carbon crediting scheme.

Best practice for offsetting

The International Carbon Reduction & Offset Alliance (ICROA)[4] was established by the International Emissions Trading Association (IETA) as the body to set international best practice for offsetting. The ICROA Code of Best Practice[5] provides principles and key requirements for carbon credit projects (summarised on page 24). Carbon crediting schemes that are approved by ICROA are listed in Appendix 4.

Other recent initiatives addressing best practice in offsetting, carbon neutrality and achieving net zero carbon status include:

- The Oxford Principles for Net Zero Aligned Carbon Offsetting
- Taskforce on Scaling the Voluntary Carbon Market (TSVCM)
- Science Based Targets Initiative (SBTi) draft criteria for a net zero standard
- International Standards Organisation (ISO) draft standard ISO/WD 14068 on carbon neutrality

[3] www.MFE/Redacted-cab-min-and-paper-establishing-a-carbon-neutral-govt.pdf
[4] www.icroa.org
[5] www.icroa.org/resources/Documents/The%20Code/ICROA_cobp_tech_specs_2021.pdf

- Voluntary Carbon Markets Integrity Initiative (VCMI).

These initiatives mainly address the process of achieving carbon neutral or net zero status and defer to existing standards for creating carbon credits. However, they generally take a stringent position on environmental integrity and 'double claiming'. 'Double claiming' is a new issue that is believed to arise under the Paris Agreement because the emission reductions used to create carbon credits for the VCM may also contribute towards the host country NDC. This was partially addressed in COP26 by formalization of the requirements for a Corresponding Adjustment as part of the international transfer of emission credits.

Addressing double counting/double claiming

In 2020, EECA commissioned Motu (an economic and public policy research organisation) to investigate and report on the evolving VCM expectations under the Paris Agreement[6]. Motu proposed a two-track system to overcome the 'double claiming' issue:

- 'Carbon Horizon' providing certification or carbon credits for financing or otherwise supporting external GHG mitigation beyond government requirements, allowing a 'carbon contribution', 'carbon neutral' or 'carbon positive' claim with 'Horizon' status.
- 'Carbon Frontier' providing carbon credits with CA for financing external GHG mitigation beyond government requirements, allowing a 'carbon neutral' or 'carbon positive' claim with 'Frontier' status.

The recently launched Voluntary Carbon Markets Integrity Initiative (VCMI) consortium has proposed the following clarification[7]:

> *"Double claiming does not result in double counting of GHG emission reductions under the Paris Agreement, as long as only one country counts a relevant emission reduction or removal as having taken place within its territory at any given time, including after any international transfer. In the context of international transfer of emissions reductions or removals, such as those envisaged under Article 6 of the Paris Agreement, the host country would make a 'corresponding adjustment' to its own accounts to ensure that it no longer counted the abatement, which was now being used by the acquiring country. In the context of VCMs, the host country would count the GHG emissions reduction or removal."*

As noted, COP26 addressed the issue of potential double claiming applying to VCMs by formalizing the requirement for a Corresponding Adjustment in the NDC of the host country. However, the mechanism has yet to be developed which will clarify the double claiming issue and provide guidance on making voluntary net zero and carbon neutral claims[8].

Key international voluntary standards and carbon crediting schemes

The range of international carbon crediting schemes with their suitability for operation in NZ are summarised in Table 1 below.

Table 1: Carbon crediting mechanisms—are they suitable for use in NZ?

[6] Leining, C. and White, D. 2021. Boosting voluntary climate action in Aotearoa New Zealand – an overview. Motu. Report commissioned by EECA. www.motu.nz/assets/Documents/our-research/environment/climate-change-mitigation/Boosting-Voluntary-Climate-Action-Motu-Full-report.pdf

[7] Voluntary Carbon Markets Integrity Initiative, July 2021. Aligning voluntary carbon markets with the 1.5°C Paris Agreement Ambition. https://vcmintegrity.org/wp-content/uploads/2021/07/VCMI-Consultation-Report.pdf?

[8] https://www.ieta.org/resources/Resources/COP/COP26-Summary-Report.pdf p8

Program	Characteristics	Assessment for NZ	Potential for use in NZ?
ACR	The American Carbon Registry (ACR) operates as an approved Offset Project Registry (OPR) for the California Cap-and-Trade program. ACR works with the Air Resources Board (ARB) to oversee the registration and issuance of California-eligible Registry Offset Credits developed using ARB's compliance or early action offset protocols. ACR is approved by the Council of the International Civil Aviation Organization (ICAO) to supply eligible ACR-issued emission reduction units for compliance under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).	The program is implemented to meet specific voluntary and compliance purposes using their own offset protocols.	No
AU CFI	Emission Reduction Fund (ERF) projects created under the Carbon Farming Initiative (CFI) generate Australian Carbon Credit Units (ACCUs) for sale to the Commonwealth or are domestically traded to fulfill regulatory obligations or voluntary commitments.	The program is implemented for Australian domestic policy purposes under a regulatory framework, and so implementation in NZ would require a domestic policy to that effect. The machinery of government in Australia and NZ is similar, so the basis for the program including validation/verification protocols should be transferrable.	Yes
British Columbia	The British Columbia Offset Portfolio (BCOP) allows for the issue, transfer and surrender of B.C. Offset Units. The units can be sold to government and are used for voluntary or compliance purposes.	This provincial program is implemented for British Columbia domestic policy purposes under a regulatory framework, and so implementation in NZ would require a domestic policy to that effect. The basis for the programme including validation/verification protocols is not so easily transferrable as	Yes

Program	Characteristics	Assessment for NZ	Potential for use in NZ?
		audit bodies must be ISO 14065 accredited.	
California	The California Compliance Offset Program allows for part of the compliance obligation to be met by carbon credits created by standards approved by the California ARB and issued by ACR, Climate Action Reserve (CAR) and Verra	The California program allows for carbon credits created by other programs to be used to meet compliance obligations - addressed elsewhere in this report.	No
CDM	The Clean Development Mechanism (CDM) was defined in Art. 12 of the Kyoto Protocol to Annex B Parties to acquire Certified Emission Reduction units (CERs) from non-Annex B parties in partial compliance of Kyoto Protocol obligations.	The mechanism itself only allows for project development in non-Annex B Parties, but NZ is an Annex B Party. However, the methods are available for use in other programs as described under the sections on GS and VCS.	No
China	The pilot ETS operating in China (in seven provinces) allows for the use of China Certified Emission Reductions (CCERs) for compliance purposes to different degrees. The projects are either existing CDM projects or using methods based on existing CDM methods.	The mechanism is specific to the China ETS, and the projects themselves are CDM or CDM adjacent projects.	No
GIS	The Green Investment Scheme (GIS) concept was designed to allow Annex I countries directly trade Assigned Amount Units (AAUs), with revenue from the sale being allocated to domestic emission reduction projects.	The concept was designed to address the issue of 'hot air'— this is not the situation with NZ.	No
GS	The Gold Standard (GS) operates an offset standard focussing on environmental and social benefits. Eligible sectors include renewable energy and energy efficiency	The GS has restrictive rules for project eligibility allowing only GS approved projects or Small Scale CDM projects using end-use energy efficiency, biomass for	Yes

Program	Characteristics	Assessment for NZ	Potential for use in NZ?
	projects that are issued Verified Emission Reduction units (VERs).	heat generation, waste energy, composting.	
JCM	The Joint Crediting Mechanism (JCM) is a project-based bilateral crediting mechanism initiated by the Government of Japan.	This mechanism is only possible on the basis of government agreements, and it is not clear how this will be applied under the Paris Agreement.	No
JI	The Joint Implementation (JI) mechanism was defined in Article 6 of the Kyoto Protocol to allow Annex B Parties to acquire Emission Reduction Units (ERUs) from other Annex B Parties within the capped Kyoto Protocol environment.	The mechanism itself allows for development of projects in Annex B Parties (NZ), but the intent of the mechanism is for transfer of credits between parties with an adjustment of the Kyoto Protocol emissions cap. The original NZ Projects to Reduce Emissions (PRE) from 2003-04 was a JI programme.	No
Ontario	The existing Ontario Offset Program generates offsets for use in Ontario's cap and trade system.	The scheme is specific to Ontario and does not appear to offer any benefits that are not available from other schemes.	No
Quebec	Quebec operates a project-based offset scheme for sectors not covered by the Quebec ETS (which is linked to the California ETS as part of the Western Climate Initiative).	The program covers manure management, landfill gas and ozone-depleting substances. It does not include the energy sector. The carbon credits issued are one of the types of eligible emission allowances that can be used for compliance obligations.	No
Spain	The Carbon Fund for a Sustainable Economy was implemented primarily to acquire Verified Emission Reduction units (VERs) from projects implemented in Spain. International credits were sourced from energy efficiency and renewable energy projects.	The fund is not a stand-alone program, but acquires credits developed under other schemes.	No
Switzerland	Specific to Switzerland and allows for producers and importers of	The transport fuel sector makes a voluntary contribution into the	No

Program	Characteristics	Assessment for NZ	Potential for use in NZ?
	motor fuels to meet their obligations using carbon credits.	Climate Cent Foundation which funds emission mitigation projects predominantly in other countries. Projects are in all sectors except for nuclear, carbon capture and storage (CCS), research and development, biofuels and fuel switch to natural gas in transport and building.	
US (CAR)	This is a United States voluntary program established to include sectors eligible under the California Compliance Offset Program.	The program does not include the energy sector.	No
Verra	Verra is a voluntary program operating the Verified Carbon Standard (VCS) and using Verra specific methods and the full range of CDM methods. The program issues Verified Carbon Units (VCUs).	The program is flexible allowing for Verra projects and for transitioning CDM projects.	Yes

Source: NICA-Crediting-Mechanisms-Final-February-2019.pdf (nefco.int).

The research and discussion in this paper is based on the requirements of the Gold Standard, Verified Carbon Standard (Verra), Australian Emission Reduction Fund (Carbon Farming Initiative) and British Columbia Offset Portfolio.

Government carbon crediting schemes

There are up to nine carbon crediting schemes operated by national or regional governments – see Table 1. Of these, the

- Emissions Reduction Fund (Australia), and
- British Columbia Government Offset Portfolio (Canada)

have approved project methodologies for energy- and technology-related projects and a well-established scheme framework and carbon crediting infrastructure that are recommended as reference models for NZ.

Emissions Reduction Fund

The Emissions Reduction Fund (ERF)[9] is an Australian Government scheme established under the *Carbon Credits (Carbon Farming Initiative) Act 2011*. The objectives of the Act are:

- to remove greenhouse gases from the atmosphere, and avoid emissions of greenhouse gases, to meet Australia's international mitigation obligations
- to create incentives for people to undertake offsets projects
- to increase carbon abatement in a manner that is consistent with the protection of Australia's natural environment and improves resilience to the effects of climate change
- to authorise the purchase by the Commonwealth of units that represent carbon abatement.

The ERF offset integrity standards provide a credible benchmark for the proposed NZ projects and potential future carbon credit issuance. The ERF integrity standards are:

- additionality
- measurable and verifiable
- eligible carbon abatement
- evidence-based
- project emissions (deducted)
- conservative.

Project types include:

- new technology
- upgrading equipment
- changing business practices to improve productivity or energy use
- changing agricultural practices to reduce emissions
- changing the way vegetation and soil is managed to store more carbon
- changing the way forest fire is managed to reduce emissions.

Organisations can propose a methodology which, if approved, becomes an eligible project methodology. Eligible projects report to the Clean Energy Regulator at regular intervals and must complete a minimum of three scheduled audits across a seven-year crediting period[10]. Auditors must be selected, with the appropriate specialisation, from the Register of Greenhouse and Energy Auditors[11].

Participants can earn Australian Carbon Credit Units (ACCUs) for every tonne of emissions reduced or stored through a project. Approved projects are listed on the ERF Project Register[12]. ACCUs are issued to project owners in the Australian National Register of Emission Units (ANREU). Project details can be viewed on the Carbon Market Institute's Market Directory[13]. Note that ACCUs issued by the Clean Energy Regulator under the ERF can be used for voluntary offsetting by organisations outside Australia; however, the

[9] www.industry.gov.au/funding-and-incentives/emissions-reduction-fund

[10] www.cleanenergyregulator.gov.au/ERF/Want-to-participate-in-the-Emissions-Reduction-Fund/Step-3-Reporting-and-auditing/Audit-Requirements#Choosing-an-auditor

[11] www.cleanenergyregulator.gov.au/Infohub/Audits/register-of-auditors

[12] www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/project-register

[13] https://marketplace.carbonmarketinstitute.org/registry

offsetting organisation would need to have an account in the ANREU or an account in a registry that will accept ACCUs.

The ERF has comprehensive and rigorous offset integrity standards for carbon credit project development and issuance of carbon credits aligned with the ICROA Code of Best Practice, regulated through the *Carbon Credits (Carbon Farming Initiative) Act 2011*, and which are described fully in the Climate Change Authority's review[14] of the ERF scheme.

British Columbia Government Offset Portfolio

The British Columbia Offset Portfolio (BCOP)[15] issues carbon credits called 'B.C. Offset' units to eligible projects that have reported verified GHG emissions reductions/removals. The scheme is intended to advance green technologies, support clean job growth, and stimulate the economy.

Organisations can propose emissions reduction projects to the BCOP and if approved, these become part of the offset portfolio. Emissions reporting and conduct of the portfolio are regulated under the *Greenhouse Gas Industrial Reporting and Control Act (GGIRCA) 2014*[16].

To have their reductions recognised as B.C. Offset Units, projects must meet provincial regulations. Independent validators and verifiers provide third-party reviews to ensure the resulting offsets are verifiable and incremental. The validation/verification bodies are required to be accredited to ISO 14065:2020[17] by either the Standards Council of Canada (SCC) or the American National Standards Institute (ANSI). The Climate Investment Branch of the Ministry of Environment and Climate Change Strategy (MECCS) provides regulatory oversight of the scheme and issues B.C. Offset units to project owners in the BC Carbon Registry. B.C Offset units are sold to the province and used for the BC Carbon Neutral Government Programme[18]. Excess units are made available to the business sector through the VCM, and some excess units are sold overseas, mainly into Europe.

Project types include:

- transportation – fuel switching
- buildings – energy efficiency
- waste and Residual Management
- industry – energy efficiency
- enhanced carbon sequestration.

Common features – Emissions Reduction Fund and British Columbia Government Offset Portfolio

The ERF and BC schemes have the following features in common:

- established under climate change or GHG reporting regulations
- maintain a standard for carbon credit projects
- project accounting (measurement) methodologies are approved by the regulatory body

[14] www.climatechangeauthority.gov.au/sites/default/files/2020-11/ERF%20Review%20Final%20Report%2020201009_2.pdf

[15] https://www2.gov.bc.ca/gov/content/environment/climate-change/public-sector/offset-portfolio

[16] https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/legislation

[17] ISO 14065:2020 General principles and requirements for bodies validating and verifying environmental information.

[18] www.cgai.ca/the_case_for_carbon_offsets_and_trading_in_bc_and_canadas_climate_framework

- require eligible projects to report emissions reductions/removals and complete scheduled audits at regular intervals
- oversee third-party verification/certification of the projects
- set accreditation requirements and approve validation/verification bodies
- carbon credits are issued by the regulatory body
- oversee listing of status of carbon credits in the province/national public registry
- the carbon credits can be used for both regulatory obligations and voluntary offsetting
- the carbon credits are mainly used domestically.

Voluntary carbon crediting schemes

The Gold Standard (GS) and the Verified Carbon Standard (VCS) operated by Verra are the largest carbon crediting schemes and these dominate the international VCM. Both these schemes have been influenced by the design of the Clean Development Mechanism (CDM)[19] that was established by the United Nations Framework Convention on Climate Change (UNFCCC) under the Kyoto Protocol.

There has been criticism of the integrity of some project types under the CDM. Nevertheless, the CDM framework and process for carbon crediting are regarded as best practice i.e., scheme design, governance, validation/verification procedures and accreditation requirements, and methodologies for GHG emissions reduction projects. In particular, the CDM established certification criteria for carbon credits including rules for determining 'additionality' that have formed the basis for many other programmes that issue carbon credits.

The Gold Standard

The Gold Standard (GS)[20] is a standard and certification programme for non-governmental emission reductions projects in the CDM, the voluntary carbon market, and other climate and development interventions. The 'Gold Standard for CDM' which issued Gold Standard Certified Emissions Reductions (GS CERs) was developed in 2003 by the World Wildlife Fund (WWF), SouthSouthNorth and Helio International. The 'Voluntary Gold Standard' which issues Gold Standard Verified Emissions Reductions (GS VERs) was developed for the voluntary carbon market in May 2006. The programmes were created through a consultation process by an independent Standards Advisory Board which includes scientists, project developers and government representatives.

The GS provides validation and verification requirements and approves third party organisations to undertake audits of project design and GHG emission reductions/removals reported. There are around 20 validation/verification bodies[21] currently approved to undertake GS audits.

GS certified carbon credits are issued to project owners in the GS Impact Registry[22]. The registry provides publicly available information that enables ownership and status of the carbon credits to be tracked.

[19] https://cdm.unfccc.int/about/index.html

[20] www.goldstandard.org

[21] https://globalgoals.goldstandard.org/approved-auditors/

[22] www.goldstandard.org/resources/impact-registry

In respect of the double claiming issue, the GS has taken the position that a CA is necessary for all carbon credits used for voluntary offsetting whether sourced from domestic or international projects[23].

The Verified Carbon Standard

The Verified Carbon Standard (VCS) is a standard for certifying GHG emissions reductions and was developed in 2005 by The Climate Group, IETA, The World Economic Forum (WEF) and the World Business Council for Sustainable Development (WBCSD). It is administered by Verra[24], a not-for-profit organisation.

Verra provides validation and verification requirements and approves third party organisations to undertake audits of project design and emission reduction/removals reported. There are around 20 validation/verification bodies[25] currently approved to undertake VCS audits.

Verified Carbon Units (VCUs) are issued to project owners in the Verra Registry[26] which facilitates the transparent listing of information on certified projects, issued and retired units, and enables the trading of the units.

In respect of the double claiming issue, Verra has suggested that carbon credits be differentiated by being labelled according to whether the carbon credit does or does not have an associated CA. Verra plans to make an Article 6 label and associated guidance available when Article 6 has been finalised, anticipated at COP26 in November 2021[27]. Verra proposes that companies may wish to purchase domestic carbon credits without CAs because they want to contribute to their country's NDC; in this case, a carbon neutral claim would not be allowed. Note that Verra may change its position on this issue because of the recent launch of the VCMI.

The principles and key requirements of GS and VCS for certification of carbon credit projects are compared in Appendix 5.

To be eligible to apply for certification, a project must use a measurement methodology that has been approved by the certifying scheme. Both GS and Verra list a range of approved methodologies including energy- and technology-related methodologies.

Potential application of international standards/schemes in NZ

One option for generating domestic energy and/or technology-related carbon credits for the NZ VCM could be to apply for certification of projects by GS or Verra. Both schemes have their own bespoke project methodologies and allow a range of CDM project methodologies. Verra will allow a project to transition to one of its programmes provided that the project meets the requisite project methodology requirements.

The requirements of the GS and the VCS (operated by Verra) are compared and issues specific to implementing these schemes in NZ are assessed in Appendix 5. Based on this assessment, it is unlikely that

[23] Gold Standard, February 2021. Treatment of double counting and corresponding adjustments in voluntary carbon markets. www.goldstandard.org/sites/default/files/documents/gs_guidance_correspondingadjustments_feb2021.pdf

[24] https://verra.org

[25] https://verra.org/project/vcs-program/validation-verification/

[26] https://registry.verra.org/app/search/VCS

[27] Verra, 2020. Proposal for scaling voluntary carbon markets and avoiding double counting post-2020. https://verra.org/project/public-consultation-proposal-for-scaling-voluntary-carbon-markets-and-avoiding-double-counting-post-2020/

the proposed energy and technology-related decarbonisation projects could be certified and issued carbon credits through one of these schemes.

To have projects certified, validation and verification would have to be undertaken by GS or Verra approved audit bodies. There is no approved GS or Verra audit body in Australia or NZ. Sourcing approved audit capability from overseas will add additional cost to the certification process.

GS requires there to be a CA provided by the project host country for all GS VERs whether used in the domestic or international VCM. Verra proposes to issue two types of carbon credit – one carrying an Article 6 label and requiring a CA. Carbon credits not carrying an Article 6 label will not be able to be used to make carbon neutral claims.

The cost of project certification and carbon credit issuance through GS or Verra is likely to impact on the financial viability of the proposed decarbonisation projects due to the scheme registration, assessment and issuance costs compared to the relatively low volumes of emission reductions associated with each project.

Potential adoption of the framework from international government schemes

The Australian ERF and the British Columbia BCOP provide tried and tested frameworks and methodologies that could be adopted by the NZ Government. From a technical perspective, suitable methodologies for the NZ energy and technology-related projects can be identified, or a process put in place for approval of new project methodologies. If the ERF framework for validation/verification of projects was adopted, validation/verification capability could be sourced from Australia until suitable audit bodies are trained and approved in NZ.

The ERF interprets eligible carbon abatement to 1) result from the project and 2) be capable of meeting Australia's mitigation targets under the Kyoto Protocol and Paris Agreement (as of March 2021). The Carbon Market Institute advised[28] that the Australian Government is unlikely to require or provide CAs for the ACCUs issued to projects under the ERF.

The BCOP will not be issuing guidance in relation to the potential double claiming issue under the Paris Agreement. Guidance is being developed at Canadian federal level but is not yet available[29].

Potential arrangements for a NZ domestic carbon crediting scheme

The generation and use of carbon credits from domestic energy and technology-related decarbonisation projects could take place through a domestic carbon crediting scheme. The EECA decarbonisation projects forming the basis for this report predominantly involve the reduction of coal consumption, a commodity covered by the NZ ETS. The relationship between creation of carbon credits based on emissions abatement and the obligations of entities under the ETS is critical.

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[28] Personal communication with John Connor, CEO and Brad Kerin, General Manager and Company Secretary from the Carbon Market Institute, Melbourne, Australia on 3 August 2021.

[29] Personal communication with Chris Fleming, Director, Industrial Reporting and Control; Andrea Orellana, Unit Head, Emissions Mitigation; and Jordan Kummerfield, Senior Policy Analyst for the British Columbia Offset Portfolio, provincial government, Victoria, British Columbia on 1 July 2021.

Trading and offsetting

A prospective use for the proposed domestic carbon credits is to meet demand for offsetting in the VCM, including the CNGP. Some important considerations in scheme design are:

- There needs to be a form of certification or approval and tracking of carbon credits.
- Carbon trading does not require an exchange or other form of open market, sales can be over-the-counter.
- A centralised public registry remains international best practice.
- A domestic trading and offsetting program can target specific project types and emission sources.

The framework for a potential carbon crediting scheme for the decarbonisation projects, based on the Australian ERF, is outlined in Appendix 10.

Does trading of an emissions abatement credit result in double claiming or greenwashing?

In general, we think that this is unlikely to be an issue.

The project emissions abatement is real and verifiable, and it is unlikely that the fossil fuels no longer consumed by the project facility can be sold and consumed elsewhere.

Coal suppliers are directly exposed to the NZ ETS, so a reduction in coal use by one customer does not create a subsidy for other users, and in fact may increase the per unit costs as production overheads are spread across a smaller supply volume.

Some firms that use stationary energy are eligible for free allocation of NZUs on a production basis using a sector emissions factor, and after a project is implemented may have a surplus of NZUs as a result of an improved emissions factor. However, these firms represent a small subset of potential projects, and free allocation rules are under review and already being phased down over time.

Strictly speaking, and as clarified by the VCMI Consultation Report, the requirement for a CA under Article 6 of the Paris Agreement was intended to ensure that there is no double claiming between countries, i.e., if NZ purchases International Transferred Mitigation Outcomes (ITMOs) from a project in another country to meet its NDC, the host country must make a CA in its national carbon accounts that are reported to the UNFCCC.

Domestic voluntary emissions abatement that helps NZ meet its NDC and that is traded domestically as carbon credits in the VCM does not compromise the integrity of international emissions trading which is separate from domestic voluntary actions. To ensure any claims around such voluntary action will be seen in the future as having integrity, organisations should publicly and transparently disclose the action behind any voluntary carbon claims being made, and that the action being undertaken contributes to an NDC but does not go beyond it.

KEY RESEARCH QUESTIONS

Which international standards would apply for energy related projects?

The four schemes suitable for further consideration in a NZ context are the Gold Standard, Verra, Australian Emission Reduction Fund, and the British Columbia Offset Portfolio

Voluntary standards exist for a purpose and operate within a defined framework. In general, the purpose is to incentivise emissions abatement (energy and other emission reductions), avoidance, and sequestration projects. The focus of this research question is on schemes that include energy-related project methodologies. As discussed earlier in this report, the four schemes with energy-related project methodologies most likely to prove suitable for use as the basis of a domestic NZ scheme are:

- The Gold Standard (global)
- Verra (global)
- Emissions Reduction Fund (Carbon Farming Initiative) Australia (ERF)
- British Columbia Offset Portfolio (BCOP).

Table 2 below describes the features of interest in each program and their relevance to the New Zealand situation.

Table 2: High level assessment of the features of the international carbon credit schemes suitable for use in NZ

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
Methodology	Both GS and CDM methodologies are available, and the project can propose a	Both VCS and CDM methodologies available and the project can propose a	Methodologies have been developed across major	Protocols follow ISO 14064-2:2018[30]. Fuel switch protocol approved. Other protocols under	Likely to be existing methodologies suitable for the NZ projects available in

[30] ISO 14064-2:2018 Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
	new methodology for approval. The GS independent Technical Advisory Committee (TAC) makes the approval decision.	new methodology for approval. Draft methodologies are posted on the website for a 30-day public comment period. Two approved validation and verification bodies (VVBs) independently assess the methodology and must provide a positive assessment. Verra conducts an in-depth review of the methodology and assessment reports.	industrial and agricultural sectors, covering energy consumption, emissions, abatement, avoidance, and sequestration	development include afforestation and reforestation, conservation and improved forest management, avoided conversion, landfill gas management, organic waste diversion, anaerobic digestion.	GS, VCS and ERF schemes. Under GS and VCS, approval would need to be sought for any decarbonisation methodologies that do not fit an existing GS or VCS methodology.
Additionality	UNFCCC additionality requirements are applied.	Additionality requirements are set out in the project methodology. This can e.g., specify the CDM Additionality Tool. New project-	The requirement for additionality is included in the Carbon Credits (Carbon Farming Initiative) Act. Additionality is	Three additionality tests: financial, regulatory and market penetration. Protocols defined under the Greenhouse Gas Industrial Reporting and Control Act (GGIRCA). Specific	GS requirements likely to be challenging. Under VCS, it may be possible to seek approval for NZ scheme-specific approach for

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
		specific approaches for demonstrating additionality can be submitted for approval.	primarily regulatory, with requirements for allowable project types and other matters defined in each methodology.	additionality requirements are included in project methodology protocols.	additionality. Could be an obstacle if must apply for approval of additionality approach on a project-by-project basis.
Baseline setting	Determined on a project-by-project basis. *Baseline means the amount of greenhouse gas emissions that would be produced in the absence of the carbon credit project, i.e., business-as-usual scenario, which forms the basis for calculating a project's emissions*	Determined on a project-by-project basis. *In developing the baseline scenario, assumptions, values, and procedures shall be selected that help ensure that net GHG emission reductions and removals are not overestimated.*	The baseline is defined using a specific protocol for each methodology and project.	The baseline scenario is defined in the GGIRCA regulation and specific project methodology protocols.	

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
	reductions and helps determine additionality.				
Environmental and social impacts	Local stakeholder consultation is required, and wider non-governmental organisations (NGO) supporters of the GS have the right to comment on the project. Assessment covers a wide range of social and environmental factors designed to protect people in developing countries	No stakeholder consultation requirements for project developers. There are safeguard requirements to prevent negative impact on the local environment or communities, referred to as "no net harm".	The impact is considered as part of a comprehensive assessment of the methodology itself before approval. Impacts are considered in general with the existing local, state, and federal requirements for environment impact assessment and development approval.	Projects should align with current priorities, sustainable development goals and existing policy. The sale of offsets provides another funding source for innovative emissions reduction work across all sectors, as well as economic diversification opportunities within the province.	GS requirements are inappropriate for energy- and technology-related NZ projects. VCS requirements unlikely to be an obstacle.

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
Environmental integrity	Real Certified Additional Independently verified Unique Traceable GS requires a CA for all types and uses of carbon credit.	Real Measurable Permanent Additional Independently audited Unique Transparent Conservative Verra proposes an Article 6 label for carbon credits with an associated CA. No carbon neutral claim allowed without a CA.	Additionality Measurable and verifiable Eligible carbon abatement Evidence-based Project emissions Conservative All methods are assessed for environmental integrity as an essential part of the approval process.	Additionality Measurable and verifiable Conservative Reduction or removal from the atmosphere will be achieved Insurance against risk of reversal is required.	GS requirements may be too stringent for NZ projects. VCS requirements would allow non-Article 6 carbon credits to be issued to NZ projects but users using these to offset their emissions could not make a carbon neutral claim.
Validation and verification	GS approved validation/verification bodies must be CDM-accredited auditors. The GS provides training on sustainable development audits. Different body required	Verra approved validation/verification bodies must be accredited under ISO 14065:2020. Verra relies on the ANSI to accredit third-party	Regulator approved auditors (listed on register with specialisation) required to use the regulator defined	Validation/verification bodies must be accredited under ISO 14065:2020 by SCC or ANSI. The Climate Investment Branch (regulator) of MECCS	There are no GS or VCS approved validation/verification bodies in Australia or NZ Auditors would need to be selected from the GS or VCS lists of approved

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
	for validation and verification. Audit bodies accredited by the ANSI are approved for energy-related audits.	auditors of offset projects.	standard. All reports are subject to review by the regulator, and all auditors are regularly inspected by the regulator to ensure quality is maintained.	provides regulatory oversight of the scheme.	bodies. There is unlikely to be enough demand for audits to justify a NZ body seeking approval to undertake GS or VCS audits.
Reporting and audit frequency	Annual reports in years when verification does not occur. Verification generally every two years.	Reporting and verification frequency is defined in the approved methodology.	Reporting is for up to two years for non-Agriculture, Forestry and Other Land Use (AFOLU) projects, and audit is required on a risk-based schedule.	Every three years, organised in 12-month periods, after an initial 12-month report.	An audit and reporting infrastructure would need to be designed, implemented, and the required personnel trained and approved.

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
Certification	GS Secretariat reviews verification documents. Final certification decision is made by GS Secretariat and GS-TAC.	The VCS undertakes accuracy reviews of projects prior to registration or issuance.	The regulator issues ACCUs on acceptance of an offsets report which may require an accompanying audit report.	The regulator issues B.C. Offset Units on acceptance of the verification report.	NZ can develop and certify a unit suitable for use in NZ using the ERF and BCOP schemes but would need to work with GS or Verra if using one of their schemes.
Crediting period	One 10-year period or up to three 7-year periods.	Two 10-year periods for non-AFOLU projects.	7 years for non-AFOLU projects.	10 year increments up to 20 years.	Unlikely to provide any obstacles to the NZ projects.
Registry and issuance of carbon credits	The GS maintains a registry of projects and GS-VER credits. GS issues GS serial numbers in its GS-VER registry.	Verra maintains its own registry and has approved two independent VCS Registry Operators: APX Inc and Markit. Registry operators are responsible for verifying documentation and checking that the project has not been	All ACCUs are maintained in the Australian National Register of Emissions Units (ANREU)	All B.C Offset Units are maintained in the British Columbia Carbon Registry	NZ would need to either establish a registry or develop a relationship with an existing registry operator i.e., the New Zealand Emissions Trading Register (NZETR).

REQUIREMENTS	The Gold Standard	Verified Carbon Standard (Verra)	ERF (Carbon Farming Initiative)	British Columbia Offset Portfolio	New Zealand perspective
		previously registered under the VCS Program.			

Would credits be generated only as carbon is displaced or could the lifetime emissions avoided be traded at time of investment assuming robust monitoring was in place and risks and uncertainty are managed?

Credits can only be created after the abatement has been achieved, other than in a small number of clearly defined project types. Other options exist to front load project funding.

In international best practice, access to pure forward creation of carbon credits (that is, creating, registering, and trading the carbon credits for the full project crediting period at the time of first registration) is restricted to:

- classes of project with significant upfront costs which are not materially offset by carbon revenues or secondary benefits in the short-term,
- where the future emission abatement is easily forecast with reasonable precision over the crediting period,
- and where abatement is not contingent on the outlay of significant recurrent resources.[31]

Project types currently implementing forward creation include alternate waste treatment by composting, the small scale CDM project (AMS.III.-AR) for light emitting diode (LED) lighting which allows two years creation under specified conditions, and energy projects such as LED lighting and home energy retrofits. For other project types, the carbon credits are only available after the abatement is achieved.

Pure forward creation from other types of emission abatement projects is not applied under any recognised jurisdiction. However, the question need not be about pure forward creation. The critical issue is about front-loading payment, not about actual forward creation of carbon credits, which is amenable to a financial solution.

One role of carbon trading is to incentivise the development of abatement projects—of all types—that are additional. There are options available to provide early funding of emissions abatement projects without pure forward creation, including:

1. Co-funding of high capital cost projects.

Co-funding of high capital cost projects is the option currently adopted by EECA, but without any recognition of emissions abatement generated by the projects. Conversion of the emissions abatement from these projects into carbon credits would require a new agreement with each project operator. This approach has the benefit of reducing administrative burden, but at the expense of effectively measuring and crediting achieved emissions abatement. This option does not provide a clear market price signal for carbon credits.

2. Forward payment for all credits for progressive delivery (with appropriate penalties if not delivered).

This option is a formalisation of the previous option for new projects. Under this option there would be a formal recognition of the acquisition of carbon credits, but still with payment upfront for all future carbon credits and progressive delivery. This approach provides significant funding to incentivise project implementation but has a potential downside if several projects fail to perform and the promised carbon credits are not delivered. Including a contractual make-good obligation reduces this risk. This option can provide a clear market price signal for carbon credits, depending on how the price is fixed.

3. Forward payment for a proportion of credits for progressive delivery.

[31] Report of the Expert Panel examining additional sources of low-cost abatement (industry.gov.au) p44

This option is an extension of the previous option and allows for an EECA-funded program to also provide for carbon credit sales into a broader domestic trading market. This option is an alternate method of addressing delivery risk, but at the cost of reduced up-front contribution to project development. This option can provide a clear market price signal for carbon credits, depending on how the price is fixed.

4. Commitment to purchase credits at an agreed price to an agreed schedule.

The final option is the method adopted by the Australian Emission Reduction Fund (ERF). In this case EECA enters into a binding contract to purchase an agreed number of carbon credits at an agreed schedule and price. If additional funds are required for project implementation the binding contract can be used as security for a loan at normal commercial rates, or for a loan from a government loan facility at preferential rates. This option can provide a clear market price signal for carbon credits, depending on how the price is fixed.

The requirements for each of the funding options is summarised in the following table.

Table 3: Requirements for different funding arrangements

Requirement	Co-funding high capital cost projects	Forward payment for all credits, progressive delivery	Forward payment a proportion of credits, forward payment	Commitment to purchase at agreed price and schedule
1. Upfront payment at the time of the project agreement	✓	✓	✓	
2. Completion of a project agreement to develop, operate, monitor, and verify a carbon abatement project	✓	✓	✓	✓
3. Commitment by the project operator to manage the project in accordance with the project agreement.	✓	✓	✓	✓
4. Implementation of project to approved emissions abatement methodology (including monitoring, reporting and verification)	✓	✓	✓	✓
5. Periodic monitoring, reporting, and verification of abatement achieved by the project.	✓	✓	✓	✓
6. Registration of the verified achieved abatement as carbon credits in accordance with the agreed Scheme framework.	✓	✓	✓	✓
7. Annual transfer of all registered carbon credits to EECA	✓	✓		
8. Annual transfer of agreed number of registered carbon credits to EECA			✓	
9. Annual sale of the agreed number of credits at an agreed price to EECA				✓
10. The balance of the carbon credits from each reporting year are available for sale by the project operator into a yet to be developed domestic trading system			✓	✓

What volume of credits / proportion of the total emissions savings could be created by maintaining credibility?

The volume of abatement used in the funding estimate for each is a reasonable first approximation to the potential credible abatement from the project. The projects themselves are credible projects and there are no project specific constraints that could result in a reduction of potential abatement credits.

The funding by EECA of the existing decarbonisation projects was an-independent decision made based on independent advice and related to the level of funding sought, the expected whole-of-life abatement, commercial additionality, and the program funding policy. The credibility of the funding process and the projects selected is a matter of NZ Government policy and probity, and the funding provided to each of the project operators does not count against the additionality or credibility of any individual project.

The nominal annual abatement quantities shown in Table 3 below are unverified annual volumes from the project application documentation submitted to EECA and used as one element of the funding decision. The use of an annual abatement quantity rather than full whole of project abatement is credible as the EECA projects are not avoidance projects but are types of project where forward creation of abatement carbon credits is not recognised in any of the existing global schemes.

The analysis completed for each of the projects suggests that, where an applicable project mechanism exists, the projects examined are credible. The information provided by each of the project proponents in the relevant application documents is suitable for the funding application and approval process but (as it is not verified and does not follow an established project methodology) not to calculate verifiable emission reductions. For this reason, the quantity of claimed annual abatement has not been described as verified.

The data and information requirements for a complete project methodology normally include:

- project eligibility criteria
- methods to calculate the project emissions baseline, including requirements for data collection over an extended baseline period
- methods to calculate the emissions from the operating project
- methods to take account of any changes in project activity that could either reduce or increase operating emissions, and
- detailed measurement, monitoring, reporting, and record-keeping requirements.

Conversion of the existing projects to carbon credit generating projects will require development and verification of this information. Projects where the information is not available are likely to be ineligible as carbon credit projects.

New projects which implement the selected project methodology will meet the requirements for participation in a domestic trading scheme.

The ability to trade the credible emissions reductions in a domestic voluntary market is more complex. To achieve this goal there may need to be adjustments to the registry accounts of both the project operator and the purchaser to prevent the actuality or the appearance of double claiming, while also achieving the policy goal of meeting the Paris Agreement commitment by reducing overall emissions. This is also the case if the carbon credits from these projects were to be used as part of the CNGP.

Table 4: Unverified abatement projected for the sample of decarbonisation projects reviewed

EECA Project	Unverified Annual Abatement (tCO_2-e)
01-009 Energy Optimisation and Electrification Opportunities	6,746
01-012 Boiler Conversion and Fryer Heat recovery	33,815
01-013 Boiler Two Biomass	28,500
01-017 Glasshouse Heat Demand Reduction and Low Carbon Fuel Switching	26,922
01-021 Wood Boiler Project	4,165
Pulsed Electric Field Technology installation	1,348
Peaking Electrode Boiler Installation	4,650
Install LED Lighting at Port of Auckland	1,395
Thermal screens installation	1,562

Drawing from examples of similar projects in the world having successfully (or not) delivered carbon credits for the market, what would be the best practice and limitations to take into account in setting a robust energy-based domestic scheme?

The ICROA principles and the Australian ERF scheme represent robust reference models for NZ domestic abatement project scheme

Best practice principles for robust carbon trading schemes have been developed by ICROA and included in the State and Trends of Carbon Pricing 2020 report published by the World Bank[32]. ICROA has recognised the Australian ERF as meeting its best practice principles[33] and it is on this basis suggested as the most suitable option for implementation, with relevant amendments, in NZ.

The ICROA best practice principles on carbon credits [34] are:

1. Real: All emission reductions and removals—and the project activities that generate them—shall be proven to have genuinely taken place.

[32] 9781464815867.pdf (worldbank.org)

[33] ERF Review Final Report 20201009_2.pdf (climatechangeauthority.gov.au)

[34] International Carbon Reduction & Offset Alliance, 2021.Code of Best Practice for Carbon Management Services. Technical Specification. See page 7. www.icroa.org/resources/Documents/The%20Code/ICROA_cobp_tech_specs_2021.pdf.

2. Measurable: All emission reductions and removals shall be quantifiable, using recognized measurement tools (including adjustments for uncertainty and leakage), against a credible emissions baseline.

3. Permanent: Carbon credits shall represent permanent emission reductions and removals. Where projects carry a risk of reversibility, at minimum, adequate safeguards shall be in place to ensure that the risk is minimized and that, should any reversal occur, a mechanism is in place that guarantees the reductions or removals shall be replaced or compensated. The internationally accepted norm for permanence is 100 years.

4. Additional: Additionality is a fundamental criterion for any offset project. Project-based emission reductions and removals shall be additional to what would have occurred if the project had not been carried out.

5. Independently verified: All emission reductions and removals shall be verified to a reasonable level of assurance by an independent and qualified third-party.

6. Unique: No more than one carbon credit can be associated with a single emission reduction or removal as one (1) metric ton of carbon dioxide equivalent (CO_2e). Carbon credits shall be stored and retired in an independent registry.

The fundamental limitations in implementing an energy-based domestic scheme to consider in the NZ context is the relationship or not to the NZ ETS, additionality, and the uniqueness principle.

NZUs are issued, acquired by auction, or allocated as compliance instruments under the NZ ETS. Participants in the scheme acquire or are allocated NZUs which are then surrendered at 1 NZU per 1 tCO_2-e of emissions or sold into the market for surrender by others.

The additionality requirement is that any abatement, avoidance, or removal is additional to what would have occurred under business-as-usual economic settings. The setting of interest is whether the capital and ongoing operational costs, and disruption from project implementation, are such as to render the investment in an abatement project uneconomic. In the ERF, additionality is addressed by the concept of newness and the activity type eligibility settings from each project methodology. Newness is simply that the project application is made to the regulator before approval of the project by the implementing organisation. Activity type eligibility allows the scheme to objectively define the types of equipment and other constraints that are taken to describe additional project activities. These constraints can be adjusted over time. Co-funding is not a consideration, as ACCUs are sold into the Australian compliance and voluntary market.

Under the current settings, EECA directly funds projects. The level of funding is not directly tied to the volume of potential abatement, but the co-funding formula could be adjusted for different activities to meet NZ Government policy objectives without affecting a judgement of materiality.

To meet the 'uniqueness' principle a participant in the NZ ETS should not be able to simultaneously create a domestic trading credit and sell an allocated NZU into the market. NZUs acquired at auction by an organisation and then re-sold into the market does not affect uniqueness. However, sale of an allocated NZU and sale of an abatement credit would allow the implementing organisation to gain a benefit from allowing another organisation to emit CO_2-e based on surrender of the NZU and allow another organisation to offset CO_2-e based on the sale of an abatement credit.

In conclusion, implementing a domestic scheme based on the Australian ERF scheme and ensuring that the NZ scheme infrastructure was designed to meet the ICROA principles would likely be seen as robust and credible.

Assess the amount of emission reduction from the sample projects which could be considered credible if they were to be traded on the domestic voluntary market

The projects in the sample do not have all of the data required to calculate the amount of attributable emissions abatement. The amount of abatement used in the funding estimate is a reasonable first approximation to the potential abatement from the project.

The analysis completed regarding possible schemes (see Appendices 6-9) has found that the Australian ERF scheme is a suitable scheme for adaptation into a NZ context. Analysis of each the projects against the high-level requirements of the ERF suggests that the projects developed under the EECA decarbonisation programs would be credible under the ERF criteria. The information provided by each of the project proponents in the relevant application documents is not independently verified and does not in general apply a stringent calculation process to estimate emission reductions as is used by the ERF project methodology. For this reason, the amount of claimed annual abatement has not been adjusted or verified. For the amount to be credible, full recalculation of the amount of abatement using the relevant ERF project methodology would require additional information (as noted elsewhere in this report) to meet the requirements of each methodology.

The co-funding for the decarbonisation projects by EECA was substantial (refer to Table 4 below). The extent of co-funding should not affect project eligibility, particularly if the credits are created through EECA (as EECA supplied the co-funding amount). That the co-funding was provided after probity checks within the funding approach indicates that the project would not have gone ahead in the absence of the directed funding.

The ability to trade credible emissions reductions in a domestic voluntary carbon market is more complex and requires that the project and methodology is within an appropriate administrative framework. To achieve the high-level policy goal of meeting the Paris Agreement commitment and thus justify a label of 'credible', the projects and the traded abatement would need to demonstrably support reduction of the NZ greenhouse inventory. The projects in the sample are either fuel switch projects (thermal coal to electricity or natural gas) or energy efficiency. As discussed in *Appendix 2 Relationship between domestic carbon credits, the ETS and reporting under the Paris Agreement*, lignite is not supply constrained and so reduction in consumption at a project is unlikely to be consumed at another facility. This is also the case if the credits from these projects were used as offsets in the CNGP.

It is concluded elsewhere in this report that the Australian ERF scheme is a suitable reference model for a NZ domestic trading scheme. The amount of abatement from the project funding documents and an assessment of ERF eligibility is noted below in Table 5.

Table 5: Credible emissions reduction in the NZ domestic market

EECA Project	Unverified Annual Abatement (tCO_2-e)	Co-funding percentage	Eligible as AU CFI project?
01-009 Energy Optimisation and Electrification Opportunities	6,746	50%	Yes
01-012 Boiler Conversion and Fryer Heat recovery	34,300	55%	Yes
01-013 Boiler Two Biomass	40,000	50%	Yes
01-017 Glasshouse Heat Demand Reduction and Low Carbon Fuel Switching	27,344	42.4%	Yes
01-021 Pine Wood Boiler Project	3,700	24%	Yes
Pulsed Electric Field Technology installation	1,348	14%	Yes
Peaking Electrode Boiler Installation	4,650	5%	Yes
Install LED Lighting at Port of Auckland	1,395	5%	Yes
Thermal screens installation	1,562	5%	Yes

Source information: Confidential project documents provided by EECA for the purpose of this report

ACTIONABLE RECOMMENDATIONS

The Australian ERF scheme is identified in this report as an appropriate reference model for a NZ scheme.

The ERF scheme is essentially in two parts—firstly, the administrative and operational frameworks for implementation, operation, monitoring, and audit of projects and secondly, the issue of carbon credit units to match verified abatement and then a mechanism for trading and selling these units (also see Appendix 3). The context for the involvement of EECA in a scheme based on the ERF when considering future proposals for a domestic VCM sponsored by other government entities[35] need not extend beyond the project mechanism, with confidence that projects would be eligible for credits in the final domestic VCM.

Accordingly, the following recommendations support the development and implementation of a project mechanism framework using the ERF as a reference model. A common point of reference with this and the other set of actionable recommendations is to enter a cooperation agreement with the Australian authorities for use of the scheme and its methodologies in a NZ context. This can maximise the opportunity for sharing experiences and intellectual property.

The quality of additionality checks when projects are selected for co-funding

The sample of projects reviewed for this report can be considered as additional under relevant international guidelines

The purpose of additionality is to provide confidence that funding only goes to emissions projects which would not have taken place other than for the operation of the specific scheme and its associated financial incentive (either direct co-funding or the sale of emissions credits). Additionality is also reflected in the range of technologies selected as being suitable for abatement projects—the first and fundamental additionality decision. The process and criteria for assessment of additionality is contested, as the simple existence of a positive project net present value (NPV) does not account for the alternate uses of scarce capital, in pursuit of projects that have greater strategic value.

Project funding can be tied or untied. Co-funding is a form of untied incentive—in that the funding is linked to development and implementation of the project and not tied to the performance of the project through the purchase of verified emissions abatement, avoidance, or sequestration credits. Co-funding is applicable where the policy objective (e.g., to eliminate an emissions source or aging technology) requires more upfront investment than can be reasonably recovered by the sale of abatement credits. Sale of emission credits is a tied incentive directly associated with the monitoring, verification, and certification of the abatement achieved from effective operation of the project.

Examination of the untied funding arrangements entered for the sample of projects found they fell in two groups. The boiler replacement projects had significant financial support (up to 85%) and the technology projects much less (up to 14%). The sample of projects reviewed can be considered as additional.

Actionable recommendations to implement a project mechanism with appropriate additionality considerations follow.

Project mechanism

The ERF project mechanism includes processes for selecting project types, developing project methodologies, and approving project methodologies which are designed to maintain and enhance additionality.

Specific actions

[35] Ministry for the Environment 2021. Proposed introduction of a domestic voluntary carbon market.

1. Develop and implement a comprehensive project mechanism using the ERF as a reference model, drawing on existing NZ legislative and regulatory instruments wherever possible. The mechanism should be designed to interface with the proposed NZ domestic VCM.
2. Establish a process for developing project methodologies, using ERF methodologies as reference models. If the NZ project scheme requires independent approval of methodologies, then identify and authorise an independent body using the ERF's Emissions Reduction Assurance Committee (ERAC) as a reference model.
3. The ERF reference model requires Ministerial authorisation of project methodologies as they form the basis of a financial and compliance instrument, the Australian Carbon Credit Unit (ACCU). Identify and authorise the appropriate authority as required to meet NZ legislative requirements.

Funding arrangements

The arrangements for project funding are integral to a project mechanism achieving its desired policy and abatement outcome. The options are for untied funding (grants and loans) and tied funding (sale of carbon credits). Directing funding to specific technologies and sectors, phasing of funding, and the ease of funding approval drive the speed of uptake and the extent of achieved emission savings. Tied and untied funding can be combined for project types or to meet specific policy objectives.

Specific actions

1. Develop and operationalise principles for tied funding of projects in addition to the financial benefit from the creation and sale of emissions abatement credits. The tied funding principles include:
    a. Equity—tied funding is limited only by the voluntary funds set aside for the purchase of registered carbon credits. Equity considerations to achieve a defined policy commitment (for example, conversion of a lignite boiler to an alternate fuel source) can be achieved by forward purchase and staged delivery of credits.
    b. Staged payment—payment can be upfront with commitment to staged delivery, or payment for an agreed volume at an agreed price.
    c. Policy objectives—consider the policy objectives that require tied funding to achieve cost-effective outcomes and maximise market incentives.
    d. Technology focus—all technologies can benefit from tied funding, with a technology focus through the development of targeted methodologies.
2. Develop and operationalise principles for untied funding of projects in addition to the financial benefit from the creation and sale of emissions abatement credits. The untied funding principles include:
    a. Equity—untied funding is limited to the amount needed to achieve a defined policy commitment. For example, conversion of a lignite boiler to an alternate fuel source may not be cost effective due to high capital costs, low lignite costs, and limited creation of emissions abatement credits. This may justify higher untied funding than for a project where there is greater benefit from the sale of credits.
    b. Staged payment—payment can be on project milestone or other staged payments to better align payment with project implementation and achieved abatement

c. Policy objectives—consider the policy objectives that require untied funding in addition to the revenue from sale of credits

d. Technology focus—high cost and new or innovative technologies may require untied funding to incentivise new technologies or correct identified instances of market failure

Additionality

Circumstances change over time, and the principles adopted for additionality and untied funding should provide the flexibility to adjust these arrangements to meet current goals. Target technologies and sectors will change over time as new technologies develop, market penetration evolves, ambitions increase, and cost structures adapt over time. This recommendation acknowledges this reality and implements an adaptive solution to the problem.

Specific actions

1. Develop and operationalise principles for regular review of additionality requirements and untied funding arrangements to meet the changing requirements of:
   - increased ambition for net zero including carbon neutral programs,
   - penetration of energy efficiency and renewable energy technology,
   - cost of capital,
   - arrangements for the NZ ETS including NZU prices, and
   - border adjustment effects.

The monitoring required during and after project completion to certify emissions savings

All of the projects reviewed require additional work to establish a project baseline, calculate project emissions, implement effective monitoring and measurement, and be subject to independent assurance.

Monitoring and certifying emissions reduction from emission abatement projects for the purpose of calculating and creating abatement credits requires a project monitoring and reporting methodology and an audit framework. As discussed elsewhere in this report, the ERF scheme and audit framework is a viable framework for adaptation to fit the NZ context. The obvious baseline for development of a NZ scheme is the existing framework of comparable legislative and regulatory instruments, and of instruments with a similar function that can be repurposed.

A common point of reference with this and the other set of actionable recommendations is to enter a cooperation agreement with the Australian authorities for use of the scheme and its methodologies in a NZ context. This can maximise the opportunity for sharing experiences and intellectual property.

Actionable recommendations to implement a project monitoring and certification scheme are provided below.

Project monitoring and reporting

The monitor, audit and report model developed and refined for the ERF provides a suitable starting point for development of a NZ model. The key features of the ERF model include:

- the use of conservative default emission factors where available rather than site specific factors to reduce project implementation and audit costs
- conservativeness (i.e., where there is uncertainty, ensuring that abatement calculations err on the side of under-reporting rather than over-reporting)
- using existing datasets where possible (i.e., use existing data with its associated development and update infrastructure rather than create new datasets)
- adopt a risk-based audit program where project audit frequency and stringency are reflective of the amount of claimed abatement, the complexity of the project mechanism, the project's history of compliance, and the consistency of claimed abatement from period to period
- centralised review of project reports for the issue of carbon credit units by an entity such as EECA to support the consistency and reliability of reporting.

Specific actions

1. Analyse the ERF and associated scheme documents to identify the specific legislative instruments required for use in NZ as the basis for detailed development. This is likely to include the relevant methodologies, and project monitoring and reporting requirements extracted from legislation.

2. Develop and implement consultation, communications, and training with project stakeholders.

Audit framework

Audit frameworks are complicated. The ERF audit framework builds on audit standards also in use in NZ (including ISAE (NZ) 3000 and ISAE (NZ) 3410) and so is again a suitable model for building an audit framework.

Specific actions

1. Engage with an experienced audit firm to match the comparable auditor framework requirements from the ERF framework with comparable documents established for use in NZ. This includes:

    a. auditor qualification and registration requirements, including ethics requirements

b. audit processes and rules, including guidance and report templates

c. requirements for regular reporting and quality inspections by the regulator, including disciplinary matters

2. Develop and implement consultation, communications, and training with audit stakeholders.

Appendices

APPENDIX 1 DOMESTIC CARBON CREDIT SCHEMES USED BY THE NZ VCM

Currently, the Permanent Forest Sinks Initiative (PFSI) is the only domestic carbon crediting scheme that can be used by the voluntary carbon market (VCM) in NZ. This government administered scheme operates within the NZ Emissions Trading Scheme (NZ ETS). Following assessment by the 'regulator' (Ministry for Primary Industries, MPI), New Zealand Units (NZUs) are issued, and these are listed on the New Zealand Emissions Trading Register (NZETR). The NZUs issued to PFSI landowners (projects) can be used to meet obligations within the ETS. When PFSI-NZUs are used for voluntary offsetting, the offsetting organisation should select the 'Kyoto voluntary cancellation workflow' within the NZETR which results in cancellation of the equivalent number of Assigned Amount Units (AAUs). Without the cancellation of AAUs, the PFSI-NZUs could have been double claimed i.e., also contribute to NZ's international emission reduction target. Ministry for the Environment (MfE) guidance on voluntary offsetting[36] explains that all other NZUs and AAUs held within the NZETR cannot be used to make an offset claim whether self-declared or made through a certification scheme.

The PFSI has been discontinued and will be replaced by the Permanent Post 1989 Forest Activity (PP89) in 2023. Apart from some technical changes to the accounting methodology, the PP89 will operate in a similar manner to the PFSI. Most PFSI projects are expected to migrate to the PP89. However, the Kyoto voluntary cancellation workflow ceases at the end of 2021 and there is uncertainty over whether PP89-NZUs used for voluntary offsetting would be double claimed against NZ's NDC. MfE guidance on voluntary offsetting post 2021 was not yet available at the time of preparing this report.

The PP89 is unlikely to provide sufficient carbon credits to meet the demand of the domestic VCM for 15 to 20 years (assuming new afforestation projects are registered from 2023). Additionally, there is concern from the business community that the only domestic carbon credits available for the VCM are forestry-based and increasing concern about potential reversal risks due to climate change impacts. There is significant interest from the business community in creating other energy- and technology-based carbon credits that can be used for voluntary offsetting.

Creating a new carbon crediting scheme suitable for the VCM is a major undertaking due to the need to develop scheme and registry infrastructure e.g., certification rules, system to train and approve auditors and registry system. However, there are well-established credible international carbon crediting schemes (voluntary and governmental) that could be used as a model for developing a NZ domestic scheme.

The adoption of the Paris Agreement has resulted in the need for carbon markets to develop new ways of operating. A key environmental integrity issue relates to Article 6 on carbon markets which has not yet been agreed in the international negotiations. There is concern that an emission reduction or removal could be claimed by multiple parties resulting in no net benefit to the atmosphere. In simple terms, an emission reduction cannot be both claimed and sold as a carbon credit. Almost all countries have developed NDCs many of which include emission reduction targets. The emission reductions and removals used to create carbon credits for a domestic VCM will also contribute to that country's NDC. This is called

[36] Ministry for the Environment, 2020. *Guidance for voluntary carbon offsetting – updated and extended until 31 December 2021.* Wellington: Ministry for the Environment. https://environment.govt.nz/assets/Publications/Files/guidance-for-voluntary-carbon-offsetting-updated-and-extended-until-31-December-2021.pdf

‘double claiming’ but is often referred to as ‘double counting’[37]. For clarity, the issue addressed by this report is ‘double claiming’

This issue was resolved at the annual Conference of the Parties (COP) to the Paris Agreement with the requirement for a Corresponding Adjustment to the NDC of the project host country for international trade in emission units. This requirement was already proposed by some parties, such as the Gold Standard (GS), which proposed that there should be an adjustment to the national carbon accounts when carbon credits are used for voluntary offsetting[38] – this is referred to as a Corresponding Adjustment (CA). This is now a requirement of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

[37] “Double counting” refers to counting the same emission reduction twice. “Double claiming” refers to the situation where the emissions reduction or removal (carbon credit) is purchased by a company and used to offset its emissions and contributes to the NDC.

[38] Gold Standard, February 2021. Treatment of double counting and corresponding adjustments in voluntary carbon markets. www.goldstandard.org/sites/default/files/documents/gs_guidance_correspondingadjustments_feb2021.pdf

APPENDIX 2 RELATIONSHIP BETWEEN THE NZ ETS AND REPORTING UNDER THE PARIS AGREEMENT

The NZ ETS has restricted scope with limited obligations for energy users to report consumption—the reporting and compliance obligation mainly rests with suppliers. This leaves energy users with the ability to create and trade emission abatement credits without double claiming

NZ's NDC under the Paris Agreement is measured using the NZ national greenhouse gas inventory. The national inventory is developed and reported each year to the UNFCCC using the Intergovernmental Panel on Climate Change (IPCC) framework 2006 IPCC Guidelines for National Greenhouse Gas Inventories[39]. The ETS is a cap-and-trade scheme designed to place a cap on the emissions of certain sectors of the NZ economy, with a view to better enabling NZ to meet its NDC under the Paris Agreement. The ETS does not yet cover all the sectors reported under the IPCC framework. The process used by NZ to report under the IPCC framework uses a top-down accounting process where many of the values are derived from Tier 1 statistics collated by Stats NZ[40] using high level reported and statistical data.

The ETS does not directly affect the development of the NZ national greenhouse gas accounts, but the ETS settings are subject to periodic review based on progress towards the NDC[41]. That is, the ETS is designed to reduce the consumption of fossil fuels and process emissions in covered sectors, but the ETS itself is not used to develop the national accounts. Likewise, the reduction in emissions because of the implementation of the EECA decarbonisation projects is not counted in the national inventory. Rather, the reduction in sales or total consumption of the fossil fuel is measured.

The ETS includes the stationary energy sector, and mining operations of more than 2,000 tonnes per annum (tpa) are obligatory participants. Energy Intensive and Trade Exposed (EITE) industries can apply for a free industrial allocation of NZUs which can then be used or sold into the ETS market to meet ETS compliance obligations—the stationary energy sector is not eligible for free allocations[42]. Some downstream users of stationary energy can apply for an allocation of NZUs as partial compensation for the impact of the ETS[43] on the cost of fuel. The ETS legislation defines the types of units, including NZUs,[44] able to be surrendered to meet ETS compliance obligations. Any form of carbon credit created from the proposed domestic decarbonisation projects is not, and is unlikely to be, included as a compliance unit in the ETS. It is noted that proposed changes to Electricity Allocation Factor under the ETS and Synthetic Greenhouse Gas (SGG) Levy may change the free allocation baseline, and changes to the ETS are proposed allowing for a 'removal credit' (the export of embedded emissions that would otherwise be reported in the NZ national greenhouse inventory) by ETS participants[45].

A related question is about the nature of the NZ coal, and particularly lignite, market. The NZ coal market is not constrained by the availability of supply. *The estimated in-ground resources for all coal types are over 15 billion tonnes. Approximately 80 per cent of this is lignite (low grade). Bituminous and sub-bituminous in-ground resources are around 4 billion tonnes. Most of New Zealand's bituminous coal production is exported, accounting for 97.0 per cent of total coal exports in 2015*.[46] This market data (assuming no material change since the 2015 report) indicates that most of the coal consumed in the NZ domestic market

[39] www.ipcc-nggip.iges.or.jp/public/2006gl/

[40] https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions

[41] https://www.treasury.govt.nz/sites/default/files/2019-05/ria-mfe-cci2-may19.pdf

[42] https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/industries-in-the-emissions-trading-scheme/stationary-energy/

[43] https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/industrial-allocations/eligibility/

[44] https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/about-the-nzets/

[45] https://environment.govt.nz/assets/Publications/Files/proposed-changes-to-NZETS-and-SGG-levy-regulations-2021.pdf

[46] 091345_New Zealand-NC7-1-21-12-17 Web FINAL - Seventh National Communication 2017.pdf (unfccc.int) p38

is lignite, which makes up only 3% of coal exports. The availability of the resource (11 billion tonnes) and limited exports suggests that the domestic supply of lignite is not constrained.

Implementation of a fuel switch project from lignite to a lower emission fuel is a permanent removal of the coal emissions attributable to that facility from the national inventory (measured by supplier records of the sale of lignite). Leakage from the sale of coal that had been sold into the abatement project to another facility is unlikely. As there is no domestic supply constraint and extremely limited export opportunities, the potential for new domestic or international sales is very low. Replacement of the lost sale is unlikely.

The emissions abatement from a fuel switch project is measurable and verifiable. As ETS obligations are placed on the supplier of coal, any project engendered reduction in coal consumption does not result in double claiming of the reduction. The emissions abatement can be (for ease of transfer) converted to a carbon credit. As there is no obligation on the facility, and the abatement is not associated with a coal supplier, there is no double claiming.

The emissions impact of a programme to incentivise the early removal of fossil fuel consuming equipment is real and can be prioritised or constrained to a class of equipment – such as non-residential boilers or transport efficiency projects. That is, the amount of the reduction is measurable and verifiable, and the change is likely to be permanent as the conversion of the asset back to fossil fuels is most unlikely. Conversion of the decarbonisation project emissions abatement to a carbon credit is a valid process.

As noted above, certain EITE users are eligible to apply for a free industrial allocation of NZUs based on an allocative baseline. The eligible products are disclosed in the Climate Change (Eligible Industrial Activities) Regulations 2010[47] The allocative baseline for these products may change after adjustment of the Electricity Allocation Factor[48]. After conversion of fossil fuel operations manufacturers of these products would continue to be permitted to apply for a free allocation of NZUs[49] for their production using the regulated allocative baseline. The allocated NZUs can be sold to the market to offset the additional cost of energy and electricity attributable to the ETS. Manufacturers of products eligible for an industrial allocation are therefore able to sell NZUs to the market and to create and sell carbon credits based on emissions abatement. As the NZUs are allocated as a cost offset and not emissions offset this does not constitute double claiming but there is a risk of public disapproval based on the perception of double claiming. To reduce this risk, constrain the businesses and operations eligible to participate in this proposed voluntary domestic carbon crediting scheme to those where the incentive to reduce coal consumption is most required.

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[47] Climate Change (Eligible Industrial Activities) Regulations 2010 (SR 2010/189) (as at 30 April 2021) – New Zealand Legislation

[48] https://environment.govt.nz/assets/Publications/Files/proposed-changes-to-NZETS-and-SGG-levy-regulations-2021.pdf

[49] https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/industrial-allocations/eligibility/

APPENDIX 3 CREATING AND USING CARBON CREDITS—A TWO-PART PROCESS

These two parts are:

1. Create a framework to incentivise abatement, avoidance, and sequestration projects that are beyond business-as-usual, measurable, and verifiable, and then measure and verify the emissions reduced, avoided, or sequestered in tonnes of carbon dioxide equivalents (tCO_2-e).
2. Create a second framework to exchange verified project based tCO_2-e reduced, avoided, or sequestered as carbon credit units suitable for exchange within a framework that supports domestic energy and emissions policy and achievement of NZ's NDC commitments under the Paris Agreement.

In each of the four schemes discussed above, the project frameworks are consistent and provide for the creation of equally valid emissions reduction, avoidance, and sequestration projects and measured and verified tCO_2-e reduction, avoidance, and sequestration achieved by the projects. The differences between the schemes are about what types of projects are eligible which is driven by the purpose of the project framework and the overarching policy goals of the scheme developer.

The GS has developed from an initial focus on high quality CDM-equivalent carbon credits to a broader focus on Sustainable Development Goals (SDGs) extending the original GS project framework. GHG (or environmental) projects are now encompassed within a broader policy of the "Gold Standard for Global Goals".[50]

Verra commenced operation at a similar time and with similar goals to the GS. It was created with a stronger market and commercial focus, designed to increase the availability of verified tradeable carbon credits for the VCM. It has developed to include a broader range of social goals, but not to the extent of the GS.[51]

Both GS and Verra adopt a range of CDM methodologies, the CDM Additionality tool, and have created their own bespoke standards. They each have the full infrastructure for development and oversight of a credible project mechanism.

The two government programs, ERF and BCOP, have developed their own project frameworks and methodologies, and while they draw on the global project methodology knowledge base developed since the origins of the CDM (an example is the ILUMEX efficient lighting program developed by the World Bank and funded by a Global Environment Facility grant from 1995-1998[52]), they have been developed within the regulatory and policy framework of each of the parties. The BCOP has one currently approved protocol – Fuel Switch[53] and several other methodologies under development, reflecting the policy goal of BC for cleaner industry operations[54].

The Australian Carbon Farming Initiative (CFI) project framework was first developed to support the now closed Carbon Price Mechanism. The ERF is now the mechanism that provides incentives for organisations to develop and implement emissions abatement, avoidance, and sequestration projects using

[50] Gold Standard for the Global Goals | The Gold Standard

[51] Verra Standards and Programs - Verra

[52] World Bank Document

[53] Developing emission offset projects - Province of British Columbia (gov.bc.ca)

[54] Cleaner industry - Province of British Columbia (gov.bc.ca)

methodologies developed under the regulatory framework of the CFI[55]. CFI methodologies cover all sectors of the Australian economy, with development of new methodologies prioritised by Government[56].

Conversion of verified tCO_2-e to a carbon credit is a straightforward administrative exercise. However, allowing for trading and for the conditions under which trading can be undertaken without domestic or international double claiming is more complex. The international conditions have not yet been formalised and are discussed elsewhere in this paper.

[55] About the Emissions Reduction Fund (cleanenergyregulator.gov.au)

[56] Method development (cleanenergyregulator.gov.au)

APPENDIX 4 ICROA ENDORSED CARBON CREDIT SCHEMES

United Nations and Government Standards

- CLEAN DEVELOPMENT MECHANISM (CDM) established under the Kyoto Protocol – the units issued are Certified Emissions Reductions (CERs) and these are listed on national registries.
- JOINT INITIATIVE (JI) established under the Kyoto Protocol – the units issued are Emissions Reduction Units (ERUs) and these are listed on national registries.
- AUSTRALIAN GOVERNMENT EMISSIONS REDUCTION FUND (ERF) – the units issued are Australian Carbon Credit Units (ACCUs) and these are listed on the Emissions Reduction Fund project register.
- UK WOODLAND CARBON CODE (WCC) is a voluntary carbon standard for woodland creation projects established by the UK Government – the units issued are Woodland Carbon Units (WCUs) and Pending Issuance Units (PIUs) and these are listed on the Markit Registry.

Independent Standards

- AMERICAN CARBON REGISTRY standard (ACR) – the units issued are VERs and these are listed on the ACR. The ACR also verifies, and lists units traded on the California Cap-and-Trade program where the units issued are Registry Offset Credits (ROCs) and Early Action Offset Credits (EAUCs).
- CLIMATE ACTION RESERVE protocols (CAR) – the units issued are voluntary Climate Reserve Tonnes (CRTs) and these are listed on the CAR Voluntary Offset Project Registry. CAR also operates the California Offset Project Registry where it lists units from the California Cap-and-Trade program.
- GOLD STANDARD established by an alliance led by WWF – the units issued may be GS CERs or GS VER and these are listed on national registries or the Gold Standard registry. The Gold Standard requires demonstration of social or community co-benefits in addition to verification of the emissions reductions. These co-benefits are now certified against the Sustainable Development Goals.
- VERIFIED CARBON STANDARD (VCS) operated by VERRA – the units issued are Voluntary Carbon Units (VCUs) also seen in the market as Verified Emissions Reductions (VERs) and these are listed on the Markit registry; however, VERRA is developing its own registry.

APPENDIX 5 CREDIBILITY CRITERIA OF THE SCHEMES RESEARCHED FOR THIS REPORT

Table 6: Credibility criteria of the schemes researched for this report

Scheme	Additionality tests	Analysis
The Gold Standard	• Certified • Real • Additional • Independently verified • Unique • Traceable •	• Projects are validated and verified to an internationally recognised standard. • Emissions reductions are measurable and permanent. • Emissions reductions would not have happened without the project activity. • Project activities and impact data are verified by independent third-party auditors • Carbon credits are not counted or claimed by another party • All certified impacts are tracked transparently in a public registry
Gold Standard methodology requirements for Sustainable Development Goals (SDGs)	• Safeguards • Stakeholder inclusivity • Gender-sensitivity • Project eligibility • Verified SDG impact	• Mandatory for all Gold Standard projects to follow all relevant environmental and safeguarding principles to be certified • Stakeholder consultations and access to a grievance mechanism in case where there are issues with the projects. • Follow gender-sensitive design principles. • Higher-risk project types like fossil fuel switch or large hydro are not eligible for Gold Standard certification. • Deliver impact towards a minimum of 3 Sustainable Development Goals including climate, verified by an independent third-party.
Verra Verified Carbon Standard (VCS)	• Real • Measurable • Permanent • Additional • Independently audited • Unique • Transparent • Conservative	• Meet the rules and requirements set out under the VCS programme. • Apply VCS eligible methodologies. • Project activities shall not violate any applicable law. • Appropriate quantification of GHG emission reductions or removals. • Apply methodologies that use performance methods including for additionality and crediting baseline. • Non-permanence risk assessed for AFOLU based projects.

Scheme	Additionality tests	Analysis
		• Avoidance of perverse incentives. • Legal right to control and operate the project • Potential for leakage identified. • Safeguards to prevent negative impact on the local environment or communities – no net harm. • VCU label to indicate whether there has been a corresponding adjustment to ensure transparency where double claiming has occurred.
Emissions Reduction Fund (Australia)	Scheme integrity • Environmental effectiveness • Reduce the cost of reducing emissions • Ensure value for money to the taxpayer • Provide confidence for use in compliance and voluntary offset markets Project integrity • Real • Additional • Measurable • Permanent • Independently verified •	• Principles are based on the ICROA Code of Best Practice • ERF methods – should result in carbon abatement that is additional (unlikely to occur in the ordinary course of events) and genuine (measurable and capable of being verified) – determine the net abatement amount for a project, considering eligible abatement from the project and deduct any material emissions that occur as a result of the project – supported by clear and convincing evidence – adopt conservative estimates, projections, and assumptions.
British Columbia Offset Portfolio	• Project plan is fair and reasonable. • Reduction in GHG emissions is conservatively estimated. • Reduction of GHG emissions to, or removal from, the atmosphere will be achieved.	• Meet the measurement, monitoring and reporting requirements for the programme protocols (follows ISO 14064-2). • Aligns with current priorities, sustainable development goals and existing policy. • Technological readiness and there are approved monitoring, reporting and verification methodology. • Economically viable. • Reasonable basis to expect project to cause at least one of the desirable outcomes of the programme. • Maximises market value of the offset units. • Prioritises opportunities of greatest impact.

APPENDIX 6 PROJECT ERF ADDITIONALITY ANALYSIS

Table 7: Analysis of EECA projects against the ERF additionality criteria

EECA Code	Project name	ERF method	Beyond business as usual	Measurable removal, reduction or emission	Verifiable removal, reduction or emission	Eligible carbon abatement	Clear and convincing evidence	Only counts attributable material emissions	Any estimates are conservative	Other legislative requirements	Complies
01-009	Energy Optimisation and Electrification Opportunities	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, conversion of boiler to HTHP	Yes - amount of FF and electricity can be measured	Yes - amount of FF and electricity can be verified	Yes, carbon is from combustion of FF and from grid electricity	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuels and electricity is measured, and standard default factors applied	There is no direct interaction with the NZ ETS. The ETS obligation is with the coal supplier and will remain if the coal is sold to another consumer.	Yes
01-012	Boiler Conversion and Fryer Heat recovery	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, conversion of boiler to biomass	Yes - amount of FF can be measured	Yes - amount of FF can be verified	Yes, carbon is from combustion of FF	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuels and electricity is measured, and standard default factors applied	There is no direct interaction with the NZ ETS. The ETS obligation is with the coal supplier and will remain if the coal is sold to another consumer.	Yes

EECA Code	Project name	ERF method	Beyond business as usual	Measurable removal, reduction or emission	Verifiable removal, reduction or emission	Eligible carbon abatement	Clear and convincing evidence	Only counts attributable material emissions	Any estimates are conservative	Other legislative requirements	Complies
01-013	Boiler Two Biomass	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, conversion of boiler to biomass	Yes - amount of FF can be measured	Yes - amount of FF can be verified	Yes, carbon is from combustion of FF	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuels and electricity is measured, and standard default factors applied	There is no direct interaction with the NZ ETS. The ETS obligation is with the coal supplier and will remain if the coal is sold to another consumer.	Yes
01-017	Glasshouse Heat Demand Reduction and Low Carbon Fuel Switching	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, conversion of boiler to biomass	Yes - amount of FF can be measured	Yes - amount of FF can be verified	Yes, carbon is from combustion of FF	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuels and electricity is measured, and standard default factors applied	There is no direct interaction with the NZ ETS. The ETS obligation is with the coal supplier and will remain if the coal is sold to another consumer.	Yes
01-021	Wood Boiler Project	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, conversion of boiler to biomass	Yes - amount of FF can be measured	Yes - amount of FF can be verified	Yes, carbon is from combustion of FF	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuels and electricity is measured, and standard default factors applied	Yes	Yes

EECA Code	Project name	ERF method	Beyond business as usual	Measurable removal, reduction or emission	Verifiable removal, reduction or emission	Eligible carbon abatement	Clear and convincing evidence	Only counts attributable material emissions	Any estimates are conservative	Other legislative requirements	Complies
PEF	Pulsed Electric Field Technology installation	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, conversion of boiler to PEF	Yes - amount of FF and electricity can be measured	Yes - amount of FF and electricity can be verified	Yes, carbon is from combustion of FF and from grid electricity	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuels and electricity is measured, and standard default factors applied	There is no direct interaction with the NZ ETS. The ETS obligation is with the coal supplier and will remain if the coal is sold to another consumer.	Yes
Electroboiler	Peaking Electrode Boiler Installation	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, conversion of boiler to Electrode Boiler	Yes - amount of FF and electricity can be measured	Yes - amount of FF and electricity can be verified	Yes, carbon is from combustion of FF and from grid electricity	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuels and electricity is measured, and standard default factors applied	There is no direct interaction with the NZ ETS. The ETS obligation is with the coal supplier and will remain if the coal is sold to another consumer.	Yes
Insulation	Thermal screens installation	Industrial Equipment Upgrades/Industrial Electricity and Fuel Efficiency	Yes, installation of additional thermal insulation	Yes - amount of FF can be measured	Yes - amount of FF can be verified	Yes, carbon is from combustion of FF	Yes, the combustion process is well understood, and the IEFE method can be applied	Yes, only counts emissions from the process	Yes, the amount of fossil fuel is measured, consumption is modelled, and standard default factors applied	There is no direct interaction with the NZ ETS. The ETS obligation is with the coal supplier and will remain if the coal is sold to another consumer.	Yes

EECA Code	Project name	ERF method	Beyond business as usual	Measurable removal, reduction or emission	Verifiable removal, reduction or emission	Eligible carbon abatement	Clear and convincing evidence	Only counts attributable material emissions	Any estimates are conservative	Other legislative requirements	Complies
LED installation	Install LED Lighting	Commercial and public lighting	Yes, installation of LED flood lighting	Yes - amount of grid electricity can be measured	Yes - amount of grid electricity can be verified	Yes, grid electricity includes carbon emissions from combustion of FF	Yes, the improved energy efficiency of LED lighting is well understood, and the lighting method can be applied	Yes, only counts emissions from the process	Yes, the amount of grid electricity is measured, and standard default factors applied	There is no direct interaction with the NZ ETS.	Yes

APPENDIX 7 PROJECT BCOP ADDITIONALITY ANALYSIS

Table 8: Analysis of EECA projects against the BCOP additionality criteria

EECA Code	Project name	Regulatory surplus	Exclusive ownership (no co-payment)	Penetration rate (<40%)
01-009	Energy Optimisation and Electrification Opportunities	Yes, there is no regulatory baseline for this project	Yes, the payment made by EECA is not for a carbon credit purpose	Yes, conversion of coal boilers to electric HTHP is likely to be <40%
01-012	Boiler Conversion and Fryer Heat recovery	Yes, there is no regulatory baseline for this project	Yes, the payment made by EECA is not for a carbon credit purpose	Yes, conversion of coal boilers to Biomass is likely to be <40%
01-013	Boiler Two Biomass	Yes, there is no regulatory baseline for this project	Yes, the payment made by EECA is not for a carbon credit purpose	Yes, conversion of coal boilers to Biomass is likely to be <40%
01-017	Glasshouse Heat Demand Reduction and Low Carbon Fuel Switching	Yes, there is no regulatory baseline for this project	Yes, the payment made by EECA is not for a carbon credit purpose	Yes, conversion of coal boilers to Biomass is likely to be <40%
01-021	Wood Boiler Project	Yes, there is no regulatory baseline for this project	Yes, the payment made by EECA is not for a carbon credit purpose	Yes, conversion of coal boilers to Biomass is likely to be <40%
PEF	Pulsed Electric Field Technology installation	Yes, there is no regulatory baseline for this project	Yes, the payment made by EECA is not for a carbon credit purpose	Yes, conversion of coal boilers to electric PEF is likely to be <40%
Electroboiler	Peaking Electrode Boiler Installation	Yes, there is no regulatory baseline for this project	Yes, the payment made by EECA is not for a carbon credit purpose	Yes, conversion of coal boilers to Electrode boilers is likely to be <40%
Insulation	thermal screens installation	Not a fuel switch project	Not a fuel switch project	Not a fuel switch project
LED installation	Install LED Lighting	Not a fuel switch project	Not a fuel switch project	Not a fuel switch project

APPENDIX 8 PROJECT CDM ADDITIONALITY ANALYSIS

Table 9: Analysis of EECA projects against the CDM additionality criteria (as used by Verra and GS)

EECA Code	Project name	First-of-its-kind	Realistic alternative activities	Investment analysis	Barrier analysis	Common practice analysis
01-009	Energy Optimisation and Electrification Opportunities	No, so do other barrier checks	Yes, current practice, biomass, electrode boiler, HTHP	Coal is the cheapest fuel source, HTHP is an expensive technology (subject to full financial analysis). The capital contribution is essential for the project to proceed.	HTHP is a new technology	No, HTHP is new technology and conversion is uncommon
01-012	Boiler Conversion and Fryer Heat recovery	No, so do other barrier checks	Yes, current practice, biomass, electrode boiler, HTHP	Coal is the cheapest fuel source; biomass is a more expensive fuel (subject to full financial analysis). The capital contribution is essential for the project to proceed.	No barrier to a fuel switch project	Not yet common practice
01-013	Boiler Two Biomass	No, so do other barrier checks	Yes, current practice, biomass, electrode boiler, HTHP	Coal is the cheapest fuel source; biomass is a more expensive fuel (subject to full financial analysis). The capital contribution is essential for the project to proceed.	No particular barrier to a fuel switch project	Not yet common practice
01-017	Glasshouse Heat Demand Reduction and Low Carbon Fuel Switching	No, so do other barrier checks	Yes, current practice, biomass, electrode boiler, HTHP	Coal is the cheapest fuel source; biomass is a more expensive fuel (subject to full financial analysis). The capital contribution is essential for the project to proceed.	No barrier to a fuel switch project	Not yet common practice

EECA Code	Project name	First-of-its-kind	Realistic alternative activities	Investment analysis	Barrier analysis	Common practice analysis
01-021	Wood Boiler Project	No, so do other barrier checks	Yes, current practice, biomass, electrode boiler, HTHP	NG is a cheaper fuel source; biomass is a more expensive fuel (subject to full financial analysis). The capital contribution is essential for the project to proceed.	No particular barrier to a fuel switch project	Not yet common practice
PEF	Pulsed Electric Field Technology installation	Yes, so no other checks required	First-of-its-kind	First-of-its-kind	First-of-its-kind	First-of-its-kind
Electroboiler	Peaking Electrode Boiler Installation	No, so do other barrier checks	Yes, current practice, biomass, electrode boiler, HTHP	Coal is the cheapest fuel source; an electrode boiler is an expensive technology (subject to full financial analysis). The capital contribution is essential for the project to proceed.	HTHP is a new technology	No, an electrode boiler is new technology and conversion is uncommon
Insulation	Thermal screens installation	No, so do other barrier checks	Yes, current practice, thermal insulation	Coal is the cheapest fuel source and reducing coal consumption by improving thermal efficiency is a more expensive option (subject to full financial analysis). The capital contribution is essential for the project to proceed.	No barrier to a thermal insulation project	Not yet common practice
LED installation	Install LED Lighting	Yes, so no other checks required	First-of-its-kind	First-of-its-kind	First-of-its-kind	First-of-its-kind

APPENDIX 9 PROJECT OVERALL ANALYSIS

Table 10: EECA projects—assessment of overall additionality, eligible benefits, and overall credibility

EECA Code	Project name	Strength of additionality claim	Eligible carbon credits	Professional judgement
01-009	Energy Optimisation and Electrification Opportunities	High temperature heat pumps are a new technology with higher technical risk, maintenance costs, and potentially operational cost. The significant EECA capital contribution does not reduce the downstream operating risk over the operational life of the project.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.
01-012	Boiler Conversion and Fryer Heat recovery	Conversion of coal (lignite) fired boilers to biomass (wood chip) is low technical risk but with a high capital cost and high operating costs from the cost of biomass. On this basis the ongoing differential in operating cost remains significant and makes a strong additionality claim.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.
01-013	Boiler Two Biomass	Conversion of coal (lignite) fired boilers to biomass (wood chip) is low technical risk but with a high capital cost and high operating costs from the cost of biomass. On this basis the ongoing differential in operating cost remains significant and makes a strong additionality claim.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.

EECA Code	Project name	Strength of additionality claim	Eligible carbon credits	Professional judgement
01-017	Glasshouse Heat Demand Reduction and Low Carbon Fuel Switching	Conversion of coal (lignite) fired boilers to biomass (wood chip) is low technical risk but with a high capital cost and high operating costs from the cost of biomass. On this basis the ongoing differential in operating cost remains significant and makes a strong additionality claim.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.
01-021	Wood Boiler Project	Conversion of natural gas fired boilers to biomass (wood chip) is low technical risk but with a high capital cost and high operating costs from the cost of biomass. On this basis the ongoing differential in operating cost remains significant and makes a strong additionality claim.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.
PEF	Pulsed Electric Field Technology installation	Pulsed electric field technology is a new technology with higher technical risk, maintenance costs, and potentially operational cost. The significant EECA capital contribution (compared to the other technology projects) does not reduce the downstream operating risk over the operational life of the project.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.
Electroboiler	Peaking Electrode Boiler Installation	A peaking electrode boiler is not new technology and does not have higher technical risk or maintenance costs but does have potentially higher operational cost. The EECA capital contribution is not significant (compared to the other technology projects) and does not reduce the downstream operating risk over the operational life of the project.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.

EECA Code	Project name	Strength of additionality claim	Eligible carbon credits	Professional judgement
Insulation	Thermal screens installation	Installation of additional thermal insulation to reduce waste heat from the existing lignite boiler installation is not technically complex but may be difficult to install while the company is in normal operation. The magnitude of the capital cost compared to the emissions savings achieved makes the EECA support, though only a small percentage, important and justifies an assessment of additionality.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.
LED installation	Install LED Lighting	LED lighting technology is well-established, and the luminaires proposed for installation are commercially available from a reputable manufacturer. However, they have not been previously deployed and thus the small contribution from EECA continues to allow for a claim of additionality.	The project documentation is likely to allow the creation of carbon credits depending on the detail of the scheme and methodologies developed and implemented by EECA. It is unlikely that an existing scheme exists that could be used for this purpose, but the scheme design of the Australian CFI or the BCOP could be modified and applied in NZ.	This is a project typical of those normally accepted under crediting schemes. It is the implementation of a new technology where the added capital cost is not justified. The EECA capital contribution is necessary for the project to proceed.

APPENDIX 10 PROPOSAL FOR CARBON CREDITING SCHEME

The following outline could form the basis for the regulatory framework (subject to public consultation) and could be established under the Climate Change Response (Zero Carbon) Amendment Act to give effect to a voluntary Carbon Crediting Mechanism (CCM) based on decarbonisation projects. In structure and content, it uses the Australian Emissions Reduction Fund and its associated enabling legislation and regulations as a reference model.

The Scheme

The CCM is a voluntary scheme to incentivise organisations to reduce their GHG emissions and contribute to NZ's NDC, complementing but not displacing compliance obligations through the ETS. The regulatory framework implements the carbon crediting and carbon market trading mechanisms of the CCM. Under the carbon crediting mechanism, registered projects that comply with an approved CCM methodology can earn CCM units for verified GHG emission reductions. One CCM unit is earned for each tonne of carbon dioxide equivalent (tCO_2e) reduced or avoided by a project. Subject to project contractual arrangements with the CCM regulator, CCM units may be sold to earn income through the Carbon Neutral Government Programme (CNGP) or the voluntary carbon market (VCM).

Purpose

- Support NZ climate change response – reduce GHG emissions to the atmosphere and complement adaptation responses (improve resilience to the impacts of climate change) by reducing reliance on fossil fuels and improving efficiency
- Stimulate voluntary GHG emission reduction contributions to NZ's NDC through both creation and use of CCM units for offsetting consistent with NZ climate change and other policies
- Provide a credible source of CCM units for voluntary offsetting (CNGP and VCM)
- Provide incentives for eligible emission reduction projects
- Facilitate co-investment for projects with high upfront costs

CCM Scheme Integrity Principles

- Environmental effectiveness – GHG emission reductions made by projects must be real and additional. Users of CCM units for voluntary offsetting must first demonstrate absolute reductions in GHG emissions.
- Reduce the cost of reducing GHG emissions or enable difficult GHG emissions reductions to take place sooner – reduce overall costs to the economy of reducing GHG emissions, making it more feasible to adopt more ambitious targets earlier.
- Public interest – ensure value for money for the taxpayer
- Equity – ensure that project participants are treated consistently and fairly
- Provide public, business community and investors with confidence in the VCM

Targets

- Set indicative target for emissions reductions to be achieved by the scheme on four- or five-year periods (aligned with Climate Change Commission budget periods or NDC reporting periods)
- Adapt and adopt (approve) suitable existing methodologies
- Publish statement of priority emission reduction activities for future method development
- Maintain co-investment funding levels in same four- or five-year periods
- Set the compliance baseline and allowance for compliance using carbon credits to require that reporting entities also generate internal emissions savings

Criteria for prioritised GHG emission reduction activity:

- Potential uptake of the activity
- Likely volume of abatement
- Whether activity is a proven technology and commercially ready
- Whether emissions reductions can be estimated with reasonable degree of certainty in a cost-effective way
- Whether the activity could have adverse social, environmental, or economic impacts
- Alternative ways to promote the activity more effectively and efficiently

Governance

Maintain separate decision makers for each of the key functions of the scheme:

- Eligibility and registration of projects
- Method development and variation (including review methods proposed to be adopted/adapted from similar schemes)
- Verification of emissions reductions reported
- Certification, crediting and voluntary trading of carbon credit units (including carbon credit registry arrangements)
- Independent oversight (including periodic scheme performance audit by an appropriate body such as the Office of the Auditor General, OAG).

CCM Administrator

As the CCM is a voluntary scheme, the term Administrator is used instead of Regulator.

The Administrator is responsible for:

- method development and variations
- registering/contracting projects
- approving co-investment
- ensuring compliance with the scheme
- probity checks and procedures to address potential conflict of interest
- monitoring the costs of administrative processes and transaction costs for the scheme operator and project participants ensuring that costs are minimised while upholding integrity of the CCM units issued

Co-investment can be provided upfront or at agreed dates as per the contract with Administrator.

CCM Assurance Committee

The role of the Assurance Committee is to uphold integrity of the scheme. The Assurance Committee is an independent expert body established under the CCM regulatory framework to:

- assess whether new methods comply with the CCM unit integrity criteria
- undertake periodic reviews of the methodology determinations to assess their ongoing effectiveness and additionality
- undertake reviews on whether to extend the crediting period for a method
- advise the responsible Minister whether a method should be adopted, approved, varied, suspended or revoked
- confirm the Administrator's recommendations for certification of verified GHG emission reductions prior to issuing CCM units to the project.

CCM Technical Advisory Committee

The Technical Advisory Committee has appropriate participation from industry and external third-party experts:

- Science
- Industry
- Carbon market
- Emissions reduction experts
- Representation from Assurance Committee

The Committee assists in the development of CCM methodologies and is responsible for developing and publishing a stakeholder engagement plan and assessing stakeholder feedback on new methodologies. Technical Working Groups may be established to enable the CCM to consult and work collaboratively with industry on specific methodologies.

Responsible Minister

The Assurance Committee confirms that the method complies with the CCM unit integrity criteria and submits it to the responsible Minister for approval.

Registration

To be registered, a project must comply with relevant planning and environmental regulations and adhere to the CCM methodology applicable to the project activity. Where there are multiple parties involved in the project, the party holding the rights to the GHG emission reductions must be the registrant or provide consent for the third party to register the project.

Eligible Projects

Projects must:

- be new
- go beyond business-as-usual activities
- not be a regulatory requirement
- not be receiving financial support from other government programmes

- follow an approved CCM method which sets out the rules for operating the project and estimating emissions reductions
- not be an excluded activity e.g., as defined in the NZETR or in the Climate Change Response (Zero Carbon) Amendment Act

Project Methodologies

Methods, rules, and tools are designed to keep pace with developments in science and technology, ensure estimates of emissions reductions are accurate, and the integrity of the CCM unit is maintained – e.g., some activities that are additional now might not be in the future – eligibility may need to change over time.

- Criteria for periodic method reviews
    - Current and future likely uptake of the method
    - Complexity of the method
    - Likelihood of breaches of compliance with the carbon credit integrity criteria
    - Relevant legislative rule changes (e.g., new legislation may invalidate additionality of the method)
- A robust and transparent framework is established to identify and manage risks between the CCM and project owners.
    - Aligned with best available science
    - Risk of under-delivery of contracted GHG emission reductions
    - Support existing projects impacted by future scheme or method amendments
    - Arrangements for transition to updated rules or methods
- Potential methodologies for initial adaption/adoption by the CCM from the Australian ERF include:
    - Waste and wastewater management
    - Energy efficiency
    - Industrial facilities
    - Mining, oil, and gas
    - Transport

Specific ERF methodologies suitable for the example decarbonisation projects are linked at the end of this section.

Additionality

In general, project methodologies are additional when the GHG emission reduction activity:

- would not have taken place without the upfront investment or income from sale of CCM units, or a combination of both investment and income
- are beyond regulatory requirements
- are beyond business as usual i.e., not yet significantly adopted by that sector
- has not begun at the time of project application i.e., prior to the investment decision and scheme registration

Individual approved methodologies will detail specific additionality requirements.

Reporting and Verification

The project methodology will include reporting requirements including a reporting template, information that should be included in the report and minimum and maximum reporting periods for that project methodology. The first report is made at the start of the first CCM crediting period.

Project reports submitted at the beginning of a CCM crediting period must include a verification report prepared to reasonable assurance or qualified reasonable assurance by an approved registered GHG and energy auditor.

The project methodology will detail any specific verification expertise required when selecting an approved registered auditor.

Project proponents will receive a GHG emission reduction statement from the CCM Administrator with notification of the number of CCM units issued to the project and the crediting period. Where the crediting period is more than one year, the project proponent submits an (unverified) annual report to the CCM Administrator.

Audit Protocols

The CCM Administrator will determine the protocols that should be followed by approved auditors when verifying project emissions reductions. This may be based on ISO 14064-3:2019 Greenhouse gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements or ISAE 3410 International Standard on Assurance Engagements – Assurance Engagements on Greenhouse Gas Statements.

Auditor Registration

The CCM Administrator will determine the requirements for approving and registering auditors. Audit firms may be accredited to ISO 14065:2020 General principles and requirements for bodies validating and verifying environmental information, or an assurance practitioner with track record in applying ISAE 3410 and has suitable energy management expertise. The Environmental Protection Authority (EPA) maintains a register of approved verifiers for ETS participants seeking unique emissions factors. The EPA also provides guidance on becoming a recognised verifier.

Crediting Mechanism

The CCM Administrator issues CCM units to organisations that successfully undertake eligible projects registered with the CCM and report GHG emission reductions verified by an approved auditor.

Crediting periods (vintage of CCM units) are aligned with Climate Change Commission budget periods or NDC reporting periods.

CCM Unit Integrity Criteria

See MfE proposal for a new VCM in NZ[57]. The CCM approved methodologies will be guided by the ICROA best practice principles and ensure that project GHG emission reductions:

- Are real, additional, measurable, permanent, independently verified, unique (see table)

[57] Ministry for the Environment 2021. Proposed introduction of a domestic voluntary carbon market.

- Account for eligible GHG emission reductions and deduct material emissions because of creation and operation of the project
- Are supported by clear and convincing evidence
- Adopt conservative estimates, projections, and assumptions
- Are not based on an excluded activity (e.g., a regulated activity, a project type not accepted by the NZETR, or a project activity that causes perverse environmental or social impacts)

CCM Unit Register

The CCM Administrator will establish a public register which will hold, and track ownership, status and trading of CCM units issued to project proponents. Project proponents must have an account in the register. Anyone wanting to use CCM units for offsetting (including participants in the CNGP), must have an account in the register. CCM units may be owned, traded, or retired (cancelled). CCM units that have been retired (cancelled) for offsetting purposes, cannot be further traded or used in any manner.

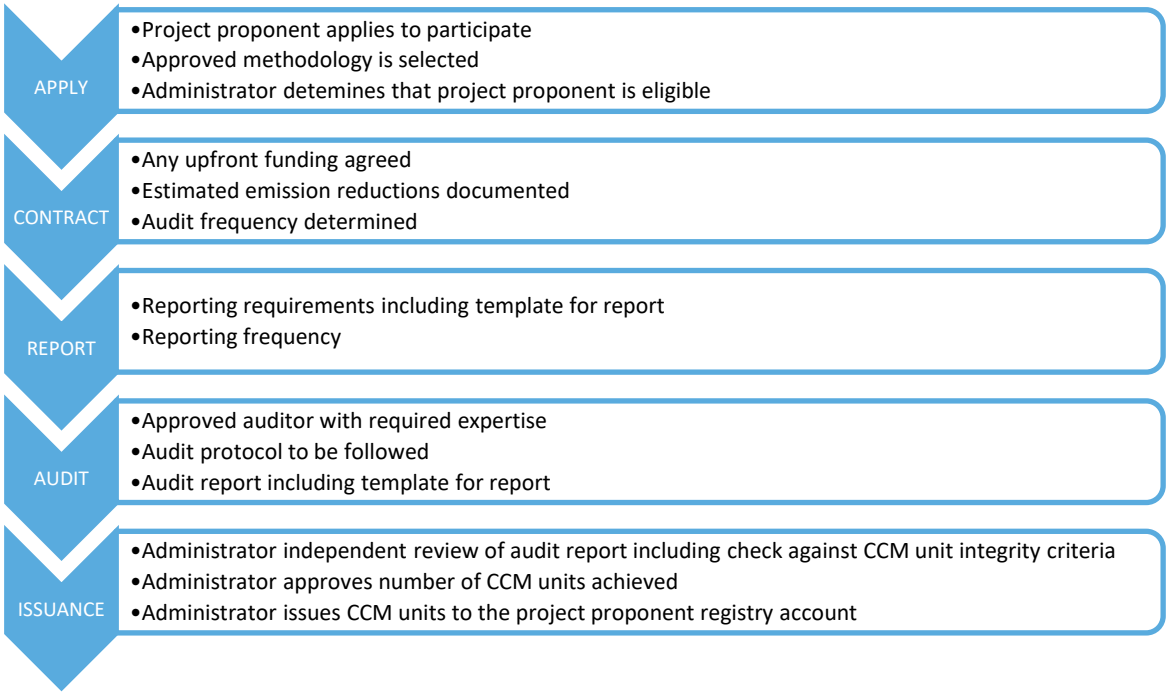
ERF Methodologies relevant to the EECA decarbonisation projects

Carbon Credits (Carbon Farming Initiative—Facilities) Methodology Determination 2015 (legislation.gov.au)

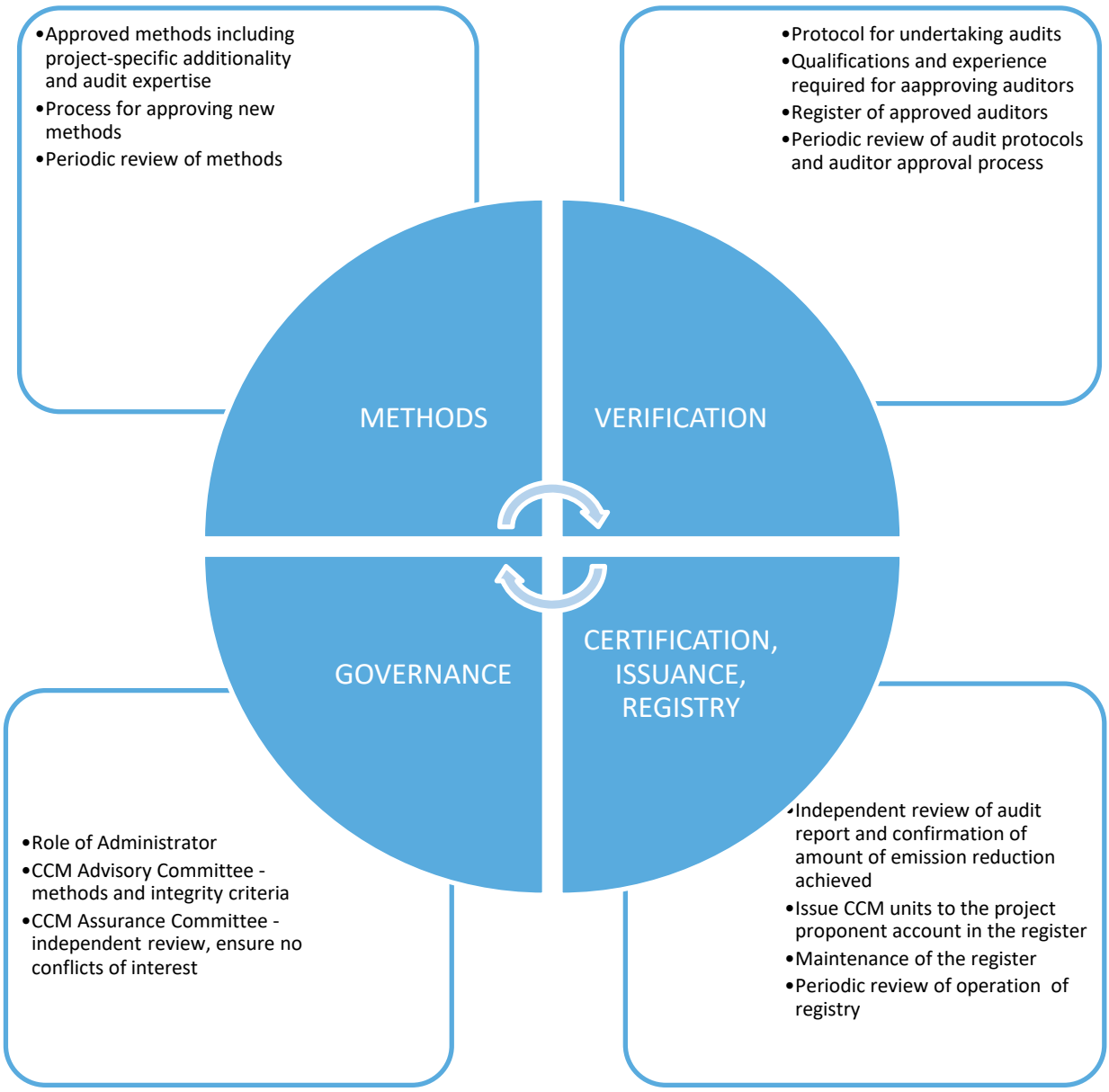
Carbon Credits (Carbon Farming Initiative—Commercial and Public Lighting) Methodology Determination 2015 (legislation.gov.au)

Carbon Credits (Carbon Farming Initiative—Industrial Electricity and Fuel Efficiency) Methodology Determination 2015 (legislation.gov.au)

PARTICIPATING IN THE CARBON CREDITING MECHANISM



FRAMEWORK AND STRUCTURE OF THE CARBON CREDITING MECHANISM



APPENDIX 11 LIST OF ACRONYMS

tCO_2e	tonnes carbon dioxide equivalents
tpa	tonnes per annum
AAU	Assigned Amount Unit
ACCU	Australian Carbon Credit Unit
ACR	American Carbon Registry
AFOLU	Agriculture, Forestry and Other Land Use
ANREU	Australian National Register of Emission Units
ANSI	American National Standards Institute
ARB	Air Resources Board (California)
BC	British Columbia
BCOP	British Columbia Offset Portfolio
CA	Corresponding Adjustment
CAR	Carbon Action Reserve (United States)
CCAR	California Carbon Action Reserve
CCS	Carbon Capture and Storage
CCER	China Certified Emission Reduction unit
CCM	Carbon Crediting Mechanism
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction unit
CFI	Carbon Farming Initiative (Australia)
CNGP	Carbon Neutral Government Programme
COP	Conference of the Parties – United Nations Climate Change Conference
COP26	The 26th meeting of the Conference of the Parties – United Nations Climate Change Conference
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
EECA	Energy Efficiency and Conservation Authority
EITE	Energy Intensive and Trade Exposed industries
ERAC	Emissions Reduction Advisory Committee (for the Australian Emissions Reduction Fund)
ERF	Emissions Reduction Fund (Australia)
ERU	Emission Reduction Units
ETS	Emissions Trading Scheme
GGIRCA	Greenhouse Gas Industrial Reporting and Control Act (British Columbia)
GHG	Greenhouse Gas
GIDI	Government Investment in Decarbonising Industry (New Zealand)
GIS	Green Investment Scheme
GS	Gold Standard
GS4GG	Gold Standard for the Global Goals
GS-CER	Gold Standard Certified Emission Reduction unit originating from the CDM

GS TAC	Gold Standard Technical Advisory Committee
GS-VER	Gold Standard Verified Emission Reduction unit originating from a voluntary carbon credit project
HTHP	High Temperature Heat Pump
ICAO	International Civil Aviation Organization
ICROA	International Carbon Reduction & Offset Alliance
IEFE	Industrial Electricity and Fuel Efficiency
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standards Organisation
ITMO	Internationally Transferred Mitigation Outcomes
JCM	Joint Crediting Mechanism
JI	Joint Implementation
LED	Light Emitting Diode
MECCS	Ministry of Environment and Climate Change Strategy (British Columbia)
MfE	Ministry for the Environment (NZ)
MPI	Ministry for Primary Industries (NZ)
NDC	Nationally Determined Commitment
NGO	Non-Governmental Organisation
NPV	Net Present Value
NZ	New Zealand
NZETR	New Zealand Emissions Trading Registry
NZU	New Zealand Unit
OAG	Office of the Auditor General
ODS	Ozone-Depleting Substance
OPR	Offset Project Registry (California)
PEF	Pulsed Electric Field
PFSI	Permanent Forest Sinks Initiative (New Zealand)
PFSI-NZU	New Zealand Unit tagged to identify its origin as coming from the PFSI
PIU	Pending Issuance Unit
PP89	Permanent Post-1989 Forest Activity (New Zealand)
PRE	Projects to Reduce Emissions
R&D	Research & Development
SBTi	Science-Based Targets Initiative
SCC	Standards Council of Canada
SDGs	Sustainable Development Goals
SGG	Synthetic Greenhouse Gas
TSVCM	Taskforce on Scaling the Voluntary Carbon Market
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
VCM	Voluntary Carbon Markets

VCMI	Voluntary Carbon Markets Integrity Initiative
VCS	Verified Carbon Standard (also Voluntary Carbon Unit)
VCU	Verified Carbon Unit
VER	Verified Emission Reduction unit
VVB	Validation and Verification Body
WBCSD	World Business Council for Sustainable Development
WCC	Woodland Carbon Code (United Kingdom)
WCU	Woodland Carbon Unit
WEF	World Economic Forum
WWF	World Wildlife Fund