

Climate forestry and national climate policy

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Abstract

In its policy options paper proposing a possible ban on exotic species from the permanent forest category of the New Zealand Emissions Trading Scheme (NZETS), the Government stated a concern that exotic afforestation would cause an oversupply of carbon credits in the domestic carbon market. In turn, this would cause a drop in the carbon price and consequently erode the power of the carbon price signal to drive down emissions across the economy. This paper examines this issue through the lens of climate forestry, where the imperative is to:

1. Meet or over-comply with our Paris Agreement obligations; and
2. Build climate-resilient landscapes.

Introduction

We are in a climate emergency – a decisive existential challenge. Our climate scientists have made it abundantly clear that we are on a disastrous path globally and nationally if we do not dramatically change how we function as a society and an economy. Our farmers are on the climate frontline and at acute risk of intensifying droughts and productivity damage from storm and flood events. Our transportation sector is at increasing risk of road closures from landslides and washouts. Our biodiversity is under threat from shifting habitat conditions as the climate changes. Our property and infrastructure face tangible contingent liability risk from intensifying extreme weather events. Fires will threaten our forests and communities. And we all, as taxpayers, are exposed to the ever-escalating cost of reducing climate risk by reducing emissions, cleaning up the mess, adapting to a different future, and meeting our Paris Agreement obligations at least cost.

In the middle of all this, we have a policy turf war between the agricultural, forestry, conservation and climate action sectors that has turned us into a dysfunctional collection of individuals pulling in different directions and blaming each other for the problem. Occasionally history demands nation-building for a common purpose, where we put aside our differences and find a way to work together. War is such a time. A climate emergency is another.

This paper explores a team approach to national climate policy through the lens of climate forestry. It examines options for addressing an oversupply of carbon credits (should it even arise) from including exotic forests in the permanent forest category of the New Zealand Emissions Trading Scheme (NZETS).

In previous papers, the lead author has explained why exotic species are necessary to fund indigenous reforestation, i.e. in most cases, carbon-financed indigenous reforestation cannot fund itself (Weaver 2021; Weaver, 2022). This unpalatable fact has compelled the authors (as practitioners in carbon-financed indigenous reforestation) to answer the call to action on climate change by innovating and using both exotic and indigenous species in permanent carbon forestry. This option delivers a sustainable financing business model for forest conservation and climate change mitigation at the scale called for by the climate science sector, the Government and the climate action community.

This economic reality remains central to this national policy issue, not least because of a strong desire among many to maximise indigenous reforestation in the NZETS. We share this preference, but must wrestle with economic reality in the scrum of forest conservation financing.

Oversupply solutions

There are two aspects to the Government's concern about a possible oversupply of carbon credits due to the inclusion of exotic forests in the permanent forest category of the NZETS (MPI, 2022, p. 14):

1. The suppression of carbon caused by an oversupply of New Zealand Units (NZUs) in the market.
2. The suppression of emission reduction efforts by emitters through the overuse of carbon offsets by those emitters instead of reducing gross emissions from sources.

First, we remain unconvinced that an oversupply of carbon credits from including exotic forests in the permanent NZETS will exceed the Climate Change Commission's (CCC's) exotic planting target of 380,000 ha by 2035. The Planting Intentions Survey (Manley, 2021) used by the Government to project an oversupply in 2035

only goes to 2023 and states that there is considerable uncertainty after that date. If we extrapolate its 2023 planting projection of 34,100 ha per year, it will be 2033 before any 'theoretical oversupply' situation could arise. As such, there is plenty of time to track planting progress and consider policy changes over that time.

There is already a floor price in the NZETS to prevent carbon prices from being driven down by 'theoretical oversupply'. The Government's NZETS auction programme can also manage market supply in the short term. These policy levers are already in place to prevent downward pressure on prices.

Although we believe it to be an unlikely scenario, if any 'oversupply' of forestry-sourced NZUs occurred. This would have four significant benefits for New Zealand:

1. A contribution to New Zealand's Nationally Determined Contribution (NDC) – creating a buffer against underperformance of what is already an ambitious emissions reduction plan.
2. A consequent reduction in the volume of imported units required, thereby reducing the cost to taxpayers to meet our Paris Agreement obligations.
3. The creation of additional jobs, wealth and tax *in New Zealand*, while taking accountability for more of our emissions within our borders.
4. The bulk of the planting that produces that oversupply will be in (or could be steered towards) land unsuitable for farming. This planting will help create climate-resilient landscapes that will reduce contingent liability risk to built infrastructure (e.g. roads, bridges), property and agricultural productivity. This will reduce public spending to repair infrastructure in the wake of the projected intensification of extreme weather events and become a major contribution to our nation's climate resilience at no cost to the taxpayer. Alternatively, the Government could buy and cancel some of that oversupply as a financing mechanism for climate resilience and funded from a government budget allocation to climate change adaptation.

Conversely, banning exotic trees in the permanent forest category will materially suppress planting, which will:

1. Run the risk of *underdelivering* the CCC planting targets.
2. Increase the number of imported carbon units required in 2030 – with the corresponding additional cost to taxpayers.
3. Undermine Cabinet's approval of the increased NDC, reducing the amount of mitigation that happens in New Zealand.
4. Increase the risk to primary productivity and infrastructure, property and public amenities from erosion and flooding in sensitive landscapes. These risks would otherwise have been mitigated

by permanent reforestation in those sensitive landscapes unsuitable for clearcut production forestry or pastoral farming.

5. Remove a market-based mechanism to fund indigenous reforestation, biodiversity improvements and pest/weed/predator control through private investment (see Weaver, 2021 and Weaver, 2022).
6. Remove a market-based mechanism to support the transition from clearcut plantation forestry to continuous cover forestry in erosion-prone landscapes.

Driving down gross emissions

The NZETS is designed to put a carbon price into the economy without using a tax instrument. In theory, this price signal will drive down gross emissions by creating a competitive advantage/higher margin for emitters with a lower emissions profile, but without an emissions cap on gross emissions. The higher the unit price, the more incentive to reduce gross emissions so they can capture that competitive advantage or margin.

This has not happened to date for three reasons:

1. The NZETS is not a cap-and-trade instrument and so does not place a cap on emissions.
2. The carbon price has never been high enough to function as a strong price signal.
3. The compliance emitters in the NZETS are predominantly upstream entities in the energy sector, which:
 - are carbon-intensive entities, unable to rapidly change to different energy systems, and
 - can pass the cost of purchasing their carbon credits onto their customers (e.g. raising retail energy prices) and thereby avoid economic harm from their emissions.

If New Zealand wanted to change gross emissions behaviour, it should either have designed the NZETS as a cap-and-trade system (the Kyoto Protocol was a cap-and-trade system) or designed complementary measures to amplify the impact of a carbon price on the economy. This is particularly relevant to the energy sector, which is price-inelastic.

As far back as 2007, the Government understood the likely lack of responsiveness of the energy sector to emissions pricing below a certain threshold. As shown in Figures 1 and 2, the top-down policy instrument of emissions pricing is incapable on its own of delivering a low carbon economy. The carbon price signal in 2022 is beginning to stimulate behaviour and investment change. However, complementary measures have always been needed to amplify the impact of a carbon price. These include 'sticks' (e.g. regulation or the threat of future regulation) and carrots (e.g. government underwriting of low carbon investment, incentive programmes and the voluntary carbon market (VCM) – more on this below).

Additional demand to soak up extra supply

A key question for addressing a potential oversupply of forestry NZUs is who would buy the additional carbon credits. We have identified four buyers who could consume any possible oversupply:

1. The Government

The Government could be a buyer of NZUs in two different ways:

- The Government has already announced plans to be 'carbon neutral' across all departments by 2025. This will require the purchase of millions of carbon credits to achieve this, particularly because the deadline to deliver carbon neutrality is well in advance of the ability of such departments to reduce gross emissions to zero. In most cases, getting to zero gross emissions will be impossible for many decades, if not in perpetuity.
- It has already been announced that New Zealand must import approximately 100 million carbon units to meet its increased NDC. It is also known that Cabinet's strong preference is that as much of this increased NDC should be met domestically. Logically, it makes sense that the Government would be a buyer of any oversupply and reduce the need to send taxpayers' money offshore to help another country with its NDC.

2. The agriculture sector

The timing and terms of agriculture's entry into the NZETS have already been set (subject only to the sector producing an acceptable emissions plan).

The sector is scheduled to enter into the NZETS in 2025 at a 5% obligation – climbing to 10% by 2030. So, by the time an oversupply of NZUs could arise from forestry, the agriculture sector will already be a buyer of 4 million units p.a. (10% of its 40 million tCO₂e emissions profile).

3. Article 6 Internationally Transferred Mitigation Outcomes (ITMOs)

If the government of the day is reluctant to buy any oversupply of units for its own NDC, it has the option under Article 6 of the Paris Agreement to consent to their conversion to ITMOs for export. While those units cannot be counted towards New Zealand's NDC, such mitigation would be an 'oversupply' and surplus to domestic requirements. Under an ITMO export scenario, New Zealand will benefit from the foreign exchange from the sale of those ITMOs to fund domestic jobs, wealth, tax revenue and climate-resilient landscapes generated by the projects that produce those units. Article 6 can therefore function as a pressure release valve should New Zealand be in a position to over-comply with its NDC target.

4. The domestic and international voluntary carbon market

In parallel with Paris Agreement Article 6 negotiations between the Parties, the VCM sector is busy redefining 'net-zero carbon' and 'carbon neutrality' for voluntary buyers to include 'carbon contribution units' (also in the context of Article 6). This includes carbon units created inside an NDC purchased by a VCM buyer pursuing a net-zero carbon aspiration (i.e. an entity without a regulatory obligation to buy carbon units – the

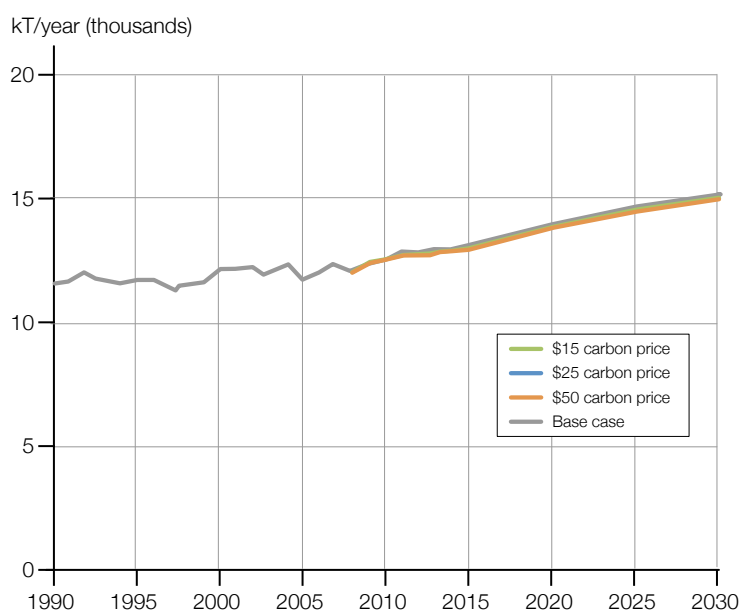


Figure 1: Impact of emissions pricing on non-electricity stationary energy emissions. Source: Ministry for Economic Development, 2007

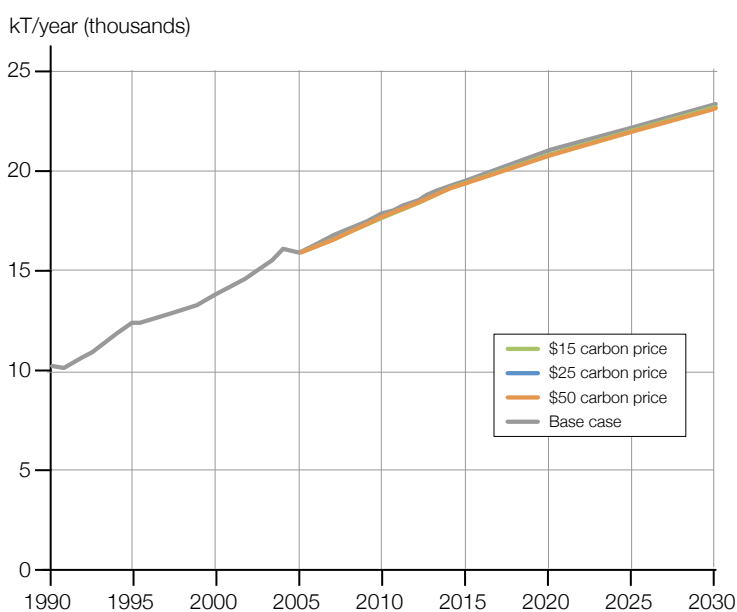


Figure 2: Impact of emissions pricing on transport emissions. Source: Ministry for Economic Development, 2007

vast majority of organisations in the economy). In theory, such voluntary buyers could include international buyers (i.e. net-zero carbon aspirants in any country). Note that carbon credits from New Zealand are already exported to voluntary buyers offshore (the company owned by the lead author (Ekos) has such buyers among its clients).

Global voluntary market demand for units increased by more than 90% in 2021 alone after an increase of 80% in 2020 (Ecosystem Marketplace, 2021). Based on VCM deals in progress among the authors and our colleagues in this sector, we expect voluntary demand for NZUs to exceed 2 million units p.a. by 2030. This volume of new demand requires an additional 50,000 ha of exotic forest (assuming a carbon yield of 40 tCO₂e/ha) or 150,000 ha of indigenous reforestation.

Voluntary carbon market

The compliance carbon market, where demand is a regulatory requirement, has relatively few players (restricted to those with obligations under the NZETS – dominated by upstream entities in the energy sector). In contrast, the VCM functions where demand is voluntary and driven by social responsibility and net-zero carbon aspirations. The VCM potentially includes all entities in the economy (some compliance buyers are also VCM buyers for elements of their operations not covered by a regulatory obligation to buy).

Furthermore, the national net-zero carbon by 2050 aspiration will require a very large volume of carbon credits because it will not be possible to be gross-zero carbon by 2050, which is why the Government has used the term ‘net’ in the aspiration. The ‘net’ in net-zero carbon means including ‘carbon offsets’.

Net-zero carbon assertions involve the following actions:

- Carbon footprint measurement (calculating gross emissions)
- Carbon footprint reduction (reducing gross emissions)
- When gross emissions after reductions are not zero (because these residual emissions are impossible or prohibitively expensive to eliminate), and if the VCM participant seeks to take responsibility for these residual emissions and voluntarily put a price on their external cost, they can cause an equal or greater volume of carbon benefits to occur outside

their organisational boundary by purchasing a volume of carbon credits to match their residual emissions. Some VCM participants go a step further and purchase even more carbon credits than their residual emissions and become ‘climate positive’ (i.e. where they take more carbon dioxide out of the atmosphere than they emit – turning their organisation into a carbon sink).

The economic principle underlying voluntary carbon offsetting (and all emissions trading) is the marginal cost of emissions abatement and the relationship between this cost and the carbon price. Here, it is economically sensible to reduce emissions when this can be done at a price per tCO₂e that is lower than the carbon price and buy carbon offsets at the carbon price for any emissions abatement that would be more costly than the carbon price.

If the price to voluntarily offset emissions is very low (e.g. NZ\$5 per tCO₂e), then it is economically sensible to only reduce gross emissions in-house where the cost is lower than \$5/tCO₂e and offset all of the rest. This has been the reason for criticism of voluntary carbon offsetting by climate action groups worldwide because we will not solve the climate change problem without dramatically reducing emissions.

When the carbon price for voluntary carbon offsetting is much higher and has a meaningful relationship with the external cost of carbon pollution (the social cost of carbon – SCC), criticism of voluntary carbon offsetting loses its foundation. This is because high voluntary carbon prices raise the volume of gross emissions that are economically sensible to reduce in-house, thereby reducing the volume of emissions to be offset through carbon credit purchases, where offsetting is restricted to emissions that are genuinely impossible or prohibitively expensive. The Treasury has calculated the social cost of carbon for New Zealand, expressed as the shadow emission values for use in cost benefit analysis (Table 1).

The NZU spot price is beginning to be high enough to have a meaningful impact on voluntary investments in emission reductions and align with the central path of the New Zealand shadow emission values shown in Table 1. However, there are two problems:

1. VCM buyers can source low-cost carbon credits internationally (and avoid buying more costly NZUs).
2. The question of a corresponding adjustment (CA) to the New Zealand NDC for each NZU used as a voluntary offset.

Table 1: Recommended shadow emission values, NZD\$ per tonne of CO₂-equivalent (2022–2035)

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Low	48	55	61	67	73	79	85	91	97	101	105	108	112	116
Central	72	81	90	99	108	118	127	136	145	150	156	162	167	173
High	96	108	120	132	144	156	168	180	192	200	207	215	223	230

Source: The Treasury, 2021, Appendix 5

Table 2: Transacted voluntary carbon offset volume and average price by standard

	2019		2020		To August 2021	
	Volume (MtCO ₂)	Price/tCO ₂ (USD)	Volume (MtCO ₂)	Price/tCO ₂ (USD)	Volume (MtCO ₂)	Price/tCO ₂ (USD)
American Carbon Registry (ACR)	2.5	\$5.36	5.4	\$8.44	2.0	\$11.37
Clean Development Mechanism (CDM)	4.9	\$2.02	7.0	\$2.19	8.2	\$1.13
Climate Action Reserve (CAR)	4.0	\$2.34	2.1	\$4.44	4.9	\$2.12
Gold Standard	13.2	\$5.27	13.9	\$4.57	5.2	\$3.94
Plan Vivo Standard	0.9	\$8.99	1.2	\$8.49	0.7	\$11.58
Verified Carbon Standard (VCS)	44	\$1.74	66.1	\$3.76	125.6	\$4.17

Source: Ecosystem Marketplace, 2021

Table 3: Voluntary carbon market size by product category 2019 – August 2021

	2019			2020			To August 2021		
	Volume (MtCO ₂)	Price/tCO ₂ (USD)	Value (USDm)	Volume (MtCO ₂)	Price/tCO ₂ (USD)	Value (USDm)	Volume (MtCO ₂)	Price/tCO ₂ (USD)	Value (USDm)
Forestry & Land Use	36.7	\$4.33	\$159.1	48.1	\$5.60	\$269.4	115.0	\$4.73	\$544
Renewable Energy	42.4	\$1.42	\$60.1	80.3	\$0.87	\$70.1	80.0	\$1.10	\$88.4
Energy efficiency/ Fuel switching	3.1	\$3.87	\$11.9	31.4	\$1.03	\$32.3	16.1	\$1.57	\$24.2
Agriculture	—	—	—	0.3	\$9.23	\$2.8	3.4	\$1.36	\$4.6
Waste disposal	7.3	\$2.45	\$18.0	8.3	\$2.76	\$22.9	2.7	\$3.93	\$10.6
Transportation	0.4	\$1.70	\$0.7	1.1	\$0.64	\$0.7	2.1	\$1.00	\$2.1
Household devices	6.4	\$3.84	\$24.9	3.5	\$4.95	\$17.3	1.8	\$5.75	\$10.4
Chemical processes/ Industrial manufacturing	4.1	\$1.90	\$7.7	1.3	\$1.90	\$2.5	1.1	\$3.22	\$3.5

Source: Ecosystem Marketplace, 2021

Carbon pricing

Tables 2 and 3 show average carbon prices in the international VCM by carbon standard or activity type.

Tables 2 and 3 show that average international VCM prices vary greatly but, on the whole, are much lower than the NZU spot price, the government price controls that influence the NZU spot price (Figure 3), the CCC carbon price path for energy and transport sectors (Figure 4) and the New Zealand social cost of carbon emissions (Table 1).

The low carbon prices available in the international VCM (Tables 1 and 2) demonstrate two problems:

1. Domestic VCM buyers have access to very low carbon prices incompatible with the social cost of carbon or the CCC price path, and function only as a weak financial incentive to reduce emissions. This leads to lower emission reductions by VCM participants who are price sensitive. In contrast, many VCM participants are willing to pay prices compatible with the social cost of carbon and the CCC price path.
2. VCM buyers do not need to buy forestry NZUs, although many do, and are therefore not a predictable source of demand for consuming any oversupply of forestry NZUs.

The Ministry for the Environment is reviewing the VCM under a Paris Agreement framework. It would be in a position to steer this market to solve these problems. This could include a minimum carbon price that VCM buyers must pay or requiring VCM buyers to purchase NZUs to comply with national guidelines or a national standard on the VCM.

Corresponding adjustment (CA)

A key consideration in the operation of VCMs inside national carbon accounting boundaries is the question of double counting and the need for CAs for any voluntary carbon claim that the NDC covers. In practice, a CA involves a government adjusting its NDC to ensure that only the VCM buyer, not both the VCM buyer and the Government, can count the carbon benefit associated with the carbon credit. An example is where an NZU (1 tCO₂e) is used as a voluntary carbon offset by a VCM participant, but the same tCO₂e is not cancelled from the NDC.

Some international policy advocates argue that all carbon offsets contained within an NDC require a CA to safeguard against double counting risk. International VCM standards like the Verified Carbon Standard and Plan Vivo assert that the place where double

counting is material and where CAs are necessary is in intergovernmental carbon accounting. The Verified Carbon Standard and Plan Vivo already issue carbon credits inside an NDC and tag these credits as ‘carbon contribution units’ (i.e. contributions to the NDC). The only way a carbon credit does not contribute to an NDC is if it was created outside any NDC (e.g. international oceans or outside the carbon accounting boundaries of NDCs) or if a CA is applied to the NDC to cancel that carbon benefit from the NDC.

Illustrative examples are presented below and conclude that CAs are not needed (they are administratively burdensome anyway), as well as unnecessary if the communication rules governing carbon-related claims in the VCM are transparent about what is taking place.

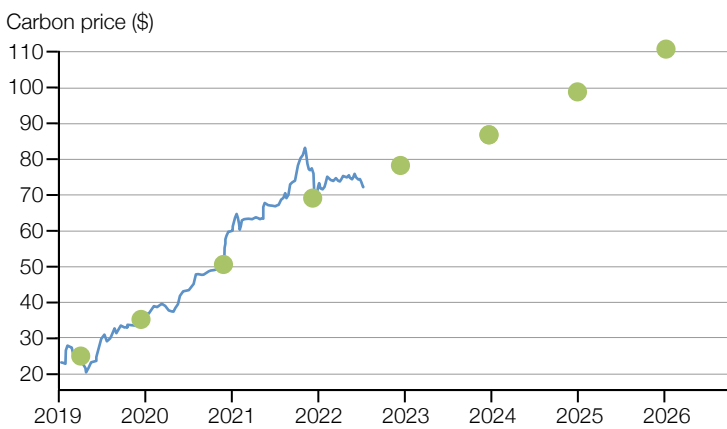


Figure 3: NZU spot price (NZD) (line) and projections based on New Zealand Government price controls (dots). Source: Jarden CommTrade (www.commtrade.co.nz/) and Ministry for the Environment government carbon market price controls (<https://environment.govt.nz/news/release-of-updates-to-nz-ets-regulations-and-sgg-levy/>)



Figure 4: New Zealand Climate Change Commission emissions price path. Source: CCC, 2022

Gross-zero carbon claims and corresponding adjustments

Imagine Organisation A aspires to become net-zero carbon. It measured its base year (Year 1) carbon footprint, which was verified to be 1,000 tCO₂e. It then reduced all these emissions to zero in Year 2 through investments in technologies and behaviour change (i.e. gross emissions amount to zero). Organisation A is then certified as zero carbon, which is true. Here, an emission reduction of 1,000 tCO₂e has been caused by a voluntary action – because no law or regulation is compelling Organisation A to do so. This voluntary action encompasses a 1,000 tCO₂e contribution to the NDC (see Figure 5). This means that two entities will claim the same 1,000 tCO₂e reduction.

In this situation, the Government will not make a CA to its national inventory (i.e. it will not delete this 1,000 tCO₂e from the national inventory), even though there is a double claim on the same emission reduction action. While there is a double claim, there is no double counting. This is because the carbon accounting arena where double counting matters is the Paris Agreement. Moreover, there is currently no proposal for the government of any country to make a CA for emission reduction elements of VCM claims, even though all voluntary emission reductions will be claimed by the Government and the organisation that delivered it.

A useful analogy of the safety of double claims that are not double counting can be seen in a hospital setting: a surgeon saves someone’s life on the operating table. She legitimately claims that she saved this life, which is true. The DHB that employs her also legitimately claims that the DHB has saved this same life – this is true because the DHB employs and manages this surgeon. Here are two legitimate claims from one intervention, but there is no double counting. Similarly, consider the relationship between a business and Gross Domestic Product (GDP): a business grows by \$1 million in annual turnover and claims it has done so. The national GDP grows by \$1 million due to the increase in annual turnover of this business and the Government makes the (legitimate) GDP claim.

Emission removals and corresponding adjustments

The underlying logic in the above analysis also applies when carbon offsets from the domestic compliance carbon arena are introduced to the picture, assuming all things are otherwise equal. In other words, if a CA is not required for voluntary emission reductions undertaken inside the NDC, then a CA is also not required for *emission removals* undertaken inside the NDC (see Figure 6). There is no material difference in relation to the New Zealand national target under the Paris Agreement.

Net-zero carbon claim rules

The key to the safety of VCM claims is the certification and communication rules associated

with those claims. For instance, such rules and communications should make it clear that all voluntary emission reductions and removals within the carbon accounting boundary of the New Zealand NDC consist of voluntary contributions to the national target. This would provide a domestic net-zero carbon claim that required minimal administrative change by the Government. The only thing required would be:

1. A new NZU unit type in the NZETS comprising permanent forest (NZU_PF) applicable to the VCM (i.e. a unit denoting permanent forest and using the permanent forest carbon accounting methodology in the NZETS). This unit type should also be available to compliance buyers in the NZETS to enable:
 - investment in permanent forestry to be unconstrained, and
 - to de-risk forest carbon projects specialising in permanent carbon forestry, especially native carbon forestry, whereby demand for these carbon credits is not restricted to the VCM demand sector.
2. Clarification of the Ministry for the Environment guidelines and Commerce Commission rules on voluntary carbon claims that provide two options for them:
 - **Track 1 Contribution to national target**
All voluntary emission reductions and emission removals undertaken within an NDC comprise contributions to that NDC.

Communication rules for those using Track 1 require transparency on this point.

- **Track 2 Contribution to national target and direct relationship with the atmosphere**

All voluntary emission reductions *undertaken within the New Zealand NDC* comprise contributions to the national target; any emission reductions and removals *undertaken outside any NDC* would comprise a direct carbon accounting relationship with the atmosphere. Communication rules for those using Track 2 require transparency on this point.

In a domestic VCM operating with the safeguards described above, New Zealand would drive down its domestic emissions and create additional demand for any oversupply of forestry NZUs. Also, if the forestry NZUs available to VCM participants are restricted to permanent forest NZUs, with an emphasis on indigenous forests or exotic forests transitioning to indigenous forests, then the VCM would deliver a major contribution to climate change resilience, catchment protection and biodiversity conservation at no cost to the taxpayer.

Conclusion

We will fail in our climate action response as a nation if we continue to develop policy in silos and for those silos to fight amongst themselves like bickering members of a dysfunctional losing sports team. This will

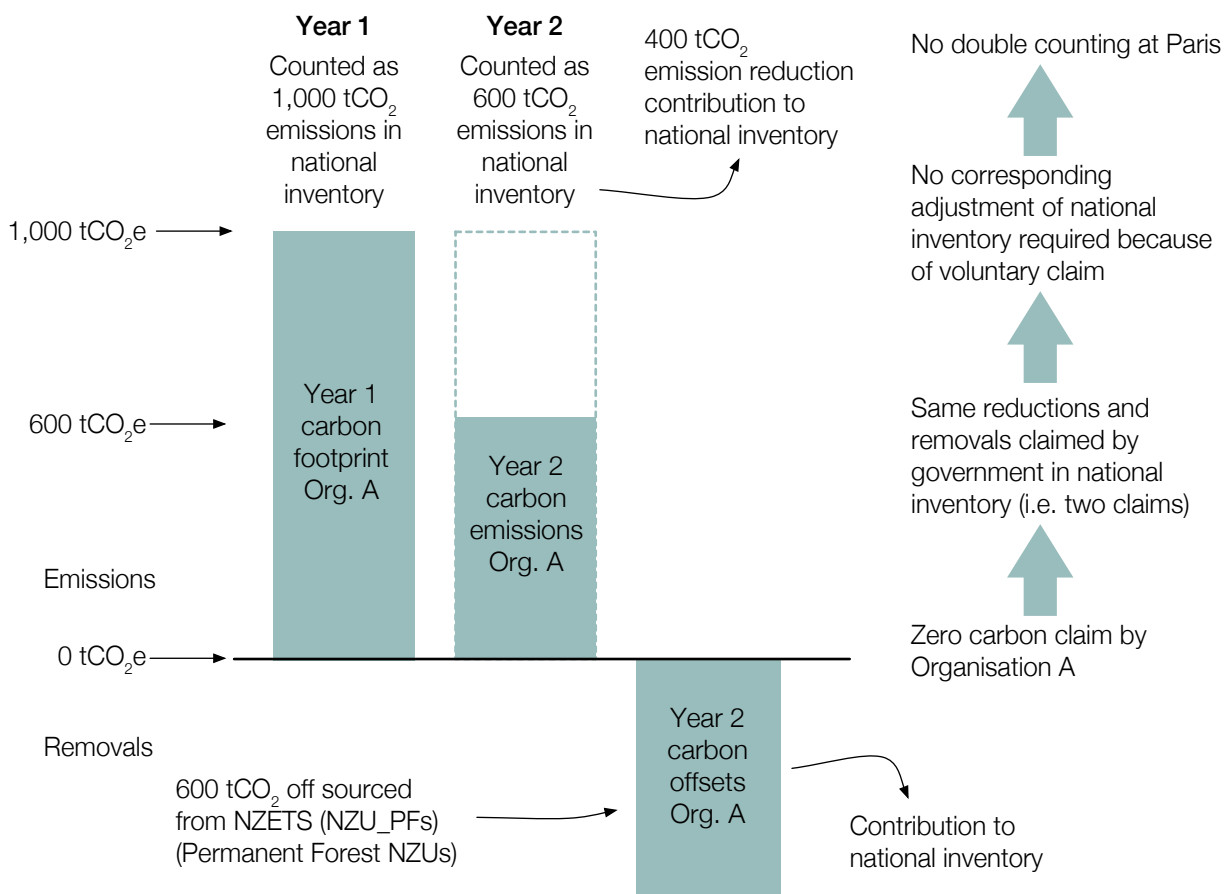


Figure 5: Concept diagram of double claiming of voluntary emission reduction actions

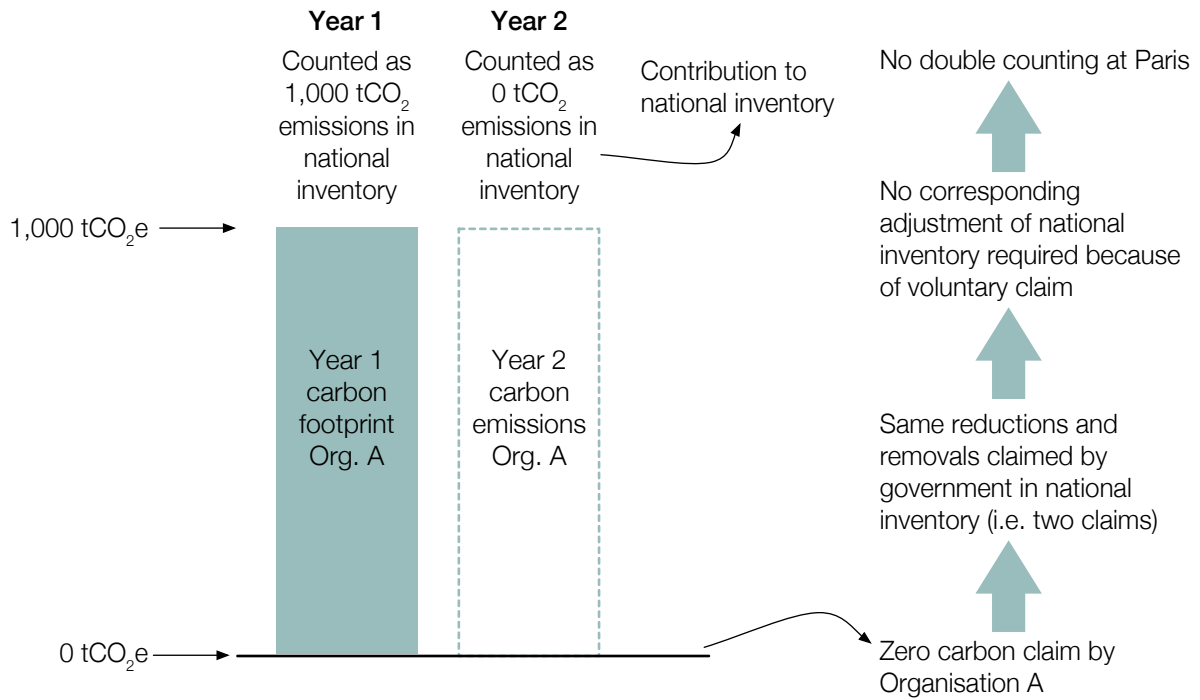


Figure 6: Concept diagram of double claiming of voluntary emission removal actions

not be a technical failure but a cultural one. It will arise from a culture characterised by an underlying narrow-minded selfishness, incapable of seeing the big picture, while the common threat of climate change looms ever larger. In systems thinking, and in sports team alike, the task is to identify and then strengthen the synergies between different parts of an interdependent whole. This requires generosity of spirit and leadership capable of bringing the team members together.

We in the climate forestry sector are not trying to compete with agriculture, biodiversity conservation, energy, transportation, production forestry and international climate policy obligations. Instead, we are trying to be a valued member of a team by reaching out to our respected colleagues in these other sectors. We recognise the valuable contribution they make to our common future. If we can link up and function as a team – and this is an open invitation to do so – we can work together to reinforce each other for a common purpose and respond to the climate change challenge that threatens to deeply harm us all.

References

Climate Change Commission (CCC). 2022. *Ināia Tonu Nei: A Low Emissions Future for Aotearoa*. Wellington, NZ: CCC.

Ecosystem Marketplace. 2021. *Market in Motion, State of Voluntary Carbon Markets 2021, Installment 1*. Washington DC, USA: Forest Trends Association.

Manley, B. 2021. *Afforestation and Deforestation Intentions Survey 2020. MPI Technical Paper No: 2021/14*. Wellington, NZ: MPI.

Ministry for Economic Development. 2007. *Benefit-Cost Analysis of the New Zealand Energy Strategy*. Wellington, NZ: Ministry for Economic Development.

Ministry for Primary Industries (MPI). 2022. *Managing Exotic Afforestation Incentives: A Discussion Document on Proposals to Change Forestry Settings in the New Zealand Emissions Trading Scheme*. Wellington, NZ: MPI.

The Treasury. 2021. *CBAX Tool User Guidance. Guide for Departments and Agencies Using Treasury's CBAX Tool for Cost Benefit Analysis*. Wellington, NZ: The Treasury.

Weaver, S.A. 2022. Investment Barriers to Indigenous Forest Climate Solutions. *New Zealand Journal of Forestry*, 67(1): 3–11.

Weaver, S.A. 2021. Carbon Financed Conservation Forestry. *New Zealand Journal of Forestry*, 66(1): 12–17.

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