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PRETENCE OF NECESSITY

Why further climate change action isn't needed and won't help

Matt Burgess

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The New Zealand Initiative is an independent public policy think tank supported by chief executives of New Zealand businesses. We believe in evidence-based policy and are committed to developing policies that work for all New Zealanders.

Our mission is to help build a better, stronger New Zealand. We are taking the initiative to promote a prosperous, free and fair society with a competitive, open and dynamic economy. We are developing and contributing bold ideas that will have a profound, positive and long-term impact.

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Executive summary

At May's Budget, the government will commit $4.5 billion to new spending on climate change, more than $2,000 per household. The government will also deliver its Emissions Reduction Plan, an array of levies, subsidies, regulations and hard bans. The government will say these interventions are necessary and that they will help deliver emissions targets.

Neither claim is true. Existing policies already have New Zealand firmly on track to deliver statutory emissions targets. Parliament has committed to reduce *net emissions of greenhouse gases*. Legislation defines net emissions as *gross emissions* (for example, from car exhausts) minus *offsets* (for example, the carbon captured by trees, co-operation with other countries). Offsets are recognised in domestic law and international agreements. They are affordable and available in effectively unlimited quantities.

These facts secure emissions targets. Regardless of how much or how little existing policies including the Emissions Trading Scheme (ETS) lower emissions, offsets will bridge the gap to targets. New Zealand is not in a position of having to resort to desperate measures to meet its climate change obligations. This country can make reasonable or best efforts to lower net emissions with existing policies and be certain of success.

Accordingly, further policies are not necessary. We have options. The government could choose not to add thousands of dollars to the cost of imported vehicles from next month with its Feebate policy and be certain of delivering our obligations. Agriculture could stay outside the ETS indefinitely while the country reaches net zero emissions. Only by overlooking offsets can the government maintain the fiction that drastic further actions are necessary. The government bears the burden of proof to show how its new policies improve on existing policies.

Even if existing policies were not enough to reach targets, the government's strategy would not help. The government has already capped greenhouse gases. Changes to the ETS in 2020 introduced a quantity cap. The new cap will be a sinking lid on emissions, set to fall in line with targets. It is well known that policies cannot reduce emissions from under an emissions cap. Cap-and-trade schemes like the ETS effectively neutralise other emissions policies. Where a policy lowers a sector's emissions, the sector will buy fewer emissions permits. That leaves more permits for others, meaning higher emissions elsewhere. Overall emissions do not change. New Zealand has one of the most comprehensive ETSs in the world. Nearly all of the government's policies will be neutralised – regardless of whether existing policies are enough.

The government's vast new spending on climate change policies could reduce emissions by zero tonnes. If this were business, it would be fraud.

This report reviews the government's climate change strategy. The strategy is based on a misunderstanding of the relationship between the ETS and other policies. The government is pushing its disruptive policies by misconstruing the legislation and by ignoring every feasible alternative. Officials have mostly abandoned cost-benefit analysis; they reject cost and effectiveness as primary goals; they believe climate policies should manage inequality and historic grievances as well as reduce emissions; emissions policies are rarely checked after they are launched; and poor performance is rarely corrected. It is not surprising that policies regularly spend 20 times more than the ETS to abate each tonne of emissions.

We are witnessing an historic public policy failure. Later this year, when the government delivers its new policies, it will call its policies "necessary" or "vital." This is the pretence of necessity. It is cover for policies that could not survive any test of their merits. After all, there can be no case for expensive, ineffective, and often regressive policies if they are not needed.

Introduction

Later this year – May according to the most recent timeline – the government will deliver its Emissions Reduction Plan. The **ERP** will be a vast array of levies, subsidies, regulations and hard bans. It will affect every household and every sector of the economy. Implemented in full, the ERP is likely to cost tens of billions of dollars over the coming decades. This year's Budget alone includes $4.5 billion of new spending on climate change policies, more than $2,000 for every household. Future Budgets will include further new spending.

It is not clear how this new spending will reduce emissions. The government has not said, and it is not obvious. That is because the government has already capped greenhouse gas emissions. Changes to the Emissions Trading Scheme (**ETS**) in 2020 introduced a quantity cap on emissions. The cap will be a sinking lid on emissions, set to fall over time in line with targets.

With the new cap in place, it is not clear how other policies can further reduce emissions. It is widely known that cap-and-trade systems like the ETS prevent other policies from having any effect on overall emissions. This neutralising effect of emissions caps is called 'the waterbed effect.' It has been recognised by institutions and agencies around the world, including the UN Intergovernmental Panel on Climate Change, which said:[1]

> [I]f a cap-and-trade system has a sufficiently stringent cap then other policies such as renewable subsidies have no further impact on total greenhouse emissions.

With the new ETS cap in place, all that other policies can do is change where in the economy emissions are reduced. Overall emissions will be determined by the cap regardless of other policies under that cap.

Thus, the government is about to commit to a sweeping programme of deeply disruptive policies with enduring consequences for current and future generations but without a pathway to lower emissions. The government has never formally explained how its strategy which combines a comprehensive emissions cap[2] with other emissions policies under that cap can lower emissions by more than the cap alone.

Absent any explanation from the government, the best we have is a recent paper that attempts to make the case for combining the ETS with other emissions policies. The paper, called "Why emissions pricing cannot do it alone," is by David Hall of Auckland University of Technology and Robert McLachlan of Massey University (henceforth **HM**).[3] HM have written something close to the best possible case for the government's strategy. Their well-referenced paper covers all the main arguments we have seen or heard for combining the ETS with other policies. HM do not speak for government. However, their argument aligns with statements by Ministers and senior officials. If the government ever formally justifies its approach, it will probably look like the paper by HM.

Having reviewed HM's argument, and noting the similar views of policymakers, we can conclude with some confidence that the government's climate change strategy is based on false premises. It will not reduce emissions. It will harm future generations, not help them. The government is about to make a public policy mistake of historic proportions.

But why attack the government's climate change strategy based on a paper written by third parties?

We would rely on an official source if it existed. What else can we do? The government has never produced its version of the paper by HM, a formal statement of its theory for how its climate change strategy works. It is not even clear the government has a theory. All we have from the government is a loose collection of beliefs – asides in reports, press statements, passing references in conference presentations, conversations with officials, and Tweets. It is extraordinary that the government could have made it so far into its climate change policy programme without a statement of how its strategy is meant to work. This is no way to do public policy. But here we are.

This paper proceeds as follows:

- In Chapter 1, we summarise HM's case for complementary policies;
- We quote official sources to show a clear alignment between HM's case and the government's own position;
- In Chapter 2, we respond to HM's case for complementary policies:
    - We begin by quoting the legislation to establish what Parliament has committed to do about climate change;
    - We show HM mischaracterises Parliament's commitments. This has the effect of making further policies appear necessary when they are not;
    - We show existing policies have New Zealand on track to deliver emissions targets feasibly;
    - We respond to other elements of HM's argument, including transport emissions, 'the waterbed effect,' and the market failure justification for complementary policies;
- In Chapter 3, we make a case for alternative policies alongside the ETS different to those the government is considering; and
- Chapter 4 concludes.

Terminology

This report advocates other emissions policies besides the ETS, just not the policies the government plans to introduce. Accordingly, we must distinguish between two groups of policies: those the government wants, and those we recommend.

Throughout this report, **complementary policies** refer to further emissions policies the government intends to introduce, nominally to complement the ETS. Complementary policies include Feebate (also called the Clean Car Discount) and various policies in the upcoming Emissions Reduction Plan.

Alternative policies refer to additional non-ETS emissions policies, which we recommend.[4]

Existing policies refer to the same group of emissions policies as those the Climate Change Commission used when it analysed expected outcomes from existing policies in 2021. Existing policies include the ETS.

Enabling policies remove barriers to expand the opportunities for the ETS to reduce emissions. These policies work on a principle of levelling the playing field to lower the cost of emissions targets.

Other terms:

Removals are any technologies that capture and store greenhouse gases from the air affordably and with the potential to operate on an industrial scale. Exotic forests are one example of a removal technology, but there are many others.

Unless otherwise stated, **reductions** refer to lower *gross* emissions of greenhouse gases.

Offshore mitigation is a term borrowed from legislation which refers to reductions and removals which occur overseas.

Offsets mean domestic removals and offshore mitigation.

Net zero is the statutory target of limiting net emissions of long-lived greenhouse gases to no more than zero from 2050. Unless otherwise stated, "net zero emissions" refer to long-lived emissions.[5]

CCRA is the *Climate Change Response Act 2002*.

CHAPTER 1

The case for complementary policies

Emissions pricing is clearly insufficient as a sole response to climate change mitigation… where deep, drastic reductions in greenhouse gas emissions are required… deep decarbonisation and technological change will require transition-oriented policies that are committed to transforming systems in ways that ensure just outcomes and secure broad, enduring public support…[6]

HM's case for complementary emissions policies alongside the ETS is essentially this. Climate change and emissions targets require "deep decarbonisation," and major changes in technologies and behaviours. HM do not believe the ETS alone is enough to deliver the necessary level of disruption. Complementary policies can compel the necessary changes, and solve other problems, too.

HM are strongly critical of the ETS. Their concerns include its performance to date; vulnerability to market failures and political lobbying; its lack of effect on transport emissions; its regressive effects; and its complexity. HM believe political constraints could limit the usefulness of the ETS, and they consider its democratic legitimacy is strained. HM accept the ETS has a permanent role, saying it can function as a "system wide lever,"[7] and acknowledge the quantity cap that was added to the ETS in 2020 and the recent rise in the ETS price. These could drive better performance from the ETS in the future, say HM. Nevertheless, they conclude emissions pricing "is clearly insufficient."[8]

While HM recognise emissions targets as an objective of climate change policies, they appear to see deep decarbonisation,[9] technology transition, and behaviour change as objectives in their own right.

HM devote a chapter to transport emissions. Transport is responsible for about 20% of New Zealand's gross emissions.[10] New Zealand has the highest rate of car ownership in the OECD.[11] HM provide compelling evidence which suggests transport emissions are hard to abate. They cite domestic and overseas studies which show emissions prices above NZ$200 may reduce transport emissions by only 12% to 44%, "rather than the 84% reduction that is required."[12] HM do not say where this figure comes from or why it is required. They rightly question the political feasibility of very high carbon prices. HM believe transport's lack of response to emissions pricing at least partly reflects how hard it is to reduce emissions in that sector, a result of "carbon lock-in".[13] Car dependency, say HM, is caused by:

> …the overprovision of car infrastructure, inadequate provision of public transport, the facilitation of urban sprawl, mass production in the automotive industry, and the emergence of 'car cultures' which shape human desires and preferences.[14]

The best response to transport's reluctance to change is early intervention. HM quote this statement:

> In sectors that are particularly expensive and difficult to decarbonise, like transportation, it is therefore preferable to start early to make the transformation as progressive and smooth as possible, minimising long-term costs…[15]

After considering transport, HM turn to the 'waterbed effect.' Cap-and-trade schemes can

prevent other emissions policies which are subject to a cap from having any further effect on overall emissions. This neutralising effect is well-recognised and follows from the fact that if an emissions cap determines total emissions, then policies under the cap will not determine (i.e. affect) total emissions since they leave the cap unchanged.[16]

HM agree with this logic in principle:

> A pure quantity instrument, such as a fixed-cap-and-trade scheme with no stockpile, would have a waterbed effect of precisely 100%.[17]

However, the ETS is not a pure quantity instrument, according to HM. It is a hybrid due to the presence of a stockpile of outstanding emissions units and the price stability mechanism in the ETS. These aspects of the ETS mean the ETS cap is not necessarily fixed. As a result, the waterbed effect will be less than 100% effective, HM say.

Avoiding the waterbed effect is a "political choice," according to HM. They say the neutralising effect of the ETS cap can be avoided if a Minister chooses to "harmonise" the ETS cap with other emissions policies. This means linking the cap's setting to emissions reductions from other emissions policies. For example, the avoided emissions due to an EV subsidy would lead to a tighter (i.e. lower) emissions cap. HM say this harmonisation of the cap with other emissions policies partly or wholly circumvents the neutralising effect of the cap.[18]

HM believe the ETS alone cannot "induce the necessary levels of behaviour change and technological transition in the urgent timeframe required."[19] Even if the ETS can cause sufficient change, HM say "there are political economy constraints to reaching the adequate price in a feasible and equitable way."[20] Thus, while HM acknowledge emissions targets, their case for complementary policies appears to be tied to changing behaviours and technologies *per se* rather than emissions reduction.

HM also note an international consensus, or something close to it, in favour of a mixed approach which combines emissions pricing with complementary policies.

Alignment with government statements

Before we respond to HM's case for complementary policies, we show how well their argument aligns with various statements by Ministers and officials.

The government says it wants transformation and gross decarbonisation. It believes this is necessary to reach net zero emissions:

> All policy levers are needed to drive the transformation to low-emissions, climate-resilient and sustainable economies
> – Joint statement by Prime Ministers of New Zealand, Fiji, Iceland and Norway[21]

> [A]ttention needs to turn to the action countries must take to decarbonise their economies… Over this time we will need to cut carbon pollution from nearly everything we do – from the way we grow our food, to how we generate energy to heat our homes, to the way we get around our towns and cities.
> – Hon James Shaw[22]

> Transitioning to a net-zero economy will require significant system change and the energy sector will have to do some heavy lifting.
> – Hon Dr Megan Woods[23]

> It is envisaged that in combination, hydrogen and electricity could provide a robust energy system platform for the delivery of deep decarbonisation of our energy and transport.
> – Government green paper on hydrogen, 2019[24]

> Decarbonising our economy is important if Aotearoa is to keep pace with – and seize the market opportunities from – the global technology transition in energy, transport and industry… The scale of change to achieve these reductions and complete decarbonisation cannot be overstated.
> – Ministry for the Environment, 2021

The government says transport emissions must fall:

> Land transport accounts for almost half of all of our national carbon dioxide emissions and we need to take action to start to mitigate transport's impact on climate change… We need to transition to low-emission vehicles…
> – Hon Dr Megan Woods, 2021[25]

> We must set a pathway to a zero-carbon transport system by 2050.
> – Ministry for the Environment, October 2021[26]

Officials say the ETS is not enough and is not effective in transport:

> The NZ ETS plays an important role, but it will not be enough to reach the net zero target. This will require other interventions to encourage travel reduction, mode-shift to lower emission modes, and cleaner technology. Although the cost of the NZ ETS on fossil fuel use for transport is ten times what it was five years ago, the impact on travel has been minimal – consistent with overseas findings.
> – Ministry for the Environment, 2021[27]

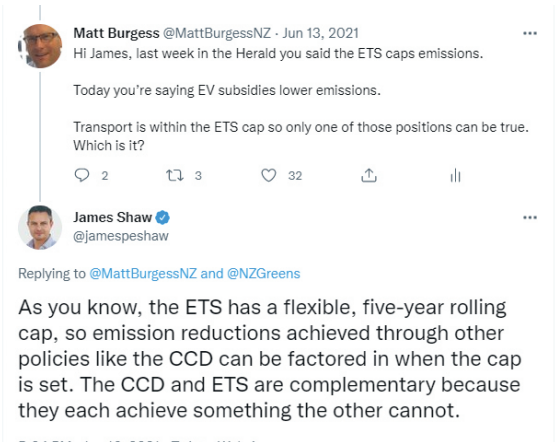
> The Emissions Trading Scheme (NZ ETS) alone won't get us to where we need to be. Action is needed across all sectors of the economy…
> – Climate Change Commission, 2021[28]

> Even with further improvements, the ETS – acting alone – will not be capable of delivering a successful low emissions future
> – Dr Catherine Leining, Climate Change Commissioner, 2021[29]

The Minister for Climate Change James Shaw makes a similar argument to HM for how the waterbed effect can be avoided:

In June 2021, we asked Minister Shaw on Twitter to explain how EV subsidies can lower emissions if the ETS caps emissions and transport is in the cap. Shaw replied saying, in effect, that linking the cap with the emissions benefit of the subsidy means the policy will reduce emissions from under the ETS cap:[30]

Figure 1: Comments by James Shaw on Twitter



Shaw's argument is essentially HM's but with the added claim that the ETS and EV subsidy together can reduce emissions by more than the ETS alone.[31]

The Climate Change Commission also says the waterbed effect is avoided by coordinating the ETS and other policies:

> [S]everal submitters [said] that the NZ ETS has a 'neutralising effect' on emissions reductions achieved by other policies… the NZ ETS can be managed in conjunction with other policies so that emissions reductions or removals from other policies are not a wasted effort…
> – Climate Change Commission, 2021[32]

Like HM, the Climate Change Commission refers to the flexible ETS quantity cap and the stockpile of outstanding units in relation to the waterbed effect:

> The NZ ETS, however, does not have a fixed cap. This is partly the legacy of how the NZ ETS was run in the past, which has led to over 130 million units banked in participant accounts. This represents significant oversupply beyond what is likely needed for annual demand and hedging purposes…[33]

The Climate Change Commission says overseas evidence supports combining emissions pricing with other emissions policies:

> International research and experience clearly show that the most effective approach to reducing emissions is to implement a comprehensive suite of climate policies.
> – Climate Change Commission, May 2021[34]

Takeaway 1

HM's case for complementary policies is essentially that climate change and emissions targets require deep decarbonisation which the ETS alone will not deliver. HM do not speak for the government. Statements by ministers and senior officials align with HM's case for complementary emissions policies.

CHAPTER 2

Our response

We believe HM have produced something close to the best possible case for complementary policies. Their paper covers all of the main arguments we know of and includes copious references to the academic literature. Their argument is consistent with statements by Ministers and officials, which suggests the government's position is similar to HM's argument.

Accordingly, having reviewed the paper by HM, we can conclude with some confidence that the government's climate change strategy will deliver few if any of its promised benefits. It will not reduce the country's emissions. It will not protect future generations. Instead, it will saddle them with debt, raise their cost of living, and make them poorer. This is the inevitable result of expensive policies which have no effect on overall emissions. The upcoming Emissions Reduction Plan will be an historic mistake.

That does not mean there is no case for other emissions policies alongside the ETS. There is a case for other policies – just not those the government wants to introduce.

Before we get into the various arguments from HM, we must first establish what Parliament has committed to do about climate change. In 2019, Parliament passed the Climate Change Response (Zero Carbon) Amendment Bill. Among other things, the amendment put emissions targets into legislation, including the commitment to net zero emissions from 2050. Statutory targets should anchor all climate change policies and are an appropriate place to begin.

What Parliament has agreed to do

HM's paper does not include the text of statutory emissions targets in legislation. This is a notable omission given HM's argument for complementary policies is inconsistent with those targets. We start by quoting the legislation before considering some of the consequences.

Parliament has committed to lower net emissions of greenhouse gases. Emissions targets include a goal to reduce net emissions of long-lived greenhouse gases to zero by 2050 (**net zero**).[35] This is probably the most significant and challenging emissions target.

Parliament carefully defines net emissions and targets in the legislation. Section 5Q of the *Climate Change Response Act 2002* (**CCRA**) spells out the commitment to net zero:

> **5Q Target for 2050**
> (1) The target for emissions reduction (**the 2050 target**) requires that—
> **net accounting emissions** of greenhouse gases in a calendar year, other than biogenic methane, are zero by the calendar year beginning on 1 January 2050 and for each subsequent calendar year…[Emphasis added]

Section 4 of the CCRA defines "net accounting emissions" as:

> **net accounting emissions** means the total of gross emissions and emissions from land use, land-use change, and forestry (as reported in the New Zealand Greenhouse Gas Inventory), less—
> (a) removals, including from land use, land-use change, and forestry (as reported in the New Zealand Greenhouse Gas Inventory); and
> (b) offshore mitigation.

In plain language, Parliament says net emissions are:

> **gross emissions**, for example, the greenhouse gases from your car's exhaust or a power station;
> *minus*
> **removals**, for example the CO_2 captured from the air by pine trees;
> *minus*
> **offshore mitigation**, which means efforts to reduce emissions in other countries.[36] This might include funding projects to replant rainforest or convert coal plants to natural gas, for example, or the trading of emissions permits which lowers emissions.

Net emissions =
Gross emissions – Removals – Offshore mitigation

The Paris Climate Agreement, referred to in the CCRA, also targets net emissions. The Paris Agreement expressly recognises reductions in gross emissions and offsets (removals and offshore mitigation) contribute to lower net emissions. Article 4 of the Paris Agreement states: "Parties aim to… achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases…"[37]

Parliament's decision to target net emissions is consistent with climate science. Net emissions are what matters for climate change. The climate does not distinguish between one less tonne of gross emissions and one more tonne of (genuine) removals or offshore mitigation. As far as the atmospheric concentration of greenhouse gases goes, they are the same thing.[38] Nor does climate change care about international borders or where emissions come down. Parliament's approach is environmentally-sound.

So Parliament recognises three pathways to lower net emissions. It expressly treats each tonne of **reductions**, **removals** and **offshore mitigation** as equal in the sense that one less tonne of gross emissions and one more tonne of removals or offshore mitigation all lower net emissions by one tonne.

Given this commitment by Parliament, the task for climate change policies is to assemble a combination of reductions, removals and offshore mitigation that are:

- Sufficient to lower net emissions by enough to reach targets; and
- Acceptable to voters.

In principle, any mix of reductions/removals/offshore mitigation will do since Parliament treats each of these pathways as equal on a per-tonne basis. In practice, however, some combinations of reductions/removals/offshore mitigation will not be possible.

There are three constraints. First, the legislation (section 5Z of the CCRA) requires net emissions should be lowered from domestic sources "as far as possible."[39] The CCRA does not say what "as far as possible" means. This rule affects the balance of domestic versus offshore mitigation. However, the CCRA puts no limit on the balance of domestic reductions versus domestic removals.[40]

The second constraint is physical limits. This country cannot rely exclusively on gross reductions to achieve net zero emissions. Zero *gross* emissions will be impossible so long as there are still people living in this country. All solutions to net zero must include offsets (removals and/or offshore mitigation). It is not a question of if offsets will be needed, only how much.

The third constraint is politics. Although Parliament has not expressly ruled out relying *solely* on offsets to reach emissions targets, voters and trading partners are likely to demand at least some minimum contribution from reductions in gross emissions. What that minimum contribution will be we cannot tell, but it will depend on costs, innovation, other countries' decisions, and animal spirits.[41]

So, Parliament has committed to lower net emissions and recognised three pathways to achieve this. Climate change policies must assemble a mix of reductions/removals/offshore mitigation that is both sufficient to reach targets and feasible. There are legal, physical and political constraints on that mix.

The key idea in this report is even after taking into account legal, physical and political constraints, this country has more pathways than it needs to reach net zero and other emissions targets, which means no individual policy is *necessary* to reach targets. We have options, which means everything is a choice.

We illustrate this point with a simple analysis that starts with Parliament's definition of net emissions:

Net emissions =
Gross emissions – Removals – Offshore mitigation

At the moment, New Zealand's annual net emissions each year (in millions of tonnes of CO_2 or equivalent) look something like this:[42]

Net emissions = 47.2 – 7.3 – 0 = 39.9

The commitment to net zero means that from 2050 means:

Net emissions ≤ 0

That is,

Gross emissions – (Removals + Offshore mitigation) ≤ 0

If we shift **Removals** and **Offshore mitigation** to the other side of this equation (and remove the brackets), then emissions are net zero when:

Gross emissions ≤ Removals + Offshore mitigation

Here is the key point. **Net zero is not a commitment to lower gross emissions. Net zero is the commitment to balance gross emissions with offsets (removals plus offshore mitigation). Gross emissions and offsets can be balanced at any level of gross emissions.**

To make this point clear, the following table shows various combinations of reductions, removals and offshore mitigation which successfully deliver on the commitment to net zero emissions (the first row shows estimated emissions in 2022, for reference).

Table 1: Many pathways to net zero (millions of tonnes of CO_2e)

Gross emissions		Removals		Offshore mitigation		Net emissions	Net zero achieved
47.2	–	7.3	–	0	=	39.9	
32.6	–	32.6	–	0	=	0	✓
25	–	25	–	0	=	0	✓
20	–	15	–	5	=	0	✓
10	–	0	–	10	=	0	✓
97.2	–	52.2	–	45	=	0	✓

The commitment to lower net emissions is not a commitment to lower gross emissions. However, HM's paper and statements by ministers and officials make clear they believe lower net emissions means lower gross emissions. But if net zero can be achieved at any level of gross emissions, then "deep decarbonisation," behaviour change and technology transition are optional but not necessary. This country does not need to use drastic measures to reduce net emissions. The government has not been clear its policy programme is a choice. Instead, it has misconstrued the targets it put in legislation two years ago to make it appear as if its demands for sacrifices by households are made necessary by those commitments. They are not.

Here is a second crucial point. **Removals and offshore mitigation are each affordable and scalable enough on their own to deliver net zero emissions.**[43] New Zealand could achieve net zero emissions only with domestic removals, using a combination of exotic forests, soil sequestration, blue carbon and other technologies. Alternatively, New Zealand could achieve net zero soley by funding emissions reduction projects overseas.[44]

This does not mean we *should* only plant trees or pay other countries to reduce emissions on our behalf. We make no judgment in this report about the combination of reductions, removals and offshore mitigation New Zealand should use to reach its emissions targets. Our point is that the availability and legal recognition of offsets in the legislation and international agreements gives this country control over its net emissions. That control secures net emissions targets regardless of how well existing policies including the ETS work.

That should call into question why the government is pushing drastic actions on climate change if it does not need to. If the government's climate change strategy is based on an assumed need for disruptive policies which does not exist, then the strategy should be reconsidered. At the very least, the strategy should be justified. In the meantime, some honesty from policymakers would be welcome. Ministers and officials should avoid saying their policies are needed when they are not.

To recap:

- Net zero is the statutory commitment that from 2050 gross emissions will not exceed offsets.[45] Net zero is not a commitment to reduce gross emissions.
- Offsets (removals and offshore mitigation) are affordable and available in effectively unlimited quantities.
- Net zero does not require or imply any need for "deep decarbonisation" or transition.

Consequences of the commitment to net emissions

Three consequences follow from the commitment to lower net emissions and the effectively unlimited availability of offsets:

1. **Existing policies already have New Zealand on track to reach net zero affordably and feasibly and before 2050.** This will not require undue reliance on trees.[46] This is relevant context for considering whether the costly and disruptive policies in the upcoming Emissions Reduction Plan later this year are justified.
2. **New Zealand can be virtually certain it will deliver net zero and other emissions targets.** No complementary policy is *necessary* to deliver emissions targets. Regardless of how much or how little the ETS reduces emissions, removals and/or offshore mitigation will be available in effectively unlimited quantities *if needed*.[47] This fact secures emissions targets.
3. **The government bears the burden of proof to show each additional complementary**

policy is better than existing policies. If existing policies already have this country on track, then complementary policies must earn their place.

Our claim that existing policies already have New Zealand on track has nothing to do with the performance of the ETS. Early in 2022, the ETS price reached $86/tonne, a four-fold increase on two years ago. It is not yet clear what effect higher prices will have on emissions. However, this uncertainty does not put our emissions targets at risk because legislation and international agreements recognise offsets and offsets are available in effectively unlimited quantities. Accordingly, this country will deliver net zero and other emissions targets regardless of how effective the ETS is.

Offsets secure emissions targets. They will be needed. They are why existing policies are enough. They are why further policies are optional but not necessary. They are why every policy is a choice. They place a burden of proof on the government to make the case for each new policy.

Even if ETS turns out to be ineffective and this is seen as a problem (perhaps due to fears of 'excessive' use of offsets), it is not clear complementary policies help. High-cost complementary policies are not only unnecessary. They are probably counterproductive. Later in this report, beginning on page 24, we introduce the idea of *political efficiency*, that is, the rate at which climate change policies burn political capital as they lower emissions. We argue that since political capital is finite, if complementary policies burn more political capital per tonne abated than the ETS, then complementary policies could cut fewer tonnes of emissions than the ETS alone, leading to *greater* use of offsets.

Box 1: The Feebate policy

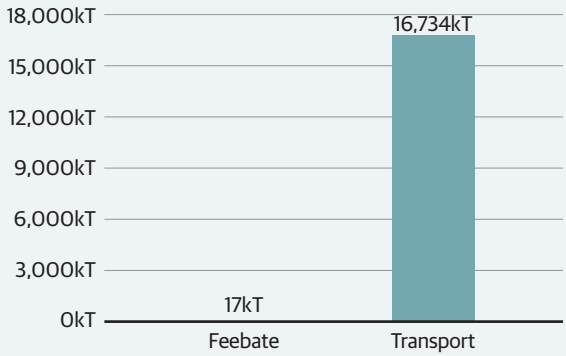
From 1 April 2022, the government's new Feebate policy will add thousands of dollars to the cost of new and used imported petrol and diesel cars and trucks. This will affect the cost of second-hand cars, causing untold hardship for households and businesses across the country. Low-income households are likely to be significantly affected.

Domestic transport is in the ETS cap. Accordingly, Feebate will have zero effect on net emissions.

Feebate is highly regressive. The money raised by the new levies on vehicle imports will fund payments to the buyers of new and used EVs. Buyers of new Tesla Model 3 cars will receive $8,625, funded by the buyers of petrol and diesel cars.

Despite these large additional costs, Feebate will be mostly ineffective. Official estimates show Feebate will reduce transport emissions by only about 0.1% over the next three years.

Figure 2: Expected annual emissions benefit of Feebate per year versus annual transport emissions, 2022–25



Sources: Feebate estimate from Ministry for the Environment, *Te hau mārohi ki anamata Transitioning to a low-emissions and climate-resilient future*, p61. Transport emissions based on Climate Change Commission, *Ināia tonu nei: a low emissions future for Aotearoa*, data for Figure 6.4 Long-lived greenhouse gas emissions in the 'unconstrained removals' scenario.

Box 1 (continued)

Feebate has already attracted protests, so this chart should lead ministers and officials to ask where material reductions in transport emissions are going to come from.

When the government launches the policy on 1 April, the government will not be able say this expensive, ineffective and highly regressive policy is necessary. Ministers will not be able to maintain that Parliament's commitment to lower emissions forced the Feebate policy on the country. Any statement to that effect will be untrue. Since existing policies already have New Zealand on track to targets, Feebate and every other policy is a choice.

The government can choose to reach net zero without resorting to high-cost policies. Only by falsely maintaining that these policies are necessary can these policies escape scrutiny. Without the pretence of necessity, the government will have to explain why it did not have to bring in Feebate, but went ahead with it anyway.

To conclude this section, Parliament has not placed New Zealand in a desperate position that requires policies like Feebate by committing to reduce net emissions. Feebate and other policies like it are a choice. This country can choose the contribution that reductions in gross emissions make to emissions targets. Offsets are there to cover the gap to targets, and they will be needed. The balance between reductions and offsets is a legitimate political choice. That choice is subverted when ministers, officials and academics insist drastic policies are necessary to reach targets. They are not under the commitments Parliament has made. It is only by misrepresenting Parliament's commitments that further policies can be made to appear necessary. This brings us to the paper by HM.

To avoid doubt

The New Zealand Initiative supports emissions targets including the commitment to net zero. This report does not question anything in climate science. This report shows statutory emissions targets do not *require* "deep decarbonisation." That does not mean we believe this country should plant its way to net zero. It means this country has choices. This report offers no view on the mix of reductions, removals and offshore mitigation this country should use to deliver targets.

Takeaway 2

Existing policies have New Zealand on track to net zero. The government's upcoming Emissions Reduction Plan is not necessary to secure net emissions targets. Those targets have already been secured.

HM mischaracterise Parliament's commitments

HM's case for complementary policies starts from the premise that climate change and emissions targets require fundamental and disruptive changes to the economy. This premise is in the opening sentence of HM's paper.

> This article explores whether emissions pricing is sufficient to achieve the low emissions transition in Aotearoa New Zealand… [E]missions pricing alone cannot be expected to induce the necessary levels of behaviour change and technological transition in the urgent timeframe required.[48]

Later in their paper, HM say:

> [D]eep decarbonisation and technological change will require transition-oriented policies that are committed to transforming systems

> in ways that ensure just outcomes and secure broad, enduring public support.[49]

Here is how HM describe the problem that climate change policies must solve:

> Carbon taxes stimulate a search for low-hanging fruit. That ceases to matter when we know we must eventually pick all of the apples on the tree.[50]

This is a dreadful mischaracterisation of the targets that Parliament has agreed to. Parliament has made no commitment which requires anything so fundamental as "pick[ing] all of the apples on the tree," i.e. eliminate gross emissions. There is no minimum "level of behaviour change." There is no *need* for "technological transition," "deep decarbonisation," or "transition-oriented policies." The commitment to lower net emissions neither requires nor implies any of these things. HM have based their case for complementary policies on an invented premise.

There is a monumental difference between gross and net emissions targets in terms of the sacrifices needed to deliver those two goals. Confusion on this point alone, given a target as ambitious as net zero with less than three decades to achieve it, has cost consequences which can be measured in percentages of GDP. The government is pushing its needlessly high-cost climate change strategy by conflating gross and net emissions.[51]

It is not just HM misrepresenting Parliament's commitments. The invented need for drastic actions is all but a mantra among officials. For example, the Climate Change Commission's draft emissions budget in 2021 included more than two dozen statements to the effect that certain actions or policies were necessary to achieve emissions targets.[52] All of those statements were false.

Box 2: New Zealand has options

Parliament has made its commitments in a way that allows many possible pathways to emissions targets, more than the public has been led to believe. For example:

- This country could plant zero additional trees and reach net zero by 2050.
- This country could permanently exclude agriculture, the largest export earner, from any form of emissions pricing and reach net zero.
- We could eliminate all sectoral policies including high-cost transport policies and reach net zero.
- We can continue to import coal in dry years indefinitely to secure electricity supply and reach net zero.
- We could reach net zero by 2050 without any use of offshore mitigation.

That targets are at the national level with no sector targets in the legislation or international agreements provides valuable flexibility since this leaves room for 'overs and unders' between sectors.

The basic problem with the government's climate change strategy is that it forces high-cost, disruptive policies while overlooking more affordable, effective, and legitimate alternatives for no environmental (climate change) benefit. The government's strategy can only target particular technologies and sectors at the expense of a least cost approach to reducing emissions. This vastly increases the cost and risk of emissions targets, which we discuss later.

The case for complementary policies is based on the pretence of necessity. Take away the false claims of necessity, and policies would be subject to a test on their merits. None of the government's complementary policies is likely to survive that test. There can be no case for expensive, ineffective, often regressive policies if they are not necessary. The pretence of necessity is cover for untenable policies.

> **Takeaway 3**
>
> Deep decarbonisation, transition, etc. are not necessary to reach emissions targets. New Zealand can choose how little or how much deep decarbonisation should contribute to the successful delivery of emissions targets.

Existing policies will deliver net zero emissions affordably and feasibly

Official analysis suggests existing policies already have New Zealand on track to deliver net zero emissions by 2050 and other emissions targets.

This claim may seem surprising. Most weeks, the government proclaims the need for ever more action on climate change. Yet analysis by the Climate Change Commission and the Ministry for the Environment make clear that existing policies will achieve net zero affordably, and without turning the countryside into a forest. Existing emissions policies are not a material threat to agriculture and with only minor adjustments will be no threat at all.

Officials and academics have talked down existing policies for years. Some have resorted to scaremongering. For example, last year the Minister for Climate Change told Parliament's Environment Committee that a least cost approach to reducing emissions will "involve converting virtually every farm in the country into pine forestry."[53] An official at the Climate Change Commission said words to the effect that existing policies could lead to exotic trees covering "every square metre" of New Zealand. In December 2021, the Chair of the Climate Change Commission told Parliament's Environment Committee that New Zealand is not currently on track to achieve statutory emissions targets.[54] HM refer to analysis by the Ministry for the Environment (MfE) which showed that at an ETS price of $50 it is economic to plant 4.7 million hectares of exotic trees; at $100, it is economic to plant almost all available land in trees. That would "effectively displace the entire sheep and beef sector."[55] According to HM, only logistical bottlenecks stand in the way of agriculture being overwhelmed by forestry.

None of this is true. It is not logistics that will save New Zealand's sheep and beef sectors. It is the fact that emissions targets require nowhere near that many trees to be planted. A $50 ETS might make it economic to plant 4.7 million hectares of land with exotic trees, but net zero only requires a quarter of that amount – between 1 million and 1.3 million hectares by 2050 – under existing policies.[56] New Zealand will never be entirely covered by forests because, among other reasons, emissions targets are not that difficult.[57]

In its advice to the government on emissions budgets in 2021, analysis by the Climate Change Commission revealed existing policies have New Zealand on track to achieve emissions targets. Specifically, the Commission found existing policies will deliver net zero emissions by about 2050 at an ETS price of $50.[58] Today, the ETS price is above $70.[59] Existing policies deliver net zero affordably.[60] Moreover, the Commission found existing policies can deliver net zero without unduly relying on trees. New Zealand will not plant its way to net zero under current policies.[61] The Commission's analysis revealed the ETS *is* enough in the important sense that it will reduce net emissions in line with Parliament's commitments.

The Commission's advice did not make its findings clear. On the contrary, the executive summary of the Commission's final report declared in large bold font, "We are not on track to meet our targets.".[62] The Commission has not reconciled this statement with its analysis. It is unclear why the Commission believes New Zealand is not on track.

Table 2 summarises findings from the Commission's analysis.[63] Appendix 2 has further results.

Table 2: Climate Change Commission's expected outcomes from existing policies at $50 ETS

	2050	2070
ETS price	$50	$50
Net zero achieved/maintained	✓	✓
Gross reduction share of net reduction	39%	62%
Additional land area for exotic forestry (million hectares)[64]	0.85MHa	1.14MHa
Additional land area for exotic forestry % of existing farms	7%	10%

Source: Climate Change Commission; author's calculations.

The Commission's analysis showed the following outcomes from existing policies:

- An ETS price of $50 achieves net zero from about 2050.[65]
- Gross emissions fall by a third by 2050, despite a 26% increase in the New Zealand population. Gross emissions fall by more than half by 2070.
- Reductions in gross emissions contribute 39% of the fall in net emissions by 2050, and more than 60% of the fall in net emissions by 2070.
- Transport emissions fall 52% by 2050 and 87% by 2070 under existing policies.

The Commission's analysis also makes clear that this country does not need to plant its way to net zero with existing policies. Far from "covering every square metre of New Zealand in trees,"[66] or displacing agriculture, the Commission's analysis suggests an area equal to only 7% of existing farmland will convert to forestry by 2050, about 3% of New Zealand's total land area. This implies a rate of new planting between now and 2050 that is in line with afforestation rates over the last 40 years. The Commission's estimates of required afforestation may be high because its analysis includes conservative assumptions likely to boost planting rates.[67]

Where, then, is the case for further complementary policies? What burning problem are existing policies going to force on the country? How can the Commission conclude New Zealand is not already on track? With the ETS price now above $70, the Commission's analysis is unambiguous: New Zealand going to achieve net zero emissions before 2050. In a sense, the Commission is right. This country is not on track. It is ahead of it. The Commission has not told anyone.

To avoid doubt

We do not believe the ETS should work alone. Even if existing policies have New Zealand on track to emissions targets, that does not mean there is no case for other policies besides the ETS.

Takeaway 4

Existing policies will not displace agriculture. Emissions targets are not onerous enough to require more than a small percentage of farms to convert to forestry. Official analysis suggests New Zealand is on track to reach net zero before 2050.

Box 3: Exotic trees are not the only removals technology

A range of technologies can capture and store greenhouse gases at scale, affordably and permanently. The US National Academies of Sciences surveyed Negative Emissions Technologies, which the Academies defined as scalable and which remove emissions for a cost of no more than US$100 per tonne abated. The report identified the following technologies:

Coastal blue carbon: Land use and management practices that increase the carbon stored in living plants or sediments in mangroves, tidal marshlands, seagrass beds, and other tidal or salt-water wetlands. These approaches are sometimes called "blue carbon" even though they refer to coastal ecosystems instead of the open ocean.

Terrestrial carbon removal and sequestration: Land use and management practices such as afforestation/reforestation, changes in forest management, or changes in agricultural practices that enhance soil carbon storage ("agricultural soils").

Bioenergy with carbon capture and sequestration: Energy production using plant biomass to produce electricity, liquid fuels, and/or heat combined with capture and sequestration of any CO_2 produced when using the bioenergy and any remaining biomass carbon that is not in the liquid fuels.

Direct air capture: Chemical processes that capture CO_2 from ambient air and concentrate it, so that it can be injected into a storage reservoir.

Carbon mineralisation: Accelerated "weathering," in which CO_2 from the atmosphere forms a chemical bond with a reactive mineral (particularly mantle peridotite, basaltic lava, and other reactive rocks), both at the surface (ex situ) where CO_2 in ambient air is mineralised on exposed rock and in the subsurface (in situ) where concentrated CO_2 streams are injected into ultramafic and basaltic rocks where it mineralises in the pores.

Geologic sequestration: CO_2 captured through BECCS or direct air capture is injected into a geologic formation, such as a saline aquifer, where it remains in the pore space of the rock for a long time.

Source: National Academies of Sciences, Engineering, and Medicine, "Negative Emissions Technologies and Reliable Sequestration: A Research Agenda (Washington, DC: The National Academies Press, 2019), https://doi.org/10.17226/25259.

The non-problem of transport emissions

If "the ETS is not enough" is the most repeated mantra among climate change policymakers, then "transport emissions must come down," or words to that effect, must be a close second.

HM devote a chapter to transport emissions. After showing transport is a major source of emissions, HM introduce evidence of pricing's limited but non-zero effect on transport emissions. This lack of response to pricing is due to "carbon lock-in," car dependency, and the intrinsic difficulty of cutting transport emissions.

We dispute none of these claims by HM.

Where we disagree with HM is their premise that transport emissions are a problem. HM start from the assumption that "decarbonisation of the transport sector" is necessary but do not say why. Of course, HM are not alone in their view. That transport emissions must come down seems close to a universal truth among policymakers.

Transport emissions do not *need* to come down to reduce net emissions. Statutory targets are at a national level and do not imply anything about emissions from any sector, even one as large as

transport. Parliament has not set any sector-level emissions targets (although it has authorised the government to plan emissions reductions in sectors). Without any contradiction, transport emissions could double at the same time as New Zealand successfully delivers net zero emissions (not that we necessarily think that should happen).

The problem with sector level emissions targets is that they are expensive and have no effect on overall emissions, since transport and most other sectors are in the ETS cap. Transport may be the most expensive place of all to target emissions reductions. HM provide compelling evidence of how difficult and expensive it is to reduce transport emissions:

> Hasan (2020) estimates that a carbon price of NZD$235/t$CO_2$ is required to reduce road transport emissions by 44% in 2030… This is about four times today's carbon price and implies an increase of about 54 cents per litre at the pump… An even weaker result comes from recent MBIE (2021) modelling which compares a high price pathway that rises from $84/t in 2025 to $250/t in 2050 against a counterfactual reference scenario that assumes a constant $35/t in real terms. Yet the high price pathway only realises a 12–18% reduction of transport sector emissions by 2050…[68]

The government does not need to set targets or policies for each sector to reduce emissions. On the contrary, the government can cut emissions more cost effectively, and raise the relative contribution from reductions, if it allows 'overs and unders' between sectors according to their relative cost of abatement. The government can only target sectors by forgoing effectiveness and least cost.

For example, the Interim Climate Change Committee review of electrification in 2019 found that the government's renewable electricity target is likely to have perverse consequences for the broader energy system.[69] Its logic was that the policy pre-empted discovery of the most effective ways to reduce emissions. This makes the policy costly. The Committee's logic applies to other energy targets and targets in other sectors.

The alternative to targeting transport emissions is not more use of offsets but less. Flexibility across sectors supports greater reductions in gross emissions, which is simply the fact that cutting emissions efficiently allows greater reductions. Almost inevitably, forcing emissions to come down from the most difficult to abate places will increase the need to use offsets.

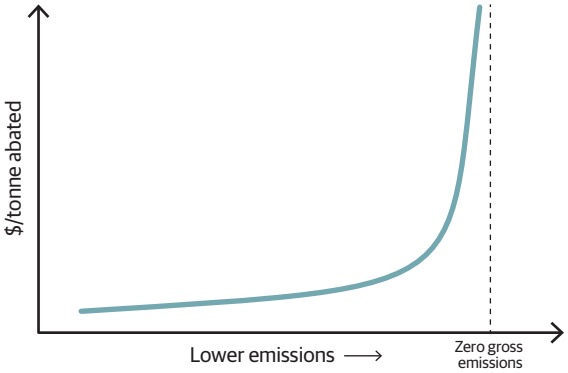
The fact that the ETS has limited effect in transport does not support the case for complementary policies. If the lack of response to emissions pricing reflects how hard it is to reduce emissions from transport, this will affect complementary policies, too. While complementary policies can coerce changes where pricing cannot, policies must spend political capital – public support for action on climate change – to do so. We have already seen nationwide protests against the 'Ute tax' due to its cost and disruption, particularly for farmers. That policy will deliver only trivial reductions in emissions.[70] Policymakers should be concerned about the risk of exhausting the public's appetite for climate change policies before this country has reached emissions targets. The question is whether the ETS or complementary policies make better use of political capital. There is a risk that forcing high-cost emissions reductions from transport ends up *raising* emissions and increasing reliance on offsets by burning political capital at a higher rate than the ETS.

If the idea that targeting transport could plant more trees seems ironic, it is the predictable result of expensive, ineffective policies.

Why targeting sectors and technologies is so expensive

Targeting sectors or technologies with emissions policies comes with a cost penalty. This penalty exists because the government only target sectors or technologies by not targeting least-cost. The cost penalty is large because of the wide variation in the cost of abating emissions from different sources. If you were to line up every source of emissions in the economy and ordered them according to their cost per tonne of abatement, it would look something like Figure 3.

Figure 3: Cost of abatement per tonne (illustrative only)



The cost of abatement is mostly invisible to policymakers. In part, this is because "cost" goes beyond out-of-pocket expenses and includes anything that depresses wellbeing, including personal preferences.

To illustrate, consider the costs of reducing emissions from, say, people who travel to their local tennis club to play matches in weekends. Even among this small group of people, the costs of reducing emissions will vary widely:

- For people who live within walking distance, or on a bus route, the cost may be minimal.
- Other people may be able to share a ride or cycle to the club. Their costs will be somewhat higher.
- Others will need to buy a low-emissions vehicle to reduce their emissions. Their costs will be very high.
- Some will give up tennis altogether. Costs will vary within this group, too: low for those who do not care much for tennis; higher for those who love the game.

Our point is that costs can vary enormously for reasons that people in Wellington ministries mostly cannot see. This variation in costs is where the shape of the cost curve in Figure 3 comes from. The deep granularity of abatement costs is partly why most economists agree pricing is a better way to solve the emissions problem than command and control. People can take account of the above factors when they respond to an emissions price. Policymakers generally cannot account for individuals' preferences. This is one reason why complementary policies cost more than the ETS.

Figure 3 explains why targeting technologies or sectors costs so much. Policies which ignore costs end up on the nearly-vertical part of the curve where costs become ruinous, large enough to be measured in percentages of GDP.

Thus, it is crucial that policymakers realise:

- Policymakers do not need to target sectors or technologies to reduce emissions;
- It is not necessary to inflict ruinous costs on households and businesses to reach emissions targets. Net zero and other emissions targets can be delivered by policies that only operate on the flat part of Figure 3; and
- The government can choose its position on the cost curve through policy design.

The government should define what "hard to abate" means

There is an apparent consensus that the use of offsets is appropriate where emissions are "hard to abate," that is, where emissions reductions require an unreasonable amount of disruption to be achieved. The Climate Change Commission has said:[71]

> [P]eople need to decarbonise the sources of long-lived greenhouse gas emissions wherever possible, and only use carbon removals to offset emissions from hard-to-abate sectors.

This principle of using offsets where emissions are hard to abate can be formalised in a policy. The government could declare a cost threshold that defines "hard to abate" emissions and a principle that any policy which spends more than that threshold amount will be replaced with offsets. "Hard to abate" would be the maximum cost per tonne for any emissions policy.

By setting a "hard to abate" threshold, the government would effectively choose its position on Figure 3. The threshold would be the maximum willingness to pay to cut emissions rather than rely on offsets. This is appropriately a political decision which would take into account voter preferences, other countries' positions, and so on. In effect, the threshold would define the removals budget, that is, the relative contribution of removals to the fall in net emissions. This is because a higher willingness to pay to reduce gross emissions means less reliance on removals. In other words, "hard to abate" would be a *de facto* lever for the government to determine the balance of gross reductions versus removals.

But perhaps the most significant benefit of a formal "hard to abate" threshold is as a much-needed source of discipline on policymakers. Currently, the cost per tonne performance of emissions policies does not seem to influence decisions. The government regularly spends more than $1,000 per tonne abated, many times more than the ETS price, without triggering any apparent interest from Ministers or officials in shifting spending to more cost-effective alternative emissions policies.

To be sure, cost-per-tonne thresholds will be imperfect and subject to the concerns HM raise about cost methodologies. But those methods can be improved to include dynamic and firm-level effects. Even imperfect measures have value in a system that has few measures to begin with.

Summary on transport

It is essential that Ministers, officials, academics and the public understand how transport emissions targets are incompatible with a goal of reducing national net emissions. This country can cut more emissions sooner if the government does not target individual sectors. Sector targets pre-empt discovery of where emissions can be lowered most effectively. Under the targets Parliament has set, policymakers can be certain that allowing 'overs and unders' between sectors will successfully deliver emissions targets.

To avoid doubt

We do not say transport emissions *should* double as New Zealand achieves net zero emissions. We say emissions targets do not require policies which force reductions in particular sectors.

The alternative to targeting transport emissions is not more use of offsets. Allowing 'overs and unders' between sectors according to their cost of abatement will raise the contribution from reductions meaning less need for offsets.

Takeaway 5

Parliament has made no commitment that requires transport emissions to come down. Reducing transport emissions is expensive. High-cost abatement is unnecessary and counterproductive for emissions targets. Targeting transport emissions threatens net zero. Transport emissions are a non-problem.

The "waterbed effect"

It is widely known that emissions caps prevent complementary policies from further reducing overall emissions. In effect, an emissions cap neutralises other policies. This is called the waterbed effect. This term comes from the idea that the water beneath an object on a waterbed does not disappear. It is only displaced. Lower water levels under the object are precisely offset by higher levels elsewhere on the bed. The volume of water in the bed has not changed.

Similarly, emissions policies under an emissions cap do not change overall emissions. Policies can change (or displace) where emissions reductions occur. However, in doing so, policies free up tradeable emissions permits to be used elsewhere in the economy, raising emissions by an amount equal to the reduction in emissions from the policies. Overall emissions will not change.

Changes to the ETS in 2020 introduced a quantity cap on emissions. The new cap came into effect in 2021. During the reform's passage through Parliament, the Climate Change Minister called the ETS "a cap-and-trade scheme without a cap."[72]

The new cap is significant as one of two necessary conditions for the waterbed effect. The other condition required for the waterbed effect to occur is a *binding* emissions cap. A cap is said to be binding when it is low enough to force emissions below the level they would be without any regulation. Imagine an economy which produces 100 tonnes of greenhouse gases each year with a cap set at 200 tonnes per year. The cap will have no effect on emissions. Annual emissions will remain 100 tonnes. The cap is "non-binding." However, if the cap were set at 80 tonnes, then annual emissions would be forced down to 80 tonnes. The cap is binding because it is low enough to force emissions below their unregulated level of 100 tonnes. The waterbed effect requires a binding emissions cap.[73]

The waterbed effect is a serious challenge to the case for further complementary policies that has not yet been recognised. Policies which may have been justifiable without the new ETS cap no longer make sense. The waterbed effect is especially relevant in New Zealand because the ETS is among the most comprehensive schemes in the world. Nearly all the government's complementary policies will be subject to the ETS cap and its neutralising effect.

Given the government has capped emissions, the essential question is under what conditions can complementary policies avoid the waterbed effect contribute further reductions in overall emissions.

HM's argument for circumventing the waterbed effect

HM devote a chapter ("Puncturing the Waterbed") to the neutralising effect of the ETS cap. HM accept the waterbed effect exists; acknowledge the recent reforms that gave the ETS its quantity cap; and accept the cap constrains emissions. HM argue the waterbed effect only applies fully in a "pure" cap-and-trade scheme. The ETS is a "hybrid" scheme, HM say, due to the large stockpile of emissions units, and because the ETS has a price stability mechanism that changes cap settings. HM say these mean the waterbed effect is less than 100% effective.

HM say circumventing the waterbed effect is a matter of linking or "harmonising" complementary policies with the emissions cap. In principle, linking policies with the cap means that for each tonne of emissions reduced by, say, an EV subsidy, the cap is tightened (i.e. lowered) by one tonne. In practice, there is no link between policies and the cap (the government rarely checks the performance of any of its emissions policies after they are launched). Presumably, HM see the link between policies and the cap as indirect, with complementary policies creating the conditions that would allow the cap to be set more tightly than would be possible without the policies.

Response to HM

HM's analysis suffers from the lack of a clear description of how the waterbed effect works. This leads HM to raise issues that are not relevant to the problem of how complementary policies can lower emissions from under a binding cap, and ultimately to recommend solutions to the waterbed effect that do not work.

HM say harmonising the ETS cap with other emissions policies means complementary policies can lower overall emissions from under the ETS cap. They reach this conclusion by comparing the following scenarios:

1. The government implements complementary policies and reduces the emissions cap; and
2. The government neither implements complementary policies nor reduces the cap.

While HM are correct that emissions are lower in the first scenario than the second, they are comparing scenarios that have two variables changing – policy settings and the cap. HM attribute lower emissions to the change in policy. But it is the cap not the policies that is doing all the work.

To see why, consider what happens to emissions when we separate the change in policies from changes to the cap. Table 3 shows only the cap, not complementary policies, lowers emissions (numbers denote the two scenarios listed above).

Table 3: The emissions cap does all the work[74]

	Cap unchanged	Cap lowered
Implements no complementary policies	**1.** Emissions unchanged	Emissions reduced
Implements complementary policies	Emissions unchanged	**2.** Emissions reduced

A binding emissions cap determines total emissions so complementary policies have no effect on overall emissions. While it is true that combining complementary policies with a tighter cap lowers emissions (scenario **2** in the bottom-right corner of the table), the government can achieve the same result by tightening the cap without the policies (the top-right corner of the table). Complementary policies have nothing to do with the fall in emissions. The complementary policies are superfluous.

Given the ETS has capped emissions, HM should be comparing either:

1. The government reduces the emissions cap and implements complementary policies; versus
2. The government reduces the cap but implements no complementary policies.

or

1. The government leaves the emissions cap unchanged but implements complementary policies; versus
2. The government leaves the emissions cap unchanged and implements no complementary policies.

Under either comparison, emissions do not change. If a binding cap determines emissions then policies under the cap do not. The cap is the cap is the cap.

Almost anything can be made to lower emissions using HM's method. HM could have tested the effect of heart surgery on greenhouse gas emissions by comparing existing health policies against an alternative where the government doubles funding for heart operations and lowers the ETS cap. HM would have been astonished to find heart surgery reduces greenhouse gases as much as complementary emissions policies! Correlation is not causation, a distinction which matters when the task for policies is to bring down emissions.

HM's confusion on the waterbed effect is summed up by this quote:

> [T]he waterbed effect is not an inevitability, it is a political choice. The neutralisation of additional abatement could be allowed by a Minister who wants net emissions to reduce no faster than existing emissions budgets. But the waterbed effect could be mitigated by a Minister who chooses to harmonise emissions budgets, ETS unit supply settings and emissions reduction plan measures as an integrated package.[75]

The waterbed effect is not a political choice. The political choice is where to set the ETS cap. After that, arithmetic not politics decides overall emissions[76] regardless of other policies. Harmony, integration and political choices are not enough to get around the neutralising effect of a binding emissions cap.

What if the government cannot tighten the ETS cap without other policies?[77]

HM argue that the waterbed effect is avoided by linking policies with the emissions cap. Our response is that this strategy only creates the illusion that policies reduce emissions. If the government can reduce emissions by tightening the cap without other policies (and do better because the cap that is not constrained by other policies that will generally if not always be more cost-effective than if the cap that is combined with other policies[78]) then other policies have no more effect on overall emissions than heart surgery. The link to policies is arbitrary.

But what if the government cannot tighten (i.e. lower) the emissions cap without the help of other policies? That is, what if complementary policies create the conditions which allow the government to set the cap more tightly than it otherwise could? HM do not expressly make this argument. However, the Climate Change Minister has said:[79]

> As you know, the ETS has a flexible, five-year rolling cap, so emission reductions achieved through other policies like the CCD [Clean Car Discount] can be factored in when the cap is set. The CCD and ETS are complementary because **they each achieve something the other cannot**. [Emphasis added]

Shaw believes complementary policies will allow the government to set a tighter cap than would otherwise be possible with only the ETS.[80]

But why? What would prevent the government from lowering the cap by enough to reach emissions targets if removals and offshore mitigation are affordable and available in unlimited quantities? And how do complementary policies, which generally cost more than the ETS, help? Will complementary policies not *prevent* the government from setting a tighter cap?

Shaw's claim is surprising, and much rests on it being true. After all, if the government can reduce emissions at a lower cost using without complementary policies, then the government's vast programme of complementary policies is worse than useless. Shaw's claim must not only be true sometimes but true generally in order to justify the government's strategy.

Shaw makes two implicit claims which must both be true for complementary policies to lower overall emissions:

- **Implied claim 1:** Before emissions targets are reached, further tightening of the emissions cap will become politically infeasible; **and**
- **Implied claim 2:** Combining the ETS with complementary policies allows a tighter emissions cap to be set compared to the ETS alone.

Neither of these implied claims from Shaw are credible.

Shaw's first implied claim is almost certainly untrue. As we have said, Parliament recognises removals and offshore mitigation lower net emissions. Both are affordable. Both are available in effectively unlimited quantities.[81] It is therefore difficult to imagine any circumstances where a future government will find itself permanently unable to reduce net emissions to deliver and maintain targets. The government has said it intends to use offshore mitigation to help deliver obligations under the Paris Climate Agreement, which makes our point.

In effect, Shaw's first implied claim treats statutory targets as far more difficult than they are.

Shaw's second implied claim is less plausible than the first. Even if the government is ever in a position where it cannot reduce net emissions any further, it is hard to see how complementary policies can help. On the contrary, high-cost complementary policies are more likely to cut *fewer* emissions than the ETS alone.[82]

To explain why, we must introduce the ideas of *political capital* and *political efficiency*. Political capital is support among voters for emissions policies. Political efficiency refers to the rate at which emissions policies consume political capital as they reduce emissions. Policies tend to "consume" voter support as they must impose costs and disruption on voters as they reduce emissions.

A government exhausts its political capital if it cannot find a majority for further tightening of the cap or for other actions outside the cap (for example, offshore mitigation) to lower emissions.

If the reason why voters oppose tightening is due to the effect on their cost of living or quality of life, then it is difficult to see how complementary policies which are more expensive than the ETS are any solution. If cost constrain the cap, and complementary policies cost more, then combining the ETS with complementary policies will cut emissions by less than the ETS alone, not more.

A possible counter to this argument is that complementary policies will lower the clearing price of the ETS, and this price reduction creates room for further tightening than would otherwise be possible. It is true that complementary policies can be expected to lower the ETS price.[83] But complementary policies will only do so by drawing from the same pool of political capital as the ETS. So a lower ETS price does not necessarily mean more room to cut emissions, it would mean less room to cut emissions. The question is whether complementary policies or the ETS make better use of political capital. If complementary policies are less politically efficient than the ETS, then combining the ETS with complementary policies could cut less emissions than the ETS alone.

HM point out that complementary policies can expand the pool of political capital. We agree. Their observation is consistent with the fact that governments around the world are politically rewarded for their climate change policies.

If complementary policies boost the pool of political capital but burn political capital at a higher rate per tonne abated, this implies a breakeven point. This is, there is a scale at which each complementary policy consumes the political capital it added to the pool when it was introduced. This breakeven point is where Shaw's claim that complementary policies allow a tighter ETS cap ceases to be true. The location of this breakeven point for each policy is important. If it is close to zero – that is, if complementary policies exhaust the political capital they introduced after reducing emissions by only a 'small' amount (however defined) – then at best combining the ETS with complementary policies will achieve only a small further reduction in emissions, with the real possibility of *raising* emissions.

It is important to remember that these permutations around Shaw's second implied claim only become relevant if Shaw's first claim (the government is in a position where

it cannot tighten the emissions cap without complementary policies) is true. As we have said, we see no plausible way for Shaw's first implied claim to be true under the targets Parliament has set. So the complicated permutations around Shaw's second implied claim are likely moot.

In any case, our goal here is not to made a definitive case either way. Our aim is to show how much has been left unsaid by the government (and HM) about how its climate change strategy works, and to demonstrate how many things must go right before the government's strategy cuts its first extra tonne of emissions. The government's climate change strategy is a bad bet, more likely to raise emissions than lower them.

The real problem, however, is the total absence of rigour behind the government's vast climate change strategy. For years, a small army of officials has worked at the public's expense on emissions policies that cannot reduce emissions. Officials know this. Public servants should work for the public not against it. Now the country is about to commit current and future generations to ruinously expensive policies that will do little if anything for climate change. This is an historic public policy failure. Those responsible should be accountable.

The stockpile and price stability mechanism do not puncture the waterbed

While HM accept the waterbed effect would be 100% effective if the ETS were a "pure quantity instrument," HM believe the ETS is a "hybrid instrument" due to the stockpile of emissions units and the price stability mechanism in the ETS. They believe these elements partly or totally prevent the ETS cap from neutralising other policies.

New Zealand has a stockpile of 141 million emissions units, equal to near two years-worth of gross emissions from this country.[84] This is a hangover from the last decade when imported overseas units were surrendered in place of New Zealand Units (NZUs) until 2015.[85] NZUs do not expire and can be stored or banked indefinitely. HM argue that banking means emissions reductions by complementary policies today may postpone offsetting increases in emissions elsewhere:

> It is far from certain that units freed up by abatement activity will be used by others to emit more **in the near term**…[86]
> …
> But does this [banking of units] not simply mean that the waterbed effect will occur across time, as stockpiled units trickle back into secondary markets in the future?[87]

[Emphasis added]

HM cite EU rules which postpone the release of emissions units according to the number of banked units. In effect, this links the cap to the stockpile, similar to linking the cap to policies.

HM believe the ETS's new price stability mechanism also circumvents the waterbed effect. The mechanism was introduced with the ETS reforms in 2020. It releases emissions units when a certain price threshold is reached during unit auctions. Releasing units raises the emissions cap and helps price stability.

HM's arguments for both the stockpile and the price stability mechanism are re-hashed versions of the idea that harmonising policies with the cap avoids the neutralising effect of the cap. Their view also reflects a misunderstanding of how the waterbed works. The waterbed effect does not depend on a fixed (i.e. unchanging) cap *per se*, but from the fact that complementary policies free up emissions units but leave the pool of available emissions units unchanged. It is the size of this pool that determines overall emissions. The waterbed effect is not interrupted

by linking the cap to the size of the stockpile or the ETS price or anything else. Even if the cap changes over time, complementary policies still free up emissions units which leads to higher emissions elsewhere. This is what neutralises complementary policies.

Even if tying the cap to price stability or the stockpile links complementary policies with the cap, that does not mean complementary policies lower emissions for the reasons we have already covered. This merely repeats the misattribution error we discussed in the previous section. The cap is doing the work, not the complementary policies. Provided the government can tighten the cap without complementary policies – whether by linking it to a stockpile or prices at auction makes no difference – the waterbed effect remains 100% effective.

Takeaway 6

There is no general way to avoid the waterbed effect. If a binding emissions cap determines total emissions then other policies under a binding cap cannot change total emissions. While it is possible to imagine exceptions to this rule, they appear very unlikely. The government's Emissions Reduction Plan will have little or no effect on overall emissions.

The incoherence of the market failure justification for complementary policies

HM believe the ETS is affected by market failures and this justifies complementary policies. This is a common justification for other policies alongside the ETS among policymakers. However, officials rarely define market failure, or consider its consequences for the design of complementary policies, or take seriously the parallel idea of government failure. As a result, complementary emissions policies do not have any connection to the market failures that justified those policies in the first place.

Market failures are various imperfections that get in the way of consumers responding optimally to the ETS's incentives. They include consumer mistakes due to irrationality or limited information or myopia.[88] Market failures make the ETS less effective, the story goes, which means the ETS needs help.

What is so strange about the market failure argument, despite its ubiquity in policy circles, is that it does not support the case for complementary policies in the way almost everybody seems to think it does. To see why, we must first explain some of the detail of how the ETS works, before considering how market failures play out in that process.

Box 4: How the ETS lowers emissions

The ETS caps the quantity of net emissions from most of the economy. The ETS excludes agriculture, so the cap covers about 96% of GDP though only around half of gross emissions. The government controls the cap. The ETS finds the emissions price that is necessary to bring emissions within the cap.

The government sets the ETS cap according to the number of emissions permits it issues. Each permit entitles its holder to emit one tonne of CO_2 (or equivalent). Permits are tradeable. Each year, businesses must obtain enough permits to cover the emissions that they or their customers produce, one permit for each tonne of emissions.

They can buy permits on secondary markets or directly from the government. The government also gives permits to trade-exposed businesses. Having obtained the permits they need for the year, businesses surrender their permits back to the government. There are steep penalties for

Box 4 (continued)

non-compliance. The ETS works on a principle of taxing each tonne of emissions once as it passes through the supply chain. Apart from forestry, only about 300 businesses directly participate[89] in the ETS.

The ETS price is the market price for permits. This price is the cost of emitting a tonne of greenhouse gases. Businesses add the cost of permits to the price of their goods and services. The ETS raises the price of products in proportion to their emissions, changing the relative price of different products. For example, the ETS has twice the effect on the price of coal as natural gas because coal produces about twice the emissions per unit of energy as gas. The ETS covers nearly everything in the economy – electricity, petrol and diesel, domestic flights, public transport, most food. Even your morning coffee.

It is this change in relative prices due to the ETS that brings down emissions. The ETS encourages households and businesses to shift their spending to goods and services that have lower emissions. It can bring forward coal boiler replacements; encourage electricity to be generated from gas rather than coal, or geothermal, wind and solar rather than gas; and encourage people to replace flights with Zoom meetings. The ETS makes EVs more attractive to more people. The ETS works through prices. It can reduce emissions from households that have never heard of the ETS.

The ETS works on a simple feedback loop which raises the cost of emissions until enough consumers have shifted their spending and lowered their emissions to bring emissions within the cap. Consumer mistakes do not break this process. For example, a business might keep burning coal even though the ETS has made it in the interests of that business to change fuels. But emissions still come down because the ETS price will rise further until somebody else cuts their emissions instead. **The ETS does not depend on perfect consumers with perfect information to lower emissions.**

Now let us introduce market failures into the process.

Market failures cause consumers to maintain their spending or behaviours when it is in their interests to change. For example, Jane and Joe's indifference to their car's running costs beyond this year (myopia) leads them to buy another petrol car when it would be better for them to buy an EV instead. Jane and Joe keep producing emissions.[90]

However, Jane and Joe's myopia does not stop the ETS from reducing emissions. Emissions still come down to the cap since there are only a limited number of emissions permits available. In effect, Joe and Jane's myopia means the ETS keeps searching for other places to lower emissions. The ETS price must rise (a little) further until someone, somewhere else changes their spending or behaviour by enough to bring emissions down to the cap.

The upshot is that market failures do not prevent the ETS from reducing emissions to the cap. Instead, market failures raise the ETS price higher than would otherwise be necessary to achieve the required reduction in emissions. Market failure causes the ETS to skip affordable opportunities to lower emissions and rely on less affordable alternatives instead.

So, the problem with market failure is not that it stops the ETS from cutting emissions but that it makes emissions targets more expensive.

Market failure opens the door for complementary policies to come in and fix what the ETS missed. Complementary policies can force emissions reductions in places the ETS skipped due to market failure.

Thus, complementary policies that successfully target and solve market failures will lower emissions at less cost than the ETS.

In practice, however, complementary policies are overwhelmingly more expensive than the ETS, costing somewhere between 5 to 10 times more per tonne of abated emissions on average than the ETS.[91] This is a sure sign that complementary policies are not successfully targeting or solving the market failures that justified those policies in the first place. If the problem with market failure is that it makes emissions targets more expensive, high-cost complementary policies make that problem worse. Far from solving the market failure problem, complementary policies exacerbate it.

Market failure implies deviations from perfection by consumers when they make spending decisions. It does not imply some blanket inability of the ETS to lower emissions. Market failure creates specific opportunities for complementary policies to come in and fix what the ETS missed. However, policymakers use market failure as a blank cheque to do virtually anything with complementary policies. We see no attempt by policymakers to target policies at where market failures have occurred. It is not clear officials even realise this implication of their market failure logic. Climate change policies look less like an attempt to solve problems and more like a free-for-all.

We consider government failure in the section beginning on page 36.

Takeaway 7

Market failure makes emissions targets more expensive. Policies that target and solve market failures would cut emissions at less cost than the ETS. In practice, none do.[92] Far from solving the market failure problem, complementary policies exacerbate it.

New Zealand is different

HM argue that combining the ETS with other emissions policies is in line with the approach in other countries. HM point to an international consensus for this mixed approach:

> …the consensus for many years now, namely that the deep decarbonization of our economies essentially requires a comprehensive and disruptive policy package that includes carbon pricing among other measures, such as technology-specific support schemes.[93]

The case for other policies must consider local factors. Each policy should be justified on its merits case-by-case, taking into account of existing policies especially the ETS.

The ETS makes New Zealand different from other countries. It is probably the most comprehensive cap-and-trade system in the world. It covers most of the government's non-ETS policies and most if not all the new policies which will be introduced later this year. In other countries where emissions pricing is patchy, non-pricing policies can usefully fill the gaps where pricing does not go. In those countries, a mixed approach makes more sense. New Zealand's comprehensive ETS cap leaves few opportunities for other emissions policies to help, and weakens the case for a mixed approach more generally.

So New Zealand should not necessarily take the same approach as other countries. We are different. The New Zealand ETS is a world-leading system for which the Ministry for the Environment and other responsible agencies deserve praise. But policymakers have been too slow to see how a comprehensive ETS cap narrows the useful scope of complementary policies.

That brings us back to the need justify policies case by case. There is no blanket case for complementary policies any more than there is a case for only using the ETS to lower emissions.

Box 5: What if removals are not permanent?

Removals technologies capture and store greenhouse gases from the atmosphere. From a climate change perspective, each tonne of removals has the same benefit as one less tonne of gross emissions. Removals technologies include exotic forestry, and many other existing and promising technologies.

But what if the emissions captured and stored by these technologies could be released back into the air at some point? For example, forest fires make trees an impermanent way to store emissions. In the five years to 2020, wildfires burned an average of 5,600 hectares each year in New Zealand.[95] The Australian wildfires of 2019–20 burned 7.4 million hectares and may have released 830 million tonnes of CO_2.[96] Other removals technologies could also turn out to be less permanent than expected. Impermanent removals is clearly relevant for successful delivery of emissions targets.

Source: Carbon News/InsideClimateNews.org

Emissions accounting systems can make the carbon stored in combustible trees effectively permanent. The ETS is an emissions accounting system. When fires occur, forest owners are obliged to report it. The ETS assigns a liability to the owner of the forest to make good on the emissions released in the fire. The owner can either recapture the released carbon by replanting the burned area, or take actions that reduce emissions elsewhere, for example, by purchasing emissions units and surrendering them back to the government.[97]

The end result is that forest fires do not raise overall emissions. The ETS requires compensating actions when fires occur. This is the power of emissions accounting – the ability to turn flammable trees into permanent stores of carbon.

The robustness and permanence of emissions reductions by EV subsidies and other complementary policies is also relevant to emissions targets.

Unfortunately, HM give only a general nod to the principle that non-ETS policies should be fit for purpose when they say "just because non-pricing policies are justified, this does not mean that any non-pricing policy is justified."[94] We agree, but wonder what HM thinks the test for complementary policies should be.

Complementary policies are no solution

Apart from its false premise of the alleged need for "deep decarbonisation," the case for complementary policies is little more than a list of actual or potential problems with the ETS and the implicit promise that complementary policies solve those problems. But will they?

Consider the implicit promises made for complementary policies in these passages from HM:

> [T]his is not a matter of abandoning the efficiency criterion. It is a matter of replacing a static conception of efficiency that is biased toward the present for a dynamic conception of efficiency that stretches across multiple decades…

> the challenge is how to induce change in spite of the self-reinforcing tendencies of systems. Socio-technical transitions are nonlinear processes of change that result from interactions between the growth of niche innovations, the weakening of incumbent systems, and increased pressures from the wider social, economic and cultural landscape…
>
> Insofar as emissions pricing creates inequitable burdens, it therefore results in unjust transitions…
>
> For low-income households, inelasticity entails regrettable trade-offs in household spending; meanwhile high-income households might also be inelastic to price, because they can afford to bear the additional carbon costs.

These examples imply complementary policies will take a long-term view; make sense of overwhelming complexity; deliver a just transition; overcome whatever factors stop households from responding to the carbon price; and do all of this in a way that is politically feasible.

We are not as optimistic as HM. On the contrary, we find it hard to see how complementary policies will deliver any of these implied promises given: officials expressly reject cost and effectiveness as the primary goals of climate change policies;[98] officials have mostly abandoned cost-benefit analysis; officials see lower emissions as one of many goals for climate change policies; the performance of emissions policies is rarely checked after they are launched; and most complementary policies are subject to the ETS cap and cannot reduce overall emissions. In these circumstances, it would be surprising if complementary policies work at all. Government failure deserves more attention.

The fundamental problem for complementary policies is that they are so ineffective. Complementary policies consume many times more resources than the ETS to abate each tonne of emissions.[99] They hold no obvious advantage over pricing on any other policy dimension, including equity. And complementary policies do not generally scale, which matters for a problem like net zero.[100]

Here is a list of actual or potential problems with existing policies. For each problem, consider whether complementary policies are the best solution (more simple/less costly/less risky/more direct) or any solution at all:

- **Reduce net emissions:** Complementary policies cannot reduce net emissions from under the ETS cap.[101]
- **Reduce emissions for a lower cost than the ETS:** In most if not all cases, complementary policies have a higher cost of abatement per tonne of emissions than the ETS.
- **Avoid too many exotic trees:** Trees could turn out to be a real problem under existing policies.[102] However, complementary policies are an indirect, costly and risky way to manage that problem. A better (direct, low-cost, low-risk) solution is a cap on afforestation or reduced rewards for forestry in the ETS. Complementary policies could ultimately plant more trees due to their high cost and political inefficiency.[103]
- **Raise gross emissions' contribution to the fall in net emissions:** Complementary policies can drive down gross emissions and may increase the relative contribution of reductions to the fall in net emissions. However, if the goal is to increase the contribution from reductions, the high cost and political inefficiency of complementary policies means they are probably not the best way to do this. A better way to raise the contribution from reductions is by capping afforestation or removals more generally. This would raise the ETS price, lower the share of removals, and increase the contribution from reductions. Limiting removals is simple and direct

way to encourage reductions, and exploits the greater cost-effectiveness and political efficiency of an emissions price.

- **Target transport emissions:** We have said transport emissions are a non-problem in view of statutory targets. In fact, targeting transport is strongly counterproductive to a goal of reducing national net emissions. Even if lower transport emissions is an appropriate end goal, we would expect an emissions price to cut more emissions from transport than policies like EV subsidies or Feebate. We do not disagree with HM that emissions pricing is ineffective in transport, but we think complementary policies are worse. The factors which prevent pricing from working well in transport will constrain complementary policies by more, again due to the cost and political inefficiency of complementary policies.[104]
- **Manage inequality:** The ETS is probably mildly regressive but complementary emissions policies are a terrible way to solve that problem. Their high cost and indirect and complicated effects on distribution make complementary policies wholly unsuited to managing equity. The better approach is to combine the ETS with a specialised re-distribution policy, either a carbon dividend or changes to the tax and welfare systems. A dedicated transfer policy is a simple, direct, low-cost, low-risk way to manage equity.
- **Deliver justice, inclusivity, and other nice-sounding outcomes:** We doubt high-cost complementary policies help these outcomes. How do subsidies for new EV buyers paid for in part by levies on second-hard vehicles deliver justice or inclusivity? How do higher electricity prices and blackouts deliver justice or inclusivity? In 2019, the Interim Climate Change Committee estimated the 100% renewable electricity policy could raise electricity prices by 40% and cause 100 times more blackouts.[105] Expensive, ineffective, often regressive complementary emissions policies are not just or inclusive.

On their own, imperfections in the ETS do not make the case for complementary emissions policies. Policymakers must always choose between imperfect alternatives. A complementary policy is justified where it does better than any alternative in some way. It is not clear there are any problems in climate change that complementary policies solve better than any alternative.

None of this means we think the ETS should work alone. There is a case for other policies alongside the ETS which we consider in Chapter 3.

HM's case for complementary policies is essentially this: Policies that cut emissions at 5 to 10 times the cost of the ETS, developed by institutions that expressly reject cost and cost-effectiveness as the main considerations for climate policies, which misconstrue or ignore the wording and consequences of statutory targets, and do not understand how an emissions cap affects other policies, will not only defy arithmetic to cut emissions from under a binding emissions cap, but will deliver justice, equity, inclusiveness, progressivity and recognition as well. HM ask us to take it on faith that the costs of complementary policies and the outcomes from them will fall on the population in a way that is more fair and politically sustainable than existing policies, not because of any analysis showing this – in most cases, there isn't any – but because of… good luck? HM's case is not wholly convincing.

Other arguments for complementary policies

Other dubious arguments for complementary policies by HM include:

- Emissions pricing can motivate least-cost emissions reductions and "[t]his is the logic of marginal abatement cost (MAC) curves."[106] MAC curves are an analytical tool that have nothing to do with emissions pricing.
- HM cite compelling evidence that a carbon dividend is highly progressive – households receive $780 million but spend only $94 million on petrol/diesel – only to dismiss a dividend because it does not solve all problems. "If the only thing at stake were inequity, a climate dividend ought to provide a substantive solution… [I]f the primary purpose of the carbon dividend is to enhance political legitimacy of emissions pricing, then it is not obvious that a carbon dividend alone will succeed…"[107] (Then why hold distribution against the ETS in the first place?)
- Having shown a dividend is strongly progressive, HM then imply inequality is not that important after all: "Why not use auction revenues to reduce systematic barriers to low emissions transition?"[108]
- The ETS was not designed with justice, equity, inclusivity, the politics of redistribution, and the politics of recognition in mind, say HM. But neither are most other public policies. They deliver those outcomes by doing their job well. Hospitals help deliver justice and equity by making sick people well; schools by educating our kids; and emissions policies by lowering emissions.

HM raise no similar concerns about complementary policies, an apparent double standard.

Summary

HM's argument for complementary policies is based on a need for drastic actions ("deep decarbonisation") that does not exist. Parliament has made no commitment which requires great sacrifices. No complementary policy is necessary. Every policy is a choice. Existing policies already have this country on track to emissions targets. The government could choose not to inflict policies like Feebate on households living on low incomes and with few alternatives, and be certain of reaching net zero emissions. The government operates as if this country is in a desperate position where it must try every conceivable policy and hope enough policies stick to reach targets. But that is not the position this country is in. Instead, this country can choose the combination of reductions, removals and offshore mitigation it will use to reach net zero. Official advice strongly suggests New Zealand will reach net zero years before 2050.

The government's strategy looks dubious from every angle. Complementary policies cannot lower emissions under a binding emissions cap other than in exceptional circumstances. If the government wants to limit trees or the use of removals more generally, EV subsidies and other complementary policies are a poor way to do it. Better to just limit removals. If the government wants to manage equity, transfers are a better solution than Tesla subsidies and other complementary policies. The same factors which constrain the ETS also affect complementary policies. The question is not how much will complementary policies further lower emissions, but whether policies make better or worse use of financial and political capital than the ETS.

New Zealand has more pathways to net zero than we need. We have choices. Yet the government's climate change strategy is based on the premise that we need to do more. But existing policies are enough, so the task now is to find *better* policies, not more of them.

CHAPTER 3

A case for alternative policies

Opposition to the government's complementary policies is not opposition to all policies besides the ETS. The ETS is not perfect. It could end up planting more trees than voters would like. It is incomplete. It is somewhat regressive. There is a case for alternative policies besides the ETS – just not the policies the government is considering.

The case for other policies alongside the ETS is that they help in some way. Policies should either reduce emissions (which requires they are outside the ETS cap); reduce emissions for a lower cost than the ETS; or ameliorate unwanted outcomes from existing policies better than alternative solutions.

Few if any of the government's complementary policies are likely to meet this test. Here some alternative policies that do.

First, we think changes should allow the government to decide the balance of reductions versus removals.[109] This is a legitimate political judgment which should be made via the transparent trade-off between competing political preferences for gross reductions against the cost of living consequences. Currently, the balance of gross reductions and removals is mostly determined by the relative economics of reductions versus removals via exotic trees, a trade-off which heavily favours trees.[110] Elected governments should be able to directly influence this balance to protect public support for emissions policies.

Second, the government should be able to place an upper bound on the domestic carbon price without compromising progress towards emissions targets. The ETS price has quadrupled in the last two years. Somewhat surprisingly, this increase has not led to a public backlash so far. Under current settings, the government only has indirect control over the ETS price via emissions budgets.[111] These are quantity controls, which influences the ETS price indirectly. The government cannot generally change emissions budgets in the short run. The ETS price is mostly determined by trading on secondary markets. If the ETS price were to double next week (or halve), there is little the government could do.

This lack of control over the domestic carbon price arguably threatens emissions targets. With nearly three decades until 2050, there may come a time when volatility in the carbon price compromises public support for ETS and perhaps climate change policies more generally. That is why we believe there is a case for changes that give elected governments a way to limit the domestic carbon price without compromising emissions targets.[112]

Third, there is a case in principle for a policy that corrects for the regressive effects of the ETS. Complementary emissions policies are a poor way to manage equity given their indirect and complicated relationship with distribution. Transfers are a simple, direct way to manage distribution, either a carbon dividend that recycles ETS revenues back to households, or changes to tax or welfare systems.

We also see a role for a category of policies which we call *enabling policies*. These policies would remove red tape which prevent the ETS from exploiting affordable opportunities to reduce emissions. Enabling policies let the ETS work better. The principle behind enabling policies is to level the playing field so that technologies compete on their merits. A level playing field

supports discovery of the most cost-effective ways to reduce emissions.

Enabling policies make emissions targets more affordable by expanding the available pathways to lower emissions, improving discovery.

Enabling policies might include:

- Planning reforms to remove rules that make it unduly difficult to build renewable generation especially wind farms;
- Wholesale electricity market rules that penalise distributed generation;
- Removing any barriers to international technology trials in this country; and
- Enabling legislation for carbon capture and storage.[113]

Like complementary policies, enabling policies will be neutralised by the ETS cap. Unlike or all complementary policies, enabling policies reduce emissions at less cost than is otherwise possible. These savings justify enabling policies.

Conclusion

HM have written probably the most comprehensive case for complementary policies produced in this country. Their paper documents the informal shibboleths that are the foundation for the government's climate change strategy, and the basis for sweeping new policies the government will introduce later this year. HM's well-referenced paper documents all of the main arguments and received wisdom we have seen or heard for complementary policies.

Our review of HM, and the clear alignment of their argument with statements by ministers and officials, leads us to conclude the government has no case for its climate change strategy. Ministers and officials will say their new policies are necessary and deliver progress towards emissions targets. Neither claim is true. The government's strategy cannot avoid climate change or protect future generations if it does not lower emissions. Whether in climate change or any other area, expensive but ineffective policies harm those who are least able to protect themselves. Future generations will not thank us for saddling them with more debt, more red tape, and lower incomes in return for no improvement in emissions.

The government should reconsider its climate change strategy. Specifically, it must rigorously show how its complementary policies can lower emissions from under the new emissions cap it introduced in 2020. We are confident the government cannot show this. It should abandon its current strategy and consider alternatives.

Our disagreement with HM is not about whether to only use the ETS or how well the ETS works. There is no case to only use the ETS *per se*. Like all policies, the ETS is imperfect and its effectiveness remains unclear. Our disagreement with HM comes down to offsets. HM's case for complementary policies is essentially that gross emissions should come down by more than the ETS alone can deliver. Our response is that Parliament has not committed to lower gross emissions. Its commitment to net emissions recognises offsets as legitimate. Offsets are available in effectively unlimited quantities. New Zealand can make reasonable or best efforts to lower emissions without resorting to draconian measures and safely deliver emissions targets. We see no way to avoid the conclusion that complementary policies, "deep decarbonisation" and other disruptive policies are optional but not necessary. Parliament's emissions targets have already been secured. Regardless of whether existing policies including the ETS cut emissions by a little or a lot, offsets will be there to bridge the gap to net zero and other (net) emissions targets. Drastic actions only buy a different mix of reductions and removals. Successful delivery of targets is not in question. High-cost complementary policies could end up *raising* gross emissions and increasing reliance on offsets. The government should be clear about these things. We doubt the government would find much support for its expensive, regressive emissions policies if it were clear those policies have no effect on overall emissions and are unnecessary.

Our other disagreement with HM is that complementary policies can reduce emissions under a binding emissions cap. They cannot, and not just because of the ETS cap, but because the climate change policy system has become a politicised juggernaut, that is disinterested in, and if not incapable of, delivering policies that work. The system looks broken: not focused on net emissions; not checking whether most policies work; disconnected from its governing

legislation; and willing to mislead the public almost daily. We cannot share HM's confidence that complementary policies will deliver when they come from a compromised process lacking any rigour.

It is hard to avoid the impression that the case for complementary policies is a ruse, designed to manufacture demand for more government action rahter than to reduce emissions. Here are the main elements of the scheme:

1. **Misrepresent emissions targets by declaring decarbonisation, transition and behaviour change as necessary.** Treat targets as if Parliament has committed to reduce gross not net emissions. "[W]e must eventually pick all of the apples on the tree."[114] Talk down removals and offshore mitigation. Never quote the text of statutory targets.
2. **Change reality with repetition.** Say "the ETS is not enough" at every opportunity. Declare decarbonisation, transition and behaviour change as the goal. This manufactures the need for complementary policies.
3. **Ignore or discredit every alternative to decarbonisation, transition and behaviour change.** Consider absurd alternatives (e.g. ETS alone with no other policies, only plant trees). Misrepresent what existing policies will do ("we will cover every square inch of the country in trees"). Ignore or misrepresent analysis that shows existing policies will deliver net zero. Treat existing policies as if they "do nothing".[115]
4. **Label the ruinous costs of your strategy and expected voter opposition as "barriers" to be overcome, rather than as a signal that your strategy is uncompetitive, unnecessary and above all undemocratic.**
5. **Make climate change about more than emissions.** Attack existing policies for not solving social problems, including inequality and historical Treaty grievances.[116]
6. **Ignore policy failure.** Imply complementary policies solve every problem with existing policies. But do not make the claim expressly and avoid specifics. Ignore that your criticisms of the ETS's costs, effectiveness, and distributional outcomes also apply to complementary policies. Question the political feasibility of the ETS while overlooking protests against complementary policies before they launch (e.g. last year's nationwide marches against the "Ute tax").
7. **Dismiss the waterbed effect as theoretical or "outdated".**[117]
8. **Be vague.** Demand "action" and "climate justice", not "lower emissions".
9. **Misrepresent your opponents.** Call them ideologues. Question their motives. Say they think the ETS is perfect.

To avoid doubt

We support the commitment to lower net emissions.

We oppose expensive, regressive, ineffective policies that force unnecessary pain on New Zealanders. We oppose misleading and untrue statements by ministers and public servants in support of those policies.

APPENDIX 1

Evidence that existing policies will deliver net zero emissions by 2050

Official studies and other research and evidence suggest New Zealand is already on track to achieve net zero emissions in 2050:

- The Climate Change Commission estimated a $50 ETS and current policies will deliver net zero emissions by 2050 or shortly after.[118]
- The Ministry for the Environment (MfE) says a $50 ETS will lead to 4.7 million hectares of afforestation by 2050. That is approximately four times more area than the Climate Change Commission estimates is required to reach net zero with existing policies.[119]
- Other New Zealand studies estimate ETS prices in the range $85–$127 will deliver net zero emissions in 2050.[120]
- Offshore mitigation is effectively unlimited and, with so many options, it is difficult to believe this country will have any trouble finding and securing affordable options.[121]
- There are a variety of carbon capture and storage technologies, besides trees, which remove emissions for less than US$120/tonne.[122] New technologies are coming on line.[123]

None of this is to suggest New Zealand should rely solely on removals and offshore mitigation to deliver emissions targets. However, access to affordable, scalable, robust and legitimate offsets secures emissions targets. The government does not need to resort to high-cost, disruptive emissions policies in order to deliver emissions targets.

APPENDIX 2

Further analysis based on Climate Change Commission's modelling

Note: At the time this Appendix was drafted the ETS price was $68.

Analysis by the Climate Change Commission in 2021 found existing climate change policies will deliver net zero emissions from about 2050, and in a way that is affordable and without relying unduly on removals by forestry. Unfortunately, the Commission chose not to make these findings clear in its final report to the government.[124] The purpose of this Appendix is to show that existing policies, including the ETS, already have New Zealand on track to deliver net zero emissions affordably and feasibly based on the analysis by the Climate Change Commission. This is relevant context to the case for further climate change policies.

Based on the Commission's analysis, we use three scenarios to reveal the track that existing policies have New Zealand on.

Table 4: Description of three scenarios

	Scenario A	Scenario B	Scenario C
ETS price	$50	$68	$68
Net emissions in 2050	0.5 Mt	-10.5 Mt	0.0 Mt
Achieves net zero emissions from year	2051	2044	2050
Limits removals	X	X	✓

Scenario A is taken directly from the modelling results from Chapter 6 of the Climate Change Commission's final report. The Commission's base case, used to compare outcomes of the policies in its "demonstration path", assumes existing climate change policies and an ETS price of $35 through to 2050. The Commission tested a modified version of this base case with an ETS price of $50. The Commission found that at $50, net emissions of long-lived greenhouse gases fall to (nearly) zero by 2050.[125]

Scenario A is this modified base case from the Commission but with one adjustment. For unknown reasons, the Commission's modified base case assumes zero further afforestation after 2050. As a result, net emissions turn positive again in the mid-2060s (see Figure 6.4 in the Commission's final report). In Scenario A, we adjust the Commission's analysis to allow enough planting after 2050 to maintain net emissions (of long-lived greenhouse gases) at or below zero indefinitely.

Scenario B is based on Scenario A but with an ETS price set to $68 rather than $50. To estimate the effect of this higher ETS price on gross emissions and removals, we looked at the reported change in outcomes as the Commission increased the ETS price from $35 to $50 in its modelling. From this we inferred the sensitivity of outcomes to price changes, and used this sensitivity to estimate the change outcomes as the ETS price increased from $50 (Scenario A) to $68 (Scenario B). This admittedly crude approach provides results which should be considered only indicative.

Our analysis found the Commission's modelling makes forestry about 12 times more responsive to changes in the ETS price than gross emissions. Raising the ETS price to $68 leads to heavy

afforestation but only minor further reductions in gross emissions. As a result, New Zealand reaches net zero early in 2044 in Scenario B.

Scenario C retains the $68 ETS price but caps forestry removals at a level that just achieves net zero in 2050.

Results

Table 5 summarises findings for Scenario A. Existing policies and an ETS price of $50 delivers and maintains net zero emissions from about 2050 affordably and without excessive reliance on forestry. According to the Commission, gross emissions fall by a third by 2050 with existing policies, despite a 26% increase in the New Zealand population, and by more than half by 2070. Reductions in gross emissions are responsible for 39% of the fall in net emissions by 2050 and more than 60% of the fall in net emissions by 2070 under existing policies. Transport emissions fall 52% by 2050 and 87% by 2070 with existing policies.

Far from "covering every square inch of New Zealand in trees" or displacing the sheep and beef sectors, existing policies plant an area equal to 7% of existing farmland by 2050, about 3% of New Zealand's land area.

Table 5: Results from existing policies at $50 ETS (Scenario A)

	Gross emissions [126]	Removals	Net emissions 2050	Gross reduction share of net reduction	Reduction in gross emissions	Area of exotic forests	Δ in area of exotic forests	% farms converted
2019	48.6Mt	-7.4Mt	+41.3Mt			1.87MHa		
2050	32.6Mt	-32.1Mt	+0.5Mt	39%	-33%	2.71MHa	+0.85MHa	7%
2070	23.1Mt	-23.1Mt	0Mt	62%	-52%	3.01MHa	+1.14MHa	10%

As far as we can tell (the Commission's report is unclear in some places), the Commission's analysis includes the following conservative assumptions:

- 100% of carbon in harvested trees is returned to the atmosphere, which forces trees to use the largest possible land area.
- The $50 ETS price only applies to forestry, energy and transport. Agriculture faces a lower carbon price.
- Zero use of offshore mitigation.
- Zero use of other carbon capture and storage technologies, including soil sequestration, direct air capture, and coastal capture technologies.

Accordingly, the estimated level of afforestation should be seen as something close to a worse-case scenario. For example, if New Zealand used offshore mitigation for 5% of the reduction in its net emissions, it would avoid planting around 60,000 hectares of farm conversions, about 0.5% of current farmland.

Scenario B (Table 6) considers outcomes from existing policies but with the ETS at its current price of $68 in 2050. Arguably, this scenario is conservative in the sense that a higher ETS price is likely by 2050 (the ETS price has since risen to $86 in February 2022). Nevertheless, based on the Commission's analysis we estimate the effect of existing policies at an ETS price of $68 on gross emissions and removals. The higher ETS price has only a marginal effect on gross emissions. The effect on forestry is more pronounced. At $68, the ETS plants an area equal to 10% of existing farmland by 2050 and

19% of farm land by 2070. As a result, gross reductions make a smaller relative contribution to the fall in net emissions (compared to Scenario A with the ETS price at $50), only 32% by 2050 and 38% by 2070.

Increased afforestation and the reduction in gross emissions mean:

- New Zealand will reach net zero emissions by 2044;
- By 2050, New Zealand's net emissions of long-lived greenhouse gases will be negative (-10.5 million tonnes per year in 2050); and
- By 2070, New Zealand's net emissions of *all* greenhouse gases, including biogenic methane, will approach zero.

This third finding suggests (near net zero emissions for all greenhouse gases by 2050 with the ETS at $68) suggests New Zealand can fully deliver on its emissions obligations without exposing agriculture, this country's largest export sector, to an emissions price. This important potential finding does not appear to have been seriously considered by the Climate Change Commission.

Table 6: Results from existing policies at $68 ETS (Scenario B)

	Gross emissions	Removals	Net emissions 2050	Gross reduction share of net reduction	Reduction in gross emissions	Area of exotic forests	Δ in area of exotic forests	% farms converted
2019	48.6Mt	-7.4Mt	+41.3Mt			1.87MHa		
2050	32.0Mt	-42.5Mt	-10.5Mt	32%	-34%	3.04MHa	+1.18MHa	10%
2070	22.7Mt	-50.0Mt	-27.2Mt	38%	-53%	4.04MHa	+2.18MHa	19%

The third scenario, Scenario C (Table 7), assumes a $68 ETS but introduces a new policy, a cap on planting of exotic forests. The cap is set such that net zero emissions is achieved on time in 2050 and maintained after that.

Limiting new planting of exotic trees under a $68 ETS price raises the relative contribution of gross emissions to the fall in net emissions, a goal some people find attractive. In Scenario C, reductions in gross emissions are responsible for 40% of the fall in net emissions by 2050 and 63% of the fall by 2070. Land equal to only 7% of farm land is planted in exotic trees by 2050, and 10% by 2070. As with other scenarios, these estimates of land area planted in forestry should be seen as something of an upper bound, since there is zero use of offshore mitigation and only forestry, transport and energy are confronted with the $68 ETS price, but not agriculture. Relaxing one or more of these conservative constraints is likely to plant fewer trees.

Table 7: Results from existing policies at $68 ETS with removals capped (Scenario C)

	Gross emissions	Removals	Net emissions 2050	Gross reduction share of net reduction	Reduction in gross emissions	Area of exotic forests	Δ in area of exotic forests	% farms converted
2019	48.6Mt	-7.4Mt	+41.3Mt			1.87MHa		
2050	32.0Mt	-32.0Mt	0Mt	40%	-34%	2.71MHa	+0.84MHa	7%
2070	22.7Mt	-22.7Mt	0Mt	63%	-53%	2.99MHa	+1.13MHa	10%

Conclusion

The Climate Change Commission's analysis of existing policies is possibly the most comprehensive to date. However, it is not definitive. There remains considerable uncertainty about the sensitivity of gross emissions to the ETS price. The recent increase in the ETS price is likely to resolve some of this uncertainty over the next two to three years. However, as the best available evidence on the balance on reductions and removals that existing policies will deliver, the Commission's analysis shows us on track and that we will not "plant our way to success."

The Commission's analysis shows that the country does not need to plant an overwhelming area of trees to deliver emissions targets. No more than a small fraction of arable land needs to be planted. Trees capture known quantities of emissions per hectare each year, so it is straightforward to show how many hectares need to be planted to reach net zero. The amount of land required for forestry is too small to pose a material threat to agriculture, and any risk can be ameliorated with relatively minor adjustments to existing policies without compromising targets.

Officials and ministers should desist from scaremongering and avoid further false claims about "planting our way to success" on emissions targets in support of complementary policies.

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Endnotes

1 Intergovernmental Panel on Climate Change (IPCC). "AR5 Climate Change 2014: Mitigation of Climate Change," Working Group III Contribution to the Fifth Assessment Report (Cambridge University Press, 2014).

2 The New Zealand ETS excludes agriculture. This is a major exclusion in emissions terms but less important in policy terms. Most of the government's climate change policies are subject to the ETS cap.

3 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," Working draft paper (16 November, 2021). Hall and McLachlan subsequently published a shorter version of the paper in *Policy Quarterly* (Volume 18, Issue 1) pp. 4-13. This report refers to the working draft.

4 HM do not distinguish between complementary and alternative policies. Their paper rebuts the view that no other policies besides the ETS are necessary, so there is no need to distinguish complementary and alternative policies in their paper.

5 Long-lived greenhouse gases are all greenhouse gases except biogenic methane. Section 4 of the *Climate Change Response Act 2002* defines greenhouse gases as carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); any hydrofluorocarbon; any perfluorocarbon; and sulphur hexafluoride (SF_6).

6 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 23.

7 Ibid. 13.

8 Ibid. 23.

9 HM repeatedly refer to "deep decarbonisation" in their report but do not define this crucial term, perhaps due to its use in the literature they cite. Deep decarbonisation presumably refers to reductions in gross emissions (we discuss the difference between gross and net emissions below). HM imply the ETS is not enough on its own to deliver deep carbonisation. HM (p3) state, "deep decarbonization of our economies essentially requires a comprehensive and disruptive policy package". HM do not define other terms including "transformative change," "low-emissions transition," and "technological transition." The meaning of these terms matters because they form the problem definition in HM's argument i.e. the list of things that existing policies will not deliver and which complementary policies are supposed to solve. In our view, terms like transition embed a normative political judgment that is contrary to the goal of reducing net emissions and carries substantial but mostly hidden consequences for living standards.

10 Ministry for the Environment, "Transitioning to a Low-Emissions and Climate-Resilient Future: Have Your Say and Shape the Emissions Reduction Plan" (Wellington: New Zealand Government, 2021), 54.

11 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 9.

12 Ibid. 10.

13 Ibid.

14 Ibid.

15 Ibid. 12.

16 An emissions cap determines net emissions only from its area of coverage. The cap neither determines emissions nor neutralise other emissions policies outside the cap's coverage. In New Zealand, agriculture is excluded from the ETS cap (though farmers still pay ETS charges in petrol and diesel prices and milk processing). In addition, the cap must be tight enough (i.e. set low enough) to constrain emissions. We discuss this further below.

17 Ibid. 16.

18 HM do not make clear how the cap could be linked with policies. A direct link might measure the performance of individual policies and reduce the cap tonne-for-tonne. HM may have in mind a less direct approach where policies create the conditions that allow the government to set a tighter cap than would otherwise be possible. The details of how the link works does not change the story.

19 Ibid. 1.

20 Ibid. 4.

21 New Zealand Government, "Joint Leaders' Statement on the launch of the 'Agreement on Climate Change, Trade and Sustainability' Initiative" (September 2019), https://www.beehive.govt.nz/sites/default/files/2019-09/ACCTS%20joint%20leaders%20statement.pdf.

22 James Shaw, "Govt will continue to show climate leadership," Press release (Wellington: Ministry for the Environment, 14 November 2021).

23 Megan Woods, "Speech to Carbon and Energy Professionals NZ," Speech (Wellington: New Zealand Government, 26 May 2021).

24 New Zealand Government, "A Vision for Hydrogen in New Zealand," Green Paper (Wellington: 2019).

25 New Zealand Government, "Powering NZ's future with biofuels," Press release (Wellington: 15 December 2021).

26 Ministry for the Environment, "Transitioning to a Low-Emissions and Climate-Resilient Future," op. cit.

27 Ibid. 57.

28 Climate Change Commission, "2021 Draft Advice for Consultation" (2021), 11.

29 Climate Change Commission, "2021 Draft Advice for Consultation" (2021), 11.

30 James Shaw's tweet, https://twitter.com/jamespeshaw/status/1405028431897661444?s=20.

31 It is possible HM also take Shaw's position but that is not clear from their paper. Later in this paper, we consider Shaw's claim and show why it is almost certainly untrue.

32 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," Final report (2021), 214.

33 Ibid.

34 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," op. cit. 213.

35 "Long-lived" gases refers to all greenhouse gases except biogenic methane. Other targets include a net emissions target under the Paris Climate Agreement, due in 2030, and a biogenic methane target due in 2050.

36 Section 4 of the *Climate Change Response Act 2002* formally defines "offshore mitigation" as "emissions reductions and removals, or allowances from emissions trading schemes, that originate from outside New Zealand; are expressed as a quantity of carbon dioxide equivalent; are robustly accounted for to ensure that, among other things, double counting is avoided; and either (i) represent an actual additional, measurable, and verifiable reduction or removal of an amount of carbon dioxide equivalent; or (ii) are an emissions trading scheme allowance that triggers the reduction of carbon dioxide equivalent."

37 See United Nations, "The Paris Agreement,"https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

38 *The Climate Change Response Act 2002* only recognises offshore mitigation if it is "robust". At all times in this report, we refer only to genuine offshore mitigation.

39 Section 5Z(1) of the *Climate Change Response Act* states, "Emissions budgets must be met, as far as possible, through domestic emissions reductions and domestic removals." The Act does not define "as far as possible." The threshold could be anywhere from what is economically efficient to what is physically possible regardless of costs. The government has recently said it intends to use offshore mitigation to help achieve the Paris climate obligations due in 2030. Even a very high threshold for access to offshore mitigation does not change our argument. If "as far as possible" is interpreted in a way that effectively bans offshore mitigation, the *Climate Change Response Act 2002* puts no limit on the balance of domestic reductions and removals, nor on how and where reductions occur within the economy. There are many possible pathways to net zero via domestic sources only. Even with a strict interpretation of "as far as possible," the government can still choose the level of gross emissions that delivers net zero, with domestic removals to make up the difference. Thus, complementary policies remain unnecessary.

40 *The Climate Change Response Act 2002* authorises the Executive to set emissions budgets that can affect the balance of reductions versus removals.

41 Join Maynard Keynes coined the term animal spirits. See https://www.economist.com/media/pdf/animal-spirits-akerloff-e.pdf

42 Based on expected net emissions for 2022 by the Climate Change Commission in their final emissions budget with existing policies and a $50 ETS (data for Figure 6.4).

43 New Zealand is small relative to the world. Net emissions of all greenhouse gases in all sectors is around 55 million tonnes (Ministry for the Environment, "New Zealand's Greenhouse Gas Inventory 1990–2019" (Wellington: New Zealand Government, 2019)). The US National Academies of Sciences, Engineering, and Medicine estimates potential global removals per year at 30 gigatonnes, about 550 times annual net emissions from New Zealand. The Academies also estimate the available global stock of removals at 1670 gigatonnes, more than 30,000 times New Zealand's annual net emissions. The Academies study only considered removals opportunities using existing technologies and which removal emissions for less than US$100 per tonne. Later in the paper, we argue New Zealand also has effectively unlimited domestic opportunities to remove emissions, including but not limited to exotic afforestation. We do not argue New Zealand should rely only on removals to lower net emissions. However, if New Zealand has the option to secure effectively unlimited access to removals domestically and/or offshore, then drastic efforts to reduce gross emissions are not necessary to achieve emissions targets.

44 Subject to the condition that section 5Z of the CCRA requires emissions budgets are met via domestic reductions and removals "as far as possible." We discuss this condition further in endnote 83.

45 More correctly, net zero is a commitment that gross emissions will not be greater than offsets from 2050.

46 Later in the report we estimate the required contribution from exotic forestry under existing policies based on analysis from the Climate Change Commission.

47 Again, with the caveat that section 5Z of the CCRA requires domestic reductions and removals "as far as possible." See endnotes 44 and 83.

48 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 1.

49 Ibid. 23.

50 Ibid. 12–13.

51 HM do not define "deep decarbonisation." The implied definition of deep decarbonisation is that it is more than what existing policies emissions will deliver, either in terms of quantity of reductions or they occur. Thus, HM's case for complementary policies is not only based on an invented premise (the need for deep decarbonisation, transition, etc.). Their argument is arbitrary and circular. If "deep decarbonisation," justifies further emissions policies, and that term means more than existing policies can deliver, then further policies are always justified.

52 The Commission's report included more than two dozen of recommendations under the titles "necessary actions" and "time-critical necessary actions." None of the recommended actions were or are necessary to deliver emissions targets. The government's climate change strategy is based on misconstruing the text of the legislation. Climate Change Commission, "2021 Draft Advice for Consultation," op. cit.

53 Matt Burgess, "How much land do we really need to plant with trees?" Great Society (24 August 2021), https://greatsociety.nz/2021/08/24/how-much-land-do-we-really-need-to-plant-with-trees/

54 Matt Burgess, "Did Rod Carr mislead the Environment Committee?" Great Society (10 December 2021), https://greatsociety.nz/2021/12/10/did-rod-carr-mislead-the-environment-committee/

55 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit.

56 Based on standard carbon capture rates per hectare for exotic forestry from the Ministry for the Environment, and analysis by the Climate Change Commission in 2021.

57 Other reasons why New Zealand will never be entirely covered in exotic trees: as forestry expands land prices will be bid up to the point further planting becomes uneconomic; there are alternative removals technologies which are less land-intensive; permanent post-harvest sequestration avoids the need for further afforestation; local and central government policies will limit planting; innovation (e.g. improved EV technology) will reduce reliance on removals over time; and about one-third of New Zealand land is protected.

58 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," op. cit. 91. The Commission found existing policies and a $50 ETS achieves net zero emissions by 2050 or early 2051. At the time of writing (15 March 2022) the ETS spot price is above $70 and forward contracts to 2026 are above $80, implying existing policies will deliver net zero emissions before 2050.

59 As at 15 March 2022. See https://www.commtrade.co.nz/

60 Ibid.

61 Based on analysis from the Climate Change Commission for "Ināia Tonu Nei: A Low Emissions Future for Aotearoa." We explain the calculations later in this chapter.

62 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," op. cit. 12.

63 In its analysis of existing policies with a $50 ETS price, the Commission's model assumed no further planting of exotic trees after 2050 (see Figure 6.4 of the Commission's final report). We can see no explanation for why the Commission assumes this. As a result, net emissions become positive again in the mid-2060s. The results in Table 2 modify the Commission's analysis to allow enough exotic trees to be planted after 2050 to maintain net emissions at or below zero indefinitely.

64 These estimates of required area of land for exotic forests are based on standard rates for carbon capture by exotic forests from the Ministry for the Environment, and conservatively counts only the emissions captured by the first rotation of trees. These estimates differ from the Commission's estimate of required land area for exotic forests.

65 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," Final report (2021), 91.

66 This remark, or words to this effect, was made in passing by an official from the Climate Change Commission during a conference call in 2021 to explain its modelling work.

67 The Commission made a number of conservative assumptions in its analysis that is likely to boost the area of land which forests need to cover to achieve targets. The Commission assumes: 100% of carbon in harvested trees is returned to the atmosphere; the $50 ETS price only applies to forestry, energy and transport but not agriculture, which pays a lower carbon price; zero offshore mitigation; limited or no use of other carbon capture and storage technologies, including soil sequestration, direct air capture, coastal capture technologies, and carbon capture and storage in geological formations.

68 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 10.

69 Interim Climate Change Commission (2019), Accelerated Electrification, 30 April, Wellington. https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/interim-climate-change-committee-reports/

70 Ignoring the neutralising effect of the ETS cap. Domestic transport is covered by the cap.

71 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," op. cit. 65.

72 Jamie Morton, "Govt reveals new cap, emissions budget, in ETS reform," *The New Zealand Herald* (2 June 2020).

73 A binding emissions cap causes a positive carbon price. A positive price reflects the relative scarcity of emissions rights due to the cap. A non-binding cap produces a zero carbon price. If there are more emissions rights (i.e. ETS units) than emissions, then rights are not scarce which is reflected in a zero price.

74 In this table, "emissions" refers to overall net emissions of greenhouse gases only from the parts of the economy subject to the emissions cap. The red boxes highlight the two scenarios that HM compare.

75 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 16.

76 Provided the cap is binding. Overall emissions refers to emissions from the cap's coverage area.

77 We wrote a version of this analysis in our submission on a discussion document by the Ministry for the Environment in 2021, https://www.nzinitiative.org.nz/reports-and-media/submissions/submission-transitioning-to-a-low-emissions-and-climate-resilient-future/

78 Policies act to constrain where emissions can come down under the cap. These constraints force second-best options in terms of cost per tonne performance. Tightening the cap without other policies allows unconstrained discovery of least-cost opportunities to reduce emissions. Emissions come down by the same amount with or without other policies. However, we expect tightening the cap without other policies will reduce emissions for a lower cost per tonne.

79 See James Shaw comment earlier in this report on page 13.

80 Context suggests Shaw's reference to "achieve something" means lower net emissions. However, it could conceivably refer to something else, perhaps reductions in transport emissions. Vagueness is a theme in climate change (see the conclusion).

81 The legislation requires domestic reductions and removals "as far as possible". Although the threshold the quoted term sets is currently clear, "as far as possible" must allow offshore mitigation if the alternative is failure to meet targets. Even if offshore mitigation is effectively ruled out, domestic removals (which includes but is not limited to exotic forestry) are affordable and almost certainly sufficient on their own to deliver emissions targets. Accordingly, Shaw's first implied claim is almost certainly untrue.

82 Note that the various permutations around Shaw's second implied claim only become relevant if Shaw's first implied claim – the government is unable to tighten the cap enough to reach targets – is true. Provided the government can tighten the cap without other policies, then complementary policies can neither raise nor lower emissions and Shaw's second implied claim is moot.

83 Since complementary policies which reduce emissions lower the demand for emissions units. This lowers the ETS price that is necessary to achieve a given reduction in emissions, other things being equal.

84 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 14.

85 Leining, Catherine and Suzi Kerr (2018), "A guide to the New Zealand Emissions Trading Scheme," *Motu Economic and Public Policy Research, August*. https://www.motu.nz/assets/Documents/our-work/environment-and-agriculture/climate-change-mitigation/emissions-trading/ETS-Explanation-August-2018.pdf

86 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 14.

87 Ibid. 15.

88 Market failure is not a state of affairs that politicians or officials do not want. Market failure has a technical definition in economics. In its final report on emissions budgets, the Climate Change Commission included a list of market failures: imperfect or asymmetric information; uncertainty about future emissions prices; split incentives; bounded rationality and myopia; barriers to accessing capital; infrastructure lock-in; network externalities; policy co-ordination or regulatory failure; co-benefits or other externalities; innovation and learning spillovers. While it is pleasing to see the Commission acknowledge the existence of policy failure, there is nothing to suggest that idea influenced their advice. See Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," op. cit. 216-218.

89 Meaning surrender obligations. A greater number of businesses have reporting obligations under the ETS. See Environmental Protection Authority, "Participants in the ETS," (web site) https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/ets-reports/participants/

90 A question we do not get into here is how to separate market failure explanations for purchasing from the informed exercise of preferences. Jane and Joe may just prefer to drive a Navara rather than a Leaf. Policymakers must be able to distinguish market failure from non-failure explanations for purchasing decisions. Policies which override decisions that are not the result of market failure lower wellbeing.

91 Matt Burgess, "Switched On!" op. cit.

92 We are aware of analysis that shows some domestic policies can abate emissions for a negative cost. We do not consider these estimates credible.

93 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 3.

94 Ibid. 23.

95 Fire Emergency/Scion, "New Zealand Wildfire Season Summary 2019/2020 Wildfire Season, Updated July 2020" (2020).

96 Adam Morton, "Summer's bushfires released more carbon dioxide than Australia does in a year," The Guardian (21 April 2020).

97 We briefly cover ETS surrender obligations on page 33.

98 For example, see Climate Change Commission (2021), "Insight: Why not the 'least cost' pathway to net zero?" https://www.climatecommission.govt.nz/news/insight-2/

99 See New Zealand Initiative (2019), *Switched On!*, Wellington.

100 This year, the ETS will cover about 96% of economic output (not emissions) for an administrative cost of less than $7 million (Treasury, *Vote Environment 2021/22*). On scalability, the ETS and complementary policies are in different leagues.

101 Earlier we identified a possible exception to this rule. However, this depends on a combination of circumstances which we consider highly unlikely.

102 We acknowledge proposed changes to exclude exotic forestry from the ETS announced on 3 March 2022.

103 We discuss political capital and efficient use of political capital from page 31.

104 This is a fundamental weakness in the case for complementary policies. Even if for argument's sake the ETS is not enough to deliver emissions targets, it is not clear how complementary policies are any solution unless there is reason to believe those high-cost policies make better use of political capital per tonne abated than the ETS. This seems implausible. Neither HM nor any official source we have seen acknowledges the risk that complementary policies could raise emissions relative to existing policies or a no-complementary policies counterfactual.

105 Interim Climate Change Commission (2019), *Accelerated Electrification*, 30 April, Wellington. https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/interim-climate-change-committee-reports/

106 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit.

107 Ibid.

108 Ibid.

109 We acknowledge the government's proposal to remove exotic forestry from the ETS, announced on 3 March 2022. The proposal is exceptionally misguided. The government effectively proposes something close to a ban on exotic forestry from 2023. We suggest an adjustable cap on forestry or removals generally so that governments can dynamically adjust the balance of reductions and removals over time.

110 See Ministry for the Environment (2020), "Marginal abatement cost curves analysis for New Zealand: Potential greenhouse gas mitigation options and their costs," Wellington. https://environment.govt.nz/publications/marginal-abatement-cost-curves-analysis-for-new-zealand-potential-greenhouse-gas-mitigation-options-and-their-costs/

111 In its current form, the price stability mechanism offers little if any protection from rapid price changes.

112 The government can cap the domestic ETS price without compromising emissions targets by expanding the "backing" rule that is part of the ETS price stability mechanism. This rule requires the government sanitise any units it issues to defend the ETS price cap if those units are additional i.e. not already in the emissions budget. That requires the government take some action to offset the extra emissions from the additional units. Expanded use of this mechanism would allow the government to set and defend a maximum domestic carbon price without raising global emissions. We suggest these changes as a way to manage risks to the political consensus for the ETS. We note these changes are desirable but not necessary. Existing policies can deliver emissions targets as Parliament has defined them.

113 See Barton et al (2013), *Carbon Capture and Storage: Designing the Legal and Regulatory Framework for New Zealand: Report for the Ministry of Business, Innovation and Employment*, Wellington; and Productivity Commission (2018), Low Emissions Economy: Final Report, page 449.

114 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 13.

115 Matt Burgess, "Why so angry?" Great Society (24 July 2021).

116 Catherine Leining, "Insight: Why the ETS alone won't get us to net zero emissions" (Climate Change Commission), Press release (n.d.).

117 David Hall and Robert McLachlan, "Why emissions pricing cannot do it alone," op. cit. 14.

118 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," op. cit. section 6.3, 91. The Commission argued the ETS is not enough due to concerns about reliance on forestry. The Commission's demonstration path plants almost as many hectares of trees as current policies, but with a higher proportion of native trees. As far as we are aware, the Commission has not said it believes the outcomes from current policies are politically infeasible. Our impression is the Commission simply prefers different outcomes. Currently, the Commission's preferences do not determine the political feasibility of emissions policies.

119 Ministry for the Environment, "Marginal Abatement Cost Curves Analysis for New Zealand: Potential Greenhouse Gas Mitigation Options and Their Costs" (Wellington: New Zealand Government, 2020), 21. According to the Climate Change Commission, New Zealand only needs about 1.2 million hectares of afforestation to deliver net zero emissions. With the ETS at $68 at the time of writing, this evidence from MfE suggests we are comfortably on track for net zero emissions. MfE is looking at ways to allow the government to place limits on afforestation.

120 See, Yue Wang Basil Sharp, Stephen Poletti and Kyung-Min Nam, "Economic and Land Use Impacts of Net Zero-Emission Target in New Zealand," *International Journal of Urban Sciences* (11 January 2021); and Concept Consulting, Motu Economic and Public Policy Research, Vivid Economics, "Modelling the transition to a lower Net emissions New Zealand: Interim results" (Wellington: New Zealand Productivity Commission, 2018). Reported in Yue Wang, et al. (2021).

121 For example, US company Terraformation replants rainforest and can achieve removals for US$7/tonne. Terraformation, "We help plant native forests to reverse climate change," Website. Air New Zealand relies in part on offshore mitigation and charges approximately NZ$23/tonne for offsets.

122 For example, a study of Negative Emissions Technologies reports blue carbon removals technology can abate emissions for between US$0.75-U$4 per tonne. National Academies of Sciences, Engineering, and Medicine, "Negative Emissions Technologies and Reliable Sequestration: A Research Agenda" (Washington, DC: The National Academies Press, 2019).

123 To give one of many examples, the University of New South Wales has developed a chemical process that captures and stores CO_2 at an estimated cost of US$100/tonne. Neil Martin, "Liquid metal proven to be cheap and efficient CO_2 converter" (University of New South Wales, 13 October 2021).

124 Climate Change Commission, "Ināia Tonu Nei: A Low Emissions Future for Aotearoa," Final report (2021).

125 Based on the Commission's reported findings, we estimate their modelling shows existing policies with an ETS price of $50 would deliver net zero emissions in early 2051.

126 Long-lived emissions only.

Good news. New Zealand has the policies in place to deliver on its climate change commitments. Parliament has recognised affordable, scalable pathways to lower emissions. This secures our emissions targets. Existing policies including the Emissions Trading Scheme will deliver net zero emissions by 2050. Further climate change policies are optional but not necessary.

Yet the government is choosing to impose drastic policies that will increase cost of living pressures for Kiwis on the pretence that further action is needed. It is not.

The government does not need to add thousands of dollars to the cost of imported cars and utes, or threaten energy security by banning oil and gas exploration, or attack agriculture, the country's largest exporter, to meet its climate change obligations.

Only by ignoring genuine, legitimate and affordable ways to lower emissions can the government maintain the fiction that further sacrifices are needed. This pretence of necessity is cover for expensive, ineffective and often regressive policies that could not possibly survive any test of their merits: they have none.

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