

Farms, forests and fossil fuels: The next great landscape transformation?

Report overview

March 2019



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Overview for policymakers

This is a report about a different approach to framing New Zealand's long-term climate change targets and policies and what that could mean for our landscapes. It is, in particular, about how we might deal with our agricultural greenhouse gases and our forest sinks in a joined up way and deal with fossil carbon dioxide emissions separately.

Parliament is about to debate legislation that will set down a long-term emissions reduction target for New Zealand. Long term in this case means 2050. That would require agreeing to a target that can outlast the parliamentary careers of almost anyone currently elected to the House of Representatives. The framework that is established will cast a long shadow.

Meeting our long-term targets will require policies and innovations that have yet to be crafted. This is especially true for biological emissions from agriculture, which are to be addressed for the first time. Aotearoa New Zealand's landscapes have endured two centuries of upheaval. How we frame our targets with respect to biological sources and sinks will write the next chapter of landscape transformation.

My advice to Parliament last year was that advising on our long-term target should be the new Climate Commission's first task. It remains my advice. But the commission hasn't yet been established. So I have decided to provide some thoughts on the matter myself.

A declaration of interest - and responsibility

It might be appropriate to commence this overview with a declaration of interest. I am a heavy user of fossil fuel – like most New Zealanders, principally as a mobile citizen. I use planes and cars. I live on the farm on which I was born. My family has interests in farming and forestry. So I am part of both the fossil and the biological economies. Again, I share that with many New Zealanders. This report is not written in the abstract. It deals with the lives of all of us.

But in my case it doesn't stop there. I also have some responsibility for the way climate policy has evolved. At the national level I spent the 1990s as a Minister trying to understand what responding to first the United Nations Framework Convention on Climate Change and then the Kyoto Protocol meant for domestic climate policy in New Zealand.

I investigated taxes and emissions trading schemes. And I oversaw the development of a negotiating position that gave countries like New Zealand maximum flexibility in being able to treat all sources and sinks as essentially substitutable using a common metric. The basis of that approach could be summed up like this:

“It's the net contribution to the atmosphere of greenhouse gases that counts whatever the sources or sinks. In the interests of minimising the cost of reducing emissions, any mix of actions will suffice as long as the quantum of gases – adjusted for their radiative warming potential minus sinks – takes us on a downwards path.”¹

Coming up with a common metric was necessary to enable countries to compare their efforts in a standardised format. But in New Zealand's case it was also a matter of pursuing a mitigation policy at the least possible cost. And for New Zealand, forests provided the key low-cost pathway forwards. In the early 1990s, when we had large, new, rapidly growing plantation forests, we were very happy to count the carbon sequestration they represented into the equation. In fact, New Zealand's very first domestic target was developed on the basis that we would rely 20 per cent on emissions reductions and 80 per cent on forest sinks to meet it.

The approach was not without its critics. I recently dug out an address I gave 25 years ago in which I replied to one critic, Greenpeace, by saying: “Scientifically, it is incontrovertible that an atom of carbon locked up (sequestered) is as good as an atom of carbon not emitted into the atmosphere.”

I may have then qualified that by saying: “No one is arguing that sinks are the whole answer. Sinks won't last indefinitely – our credit is likely to run out by around 2020.” But I don't mind admitting that the sheer scale of forest sinks at the time (and the eternity that a date 16 years away represents when you're only 36) made offsetting a very attractive policy response.

¹Upton, 2018.

When challenged by the obvious criticism that we risked covering the country in trees and leaving fossil emissions untouched, I argued that they were a bridge to a low emissions future; that forest sinks represented a relatively low-cost approach while we waited for new technologies to be developed. As a country with some emissions that appeared very difficult to reduce – notably those from agriculture – it seemed a reasonable way forward.

But my responsibility doesn't stop there. Because about ten years ago, in the wake of the unsuccessful Copenhagen climate summit, I started to try to engage a global debate on the end-point to which climate change targets and policies should be directed. That led, in 2013, to a lecture I prepared that was delivered by the Secretary-General of the Organisation for Economic Co-operation and Development, in which he called for "the complete elimination of emissions to the atmosphere from the combustion of fossil fuels in the second half of the century".²

It was the first time a major world leader had made the link between what had been clear from climate science for at least 20 years and the need for a time frame in which policies would have to bite if the rise in global average temperatures were to be limited to no more than an increase of two degrees Celsius.

I remain as persuaded as I ever have been of the serious risk that human-induced climatic disruption poses, and the need for decisive action. What was a long-term risk management challenge has in the meantime become increasingly urgent as policy ambitions have fallen short of what is required. I bear my share of responsibility for that.

What has changed?

The Paris Agreement of 2015 changed the nature of the debate in two ways. It acknowledged for the first time the scientific reality that economies would need to decisively wean themselves from reliance on fossil fuels and within a time frame of only a few decades. Secondly, it gave up on the almost utopian quest for a globally determined, top-down allocation of national emissions quotas. Rather, it was left to nations to say how they would contribute to achieving a "balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century".³

It is this 'bottom-up' approach that jolted me to think about the differences between the gases that make up New Zealand's contribution to global warming, the integrity of forest sinks as an offset for fossil carbon dioxide emissions and the need to make progress across all gases within roughly five decades.

To date, the debate in New Zealand has always commenced from the same premises: that all greenhouse gas sources and sinks are fully substitutable, one for another;

²Gurria, 2013.

³Paris Agreement, Article 4.1, December 2015.

and that we must find the least-cost way of effecting the economic transition that emissions reduction targets require.

Putting the two propositions together generates a rather narrow landing space for policies – some sort of flexible pricing mechanism thereby incentivising an exploration for the least costly technological or management innovations wherever they may be found. If we can just generate the right emissions price, the market will do the rest.

That is certainly one way to tackle the problem. It has an elegance and simplicity that cuts through the complexity of a modern economy and limits the space for lobbying. And in our Emissions Trading Scheme (NZ ETS) we have the architecture for such an approach. The fact that we don't yet have an economy-wide price is often explained as a lack of political will – a reminder that whatever its market credentials, an emissions trading scheme is a creature of politics.

That is not a reason to reject it. But we should at least be open to the possibility that the underlying premises we have long taken for granted may not be unassailable, in particular the claim that all greenhouse gas sources and sinks are fully substitutable.

In many countries, where the combustion of fossil fuels provides the overwhelming majority of emissions, this is probably a subject of marginal interest. But in New Zealand's case, where a high share of our emissions come from biological sources and forests are perceived to be a lifeline in providing low-cost mitigation, it is a premise that deserves careful attention. It is one with which I used to be entirely comfortable. That is no longer the case.

I have come to the conclusion that our current premise is questionable. It attempts to condense the many different physical characteristics of the gases we produce into a single variable. Glossing over these physical differences becomes risky for countries with emissions profiles like New Zealand. While it would be nice if we could read a solution from the science, we can't. The planetary biogeochemical cycles we are interfering with are vastly complex and there will be plenty of surprises to come. But we do know that the gases aren't all the same.

While the way the current framework accounts for each gas may be convenient and serviceable, it isn't necessarily a sensible basis for long-lasting climate mitigation. It is for this reason that, in my view, New Zealand would be well advised to treat fossil and biological sources and sinks separately. That has implications for the way we define our long-term target and the policies we might pursue to reach it.

On the premise that targets and policies have to be achieved at the least practicable cost, I have fewer misgivings. Climate policies will impose costs. They will only be tolerated if the wider community considers them reasonable. So thinking about cost will always have to be front-of-mind.

The challenge, rather, is to understand what costs we are talking about, on whom they will be imposed and over what time frames. What are the risks that different

strategies run? The greenhouse gases we are seeking to constrain are responsible for more than just global warming. They affect other environmental challenges from the ozone layer to ocean acidification. Similarly, the trees we might plant to mitigate warming supply other environmental benefits as well. But because they have, in effect, to be maintained forever, we have to understand something about the options we are closing off.

The long-term consequences of different approaches to managing our greenhouse gases has led this report to focus less narrowly on warming, and rather more on what sort of transformation of our landscape we could be letting ourselves in for. The scale of the climate challenge is such that, should we meet it, the shape and structure of our economy will look very different regardless of the path we choose. That will be true of every society. Equally, if we fail to rise to the challenge, our economy and environment will also be transformed but in a much less pleasant way.

In New Zealand's case, given the biological nature of our economy, the way we respond to climate change will have physical, environmental, visual, cultural and social consequences that will be much more apparent than they might be in a more purely industrial or service-based economy. Climate is just one of a number of stressors that plague our landscapes. Water pollution, soil depletion, biodiversity loss and pest invasions are just some of the problems we are grappling with – and all of which climate change will exacerbate.

In addressing emissions reductions, we have to be aware of the knock-on consequences for these other environmental challenges. We also have to be aware of the families and communities, the whānau and the hapū who actually live in the places where we emit half our biological gases (methane and nitrous oxide) and contemplate storing our carbon waste. We need more than an accounting approach for our climate targets, and policy responses that better reflect the physical science and the risks we are willing to run.

The argument of the report

This is a lengthy report. A summary of the argument follows. In addition to describing a different approach to framing targets and policies, the full report compiles the results of a large amount of research. As such, chapters one to three are a compendium of research that can be referred back to if detailed explanations are called for. Readers wishing to explore the key policy-relevant findings should turn to chapters four to six.

Chapter one sets the scene by placing current decisions about climate policy in the context of New Zealand's history and development. From the very first moment of settlement – more recent here than anywhere else in world – humans have set about transforming the landscape in ways that have been unintended as often as they have been intended. In the process, we have profoundly changed the operation of the natural carbon cycle.

New Zealand's biggest contribution to global climate change so far has come from the vast quantity of carbon we have shifted from the land – its forests and soils – to the atmosphere. This still exceeds the volume of carbon dioxide we have emitted from the combustion of fossil fuels.

New Zealand has undergone a series of landscape transformations. At first there was deforestation driven by the needs of Polynesian and European settlers. Then, as New Zealand became connected to a global marketplace, changes to our landscapes started to be driven by consumers on the other side of the planet.

Further deforestation in pursuit of a pastoral economy became the driver. Reforestation was driven by the development of a plantation forest industry. Subsidies introduced to support agriculture ended up seriously distorting land use. Their removal led to another convulsion in our landscapes, followed by a new phase of intensification and diversification that continues to this day.

In short, New Zealand has witnessed a series of dramatic changes in land cover and land use, each of which has moved round large amounts of carbon. The way in which we go about responding to climate change will once again drive land use change and the way in which we intervene in the carbon cycle.

Chapters two and three seek to provide the reader with an up-to-date account of how science understands human activities to be changing the planet and how those activities have played out in New Zealand.

Chapter two describes the different physical characteristics of the three main gases contributing to anthropogenic global warming – carbon dioxide, methane and nitrous oxide. It describes the different biogeochemical cycles that shift carbon and nitrogen around the planet. I have described these in some detail to provide a resource for those interested in the complexities – of which there are many – and to support the conclusions that the report draws about the wisdom of simply regarding all sources and sinks as substitutable one for the other.

To understand their ongoing impact and any practical policy responses that may be available, it is necessary to consider how these gases come to be produced or co-produced and how their impacts relate to one another.

With the science described, **chapter three** describes the contribution carbon dioxide, methane and nitrous oxide have made to New Zealand's emissions profile over the last 200 years. It charts the course of two centuries of nearly constant land use change as different commodity booms and busts have shaped New Zealand's landscape.

While most attention is currently directed to agricultural greenhouse gases, land use change emerges as New Zealand's biggest contribution to global warming. More than 3 billion tonnes of carbon have been shifted to the atmosphere from the land, largely as the result of forest clearance to make way for agriculture. The approximate scale of warming associated with these changes is estimated to be around seven times larger than our contribution of fossil emissions.

Responding to climate change – and addressing a wide range of other environmental pressures – is causing New Zealanders to consider the way land is used and managed. One option is store more carbon on the land in trees. While there is no shortage of available land for reforestation, the way and the extent to which it is done will need careful consideration.

While forests can be long-lived, they cannot be regarded as permanent. Their increasing exposure to climate change impacts through fire, pests, pathogens and erosion, further underscores their impermanence. Given these risks and the uncertainty that attaches to their temperature benefits, heavy reliance on forest offsets comes with risks.

Chapter four broaches the core proposition that this report questions: should we, in setting emissions reduction targets and designing climate change mitigation policies, continue to regard all anthropogenic sources and sinks as fully substitutable for one another?

This current approach implies that it does not matter which gas is focused on as long as you have a handy means of equating the different lifetimes and potencies of the gases. The same logic underpins the premise that carbon sequestered and locked up in trees can fully offset the impact of carbon dioxide, methane or nitrous oxide emissions from any source.

While this may be appropriate for accounting purposes, the real-world differences between the main greenhouse gases suggest that the risks they pose aren't all the same. Two main problems with the current approach are identified:

- First, a single target that includes all sources and sinks renders the temperature outcomes of climate policies uncertain. If no specific target is set for gross fossil carbon dioxide emissions, emissions reductions of methane or nitrous oxide could be substituted for action on reducing fossil carbon dioxide. However, different combinations of reductions will not lead to the same temperature outcomes.
- Second, the fossil carbon dioxide emitted into the atmosphere has a warming effect for centuries to millennia. By contrast, the carbon stored by trees and other terrestrial ecosystems can be quickly released back into the atmosphere in the event of fires, pests or other disturbances. Continuing to emit fossil carbon dioxide on the basis that an equivalent amount of carbon is being sequestered by biological sinks therefore carries significant risks.

Furthermore, the extremely long-lived warming impact of carbon dioxide from fossil emissions is known with much greater certainty than the potential climate benefits of forest sinks.

These risks are examined at some length and lead to the conclusion that managing fossil emissions separately from biological sources and forest sinks would make

better sense. This alternative approach would involve separate targets for each group that reflect the risks their concentrations and warming effects pose to our ability to influence the global average temperature.

Fossil emissions need to be reduced to zero by the second half of the century. That should be the aim. Reducing them by only half that and claiming to have managed the problem by planting forest sinks to cover the rest is a poor alternative. Not only would the sinks need to be maintained in perpetuity, planting would have to continue as long as there were any residual emissions.

Different considerations apply to biological methane and nitrous oxide. Because they do not accumulate in the atmosphere in the same way that carbon dioxide does, they do not necessarily need to be cut to zero. This is fortunate because no proven negative emissions technologies currently exist that could do so. And critically, any food production, no matter how efficient, will result in some emissions of these two gases. But they do need to be reduced and a variety of mitigation options exist or are emerging that can be deployed.

The extent to which biological emissions need to be reduced involves a judgment about what level of warming is deemed acceptable. In this context, using forest sinks to offset biological emissions is more defensible. Biological methane, nitrous oxide and trees are part of biological cycles, and the duration of the benefits forest sinks can provide is roughly aligned with the duration of warming caused by methane and nitrous emissions.

As a general observation, regardless of the level of ambition of any emissions reduction targets chosen, their rationale and expected economic and temperature impacts should be made clear and explicit. If there are reasons why the temperature objectives and emissions reduction targets for fossil emissions and biological emissions are different, these should also be clearly stated.

Chapter five applies the conclusions of chapter four to New Zealand's circumstances. After considering the *current approach*, which, in the pursuit of a least-cost approach has treated all sources and sinks as substitutable, the *alternative approach* of separating the management of fossil emissions from biological emissions is tested. Modelling was carried out using the same models as those used by the Productivity Commission in its recent report on transitioning to a low-emissions economy. Where the Productivity Commission proposed a distinction between short and long-lived gases, the modelling exercise for this report compared the current approach with an alternative that separated fossil from biological emissions.

The least-cost objective that underwrites the current approach is questioned on the basis that while the short-run costs of relying heavily on forest offsets may be lower, they may be at the expense of delaying serious action on reducing gross emissions and leaving the country more vulnerable to the damage climate change is expected to inflict.

The modelling provides a feel for the long-term environmental and economic consequences of the two different approaches. The 2050 target year currently being considered by the Government was extended to 2075, which is in line with the general language of the Paris Agreement. There is nothing magic about 2050.

Not surprisingly, the big difference between the approaches – two separate targets and limiting access to forest sinks to offset biological emissions – produced important differences in outcomes. In the alternative approach, the cost of mitigation for fossil emitters is higher without access to forest sinks (even allowing for some access to international units). Biological emissions – which are modelled to be reduced by 20 per cent or 100 per cent below current levels on a net basis including forest sinks – face a lower cost of mitigation.

But the most striking difference in real-world outcomes is the extent of land use change. Unconstrained access to forest sinks in the current approach sees 5.4 million hectares of land switched to forest cover. Under the most stringent requirements the alternative approach sees a conversion of between 1.6 and 3.9 million hectares.

New Zealand is not exactly short of land. It can easily accommodate more forestry. But making all land potentially available for storing carbon (as a substitute for not emitting it) will inevitably limit land use choices and options. A different dynamic is at work if only biological emissions can be offset with trees.

Under the current approach, the physical, economic and social shape of the landscape will be determined by decisions taken in residential and industrial New Zealand and on our roads and in our skies, as well as by international commodity prices. Under the alternative approach, there would still be many more trees planted, but the landscape would be shaped by the industries and communities who currently live and work there.

The modelling suggests that any increase in forest area would be strongly skewed to three regions – Canterbury, Otago and Manawatū-Whanganui. Significantly, the two South Island regions are predicted to become more vulnerable to extreme fire risk, further underlining the risks that a heavy reliance on forest sinks might carry.

Modelling of the type undertaken inevitably paints a stark picture of winners and losers. Governments have to deal with real businesses and communities that cannot adapt overnight and consumers who will ultimately wear the inevitable costs that flow through into the cost of living. In the same way that the expected temperature impacts of targets should be able to be transparently described, credible transition pathways that are economically and socially sustainable also need to be able to be debated.

Transitional policies should aim to enable a steady transition – one in which emitters are neither overly disrupted nor so protected that there is no incentive to change.

For fossil emitters there are insights from the modelling that many new low-cost abatement technologies are available that will soon be commercially viable. For sectors lacking those technological pathways, a variety of possibilities exist to provide support

through international permits, some transitional ongoing access to forestry offsets or free allocations.

For biological emitters the introduction of an emissions price would need to be at a pace that would allow time to develop efforts to improve on-farm measurement to accurately estimate emissions at the farm level and deploy new management techniques.

Demand for forest offsets would come from biological emitters instead of fossil emitters in the NZ ETS. Land use change would be driven largely by landowners seeking to rebalance the natural capital on which they depend rather than a completely external grab for 'sink space' by the fossil economy.

Placing biological methane and nitrous oxide emissions together with forest sinks in the same policy 'basket', separate from fossil emissions, would underscore the fact that these biological sources and sinks are often co-produced and co-managed in New Zealand landscapes.

Treating them together has the potential to optimise both economic and environmental outcomes and provide the basis for a more integrated, landscape-wide approach to managing the environmental impact of New Zealand's land-based sectors.

Chapter six provides some feel for what the alternative approach might mean at the level of an actual catchment. As a case study, the two climate policy approaches described in chapter five we applied to the Hurunui catchment in Canterbury. The results of a mix of modelling and consultations are described, which try to highlight some of the economic, social and ecosystem consequences of the different approaches.

The case study was designed not just to show what impact the different approaches would have in purely climate mitigation terms, but also a wide range of economic and environmental outcomes, including changes in the productive use of land, employment, water quality, biodiversity and cultural and recreational values.

Unsurprisingly, both approaches see an increase in forest area. But the scales are very different, with the alternative approach potentially providing a much less monolithic change in land use with more socially and environmentally sustainable outcomes.

Building on these insights, the chapter develops some very preliminary thoughts on what a 'landscape-based' approach to managing climate and other environmental challenges could mean for our land-based industries and rural communities. This approach would see the landscape as more than just a place for storing carbon. Rather, it would focus on the landscape as a place in which a wide range of interrelated environmental, social and economic services are provided.

Making such an approach work would depend on being able to integrate all that we know about environmental processes at the landscape scale with bottom-up, grass

roots knowledge. That in turn relies on willing landowners and communities taking ownership of many problems currently associated with land use practices.

Ideas like this can remain just that – lofty ideas lacking a means of implementation. Fortunately, using emissions pricing as a way to incentivise changes to land use and land management provides an important source of revenue to facilitate the transition. Revenue from the pricing of biological emissions could be, in part, directed back to the landscapes and communities from which they came. That revenue could be used to support tree planting and related activities designed to reduce the risks of climatic and economic disruption.⁴

Some tentative conclusions

This report was written in part to challenge the premise that the current approach to thinking about target setting and climate policy is beyond question. That there are alternative ways to think about the issue, which would impose different costs and run different risks. Policymakers need to be prepared to test different approaches rather than accept without argument that ‘there is no alternative’. There are always alternatives.

In my judgment, removing access to forest sinks for fossil emitters would be prudent recognition that we do not know how to manage the risks of maintaining impermanent sinks over the timescales needed to match the long-term warming associated with fossil carbon dioxide emissions. It would send a strong signal that since carbon dioxide is the main driver of global temperature rise, serious climate action to tackle New Zealand’s gross fossil carbon dioxide emissions can be delayed no longer.

But forestry still has a vital role to play. Using forestry to offset biological emissions makes more sense, as forests and farms are part of the fast biological carbon cycle and nitrogen cycle, and the durations of the warming impacts of biological emissions are better aligned with the duration of the benefits of trees. And forestry can supply a wide range of other benefits.

Parliament will be asked to legislate for a long-term target or targets. In broad terms, that target must reflect the ambition of the Paris Agreement. What that means in a domestic context has now to be determined. Whatever target is chosen has to be durable over time. I have already recommended that final targets should only be enshrined in law once they have been carefully considered by the new Climate Commission. The recommendation of the commission provides the best chance that any target or targets can command enduring cross-party support.

I would simply note that the alternative approach developed in this report would enable a zero gross fossil emissions reduction target to be set for fossil carbon dioxide sometime in the second half of the century, with clear progress made towards this target by 2050.

⁴ The scale of the revenues is likely to be sizeable. For example, modelling the alternative approach in the Hurunui catchment suggested that between now and 2050, up to \$640 million could potentially be available to the catchment that generated it, if these funds were returned to this landscape alone.

This is not as daunting as it sounds. Over the last 50 years, we have seen cars change from heavy old gas guzzlers to electric vehicles that can travel over 500 kilometres on a single charge. We have seen the rise of solar and wind power at scales undreamed of half a century ago. It is no longer wishful thinking to imagine a future with zero fossil fuel emissions.

For biological methane and nitrous oxide, however, a different target could be set. As an agricultural leader, any action taken by New Zealand to mitigate biological emissions will be noted internationally. While the target level of emissions does not necessarily have to be zero, it has to relate to a temperature outcome that is scientifically defensible and one that we would argue other countries should aspire to. Whatever the level set for biological emissions, forest sinks are a legitimate source of mitigation.

Such an approach would make the rationale and expected economic and temperature impacts of any targets transparent in a way they are not under a net zero-all-sources-and-sinks approach. In very simple terms, New Zealand policymakers must decide whether they wish to score a net zero accounting triumph in 2050 (or some other target year) by storing carbon in forests over large areas of New Zealand; or, adopt a more ambitious approach to reducing fossil emissions and make a transparent statement about how far biological emissions should be reduced.

The current approach runs the risk that we will achieve net zero emissions with gross fossil emissions still running at around half today's level and still need more time and land to offset the balance well into the second half of the century.

Ultimately there is no avoiding a move to zero gross fossil emissions, since halting runaway climate change at any temperature level requires no further injections of fossil carbon to the atmosphere. Storing the waste from fossil emissions in forest sinks is simply delaying the inevitable.

When climate negotiations were in their early days that might have been a justifiable approach – although even then scepticism was expressed about whether the time that was being bought would be put to good use. The sceptics have been proved right.

Far from using the intervening years to push for significant decarbonisation of transport and industry, New Zealand has increased its gross fossil carbon dioxide emissions by 35 per cent since 1990. Furthermore, a net loss of 50,000 hectares of planted forests occurred between the passage of the Climate Change Response Act in 2002 and the end of the first commitment period of the Kyoto Protocol in 2012. Can we be so sure that 'this time it will be different'?

New Zealand must report and account internationally for its emissions using whatever metric is for the time being agreed. But how it goes about reducing them is entirely its business. After 25 years' debate about how to make progress there appears to be a widespread desire to do something.

What that ‘something’ involves has to be responsible in terms of the risks that are being run, must be delivered within a time frame that is manageable and take account of the country’s unique emissions profile. Targets and policies need to be informed by science and economics. This report tries to add to understanding under each heading. But it cannot replace the need for judgments that are ultimately ethical and political ones.

From this lengthy investigation I have just three recommendations for Parliament as it moves to consider the Climate Change Bill:

- Develop two separate targets for the second half of the century: a zero gross fossil emissions target to be legislated as part of the establishment of the new Climate Commission; and a reduction target for biological emissions to be recommended by the new Commission and subsequently legislated. A later date than 2050 would still be consistent with the Paris Agreement and should not be ruled out if that is considered to be a more credible and achievable time frame within which to effect such a significant economic transformation.
- Allow access to forest sinks as offsets only for biological emissions on a basis to be advised by the Climate Commission.
- Develop the tools needed to manage biological sources and sinks in the context of a landscape-based approach that embraces water, soil and biodiversity objectives.

Taking a landscape-based approach is all about how landowners and communities are incentivised to act. Policy tools will be needed that go beyond simple economic instruments or regulations. However, the use of emissions pricing revenues could be a powerful additional tool to support land users making significant changes to the landscapes they live in.

Finally, I would urge policymakers to focus steadily on the long term in setting these targets. There will be all sorts of compromises and trade-offs to be made in the early emissions budgets as the transition is commenced. There will inevitably be disagreements about emphasis and technique. But the long-term targets should not be held hostage to these arguments.

I am in no doubt about the scale of the challenge policymakers face. Any serious attempt, in good faith, to start the economic transformation required by climate change will have my support. I hope this report can assist a wide range of people to think about what that transformation could mean at the level of the landscape and the risks that need to be managed.



Simon Upton

Parliamentary Commissioner for the Environment

Tirohanga whānui

He pūrongo tēnei mō te ara hou ki te tāparepare i ngā whāinga panoni āhuarangi me ngā kaupapa here karioi o Aotearoa, ā, ka ahatia ō tātou horanuku. Inarā me pēhea tā tātou whakahaere ngātahi i ō tātou haurehu kati mahana ahuwhehua me ō tātou whakatotohu ngahere, ā, ka motuhake te whakahaere i ngā putanga hauhā mātātoka.

Ākuanei ka taupatupatu te Pāremata i te ture e whakarite ai i te whāinga whakaheke putanga karioi mō Aotearoa. I konei ko te tikanga o karioi ko te tau 2050. Arā, me whakaae ki te whāinga roa ake i ngā umanga pāremata o tata ki te katoa o ngā mea kua pōtitia ki te Whare o Raro ināianei. He roa rawa te ātārangi o te anga e whakatūria ai.

Kia tutuki ai i ō tātou whāinga karioi me kite i ngā kaupapa here me ngā auaha kāore anō kia hangaia. He tino tika tēnei mō ngā putanga koiora i te ahuwhehua, ākuanei tirohia ai mō te wā tuatahi. Kua rau tau ngā horanuku o Aotearoa e akaaka ana. Ko te ara tāparepare i ngā whāinga e pā ana ki ngā mātāpuna koiora me ngā whakatotohu e tuhi ai i te wāhanga hou mō te huringa horanuku.

Ko taku kupu āwhina ki te Pāremata i tērā tau ko te mahi tuatahi a te Kōmihana Āhuarangi ko te tuku kupu āwhina mō tō tātou whāinga karioi. Koinei tonu taku kupu āwhina. Engari kāore anō te Kōmihana kia whakatūria. Nā reira kua whakatatū au māku e tuku ētahi whakaaro mō te kaupapa nei.

He whakapuaki aronga - me te takohanga

He tika pea kia timata tēnei tirohanga whānui ki te whakapuaki aronga. He kaha taku whakamahi i te kora mātātoka – pērā i te nuinga o ngā tāngata o Aotearoa, te nuinga o te wā hei kirirarau hāereere. Ka haere au mā runga wakarererangi, mā runga motokā hoki. Ka noho au i runga i te pāmu i whānau ai au. Ka whaipānga taku whānau ki te pāmu me te ngāherehere. Nā reira, kei roto au i ngā ohaoha mātātoka me ngā ohaoha koiora. Nā, he ōrite tēnei āhuatanga ki ngā tāngata maha o Aotearoa. Ehara tēnei pūrongo i te tuhinga tūrehurehu noa iho. Ka pā atu ki ngā tauoranga o tēnā, o tēnā o tātou.

Mōku ake, kāore e mutu i reira. He haepapa pea tāku mō te whanaketanga o te kaupapa here āhuarangi. Ā-motu, i pau ngā 1990 hei Minita e whakamātau ana ki te māranga he aha te tikanga o te urupare ki te Anga Kāwenata Panoni Āhuarangi o te Rūnanga Whakakotahi i Ngā Iwi o te Ao, ka tahi, me te Tikanga o Kyoto, ka rua, mō te kaupapa here taiwhenua i Aotearoa.

Ka rangahaua e au ngā tāke me ngā whakangārahu hokohoko putanga. Ā, ka tirohia e au te whakawhanaketanga o te tūranga whiriwhiri i hoatu i te tāwariwaritanga whānui ki ngā motu pērā i Aotearoa kia āhei ai te whakamahi ōrite i ngā mātāpuna me ngā whakatotohu hei riwhi, tētahi mō tētahi, mā te whakamahi i te ine ōrite. E pēnei ana te whakarāpopoto o tēnā ara:

“Ko te tāpaetanga whakamau ki te kōhauhau o ngā haurehu kati mahana te mea nui ahakoa he aha ngā mātāpuna, ngā whakatotohu rānei. Ki te whakaiti i te utu o te whakaheke putanga, he pai ngā momo mahi katoa mēnā ko te nuinga o ngā haurehu – i whakaritea mō te āheinga hihinga whakamahana mā te tango i te whakatotohu – ka ārahi tātou ki te ara whakaheke.”¹

Me whakarite te ine ōrite kia tāea ai e ngā motu te whakarite i ā rātou mahi ki te hōputu ōrite.

Engari, i Aotearoa, he mea nui hoki kia whai i te kaupapa here whakamauru ki te utu iti rawa.

Ā, mō Aotearoa, ko ngā ngahere te huarahi utu iti ki mua. I te tīmatanga o ngā 1990, i a mātou ngā ngahere whakatō nunui e tere tipu ake ana, i koa mātou ki te kaute i te huna waro i tohua e aua ngahere ki te whārite. Tēnā, ko te whāinga taiwhenua tuatahi o Aotearoa i whakawhanaketia i runga i te whakaaro e 20 paihēneti ki te whakaheke putanga, ā, e 80 paihēneti ki ngā whakatotohu ngahere kia whakatutukihia.

Tērā ngā kaiwhakahē ki tēnei ara. Inakuanei i ketuketua e au tētahi kōrero i kōrero ai au i te 25 tau kua pahure ake nei, i whakautu au ki tētahi o ngā kaiwhakahē, Greenpeace, e pēnei ana: “Ki tā te pūtaiao, kāore e taea te whakahē i te kōrero he ōrite te ngota waro kua rakaina (hunaia) ki te ngota waro kāore i whakaputaina ki te kōhauhau.”

Tērā pea i pēnei taku here i taua kōrero: “Kāore tētahi e whakapae ana ko ngā whakatotohu te whakautu katoa. Kāore te whakatotohu e tū mō ake tonu atu – ka pau tō tātou nama kia tae ki te tau 2020.” Engari, kāore taku raru ki te whāki ko te tino whānui o ngā whakatotohu ngahere i taua wā (me te tawhiti atu o te tau e 16 tau ki mua i te wā e 36 ō tau) i āhuareka te karo hei kaupapa here urupare whakamanea.

I te wā i werohia mātou ki te whakahē nei, arā, tērā pea ka uhia te motu ki ngā rākau engari kāore e whakahekea ngā putanga mātātoka, i whakapae au he arawhata ēnei ki te wāmua putanga iti, ā, ko ngā whakatotohu ngahere he ara utu iti i ā tātou e tatari ana kia whakawhanakaetia ngā hangarau hou. Nā te mea, i tō tātou motu ētahi putanga uaua rawa ki te whakaheke – arā noa ērā nō te ahuwhenua – he ara whakamua.

Kāore taku takohanga e mutu ki kōrā. Nā te mea, tata ki te tekau tau i mua, i muri iho i te taumata āhuarangi mūhore o Kopanahekana i tīmata au ki te whakarewa i te taupatupatu ā-ao mō te whāinga whakamutunga me whai ngā whāinga panoni āhuarangi me ngā kaupapa here.

Nā whai anō, i te tau 2013, ka whakaritea e au te kauhau i tukuna e te Hekeretari-Tianara o te Rōpū mō te Mahi Ngātahi me te Whakatipu Ohaoha o taua wā, i whakahau ia kia “whakamutua rawatia ngā putanga katoa ki te kōhauhau i te tahu i ngā kora mātātoka i te wāhanga tuarua o te rautau”.²

¹ Upton, 2018.

² Gurria, 2013.

Konei te wā tuatahi i tūhonoa e tētahi rangatira nui o te ao te mea i mārāma rawa i roto i te pūtaiao āhuarangi mō ngā tau 20, neke atu rānei, me te hiahia ki te angawā ka ngau ngā kaupapa here mēnā ka herea ngā pikinga o ngā paemahana toharite ā-ao kia kaua e nuku atu i te rua tākiri tohuru.

Ka ōrite taku whakaaro ki te tūraru nui e puta mai ai i te whakatōhenehene āhuarangi a te tāngata me te hiahia kia tere te mahi. Ko te wero whakahaere tūraru karioi kua whitawhita i te kore tutuki o ngā whakaeaea kaupapa here. Nāku anō tētahi wāhanga o te hē.

He aha ngā rerekētanga?

Nā te Whakaaetanga Pārihi o 2015 i whakarerekē i te āhua o te taupatupatu ki ngā āhuetanga e rua. Ka tūtohu mō te wā tuatahi ko te tūturutanga pūtaiao me mutu te kaha whakamahi o ngā ohaoha i ngā kora mātātoka, ā, i roto i ngā tekau tau torutoru noa iho. Tuarua, ka mutu te rapunga mō te ao pai rawa atu mō te whakarite ā-ao i ngā roherohenga putanga ā-motu i tohaina mai i runga. Engari, i waiho ki ngā motu ki te kī ka pēhea rātou e tāpae kia ea ai te “whakataurite i ngā putanga ā-tāngata mā ngā mātāpuna me te tangohanga mā ngā whakatotohu i ngā haurehu kati mahana i te wāhanga tuarua o tēnei rautau”.³

Ko tēnei ara ‘mai i raro’ i whakamanawahia au kia whakaaro mō te rerekētanga o ngā tūmomo haurehu o te tāpaetanga o Aotearoa ki te whakamahana o te ao, te pono o ngā whakatotohu ngahere hei karo i ngā putanga hauhā me te hiahia kia ahu whakamua i ngā haurehu katoa i roto i ngā tekau tau e rima.

Tae mai ki tēnei wā, i tīmata te taupatupatu i ngā kaupapa ōrite: ko ngā mātāpuna haurehu kati mahana me ngā whakatotohu ka tū hei tino rīwhi, tētahi mō tētahi; ā, me kite tātou i te ara utu iti o te whakaaweawe i te huringa ohaoha e hiahia mā mō ngā whāinga whakahekenga putanga.

Ko te whakakotahi i ngā marohi e rua ka hanga i te tauranga whāiti mō ngā kaupapa here – tētahi pūrere utu tāwariwari nā reira e tautoko ana i te hōpara mō ngā auaha hangarau, me ngā auaha whakahaere, utu ihi ahakoa kitea ki hea. Mēnā ka taea e tātou te hanga i te utu putanga tika, mā te mākete te toenga.

Koinā tonu tētahi ara ki te whakamahi i te raru. He purotu, he māmā hoki tēnei e hahae nei i te uaua o te ohaoha ao hurihuri, ā, ka here i te āheitanga kōkirikiri. Ā, kei roto i tō tātou Whakangārahu Hokohoko Putanga (NZ ETS) te hoahoanga mō te ara pērā. Ko te whakamāramatanga mō te take kāore he utu ā-ohaoha ko te kore kaha tōrangapū – he whakamaharatanga ahakoa ngā āhuetanga hokohoko, ko te whakangārahu hokohoko putanga he tamaiti nā te tōrangapū.

Ehara tēnā i te take kia whakahēngia. Engari me whakaaro tātou tērā pea ko ngā kaupapa taketake kua whakaponohia e tātou mō te wā roa, kāore pea e tū tonu, ina rā te kokoraho ko ngā mātāpuna haurehu kati mahana me ngā whakatotohu he tino rīwhi tētahi ki tētahi.

³ Whakaaetanga Pārihi, Article 4.1 Hakihea 2015.

I ngā motu maha, ko te tahu i ngā kora mātātoka te tino nuinga o ngā putanga, he take kāore e tino arohia ana. Engari i Aotearoa, ko tētahi wāhanga nui o ngā putanga i puta i ngā mātāpuna koiiora, ā, ko ngā ngahere e whakaarohia ana hei aho nunui ki te homai i te whakahekenga utu iti, he kaupapa me āta whakaaro. He mea i tino whakaetia e au i mua. Kāore e pēnei ana i tēnei wā.

Kua whakataua au ko tō tātou kaupapa ināianei kāore i te tika. Ka whakamātau ki te whakakotahi i ngā tini āhuetanga rerekē ōkiko mō ngā haurehu e whakaputa ana mātou ki te taurangi kotahi. Ko te hipa i ēnei rerekētanga ōkiko he tūraru mō ngā motu pēnā i Aotearoa. Ahakoa he pai rawa mēnā ka kitea he whakatika mai i te pūtaiao, kāore anō kia kitea. Ko ngā hurihanga koiiora matū whenua o te ao e rawekehia e tātou he tino pīroiroi, ā, he maha ngā whakaohorere kei te haere mai. Engari e mōhio ana tātou kāore e ōrite ngā haurehu katoa.

Ahakoa he pai, he ngāwari te anga ināianei ki te ine i ngā haurehu, ehara i te kaupapa pai mō ngā whakamauru āhuarangi karioi. Koinei te take, ki taku nei titiro, me rerekē te tirohanga, ka tika, a Aotearoa ki ngā mātāpuna mātātoka, koiiora hoki, ki tērā mō ngā whakatotohu. He hīraunga mō te ara e whāia e mātou ki te tautuhi i tō tātou whāinga karioi me ngā kaupapa here e whāia kia tutukihia.

I runga i te kaupapa me whakatutuki ngā whāinga me ngā kaupapa here ki te utu iti e āhei ana, kāore e pēnā te nui o aku māharahara. He utu mō ngā kaupapa here āhuarangi. Ka whakatūtuturia noatia mēnā he pai ki te tirohanga a te hapori whānui. Nā reira, me mātua whakaaro ki te utu *i ngā wā katoa*.

Ko te wero kē, kia mārama he aha ngā utu e kōrerotia ana e tātou, ka utua e wai, ā, he aha ngā angawā. He aha ngā tūraru o ngā rautaki rerekē? Ko ngā haurehu e rapu ana tātou kia herea ka noho haepapa mō ētahi mea atu i te whakamahana o te ao. Ka whakaaweawetia ētahi atu wero taiao mai i te whakapaparanga hāoratoru ki te whakawaikawa moana. Pērā tonu ngā rākau ka whakatōngia ki te karo i te whakamahana, ka hoatu i ētahi atu painga taiao. Engari, nā te mea, me tū tonu mō ake tonu atu, me mārama tātou ki ngā kōwhiringa e katia ana e tātou.

Ko ngā tukunga iho karioi o ngā ara rerekē mō te whakahaere i ō tātou haurehu kati mahana te take kāore i whāiti te tirohanga ki te whakamahana, ā, ka tirohia kētia he aha te huringa horanuku e tae mai ai ki a tātou. Nā te taumaha o te wero āhuarangi, ki te tutukihia e mātou, ko te āhua me te anga o tō tātou ohaoha ka rerekē rawa ahakoa he aha te huarahi e kōwhiria ai e tātou. Ka tika tēnā mō ngā hapori katoa. Waihoki, ki te kore tātou e tutuki i te wero, ka hurihia tō tātou ohaoha me tō tātou taiao, engari kāore e pērā te rerehua.

Mō Aotearoa nei, i runga i te āhuetanga koiiora o tō tātou ohaoha, ko te ara e urupare tātou ki te panoni āhuarangi ka whakaputa i ngā tukunga iho ōkiko, ā-taiao, ā-ataata, ā-hapori hoki e tino kitea i tō te ohaoha ahumahi, ohaoha ratonga rānei. Ko te āhuarangi kotahi anake o ngā uauatanga e tūkinu ana i ō tātou horanuku. Te wai parakino, te whakapau oneone, te ngaro o te kanorau koiiora me ngā urutomo riha

ētahi noa iho o ngā tūraru e whakaarohia ana e tātou – he mea whakanui e te panoni āhuarangi.

Ki te anganui ki ngā whakahekenga putanga me mōhio tātou ki ngā tukunga iho e whai ake nei mō ēnei wero taiao. Me mōhio hoki tātou ki ngā whāmere me ngā haporī, ngā whānau me ngā hapū e noho ana ki ngā wāhi e whakaputa tātou i te haurua o ō tātou haurehu koiora (mewaro me te hauota-rua ōkai) me te whakaaro ki te whakaputu i tō tātou para waro. E hiahia ana mātou ki tētahi mea i tua atu i te ara kaute mō ngā whāinga āhuarangi me ngā urupare kaupapa here e whakaata pai ai i te pūtaio ōkiko me ngā tūraru e pai ana ki a tātou.

Ko te whakapae o te pūrongo

He pūrongo roa tēnei. Ko te whakarāpopototanga o te whakapae e whai ake nei. Atu i te whakaatu i te ara rerekē ki te tāparepare i ngā whāinga me ngā kaupapa here, ka whakakotahi te pūrongo roa i ngā hua o ngā rangahau maha. Nā reira, ko ngā upoko tahi ki te toru he whakakotahitanga rangahau e taea ai te whakahoki hei tohutoro mēnā e hiahiatia ana ngā whakamārama hōhonu. Ko ngā kaipānui e hiahia ana ki te hōrapa i ngā kitenga nui e pā ana ki te kaupapa here me titiro ki ngā upoko whā ki te ono.

Upoko tahi ka whakarite i te tirohanga mā te kōrero mō ngā whakataunga kaupapa here o nāianei i roto i te horopaki o te hītori me te whakawhanaketanga o Aotearoa. Mai i te wā tuatahi o te nohonoho mai – he wā iti iho i tētahi atu wāhi i te ao – kua tīmata ngā tāngata ki te whakahuri i te horanuku i ngā ara i whakaarohia ai, me ngā ara kāore i whakaarohia ai.

I te hātepe nei kua tino whakarerekētia te whakahaere o te hurihanga waro māori.

Ko te tino tāpaetanga o Aotearoa ki te panoni āhuarangi o te ao ināianei kua puta mai i te maha rawa o te waro kua whakaputaina mai i te whenua – ōna ngahere me ōna oneone – ki te kōhauhau. He nui ake tēnei i te nui o te hauhā kua whakaputaina i te tahu o ngā kora mātātoka.

He raupapa huringa horanuku i whakamahia i Aotearoa. I te tuatahi ko te whakaheke ngahere i whakamahia e ngā hiahia o ngā tāngata nohonoho nō Te Moananui-a-Kiwa me Ūropi. Nā, i te tūhononga o Aotearoa ki te hokohoko ā-ao, ko ngā whakarerekētanga ki ō tātou horanuku i whakamahia e ngā kiritaki i tērā taha o te ao.

Ko te whakaheke ngahere i te whāinga ki te ohaoha tarutaru te mea hou. Ko te whakahoki ngahere i whakamahia e te whakawhanake o te ahumahi whakatō ngahere. Ko ngā pūtea tāpiri i whakauruhia hei tautoko i te ahuwahenua i tino whakaroi i te whakamahi whenua. Nā te whakakorenga o aua pūtea tāpiri i hūkeke ai ō tātou horanuku me te wā hou o te whakamarohi me te kanorau e haere tonu ana tae noa ki tēnei rā.

Hei whakarāpopoto, kua kitea e Aotearoa he raupapa whakarerekē whakamīharo i te uhi whenua me te whakamahi whenua, nā tēnā rerekētanga, nā tēnā rerekētanga

i whakaneke i ngā rahinga waro tino nui. Ko te ara e whāia e tātou hei urupare i te panoni āhuarangi e aki anō ai i te whakarerekē whakamahi whenua me te ara e wawao ai tātou ki te hurihanga waro.

Upoko rua me te toru e kimi ana ki te hoatu ki te kaipānui i te kōrero hou mō te māramatanga o te pūtaio e pā ana ki te mahi whakarerekē i te ao a ngā mahi tāngata, ā, he aha te āhua o ēnei mahi ki Aotearoa.

Upoko rua ka whakaatu i ngā āhuatanga ōkiko rerekē o ngā haurehu e toru e kaha tāpae ki te whakamahana a te tangata i te ao – hauhā, mewaro me te hauota-rua ōkai. Ka whakaatu i ngā hurihanga koirora whenua matū e whakanuku i te waro me te hauota ki te ao. Kua āta whakaatu au i ēnei hei rauemi mō ngā tāngata e hiahia ana ki ngā pīroiroitanga – he maha ērā – ki tautoko anō hoki i ngā whakataunga i roto i te pūrongo mō te painga o te whakaaro he ōrite ngā mātāpuna me ngā whakatotohu hei rīwhi, tētahi mō tētahi.

Kia mārama ai ki te whakaaweawe e haere tonu ana me ngā urupare kaupapa here pai, me whakaaro i pēhea aua haurehu i whakaputaina, i tautokohia rānei te whakaputa, ā, he aha te tūhononga o ngā whakaaweawe, tētahi ki tētahi.

Whai muri i te whakaatu i te pūtaiao, **upoko toru**, e whakaatu ai i te tāpaetanga o te hauhā, te mewaro me te hauota-rua ōkai ki te whakaritenga putanga i ngā 200 tau kua pahure ake nei. Ka whakamahere i te ara o ngā rautau e rua me te whakarerekē tonu o te whakamahi whenua i runga i te pahū me te pakaru o ngā rauemi hoko i whakaahua i te horanuku o Aotearoa.

Ahako ko te nuinga o te whakaaro e hāngai ana ki ngā haurehu kati mahana ahuhenua, ko te whakarerekē whakamahi whenua te tino tāpaetanga a Aotearoa ki te whakamahana ao.

Neke atu i te 3 piriona tana o waro kua whakanekehia ki te kōhauhau i te whenua, i te nuinga o te wā nā te whakaheke ngahere mō te ahuhenua. Ko te whakatau tata o te taumaha o te whakamahana o ēnei whakarerekētanga whakarea mā te whitu te tāpaetanga o ō tātou putanga mātātoka.

Ko te urupare ki te panoni āhuarangi – me te whakamahi i te maha noa atu o ngā taumahatanga taiao e whakaaweawe ana i ngā tāngata o Aotearoa ki te whakaaro mō te ara e whakamahia ai, e whakahaeretia ai, te whenua. Ko tētahi kōwhiringa ko te whakaputu i ētahi atu waro ki te whenua i roto i ngā rākau. Ahako he maha te whenua mō te whakahoki ngahere, ko te ara me te whānui me āta whakaaro.

Ahako he roa te tauoranga o ngā ngahere, ehara i te tauoranga pūmau. Kei te piki te whakapā o ngā pānga panoni āhuarangi ki ngā ngahere mā te ahi, ngā riha, ngā tukumate me te ngāhorohoro, e tīpako ana te āhua memeha. Nā ēnei tūraru me te kore e tino mōhio e pā ana ki ō rātou painga paemahana, he tūraru e puta mai ai i te kaha whakawhirinaki ki ngā karo ngahere.

Upoko whā ka whakaputa i te whakapae nui e pāitaihia ana e te pūrongo nei: me whakaaro tonu tātou he ōrite ngā mātāpuna me ngā whakatotohu ā-tāngata, he rīwhi tētahi ki tētahi, i te wā e whakarite ana mātou i ngā whāinga whakaheke putanga me te whakarite i ngā kaupapa here whakamauru panoni āhuarangi?

Te āhua nei, ki te ara onāiane, kāore he māharahara ki tēhea haurehu e tirohia ana, mēnā e āhei ai te whakaōrite i ngā tauoranga me ngā kaha o ngā haurehu. He ōrite te whakaaro i raro i te kaupapa e kī ana ko te waro i hunaia, i rakaina hoki ki ngā rākau ka tino karo i te whakaaweawe o te hauhā, te mewaro me te hauota-rua ōkai ahakoa he aha te mātāpuna.

Ahakoa he tika tēnei mō te mahi kaute, ko te rerekētanga ao tūturu i waenganui i ngā tino haurehu kati mahana, e whakaatu ana kāore e ōrite ngā tūraru o tēnā haurehu, o tēnā haurehu. E rua ngā tūraru nui ki te ara onāiane e whakaatuhia:

- Tuatahi, he whāinga kotahi e whakakotahi ai i ngā mātāpuna me ngā whakatotohu e whakapūrehurehu ana i ngā tukunga iho o ngā kaupapa here. Ki te kore tētahi whāinga tautuhi e whakaritea mō ngā putanga mātātoka hauhā katoa, ka taea te whakaheke kē i ngā putanga mewaro, hauota-rua ōkai rānei, kua ko te whakaheke hauhā mātātoka. Heoi anō, kāore ngā whakakotahitanga o ngā whakahekenga e whakaputa i ngā tukunga iho paemahana ōrite.
- Tuarua, ko te hauhā mātātoka i whakaputaina ki te kōhauhau ka whakaputa i te whakaaweawe whakamahana mō ngā mano tau. Hei whakatairitenga, ko te waro i whakaputua ki ngā rākau me ērā atu pūnaha hauropi whenua ka whakaputaina wawetia ki te kōhauhau ki te tae mai he ahi, he riha, he tūraru anō hoki. He nui ngā tūraru o te whakaputa tonu i te hauhā mātātoka i runga i te kaupapa he ōrite te maha o te waro i hunaia ki ngā whakatotohu koiora.

Waihoki, te tino wā roa o te whakaaweawe whakamahana o te hauhā mai i ngā putanga mātātoka e tino mōhiohia ana, engari kāore e pērā ngā painga āhuarangi o ngā whakatotohu ngahere.

Ko ēnei tūraru e āta tirohia ai, ā, ka tautoko i te whakataunga he pai ake te whakahaere kē i ngā putanga mātātoka me ngā mātāpuna koiora, whakatotohu ngahere hoki. Mā te ara rerekē ka whakatū i ngā whāinga rerekē mō tēnā rōpū, mō tēnā rōpū, e whakaatu i ngā tūraru e pā ana ki ngā pihangaiti me ngā whakaaweawe whakamahana ki tō tātou taenga ki te whakaaweawe i te paemahana toharite ā-ao.

Me whakaheke ngā putanga mātātoka ki te kore kia tae atu ki te wāhanga tuarua o te rautau.

Koinā te whāinga. Ko te whakaheke mā te haurua, me te kī kua whakahaeretia te tūraru mā te whakatō whakatotohu ngahere he rīwhi kino. Tuatahi, me whakapūmau ngā whakatotohu mō ake tonu atu, me whakatō tonu i te wā e puta tonu ana ngā putanga.

He rerekē te whakaaro mō te mewaro koiora me te hauota-rua ōkai. Nā te mea, kāore rātou e whakaemi ki te kōhauhau, pērā i te hauhā, ehara i te mea me whakaheke

ki te kore. He mea pai i te mea kāore he hangarau kore putanga kua puta hei whakamahi i tēnā. Ā, ko te mea nui rawa, ko te whakamahi kai, ahakoe pēhea te pai, ka whakaputa i ētahi o ēnei haurehu e rua.

Engari, me whakaheke, ā, he maha ngā tikanga whakamauru ināianei, e whakawhanakehia rānei, e taea te whakamahi.

Mō te whānui o te whakaheke i ngā putanga koiora, me whakatau he aha te taumata whakamahana e pai ana. Ki tēnei horopaki, ko te whakamahi i ngā whakatotohu ngahere ki te karo i te whakamahana e whakaaweawetia he mea tika. Ko te mewaro koiora, te hauota-rua ōkai me ngā rākau he wāhanga nō ngā hurihanga koiora, ā, ko te roanga o ngā painga whakatotohu ngahere e āhua ōrite ki te roa o te whakamahana o ngā putanga mewaro me ngā putanga hauota-rua ōkai.

He tirohanga noa, ahakoa te taumata o te hiahia o te whāinga whakaheke e kōwhiria, ko te pūtake me ngā tukunga iho ā-oahoha, ā paemahana, me tino mārāma rawa. Mēnā he take mō te rerekētanga o ngā whāinga paemahana me ngā whāinga whakaheke putanga mō ngā putanga mātātoka me ngā putanga koiora, me tino kōrero.

Upoko rima ka whakauru i ngā whakataunga o wāhanga whā ki te horopaki o Aotearoa. I muri i te whakaaro ki te *ara onāianei*, i roto i te whāinga ki te ara utu iti kua whakaarohia ko ngā mātāpuna me ngā whakatotohu hei rīwhi, ko te *ara rerekē* o te whakawehe i te whakahaere putanga mātātoka me ngā putanga koiora e whakaarohia. Ko te whakatauiria i whakamahia ki ngā tauira i whakamahia e te Kōmihana Whai Hua o Aotearoa i tana pūrongo hou mō te oahoha putanga iti. I ngā wāhi i whakarerekē te Kōmihana Whai Hua o Aotearoa i ngā haurehu tauoranga iti me ngā haurehu tauoranga nui, ko te mahi whakatauiria mō tēnei pūrongo i whakataurite i te ara onāianei ki te ara i whakarerekē i ngā putanga mātātoka me ngā putanga koiora.

Ko te whāinga utu iti hei kaupapa mō te ara onāianei i pāitaihia i runga i te take, ahakoa ko ngā utu poto mō te whakamahi i ngā whakatotohu ngahere he iti iho, ko te tukunga iho ko te whakaroa ake i te tino mahi ki te whakaheke i ngā putanga katoa, ā, ka paraheahea te motu ki te kino e puta mai ai i te panoni āhuarangi.

Ko te whakatauiria ka āwhina i te mōhio ki ngā whakaaweawe taiao, me ngā whakaaweawe oahoha, o ngā ara e rua. Ko te tau whāinga 2050 e whakaarohia ana e te Kāwanatanga i whakaroa ake ki te 2075 e ōrite ana ki te Whakaaetanga Pārihi. Ehara te 2050 i te mea whaiwhaiā.

Kāore he whakaohorere, ko te rerekētanga i waenganui i ngā ara e rua – e rua ngā whāinga me te whakaiti i te whakamahi i ngā whakatotohu ngahere ki te karo putanga koiora – i whakaputa i ngā rerekētanga hua. I te ara rerekē ko te utu karo mō ngā kaiwhakaputa mātātoka he nui ake mēnā kāore e whakamahia ngā whakatotohu ngahere (ahakoa ka whakamahia i runga i ētahi wāhanga ā-ao). Ko ngā putanga koiora – e whakahekea mā te 20 paiheneti, 100 paiheneti rānei i raro i ngā taumata o nāianei ki te kaupapa whakamau tae atu ki ngā whakatotohu ngahere – he iti iho te utu whakamauru.

Engari ko te tino rerekētanga ki ngā hua i te ao tūturu ko te whānuitanga o te whakarerekē whakamahi whenua. I runga i te tino whakamahi i ngā whakatotohu ngahere ināianei ka 5.4 miriona heketea e hurihia ki te uwahi ngahere. I raro i ngā ritenga uaua o te ara rerekē ka huri ki te 1.6, tae atu ki te 3.9 miriona heketea.

He maha rawa te whenua i Aotearoa. He maha ake ngā ngahere e taea te whakatō ki te whenua. Engari, ko te whakawātea i te whenua katoa mō te whakaputu waro (hei rīwhi mō te kore whakaputa) ka whakaiti i ngā kōwhiringa whakamahi whenua. He kaupapa anō tēnā mēnā ko ngā putanga koirora anake ngā mea e taea te karo mā ngā rākau.

I runga i te ara o nāianei, ko te āhua ōkiko, ohaoha, hapori o te horanuku ka whakaritea e ngā whakataunga ki ngā kāinga me ngā ahumahi o Aotearoa, i runga i ō tātou rori me ō tātou rangi, tae atu ki ngā utu rauemi ā-ao. I runga i te ara rerekē, he maha tonu ngā rākau ka whakatōngia engari ka whakaahuatia te horanuku e ngā ahumahi me ngā hapori e noho ana, e mahi ana, i reira.

E ai ki te whakatauirā ko ngā wāhi e nui ake te whakatō ngahere ko ngā takiwā e toru – Ōtautahi, Ōtakou me Manawatū-Whanganui. Nā, ko ngā takiwā e rua o Te Waipounamu e matapaehia ana, ka paraheahea ki te tūraru ahi, e kaha whakaatu ana i ngā tūraru e puta mai ai i te whakawhirinaki ki ngā whakatotohu ngahere.

Ko te whakatauirā pēnei e whakaahua i te rōpū e toa ana me te rōpū e hinga ana. Me mahi tahi te Kāwanatanga me ngā pākahi me ngā hapori tūturu, kāore e taea te urutau i te pō kotahi me ngā kaiwhakatange e utu i ngā utu, kāore e kore, ka rere ki te utu o te tauoranga. Pērā ki te ara e āta whakamāramahia ngā tukunga iho paemahana o ngā whāinga, me āta taupatupatu i ngā ara whakawhiti tika e toitū ana ā-ohaoha, ā-hapori.

Ko ngā kaupapa here whakawhiti me whai i te ara whakawhiti pūmau – tētahi ara kāore i tino whakatōhenehenetia, ā, kāore i tino whakamaruhia ngā kaiwhakaputa, kei kore e whakapoapota te whakarerekētanga.

Mō ngā kaiwhakaputa mātātoka he kitenga mai i te whakatauirā tērā atu hangarau whakaheke iti utu kua hangaia e pai ai te hoko akuanei. Mō ngā rāngai kāore e whai ana i aua huarahi hangarau, tērā ngā momo āhuatanga ki te tautoko pērā i ngā puka whakaaetanga ā-ao, me te āheinga whakawhiti ki ngā karo ngahere, ki ngā toha kore utu rānei.

Mō ngā kaiwhakaputa koirora te tīmatanga o te utu whakapuuta me tuku i te wā kia taea te whakawhanake i ngā mahi ki te whakapai i ngā ine ā-pāmu kia tika te whakatau tata i ngā putanga i runga i ngā pāmu me te whakamahi i ngā tikanga whakahaere hou.

Ko te tono mō ngā karo ngahere e puta mai i ngā kaiwhakaputa koirora, kāore e puta mai i ngā kaiwhakaputa mātātoka i roto i te NZ ETS. Ka ākina te whakarerekē whakamahi whenua e ngā kaupuri whenua e titiro ana ki te whakataurite i te moni hua e hihiatia ana e rātou, kaua ko te mahi o waho e pā ana ki te whai i te ‘takiwā whakatotohu’ a te ohaoha mātātoka.

Ko te whakanoho i ngā putanga mewaro koiora me ngā hauota-rua ōkai ki te 'kete' kaupapa here ōrite, whakawehetia ai i ngā putanga mātātoka, ka tautoko ko ngā mātāpuna koiora me ngā whakatotohu he wāhanga i whakaputa, i whakahaere rānei, ki ngā horanuku o Aotearoa.

Ko te whakamahi ngātahi ka whakapai ake i ngā hua ohaoha me ngā hua taiao me te hoatu i te kaupapa mō te ara ngātahi, ki ngā horanuku katoa mō te whakahaere i te whakaaweawe taiao o ngā rāngai whenua o Aotearoa.

Upoko ono ka whakaatu i te ara rerekē ki te taumata o te takiwā awa. Hei kēhi rangahau, ko ngā ara kaupapa here āhuarangi e rua, i whakaatuhia i upoko rima i whakamahia ki ngā awa o Hurunui i Ōtautahi. Ko ngā hua o te whakatauiria me ngā kōrerorero i whakaatuhia hei tīpako i etahi o ngā tukunga iho ā-oahaoha, ā-pāpori, ā-pūnaha koiora hoki o ngā ara rerekē.

Ko te kēhi rangahau i whakaritea kia whakaatu i te whakaaweawe o ngā ara rerekē ki ngā whakamauru āhuarangi, waihoki ki ngā tukunga iho whānui e pā ana ki te ohaoha me te taiao, tae atu ki ngā whakarerekētanga ki te whakamahi hua o te whenua, te whai mahi, te kounga wai, te kanorau koiora me ngā uara ahurea, tākarō anō hoki.

Kāore he whakaohore, mā ngā ara e rua e whakawhānui ai te takiwā ngahere. Engari ko te whānuitanga he tino rerekē, kāore e pērā te whakarerekē whakamahi whenua pōturi ki te ara rerekē, he pai ake ngā tukunga iho ki te hāpori me te ohaoha.

I muri i ēnei kitenga, ka whakawhanake te upoko i ētahi whakaaro tīmatanga mō te tikanga o te ara 'pūtaka horanuku' ki te whakahaere āhuarangi me ētahi atu wero taiao mō ngā ahumahi pūtaka whenua me ngā hāpori taiwhenua. Mā tēnei ara ka kitea he mea tua atu i te wāhi hei whakaputu waro te horanuku. Engari, ka tirohia te horanuku hei wāhi e whakaratoa te maha o ngā ratonga ā-taiao, ā-pāpori, ā-oahaoha anō hoki me te hononga o aua ratonga.

Kia tika ai tēnei ara me whakakotahi i ngā mea katoa e mōhio ana tātou mō ngā hātepe taiao ki te āwhata horanuku mai i raro, ki ngā mātauranga pakiaka kararehe. Waihoki, me pīrangi ngā kaupupuri whenua me ngā hāpori ki te mau i ngā tūraru maha e whakapiritia ana ki ngā ritenga whakamahi whenua.

Ko ngā whakaaro pēnei ka noho pēnei – he whakaaro hōhonu kāore e taea te whakamahi. He mea waimārie, ko te whakamahi i ngā utu whakaputa hei whakapoapoa i ngā whakarerekētanga ki te whakamahi whenua me te whakahaere whenua e homai nei i te mātāpuna moni whiwhi ki te tautoko i te whakawhitinga. Ko tētahi wāhanga o te moni whiwhi mai i ngā putanga koiora, ka whakahokia ki ngā horanuku me ngā hāpori i puta ai aua moni. Ko taua moni whiwhi ka tautoko ai i te whakatō rākau me ngā mahi tūhono i hoahoa ki te whakaheke i ngā tūraru āhuarangi me te whakatōhenehene ā-taiao, ā-oahaoha anō hoki.

Ētahi whakataunga tīmatanga

Ko tētahi take o tēnei pūrongo i tuhia ki te wero i te kaupapa ko te ara hou mō te whakaaro whakarite whāinga me te pūrongo āhuarangi kāore e taea te whakahē. Tērā ētahi ara rerekē hei whakaarotanga mō te take, ka whakauru i ngā utu rerekē, ā, ka whakaputa i ngā tūraru rerekē. Me reri ngā kaihangā kaupapa here ki te whakamātau i ngā ara rerekē, kau e whakaae me te kore tautohe 'kāore he ara rerekē'. He ara rerekē i nga wā katoa.⁴

Ki taku nei titiro, he pai te whakakore i te āheinga ki ngā whakatotohu ngahere hei tohu i tō tātou kore mōhio ki te whakahaere i ngā tūraru o te whakapūmau i ngā whakatotohu mō ake tonu atu mō ngā angawā e hiahiatia ana kia whakarite te whakamahana karioi o ngā putanga hauhā. He mea tūtohu tēnei nā te mea ko te hauhā te tino take o te whakapiki paemahana a-ao, kāore e taea te whakaroa ake i te tino mahi āhuarangi ki te whakamahi i ngā putanga hauhā mātātoka katoa.

He tino tūranga tō te ngaherehere. He pai ake te whakamahi i te ngahere hei karo i ngā putanga koiara nā te mea ko ngā ngahere me ngā pāmu he wāhanga nō te hurihanga koiara tere me te hurihanga hauota, ā, ko te roanga o te whakaaweawe whakamahana e ōrite ana ki te roanga o ngā painga o ngā rākau. Ā, he painga anō tō te ngaherehere.

Ka pātaihia te Pāremata ki te hanga ture mō tētahi, ētahi rānei, whāinga karioi. Me pēnei, me whakaata taua whāinga i te whakaaeae o te Whakaaetanga o Pārihi. Ko te tikanga ki te horopaki taiwhenua, me whakarite. Ahakoa he aha te whāinga me pūmau tonu haere ake nei. Kua tūtohu au me whakature i ngā whāinga whakamutunga a muri ake o te āta tirohanga e te Kōmihana Āhuarangi hou. Mā te tūtohu o te kōmihana e tatutoko ai i te āheinga kia tautokohia ai te whāinga, ngā whāinga rānei, e ngā pāti katoa o te whare.

Māku e kī atu ko te ara rerekē i whakawhanakehia ki te pūrongo nei e whakaāhei ai i te whāinga putanga mātātoka whakaheke kore katoa e whakaritea mō te hauhā mātātoka hei te tuarua o te rautau, me te nekehanga mārama ki tēnei whāinga kia tae ki te 2050.

Kei whakamatakuhia te tāngata e tēnei. I ngā 50 tau kua pahure ake nei, kua huri ngā motokā mai i ngā waka tawhito kaiapo ki te penehini, ki ngā waka hiko e haere ana mō te 500 kiromita ki te whakahiko kotahi. Kua kitea e tātou te piki o te hiko nō te rā me te hau ki te nui kāore i wawatahia i te haurua rautau kua pahure ake. Ehara i te wawata noa ki te whakaaro mō te wāheke me te kore whakaputa kora mātātoka.

Heoi anō, mō te mewaro koiara me te hauota-rua ōkai, ka whakaritea te whāinga rerekē. Hei kaiārahai ahuhenua, ko te mahi a Aotearoa ki te whakamauru i ngā putanga koiara ka kōrerotia ā-ao. Ehara i te mea me kore te taumata whāinga mō ngā putanga, engari me tūhono ki te tukunga iho paemaha e taea te parahau ā-pūtaio,

⁴ He nui rawa atu ngā moni whiwhi. Hei tauira, ko te whakatauiria i te ara rerekē ki te takiwā awa o Hurunui mai i tēnei wā tae atu ki 2050, e mea ana ka tae pea ki te \$640 miriona e wātea ana ki te takiwā awa nei, mēnā i whakahokia ēnei pūtea ki tēnei horanuku.

ā, tētahi e whakapae ai tātou me whai ētahi atu motu. Ahakoa he aha te taumata i whakaritea mō ngā putanga koiiora, ko ngā whakatotohu ngahere he mātāpuna tika mō te whakamauru.

Ko te ara pērā ka āta whakamārama i pūtake me ngā whakaaweawe ohaoha me ngā whakaaweawe paemahana e whakaarohia ana, he mea kāore i kitea i raro i te ara kore whakamauru mātāpuna me ngā whakatotohu. Me kī pēnei, me whakatau ngā kaihanganga kaupapa here mēnā e hiahia ana rātou kia toa ki te kaute kore whakamauru i 2050 (tētahi atu tau whāinga rānei) mā te whakaputu i te waro ki ngā ngahere ki ngā takiwā maha o Aotearoa; ko te ū rānei ki te whakaheke i ngā putanga mātātoka me te tuku i te kōrero mārama mō te whakaheke tika o ngā putanga koiiora.

Ka puta pea te ara onāiane te tūraru pēnei, ka tutuki tātou i te putanga whakamauru kore me ngā putanga mātātoka katoa e haere tonu ana ki te haurua o te taumata onāiane, ā, ka hiahia tonu ki te wā me te whenua ki te karo i te toenga tae atu ki te wāhanga tuarua o te rautau.

Kāore he ara hei karo i ngā putanga mātātoka kore nā te mea ki te whakamutu i te panoni āhuarangi, kua whakakaha rawa, ki *tētahi* taumata paemahana me kua rawa ētahi atu waro mātātoka e whakaputa ki te kōhauhau. Ko te whakaputu i te para mai i ngā putanga mātātoka ki ngā whakatotohu ngahere he whakaroa noa iho i tērā e haere mai ana.

I te moatatanga o ngā whiriwhiringa he ara e taea ai te parahau – ahakoa i taua wā kua kōrerotia te whakahē mēnā ko te wā ki utua ka whakamahia tikatia. Kua tika ngā kaiwhakahē.

Kua kore ngā tau i waenganui i whakamahia kia tautohetohe mō te whakaiti waro i te ikiiki me te ahumahi, kua whakanui a Aotearoa i tana hauhā mātātoka katoa mā te 35 paihēneti i te tau 1990. Waihoki, ko te ngaronga whakamauru o te 50,000 heketea o ngā ngahere whakatō i kitea i waenganui i te pāhitanga o te Ture Whakautu Panoni Āhuarangi i te tau 2002, me te mutunga o te wā titikaha o te Tikanga o Kyoto i 2012. Ka tino mōhio tātou 'he rerekē tēnei wā'?

Me pānui me te kaute a-ao a Aotearoa mō ana putanga mā te ine e whakaaetia kia hakamahia i taua wā. Engari kei a Aotearoa tana ara ki te whakaiti i ngā putanga. Ka pau te 25 tau e taupatu ana me pēhea e ahu whakamua, tērā te hiahia whānui kia mahi i tētahi mahi.

Engari ko te āhua o taua 'mea' me tika i runga i ngā tūraru, me tuku ki te angawā e taea ai te whakahaere, ā, me whakaaro i te whakaritenga putanga motuhake o te motu. Me hanga ngā whāinga me ngā kaupapa here i runga i te pūtaiao me te ohaoha. Ka whakamātau tēnei pūrongo ki tuku māramatanga ki tēnā taitara, ki tēnā taitara. Engari, kāore e tū hei rīwhi mō te hiahia ki ngā whakataunga matatika, ki ngā whakataunga tōrangapū.

Ko te tukunga iho o taku rangahau roa e toru aku tūtohu mō te Pāremata i te wā ka whakaarohia te Pire Waro Kore:

- Whakaritea ngā whāinga e rua mō te wāhanga tuarua o te rautau: he whāinga kore putanga mātātoka katoa ka whakaturehia hei wāhanga nō te whakatūnga o te Kōmihana Āhuarangi hou; me te whāinga whakaheke mō ngā putanga koiora e tūtohua e te Kōmihana Āhuarangi hou, kātahi ka whakaturehia. He rā i muri i te 2050 ka tautoko tonu i te Whakaaetanga o Pārihi, ā, me kua e whakahēngia mēnā he angawā pono e taea te tutuki hei whakaaweawe i te whakawhitinga nui o te ohaoha.
- Whakaaetia te āheinga ki ngā whakatotohu ngahere hei karo i ngā putanga koiora anake, ki te pūtake e tūtohua e te Kōmihana Āhuarangi.
- Hangaia ngā taputapu e hiahiatia ana ki te whakahaere i ngā mātāpuna koiora me ngā whakatotohu i roto i te horopaki o te ara pūtake horanuka e tiro ai ki te wai, ki te oneone me ngā whāinga koiora.

Ko tikanga o te ara horanuka ko te whakapoapoa i ngā kaiwhiwhi whenua me ngā haporī ki te mahi. Ko ngā taputapu pūrongo e hiahiatia ana he mea i tua atu i ngā taputapu me ngā waeture. Heoi anō, ko te whakamahi o ngā moni whiwhi utu putanga he taputapu kaha ki te tautoko i ngā kaiwhakamahi whenua kia whakamahi i ngā rerekētanga nunui ki ngā horanuku e noho ana rātou.

Ka mutu, ka akiaki au i ngā kaihangā kaupapa here ki te āta titiro ki te wā karioi i te whakaritenga o ēnei whāinga. Tērā ngā kōrero tau me ngā hoko atu, hoko mai, i roto i ngā tahua putanga moata i te tīmatanga o te whakawhitinga. Kāore e kore, tērā ngā taupatupatu mō te whakakaha me te āhua ā-mahi. Engari kua ngā whāinga karioi e noho mau herehere ki ēnei taupatupatu.

Kāore taku pōhēhē mō te taumaha o te wero mā ngā kaihangā kaupapa here. Ko te tino whakamātau, me te pono, ki te tīmata i te huringa e hiahiatia ana e te panoni āhuarangi ka tautokohia e au. Ko taku moemoeā ka āwhina tēnei pūrongo i ngā tāngata maha ki te āta whakaaro he aha te tikanga o te huringa ki te taumata o te horanuka me ngā tūraru kia whakahaeretia ai.



Simon Upton

Parliamentary Commissioner for the Environment

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