

Tax Working Group Public Submissions Information Release

Release Document

September 2018

taxworkinggroup.govt.nz/key-documents

Key to sections of the Official Information Act 1982 under which information has been withheld.

Certain information in this document has been withheld under one or more of the following sections of the Official Information Act, as applicable:

- [1] 9(2)(a) - to protect the privacy of natural persons, including deceased people;
- [2] 9(2)(k) - to prevent the disclosure of official information for improper gain or improper advantage.

Where information has been withheld, a numbered reference to the applicable section of the Official Information Act has been made, as listed above. For example, a [1] appearing where information has been withheld in a release document refers to section 9(2)(a).

In preparing this Information Release, the Treasury has considered the public interest considerations in section 9(1) of the Official Information Act.



Taxing times

Assessing proposed taxes on the primary sector

NZIER report to a group of agriculture sector organisations

March 2018

About NZIER

NZIER is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice to clients in the public and private sectors, throughout New Zealand and Australia, and further afield.

NZIER is also known for its long-established Quarterly Survey of Business Opinion and Quarterly Predictions.

Our aim is to be the premier centre of applied economic research in New Zealand. We pride ourselves on our reputation for independence and delivering quality analysis in the right form, and at the right time, for our clients. We ensure quality through teamwork on individual projects, critical review at internal seminars, and by peer review at various stages through a project by a senior staff member otherwise not involved in the project.

Each year NZIER devotes resources to undertake and make freely available economic research and thinking aimed at promoting a better understanding of New Zealand's important economic challenges.

NZIER was established in 1958.

Authorship

This paper was prepared at NZIER by Peter Wilson.

It was quality approved by John Ballingall.

The assistance of Sarah Spring is gratefully acknowledged.



L13 Willeston House, 22-28 Willeston St | PO Box 3479, Wellington 6140
Tel +64 4 472 1880 | econ@nzier.org.nz

© NZ Institute of Economic Research (Inc) 2018. Cover image © Dreamstime.com
NZIER's standard terms of engagement for contract research can be found at www.nzier.org.nz.

While NZIER will use all reasonable endeavours in undertaking contract research and producing reports to ensure the information is as accurate as practicable, the Institute, its contributors, employees, and Board shall not be liable (whether in contract, tort (including negligence), equity or on any other basis) for any loss or damage sustained by any person relying on such work whatever the cause of such loss or damage.

Key points

Federated Farmers of New Zealand Inc., B+LNZ (Beef + Lamb New Zealand Ltd), DairyNZ, Horticulture NZ, and IrrigationNZ have asked us to review a range of proposed taxes on the primary sector against principles of good tax policy.

Taxes are necessary to fund government services, but involve potentially large economic costs

The Tax Working Group convened by Victoria University of Wellington proposed a set of principles for a good tax system in its 2010 report that we have applied in assessing a series of proposed new taxes on the primary sector:

- Efficiency and growth
- Equity and fairness
- Revenue integrity
- Fiscal cost
- Compliance and administration cost
- Coherence.

No tax that raises the levels of revenue required by modern economies can meet these criteria at the same time: trade-offs are required

In practice, public finance economics recommends that governments adopt a 'broad-base, low-rate' (BB/LR) approach to designing tax systems:

- Taxes should apply to wide ranges of activities
- Individual taxes on specific sub-sectors of the economy should be avoided
- Rates of taxation should be as low as possible, while still meeting revenue needs and equity concerns
- Taxes should be seen as a system, not a collection of individual measures designed to meet specific policy objectives.

New Zealand's current tax system has been consistently assessed as being one of the best in the OECD at raising revenue at least cost

While reviews by local and international bodies have recommended changes at the margin, no serious case has been made for moving away from the BB/LR approach.

Most of the tax policy proposals advanced prior to the 2017 general election by parties now forming part of or supporting the Government find little support in our framework

- Applying a resource rental tax on all uses of water might be justified on efficiency grounds, but should be compared with other regulatory instruments, following a robust assessment of the actual public policy problem such measures are seeking to address
- Taxing exported bottled water in isolation is difficult to justify on any grounds: it would be an outlier within the New Zealand tax system (i.e. it

would be the only tax applied exclusively to an exported product), is likely to have high compliance and administrative costs because it is applied on a very narrow base (i.e. one product) and would likely raise very little revenue

- Applying a tax to one by-product of farming (nitrate) is difficult to justify: it would be an additional tax on one production process; is likely to have high compliance and administrative costs because it would be applied on a very narrow base and would likely raise very little revenue. Using the proceeds of this tax to finance specific expenditure would likely lead to sub-optimal spending or taxation levels
- Extending the Emissions Trading Scheme (ETS) to agriculture can be justified, but would need to be undertaken as part of a comprehensive policy programme if unintended consequences, especially international leakage and loss of competitiveness, are to be avoided.

Contents

1.	Introduction.....	1
1.1.	New Zealand tax policy.....	1
1.2.	A much-reviewed system	2
1.3.	Principles of good tax policy	3
1.4.	The special case of taxing economic rents	4
1.5.	New Zealand Emissions Trading Scheme.....	5
1.6.	What has the Government proposed?	6
2.	Assessment of the proposals.....	7
2.1.	Summary of assessment	7
2.2.	Resource rental tax on water	8
2.3.	Nitrate tax.....	12
2.4.	Extending the NZ ETS.....	13
3.	Bibliography.....	17

Appendices

Appendix A Detailed proposals.....	19
------------------------------------	----

Figures

Figure 1 Income tax and GST raise over 90% of the Government’s annual revenue	2
Figure 2 How the NZ ETS works.....	5
Figure 3 The water cycle is complex.....	9
Figure 4 Bottled water exports are very small	11

Tables

Table 1 Few of the taxes find wide support under our framework.....	7
Table 2 The water royalty could be justified on efficiency grounds.....	8
Table 3 The royalty on bottled water is very hard to justify	10
Table 4 A nitrate tax scores poorly	12
Table 5 Extending the NZ ETS could be justified	13

1. Introduction

Leading up to the 2017 general election, the political parties now forming or supporting the Government proposed a range of new taxes on the primary sector. A number of these proposals, with some modifications, are on the new Government's agenda.

Federated Farmers of New Zealand Inc., B+LNZ (Beef + Lamb New Zealand Ltd), DairyNZ, Horticulture NZ, and IrrigationNZ have asked us to assess these proposals against principles of good tax policy.

In undertaking this review, we have adopted a systems approach. Rather than look at individual proposals in isolation, we have examined how they would fit within the whole New Zealand tax system. The Tax Working Group (TWG), which conducted the last major review of taxes in New Zealand, stressed that system-wide coherence was one of the key principles it used. We return to the TWG's other principles below.

1.1. New Zealand tax policy

Given our focus on the tax system, we first outline the basic structure of that system and the policy considerations have been used to arrive at where we are today.

After a series of reforms undertaken in the 1980s and 1990s, the New Zealand tax system has long been regarded as one of most efficient within the OECD.¹

The guiding principle that has led to this result goes by the general name broad-base low-rate (BB/LR).

Major features of the BB/LR approach in New Zealand have been:

- Repeal of many small, ad hoc, taxes and charges, like stamp duty and the TV licence fee
- Repeal of taxes that might be justified on equity grounds, but which raised a limited amount of revenue, were costly to administer and were relatively easy to avoid, like gift and death duty
- Replacing taxes on business inputs (like tariffs² and the wholesale sales tax) with taxes on outputs (income and consumption), i.e. Goods and Services Tax (GST)
- Progressive removal of tax incentives – departures from treatments applied to sectors or the whole economy designed to promote specific economic developments – and the resulting increases in revenue used to fund across-the-board rate reductions.

Today, the New Zealand government annually raises about \$67 billion or 91% of total revenue from the income tax and GST. Of the remaining 9%, 4.5% is road user charges

¹ Mourougane (2007), p. 2.

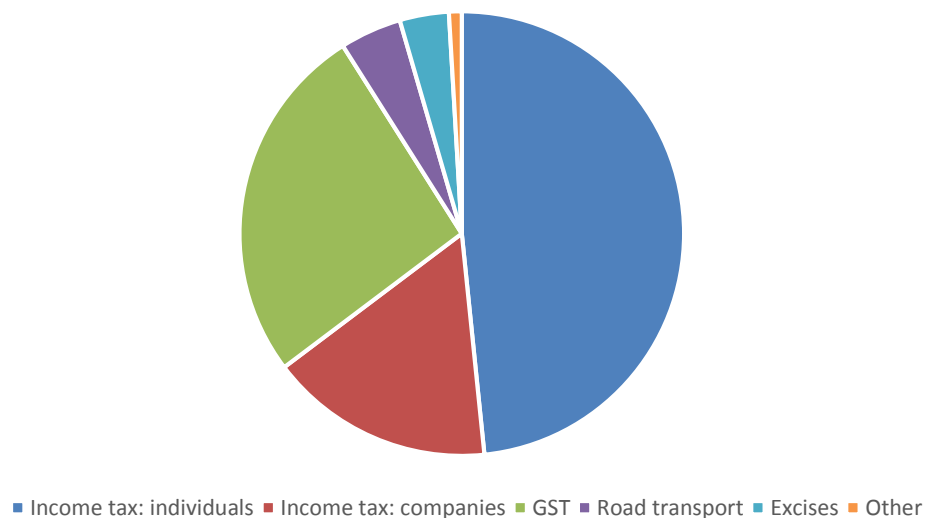
² While the removal of tariffs was undertaken as part of a trade liberalisation programme and wider economic reform agenda, tariffs had been a major source of general revenue for successive governments. For example, in 1915, customs and excise duties contributed 56.03% of total revenue, falling to a modest 33.26% in 1934 (Statistics New Zealand 1935).

and fuel excise; 3.5% is excises on tobacco and alcohol and the remaining 0.8% is comprised of a range of smaller taxes.³

Successive governments wishing to change tax revenue have altered the rates of income tax and GST, rather than add or repeal specific taxes.

Figure 1 Income tax and GST raise over 90% of the Government's annual revenue

Projections for financial year ended 30 June 2018



Source: Treasury

1.2. A much-reviewed system

Since BB/LR was adopted as a guiding principle for tax policy, there have been many reviews of the New Zealand tax system undertaken both locally and by international bodies like the OECD and the IMF. Three major local reviews have been:

- The Committee of Experts of Tax Policy (1999)⁴
- Tax Review 2001 (2002)⁵
- The Tax Working Group (2010).⁶

Comprehensive reviews of the tax system were undertaken by the OECD in 2000 and 2007. Successive biennial Economic Surveys of New Zealand by the OECD have also

³ Tariffs (\$148m), gaming duties (\$240m), motor vehicle fees, (\$237m), petroleum and mineral royalties (\$200m). Approved Issuer Levy and cheque duty (\$31m) and energy resources levies (\$31m). All figures are revenue raised for the year ended 30 June 2017.

⁴ <https://taxpolicy.ird.govt.nz/sites/default/files/1998-other-tax-compliance.pdf>

⁵ <http://www.treasury.govt.nz/publications/reviews-consultation/taxreview2001>

⁶ <https://www.victoria.ac.nz/sacl/centres-and-institutes/cagtr/twg>

considered tax matters to greater or lesser degree.⁷ Likewise, the IMF's routine consultations with the New Zealand authorities also address tax policy.⁸

While each of these reviews have made recommendations for specific changes to the tax system, none has suggested moving away from the current overall BB/LR approach.

1.3. Principles of good tax policy

The BB/LR approach is the result of applying a set of consistent principles.

In this report, we have used the six principles of a good tax system proposed by the TWG in 2010. These principles are very similar to those applied by successive governments and recommended by the OECD and the IMF.⁹

The TWG explained its principles as:¹⁰

- **Efficiency and growth:** Taxes should be efficient and minimise as far as possible impediments to economic growth. That is, the tax system should avoid unnecessarily distorting the use of resources (e.g. causing biases toward one form of investment versus another) and imposing heavy costs on individuals and firms. Another term used to describe efficient taxes is “neutrality”.
- **Equity and fairness:** The tax system should be fair. The burden of taxes differs across individuals and businesses depending on which bases and rates are adopted. Assessment of both vertical equity (the relative position of those on different income levels or in different circumstances) and horizontal equity (the consistent treatment of those at similar income levels, or similar circumstances) is important. The timeframe is also important, including how equity compares over peoples' life-times.
- **Revenue integrity:** The tax system should be sustainable over time, minimise opportunities for tax avoidance and arbitrage, and provide a sustainable revenue base for government.
- **Fiscal cost:** Tax reforms need to be affordable given fiscal constraints.¹¹
- **Compliance and administration cost:** The tax system should be as simple and low cost as possible for taxpayers to comply with and for the Inland Revenue Department to administer.¹²
- **Coherence:** Individual reform options should make sense in the context of the entire tax system. While a particular measure may seem sensible when viewed in isolation, implementing the proposal may not be desirable given the tax system as a whole.

⁷ Reviews since 1975 can be found online at: http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-new-zealand_19990162

⁸ See <http://www.imf.org/en/Countries/NZL>.

⁹ See Brys et al. (2016) and International Monetary Fund (2017), especially Chapter 2.

¹⁰ Tax Working Group (2010) p. 15.

¹¹ As none of the proposals we are examining involve reductions in revenue, we have not needed to apply this criterion.

¹² The TWG was focused mainly on income tax, hence the reference to Inland Revenue. New Zealand Customs administers tariff duties, excise taxes and GST on imports. The New Zealand Transport Authority (road user charges and motor vehicle licence fees), the Ministry of Business, Innovation and Employment (mineral royalties) and the Department of Internal Affairs (gaming duty) also administer various tax regimes.

1.4. The special case of taxing economic rents

There is one case where public finance economics recommends a departure from the general principle of neutrality, and that is the taxation of natural resources like minerals where the owners of rights to exploit those resources can earn excess profits, or economic rents.

Partly because mineral resources are not a large part of the New Zealand economy, whether departing from the BB/LR approach is justified in the case of natural resource taxation has not featured prominently in local tax policy debates.¹³ However, the Labour Party's proposal to impose a tax on all commercial uses of water was an example of such a tax, and therefore we will provide a brief discussion of the main elements of such taxes.

One important feature of economic rents is that they can be taxed with little or no efficiency cost.¹⁴ This is because economic rents are an extra return above that required to compensate the owner of the capital earning the rent for risk and the opportunity cost of their investment. Taxing away that extra return, or a part of it, does not diminish the attractiveness of the investment compared to investment that only earn "normal" (i.e. rent-free) profits. So just taxing rents would not cause investors to reduce the amount that they have invested.

Under a traditional income tax, economic rents are taxed at the same rate as all other returns to capital and labour.¹⁵ Some countries, therefore, impose additional taxes on owners of natural resources that can earn rents. The Australian Treasury has long favoured resource rental taxes, given the importance of extractive industries to Australia's economy.¹⁶

While the case for taxing rents is conceptually sound, differentiating between normal and excess rates of return is difficult in practice. Most countries do not include additional taxes on rents in their main income taxes.

Royalties on extraction, which are easier to measure (because they are often charged on the quantity mined, rather than the profits earned) are, however, common. New Zealand applies royalties to a small number of minerals (petroleum, coal, gold), raising about \$200 million annually.

¹³ Resource rental taxes are different from the more common environmental taxes used to correct market failures that lead to sub-optimal levels of pollution. We discuss this issue further in Section 2.3. Although environmental taxes were out of scope of the 2010 TWG, the 2001 Tax Review did discuss 'Eco Charges'. The Labour Party and the Green Party have advocated for environmental taxes in their tax and environmental policies and we note that the terms of reference of the recently announced review of the New Zealand tax system includes how the tax system can help deliver positive environmental and ecological outcomes.

¹⁴ Garnaut (2010).

¹⁵ It is possible, at least conceptually, to design a broad-based tax that taxes rents at a higher rate than normal returns. A cash-flow tax is one such instrument, and implementing such a tax remains the goal of many tax policy experts in the United States. In its 2017 review of the United States economic policy, the IMF recommended that the United States convert its income tax to a cash-flow tax and elements of this proposal were enacted as part of the President Trump's tax bill. Some years ago, the New Zealand Treasury investigated whether a cash flow tax was practical in New Zealand and decided it wasn't, mainly for reasons to do with the fiscal and economic cost of a transition. See Katz (1999) and Wilson (2002).

¹⁶ See Australian Treasury (2009).

1.5. New Zealand Emissions Trading Scheme

Introduced in 2008, the New Zealand Emissions Trading Scheme (NZ ETS), while technically not a tax or a charge, is a significant economic instrument used to change behaviour. A carbon tax is an alternative instrument often used to achieve the same goals as an ETS, and indeed, the Green Party proposed in its manifesto that the NZ ETS be replaced by such a tax. It is, therefore, appropriate to provide a brief description of the scheme here.¹⁷

The NZ ETS puts a price on greenhouse gas emissions. This is intended to create a financial incentive for people to invest in technologies and practices that reduce emissions.

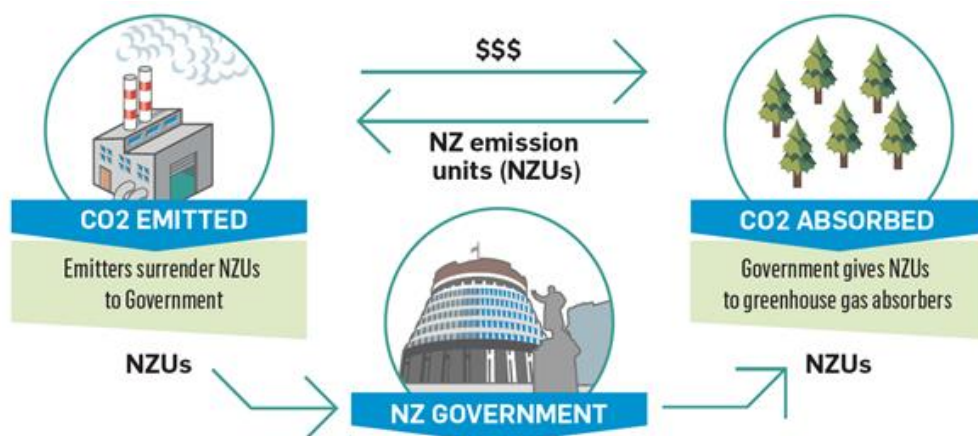
The NZ ETS requires all sectors of New Zealand's economy to report on their emissions and, with the exception of biological emissions from agriculture, to purchase and surrender emissions units to the Government for those emissions. Just over half of New Zealand's greenhouse gas emissions are covered by the NZ ETS' surrender obligations.

The scheme also encourages forest planting by allowing eligible foresters to earn emission units as their trees grow and absorb carbon dioxide.

An emission unit represents one metric tonne of carbon dioxide, or the carbon dioxide equivalent of any other greenhouse gas. Currently, the only eligible emissions unit in the NZ ETS is the New Zealand Unit (NZU).

Figure 2 provides a schematic overview of how the NZ ETS works.

Figure 2 How the NZ ETS works



Source: Ministry for the Environment

¹⁷ For an explanation of the economics behind the NZ ETS, see Wilson (2011).

1.6. What has the Government proposed?

Prior to the election, the Labour Party, New Zealand First and the Green Party all issued manifestos that proposed changes to the taxes applied to the primary sector.

More details are in Appendix A.

Following the government formation process, a number of these proposals are to proceed, at least in a modified form. Some of the proposals to be adopted are amalgams of the various parties' positions, others are conditional on further study and, in some cases, the policy announcement is not to proceed with proposed initiatives in the first term of the Government.

The proposals that we have analysed in this report are:

- A tax on all commercial users of water (which is not to proceed this term, but could conceivably be considered post-2020). Included in this analysis is a discussion of the proposal to tax exports of bottled water
- A tax on nitrate (while this not proceeding this term, the proposal is a good example of how taxes on narrow bases can have high costs)
- Including agriculture in the NZ ETS (which is to be subject to further study by the newly established Climate Commission).

2. Assessment of the proposals

Just because a tax **can** be imposed, or **has** been imposed in some other place or at some other time, doesn't mean that it **should** be imposed.

In this section, we provide our initial assessment of the policies the new Government has said it will be advancing to determine whether they might be justified on grounds of improving the overall tax system.

We have also included an analysis of some of the proposals that the Government has indicated will not be progressed immediately, because they represent interesting examples of how to analyse taxes within our framework, and because such taxes could be considered at a later date by government.

This analysis is only preliminary, as many of the important details of what has been proposed have yet to be announced.

2.1. Summary of assessment

In Table 1, we provide a high-level summary of our assessment against the TWG's principles.

Table 1 Few of the taxes find wide support under our framework

Principle	Resource rentals, specifically a tax on water	Nitrate tax	Extending the NZ ETS
Efficiency	Yes. Conceptually, if they are earning economic rents.	Perhaps. Addressing unpriced externality can improve efficiency.	Yes. Conceptually, but depends on important design issues.
Equity	No. Many other firms are likely to be earning economic rents, so it is hard to justify only taxing one sector.	No. Only applied to one by-product of one production process.	Yes. Conceptually, but depends on important design issues.
Revenue integrity	Yes	Yes	Yes, provided emissions units themselves have integrity.
Compliance and administration cost	Likely to be high compared to revenue raised.	Likely to be very high compared to revenue raised.	Key trade-off will be between farm-based measurement of emissions and using industry averages.
Coherence	No. If only sector taxed on rents.	No. Tax on one by-product of one sub-sector.	Yes. If applied within well-established principles of the NZ ETS.

Source: NZIER

2.2. Resource rental tax on water

Table 2 The water royalty could be justified on efficiency grounds

Efficiency	Equity	Revenue integrity	Compliance and administration cost	Coherence
✓	✗	✓	✗	✗

Source: NZIER

The coalition agreement between the Labour Party and New Zealand First specifically states that the proposal to place a royalty on the commercial uses of water will not proceed *this Parliamentary term*.

Given the prominence of this issue prior to the election, we include some high-level commentary on this matter. Again, detailed analysis is not possible given the lack of detail on these specific proposals.

As we noted above, there is a conceptual case for applying an additional tax on owners of rights to use natural resources where they can earn economic rents.

However, there are many steps required from that case to deciding in practice whether a royalty should be applied to users of water in New Zealand.

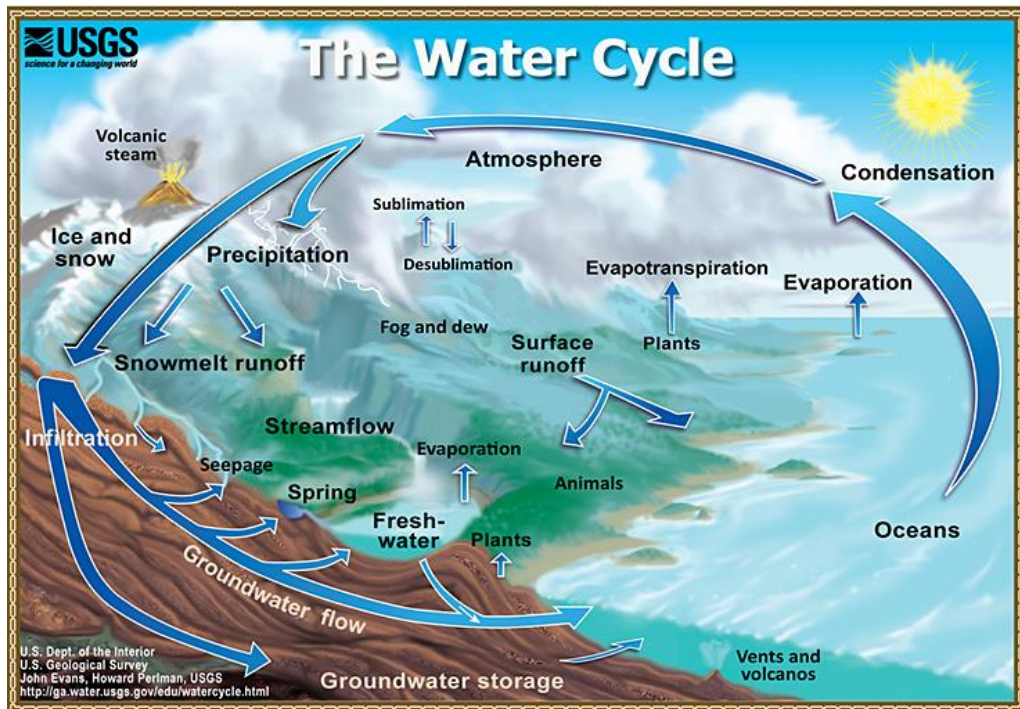
The first, and perhaps most important, is whether rents are actually being earned and, if so, why.

Using water for agricultural purposes is often capital intensive, as it requires investment in water storage and irrigation equipment, in addition to operating costs of irrigation (electricity, etc.) and resource management costs. The return on this investment will not likely give rise to rents and should thus only be subject to normal income tax treatment. This is a further example of the potential complexity of a resource rental tax.

In the case of most natural resources like minerals, rents arise because of the finite supply of the resources, which is a product of nature. Water itself is not a finite resource in New Zealand (notwithstanding droughts) in the way that minerals are. Minerals, once mined, are not replaced by nature. Water, however, is continually going through a cycle as rain water eventually returns to clouds via evaporation.¹⁸

¹⁸ Tietenberg and Lewis, (2012), p. 206.

Figure 3 The water cycle is complex



Source: US Geological Survey

The water cycle, can however, be measured in millennia. Water that seeps into deep aquifers (groundwater storage in the picture above) may be trapped for thousands of years, as is water that falls as snow and forms glaciers and ice sheets.¹⁹ Water that is taken from anywhere in the cycle, from rivers and streams or underground bores and used for man-made purpose (drinking, irrigation, etc.), will eventually be returned to the cycle in some form.²⁰

Rights to use water in New Zealand are the product of law, not nature. If it is established that these laws give rise to rents (which is far from certain or simple), then a better approach would be to question whether the laws are efficient. If they are found not to be, then addressing the conditions in law that give rise to rents, rather than using the indirect measure of a tax on excess profits would make sense.

More generally, the entire question of water use and its regulation is a complex matter that is still under active consideration.²¹ We note, in particular, that the stated aim of the policy is “encourage the best and most efficient use of freshwater”.²² It is not clear to us that using a tax would represent the best and most efficient way of achieving this aim. Using taxes to align private and social costs, as is the case with externalities, requires the government to know the difference between those costs. That is, how

¹⁹ For a description of the hydrological cycle, see the United States Geological Survey’s website at: <https://water.usgs.gov/edu/watercyclesummary.html#infiltration>.

²⁰ This raises the point of where in the water cycle any royalty should apply: should it just apply to water taken from rivers, streams and aquifers, or also to rain water?

²¹ See Ministry for the Environment (2017).

²² *Labour Party Manifesto 2017: Water*, p.8.

much the tax should be. (We return to this point below when considering the nitrate tax).

The Labour Party’s proposal was to apply different rates of tax to different uses of water in each region. This would give the royalty the nature of a charge for use, which would be more efficiently imposed by way of tradeable permits or auctions, because these regimes have the advantage of revealing the true social value of the resource.

Applying a resource rental tax on all uses of water should, therefore, be compared with other regulatory instruments, following a strong assessment of the actual problem such measures are seeking to address.

2.2.1. Bottled water royalty

Following the coalition formation negotiations, the Government announced that it would introduce a “royalty” on exports of bottled water. No details have been announced regarding the rate of the royalty, on whom it will be levied and by whom it would it will be administered.

Also unavailable is any clear discussion of what policy problem the royalty is intended to address.

This tax is not specifically directed at the agricultural sector: if anything, it is a tax on part of the manufacturing sector. The context of the proposal, however, is clearly the Labour Party’s proposal for a wider tax on commercial users of water, which the new Government has announced is not going to proceed in the term of the current parliament.

We have included this tax in our report because it represents a recent example of how very specific proposals can emerge from the government formation process without the usual input from experts and consultation with affected parties.

Table 3 The royalty on bottled water is very hard to justify

Efficiency	Equity	Revenue integrity	Compliance and administration cost	Coherence
✘	✘	✘	✘	✘

Source: NZIER

The Labour Party’s original proposal was based on concerns about the way in which water use rights are allocated. If that is the case with the narrower proposal, then it might be better to change that over time, rather than introducing a new narrow tax.

This all points to the need for a clear problem definition and for all alternative solutions to be considered.

One possible way to impose this tax would be to use the current excise regime, administered by New Zealand Customs, which is a product-specific tax regime, albeit one that applies only to domestic consumption. As excises are not charged on exports

the system used for items like wine and spirits would require modification if it were to apply to exported water.²³

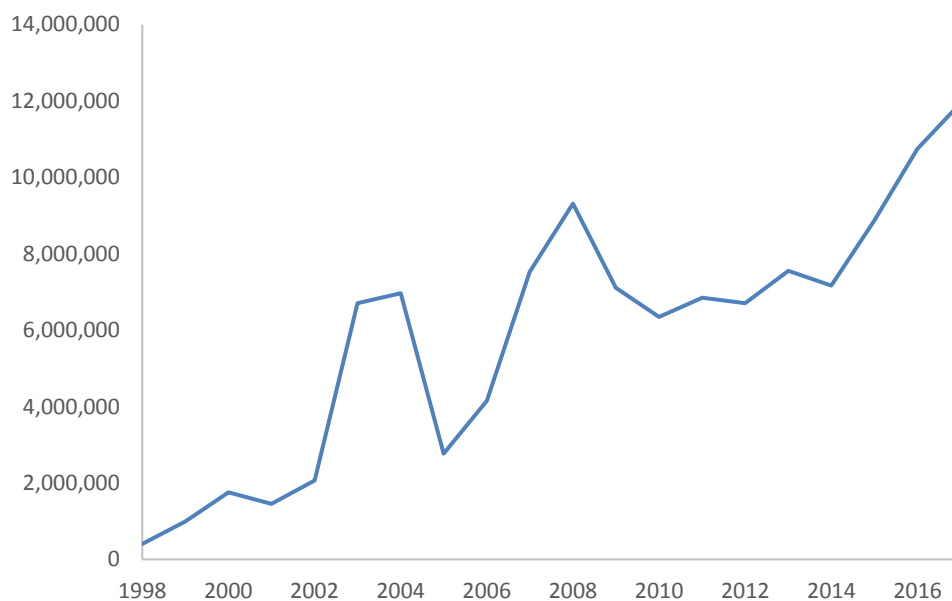
Because it will apply to a narrow sub-sector of the economy, it is likely to involve proportionately high administrative and compliance costs. To put this in context, the value of bottled water exports from New Zealand is very small, as shown in Figure 4.²⁴ If the tax was set at the GST rate (15%), it would have raised about \$1.8 million in 2017.

Officials from the Ministry of Foreign Affairs and Trade have advised Parliament that taxing water exports could breach New Zealand's trade agreements.²⁵

If it were subject to a tax, bottled water would be the only manufactured export that would be taxable by New Zealand (under New Zealand's GST regime, exports are zero-rated and royalties on minerals apply equally to exports and domestic consumption).

Figure 4 Bottled water exports are very small

Value of exports in NZD at FOB of bottled water for the year ending 30 June



Source: Statistics New Zealand

Taxing exported bottled water in isolation is difficult to justify on tax policy grounds. It goes against the BB/LR approach. We note that commercial bottlers of water are subject to income tax on their profits. If the industry continues to grow at its current

²³ Under the Customs and Excise Act, the manufacture of goods subject to excise in New Zealand must take place in a Customs controlled area. Goods that are intended for home consumption are taxed at the time they leave the controlled area (called "entered for home consumption"). Goods that are intended for export are either exported immediately after they leave the manufacturing area or are moved to a licensed export warehouse and are exempt from duty.

²⁴ The data in **Error! Reference source not found.** relates to exports of natural and mineral water without additives. We take this to be the target of the Government's proposal. Exports of drinks that contain or are made from water (like soft drinks and beer) are clearly much higher. However, they are not "water". This point shows another problematic aspect of the proposal: what is to be counted as "water".

²⁵ *New Zealand Herald* 30 November: "Tax on water exports would breach NZ trade agreements says top MFAT official". http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11950475

rate, then, assuming bottlers continue to be profitable, the sector will make a greater proportional contribution to the tax take. It is unclear why an additional tax is required.

2.3. Nitrate tax

Table 4 A nitrate tax scores poorly

Efficiency	Equity	Revenue integrity	Compliance and administration cost	Coherence
✓	✗	✓	✗	✗

Source: NZIER

The Green Party proposed a specific levy of \$2 per kilogram of nitrate leached per hectare per year.

The levy is an impost on an input, while the principles of good tax policy state that outputs (income and consumption) should be taxed. It is also a tax on one input into dairy farming, rather than applying generally.

This levy is also an example of an important finding in public finance economics about the difference between regulation of prices versus quantities.²⁶

In cases of environmental externalities, the desired outcome is to reduce the quantity of pollution to an optimal level. Environmental economics does not consider pollution a bad thing in its own right, due to a reduction in amenity values.²⁷

Rather, the environmental economics framework considers pollution undesirable only if it is the result of a breakdown in the decision-making process of the relevant market, most often in the form of externalities,²⁸ but also due to public goods²⁹ or instances of common property.³⁰

Provided economic decision-makers are taking all the costs and benefits of their actions into account (along with other conditions), markets will operate to produce an equilibrium outcome and this outcome will be optimal.³¹ The central contribution of

²⁶ The seminal article is Weitzman (1974).

²⁷ Not to be confused with a large body of literature on how to value the conservation of natural resources, especially national parks, which is critically interested in amenity values.

²⁸ Where the full benefits or costs of an activity are not accurately reflected in market prices.

²⁹ Where it is not possible for firms to set prices equal to marginal cost. Maler (1985) presents an extensive welfare framework for environmental economics based on "the environment" being a public good (although he does also suggest that it is a common property good).

³⁰ Where profit-maximising firms do not face the true scarcity value of an input.

³¹ Pigou (1920/2005) is often credited as being the first person to state this result, although Sedgewick is also credited at having touched on the matter in his *Principles of Political Economy*. Baumol (1972) was an early developer of the formal version of the modern concept of Pigouvian taxes and Baumol and Oates (1988) did much to popularise its use.

economics to the study of environmental issues is that there may be a non-zero optimal level of pollution.³² This is still a current view.³³

Government will seldom be able to predict with much certainty what the optimal level of pollution will be. While economics predicts that applying a tax will reduce the quantity produced, the amount of that reduction is an empirical matter that can only be determined by measurement of the responsiveness of supply and demand to price (known as elasticities).

We are not aware of whether the \$2 levy proposed by the Green Party will be sufficient to achieve an optimal level of nitrate use. An alternative approach, which is in use in Taupō, is to set the quantity of nitrate that can be used and then use a rights-trading regime to deliver the optimal outcome of social marginal cost equalling social marginal benefit.³⁴

The Green Party’s proposal is that the revenue raised by the levy will be used to fund sustainable farming programmes and the clean-up of waterways. We assume that means “environmentally sustainable” given the traditional focus of the Green Party. Thus, the levy would be what is called a “tied-tax”.

But not only is the revenue tied to a particular expenditure, that expenditure is to be directed at reducing the very thing that is being taxed. It is possible, therefore, that the tax would be the victim of its own success. If the tax is very successful in reducing nitrate use, then the amount of revenue raised will fall and it may be that the amount raised would be insufficient to fund the desired level of expenditure.

2.4. Extending the NZ ETS

Table 5 Extending the NZ ETS could be justified

Efficiency	Equity	Revenue integrity	Compliance and administration cost	Coherence
✓	✓	✓	✓ ✗	✓

Source: NZIER

Extending the NZ ETS to agriculture can be justified within the tax policy framework we are using to assess proposals, but would need to be undertaken as part of a comprehensive policy programme if unintended consequences are to be avoided.

³² See Bator (1974) for an early contribution along these lines.

³³ Stavins (2008) begins his entry on environmental economics in the New Palgrave Dictionary of Economics with: “The fundamental theoretical argument for government activity in the environmental realm is that pollution is an externality: an unintended consequence of market decisions, which affects individuals other than the decision maker”.

³⁴ Lake Taupo nitrogen cap and trade programme was established in 2011 as part of Waikato Regional Council’s Regional Plan. For details, see: <https://www.waikatoregion.govt.nz/Community/Your-community/For-Farmers/Taupo/Nitrogen-management-in-the-Lake-Taupo-catchment/>. For reviews of the scheme, see OECD (2015) and Duhon, McDonald and Kerr (2015).

Issues of leakage (where production shifts to another country that does not impose a carbon charge) and export competitiveness are critically important issues to address to avoid imposing a cost for limited or no environmental benefits.

Although there is some evidence that it is possible to lower emission rates from agricultural activity without reducing livestock numbers (for example, by use of nitrogen inhibitors in fertiliser application, or by feed management in growing cattle), measurement of emissions from a specific agricultural activity (for example, by individual livestock) is currently not achievable.³⁵

The aim of any domestic policy decisions regarding agriculture (and indeed any sector subject to emissions reduction initiatives) should be to minimise the total long-run cost of meeting New Zealand's climate change commitments in a global context, including the cost of fulfilling any obligations arising from failure to meet these commitments.

Ensuring that the benefits are greater than the costs, even if the costs seem very large and global in scale, is a core part of public policy. Benefits, however, are not just financial, nor are costs. Matters like international reputation, support for rules-based global solutions for global problems and burden-sharing between developed and developing countries are all important, but are unlikely to determine optimal domestic policies.

This objective captures the relatively simple point that the lowest cost means of meeting the climate change target should be adopted. Although this is a simple point, it is not necessarily one that is easy to achieve.

The reality is that it may prove cheaper to pay emitters in another country to reduce emissions rather than to achieve any reduction within New Zealand. This is not a failure of policy. All emissions regardless of where in the world they are emitted will become part of the global atmosphere and thus make the same contribution to climate change as any other emissions.³⁶

All costs should be considered when designing policy, for example, a balance should be sought between the benefit of including all emitters in any scheme, and the cost of monitoring individuals who have only a small effect on overall emissions.

In most cases, the initial entity on whom the costs fall will not be the party who eventually pays, as the costs are diffused through the economy. The exception is where entities are exposed to international competition. In this case, they are unlikely to be able to increase prices to reflect the cost of climate change mitigation policy (unless the policy is international).

This means that the party that receives the benefit of the emission (the consumer) does not also bear the cost of the emission. As much of New Zealand's agricultural production is destined for export markets where it is a price-taker, there are clear risks to competitiveness if New Zealand imposes commitments on agriculture when other countries have not.

The design and effect of the free-allocation system that the Government has proposed will therefore be very important for determining the outcome of extending the scheme.

³⁵ Kerr (2016) and Hollis et al. (2016).

³⁶ However, the process of international carbon trading has been controversial and the New Zealand Government decided in 2015 to limit the ETS to domestic market.

The compliance and administration costs of the NZ ETS will depend very much on how the scheme is extended to cover livestock emissions, including key issues like point of obligation, and there is still a lot of policy uncertainty over the how the scheme will work in practice.

For example, if the obligation to surrender units is applied at the processor level (the current default in the legislation), then providing individual farms with an incentive to reduce emissions without reducing stock numbers will be dependent on how the economic impact of the scheme is passed down the production chain.³⁷

In a major report to Business New Zealand in 2007, when plans for the NZ ETS were in their infancy, NZIER set out a series of pre-conditions that would need to be met before establishing such a scheme would be justified.³⁸ While much has transpired since, those pre-conditions remain relevant to considering the question of whether agriculture should be included within the NZ ETS.

At the international level, the pre-conditions we proposed were:

- Acceptance that climate change presents a sufficient risk, albeit one with uncertainty, for it to be prudent to take action now to reduce the probability of significantly larger damage and costs later;
- Understanding of the potential for significant amelioration of climate change through reductions of emissions from human activities;
- International commitments to reduce emissions with an internationally agreed means of counting net emissions; and
- New Zealand and international agreement among a significant number of countries on emissions reduction targets.

These conditions now seem to have been largely met, particularly following the Paris Accord.

At the domestic level, the pre-conditions we proposed were:

- An accurate and comprehensive emissions monitoring and reporting system, for measuring performance relative to targets and reconciling abatement with allowances and credits;
- The conditions required for a market to operate – a clearly and specifically defined tradable unit, transferability of units and enforcement of transfer, sufficient numbers of competitive buyers and sellers, institutions and infrastructure for trade and exchange, and reasonable transaction costs;
- Established accounting, financial reporting and tax rules for participants in the ETS to use;
- Sufficient economic efficiency benefits from trading to outweigh the costs of establishing and operating an ETS;
- Public and social consensus that emissions trading will deliver the intended policy outcomes such as controlling emissions, without significant

³⁷ If processors add a charge per head for animals processed at an abattoir or per kilo of milk solids in the case of dairy farming, then the economic impact on farmers would be invariant to the amount of effort applied to reduce emissions at the level of individual animals.

³⁸ Branson et al. (2007).

unintended side-effects. This will require there to have been a thorough economic analysis of the potential impacts of any ETS for New Zealand; and

- Sufficient public and social consensus on the need for moving towards emissions trading to ensure durability and avoid disruptive policy reversals that undermine the value of investments and confidence in the system.

Experience with the NZ ETS to date means that there is now more evidence available regarding whether these pre-conditions can be met than there was in 2007. We note that Federated Farmers and other sector groups have been active in continuing to engage with the Government on these issues, for example in its submission to the last review of the NZ ETS.³⁹

Despite its conceptual appeal, applying the NZ ETS to biologically-based emissions would still be a world-first and the case for doing so is yet to be made. The above list of pre-conditions remains, in our view, an appropriate starting point for further official consideration of this matter.

³⁹ We note that in addition to Federated Farmers also made a submission to the Productivity Commission's inquiry into a low emissions economy. Federated, Horticulture NZ, Beef+Lamb NZ, and Dairy NZ are all members (along with some other agricultural sector groups and the Ministry of Primary Industries) of the Biological Emissions Reference Group (or BERG) which has been working over to jointly build an agreed evidence-base on current and future opportunities to mitigate biological (methane and nitrous oxide) greenhouse gas emissions on-farm and the costs and opportunities and barriers of doing so.

3. Bibliography

Australian Treasury (2009) *Australia's future tax system, a Report to the Treasurer*, Canberra, Commonwealth Treasury.

Baranzini, Andrea; Jeroen C. J. M. van den Bergh, Stefano Carattini, Richard B. Howarth, Emilio Padilla and Jordi Roca (2017) 'Carbon pricing in climate policy: seven reasons, complementary instruments, and political economy considerations', *Wiley Interdisciplinary Reviews: Climate Change*, 8:e462.

Baumol, William (1972), 'On Taxation and the Control of Externalities'. *American Economic Review*, 62 (3): 307-322.

Baumol, William and William Oates. 1988. *The theory of environmental policy* (2nd Ed.). Cambridge: Cambridge University Press.

Branson, Johannah; Peter Clough, Vhari McWha, Brent Layton and John Stephenson (2007) *Emissions Trading Scheme for New Zealand. Report to Business New Zealand*, Wellington, New Zealand Institute of Economic Research.

Brys, Bert; Sarah Perret, Alastair Thomas and Pierce O'Reilly (2016), "Tax Design for Inclusive Economic Growth", *OECD Taxation Working Papers*, No. 26, OECD Publishing, Paris.

Committee of Tax Experts on Tax Compliance (1998) *Tax Compliance*. A report to the Treasurer and Minister of Finance. <https://taxpolicy.ird.govt.nz/sites/default/files/1998-other-tax-compliance.pdf>

Duhon, Madeline; Hugh McDonald and Suzi Kerr (2015) Nitrogen Trading in Lake Taupō, *Motu Working Paper 15-07*. Motu Economic and Public Policy Research, Wellington.

Flues, Florens and Kurt. van Dender (2017), "Permit allocation rules and investment incentives in emissions trading systems", *OECD Taxation Working Papers*, No. 33, OECD Publishing, Paris.

Garnaut, Ross (2010) "Principles and Practices of Resource Ret Taxation", *Australian Economic Review*, 43(4), pp 347-56.

Gill, Derek and Killian Destremau (2015) *Quantifying the value of effort: the costs to New Zealand businesses to comply with New Zealand government taxes and regulations*. Wellington: New Zealand Institute of Economic Research

Hollis, Michele; Cecile de Klein; Dave Frame; Mike Harvey; Martin Manning; Andy Reisinger; Anna Robinson and Suzi Kerr (2016), 'Cows, Sheep and Science: A Scientific Perspective on Biological Emissions from Agriculture', *Motu Working Paper 16-17*, Motu Economic and Public Policy Research, Wellington.

International Monetary Fund (2017) *Fiscal Monitor: Achieving More with Less*, IMF, Washington.

Katz, Dieter (1999) 'Towards a Practical Cash-Flow Tax', *New Zealand Treasury Working Paper 99/01*.

Kerr, Suzi (2016) 'Agricultural Emissions Mitigation in New Zealand: Answers to Questions from the Parliamentary Commissioner for the Environment', *Motu Working Paper* 16-16, Motu Economic and Public Policy Research, Wellington.

Labour Party (2017) Labour Party Manifesto: Water <http://www.labour.org.nz/water>

Leining, Catherine and Suzi Kerr (2016) 'Lessons Learned from the New Zealand Emissions Trading Scheme', *Motu Working Paper* 16-06, Motu Economic and Public Policy Research, Wellington.

Mankiw, Gregory; Matthew Weinzierl and Danny Yagan (2009). Optimal Taxation in Theory and Practice. *Journal of Economic Perspectives*, 23(4), p. 167.

Ministry for the Environment (2017) *Briefing to the Incoming Minister for the Environment: water issues*, Wellington, Ministry for the Environment

Mourougane, Annabelle (2007) "Toward a More Efficient Taxation System in New Zealand", *OECD Economics Department Working Papers*, No. 557, OECD Publishing, Paris.

OECD (2015) "The Lake Taupo Nitrogen Market in New Zealand: A Review for Policy Makers", *OECD Environment Policy Papers*, No. 4, OECD Publishing, Paris. <http://dx.doi.org/10.1787/5jrtg1l3p9mr-en>

OECD (var) *OECD Economic Surveys: New Zealand 2017* http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-new-zealand_19990162

Parliamentary Commissioner for the Environment (2017). *Stepping stones to Paris and beyond: Climate change, progress, and predictability*, Wellington, *Parliamentary Commissioner for the Environment*.

Pigou, Arthur (2005). *The Economics of Welfare*, New York: Cosimo Inc.

Royal Society of New Zealand (2016) *Transition to a low-carbon economy for New Zealand*.

Tietenberg and Lewis (2012) *Environmental & Natural Resource Economics*, (9th ed.), Boston: Pearson.

The Treasury (2001) *The Tax Review*. <http://www.treasury.govt.nz/publications/reviews-consultation/taxreview2001>

Victoria University of Wellington Tax Working Group (2010) *A Tax System for New Zealand's Future*, Wellington: Centre for Accounting, Governance and Taxation Research.

Weitzman, Martin (1974) "Prices vs. Quantities." *Review of Economic Studies*, 61(4): 477-491.

Wilson, Peter (2002) 'An Analysis of a Cash Flow Tax for Small Business', *New Zealand Treasury Working Paper* 02/27

Wilson, Peter (2011) "The Economics of Emissions Trading" in *Climate Change Law and Policy in New Zealand*, Alistair Cameron (Ed.), LexisNexis, Auckland.

Appendix A Detailed proposals

This appendix outlines the details of the taxes studied in the main body of this report.

A.1 Labour policy

A.1.1 Freshwater royalty

In its manifesto, the Labour Party proposed a “freshwater royalty”, that would be applied to “large commercial users”, including water bottlers, irrigators and other industrial users. The stated purpose of the royalty was to “encourage the best and most efficient use of freshwater”.

Some features that were to apply were:

- The royalty would be set on a per cubic metre basis
- Different rates would apply in different regions, and different uses would also attract different rates
- A premium would be charged on the taking of pristine water suitable for bottling
- Details of the scheme would be developed by experts, including the Treasury, with input from users, councils and other stakeholders.

A.1.2 Climate change

The Labour Party committed to setting a target of net zero for greenhouse gas emissions by 2050, with legally binding emissions reduction targets, and carbon budgets to keep New Zealand on track to this goal. It also promised to establish an independent Climate Commission to recommend interim emissions reduction targets and provide advice on the ramifications of not achieving them.

A Climate Commission has independently been recommended by the New Zealand Parliamentary Commission for the Environment, based on the model of the UK Climate Change Act.⁴⁰

A.1.3 Emissions trading

In its environmental manifesto, the Labour Party proposed that it would reform the NZ ETS so it puts a price on carbon that drives behaviour change away from carbon-polluting goods and services towards low or zero-carbon options.

As part of these reforms, the Labour Party announced that it would not allow the importation of international units until “it is clear that they have environmental integrity, are from a reputable source and a mature international market, and are realistically priced; and for the foreseeable future will manage access to any such units through direct acquisition by the Government”. More generally, it proposed that at least 50% of all units surrendered to meet obligations under the NZ ETS would need to be NZUs issued by the New Zealand Government.

⁴⁰ Parliamentary Commissioner for the Environment (2017).

It also proposed to bring agriculture into the NZ ETS in its first term with a free allocation of 90%.⁴¹

A.2 Green Party policy

A.2.1 Nitrate tax

In its policy paper, *Clean Water, Great Farming*, the Green Party proposed to implement a nitrate pollution levy, calculated using the nutrient management tool OVERSEER, to incentivise farmers to pollute less.

For an initial period of three years, the levy would only apply to dairy farmers. Over an unspecified timeframe, the Green Party said that the levy would be extended to include beef and sheep farming, other agriculture, horticulture, and other sources of nitrogen pollution.

The levy would be set at a rate of \$2 per kilogram of nitrate leached per hectare per year. The levy would be collected from dairy processors, not individual farmers. The revenue (estimated by the Greens at \$136.5 million), would be used to fund sustainable farming programmes and the clean-up of waterways.

A.2.2 Replacing NZ ETS in favour of carbon charges

The Green Party's Climate Protect Plan proposes replacing the NZ ETS with a "Kiwi Climate Fund". The fund will be a combination of a tax of carbon emissions, a bounty on carbon absorption by forests and a universal payment system to recycle revenue to adult New Zealand citizens and residents.

While an independent Climate Commission will advise on rates of any taxes, the Green Party expects prices at the following levels to be indicative of what would be set in 2020:

- \$40 per tonne of carbon dioxide emissions (excluding biological emissions);
- \$6 per tonne of nitrous oxide emissions from agriculture; and
- \$3 per tonne of methane emissions from agriculture.

The policy states that levels of taxes would rise over time "in line with the necessity of reaching net zero emissions by 2050".

Foresters would receive a "guaranteed minimum payment" for every tonne of carbon dioxide sequestered. This would "initially" be set at the same rate that applies to emission, i.e. \$40 per tonne.

A.3 New Zealand First

New Zealand First proposed to repeal the NZ ETS and replace it with a UK/Norway-style Climate Change Act and to establish a new Parliamentary Commission for Climate Change as an Office of Parliament. The Parliamentary Commissioner would be responsible for reporting against both the Kyoto and Paris Accord by setting a three-

⁴¹ Under transitional provisions in the NZ ETS, when trade-exposed sectors become covered by the scheme, emitters are given a free allocation of emission units, based on emission levels in the past.

yearly 'Carbon Budget' designed to reach these commitments (first Budget to become operative in 2021).

Resources previously devoted to the NZ ETS would be applied to research and development and climate change adaptation.

The Parliamentary Commissioner would also provide independent advice to central and local government on meeting the Carbon Budget and preparing for climate change.

A.4 The Government's agenda

The new Government's policy programme is based on a coalition agreement between the Labour Party and New Zealand First and an agreement on confidence and supply between the Labour Party and the Green Party.

A.4.1 Labour Party and New Zealand First coalition agreement

Specific tax and related provisions directed at the primary sector in the coalition agreement are:

- Introduce a royalty on exports of bottled water
- No resource rentals for water in this term (2017 to 2020) of Parliament
- Introduce a Zero Carbon Act and an independent Climate Commission, based on the recommendations of the Parliamentary Commissioner for the Environment
- If the Climate Commission determines that agriculture is to be included in the NZ ETS, then upon entry, the free allocation to agriculture will be 95% but with all revenues from this source recycled back into agriculture in order to encourage agricultural innovation, mitigation and additional planting of forestry.⁴²

A.4.2 Labour Party and Green Party confidence and supply agreement

The agreement between Labour and the Green Party includes the following matters:

- Adopt and make progress towards the goal of a Net Zero Emissions Economy by 2050, with a particular focus on policy development and initiatives in transport and urban form, energy and primary industries in accordance with milestones to be set by an independent Climate Commission and with a focus on establishing Just Transitions for exposed regions and industries
- Introduce a Zero Carbon Act and establish an independent Climate Commission
- All new legislation will have a climate impact assessment analysis
- A comprehensive set of environmental, social and economic sustainability indicators will be developed

⁴² Note that the Labour Party's proposal of 90% free-allocation has been increased to 95% and there is now a proposal to recycle "revenues" from the agricultural sector. It is unclear what this relates to, as the ETS operates by way of units, not money.

- A new cross-agency climate change board of public sector CEOs will be established.

A.4.3 Climate change

Under the Paris Agreement, New Zealand has committed to reduce its emissions to 30% below 2005 levels by 2030, and under the Climate Change Response Act 2002, has committed to reduce its emissions to 50% below 1990 levels by 2050.

The new Government has stated its intention to adopt and make progress towards the goal of a net zero emissions economy by 2050, with a particular focus on policy development and initiatives in transport and urban form, energy and primary industries. It will establish a Climate Commission to provide independent advice and, in particular, to consider whether and how agriculture should be included within the NZ ETS.

Some details of the Government's proposed action plan are contained in a Cabinet Paper from the Minister for Climate Change considered by the Cabinet on 17 December 2017.⁴³ In that paper, the Minister acknowledged the transition to lower emissions will be challenging and will require a fundamental economic shift, saying:

26. New Zealand has an existing 2030 target (our Paris Agreement contribution). This commits us to a reduction in emissions to 11% below 1990 levels by 2030 (30% below 2005 levels).

27. Based on current estimates, approximately 193 million tonnes of carbon dioxide equivalent (MtCO₂e) abatement (ie reduce emissions, absorb through forests or buy international emissions reductions) is required over the 2021-2030 period to meet this target. Achieving the 2030 target will require significant action across multiple sectors of the economy, particularly if the target is primarily to be met by domestic efforts. For example, the forecast abatement from forestry would only mitigate approximately 18 MtCO₂e across the 2021-2030 period (I understand that the proposed Billion Trees Planting Programme could lead to between 10 and 30 MtCO₂e of additional carbon dioxide being stored).

*28. Taking bolder action on climate change will require further investment, policy intervention, social adjustment, and economic transformation. This could include moving towards 100 per cent renewable electricity generation, with: fossil fuel generation only called upon in years of hydroelectric electricity generation shortages; the electrification of low grade industrial heat sources; and a shift to mostly electric vehicles with more domestic freight carried by rail. **New methane inhibitors and techniques to reduce biological emissions would also need to be developed, and we will***

⁴³ See: <http://www.mfe.govt.nz/more/cabinet-papers-and-related-material-search/cabinet-papers/100-day-plan-climate-change>

***need changes in land use, including substantial afforestation.
(Emphasis added)***