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Finalist Submission

TAXING FRESHWATER:
PROPOSAL FOR A PIGOUVIAN WATER TAX ADMINISTERED BY REGIONAL COUNCILS

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Til taught by pain
Men know not what good water's worth.

Lord Byron[1]

[1] George Gordon Byron *Don Juan* (Whitefriars, London, 1819).

I Introduction

This proposal responds to the call for a significant reform to the New Zealand tax system that could make a real difference to our economy, social equity and environment. This proposal is for a Pigouvian water tax administered by regional councils.

Water is our greatest natural resource, eternally renewable, but finite in any particular year. Water is taken for granted because it seems free and infinite. It is not. In designing a policy which reflects the value of water, this paper draws on a blend of law, science, economics, philosophy and politics. This paper aims to answer the most fundamental question of how we can best balance our economy, our environment and our society, and applies the conclusion to water management.

Economists have long preferred the use of taxes as instruments of environmental protection. Surprisingly, New Zealand has few environmental taxes.[2] As in other jurisdictions, water is regarded as public property and officials decide on its distribution. Water rights are obtained largely without charge and often used wastefully, despite high environmental costs and scarcity. Now, there is an increasing trend in water management from infrastructure to institutions, such as community management.[3]

This paper mainly adopts an interdisciplinary, qualitative research methodology and draws on published economic literature to design a water tax. The philosophical component of this paper engages institutional analysis to explain how institutions influence behaviour.

Part II describes the water issue, current arrangements and reviews the Tax Working Group (**TWG**)'s findings. Part III considers the philosophies which could underpin future environmental taxes. Part IV outlines the detail of this proposal; Part V considers the economic impact; Part VI, its political feasibility; Part VII, its social acceptability; and Part VIII, its administration.

II Background

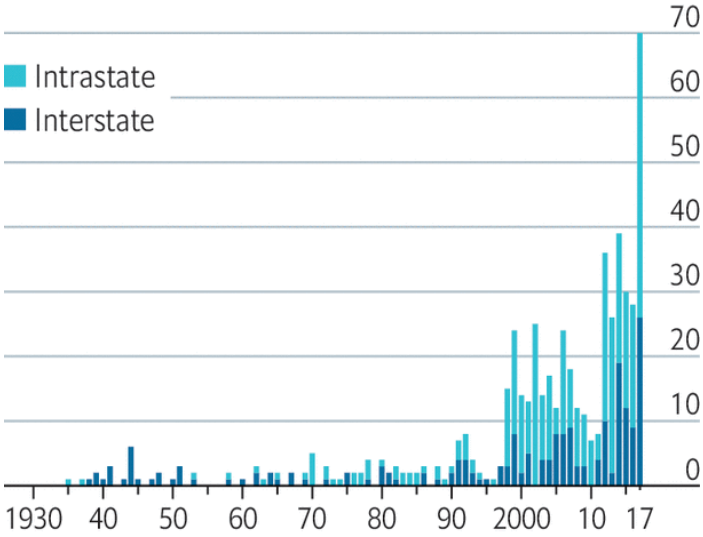
A. The issue

Freshwater management reform is a topical and pressing issue. Internationally, common signs of water stress: a Dubai company's proposal to tow an Antarctic iceberg to the Persian Gulf; the Cape Town water crisis; or the drought threatening 15 million people in East Africa at the time of writing, of which most people are unaware. Some may recall water was

[2] Lawrence H Goulder "Environmental Taxation and the Double Dividend" (1995) 2 International Tax and Public Finance 157-183; Dave Owen "Water and Taxes" (2017) 50 UCDL Rev 1559 at 1597.
[3] Mateen Thobani "Tradeable Property Rights to Water" (1995) 34 World Bank: Public Policy for the Private Sector.

often predicted to cause the next global conflict. While water is rarely the sole cause of conflict, it is increasingly an aspect:[4]

Number of water conflict events per year[5]



This trend is expected to continue. By 2050, water scarcity could affect 5 billion people.[6] Existing technologies to alleviate shortages are not universally feasible. Moreover, incremental efficiency increases may not withstand the pressure of population increases.

New Zealand, a water-rich nation, is distant from many of these statistics. Here, freshwater is renewable at a certain rate of abstraction, although falling ground-water and surface-water levels are a widespread phenomenon.[7] National consumptive water allocations have doubled in a decade.[8] While the true state of freshwater reserves and their absorptive capacity are difficult to determine, public policy cannot be reactive for a resource as vital as water. Yet under the existing legal standard of "sustainable management", a term of conflated ideals, there is a trend toward resource efficiency, rather than protection.[9]

The failure to attribute a true economic cost to water is causing its efficient depletion. A number of consequences are apparent:

- every year, 101 billion litres of water is wasted through leaks in piping systems;[10]

[4] Peter Gleick and Charles Iceland "Water, Security and Conflict" (2018) Pacific Institute, World Resources Institute https://pacinst.org/wp-content.
[5] Peter Gleick and Charles Iceland "Water, Security and Conflict" (2018) Pacific Institute, World Resources Institute https://pacinst.org/wp-content.
[6] Institute of Mechanical Engineers "Global food: Waste not want not" (2 November 2013) www.imeche.org/policy-and-press.
[7] Dave Owen "Water and Taxes" (2017) 50 UCDL Rev 1559 at 1589.
[8] Charles Feltham "Freshwater use in New Zealand" (2011) <www.parliament.nz/en/pb/research-papers/>.
[9] Resource Management Act 1991, s 5.
[10] Water New Zealand "2015-16 National Performance Review" (2016) www.waternz.org.nz

- 2,000 New Zealand dairy farms use as much water as 60 million urban people;[11]
- 74 percent of our freshwater fish are threatened with extinction;[12]

Recent water quality crises in New Zealand include the Christchurch earthquake, Buller District Council crisis,[13] the evaporation of Coes Ford[14] and incidents in Auckland, Wellington, Mangawhai.[15] Infamously, Havelock North residents recently contracted gastroenteritis, caused by sheep manure, affecting 5,000 people and killing three.[16] While water scarcity may not strictly be a problem in New Zealand, access and quality obviously are.

B. Current arrangements

New Zealand is divided into sixteen regions for local government purposes. Eleven are administered by regional councils and five by unitary authorities with the same functions.

Map of New Zealand regions and territorial authorities[17]

[11] Parliamentary Commissioner for the Environment *Water quality in New Zealand: Land use and nutrient pollution* (November 2013) at 13; The Economist "Disputes over water will be an increasing source of international tension" (28 February 2019) www.economist.com; The Economist "Dairy farming is polluting New Zealand's water (16 November 2017).
[12] Ministry for the Environment "Our fresh water 2017" (April 2017) ME1305 www.mfe.govt.nz at 79–83.
[13] Sam Strong "Town in one of NZ's wettest areas may run out of water in less than a fortnight" (8 September 2017) www.stuff.co.nz/the-press.
[14] Fish & Game "Welcome to the future: Popular family swimming spot completely dries up" (2016) https://fishandgame.org.nz/news/.
[15] Newshub "The lessons New Zealand could learn from the Cape Town water crisis" (24 January 2018) Newshub www.newshub.co.nz/.
[16] Laura Wiltshire "Tale of the taps: How Havelock North turned Napier's water brown" (16 March 2019) The Herald www.nzherald.co.nz/nz/news; Ruby Harfield and Nicki Harper "Havelock North water crisis: One year on" (12 August 2017) Hawkes Bay Today www.nzherald.co.nz/the-country/news/.
[17] Korakys "Map of the Territorial Authorities of New Zealand overlaid with Regional Council areas, including the Chatham Islands in an inset" (March 2017).

The boundaries of local authorities (or "regional councils", used interchangeably) are defined mainly by drainage basins. This makes them a highly convenient body to administer a local water tax.

Local authorities are already significant to the New Zealand economy. They have high fiscal autonomy and are less reliant on central government funding, relative to international counterparts.[18] Local authorities can already impose general and targeted rates, fees and user charges and development contributions.[19] They are generally elected every three years. Landowners pay rates to both their city and regional councils, though the former often collects rates for the latter. Council rates are not integrated with the national income tax system.

Water quality and quantity is a specific function of regional councils under the Resource Management Act 1991 (**RMA**), though the Audit Office says one in four local councils are poorly placed to meet expected demand for drinking water.[20] Not all water usage requires a consent. For example, a residential water user does not require a consent from a regional council, unless usage will breach the city council's district plan.[21] Water is allocated on a first-come, first-served basis. There are long grant periods and renewal rights.

C. Recent developments

The most significant investigation into taxing water New Zealand seems to have been the 2019 Tax Working Group's (**TWG**) report (the **Report**). The Report revealed that some of the most glaring deficiencies in the tax system arise in the environmental sphere. The Report noted a water taxation instrument would be desirable, but no decision was made on the nature of that tool.

The Government's coalition agreement indicates "resource rentals" for water will not be introduced in this term of Parliament, but a royalty on exports of bottled water may be introduced.[22] Whatever the outcome, there is a torrent of information and advice on water management:

- in mid-2017, the Three-Waters review began, involving 13 government agencies;[23]
- in November 2017, the Water Allocation Technical Advisory Group reported back;
- in October 2018, the new Government appointed a cross-ministry Water Taskforce;
- in February 2019, the TWG released the Report;

[18] Productivity Commission "Local Government Funding and Financing: Draft Report" (July 2019) www.productivity.govt.nz at i.
[19] Productivity Commission "Local Government Funding and Financing: Draft Report" (July 2019) www.productivity.govt.nz at 2
[20] Radio New Zealand "Councils poorly placed to meet water demand" (26 February 2010) Radio New Zealand news www.rnz.co.nz/news/national.
[21] See e.g. Christchurch City Council's District Plan at 11.8.1: Christchurch City Council "Permitted activities: Water, wastewater and stormwater" https://districtplan.ccc.govt.nz/pages.
[22] Labour and New Zealand First "Coalition Agreement: 52nd Parliament" (2017).
[23] Department of Internal Affairs "Three waters review" (November 2018) www.dia.govt.nz; David Clark "Dedicated watchdog for water quality" (1 August 2019) www.beehive.govt.nz/release.

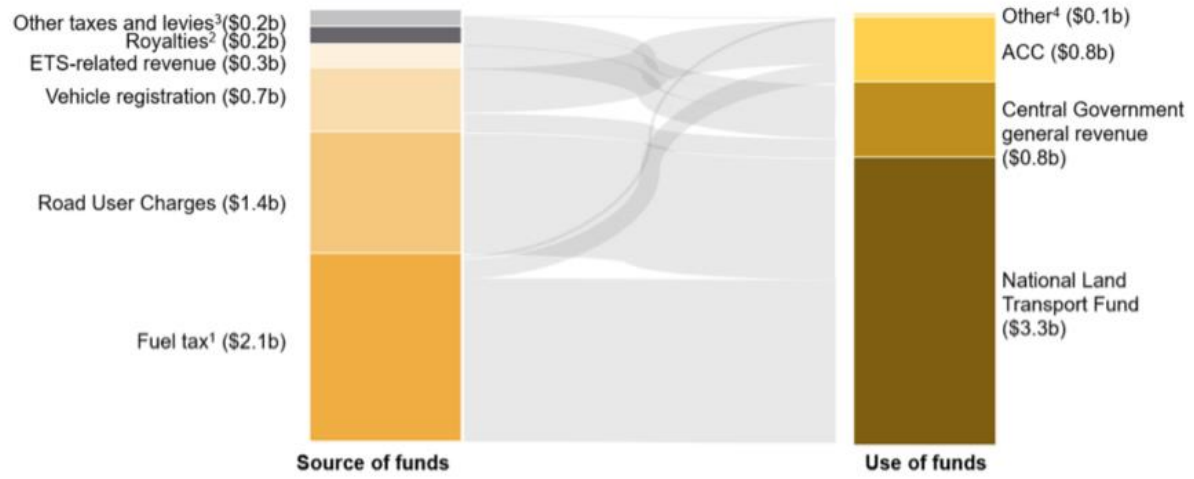
- in March 2019, 6,000 people protested a water-bottling plant in Christchurch;
- in July 2019, Auckland's water storage levels fell below 60 percent of capacity; the Productivity Commission released its report on local government funding (but not suggesting a water tax);[24] and the Government released terms of reference for an RMA working group, in which water management was specifically implicated;
- in August 2019, the Waitangi Tribunal released a report on Māori freshwater rights;
- in September 2019, the Government released the National Environment Standard on Freshwater Management and a refreshed National Policy Statement (**NPS**).[25]

Thus, a water tax must compete for relevance among many other suggestions. Fortunately, there is a strong case for environmental taxation.

D. Environmental taxes in New Zealand

The Government raised approximately $5 billion in environmental taxes in 2016, equivalent to 6.2 percent of tax revenue.[26]

Sources and uses of environmental tax revenue in New Zealand in 2016[27]

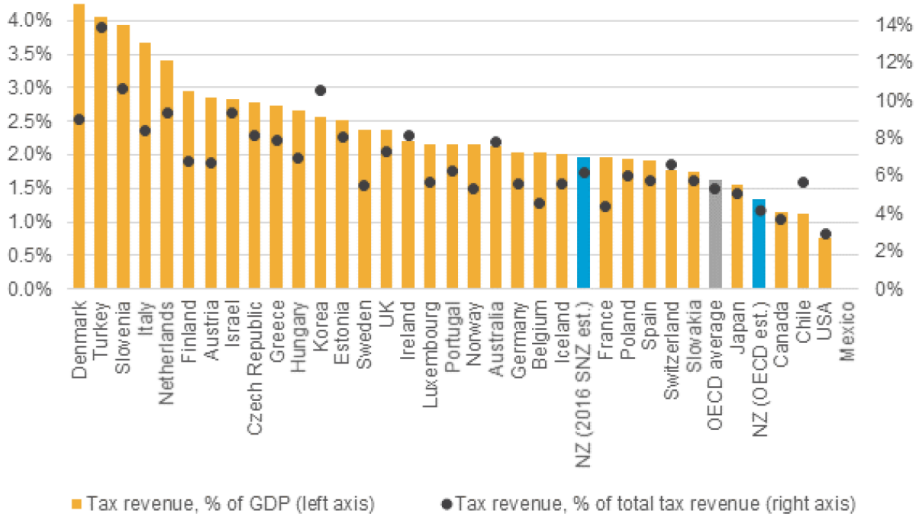


It appears most environmental tax revenue comes from taxes levied for non-environmental purposes. Vehicle-related taxes are "largely hypothecated to the National Land Transport Fund to pay for land transport infrastructure, or to ACC to provide compensation for

[24] Productivity Commission "Local Government Funding and Financing: Draft Report" (July 2019) www.productivity.govt.nz at 6.3.
[25] David Parker "Government launches action plan for healthy waterways" (5 September 2019) www.beehive.govt.nz/release.
[26] Statistics New Zealand "Environmental Economic Accounts: Data to 2016" (2018) www.stats.govt.nz.
[27] Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz.

road-related injuries".[28] Moreover, New Zealand is a relatively low user of environmental taxes overall:

Environmental tax revenue across OECD countries in 2013[29]



In this study, New Zealand ranked 30th for environmental tax revenue as a share of total tax revenue in 2013.[30] Therefore, environmental taxes would significantly broaden the tax base.

III. Philosophy

The TWG noted in the Report's environmental chapter:[31]

> These environmental challenges call for profound changes to the structure of economic activity. Policymakers will need to think in terms of systems change – and develop a set of goals and principles that can guide a transition, in the short and long term, to more sustainable patterns of economic activity.

Further, Richardson J, writing on law and economics, noted "there are always policy trade-offs between efficiency, fairness, and other individual and community values".[32] This

[28] Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz.
[29] Statistics New Zealand "Environmental Economic Accounts: Data to 2016" (2018) www.stats.govt.nz.
[30] Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz at 40.
[31] Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz at 37.
[32] Ivor Richardson "Law and Economics" (1998) 4 NZBLQ 64.

section adopts this broad approach and considers what principles can guide a transition to a sustainable economy.[33]

A. The precautionary principle

The first principle which should underlie environmental taxation is the precautionary principle. The principle advocates for protective measures, even where there is little scientific evidence in an uncertain situation that harm will occur.[34] In the context of water, a precautionary approach means taking care to moderate consumption, even though there is little scientific clarity about water reserves, regeneration rates and the impacts of activity on water quality.

In New Zealand, there is currently no explicit duty of precaution. The RMA requires authorities to have regard to effects on the environment, but it has generally fallen short of the expectations of environmentalists.[35] The ambiguous s 5, which attempts to reconcile development and the environment, gives the impression of precaution, but the reality of the orderly degradation of society.[36] Interpretations are wide, and litigation is very common.[37] An express reference to precaution is needed in the new water tax legislation.[38]

B. Decentralisation

Our current economic arrangements make environmentally destructive decisions logical, or at least "organisationally inescapable."[39] To illustrate, the 'tragedy of the commons' arises in conditions where there are limited resources, such as water, and where it is rational for humans to maximise profit.[40] It is necessary to alter human rationality to tend towards preservation, not exploitation. Society needs to fetter its own progress for posterity.[41]

Therefore, the second principle which should underlie environmental management is decentralisation. Decentralisation leads to better management of environmental resources because it capitalises on the "not in my neighbourhood" mentality, which outsourcing has rendered dormant. Self-sufficient communities sooner remedy their predicaments than those which depend on national governments for answers.[42] Regional councils are a convenient tier

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[33] See Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz at 39.
[34] United Nations Rio Declaration on Environment and Development 1992.
[35] Resource Management Act 1991, s 104.
[36] David J Round "The Future of Environmental Law" (2011) 19 Waikato L. Rev. 144 at 155.
[37] Linda Cameron *Environmental Risk Management in New Zealand – Is There Scope to Apply a More General Framework?* New Zealand Treasury (Policy Perspectives Paper 06/06) July 2008.
[38] Greg Severinsen "To Prove or Not to Prove? Precaution, the Burden of Proof and Discretionary Judgment Under the Resource Management Act" (2014) 13 Otago LR 351.
[39] Jared Diamond *Collapse: How Societies Choose to Fail or Succeed* (Viking Press, New York, 2005) at 427; O'Riordan, above n 14.
[40] See William J Ophuls *Ecology and the Politics of Scarcity Revisited* (W. H. Freeman, New York, 1992) at 204.
[41] See Mihajlo D Mesarovic *Mankind at the Turning Point* (Hutchinson, London, 1975) at 142.
[42] See Edward Goldsmith "De-industrialising Society" (1977) 7 The Ecologist 4 at 14.

of government for water management because their boundaries align with water catchment areas.

Not everyone agrees with a localised approach because climate change and harmful trade are global issues.[43] But international remedies can be consistent with a regional approach. The United Nation's 15 Sustainable Development Goals (**SDGs**), to which New Zealand subscribes, include "support the participation of local communities in improving water management".[44] New Zealand's self-review of its compliance with the SDGs noted our relatively strong role for local government in environmental management. [45]

In summary, a sustainable economy will necessarily be precautionary and decentralised. On the strength of these philosophies and the existing institutions for regional environmental management, we turn now to consider the proposal in detail.

IV Proposal detail

A. Outline

This proposal is that each of the 16 regional councils be conferred the power to impose a tax on quantities of abstracted freshwater. The tax rate would be determined at the discretion of the regional council to accommodate local circumstances, consistent with TWG's preference for localised pricing.[46] The local rate would be expressed in a regional plan.

The national default base tax rate would be two cents per thousand litres. This would be mandated in a new, mandatory NPS on Freshwater Management. Empowering legislation would be necessary, including an expansion of the powers of regional councils under the Local Government Act 2002 (**LGA**) and the RMA. Note that district plans and regional plans are subordinate to regional policy statements, which are subordinate to national environmental standards and national policy statements, which are subordinate to legislation.[47]

Regional councils would retain 50 percent of revenue. Regional councils need revenue to administer the scheme, but central government also needs revenue to respond to the

[43] AY Hoekstra "The global dimension of water governance: Nine reasons for global arrangements in order to cope with local water problems" (2006) 20 Value of Water Research Report Series, Unesco-IHE Institute for Water Education.
[44] United Nations "Sustainable Development Goals: Water and Sanitation: Goal 6: Ensure access to water and sanitation for all" (2016) www.un.org/sustainabledevelopment.
[45] Ministry of Foreign Affairs and Trade "Towards a better future, together" (2019) https://sustainabledevelopment.un.org/content at 49.
[46] Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz.
[47] Resource Management Act, s 30(1)(c); *Environmental Defence Society v King Salmon* NZSC 38

inevitable macroeconomic consequences of an environmental tax.[48] This division pursues the principle of decentralisation, but in a centralised reality.

District and city councils are usually the largest consented users of water and should not be exempt. Residents themselves would not be directly subject to this tax, because generally residents do not hold water consents from a regional council. The existing arrangement between a city council and its residents would be unchanged. In Christchurch, this would mean residents would continue to pay a water rate based on the value of their property, and Aucklanders would continue paying based on usage. However, households would bear an indirect burden by proxy of their city or district council, which may proportionately increase rates to meet tax obligations.

However, politics and equity necessitate exemptions. Non-consumptive users, such as hydroelectricity users, would be exempted where the consent is for surface water.

If it becomes apparent that the increased residential burden of a water tax is unpalatable, the reforms could include a "block pricing" system. When a district or city council receives a tax bill from the regional council, it would be entitled to claim a rebate of one specified unit (say, 40,000 litres per household per year, which roughly equates to basic needs of a two-person household) of water for each residential household in its domain.[49] For simplicity, it would be preferable to have no block pricing system.

Central and regional governments could justify greater expenditure on water projects like riparian planting, educational programmes or transition schemes for affected people, which would be beneficial for the environment.[50] An essential feature of the reform would be annual audits of the regional councils' administrative competence.

Other features of the water tax reform would include:

- A discount in respect of the amount of water consented but not actually abstracted. This ensures there is an incentive to use only what is required, rather than the full allocation.
- No integration with the national tax system. This would be antithetical to the decentralisation principle. The equity of this feature is considered later.
- Continued permission for tradeable water rights under RMA, but no official endorsement. There are some economic benefits to trading, but this should be a private market.

[48] Changbo Qin "The Economic Impact of Water Tax Charges in China: A Static Computable General Equilibrium Analysis" (2012) 37(3) Water International.
[49] Learn NZ "Water Use" www.learnz.org.nz/water.
[50] Kathryn Collins "Benefits of riparian planting: A case study of lowland streams in the Lake Ellesmere catchment" Lincoln University Masters Thesis https://researcharchive.lincoln.ac.nz.

- An option, as part of the reform package, for consented users to permanently return an annual allocated amount of water for lump sum consideration.

Finally, a necessary political concession may be a fixed upper limit the tax rate. If implemented, it is envisaged this cap would increase to pursue decentralisation. This should be set at approximately 8 cents per 1000 litres in the mandatory NPS, with an automatic cap increase of 2 cents per year for the first 5 years.

The reason for this concession relates to the Canterbury Regional Council (**ECan**). In the 2004 and 2007 local elections, a number of councillors concerned with Canterbury's increased irrigation were elected. In 2009, the Government announced a review of ECan on the grounds of resource consent processing delays. In March 2010, all councillors were sacked by the Government and replaced with commissioners.[51] This episode shows that regional decisions affect central government's agenda. Some may be concerned that to empower local authorities with water taxing rights would risk the election of pro-environmental councillors, who would then substantially raise the tax rate and thereby damage the primary industry.

To counter this argument and encourage central government to relinquish water taxing rights to local authorities, it may, therefore, be necessary to include a statutory or NPS cap on the implementable regional tax rate.

B. Pricing and elasticity

The proposed tax rate is two cents per 1000 litres, which allows for approximations of tax liability. First, we consider a consented rural farm. Silver Fern Farms (**SFF**) is consented to take 4.7 billion litres per year.[52] Applying the tax rate, the prima facie tax liability would be $94,000, though this would likely be reduced to account for the part of the consent which was not used. For context, SFF turnover in 2016 was $2.2 billion.[53]

Second, we consider the average burden on residential households. Note this burden is indirect, because the relevant consented party is the city council, not individual residents. Using Christchurch City Council as an example, the annual average indirect cost would be:

[75b consented litres per year[54]] x [2 cents per 1,000 litres] = $15m

[$15m] / [129,100 city households] = $11.62

Therefore, the average cost to a Christchurch household would be $11.62, before the deductions for unused water and the application of the block pricing system.

[51] Paul Gorman "ECan councillors sacked" (The Press, 30 March 2010).
[52] Liz McDonald "The industries with a thirst for Christchurch's pure water" (9 November 2018) <www.stuff.co.nz/the-press/news/>.
[53] Silver Fern Farms "Silver Fern Farms Annual Result" (16 January 2017) www.silverfernfarms.com.
[54] Learn NZ "Water Use" <www.learnz.org.nz/water172/>.

The commercial water trading industry tells us that the proposed tax rate is substantially beneath the market price. One water consultancy facilitates trades of water permits where prices range from 70 cents to $1.60 per 1000 litres, with an average of about $1 (though the real price is lower because this price covers extraction for the remainder of the water permit – up to 35 years).[55] In Auckland, existing pricing arrangements between the council and residents prices water at $1.40 per thousand litres.

However, accurately priced water could be an unbearable burden on primary industries. This is why the proposal is for rate significantly below the value it provides. Over time, water should gradually be priced appropriately.

In terms of elasticity, it is illustrative that Auckland water consumption per household fell 30 percent following the introduction of the volumetric charge the late 1990s.[56] This is consistent with international studies which show that households are at least "moderately sensitive" to changes in the price of water.[57] One study of a Californian bottled water tax found a six percent drop in consumption in response to an average eight percent tax.[58]

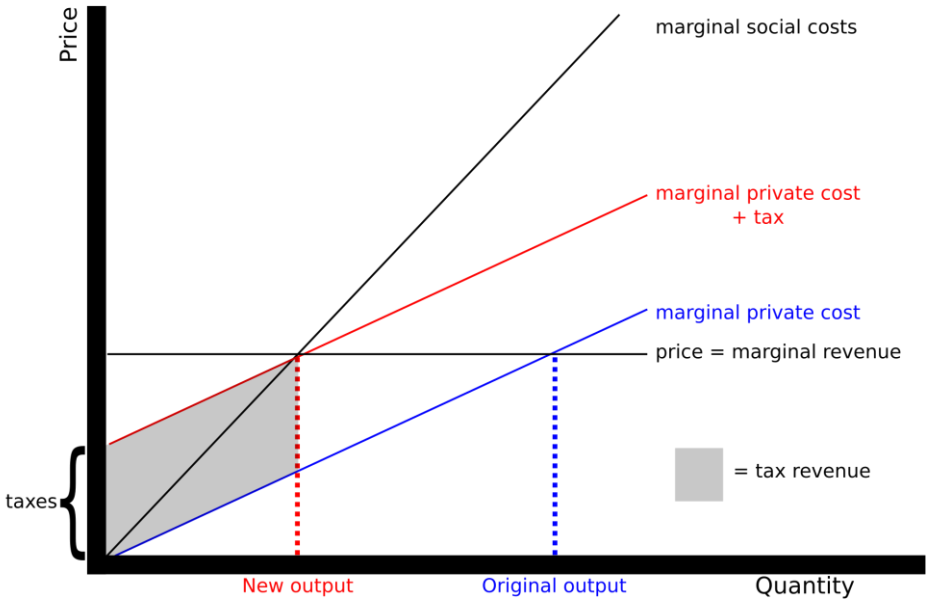
However, Dave Owen rightly observed that significant changes will only come about from agricultural, industrial and commercial responses.[59] Fortunately, an analysis of 14 price elasticity studies found that irrigation water demand is "fairly responsive" where changes in crops and irrigation technologies are available.[60] Research on commercial and industrial usage has yielded similar results.[61]

C. Economic theory: What is a Pigouvian tax?

We now consider the economic theory which supports this proposal. In 1920, British economist Arthur Pigou wrote *The Economics of Welfare*.[62] Pigou noted that when marginal private interests diverge from marginal social interest, there is no incentive to internalise the marginal social cost. A Pigouvian tax attempts to correct this market failure:

[55] Eloise Gibson "When the rivers run dry: The true cost of NZ water" (27 April 2017) www.newsroom.co.nz.
[56] Organisation for Economic Cooperation and Development (OECD) *Report into New Zealand's environmental performance* (20 March 2017) OECD Environmental Performance Reviews.
[57] Steven Renzetti "The Economics Of Water Demands" (2002) 21-34.
[58] Peter Berck, Jacob Moe-Lange, Andrew Stevens and Sofia Villas-Boas "Measuring Consumer Responses to a Bottled Water Tax Policy" Amer. J. Agr. Econ. 98(4): 981–996.
[59] Dave Owen "Water and Taxes" (2017) 50 UCDL Rev 1559 at 1591.
[60] Susanne M Scheierling et al "Irrigation Water Deman & A Meta-Analysis of Price Elasticities" (2006) 42 Water Resources Res, No. W0141 at 1.18.
[61] Dave Owen "Water and Taxes" (2017) 50 UCDL Rev 1559 at 1592.
[62] Arthur C Pigou *The Economics of Welfare* (Macmillan, London, 1920).

The Pigouvian tax model



A Pigouvian tax should equal the social cost of the negative externality. [63] A tax on water abstraction is consistent with the fundamental premise for Pigouvian taxes: a private water user will exploit a resource contrary to social interests, unless private and social interests are aligned.

It has been observed that "of all the currently regulated markets in which alternative price-based policies have been proposed, municipal water markets may be the easiest in which to imagine actually introducing a price-based approach."[64] A tax can be a neutral price; but a regulation is inherently normative. Tax instruments are the most effective way to help prices approximate marginal social costs, and therefore encourage people to realize that water has value.[65] A tax is preferable to tradeable water rights because of lower transaction costs, broader geographic coverage and the allocation of cost burdens.[66]

The Pigouvian framework above ignores (1) revenue uses and (2) other sources of distortion in the economy. These two effects are important and are therefore considered in further detail:

1. The **tax interaction effect** describes how a new environmental tax could exacerbate the harms caused by existing taxes. Bovenberg and Mooij wrote that revenue earned from taxing poor environmental outcomes can be used for lowering income tax,

[63] Lans Bovenberg Lans and Ruud de Mooij (1994) "Environmental Levies and Distortionary Taxation" 84(4) The American Economic Review 1085–1089.
[64] Erin Mansur and Sheila Olmstead "The Value of Scare Water: Measuring Inefficiency of Municipal Regulations" (2007) WP13513 National Bureau of Economic Research.
[65] Nathaniel Keohane and Sheila Olmstead *Markets And The Environment1* 33-37 (2nd ed, 2007).
[66] Dave Owen "Water and Taxes" (2017) 50 UCDL Rev 1559.

which evens out with higher consumer prices.[67] But, they argued, this leads to the erosion of the tax base as more people buy alternative, untaxed goods, which reduces revenue and means the reduced income tax cannot be supported. The limitation of this argument to water taxes is that there is no substitute for water.

2. The **revenue recycling effect** describes how environmental tax revenues offset the tax interaction effect. David Pearce first observed that swaps of environmental taxes for distortionary taxes may produce a double dividend by not only (1) discouraging environmentally damaging activities, but also (2) reducing the distortionary cost of the tax system.[68] This is why environmental economists prefer that revenues be allocated to reducing distortionary taxes like income tax.[69]

Ian Parry has studied the choice between revenue-raising (**RR**) and non-revenue-raising (**NRR**) policies for environmental protection. The research was performed in a "second-best setting", which acknowledges the reality of existing distortionary taxes which are economically sub-optimal (such as income tax) and their effect on a proposed instrument.[70]

Parry observed, for both RR and NRR policies that revenue recycling can substantially lower the aggregate social cost of environmental policies, though failing to exploit the revenue recycling effect may not generate an efficiency improvement.

But importantly, Parry concluded that the gross efficiency costs of NRR policies are higher than RR policies:

$$\frac{1}{\lambda}\frac{dU}{d\tau_X} = \underbrace{(D-\tau_X)\left(-\frac{\partial X}{\partial \tau_X}\right)}_{\partial W^P} + \underbrace{M\left(X+\tau_X\frac{\partial X}{\partial \tau_X}\right)}_{\partial W^R} \underbrace{-(1+M)\tau_L\frac{\partial l}{\partial \tau_X}}_{\partial W^I}$$

To briefly summarise, Parry's formula has a tax rate input (t_x) and three welfare impacts as outputs: (1) the Pigouvian effect (the net welfare effect of the tax and the environmental effect), (2) the revenue recycling effect, and (3) and the tax interaction effect.[71] Parry concluded that the curve for the RR policy has a zero intercept because the tax interaction effect is offset

[67] A Bovenberg and R Mooij "Environmental levies and distortionary taxation" (1994) 94(4) American Economic Review 1085–89.
[68] David Pearce "The Role of Carbon Taxes in Adjusting to Global Warming?" (1991) 101 Economic Journal 938-948.
[69] Dave Owen "Water and Taxes" (2017) 50 UCDL Rev 1559 at 1606; Lawrence H Goulder "Environmental Taxation and the Double Dividend" (1995) 2 International Tax and Public Finance 157-183
[70] Ian Parry "Revenue Raising vs Other Approaches to Environmental Protection: The Critical Significance of Pre-Existing Tax Distortions" (2007) WP5641 National Bureau of Economic Research.
[71] Ian Parry "Revenue Raising vs Other Approaches to Environmental Protection: The Critical Significance of Pre-Existing Tax Distortions" (2007) WP5641 National Bureau of Economic Research.

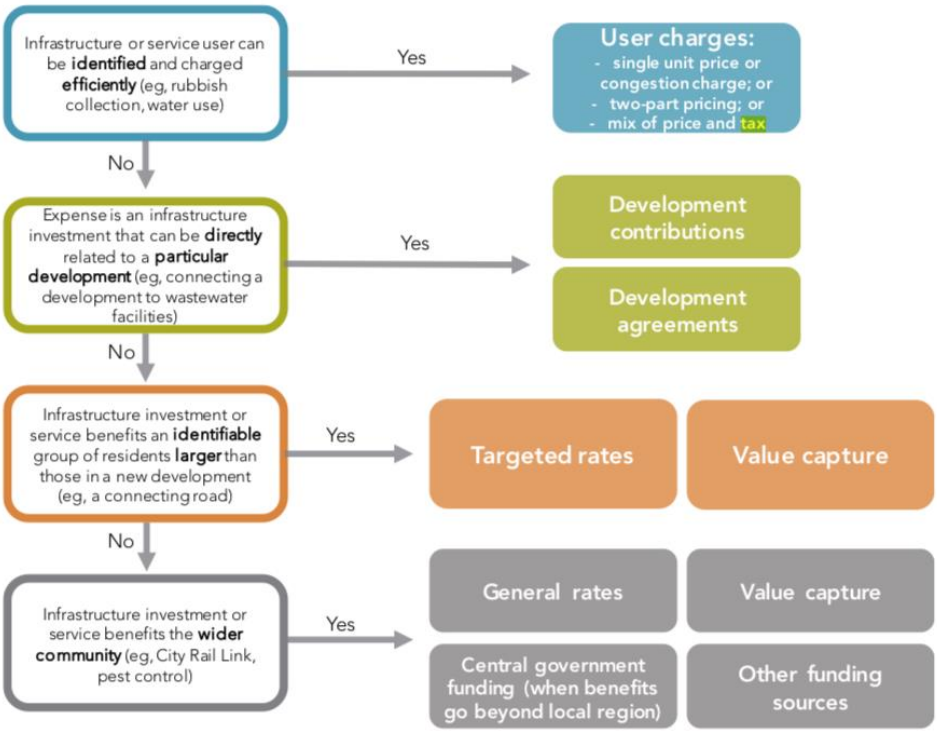
by the revenue recycling effect.[72] But for NRR policies to have this benefit, marginal environmental damage must exceed 60 percent of marginal production cost where elasticity of demand for the good is 0.5 (relatively inelastic). In short, taxes may have the more assured benefit of the revenue recycling effect, which makes them preferable as environmental instruments.

D. Consistency with existing frameworks

This proposal aligns with the TWG's suitability criteria for an environmental tax: behavioural responsiveness; high revenue-raising potential; measurability; risk tolerance; and sufficient scale. This proposal also meets the TWG's seven design principles for externality taxes, including local variation and international linkage. The TWG cited the following benefits of a water tax: pricing externalities, improving water use efficiency, capturing resource rents; funding environmental outcomes; feasibility, change of behaviour and long-term revenue.[73]

Using the Productivity Commission's guidance on funding tools, the case for a water tax seems quite obvious at the first step:[74]

Decision-making framework for choosing funding tools for local government services



[72] Ian Parry "Revenue Raising vs Other Approaches to Environmental Protection: The Critical Significance of Pre-Existing Tax Distortions" (2007) WP5641 National Bureau of Economic Research at 17.
[73] Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz.
[74] Productivity Commission "Local Government Funding and Financing: Draft Report" (July 2019) www.productivity.govt.nz at 5.

V Impact on the New Zealand economy

The most sensitive part of the proposal is the effect of the tax on New Zealand's primary industry. Therefore, the economic impact needs to be carefully considered.

As observed earlier, prices are a strong incentive for significant industrial water users.[75] National consumptive freshwater allocations indicate which industries would likely be affected: pasture (60%), horticulture (10%), viticulture (3%), other industry (11%). Drinking water takes just 8 percent.[76] Given the dominant usage by industries, gross domestic product (**GDP**) and growth would both likely be negatively affected if water were to be priced. However, in the long-term, sustainable water reserves could be a competitive advantage to New Zealand. That is, a reputation for reliable and high-quality water, as would result from better management, could be attractive for investment.

One study quantified the economic contribution that irrigation makes to the New Zealand economy.[77] It found the net GDP contribution of irrigation was approximately $2.17 billion in 2012. As irrigation is somewhat responsive to price, irrigation may decrease and thereby negatively affect GDP. However, the proposed tax rate is very low so the impact should not be extreme.

The same study also noted that irrigation flows through to higher employment, wages and returns to capital and land, which boosts household spending on other goods and services. If irrigation had never occurred, exports would be $1 billion lower (offset by reallocation of capital and depreciation of the exchange rate). Business growth may fall as future tax costs are factored into investment decisions, but growth would become more sustainable.

In terms of government revenue, there is no comprehensive analysis of the fiscal potential of a water tax.[78] Total revenue from a two-cent-per-1000-litre water tax, based on total national allocated consumptive volumes, would amount to $540 million per year. However, it is estimated that actual use of water is 65% of consented volumes, so the actual incidence and revenue may be lower.[79]

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[75] Dave Owen "Water and Taxes" (2017) 50 UCDL Rev 1559 at 1591.
[76] Ministry for the Environment "Update of Water allocation data" (November 2010) www.mfe.govt.nz/publications/.
[77] New Zealand Institute of Economic Research Inc and AgFirst Consultants "Value of Irrigation in New Zealand: An Economy Wide Assessment" Final Report to the Ministry for Primary Industries (17 November 2017).
[78] Inland Revenue and Treasury "Tax and the environment – Paper II: Assessments: Discussion Paper for Session 13 of the Tax Working Group" Officials Advice (20 September 2018) at 87.
[79] Ministry for the Environment "Executive Summary: Update of water allocation data and estimate of actual water use of consented takes 2009–10" www.mfe.govt.nz/publications.

VI Political feasibility

A. Labour's royalty proposal

In 2017, Labour proposed a relatively vague water royalty regime. There were a number of ideas to: differentiate between water of different quality; price water for bottling higher than farming; return the majority of revenue to regional councils; update the NPS to curtail agricultural development; require regional councils to report annually; require an Audit Office review; and fund an environmental body to enforce RMA law. Labour's policy was abandoned during coalition talks, but it instead agreed to introduce a royalty on exports of bottled water this term.

B. Criticisms and responses

There were nationwide protests at the prospect of a water royalty.[80] Part IV has already considered allowances for legitimate or widely held complaints, but this section further assuages the political opposition. Quotes from opponents of water pricing are addressed with counterarguments:

> *... drives a perverse incentive for farmers to intensify their activity…*
>
> *…it should be paid by all, with no room of discrimination.*
>
> *... even one thousandth of that figure, if that's a level Labour has in mind (10 cents per litre), would be "eye-watering".*
>
> \- Federated Farmers[81]

First, the potential for intensification is a valid observation, but the effect is better characterised as economic efficiency. That is, farmers will use water more carefully, but there is a limit to how much they can scale down operations to minimise water use. Second, this proposal is that all consented users would be taxable, unlike Labour's proposal. Finally, the comment on the pricing is probably exaggerated. As the pricing analysis above demonstrated, the expected burden is relatively low and substantially undervalues water.

> *…there is no detail in the policy. Labour needs to explain to New Zealanders clearly who would get to charge, how much would they charge, and who gets all the money…*

[80] Radio New Zealand "Protests Nation-wide over Water Rights" (14 March 2017) Radio New Zealand News www.rnz.co.nz/national/programmes.
[81] Alex Tarrant "Labour to impose royalties on all commercial water use, but says rates won't be set until after 'first 100 days' meeting with affected parties after election" (9 August 2017) Interest: Rural news www.interest.co.nz.

... families would pay more for their weekly shop including things like milk, fruit and veges.

- Stephen Joyce, National Party Chair[82]

First, this proposal articulates that regional councils would charge a default tax of two cents and that revenue would be split evenly with central government. The details of this proposal are clear and defendable. Second, the water tax rate will gradually increase over time and cost of water will gradually manifest itself in products which rely on water. It is very unlikely that food and beverages prices would significantly inflate in the initial stages of this tax, because of the very low tax rate. Over time, price increases should be regarded as a rebalance of priorities, rather than an absolute reduction in welfare.

Picking and choosing who pays what 'water tax' and changing the tax rate based on its use, is economic silliness.

If Labour is genuine in charging a 'fair' amount for water, why hasn't it backed tradable permits for water? That's a far more efficient, fair, and environmentally beneficial system than royalties payable by some users.

- Taxpayers Union[83]

First, unlike Labour's proposal, this water tax would apply broadly, independent of the user and of the quality of the water abstracted. Second, the economic analysis in Part IV proves that environmental taxes are efficient and certainly more environmentally beneficial than trading, because of revenue. For political purposes, this tax could also be described less abrasively as a water "price".

How could a water tax be implemented in practice given the differences in weather and water use across the country? It would be a hugely complex administrative nightmare.

The majority of irrigation is in the east coast areas - are these communities to be penalised because they live in an area with a drier climate that needs more irrigation?

... hydroelectric power users are to be excluded. ...Energy companies are the largest extractors of water in New Zealand, barring others from using it.

- Irrigation NZ[84]

[82] Steven Joyce "Second extra tax would hit regions hard" (9 August 2017) National Party: News www.national.org.nz.
[83] Alex Tarrant "Labour to impose royalties on all commercial water use, but says rates won't be set until after 'first 100 days' meeting with affected parties after election" (9 August 2017) Interest: Rural news www.interest.co.nz.
[84] Alex Tarrant "Labour to impose royalties on all commercial water use, but says rates won't be set until after 'first 100 days' meeting with affected parties after election" (9 August 2017) Interest: Rural news www.interest.co.nz.

First, the localised approach acknowledges regional variation in weather, water reserves and use. Local administration is analogous to a city council's water rates regime, which precedent should dispel the notion of insurmountable complexity. Transient administration costs are valid concerns but should not obstruct best policy. Second, the reality of drainage basins is that certain regions are suited for different activities.[85] There would be obvious regional inequities without localised pricing. Third, hydroelectric users are non-consumptive users because water is returned to the environment unpolluted. Other users may and do hold consents for downstream activities.

Finally, consider that a poll found 77 percent of people, regardless of whether they were rural or metropolitan, believed agricultural and horticultural users should pay for water.[86] Perhaps the political opposition comes largely from organised bodies.

VII Social acceptability

A. The ownership question - Māori interests

Legal experts fundamentally disagree on the nature of Māori interests in water.[87] Māori claims are founded on customary title and the principles of the Treaty of Waitangi.[88] Labour claims "everybody owns the water"; National claims "nobody owns the water". The TWG solicited a report on Māori perspectives on environmental taxes and economic tools, but did not attempt to resolve the issues. It seems that taking a position alienates half the audience, but vague platitudes are equally ineffectual.

The ownership question is possibly the most significant impediment to a water tax in New Zealand. Māori rights in water could take a decade to resolve; this paper will not attempt to bypass the process underway between Iwi and the Crown. But rights issues should not be a reason to defer a solution to a pressing and bipartisan issue. Indeed, a report on Māori water issues contains a number of assertions that are consistent with this proposal, including that water costs should be borne by users and solutions should be catchment specific.[89]

In any event, this proposal arguably can be implemented independent of the final resolution of Māori water rights, because a tax does not presume ownership of the source. Admittedly, this is an academic approach, because consents are increasingly "property-like"

[85] Tax Working Group "Future of Tax: Final Report Volume I – Recommendations" (21 February 2019) Tax Working Group: Key documents https://taxworkinggroup.govt.nz at 47.
[86] Thomas Manch "Over half of Kiwis want all water users to pay, Water NZ survey shows" (20 September 2017) Stuff www.stuff.co.nz/national/politics.
[87] Radio New Zealand "Legal experts at odds over Maori bid for water ownership" (8 February 2012) Radio New Zealand news www.rnz.co.nz; D Round "Māori Sovereignty: The Enemy of Democracy and Equality" in Barr H; Brash D; Butler M; Chapple R; Cresswell P; Moon B; Robinson J; Round D (eds) *One Treaty, One Nation: The Book Every New Zealander Should Read* (2015) at 76-99; c.f. Alex Johnston "Murky Waters: The Recognition of Maori Rights and Interests in Freshwater" (2018) 24 Auckland U.L. Rev. 39.
[88] *Paki and Others v Attorney-General* [2014] NZSC 118*; Paki and Others v Attorney-General* [2012] NZSC 50.
[89] "Māori Perspectives on Environmental Taxes" (20 September 2018) Officials advice https://taxworkinggroup.govt.nz at 40.

allocable interests.[90] But it is worth noting that a number of freshwater regulatory measures have been enacted without finally resolving Māori rights. Further, there would also be scope for Māori participation in the select committee stage in Parliament.

The Court of Appeal in *Hampton* rejected the application of the non-derogation from grant principle and the analogy with *profits a prendre* in *Aoraki*, because they created de facto property rights.[91] However, the doctrine of legitimate expectations may be a valid argument against a water tax because it would impinge on rights already granted. The new water tax legislation may need to explicitly extinguish the possibility of such a claim.

B. Equity

A water tax or any incidence passed on to consumers would be relatively flat in nature. It could disproportionately affect low-income houses, if councils passed on direct tax costs, because a certain level of water is unavoidable for households. However, the above calculations show the tax would not be very burdensome and the "block system" could further shelter low-income households, if necessary.

Another possible inequity is the non-integration with the national tax system. This means that even loss-making entities would be subject to the water tax. The justification is that water should be viewed as a business cost which cannot be offset, but there are obvious implications for users in hardship. This should be dealt with on a regional basis, as is presently the case for rates collected by regional authorities.

VIII Administrative matters: simplicity, ease and compliance costs

Inevitably, there would be increased compliance costs and complexity under this proposal. However, allocation systems and metering are already in place under law for users who hold consents from the local authority under the RMA (except non-consumptive users, but that is inconsequential for this proposal). The existing regulations compel water users who extract more than five litres per second to measure and report on activities.[92] These regulations were observed by 98 percent of consented water allocations in November 2016.[93]

A water tax should not be inherently difficult to administer. Technology is significantly reducing administration costs. One can envisage a situation where extraction volumes are digitally communicated from software at the source to council systems. A program could foreseeably calculate the tax due and even direct-debit a nominated bank account. It is plain

[90] Alex Johnston "Murky Waters: The Recognition of Māori Rights and Interests in Freshwater (2018) 24 Auckland U. L. Rev. 39.
[91] *Aoraki Water Trust v Meridian Energy* [2005] 2 NZLR 268; *Hampton v Canterbury Regional Council* [2016] NZSC 50.
[92] Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.
[93] Ministry for the Environment "Executive Summary: Update of water allocation data and estimate of actual water use of consented takes 2009–10" www.mfe.govt.nz/publications.

that a water tax would be simpler to administer than a water pollution tax, which has more difficult measurability issues.[94]

As noted, local authorities already have fiscal autonomy and maintain a number of revenue streams. Therefore, there should be existing controls and mechanisms which can be developed to accommodate the additional responsibility of a water tax, which will control initial costs.

There will be increased compliance costs for consented users of water. Preferably, the bulk of initial compliance costs would be borne by the regional council, who should already have records of consented users and can issue communications.

IX Conclusion

A. Where next?

This paper attempts broad coverage of issues, but some details are out of scope. Pure environmental taxation is novel to New Zealand so detailed analysis is important. If this policy proposal were to be taken further, a work programme might involve:

- Inland Revenue, to draft legislation and advise on tax administration matters to assist local councils. It would be appropriate to observe the Generic Tax Policy Process, particularly in respect of the refreshed tax and social policy engagement framework and the commitment for consultation on the problem, not merely the solution.[95]
- Treasury, to fully cost the proposal and consider the complex economic arguments. In particular, it should consider (1) the "second-best" reality of distorting taxes,[96] (2) the case for the so-called "strong-form" double dividend, which theory suggests there is a zero or negative gross cost for revenue-neutral substitution of the environmental tax;[97] and (3) existing international tax solutions to water problems, which vary by base, type and rate.[98]
- The Waitangi Tribunal, to report specifically addressing the Māori issues around the proposal.
- The Law Commission, to consider issues such as the doctrine of legitimate expectations, which could be asserted by consent holders.
- Parliamentary Counsel, to draft technical transitional matters and the necessary amendments to the LGA, RMA, Income Tax Act 2007, Health Act 1956, Climate Change Response Act 2002 (and its pending amendment, the Zero Carbon Bill), Local

[94] Terry Ferrar and Andrew Whinston "Taxation and Water Pollution Control" (1972) 12 Nat. Resources J. 307.
[95] Inland Revenue *Tax and social policy framework* (August 2019) at 41
[96] Ian WH Parry and Wallace E Oates "Policy Analysis in the Presence of Distorting Taxes"
[97] Lawrence H Goulder "Environmental Taxation and the Double Dividend" (1995) 2 International Tax and Public Finance 157-183 at 159.
[98] Travis Russell "Bottled Water: The Next Empire and Its Effect on the Planet" (2013) 8 Appalachian Nat. Resources L.J. 213 at 231; Zoltan Nagy "The Role of Environmental Taxation in Environmental Policy" (2013) 47 Zbornik Radova 515 at 523.

Electoral Act 2001, Tax Administration Act 1994 and other land or human rights legislation.

The conclusions of the Water Taskforce and the RMA working group, unpublished at the time of writing, will also need to be considered.

B. The case for a regional water tax

Humanity has struggled not so much to identify the various environmental problems it faces, as it has struggled to act. This is because, Ophuls wrote "the dynamic of the commons is so powerful that individuals are virtually powerless to extricate themselves unaided from its remorseless working. Our political institutions must indeed force us to be free."[99]

Nevertheless, the primary sector is a pillar of the economy and society and requires careful treatment. That is why this tax does not immediately price water accurately (if that is indeed achievable). What it does do is strive to recognize water's value and establish a mechanism for pricing water properly in the long-term. This medium-term economics-based solution can soften the transition to the long-term environmental solution based on decentralisation and the precautionary principle.

In summary, this proposal for significant reform to the New Zealand tax system would certainly make a significant difference to our economy, social equity and environment. This proposal is the most politically neutral option capable of addressing water management issues, because it applies broadly and at a low rate. This proposal respects cultural sensitivities because it theoretically does not affect ownership rights as would a royalty. This proposal is readily implementable, because water measurement is already mandated by law. This proposal is equitable, because it contains allowances for non-consumptive and residential users. This proposal is doubly effective in moderating water use and collecting revenue, as compared to alternative economic instruments. Finally, this proposal breaks the fetters of traditional liberal economics by pricing a public resource in view of changing our habits, but with an instrument that is proven in practice and consistent with modern economic theory.

From a policy perspective, there is a compelling case for a regional water tax.

Word count: 6,000 words

[99] William J Ophuls *Ecology and the Politics of Scarcity Revisited* (W. H. Freeman, New York, 1992) at 204.