

Addendum to Castalia's report on Water Reform to Timaru District Council dated September 2021

12 October 2021

1 Introduction

Castalia advised Timaru District Council (TDC) on the implications of the government's water reform proposals in a report dated September 2021 (TDC Water Reform Report) and Castalia's Director Andreas Heuser gave a presentation on the report's findings to TDC elected members and senior officers on 31 August 2021. Castalia has also advised other local authorities on the water reforms.

On 10 September 2021, DIA issued a Departmental Statement (DIA Departmental Statement) in response to Castalia's Report on the water reforms for Whangārei District Council dated August 2021 (WDC Report). The DIA Departmental Statement also commented on a series of other reports and analysis by Castalia:

- Economies of Scale in New Zealand Water Services for LGNZ dated September 2020 (one year ago).
- A 2017 report to DIA on management sophistication in New Zealand Three Waters.

Appended to the DIA Departmental Statement is an analysis of the Economies of Scale report by FarrierSwier. DIA also provided a briefing to the Minister for Local Government dated 16 September 2021 on Castalia's WDC Report.¹

The WDC Report reaches conclusions that are also relevant to TDC. Castalia's conclusions in the TDC Water Reform Report are consistent with the WDC Report because the issues, errors and flawed assumptions in the advice and analysis provided to the government by its advisors on the water reforms are the same.

TDC has now asked Castalia to provide an addendum to the TDC Water Reform Report that addresses the comments and criticisms in the DIA Departmental Statement and related advice and analysis.

¹ Available at: <https://www.dia.govt.nz/commentary-on-castalia-reports-three-waters-reform-programme>

Castalia affirms its advice to TDC and stands by previous work for other clients

Castalia stands by the analysis in its work for DIA (2017), three reports for LGNZ and the Joint Steering Committee (2020),² the WDC Report, the TDC Water Reform Report and reports and analysis for other local authority clients (issued in August and September 2021). There are several incorrect statements and potentially misleading descriptions of our analysis in the DIA comments that need to be clarified.

This addendum addresses the following points regarding the government's evidence base and Castalia's analysis of it for local authorities:

- WICS modelling is flawed and, as a result, significantly overstates the required investment for TDC as well as other local authorities (section 2 below)
- DIA has overlooked or misinterpreted the overwhelming evidence that shows that significant cost savings are not generally available from administrative amalgamations of disparate water networks (section 3 below).

2 WICS approach to required investment is flawed

Castalia stands by its analysis that the government's WICS modelling is flawed in estimating the required level of investment for TDC's water services and the water services of other local authorities we have analysed, including WDC. WICS also uses inappropriate comparators to model projected investment. We acknowledge that future regulatory requirements will likely increase the level of investment needed in water networks in some parts of New Zealand. Nevertheless, WICS' modelling has flaws that make it inappropriate as a basis for assessing the required level of investment for New Zealand, and TDC specifically.

WICS models a top-down estimate of required investment that is different to the forecasts from TDC's long-term plan and its officers' view of required investment in an unconstrained fiscal environment. When TDC's officers estimated the future water sector investment in the response to the government's request for information (RFI), the estimated amounts for 2022-2051 were (with WICS estimates in brackets):

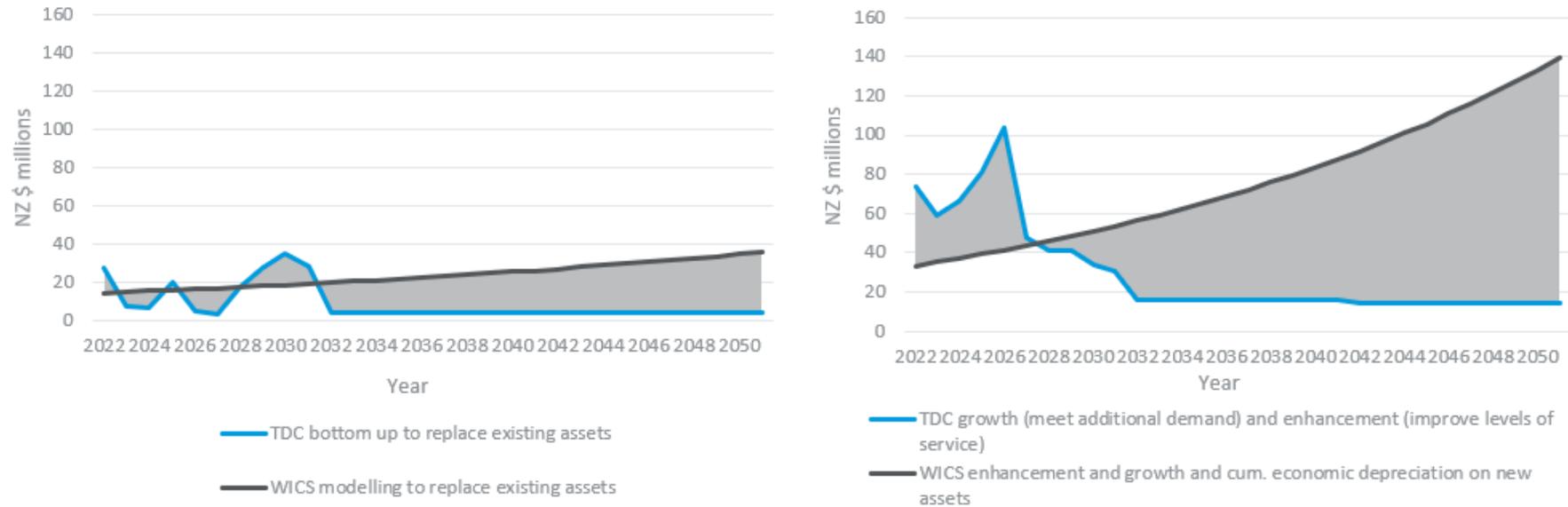
- Replace existing assets: \$252 million (WICS = \$702 million)
- Growth to meet additional demand and enhancement to improve service: \$879 million (WICS = \$2.3 billion including cumulative economic depreciation on new assets)

This is illustrated in Figure 2.1 below:

² Castalia completed three reports for LGNZ in support of its participation in the Three Waters Joint Steering Committee:

1. Criteria for evaluating water reform options dated July 2020 (Evaluation Criteria Report)
2. Comparative analysis of reform options for water services dated August 2020 (Reform Options Report)
3. Economies of scale dated August 2020 (Economies of Scale Report)

Figure 2.1: Comparing WICS' top-down and TDC management's approaches to estimating replacement of existing assets and enhancement and growth investment



WICS uses three components to estimate the future investment for local authorities:

- Cumulative economic depreciation on new assets
- Required enhancement and growth capital expenditure
- Capital maintenance on existing assets (that is, replacement of existing assets).

DIA claims that local authorities' own investment plans are not a good basis to estimate required future investment.³ DIA also says that WICS' modelling "projects future renewals investment based on the applicable rates of economic depreciation"⁴ and that this is a superior approach to predicting the required level of investment. The WICS approach is unconventional and inflates the investment projections.

2.1 Cumulative economic depreciation is not a valid method to forecast replacement capital expenditure for brand new assets

Incorporating cumulative economic depreciation on new assets (the third component) inflates the level of investment in an unconventional and incorrect way. The impact on WICS' modelling for TDC and other local authorities is significant.

The use of cumulative economic depreciation on new assets essentially assumes that future replacement capital expenditure will be exactly equal to estimated future depreciation. This is an incredibly crude assumption. The depreciation-derived estimates are far inferior to the bottom-up capex forecasts developed by TDC and other local authorities for the purposes of their long-term plans and internal investment planning.

Standard regulatory approaches do not equate economic depreciation with capital expenditure. To our best knowledge, neither OFWAT, OFGEM, AER, Australian State regulators, nor the New Zealand Commerce Commission (to name a few) have set capital expenditure allowances based on economic depreciation. Local Government New Zealand has issued guidance to local authorities that depreciation should not be confused with replacement capital expenditure.⁵

As depreciation reflects the consumption of the asset over its useful life, there are two critical factors in determining this expense. The first is the asset cost or revalued amount, and the second is the asset's useful life. It is therefore not related to the physical wearing out of the asset. The purpose of depreciation is not to provide for the replacement of the asset(s), however this may be an intended or unintended consequence.

The inclusion of cumulative economic depreciation increases replacement capital expenditure in WICS' estimate by approximately \$683.2 million over the modelling horizon to 2051 (expressed in projected outturn prices). Figure 2.2 illustrates the components of WICS' modelling of total required investment for TDC, separating this into the three components.

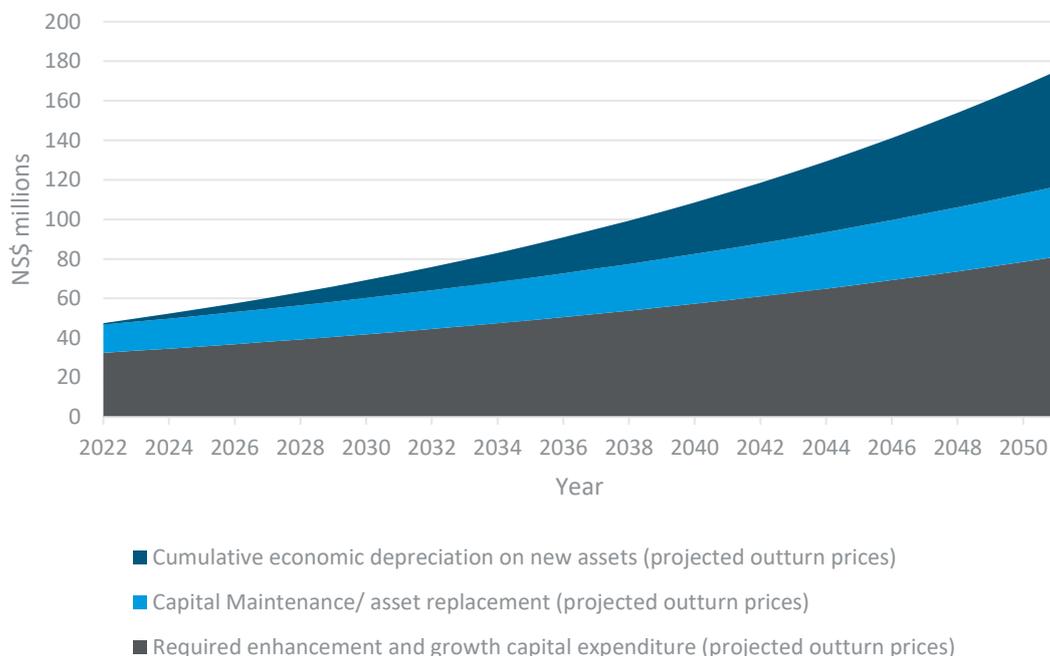
³ Departmental Statement, p. 3

⁴ Departmental Statement, p. 3

⁵ LGNZ, Depreciation in the local government context, available at: <https://www.lgnz.co.nz/assets/Induction-Extras/78d9041b79/Depreciation-paper-final.pdf>

Cumulative economic depreciation on new assets (dark blue area) makes up a significant portion (22.9 percent) of total investment requirement for TDC.

Figure 2.2: Required investment after capital price inflation for TDC (WICS modelling)



2.2 WICS’ enhancement and growth expenditure estimates are based on inappropriate Scottish and UK models

WICS uses Scottish comparators as the basis for its modelling of enhancement and growth expenditure. WICS acknowledges this at various places in its Phase 2 slides on required investment.⁶ WICS even comments on why it uses Scottish comparators: “These models have the advantage that they come from a single jurisdiction that has many geographical and economic similarities to New Zealand”. It is accurate and fair to say that WICS’ investment estimates are based on Scottish levels of investment.

We reiterate that Scotland is not the only relevant comparator for New Zealand. There are many reasons why Scotland should not be used as the only comparator, or even a good comparator, which we outline in the TDC Water Reform Report.

No evidence that council-specific variables included in the model

DIA asserts in its Departmental Statement that WICS used “WDC asset values and asset lives... [and] population density, topography and geographic variables” as inputs into its modelling. DIA is claiming that WICS’ modelling reflected relevant council-specific information. However,

⁶ WICS, May 2021, Supporting Materials Part 1: Required levels of investment, at slides 13-14, 26, 58, 59, [https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/\\$file/wics-supporting-material-1-required-investment.pdf](https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/$file/wics-supporting-material-1-required-investment.pdf)

the models released to stakeholders do not show that such variables were in fact used for WDC, TDC or any other local authority.

The detailed RFI responses provided by each local authority run over 66 tabs in excel spreadsheets. However, WICS' released models use only eight data points from the RFI responses. The data used by WICS is basic information such as connected population, asset values, water-related debt and current water-related revenues. The WICS models released to date do not use any Timaru or indeed any New Zealand-specific variables other than total population and asset values.

We have been unable to find any inputs or calculations in the models that relate to population density, topography or geographical variables. It is possible that there may be another layer of modelling that has not been released to, or reviewed by, any expert other than WICS. This is particularly important, considering the differences in geography and topography between New Zealand local authorities and indeed between New Zealand and United Kingdom.

None of DIA's expert reports verified any New Zealand-specific variables used in WICS' modelling

DIA cite the expert reports it commissioned to review WICS' work in support of its claims that UK and Scottish models are appropriate for New Zealand. Nothing in those expert reports suggests that the authors verified whether any New Zealand-specific variables were included. Nothing in the FarrierSwier review suggests a review of New Zealand-specific inputs or calculations was undertaken.

Beca New Zealand⁷ compared the regulatory environment and industry practices in Scotland. However, Beca New Zealand does not compare whether the level of investment modelled by WICS is appropriate, only that the assumptions about the regulatory environment bear similarities. Beca New Zealand's report explicitly does not cover differences in financial or accounting practices (such as asset depreciation and renewals, asset insurance, debt management and so on) between Scottish Water utilities and New Zealand local authorities. Crucially, it is these matters that have undermined WICS' estimates of required investment.

It is true that some additional investment is needed in some parts of New Zealand to comply with future regulatory requirements, and to improve the resilience of water services to climate change. Beca New Zealand's report is useful to compare the regulatory regimes and network technical similarities. However, Beca New Zealand's report cannot (and does not) provide a view on whether WICS' top-down analysis and crude modelling techniques give accurate insights on the level of investment required.

WICS states that it assumes that New Zealand-specific input variables (which are not disclosed and cannot be verified) will have the same impact on the required investment as they do in Scotland.⁸ While other relationships were considered by WICS, the model and commentary released rely heavily on Scottish information and data. Our analysis in the TDC Water Reform

⁷ Beca New Zealand (2021), DIA Three Waters Reform WICS Modelling Phase 2: Review of Assumptions between Scotland and New Zealand Three Waters Systems, available at: [https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/\\$file/beca-report-dia-three-waters-reform-wics-modelling-phase-2.pdf](https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/$file/beca-report-dia-three-waters-reform-wics-modelling-phase-2.pdf)

⁸ WICS, May 2021, Supporting Materials Part 1: Required levels of investment, for example at slides 58, 59, [https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/\\$file/wics-supporting-material-1-required-investment.pdf](https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/$file/wics-supporting-material-1-required-investment.pdf)

Report shows that the Scottish relationship is very different to the relationship in Australia, for example.

Modelling approach is unconventional to best of our knowledge

DIA also claims that the models were “developed by OFWAT and used and applied by WICS and other economic regulators throughout Europe”.⁹ To our best knowledge, OFWAT has never used this type of model to forecast capital expenditure. It may have used this type of modelling as part of a building blocks model approach to setting tariffs. Even in that case, OFWAT would not have equated a capital expenditure forecast with depreciation amounts (as set out in section 2.1). These are entirely separate concepts. We would appreciate being directed to the OFWAT models that WICS’ work is based on.

2.3 TDC’s investment plans are valid starting point for future investment needs

Regulators generally prefer asset managers’ own estimates of required investment over crude modelling based on depreciation. The asset manager knows the condition of the assets. For example, it would be highly unusual for an economic regulator such as the Commerce Commission to use depreciation calculations to over-ride bottom-up forecasts from an electricity distribution business when setting a capital expenditure allowance. This is especially the case given the important interlinkages and potential optimisation that can arise between replacement and enhancement capex. For example, in the years after 2031, the WICS model assumes ever increasing investment, whereas TDC’s internal estimates show reduced investment (after key infrastructure is built in the 2021-2031 period). WICS’s approach is incapable of recognising interlinkages and optimisation between replacement and enhancement capex because it sums up replacement and enhancement capex without any adjustment. As noted above, the discrepancy between WICS’ and TDC’s unconstrained replacement investment accounts for 24 percent of the total discrepancy (\$450 million of \$1.85 billion of total difference) between the two sets of capital expenditure forecasts.

3 Only relatively minor cost savings available from administrative amalgamations

Castalia stands by the considerable evidence that the claimed cost savings from amalgamation are implausible. The evidence of relatively minor cost savings from administrative amalgamation is summarised in the TDC Water Reform Report, WDC Report and in Castalia’s Economies of Scale Report to LGNZ dated October 2020. DIA commissioned a FarrierSwier review of the latter report which unfortunately does not address the central issue, and only partially assesses the relevant evidence Castalia prepared for LGNZ that contributed to the Joint Steering Committee’s consideration of water reform issues.

⁹ Departmental Statement, p. 3.

DIA, WICS and FarrierSwier overlook that economies of scale in the capital costs of water services are not available from the administrative amalgamation of water and wastewater services

Castalia's central point in the Economies of Scale report is that savings in the **capital costs** of water and wastewater networks and water and wastewater production (drinking and wastewater plants) are unlikely. The empirical evidence, including the evidence collected by DIA and cited in its regulatory impact statement (RIS), is clear: economies of scale are not available for **administrative amalgamations** of the type proposed for New Zealand. DIA has not produced any analysis—other than WICS' modelling—that refutes Castalia's central point. DIA cites evidence in its RIS,¹⁰ but manages to misinterpret it. The key point being missed by DIA in its public statements on water reforms and in advice to the Minister and Cabinet is:

- There are lower average costs in water networks that serve large cities with concentrated populations compared to more rural areas or small towns
- Those savings in capital costs are a function of the **geography and urban density**
- It does not follow that, by carrying out an administrative merger to reach 800,000 connections (for example, merging Tairāwhiti to Takaka), those cost savings will automatically arise.

The Economies of Scale report reached three other key findings on the evidence base, which have not been refuted.

FarrierSwier appear to have only been given partial information by DIA, and reviewed the 2020 Economies of Scale Report as if it was a full options review

FarrierSwier appear to have been asked by DIA to review the 2020 Economies of Scale report as if it were a full review of reform options. Castalia prepared a review of available reform options, reviewing global evidence of reform episodes in a separate Reform Options Report. This was presented to the Joint Steering Committee in October 2020 and presumably has not been referred to FarrierSwier for review. DIA and FarrierSwier criticise Castalia's Economies of Scale Report because it focuses mainly on economies of scale. Yet, that was the specific purpose of that particular report as part of a wider body of analysis contained in a number of reports. We encourage DIA and interested stakeholders to review our Reform Options Report, which assesses the government's proposed option and three other globally common sector structuring options along with **seven criteria**, including management sophistication. The Reform Options Report shows that the government's proposed option has significant risks compared to the alternative options. Castalia's advice to LGNZ is available here:

<https://www.lgnz.co.nz/assets/LGNZ-release-of-Castalia-reports-context-and-response-v2.pdf>

FarrierSwier agrees with Castalia (for example, Castalia's 2017 report to DIA) that some cost savings are possible in larger water entities from improved management and specialist services, and from coordinating procurement. Castalia goes on to note that these cost savings are minor **in comparison to** the more significant costs of network and production services (emphasis added). FarrierSwier does not address the relative size of cost savings from improving management to the more significant costs of network and production services. Neither FarrierSwier nor DIA discuss the costs of reform, which need to be weighed against such relatively minor benefits. Furthermore, as Castalia notes in the Reform Options Report,

¹⁰ Department of Internal Affairs, May 2021, Regulatory Impact Statement: Policy decisions on the reform of three waters service delivery arrangements, pp, 39-40

the proposed reform is not the only way to achieve these management and procurement gains. Other available options include the joint procurement and management model used by Southland electricity distribution companies, and the Wellington Water management services model.

DIA only released the underlying WICS models in July 2021. Castalia has reviewed these models in its reports to TDC and other local authorities. Our review of the modelling confirms the findings from 2020 in the Economies of Scale Report and the Reform Options Report: the very large cost savings claimed for capex and opex are implausible given the nature of New Zealand’s disparate water networks and current operating expenditure profile.

None of the new points raised change the conclusions on implausibility of claimed efficiency gains

DIA refers to a 2018 Frontier Economics paper to claim that “efficiency gains have been well documented”.¹¹ That report analyses efficiencies from **privatisation** and does not deal with efficiencies from **amalgamation**. Amalgamation of the English and Wales water companies occurred in 1972. Privatisation of the 10 companies occurred in 1989. The nine English companies remain private companies. Therefore, the conclusions on efficiency improvements have only limited relevance. We pointed this out in the Reform Options Report.

DIA also claims that benefits to Watercare from greater borrowing capacity from balance sheet separation is an “efficiency improvement”. We agree with the Board of Watercare (and advised its management) that increased borrowing capacity from balance sheet separation enables greater investment which is currently constrained. However, this has nothing to do with efficiency.

DIA says that incremental operating efficiency improvements eventually add up to significant amounts. However, the improvements are still implausible relative to the counterfactual. The government and LGNZ representatives have promised that there will be no job losses which means opex savings from workforce changes will not occur. WICS and DIA also assume that local authorities will not benefit from any operating efficiencies if they opt out of the reforms. This is unlikely given the opex profile of local authorities we have analysed (including TDC and WDC). We point out that outsourcing, documented evidence of performance improvement over time, and the fact that regulation will incentivise and support performance improvements already generate efficiencies. In the Departmental Statement, DIA and WICS provide no evidence that WDC “has been assessed as significantly below industry-standard benchmarks for service efficiency”. There is also no evidence from DIA or WICS that TDC performs below benchmarks. There may be potential for ‘catch up’ efficiency in some places in New Zealand, but WICS does not show this is true for TDC, WDC or any specific local authority in the materials released to date.

Full options analysis would assist in understanding all the costs and benefits of reform

Focussing on one aspect of reform—apparent benefits of scale—can lead to a premature selection of a preferred option. Indeed, both Castalia’s Evaluation Criteria Report and Reform Options Report note that there are major risks in a process that does not consider the full range of options.¹² There are common models from around the world that have not been

¹¹ Departmental Report, p. 4.

¹² We also note that contrary to DIA’s assertion, Castalia has not recommended a “regulation-only” scenario for New Zealand in any report.

discussed in the reform policy process (apart from Castalia raising these, but receiving no material engagement on this from DIA or the Joint Steering Committee). The policy process should also consider the costs of the reform, which may outweigh the relatively small cost savings from greater scale.