

## **Addendum to Castalia’s report on Water Reform to Whangārei District Council dated August 2021**

24 September 2021

### **1 Introduction**

On 10 September 2021, DIA issued a Departmental Statement on the Castalia Report for Whangārei District Council (DIA Departmental Statement) that related to Castalia’s report on Water Reform to Whangārei District Council dated August 2021 (WDC Report) and Castalia’s report on Economies of Scale in New Zealand Water Services for LGNZ dated September 2020 (one year ago). The Departmental Statement also referred to Castalia’s 2017 report to DIA on management sophistication in New Zealand Three Waters. Appended to the DIA comments is an analysis of the Economies of Scale report by FarrierSwier.

Castalia stands by the analysis in its work for DIA (2017), three reports for LGNZ and the Joint Steering Committee (2020),<sup>1</sup> the WDC 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 WDC (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).

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<sup>1</sup> Castalia completed three reports for LGNZ in support of its participation in the Three Waters Joint Steering Committee:

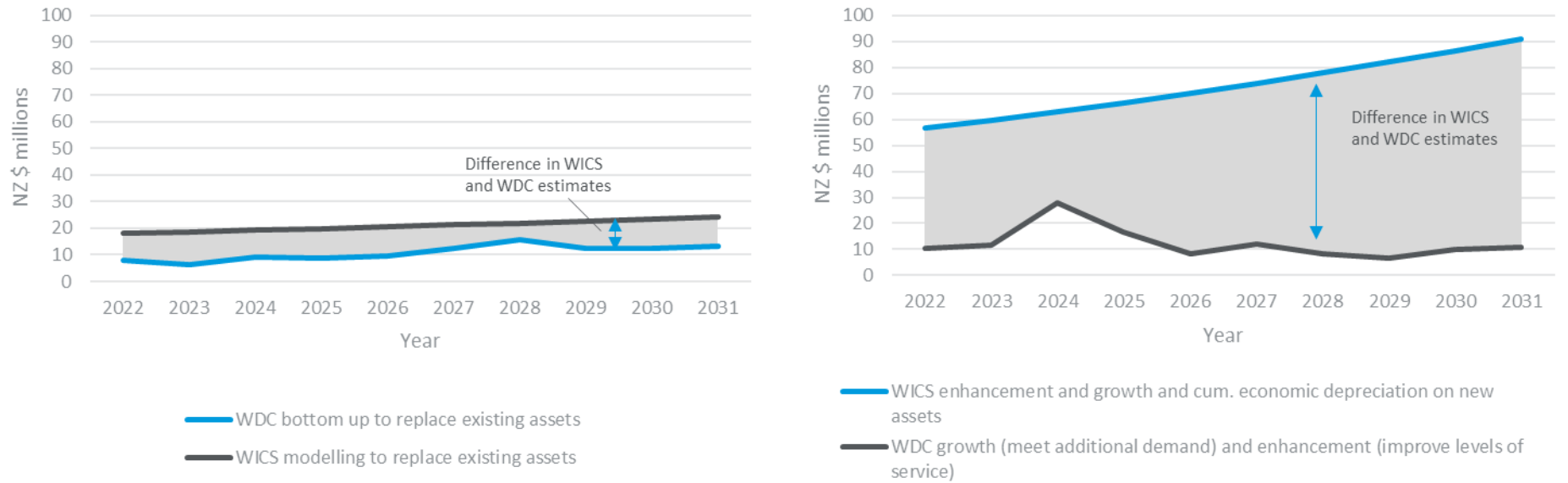
1. Criteria for evaluating water reform options dated July 2020 (Evaluation Criteria Report)
2. Comparative analysis of reform options for water services dated August 2020 (Reform Options Report)
3. Economies of scale dated August 2020 (Economies of Scale Report)

## **2 WICS overstates required investment and uses inappropriate comparators**

Castalia stands by its analysis that the government's WICS modelling overstates the required level of investment for WDC's water services. It 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 WDC specifically.

WICS models a significantly higher level of required investment than the forecasts from WDC's investment planning. Enhancement and growth capex and the cumulative economic depreciation on that new capex amounts to 85 percent of WICS calculated investment above WDC's own forecasts. Only 15 percent of the discrepancy between WICS and WDC relates to differences in estimates for replacement capex on existing assets. This is illustrated in Figure 2.1 below:

Figure 2.1: Comparing WICS and WDC'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.<sup>2</sup> DIA also says that WICS' modelling "projects future renewals investment based on the applicable rates of economic depreciation"<sup>3</sup> 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 WDC and other local authorities is profound.

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 WDC and other local authorities for the purposes of their long-term plans.

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.<sup>4</sup>

*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 **overestimates replacement capital expenditure** by approximately \$88.2 million to 2031 and **\$1.16 billion** 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 WDC, separating this into the three

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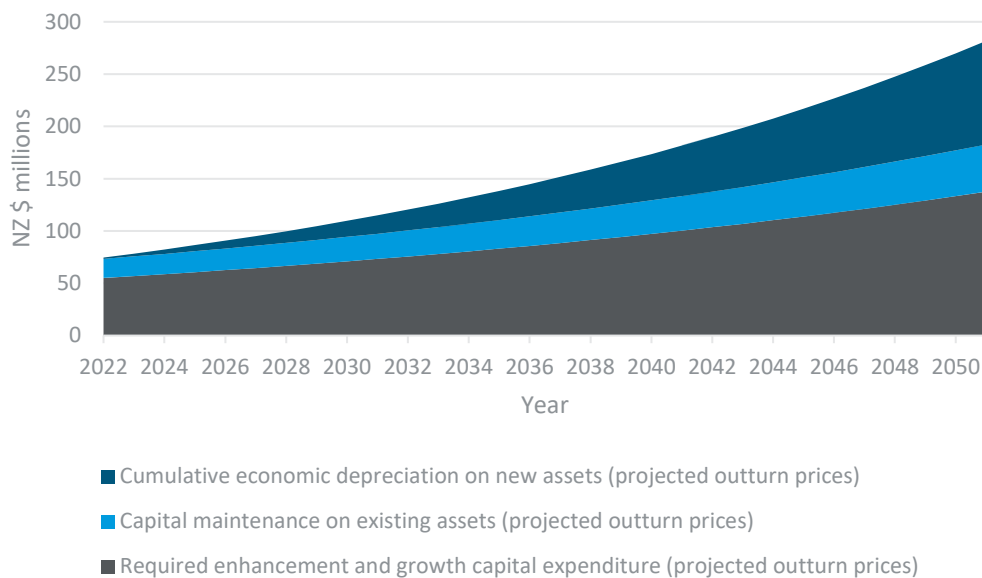
<sup>2</sup> Departmental Statement, p. 3

<sup>3</sup> Departmental Statement, p. 3

<sup>4</sup> LGNZ, Depreciation in the local government context, available at: <https://www.lgnz.co.nz/assets/Induction-Extras/78d9041b79/Depreciation-paper-final.pdf>

components. Cumulative economic depreciation on new assets (dark blue area) makes up a significant portion (24.4 percent) of total investment requirement for WDC.

**Figure 2.2: Required investment after capital price inflation for WDC (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.<sup>5</sup> 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 WDC Report.

### *No evidence that Whangārei-specific variables included in the model*

DIA asserts that WICS used “WDC asset values and asset lives... [and] population density, topography and geographic variables” as inputs into its modelling. However, the models released to stakeholders do not show that such variables were in fact used for WDC or any other local authority.

<sup>5</sup> 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 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 Whangārei 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.

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 Zealand<sup>6</sup> 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.<sup>7</sup> While other relationships were considered by WICS, the model and commentary released rely heavily on Scottish information and data. Our analysis in the WDC 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".<sup>8</sup> 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,

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<sup>6</sup> 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)

<sup>7</sup> 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)

<sup>8</sup> Departmental Statement, p. 3.

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 WDC's planned investment is 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. WICS's approach is incapable of recognising such interlinkages and optimisation because it sums up replacement and enhancement capex without any adjustment. As noted above, the discrepancy between WICS' and WDC's forecasts for replacement accounts for 15 percent of the total discrepancy (\$102.36 million of \$603.63 million) 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 WDC Report and in Castalia's Economies of Scale Report to LGNZ dated October 2020. DIA commissioned a FarrierSwier review of that 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.

*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,<sup>9</sup> 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:

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<sup>9</sup> Department of Internal Affairs, May 2021, Regulatory Impact Statement: Policy decisions on the reform of three waters service delivery arrangements, pp, 39-40

- 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, 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 WDC 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”.<sup>10</sup> 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 WDC will not benefit from any operating efficiencies if it opts out of the reforms. This is unlikely given the opex profile of WDC, as we point out (outsourcing, documented evidence of performance improvement over time, and the fact that regulation will incentivise and support performance improvements). DIA and WICS provide no evidence that WDC “has been assessed as significantly below industry-standard benchmarks for service efficiency”. There may be potential for ‘catch up’ efficiency in some places in New Zealand, but WICS does not show this is true for 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.<sup>11</sup> There are common models from around the world that have not been 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.

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<sup>10</sup> Departmental Report, p. 4.

<sup>11</sup> We also note that contrary to DIA’s assertion, Castalia has not recommended a “regulation-only” scenario for New Zealand in any report.