Three Waters: Lifting the veil of complexity

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"The data shows the case for change is compelling. Without these changes DIA modelling shows that even at the more conservative end of estimates, the average household bill for water services could be as high as $1900 to $9000 by 2051, which would be unaffordable for many communities… Under our proposal for four providers those figures range from $800 to $1640, saving households thousands of dollars." – Nanaia Mahuta, Minister of Local Government, 30th of June 2021.

Figures don't lie – assumptions do.

Introduction

While the Three Waters reform has made headline news, the dialogue to date has largely accepted at face value the expert opinions that central government says proves the case for reform. The debate has not looked behind the veil, into the expert reports. There is a practical reason why that would be the case. They are not a leisurely read, and I doubt many journalists have ventured into the reports themselves.

My first reaction to the "compelling" financial benefits claimed by Minister Mahuta was scepticism, for two reasons.

The first reason is the figures seem too good to be true. During my time as a councillor on the Whangarei District Council, I had no reason to believe its water services were inefficient, at least not to the extent that they could be improved to produce the financial benefit claimed by the Minister. I have no reason to believe most other councils are performing appreciably worse than Whangarei.

The second reason for being sceptical is, as someone familiar with discounted cash flow analysis, I am aware that minor "adjustment" to an underlying assumption can result in a significantly different result – the difference between a favourable or unfavourable recommendation. I have not seen any media commentary about the integrity of the assumptions underlying the report recommendations.

As readers will know, the term "three waters'' refers to drinking water, wastewater and stormwater. The government's proposal is to transfer the water assets and infrastructure to four mega water authorities, each serving a population between 800,000 (Entity B) and 1.7m (Entity A). They say the reason is to gain economies of scale that will flow through to cost savings to consumers.

The government's restructuring plan is based on the financial modelling carried out by the Water Industry Commission of Scotland (WICS), the economic regulator of the water and sewerage industry in Scotland. Established in 2005, their website states it, *"promotes the interests of water and sewerage customers in Scotland by making sure that householders and businesses receive a high-quality service and value for money by setting prices, monitoring Scottish Water's performance and facilitating competition in the water industry".*

Its recommendations are based on modelling two scenarios: status quo or amalgamation (into four entities). Their raw data was sourced from the Department of Internal Affairs who surveyed councils about their water infrastructure and expected infrastructure needs through a Request for Information (RFI) process. The RFI process included selecting a sample of about half of the 67 councils to provide detailed information. The DIA (Department of Internal Affairs) notes, "*The Local Authorities identified for the representative sample were selected to ensure an appropriate spread of council types, geographies and underlying drivers of need." [https://www.dia.govt.nz/Three-Waters-Reform-RfI#Purpose]*.

Let's be clear what the Three Waters forecasting is attempting to do so. It is projecting expenditures and income streams over 30 years for the two scenarios. It then calculates the expected cost per connected household for each scenario, for each of the four entities. For example, for entity A (Auckland and Northland) the annual cost in the year 2051 is projected to be $800 if the amalgamation scenario is pursued or $2,170 is the status quo were to prevail.

So, how much reliance should we place on the 2051 projections?

That leads to the obvious question: Is it possible to project numbers 30 years into the future with any degree of accuracy?

Most people with experience in financial forecasting will say no. Projecting that far into the future is more theoretical than practical. Realistically, 10 years is the maximum one would forecast and even then typically the protected scenario bears little correlation to what actually eventuates. One has only to look at past Long Term Council Community Plans which forecast a council's finances 10-years ahead to see how little correlation they have to what eventuates. That's unsurprising given the impossibility of accurately projecting variables like inflation and interest rates, costs, growth, and of course political influences – all of which are likely to have a material impact of future cash flows.

In my view, basing a decision on a 30-year financial projection is fanciful. That limitation alone would relegate the weight given to the financial benefits (or otherwise) of reform, and lead one to place greater weight on other factors such as the quality of service delivery and retention of democratic accountability.

However, let's accept the limitation of long-range financial forecasting and look specifically at the assumptions underlying the figures. The key reports being relied upon to make the decision are as follows:

- July 2020 – Castalia, *Parameters for Evaluating Aggregated Water Service Delivery Models.* Commissioned by LGNZ (Local Government New Zealand).
- September 2020 – Castalia, *Comparative Analysis of Institutional Forms in Water Services for Proposed New Zealand Reforms.* Commissioned by LGNZ.
- October 2020 – Castalia, *Analysing Economies of Scale in New Zealand Water Services*
- May 2021 (Final draft) – Water Industry Commission of Scotland (WICS), *Economic analysis of water services aggregation*. The report commissioned by the government and used to justify the proposed reform. https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/$file/wics-final-report-economic-analysis-of-water-services-aggregation.pdf
- May 2021- Farrier Swier Consulting, "Three Waters Reform, Review of methodology and assumptions underpinning economic analysis of aggregation". A peer review of the WICS report. https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-reform-programme/$file/farrierswier-three-waters-reform-programme-review-of-wics-methodology-and-assumptions-underpinning-economic-analysis-of-aggregation-released-june-2021.pdf
- May 2021 – Deloitte, *Industry Development Study & Economic Impact Assessment*. A study into the macroeconomic impacts of reform and the implications for affected industries. This will be of little relevance to households or individual councils.

The Water Industry Commission of Scotland (WICS) report

The primary document is the Water Industry Commission of Scotland report. It is this report that the government is using to justify the proposal. The key finding of the report is:

"There is considerable scope for efficiency across the Three Waters in New Zealand. In finalising its benchmarking, WICS has taken account of the special factor submissions of Councils. It has adjusted for the material factors affecting New Zealand councils including extreme rurality and location, additional costs of engaging with Iwi communities, seismic resilience and high tourist population. The adjustment is three times higher than was allowed for in Scotland – notwithstanding the lower 'on' costs of employing staff in New Zealand… WICS considers that its modelling likely understates the benefits of amalgamation and a wider reform of the governance and regulation of the Three Waters sector. Experience suggests that regulated companies consistently out-perform the expectations set by their regulators." (Page 67)

Castalia reports

Prior to the release of the WICS report, Castalia Consulting prepared three reports for LGNZ. These addressed the framework or foundation that should be applied when considering the reforms if the best outcome is to be achieved. LGNZ were part of a Joint Three Waters Steering Committee of officials, advisors, and stakeholders, including the Department of Internal Affairs, LGNZ, Society of Local Government Managers, Taumata Arowai, and Treasury.

I will initially focus on the three Castalia reports. They may be found at: https://www.lgnz.co.nz/assets/LGNZ-release-of-Castalia-reports-context-and-response-v2.pdf

First report: July 2020.
Parameters for Evaluating Aggregated Water Service Delivery Models

The key finding of this report is: *"The Government's policy process appears flawed and is focusing on high-risk options that may not deliver benefits."* (Page 1)

It goes on to say, *"The policy development process so far has not followed the standard process for reforms of this sort. An early focus on only one among a range of important factors—economies of scale—has contributed to premature emphasis on a preferred model following a relatively cursory review of the international experience. Not following standard policy processes creates a risk that the model selected could fail…or that produce unintended consequences."* (Page 1)

They conclude by saying, *"LGNZ should insist that reform options are evaluated against agreed criteria or parameters".*

In other words, they say LGNZ should insist that government be clear about what the problem is, what it wants to achieve, and then look at the full range of solutions. It says, looking at economies of scale only, will lead to a high risk of failure.

It appears LGNZ did not insist on this clarity. What it did do was enter into a Heads of Agreement with central government which in effect requires it to become an advocate in favour of the reform as proposed by the government, rather than a representative acting on behalf of its members.

Second Castalia report: September 2020.
Comparative Analysis of Institutional Forms in Water Services for Proposed New Zealand Reforms

The key extracts from this report are as follows.

"A handful of reform cases do not provide enough data to confidently choose the most appropriate model." (Page iv)

"Three models: regional public corporations; regional private companies; and delegation to a third-party provider, are better suited to enabling such economies than a purely local government system…It should also be noted that local governments may cooperate to achieve economies of scale, as happened in England before 1973; as is common in Colombia; and as the local authorities in the Wellington region have done." (Page iv). In other words, there are at least three better ways of delivering water services at a lower cost than is being proposed by the government.

“Direct customer accountability is provided by the local government model. When water service is a problem in a community, and local government is responsible, the matter often becomes an election issue. Customers are empowered to change their water service arrangements at the ballot box…If central government makes good decisions, customer interests will be served. However, direct accountability to consumers is weak, since it is unlikely that national elections will turn on water service matters.” (Page 1)

In other words, amalgamation will result in a loss of accountability. Under the Government proposal, local authorities will not be shareholders with a direct ownership interest. “Ownership” will be via their presence on the Board, where half of the seats will be reserved for constituent local authorities in proportion to the value of the infrastructure they have contributed, and half reserved for local iwi representatives.

Third Castalia report, October 2020.
Analysing Economies of Scale in New Zealand Water Services

The key extracts from this report are as follows.

“The key question for this report is whether the evidence available at this stage in the reform process supports the existence of economies of scale for the type of amalgamations proposed and applicable to the geography and organisational form prevalent in New Zealand. This report finds that economies of scale are generally not available from amalgamations of municipal water services, except in very limited scenarios. The evidence prepared by the Government to date does not establish that the intended benefits from economies of scale will materialise.” [Page i-ii] “*Apart from limited instances of existing urban areas merging, administrative amalgamations are unlikely to deliver any returns to scale in network services and water production services.”* (Page 32)

“The proposed amalgamations must be weighed against the costs and risks. These include the loss of local influence over water assets and loss of economies of scope with other activities of local government. The Government’s proposed reforms will be very costly. The Government needs to show that the reform will deliver benefits and that these outweigh the costs, including any costs imposed by transition.” (Page 32-33)

In essence, the Castalia reports say the government’s proposal is fundamentally flawed.

What is inexplicable is why LGNZ, having commissioned the reports, would enter into a Heads of Agreement (HoA) with central government that requires it to support the proposed reform, despite a significant number of its members expressing their opposition to Three Waters.

LGNZ says it represents “the national interests of councils in New Zealand”. Some of its members may have a different view.

Farrier Swier Consulting

The Farrier report, *"sets out findings from our review of work completed by the Water Industry Commission of Scotland (WICS) to assess the potential benefits from amalgamating and reforming water, wastewater, and stormwater (3waters) services…Our task was to review WICS' methodology and assumptions to undertaking this assessment."*

It's a peer review, of some 104 pages. The main comments as extracted are as follows:

- *"Due to the scope of our review, we cannot provide an opinion on whether the forecasts and estimates generated by WICS by applying its methodology and assumptions are reasonable."* (Page iv)
- *"We consider there are several potential differences between the New Zealand and UK context that may make it difficult to achieve UK levels of operating efficiency". To reflect those differences a "special factor adjustment of 5.1% for all councils except for Auckland"* was used in the model. They then say, *"Given the high-level nature of this adjustment and how it is applied, it is unlikely to accurately account for all the differences…"* (Page 33) *"Differences in topography between NZ and Scotland have not been fully assessed."* (Page 93)
- *"Given the nature of the analysis, there are invariably limitations with it, including that:*
  - *forecasts almost always turn out incorrect, especially over a 30-year horizon…*
  - *decisions on reform processes of this kind are typically undertaken while facing information challenges*
  - *there are a wide range of unknowns, including as to what the eventual structure of the 3waters sector will actually look like once the 3waters reform is implemented."* (Page v)
- *"we do not consider that the modelling undertaken by WICS and the choices it has made over how to do this materially affect the direction (i.e. sign) of estimated benefits from amalgamation and associated reforms. We could, of course, be wrong about this – with the actual outcome…being a reduction in efficiency or otherwise some form of economic loss. However, we consider that highly unlikely based on the information we have reviewed and our experience…"* (Page v)
- *"Importantly, our review has not assessed whether the outputs from WICS' analysis (e.g. expenditure, revenue and price forecasts) are reasonable, nor whether the calculations used to derive those outputs are free from error."* (Page v)
- *"It is out of scope for us go further to say that the range of estimated benefits produced by that analysis is likely to be reasonable or not."* (Page v)
- *"the benefits estimated by WICS cannot be used to definitively conclude that amalgamation by itself will lead to material efficiency gains in New Zealand. The associated economic and other reforms are an important contributor to the benefits estimated by WICS."* (Page v)

- *"We also have not assessed whether financial inputs provided through the Request for Information (RFI) process or by DIA's commercial and financial advisors are accurate. We understand that this is a matter for DIA to consider further when preparing its advice to Government."* (Page v) In other words, the reliability of the source data used for the analysis has not been verified, at least not by an independent source.
- *"the availability and quality of information has improved noticeably because of the RFI process undertaken (in part) to support the WICS analysis, but it still falls well short of the information that would be expected in a well governed and regulated 3waters industry."* (Page 27*)*
- *"it is unclear how appropriate the amalgamation and associated reform cost assumptions are given differences between the reform planned for New Zealand and what occurred in Scotland – we consider that amalgamation and associated reform costs in New Zealand could potentially be higher than they were in Scotland because of the complexity of combining 3water services from 67 councils into a handful of water entities…" (Page vii)*
- *"the effect of cultural standards and expectations on future expenditures in New Zealand – such as Māori views on wastewater discharge quality standards – are not included in the base case."* Arguably this is likely to be material given iwi would have half of the seats on the decision-making board. (Page vii)
- *"the [WICS] analysis is high-level and directional and should not be relied on to project actual expenditure, revenue and pricing outcomes."* (Page viii)
- WICS used a Net Present Cost approach to their modelling. A critical assumption is the discount rate applied to future cash flows. Farrier notes a discount rate of 0.65% per year was adopted, which is the risk-free rate as published by Treasury in May 2020. Treasury Working Paper 17/02 (Feb, 2017) notes the appropriate discount rate for water infrastructure to be 6%. It states the discount rate used should be *"set with reference to the rates of return that the government could hypothetically earn by investing public funds in a private sector project with similar risk characteristics to public investments".* The difference between the 0.65% discount rate used by WICS and the Treasury guidance is not explained. Changes in this variable alone will materially alter the outcomes, and materially influence a for-or-against recommendation.
- Other key assumptions are applied over the 30-year projection include inflation 2.2% p.a., and interest costs 3.5% p.a.
- It is assumed the amalgamated entity will be able to halve (-50%) its operating expenses (opex) and capital expenditure (capex) relative to the status quo model. That is simply implausible. If operating costs can be achieved they would more likely be in the range of zero to 10 per cent, but even this is unlikely given the government's assurance that no jobs would be lost as a result of the amalgamation. The WICS model also makes manual adjustments to assume local authorities will need significantly higher levels of capital investment over the next 30 years than is currently estimated by local authorities.

- *“as with renewal and replacement investment, WICS also assumed that capital costs for councils would increase by 1% more than inflation over the 30-year horizon and match inflation for the amalgamated entities.”*. (Page 53) In other words, an assumption has been made that the amalgamated entity will have access to cheaper finance that the individual councils who will pay 100 percentage points more. Arguably lower funding costs could be achieved without having to restructure if central government made debt available to local councils at or near its own borrowing rate. Assuming a higher cost of debt for local councils clearly leads to a recommendation favouring amalgamation.
- *“Core to the estimated benefits from amalgamation and associated reform is the projected investment over the 30-year horizon. Given such a long horizon and the difficulty in forecasting enhancement investment, the forecasts used by WICS are inherently uncertain.”* (Page 35)

So what can we take from the Farrier review? The single line abbreviation of their report would be that the WICS modelling should not be relied upon. That contradicts the claim from the Minister that the case for change has been proven.

Conclusion

My observation is that amalgamation itself is highly unlikely to provide the financial benefits claimed by central government and used to justify the proposed reform. Castalia states, and indeed the simple observation of free-market principles in practice would suggest, that efficiencies arise from competition. The Government’s proposal has excluded competition, and Cabinet papers make reference to the new entities being monopolies.

Castalia makes the point that there are a number of alternative reforms that could be adopted to achieve better outcomes. Those alternatives were not modelled because they fell outside the parameters set by central government. That must surely lead one to question the credibility of the Minister’s claim that service and cost efficiency are the primary intention of the reforms.

As to the reliability of the analysis model adopted, my view is the 30-year time frame, the unverified base data, and questionable underlying assumptions; make the outcome unreliable, to the extent that the WICS report should not be used to justify the proposed reform. To quote Castalia, “*the Reform Scenario is founded on unsound evidence and faulty analysis.”*

Furthermore, a significant unknown without international precedent upon which to base modelling is the influence of iwi. That influence is likely to be significant given iwi will have the status of equal partners in the management of the entities. Without legislation defining the role of iwi and placing boundaries on their financial influence, quantifying that influence in dollar terms with any degree of certainty is not possible.

I am in no doubt the cost savings the Minister says are "proven", will not only not eventuate but is more likely to produce a negative outcome over the alternative which is to retaining local ownership of water assets. That does not mean to say local councils could not improve and should not improve their service delivery to minimise costs; the Castalia reports offer a number of ways for them to do so. It is those options that should be modelled against the Government's Three Waters proposal.

Fortunately, some councils are looking beyond the political rhetoric and political motivations, and are undertaking their own due diligence. The Whangarei District Council for example has commissioned its own report from Castalia Consulting specifically as it would affect their ratepayers.

They conclude, *"We recommend that WDC carry out a proper net benefit analysis, potentially with other local authorities that have a similar viewpoint. This is likely to be many councils since the WICS analysis has consistent faults that apply to all local authorities. Such an analysis should include the full range of options together with transparent data and sound and contestable analysis so these options can be properly evaluated."*

The WDC report may be viewed here:
https://www.wdc.govt.nz/files/assets/public/documents/services/water/castalia-report-three-waters.pdf

I applaud the Whangarei District Council and other councils, for not accepting government as the sole source of truth.