

Updated Preliminary Assessment of Merits of Part 4 Inquiry into Gas Metering

Prepared for

NZ Commerce Commission

Authorship

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Executive summary

This report assesses the potential benefits from regulating gas metering services. It is a preliminary assessment for the purpose of assisting the Commerce Commission to decide whether to launch an official inquiry into the merits of regulation under Part 4 of the Commerce Act.

The analysis is focused on the gas metering businesses operated by Vector and Powerco. Following an information request, these firms provided data summarising their metering businesses, including key measures that extended back five years and were forecast forward another five years.

We have built financial models for both firms, which are contained in an associated spreadsheet. This report updates an earlier report¹ using extra information supplied by the firms in submissions which has now been incorporated into the spreadsheet models. The report details the assumptions embedded in those models and the sensitivity tests undertaken.

Originally, Vector and Powerco presented rather different views of the recent past and the anticipated future. [] whereas Vector's information shows the reverse. Both firms reported a degree of linkage between CPI inflation and their revenues. [] Vector reported that it doesn't expect to achieve CPI level revenue increases but this statement is immediately followed by a reference to a temporary constraint arising from its acquisition of Contact's metering business.

The firms also differed in respect of their technology expectations, with Vector considering that smart meters are imminent and may even be installed by a competitor, whereas Powerco appear to view smart meters as more of a medium term development.

The new information incorporated into this updated analysis is:

- Long-horizon forecasts of capital investment and depreciation expenses supplied by Powerco;
- Changing the long-term revenue growth assumption for Powerco to []% per annum; and
- Revenue and capital investment growth forecast methods for Vector are now standardised, both being based on an average of values for 2017 – 19 inclusive.

These changes address the submission points that are considered reasonable and valid. Vector also requested that we model a smart meter scenario for Powerco; that request has been met through changes to Powerco's assumptions which are now fully consistent with Powerco's expectations regarding smart meter deployment.

¹ Covec, Preliminary Assessment of Merits of Part 4 Inquiry into Gas Metering, 4 March 2015

Through the Commission we sought further information from []. Our interpretation of the response is that [].²

We modelled three scenarios for each firm, taking each out to 2036. For each firm, one scenario assumed depreciated replacement cost asset valuation, and the other two scenarios were derived following inspection of the data provided.

- Powerco
 - Scenario 1 (referred to as “Bottom-up BAU”) uses Powerco’s business as usual expectations from its bottom-up model of capital investment, which assumes an intensive program of meter testing and renewal (presumably with smart meters) over 10 years and also provides actual depreciation figures that turn out to be around 7% per annum on average;³
 - Scenario 2 (referred to as “Corporate BAU”) uses Powerco’s business as usual expectations] from its [] figures for capital investment, which makes no explicit assumption about smart meters and contains constant growth in annual investment from 2023 and all other assumptions (notably revenue and depreciation) are as for scenario 1; and
 - Scenario 3 (referred to as “DRC”) uses 7% depreciation and depreciated replacement cost for assets (unchanged from March).
- Vector
 - Scenario 1 (referred to as (BAU) is based on Vector’s business as usual expectations;
 - Scenario 2 (referred to as “Smart Meters”) is based on Vector rolling out its own smart meters over a ten year period;⁴ and
 - Scenario 3 (referred to as “DRC”) applies Vector’s business as usual figures with depreciated replacement cost for asset values.

² The relevant section of Vector’s response reads: “Our assets, including our gas metering assets, are measured at cost. Depreciation begins when the asset becomes available for use, is calculated on a straight line basis, and is expensed over the useful life of the asset.”

³ The ‘bottom up’ model differs from the [] in that it explicitly models Powerco’s program of meter testing and replacement which is expected to take around 10 years. It is a detailed model that includes the age structure of Powerco’s existing meter fleet.

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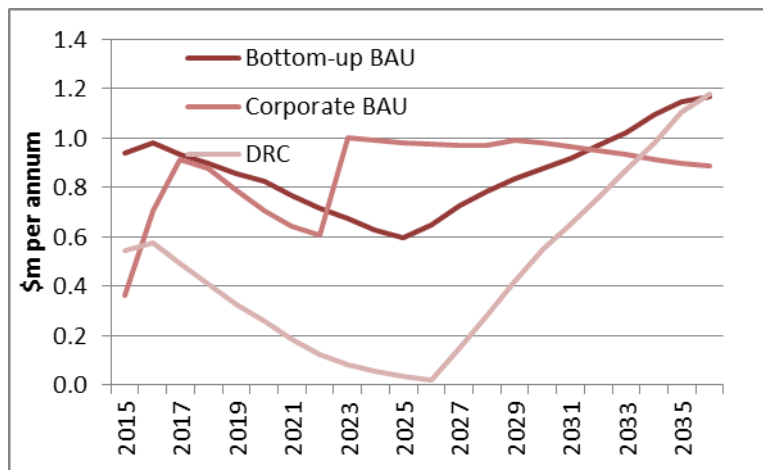
⁴ [] year timeframe as opposed to the original timeframe of [] years. This was so that there would be a Vector and Powerco scenario that had the same smart meter assumptions and could be easily compared to each other.

Vector reported an additional scenario in which a rival essentially steals Vector’s metering business by means of a rapid deployment of smart meters. This scenario was not included in our model because the competition test within Part 4 of the Commerce Act would not be passed in this scenario.

The benefits of regulation were estimated by scaling back the after tax rate of returns to 6.86% for Vector and 7.25% for Powerco; these figures were drawn from the Commission’s latest determinations for the gas distribution businesses of these firms.⁵ The results are summarised in Figure 1 and Figure 2 below. For Powerco, annual benefits start at under \$1m per annum and generally increase over time.

The estimates of the benefits from regulating Powerco’s gas metering assets have fallen somewhat since the March report due to Powerco supplying its own forecasts out to 2036 of investment and depreciation. It should be noted that the input data for the two BAU scenarios for Powerco only differ in respect of capital investment assumptions: Powerco supplied two (quite different) sets of capital investment forecasts, one from a bottom-up model and the other from a [].

Figure 1: Benefits of Regulation – Powerco (\$m per annum)

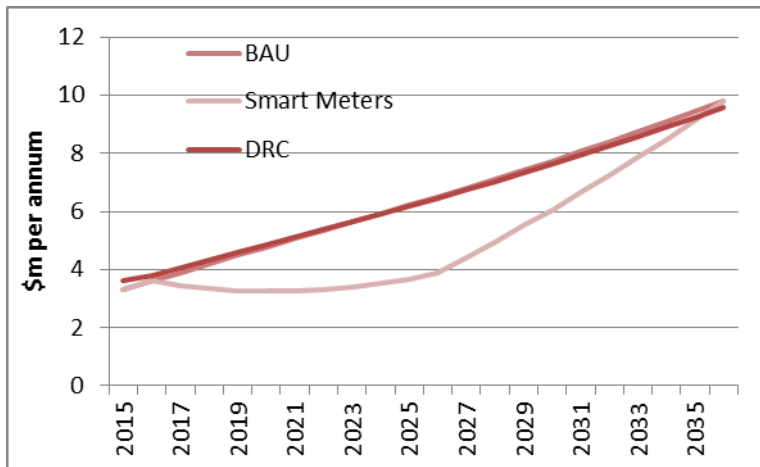


For Vector, depreciated replacement costs were estimated for all of the meters Vector already owned prior to acquiring Contact’s metering business. Assets acquired in that transaction were modelled at their purchase cost to Vector.

The resulting benefits are shown in Figure 2. They start at around \$4m per annum and increase by 2036 to around \$10m per annum in the base case and \$12m using DRC valuations. The benefits of regulation are materially lower in the smart meter scenario due to a significant increase in asset values over the period from 2016-2020, which drives the asset value upwards.

⁵ See <http://www.comcom.govt.nz/dmsdocument/13120> for Powerco and <http://www.comcom.govt.nz/dmsdocument/13964> for Vector

Figure 2: Benefits of Regulation - Vector



The estimated benefits of regulating Vector range from about \$4m per annum at the start of the period (2016) through to over \$9m per annum in 2036.

There are two further ways to view the benefits of regulating these businesses. One is by calculating a 10 year present value figure over the period 2016 – 25 inclusive. The other is by estimating the WACC that would eliminate those benefits (i.e. leave the 10 year present value at zero). The following table reports these estimates by firm and scenario.

	Powerco		Vector	
	10 yr PV (\$m)	PV=0 WACC	10 yr PV (\$m)	PV=0 WACC
Scenario 1	\$5.82	12.2%	\$33.68	12.8%
Scenario 2	\$5.64	12.8%	\$24.12	10.7%
Scenario 3	\$2.02	8.6%	\$34.24	13.0%

Full details of these calculations are available from the body of this report and the accompanying spreadsheet models.

We also considered two other issues:

- The total welfare standard; and
- The form of regulation.

Our analysis is primarily based on a consumer welfare standard in which transfers from producers to consumers count as a benefit of regulation. An alternative is to consider total welfare. Regulation would increase total welfare (in gross terms) if it stimulated extra demand. That seems rather unlikely for gas meters, which are subject to unit demand by consumers (i.e. we generally only require one meter). Metering is an ancillary service required by anyone who takes reticulated gas. Decisions to take gas service will be primarily driven not by the cost of metering but by the cost of gas relative to its benefits and relative to alternative forms of energy. We therefore consider the safest assumption to be that total welfare would not change materially as a result of regulation.

Regarding the form of regulation, an option that is potentially open to the government via legislative change is to roll gas meters into the existing regulation of gas pipeline services. In our view this would not materially change the benefits of regulation estimated here. That is because we have adopted similar methods as are used currently for setting default price paths, including in respect of the cost of capital. There may however be a cost saving available from jointly regulating pipeline services and metering services rather than proceeding separately. Costs of regulation are outside our brief however so we have not pursued this point.

1 Introduction

Prompted by the findings of merger clearance investigation, the Commerce Commission is considering whether to launch an inquiry under Part 4 of the Commerce Act 1984 into the gas metering sector. Covec was contracted to undertake a preliminary assessment of the potential benefits of regulation in this sector. The scope of this preliminary assessment includes the following tasks:

1. Requesting relevant information from Vector and Powerco;
2. Using this information to construct financial models of the gas metering businesses of both firms; and
3. Reporting to the Commission on the potential benefits of regulation over the period 2016-36.

It is important to note that this work is part of a preliminary assessment that will inform a decision over whether to initiate a full inquiry under Part 4 of the Commerce Act. It is focussed on the benefits of regulation only and intended to provide a range for the potential benefits rather than firm conclusions.

This report is accompanied by, and refers to, a purpose-built spreadsheet model which is also supplied to the Commission. The report is structured as follows.

- Section 2 reports the financial modelling of the benefits of regulation, including
 - the assumptions made;
 - the scenarios considered; and
 - the uncertainties associated with the final results.
- Section 3 discusses welfare issues, particularly
 - the role of the welfare standard; and
 - linkages with existing regulation.

2 Modelling the Benefits of Regulation

Gas metering services are supplied by the companies under study (Vector and Powerco) to gas retailers, who re-supply them to several different types of customer. Generally speaking, smaller consumers of gas have smaller meters and lower charges. The modelling of benefits is undertaken at a higher level, averaged across customer types, so we can focus on excess returns at the level of the metering supplier.

Information received from Vector and Powerco suggests these firms have different views of their metering markets. This is most obvious in their representations concerning smart meters. Vector says it would be more profitable if smart meters were delayed but sees them as a competitive threat. In responding to our information request, Vector presented three future scenarios for its business:

1. Status quo, in which smart meters have no significant role;
2. Vector accelerates smart meters, presumably in response to a competitive threat;
3. A rival enters with smart meters and steals Vector's metering business

By contrast, Powerco has offered a single set of forecasts and while noting that smart meters are the next technological step stated that they expect to roll them out incrementally over a ten year timeframe.

There is also [] in the data originally supplied by Vector and Powerco regarding depreciation, which was []% of book value for Powerco (one observation only) and []% for Vector (5 observations). Both firms are spending in the vicinity of []% of revenue on operating costs, [].

[] Powerco's information contains the following statement.

[

]

Vector has [] regarding future pricing and revenue.

[

]

2.1.1 Time Periods

The project brief calls for annual forecasts over the period 2016-36. To support this requirement, we asked the firms for data that went back five years into the past and projected five years into the future. The reasoning was that this would

- Not force the firms to speculate too far ahead, but also
- provide a good basis for our own projections.

The firms responded differently to essentially the same data request. Powerco, citing a change to its accounting processes and balance data has only provided book values and depreciation figures for the last two years. Vector has offered three forward scenarios depending on what happens with smart meters.

2.1.2 Structure

It will be convenient to split this section of the report by firm. For each firm, we will explain the assumptions made, scenarios modelled and the resulting estimates of the benefits of regulation. However at this point we note that three scenarios were modelled for each firm as follows:

- Powerco
 - Scenario 1 (referred to as “Bottom-up BAU”) uses Powerco’s business as usual expectations from its bottom-up model of capital investment, []
 - Scenario 2 (referred to as “Corporate BAU”) uses Powerco’s business as usual expectations] from its []figures for capital investment, []and all other assumptions (notably revenue and depreciation) are as for scenario 1; and
 - Scenario 3 (referred to as “DRC”) uses []% depreciation and depreciated replacement cost for assets (unchanged from March).
- Vector
 - Scenario 1 (referred to as (BAU) is based on Vector’s business as usual expectations;

⁶ [

]

- Scenario 2 (referred to as “Smart Meters”) is based on Vector [];⁷ and
- Scenario 3 (referred to as “DRC”) applies Vector’s business as usual figures with depreciated replacement cost for asset values.

2.2 Powerco

Powerco supplied considerable detail as to its physical assets, their distribution across retailers and geography, replacement plans and replacement costs by region. However the data were initially less detailed on pivotal matters such as book values and depreciation charges. From the perspective of inputs into the financial modelling, the actual information originally supplied by Powerco is shown in Table 1.

Table 1: Data Originally Supplied by Powerco (\$ x 1000) except grey values estimated by Covec

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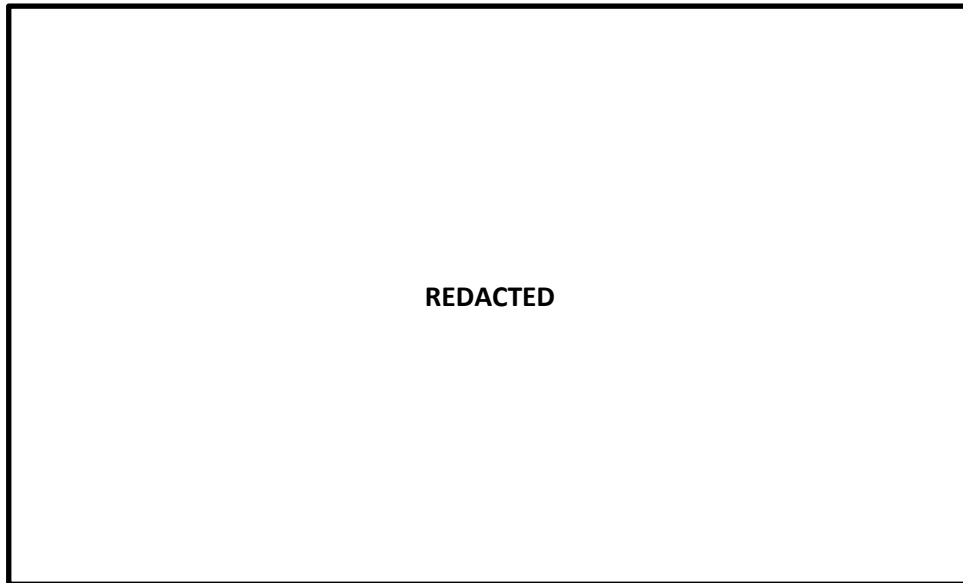
The operational costs (opex) figure for 2012 is grey to indicate it was estimated by Covec from data supplied.⁸ We modelled opex as a percentage of revenue. For 2013 and 2014 this percentage was 23% and 18% respectively, whereas it was 26% for 2012 which was the estimated year. We considered that the 2013 and 2014 years were more reliable and applied an average of the ratio for those years to estimate opex for all forecast years (2015-2036).

In the original data supplied, depreciation was 12% of the opening book value but it was only reported for the 2014 year. This was the only indication we had of Powerco’s depreciation policy in the first version of this report. Since then, Powerco has supplied long-horizon forecasts which have been used throughout this analysis. In respect of new investment only, the new Powerco forecasts come from two different sources: a [] and a bottom-up model of the meter fleet that details the cost of testing and replacing old meters, plus growth in meter numbers. The first two scenarios we model for Powerco differ according to which of these sources we use for Powerco’s forecasts of new capital investment. To aid understanding, the following chart shows how these investment forecasts differ.

⁷ [] year timeframe as opposed to the original timeframe of [] years. This was so that there would be a Vector and Powerco scenario that had the same smart meter assumptions and could be easily compared to each other.

⁸ Powerco reported opex of \$174,000 “between July 2012 and September 2012”. We assumed this is a 3 month period and multiplied it by 4 to generate the annual figure shown in Table 1.

Figure 3: Powerco's forecasts for Capital Investment (\$m)



The bottom-up forecasts reflect the fact that Powerco has an active meter testing/replacement programme and a backlog of replacements, driving higher investment levels over the next decade followed by a return to levels more consistent with historical norms at the company.

Future book values are also affected by new investment. For the first version of this report Powerco supplied investment data in a very disaggregated format. It reported the number of new meters expected to be installed for each of the next six years (2015-20 inclusive), plus the meter cost and installation costs for each meter type disaggregated by region. There were no meter or installation costs supplied for the larger meters (above 60 scmh) [].

We handled the omission of larger meter installation costs in the first version of this report by:

- Not counting them as increments to the asset base; and
- Removing from the revenue line an estimate of the revenue they would earn.

This approach kept the model balanced, and focused it on the market below major users who may in any case be thought to have a reasonable amount of countervailing market power. It did omit information for larger customers however.

The new information provided by Powerco has long-term forecasts for metering investment however, so there is no need to omit revenue, which removes a source of model error.

In the model, we estimate earnings before interest and taxation (EBIT) value for each year out to 2036 using Powerco's data. We then apply the statutory company tax rate of

28% to convert this into a net profit after tax (NPAT) value, and divide by the book value to estimate return on assets. The firms were not asked for debt or gearing information, and the modelling effectively assumes zero debt.

Figure 4: Powerco Asset Values and Rate of Return (Bottom-up BAU scenario)

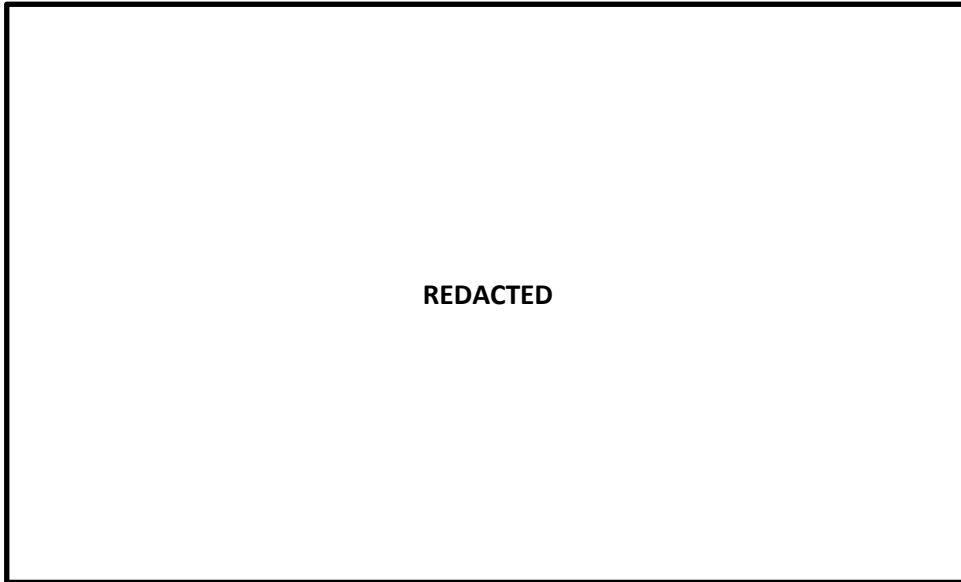
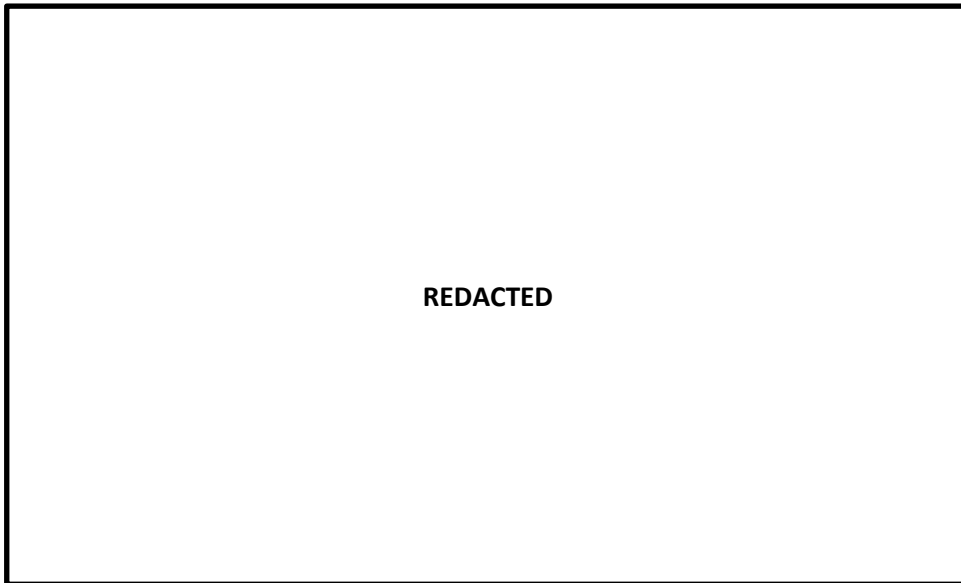


Figure 4 shows the results of this approach for the Bottom-up BAU scenario (which uses Powerco's bottom up forecasts of investment). Notice that book values [] and are thereafter [] at the end of the analysis period (2036).

These outcomes arise quite directly from information supplied by Powerco, particularly in respect of revenue, depreciation and new investment.

To check the sensitivity of the model to the asset value assumptions we modelled a second [] Figure 5 shows the results. []

Figure 5: Powerco Asset Value and Rate of Return (Corporate BAU scenario)



A third scenario requested by the Commission involved revaluing the assets from book value to depreciated replacement cost (DRC). Powerco supplied detailed cost information on the purchase and installation cost of new meters, but only for the three smallest capacity meters. We used Vector's data to estimate the installation cost of the larger meters and the total cost of installing an entire new fleet of Powerco meters in 2015.⁹

There is a question over how much depreciation should be deducted off the replacement cost under this scenario. Experimentation showed that the 2015 book value is equivalent to 50% of replacement cost. Powerco supplied a chart showing the number of meters added each year back to the mid-1970s. Translating this chart information by eye, we estimated that the average age of meters on Powerco's network is 17.5 years. The chart showed approximately 52,000 meter installations.

Lacking further information we proceeded on the basis that meter lifetimes of 30-40 years are not unusual. We tested four possible meter lifetimes (25 years – 40 years in 5 year increments), applied the 17.5 year average age to each and calculated the amount of depreciation of replacement cost that would correspond to each age profile. In what follows we show depreciated replacement cost (DRC) scenarios with 40 year asset lifetimes.

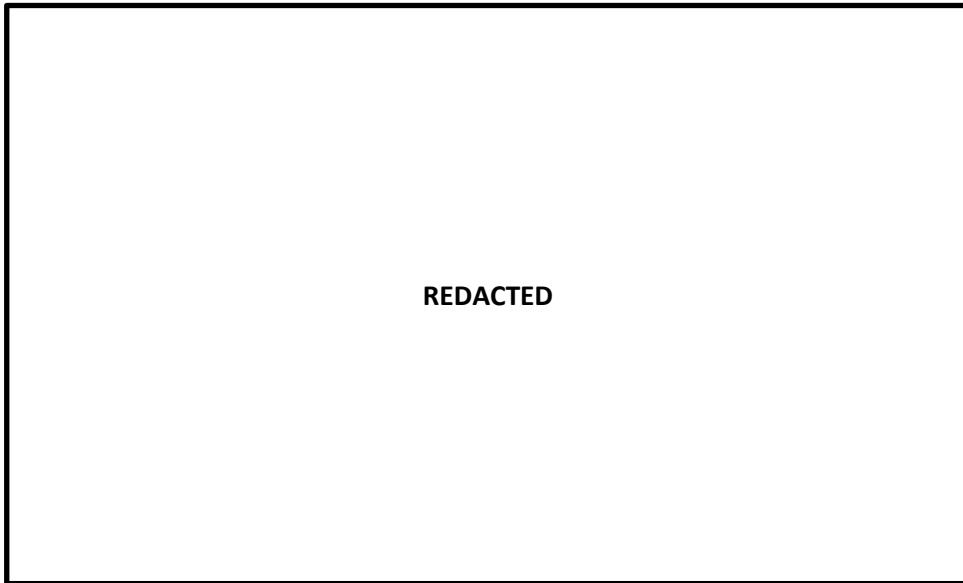
In the DRC scenario, Powerco's asset value was reset to DRC in 2015 and thereafter depreciated at []% per annum.¹⁰ All other assumptions described above were retained.

⁹ In the earlier version of this we omitted the larger meter cost and an estimate of the associated revenue.

¹⁰ An alternative would be to impose a tilted annuity structure which would require reasonable knowledge of expected trends in the costs of gas meters and installation costs (including labour) and their likely future shares in metering network build costs.

Figure 6 shows the results of Scenario 2 for Powerco (the DRC scenario is discussed further below).

Figure 6: Powerco results using DRC scenario

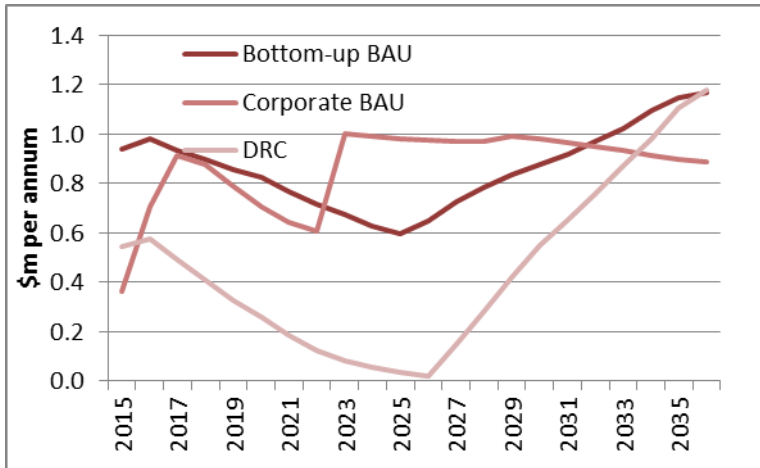


In what follows, we use all of these scenarios to estimate the benefits of regulation.

2.2.1 Excess Returns

The consumer welfare benefit of regulation is estimated by the size of the price cut that would occur if the rate of return was regulated. We take the regulated rate of return to be 7.25% per annum which is consistent with the Commission's latest determinations on WACC for Powerco's gas distribution business. Figure 7 shows the estimated benefits of regulation under the three scenarios modelled. For the two BAU scenarios, the benefits of regulation vary between about \$0.6m and \$1m per annum over most of the range, while benefits fall lower for the DRC scenario. Full details are provided in the accompanying spreadsheet.

Figure 7: Benefits of regulating Powerco under different assumptions



2.3 Vector

Vector supplied a deeper history of asset values and operating costs than Powerco. The core information is shown in Table 2.

[]

Table 2: Data supplied by Vector (\$ x 1000)

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For the five year ahead forecasts, Vector offered three scenarios each based on a different outcome in respect of smart meters. The “status quo” scenario involved no material change. The other two scenarios involved a rapid switch to smart meters either by Vector or by a rival. []

[]¹¹ [] The third scenario, in which a rival essentially drives Vector out of business is not explored in detail because the competition test within Part 4 of the Commerce Act would not be passed in this scenario. Instead we model a depreciated replacement cost scenario.

¹¹ []

To generate the financial forecasts we used the following key ratios that were embedded in Vector’s own forecast (which ran out to 2019):

- Depreciation at []% of book value per annum;
- Operating costs at []% of revenue per annum;
- Investment increasing by []% per annum; and
- Revenue increasing at []% per annum.

All of these values were derived from the forecasts (2015-19) supplied by Vector.¹² The basic structure of our financial modelling mirrored that used for Powerco and reported above. However since Vector supplied aggregate investment data we did not need to generate a bottom-up estimate of investment from meter installation costs.

Figure 8: Vector Book Values and Rate of Return (BAU Scenario)

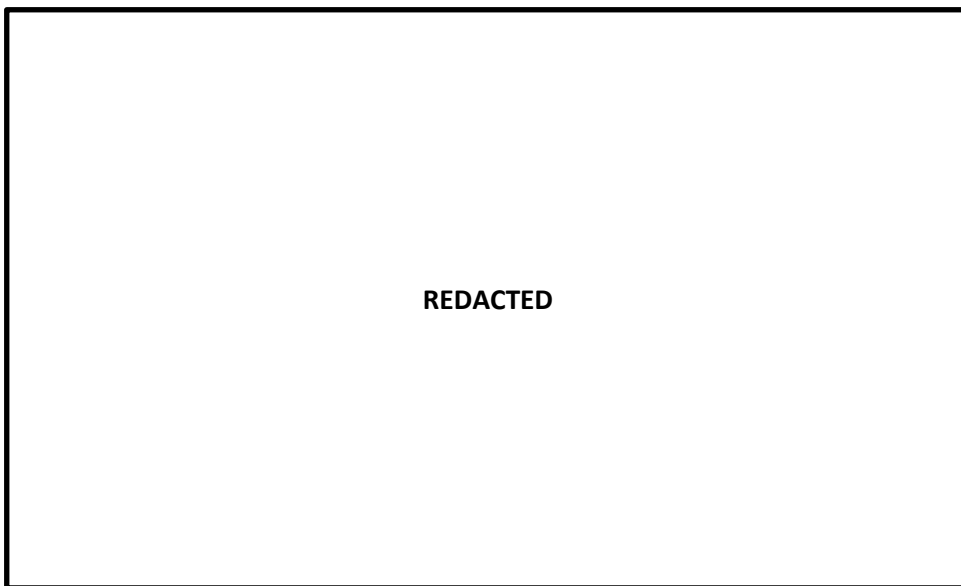


Figure 8 shows the core results from the financial modelling. Unlike [], As with Powerco, the forecast changes in book value in our model are built off the company’s own forecasts; in Vector’s case it has [] over its own forecast period (2015 – 19) so this basic pattern also shows up in our longer-horizon forecasts.

Because the asset base is increasing, the growth in the rate of return is moderated, though it still reaches [] by the end of the forecast period (2036).

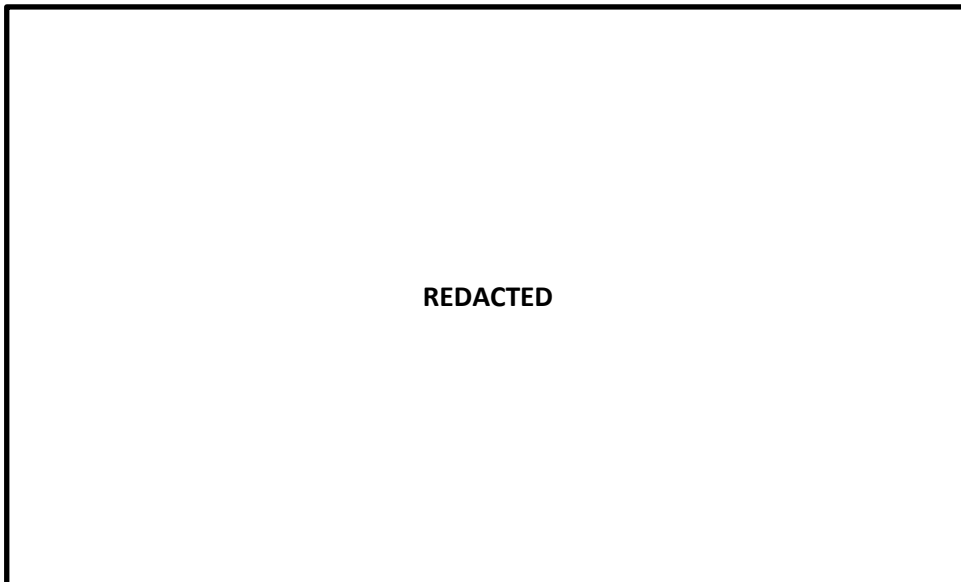
Turning now to the [] scenario, we modelled this in a broadly similar manner though we have modified Vector’s roll-out plan to align it better with Powerco’s. Vector []. We

¹² In its submission CEG (for Vector) argued that the first version of this work used different methods to estimate future investment and revenue growth rates. We have accommodated this criticism by basing both forecasts on an average of the growth rates for the last three years of data that Vector supplied (i.e. 2017 – 19 inclusive).

have [] the roll-out period to 10 years and allowed for the same number of replacements in each year. We used Vector’s information on total investment and number of meters installed to estimate an investment cost per meter. That value began at around [].^{13]}

[] However, lacking reliable information on the balance between new investment and depreciation in this scenario we assumed these would be equal; effectively this stabilised the asset base over our longer forecast period. The results are shown in Figure 9.

Figure 9: Vector Book Values and Rate of Return (Smart Meter Scenario)



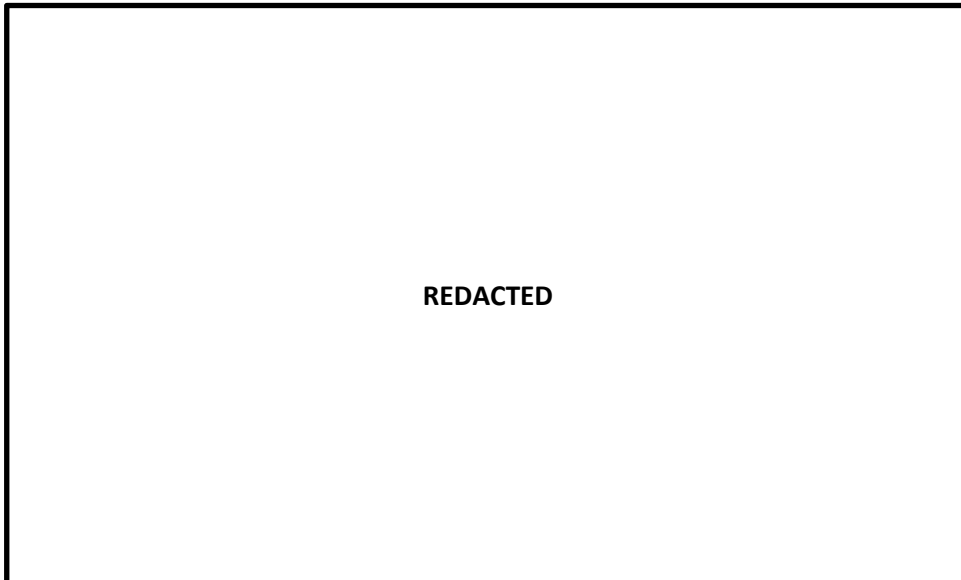
[]

To estimate the DRC of Vector’s meters we split the assets into two groups. One contained the assets acquired from Contact; these entered the model at their acquisition value. The second group contained the meters Vector already owned prior to acquiring Contact’s meters. We estimated the replacement cost for these meters and depreciated it

¹³ []

by 44%.¹⁴ []. Figure 10 shows the asset value and return on assets arising from this third scenario.

Figure 10: Vector's Rate of Return & Asset Value under DRC Scenario



2.3.1 Excess Returns

Using the same approach as reported for Powerco, we estimated the benefits of regulation by scaling the rate of return back to 6.86% after tax and calculating the difference in after tax profit.

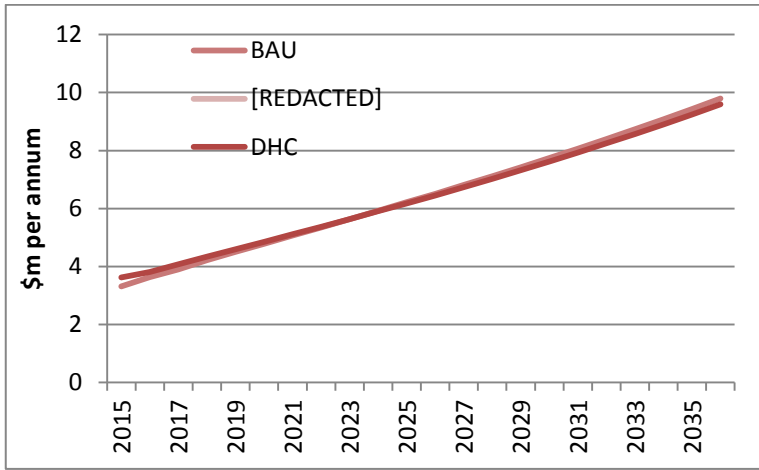
The results are shown in Figure 11. In the

[].
[]

Figure 11: Benefits of Regulation – Vector

¹⁴ [We did not have an age profile so we used the Powerco information along with the same set of assumptions on asset lives to estimate a depreciation figure.

[].



3 Other Issues

There are two other issues to be addressed in this section.

- The role of the welfare standard; and
- The method of regulation.

3.1 The Welfare Standard

The above analysis has been conducted on the basis that any price reductions for consumers are a benefit. This amounts to using a consumer welfare standard. An alternative is to consider total welfare.

Total welfare only changes if demand for the good or service traded changes. In general, a price reduction leads to more demand, and the (total) welfare increase is defined as the additional surplus (i.e. gains from trade) that is generated as a result.

In the case of gas metering it seems quite unlikely that any material extra demand would eventuate from a price cut, irrespective of the rate of pass-through. Consumers are likely to have unit demands for gas meters. If metering was very cheap some extra demand might arise¹⁵ but demand for metering seems more likely to be an ancillary (or derived) demand associated with the more fundamental purchase of a gas supply.

For these reasons we consider that there is unlikely to be any material change in total welfare as a result of regulation.

3.2 Form of Regulation

One option open to the government via legislative change is to vary the existing regulation of gas pipeline services so that it includes metering, rather than regulating gas metering as a distinct service.

In our view this would not materially change the benefit estimates we have presented above. This is because our modelling is similar to that which is already used by the Commission, including through the use of a similar cost of capital.

It seems more likely that any differences would show up in the cost of regulation, where there may be some economies of scope arising from rolling meters into an existing asset base rather than setting stand-alone terms for metering.

¹⁵ For example, there may be two parties sharing a gas connection who would contract independently if costs were low enough.

Appendix: Summary of assumptions

Titl e	Nam e	Data	Reve nue	Dep'n	Investmt	S. Meters	W AC C
Vec tor 1	Base case	Vect or data up to 2020 & Cove c esti mate s ther eafte r	Grow s at []= avg for 2017-19 in Vecto r's data	[]% of book value = avg for 2017-19 in Vecto r's data	Grows at []% being the average for 2017-19 in Vector's data	Nothing explicit	6.8 6% from lat est rul ing
Vec tor 2	Smart Meters	Vect or data up to 2020 & Cove c esti mate s ther eafte r	Grow s []= avg for 2017-19 in Vecto r's data	[]% of book value = avg for 2017-19 in Vecto r's data	[]	[]	6.8 6% from lat est rul ing
Vec tor 3	DRC	Book values change at 2014 to reflect modern equivalent asset value: meters acquired from Contact are valued at purchase cost;	Assu med to grow at []% being the average for 2017-19 in Vecto r's data	Assu med to be []% of book value being the average for 2017-19 in Vecto r's data	Assumed equal to depreciation	Nothing explicit	6.8 6% from lat est rul ing

		all others at Vector's estimate of new cost					
Powerco 1	Business as usual - Bottom up investment	Supplied by Powerco & estimated by Covec	Supplied by Powerco to 2020 and then growing at []% (as in Sept 2015 submission)	Raw data supplied by Powerco from bottom-up model	All data from bottom up model supplied Sept 2015. Assumed to imply 10 yr rollout of smart meters	Reflects Powerco's bottom-up test & renew model. We assume this involves 10 yr roll out smart meters	7.25% from latest ruling
Powerco 2	Business as usual - corporate model	Supplied by Powerco & estimated by Covec	Supplied by Powerco to 2020 and then growing at []% (as in Sept 2015 submission)	Raw data supplied by Powerco from bottom-up model	All data from [] supplied Sept 2015. Assumed to imply 10 yr rollout of smart meters	Reflects Powerco's overall view. We assume this involves 10 yr roll out smart meters	7.25% from latest ruling
Powerco 3	DRC	Book values change at 2015 to estimate the modern equivalent asset value and of DRC	Supplied by Powerco to 2020 and growing at []% thereafter (as in Sept 2015 submission)	Constant depreciation rate assumed at []% of book value	All data from Powerco's bottom-up model supplied Sept 2015. Assumed to imply 10 yr rollout of smart meters	Nothing explicit	7.25% from latest ruling