



**Cross – Submission on  
STA's Oral and Written Submissions  
on the Review of Asset Valuation Methodologies**

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## **Executive summary**

This cross-submission is in response to the written and oral submissions of Simon Terry & Associates (STA) on the Commerce Commission's review of asset valuation methodologies

### ***Key points of cross-submission***

This cross-submission makes three key points:

- There is no economic or legal substance to STA's claim that net operating surpluses or the calculated IRRs of lines businesses indicate over-collections and the generation of excess profits, as STA fails to demonstrate that the use of vesting values in these calculations is appropriate.
- Even if STA's analysis did have a basis for claiming over-collections, the allocative inefficiency for electricity distribution services would be in the order of \$10m, not \$200m per annum as claimed. A similar reduction would apply also to STA's claim of \$60m per annum efficiency costs for the gas industry.
- While ODV and DHC can be implemented to achieve the same expected returns for a regulated entity, the allocation of risks is important for achieving dynamic efficiency. For both electricity and gas sectors, ODV may result in superior risk allocation, though ultimately this would be determined by the overall price setting mechanism for a regulated entity, and not just with respect to the valuation methodology.

### ***Purpose and criteria for the review***

STA states that the Commission should adopt whatever asset valuation methodology best serves the interests of consumers. In the case of electricity, STA's interpretation of section 57E is flawed, its focus on section 57E of the Commerce Act is too narrow, its assumption that alleged past excessive profits can be clawed back is incorrect, and its reliance on the Energy Policy Framework is misplaced. As a result, STA's interpretation of the purpose of the review and its use of an "excessive profits" criterion is flawed, and the STA analysis of excessive profits irrelevant.

In addition, in appraising the benefits of different valuation methodologies, STA inappropriately mix together efficiency and income distribution issues. Maintaining a correct distinction between these two concepts is fundamental to sound decision making by a regulator.

### ***Regulatory compact for use of DHC***

STA argues that there is a regulatory compact going back to the vesting of the assets of electric power boards and municipal electricity departments, and which continued under the light-handed regulatory regime, that DHC should be used for the pricing of lines function services.

We can find no evidence of such a regulatory compact. Information provided by PricewaterhouseCoopers indicates that a wide range of valuation methodologies were used at vesting. We can find no government statements made under the light-handed regulatory regime requiring the use of DHC for pricing purposes. While it is clear that

the government did not mandate the use of ODV for pricing purposes, there was nothing to prevent companies from doing so.

### ***STA analysis of excessive profits***

An important part of STA's argument for the use of DHC is its analysis of excessive profits that have allegedly been earned by line companies in the past. These are alleged to have arisen through windfall gains arising from asset revaluations. We consider that this analysis is fundamentally flawed:

- The baseline used by STA to calculate the alleged windfall gains is the vesting values of line company assets. These values were compiled on inconsistent bases, and relied on incomplete accounting records.
- The revaluations since vesting have included the result of improvements in asset recording, so that companies' records now better reflect the assets owned by these businesses.
- STA's analysis of the Internal Rates of Return of lines companies is flawed. In terms of calculation method, the most serious issue is the choice of opening and ending valuations, as the IRRs are extremely sensitive to the choice of these values. In the case of electricity, an independent expert report by PricewaterhouseCoopers concludes that the accounting history of the opening valuations that are adopted by STA has resulted in "*inconsistent and understated historical values*", rendering STA's results spurious.
- STA's exclusive reliance on IRR analysis ignores the widely accepted approach in competition analysis of defining the relevant markets and assessing the full range of factors that could give rise to competitive pressures. STA also ignore serious limitations in interpreting *ex post* IRRs to detect excessive profits.
- More generally, STA makes no attempt to test the statistical significance of IRR results relative to target returns or take account of limitations in their underlying theoretical model. For all these reasons, STA's conclusions regarding monopoly profits are premature at best and have a high probability of being wrong.

### ***Allocative efficiency benefits of using DHC***

Most commentators agree that the *ex ante* choice between DHC and ODV prior to investments rests on several subtle arguments and that the bigger issue is to avoid mid-stream changes to the valuation method. It appears that STA are largely in agreement with this conclusion but nevertheless its papers still tend to confuse the issues.

STA suggests that ODV is an inappropriate basis for pricing as it ignores the reality that network assets are sunk investments, and claims that variable prices should therefore be close to zero. However, STA are incorrect as they focus on allocative efficiency only rather than overall efficiency that includes investment incentives. Also, we note these same issues apply to DHC based pricing.

STA suggests that ODV forces consumers to accept greater risks as they would be "*trading the certainty of higher prices today for the possibility of higher prices tomorrow.*" This is incorrect and reflects confusion by STA between the choice of alternative price profiles and risks of mid-stream switch in valuation methods. We suggest that the ODV method is more likely to be time-consistent and therefore may have less risk of resulting in a switch in valuation method part way through the life of the asset.

STA suggests that the ODV approach permits ongoing over-collections of revenue. This is incorrect, provided the method is implemented correctly.

### ***Dynamic efficiency***

STA suggests that "*rate base methodologies based on replacement cost offer no advantage over historic cost in terms of dynamic efficiency.*" This is consistent with statements by most commentators to the extent that pricing methods based on either DHC or ODV equate the expected present value of revenues and costs. However, the efficiency properties of the two methods may differ if, along with associated price rules, they result in a different allocation of risks. ODV has desirable features, particularly in relation to demand and technology risk, which STA erroneously ascribe as regulatory risk. The absence of an optimisation process in STA's proposed DHC approach could skew investment incentives.

### ***Mid-stream switching costs***

STA rebuts the Commission's concern that a switch now from ODV to DHC could be interpreted by investors as opportunism on the part of the Commission. In our view, STA confuses the ex ante choice of valuation method (as summarised above) with the issue of switching valuation method mid-stream. We construct a time-consistency argument in favour of ODV as presenting potentially less risk of mid-stream switching of valuation method.

## 1 Introduction

This paper reviews and comments on the written and oral submissions from Simon Terry Associates Limited (STA) on the review of asset valuation methodologies. The review of asset valuation methodologies is required to be carried out by the Commerce Commission under section 57ZD of the Commerce Act. The statutory context for this review is described in VECTOR's and UnitedNetworks' joint submission on the review.

It is unclear exactly what STA's position is on an appropriate asset valuation methodology. In its written submission, STA argues for the use of a DHC methodology. In its oral submission, STA began by presenting the same argument, but later acknowledged that ODV could be used (e.g. transcript, 27 Nov, p80). However, STA later submitted that opening values for regulatory purposes should be set at 1993 vesting values (transcript, 27 Nov, p82). STA does not reconcile these positions.

We have therefore assumed that STA's position is that:

- Opening values for regulatory purposes should be set at 1993 vesting values;
- Moving forward, DHC is preferred but that ODV could be used; and
- Regardless of which approach is used, revaluations should be treated as income, and any excessive profits that are identified in STA's analysis of the period 1992 to date and going forward should be recovered from lines companies.

Much of STA's submissions go beyond the scope of the review and deal with substantive issues relating to the design of thresholds. These issues have yet to be determined by the Commission. We note that VECTOR's and UnitedNetworks' position is that asset valuations are not needed for setting thresholds.

The STA submissions are based on:

- Its view that the purpose of the review is to adopt a valuation methodology based on their interpretation of what best serves the interests of consumers;
- Its use of the Commission's "excessive profits" and "cost effectiveness" criteria;
- Claims that lines companies have been earning and continue to earn excessive profits since vesting of the electricity undertakings of electric power boards and municipal electricity departments in energy companies, based on claimed increases in asset valuations since vesting;
- The alleged net benefits that STA calculate would result if prices were set with reference to vesting values, and the use of DHC valuation methodology since then; and
- An argument that there is no regulatory risk arising from the use of vesting values to set DHC starting values as there has been a regulatory compact that DHC valuations should be used for pricing purposes.

STA also appear to argue that there is a regulatory compact that the alleged excessive profits earned under the light-handed regulatory regime would be clawed back (written submission, pp 19-21) and appear to suggest that the Commission should claw back these profits.

This paper considers the STA analysis and claims under the following headings:

- Purpose and criteria for review
- Supposed regulatory compact for use of DHC
- Analyses of alleged excessive profits
- Net benefit comparison of DHC and ODV prior to investment
- Impact of mid-stream switching costs

The STA submission attaches two other STA papers as appendices: *Lining Up the Charges: Electricity Line Charges and ODV*, Geoff Bertram and Simon Terry, July 2000 and *Pipeline Profits: Gas Pipeline Rates of Return*, Geoff Bertram, Ian Dempster, and Simon Terry, July 2001. We refer to them where appropriate in this paper.

## 2 Purpose and criteria for review

STA states that the Commission should choose a valuation methodology that best serves the interests of consumers (written submission, p3) and adopts the Commission's "excessive profits" criterion for evaluating asset valuation methodologies (written submission, p4). These matters are discussed further below.

STA's position, as further developed, however, is more complicated. At p5 of its written submission, STA claims that the choice of asset valuation methodologies turns on the existence and magnitude of excessive profits taken in the past versus gains to productive and/or dynamic efficiency in the future plus cost effectiveness considerations (p5). However, in the following pages of its written submission and in its oral submissions, STA focuses on the alleged allocative efficiency benefits that would arise in the future from using a DHC valuation methodology.

We have therefore considered both whether excessive profits taken in the past is a relevant criterion for the choosing between asset valuation methodologies (see below) and the validity of STA's claims about the alleged allocative efficiency benefits in the future of using DHC (see section 4).

In our view, STA's view of the purpose and criteria for the review is legally flawed for a number of reasons:

**(a) It is based on an incorrect interpretation of section 57E**

STA claims that the "*long term benefit of consumers*" is central to the review and that this entails curtailing excessive profits, maintaining service quality, and passing through efficiency gains to customers (written submission, p3).

STA has however ignored section 1A of the Commerce Act and the wording of the first part of section 57E, (which would apply in respect of tasks under the targeted control regime such as threshold setting). The latter states that "*the purpose of this subpart is to promote the efficient operation of [the relevant markets] through targeted control for the long-term benefit of consumers*". The overall purpose of the targeted regime therefore is efficiency, not excessive profits or any of the other objectives claimed by STA<sup>1</sup>. The long-term benefit of consumers requires a focus on overall efficiency (this was recognised by the Commission in its Final Report in its Airfields Price Control Inquiry in relation to the overall purpose of the Commerce Act as stated in section 1A of the Act (see paragraph 2.61)).

STA has presumably taken, selectively, the objectives of limiting excess profits, maintaining service quality, and passing efficiency gains to consumers from sub-paragraphs (a) to (b) of section 57E. There are a number of problems with such an approach:

- (a) The sub-paragraphs are subservient to the overall efficiency purpose and not ends in themselves. STA's approach elevates them to

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<sup>1</sup> In addition, as noted in VECTOR's and UnitedNetworks' submission, the use of the "*cost effectiveness*" criterion, separate from an economic efficiency criterion, is unnecessary.

absolute mechanistic requirements, rather than matters that must be considered by the Commission within the overall purpose.

- (b) The objective in sub-paragraph (a) is to ensure that suppliers “*are limited in their ability to extract excess profits*”. STA has restated this, incorrectly, as a requirement to curtail excess profits.
- (c) The objective in subparagraph (c) is to ensure that suppliers “*share the benefits of efficiency gains with consumers*”. This does not require that all the benefits of efficiency gains need to be shared: the retention by electricity lines businesses of some of these benefits provides an incentive to innovate. STA, however, suggests that all efficiency gains should be passed through to consumers.

Also, as stated in VECTOR’s and UnitedNetworks submission, it is not necessary for the Commission to set thresholds that require asset valuations. It is therefore inappropriate to assume in the review that thresholds will address, mechanistically, the removal of excessive profits. Thus, by adopting the excessive profits criterion, STA is preempting the decisions that the Commission is yet to make. This is inappropriate.

**(b) It refers to wrong Government Policy Statement**

STA refers to two objectives taken from the Government’s energy policy framework to support its view of the purpose of the review (written submission, p4).

This energy policy framework has not, however, been notified by the Government to the Commission under section 26 of the Commerce Act. There is therefore no requirement on the Commission to take this policy framework into account. Instead, the Commission is required to consider the *Government Policy Statement on Further Development of New Zealand’s Electricity Industry* of February 2002, which has been notified under section 26. This economic policy statement does not contain either of the objectives referred to by STA at page 3 of its submission.

The objectives described by STA are therefore not relevant to the review and it is wrong for STA to rely upon them for support.

**(c) It focuses narrowly on section 57E**

In its submission, STA states that it agrees with the Commission that section 57E of the Commerce Act should be taken as setting out the purpose of the review (written submission, p3). This is an overly narrow focus.

Section 57E relates only to the targeted control regime (indeed we note that the VECTOR and UnitedNetworks’ submission on the asset valuation review acknowledges that asset valuations could be used in making authorisations). However, asset valuations may also be used in setting information disclosure requirements. This means that the purpose statement in section 57T(1) of the Commerce Act is also relevant to the review. Significantly 57T(1) does not include any reference to “*excessive profits*”. This is ignored by STA.

**(d) STA incorrectly assumes that excessive profits taken in the past can be clawed back**

As noted above, one of the matters that STA claims that the Commission should take into account in choosing between asset valuation methodologies is the existence and magnitude of excessive profits taken in the past.

However, the Commission has no legal powers under the targeted control regime (or elsewhere in legislation) to claw-back any alleged excessive profits made in the past (for further discussion see UnitedNetworks' response to Orion's submission of 30 August 2002). As a result, it is completely inappropriate to establish a test based on the benefits of recovering alleged past excessive profits when there is no way for the Commission to recover these benefits. STA is claiming a benefit that the Commission cannot deliver.

STA's argument that the Commission should consider alleged excessive profits taken in the past appears to be partly based on an argument that claw-back of past excessive profits was an implicit or explicit threat of the light-handed regime that was in place for much of the 1990s (written submission, pp19-20). We can find no evidence that there was ever such a threat. In particular we note:

- The threat of claw-back was never a stated component of the light-handed regime. While the Government stated that price control might be introduced if market dominance is abused, including through monopoly pricing (*Light-Handed Regulation of New Zealand's Electricity and Gas Industries* Ministry of Commerce, 1995), none of these statements suggested that price control would involve the claw-back of past profits.
- As set out above, the Commerce Commission does not have the power under Part 4A or elsewhere in the Commerce Act to claw-back profits retrospectively. The Commerce Commission, similarly, did not have the power under Part 4 of the Commerce Act, prior to Part 4A being enacted, to claw-back profits retrospectively. Therefore, as no legal power of claw-back exists or existed, it is difficult to see how any alleged threat could have been credible. If Parliament had intended to allow for claw-back of excessive profits, it would be expected to have enacted legislation allowing this to occur.

**(e) It refers inappropriately and incorrectly to Part 4 of the Commerce Act**

STA refers to Part 4 of the Commerce Act and states that the purpose of this part is to protect consumers by the promotion of allocative efficiency (written submission, p31).

Part 4 is not relevant to the asset valuation methodology review, which is undertaken under Part 4A of the Commerce Act, and there are various differences between the provisions of each Part. STA's reference to Part 4 is therefore inappropriate and should be ignored by the Commission.

STA also states that the Privy Council in *Telecom v Clear* and the Court of Appeal in *Vector v Transpower* spelt out the purpose of price control, with explicit reference to Part 4 of the Commerce Act, to be the "protection of consumers by promotion of allocative efficiency". This proposition, however, is not supported by the two judgments STA refers to.

The most that can be said of either judgment is that they contain obiter that Part 4 is concerned with the elimination of monopoly rents. The making or implementation of control under Part 4, in any event, would involve consideration of all three aspects of efficiency, and not just allocative efficiency. STA ignores this.

As a result of these errors, STA's interpretation of the purpose of the review, its use of the "excessive profits" criterion and its test based on the benefits of taking back alleged profits is flawed.

This means, quite apart from the substantive flaws in STA's analysis of alleged past excessive profits and in STA's analysis of the benefits of using a DHC approach discussed later in this paper, that STA's analysis has no relevance to the review, does not provide an appropriate basis for choosing between asset valuation methodologies under Part 4A of the Commerce Act and should be put to one side by the Commission.

**(f) Reference to gas decisions irrelevant and incorrect**

STA refers to a Government Cabinet paper setting out the background to its recent gas policy decisions, particularly to request the Commission to undertake a price control inquiry under Part 4 of the Commerce Act, to support its arguments about regulatory risk (written submission, p26). The papers released by the Government do not, however, support STA's arguments:

- The papers do not make any conclusions that excessive profits have been earned in the gas industry. Rather, they refer only to STA's claim that excessive profits have been earned; and
- The papers do not suggest any intention to "claw back" past excessive profits. Indeed, this would not be possible, as there are no powers in the Commerce Act enabling the Commission to do so.

STA's oral submissions contain other claims about the Government's deliberations that are not supported by published documentation.

It is neither safe nor appropriate pending the outcome of the Commission's deliberations on the Minister's announced requirement for a price control inquiry in respect of gas pipelines for the Commission to have any regard to STA's submissions on this topic. It is noted that the Government has decided ODV is to be mandated for gas network disclosure purposes meantime.

**(g) STA reference to Hope decision misstates decision and is irrelevant**

In its oral submission, STA referred to the *Hope* decision (*Federal Power Commission v Hope Natural Gas Co.* 320 US 591 [1945]) (transcript, 27 Nov, p69). STA claims that this case "outlawed a whole range of practices that were essentially about assets being traded from one agent to another, just notching the price up on the basis of trades".

In fact, the issue in the case was not about the use of traded asset prices. The issue, rather, was whether the historic cost approach, based on actual costs, applied by the Federal Power Commission was "just and reasonable". This was the first time that Hope Natural Gas Co was subject to regulation. There were no issues of *Hope* attempting to artificially increase its valuation for regulatory purposes over time through a set of illusory trades as suggested by STA.

In the case, the US Supreme Court held that the historic cost approach was “*just and reasonable*”. It did not find that this was the only approach that could be used. Recent US cases have acknowledged this (e.g. *Verizon Communications v Federal Communications Commission* 122 s.Ct. 1646 (2002)).

In any case, the *Hope* decision was made within the context of the US Natural Gas Act, which established a “just and reasonable test”. This is very different from the efficiency criteria that applies to the review. Also, the *Hope* decision was made within the context of a specific set of facts, not relevant to the review.

#### **(h) STA support for opportunity cost misguided**

In its oral submissions, STA expressed support for an opportunity cost valuation of assets as “*the only way in which you could put any genuine market discipline*” (transcript, 27 Nov, p84).

STA’s support for opportunity cost valuation, however, ignores:

- That there are no accepted methodologies or empirical measures for the principle;
- Opportunism by submitters in other jurisdictions using the principle to favour the use of a particular methodology;
- Accounting and valuation standards (which require other methods to be used);
- That using opportunity cost would lead to inefficiencies;
- Its rejection in the United States (see *City of Los Angeles v United States Department of Transportation*) No 98 1071, USCA, District of Columbia Court, June 8, 1999); and

STA claims at p31 of its written submission that the standard justification for regulation found in economics textbooks is to protect consumers by the promotion of allocative efficiency. This is an overly narrow statement of the standard economic justifications. These justifications usually examine all the elements of efficiency, i.e allocative, productive and dynamic. Regulation is usually considered to be justified when it would provide net economic benefits, and not just to improve allocative efficiency.

STA also inappropriately mixes together efficiency and income distribution issues. Maintaining a correct distinction between these two concepts is fundamental to sound decision making by the regulator.

The difference is illustrated in the figure below that shows a situation where prices have increased from  $P_1$  to  $P_2$ . An allocative inefficiency arises because the price increase causes buyers to demand less of the good (quantity demanded falls from  $Q_1$  to  $Q_2$ ) even though they value the good more highly than the marginal cost of production (as measured by the supply curve). This inefficiency is also referred to as the deadweight loss, and is measured by the shaded area ABC in the figure.

In addition to the efficiency loss, the higher prices result in a transfer of value from consumers to suppliers. The distributional impact is measured by the area  $P_1P_2BD$ .



### 3 Supposed regulatory compact for use of DHC

STA argue that there is a regulatory compact arising from the vesting of assets of electric power boards and municipal electricity departments in energy companies and that DHC and not ODV should be used for pricing (section 6, written submission; transcript, Nov, 27, p77).

We consider this claim further below.

#### 3.1 Inference from vesting in 1993

In response to the Commission's question "*What events could be used as a basis for valuing system fixed assets at historic cost?*", STA (written submission, p23) replies that the Minister of Energy's directive to use "*book value*" was understood to require DHC valuations and the Minister's explicit sign off of vesting values using HC in 1993 is the key.

In the *Lining up the Charges* paper, STA states that lines companies were required to retain their vesting valuations under clause 32 of the Energy Companies Act (*Lining up the charges* p.9).

This position was ameliorated somewhat in STA's conference presentation where STA acknowledged that the "*book value*" directive was "*not necessarily entirely prescriptive*" (transcript, 27 Nov, p77) and that some companies used alternative methodologies to DHC (transcript, 27 Nov, p78). Nevertheless, STA stated that the understanding was that book values were in the vicinity of historic costs.

There was no directive or requirement under the Energy Companies Act 1992 to use DHC methodologies on vesting. Under section 18(2)(b) of the Act, the establishment plans of energy companies were required to value undertakings on "*such basis as is determined by the Minister after consultation by the Minister with such representatives of ESAs as the Minister thinks fit*".

In fact, as acknowledged by STA, a range of valuation methodologies were used and approved by the Minister under the Energy Companies Act 1992. PricewaterhouseCoopers have, for example, given four instances of companies using different valuation methodologies at vesting in Appendix 4 at page 32 of VECTOR's and UnitedNetworks' submission on the asset valuation methodology review. In addition, Powerco gave evidence at the conference that the New Plymouth MED and the Taranaki Electric Power Board vested at ODV.

It is therefore incorrect of STA to suggest that DHC was in some way mandated by the Minister and that this formed the basis for a regulatory compact.

Section 32(3) of the Energy Companies Act provides that "*no company shall be formed and registered in this section except in accordance with the terms of an approved establishment plan*". This does not require continuing use of the vesting valuation, as stated by STA.

### 3.1.1 Inference from information disclosure regime

In response to the Commission's question 86 on "*what inferences, if any, could electricity lines businesses reasonably have drawn as to the appropriate asset valuation methodology to be used for pricing, from the introduction of information disclosures in 1994?*", STA (written submission, p22) suggest no inference is possible because:

- The ODV Handbook stated that "*there is specifically no regulatory requirement that prices be determined on the basis of system assets being valued according to ODV*"
- At the time the information disclosure regulations were introduced, DHC was the accounting norm for distribution companies and would have been expected to remain so on the basis of their establishment plans,
- From 1994-96 the great majority of distributors continued to file their annual accounts on a DHC basis while filing disclosure returns on an ODV basis.

STA states that there is no inference that electricity lines businesses could draw from the introduction of information disclosure in 1994 that ODV should be used as the appropriate asset valuation methodology for pricing (written submission, pp22-23).

VECTOR and UnitedNetworks note that the ODV Handbook states "*there is specifically no regulatory requirement that prices be determined on the basis of system assets being valued according to ODV*". However, this does not prevent the use of ODV or a replacement cost valuation for pricing.

STA contradicts its line of reasoning in their Pipeline Profits paper, wherein they state "the proposed reform ... would have provided an implicit signal to gas companies that pricing on the basis of ODV values was legitimate, as has been the conventional wisdom in respect of electricity lines companies" (Pipeline Profits, p3).

## 4 Analysis of alleged excessive profits

A central part of STA's submission is its analysis of alleged excessive profits that have been earned in the past and continue to be earned by lines companies.

This analysis is based on:

- (a) The supposed soundness, alleged mandatory character and uniformity of vesting values of electric power boards and municipal electricity departments when established as energy companies;
- (b) Including revaluations of line company assets that have occurred since vesting to arrive at a figure of an average \$200m in excessive profits earned in each year from the period 1994 to 1999; and
- (c) Calculating lines companies internal rates of return based on their annual net operating surpluses plus capital gains from revaluations, and comparing this to a target WACC.

### 4.1 Vesting values

STA's analysis of excessive profits starts with the vesting values of electric power boards and municipal electricity departments when established as energy companies.

The overwhelming evidence before the Commission is that the vesting values did not provide a reliable measure of the value of their assets.

Appendix 4 to VECTOR's/UnitedNetworks' submission describes the position of these two companies. In the case of Mercury Energy (the predecessor to VECTOR), the large proportion of assets vested at their "globo" value, which recorded an overall estimated value of the pool of assets. In the case of Power New Zealand (one of UnitedNetworks' predecessor companies) the historical cost records were insufficient and assets vested based on discounted cash flow methodology.

The experience of the two companies since vesting has been that significant amounts of data were missing from the companies' records at vesting. This lack of robustness of vesting values is evidently common across all electricity lines companies.

It is inappropriate to use the vesting values as the starting point for any calculation of excessive profits.

### 4.2 Treatment of revaluations

STA argues that lines companies have more than doubled their book values in the eight years from 1993.

Both VECTOR and UnitedNetworks treat revaluations as income, in accordance with the ODV Handbook. These revaluations include the result of more accurately recording the assets held by the companies.

The submission by Powerco also noted that most revaluations have arisen from "discovery" assets (transcript, 28 Nov, pp22-23). We understand that this is a common experience across all lines companies.

As a result, it is incorrect for STA to claim that lines companies have been making windfall gains as a result of revaluations. Revaluations have included the result of lines companies' asset registers becoming more complete. These revaluations result in lines companies' financial statements now accounts better reflecting the value of their assets.

We note that Mr John Hagen of Deloitte Touche Tohmatsu, in making submissions for Powerco in relation to switching from historic cost to replacement cost stated "in my view that's a restatement, that's what in the accounting profession we would talk about [as] a change in accounting policy". (transcript, 28 Nov., p36).

### 4.3 Calculation of excessive profits

STA calculate excessive profits by two methods:

- (a) By examining the gross operating surplus of lines companies in the period from 1994 to 1999; and
- (b) By examining the IRRs of lines companies in the period from 1994 to 1999.

#### 4.3.1 Treatment of rates of return

The STA *Lining up the Charges* and *Pipeline Profits* papers calculate IRRs earned by network owners in the electricity and gas industries respectively. STA compare *ex post* IRRs to the target level of the weighted average cost of capital (WACC) it considers to be consistent with competitive rates of return in those industries. They suggest that IRRs above WACC indicate strong likelihood that the network owners are exercising market power in their markets.

#### 4.3.2 Calculation of returns

STA calculate IRRs on a hypothetical series of cash flows based on the notion that an investor could purchase the business in a starting year at the value of assets as reported in that year, receive net cash flow surpluses during the holding period, and also receive the exit value of assets upon sale of the business:

<b>Investor's action</b>	<b>Cash flow (+/-)</b>
Purchase business	- Opening valuation
Hold in year 1	+ Operating surplus for year 1
Hold in year 2	+ Operating surplus for year 2
...	...
Hold in year t-1	+ Operating surplus for year t-1
Sell business in year t	+ Op. Surplus + Closing valuation in year t

Thus, IRRs are calculated on an initial outlay (as determined by the opening valuation) followed by a series of positive cash flows including the asset value received on exit.

STA reported post-tax IRRs ranging between 16-23% for the electricity lines sector (*Lining up the Charges*, p9) and 14-33% for gas distribution and transmission

(*Pipeline profits*, p11 & p17). Target WACC is estimated at 7.5-10% for electricity lines and 10.4% for gas business. STA considers that these results warrant regulatory intervention.

STA's methods are subject to a number of critiques (refer ISCR study by Evans, Guthrie, and Hutton (2002), Boyle and Guthrie (2002), and also Marsden (2002)). In our view the most serious issue is consistency in the selection of the opening and ending valuations as the IRRs are extremely sensitive to the choice of these values. In the gas industry, for example, the ISCR found that "virtually the sole source of this high profitability arises from STA's use of the 1996 depreciated historical cost of pipeline assets, rather than the ODV value adopted by the company in 1997" (written submission, p3).

Similar conclusions apply to IRRs for the electricity lines industry. In particular, an independent report by PricewaterhouseCoopers concludes that the accounting history incorporated in the opening valuations, that were adopted by STA has resulted in "*inconsistent and understated historical values*"<sup>2</sup>, including:

- The Energy Companies Act 1992 required all electric power boards and municipal electricity departments to be vested as energy companies. At this time the companies were fully integrated line and energy businesses with electrical contracting, generation, appliance sales and servicing and other business activities such as vehicle workshops and pole and concrete factories. The line component of the business was not separately identified or ring-fenced at vesting and therefore separate identification of "lines" asset value at vesting is not possible. Under the Act, energy companies were vested at a valuation approved by the Minister of Energy which resulted in a wide range of values being adopted, ranging from historic cost with or without depreciation, discounted cash flow approaches, to depreciated replacement cost.
- From 1977-92, electricity power boards were non-profit entities with no incentive to maximise profits and therefore they tended to expense as much network expenditure as possible which, combined with a lack of accounting guidance, resulted in significant inconsistencies between capital and maintenance classifications across the industry, and an incentive to understate historical cost asset values.
- A review of financial statements of energy companies at vesting in 1993 reveals a wide range of depreciation policies, e.g. 2.5-10%, 3-5.5%, 4%, 4-10%, 5-6.3%, and a mix of straight line and diminishing value methods. These rates reflect significantly shorter asset lives than the engineering and economic lives used today.
- A review of financial statements over several years following the introduction of new SSAP accounting standards for determining whether expenditure is maintenance or capital shows substantive changes, implying that previous approaches had understated historical cost asset values.

These inconsistent and unreliable approaches to valuation render STA's IRR results spurious.

Quite apart from the serious data quality issues, STA's approach of favouring DHC for opening values and ODV for closing values is inconsistent and *ad hoc*. Since the purpose of STA's analysis is to calculate IRRs to hypothetical investors it is critical that

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<sup>2</sup> Expert advice provided by Grant Burns, Partner, Assurance and Business Advisory Services, PricewaterhouseCoopers in Appendix 4 of Vector/UnitedNetworks joint submission to the Commerce Commission, 11 November 2002.

the valuation method be consistent with the pricing policy being followed by the network business. The differing profile of prices over time under DHC and ODV (see Figure 2 in section 5.1) determines the profile of operating surpluses in the IRR calculation. Even if not based explicitly on ODV, if the network owner is applying a policy of price smoothing (to avoid adverse customer reactions to jagged “see-saw” pricing) then it would be inappropriate to apply the DHC valuation method for any sample period less than the full life of the network investment.

Rather than identify the pricing policy adopted by the network businesses and determine the valuation method accordingly, STA simply asserts that the relatively constant network prices observed in the electricity and gas industries is evidence of market power. This undermines further the IRR results obtained by STA.

#### 4.3.3 Adequacy of IRR as test for market power

STA reaches conclusions about whether network businesses are exercising market power, and the need for regulatory intervention, solely by comparing IRRs against target WACC.

STA’s exclusive reliance on IRR analysis ignores the widely accepted approach in competition analysis of defining the relevant markets and assessing the full range of factors that could give rise to competitive pressures.

*Ex post* IRRs also confer limited ability to detect monopoly profits, for two reasons. When market values are used as entry and exit values (as adopted by STA for the gas industry), the *ex post* IRR simply reveals whether the firm did better or worse than the market anticipated at the entry date. It says nothing about monopoly profits. Boyle and Guthrie (2002) give an example where STA conduct IRR analysis of port companies and similarly concludes that monopoly profits have been made, whereas in fact the records show that volume growth has been higher than was anticipated at the time of the sale. Hence, it is far from obvious that market power has been exercised or exercised to the extent implied by STA’s IRRs. Similar comments could apply to the gas industry where volume growth has been strong.

Even when *ex post* IRRs are based on replacement values (as adopted by STA for electricity) they suffer from difficulty of statistical inference. The problem arises because the excess profit recorded *ex post* is the sum of planned excess profit plus two sources of statistical error that can be large and compounding, these being the random shock to planned profit and the random shock to replacement cost. To detect monopoly profits with confidence it is necessary to conduct statistical tests on the IRRs with appropriate critical values that reflect the estimated standard errors. Boyle and Guthrie (2002) suggest the critical values would be substantially above the target WACC used by STA.

A further issue is that the WACC and stock market comparator benchmarks used by STA may not represent fair *ex ante* rates of return for businesses who are not operating under price caps. As Boyle and Guthrie (2002) report, it is now widely recognised that unsystematic risks, financing constraints, and growth and timing options can cause the investment hurdle rate to be substantially above the theoretical fair return derived from simplified financial models. They report evidence from US studies showing that unregulated firms use investment hurdle rates up to three times any possible WACC. Similarly, benchmark returns for investments with high unsystematic risk but low systematic risk (such as catastrophe insurance) frequently exceed 100%.

For all these reasons, STA’s strong conclusions regarding monopoly profits are premature at best and have a high probability of being wrong.

## 5 Net benefit comparison of DHC and ODV prior to investment

STA's submission provides a quantitative comparison of the net benefits of DHC versus ODV. This section reviews STA's arguments in relation to a one-off choice made prior to the network business making sunk investments in network assets. The following section (Section 6) discusses STA's arguments relating to a mid-stream switch in valuation method part way through the life of the network.

By way of summary, most authors agree that the *ex ante* choice between DHC and ODV prior to investments rests on several subtle arguments and that the bigger issue is to avoid mid-stream changes to the valuation method. It appears that STA is largely in agreement with this conclusion but nevertheless its papers still tend to confuse the issues.<sup>3</sup>

### 5.1 Allocation efficiency

#### 5.1.1 Efficiency versus income distribution

STA equates excess profit with allocative efficiency, claiming that \$200m excess profits by electricity lines businesses "*provides the first estimate of the benefit to consumers of the allocative efficiency gain from adopting DHC rather than ODC*" (written submission, p6). STA arrives at this figure by calculating the alleged gross operating surpluses of lines companies.

We adopt the methodology and parameter values in NZIER (2002) to estimate allocative inefficiency of a reduction of \$200m in lines business revenue. This results in an estimate of a gain in allocative efficiency of \$10m per annum.<sup>4</sup> This analysis is consistent with the fact that demand for electricity is relatively insensitive to electricity prices, and the allocative efficiency gain is correspondingly small.

#### 5.1.2 Long-run versus short-run marginal cost

STA suggests that ODV is an inappropriate basis for pricing as it ignores the reality that network assets are sunk investments. "*Therefore, for marginal increases in usage that do not trigger a capacity increase, the correct price signal would seem to be zero .... The problem with the 'efficient prices' argument for ODV is that it is based on prices set in a hypothetical long term competitive market with balanced supply and demand and short-lived non-lumpy assets*" (*Lining up the Charges*, p21).

STA's argument has merit in a one-period static model where all investments have been made. However, their argument is not correct in the broader dynamic context where businesses require incentives to invest by the prospect of generating a return at

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<sup>3</sup> STA also appear very keen to extract penalties from entire industries where they assess evidence of over-charging. We have sought to deal with these issues separately in Section 5.

<sup>4</sup> This estimate is double that ascribed by NZIER on the basis that this estimate covers all electricity lines businesses rather than only the private sector and local authority-owned businesses in the NZIER study. The estimate is calculated as follows:

- Marginal cost is zero (i.e. the supply curve for lines services is horizontal along the x-axis)
- Current variable price is 3.2c/kwh and demand is 25TWH for whole lines sector
- Introduction of DHC would reduce revenues by 18%, consistent with STA (written submission, p28)
- Half of the revenue reduction is taken through reduction in fixed fees (with no allocation efficiency gain) and half by reducing variable unit prices (reduced by 9%).
- Elasticity of demand is -0.15, so demand reduction is 1.4%
- With marginal cost at zero, DWL is (3.2c/kwh x 9%)(25TWH x 1.4%)x100.

least equal to long run average cost. This reflects the outcome expected in open markets where businesses normally would cover the revenue risk on sunk assets either through long-term supply contracts with key customers or through vertical integration (e.g. generator-retailer integration). Otherwise the investment would not be made and net economic welfare would be forgone. This does not deny that businesses in competitive markets may sell some excess capacity at prices close to short-run marginal cost.

In effect, allowing pricing on the basis of ODV reflects a judgement that the majority of the returns normally would be secured through contracts or other long-term relationships. On this basis, ODV-based prices result in efficient outcomes overall by encouraging desirable long-term investments (resulting in dynamic efficiency) that outweigh the allocation inefficiency caused when prices exceed short-run marginal cost.<sup>5</sup>

Further, STA's argument that ODV pricing causes allocative inefficiency apply equally to DHC-based prices. Under DHC, the price on average over time also is sufficient to recover the cost of investment and therefore also exceeds short-run marginal cost (and hence causes some level of allocative inefficiency). In fact, an argument can be made that DHC could cause greater inefficiency than ODV because DHC prices are highest in the early years when a low price may be warranted to encourage utilisation of the network. In later years, underlying demand for network services is likely to be higher as a result of trend growth in economic activity.

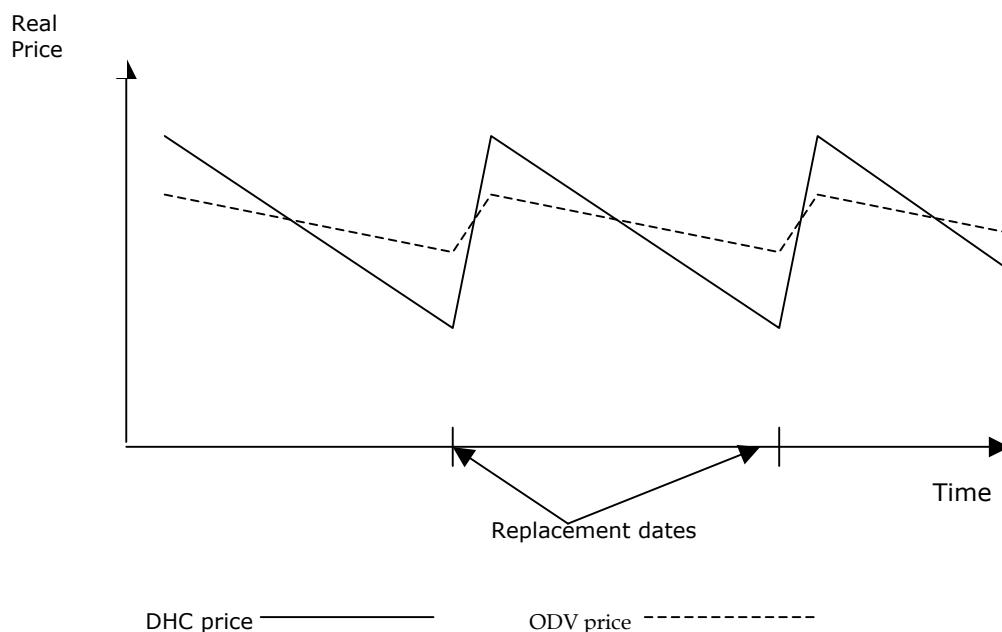
### 5.1.3 Price smoothing

At some time in the future there may be a requirement to expand portions of the network or replace assets that have reached the end of their lives. A key difference between DHC and ODV approaches to price setting is that they result in different time profiles for prices. STA illustrates this point with a stylised example in their submission to the Ministerial Inquiry into the Electricity Industry.<sup>6</sup> Based on their assumptions regarding purchase price, asset life (10 years), inflation rate, real returns and no variable costs, STA presented the following graph:

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<sup>5</sup> The trade-off between allocation efficiency and production and dynamic efficiency need not exist if the asset owner can charge two-part tariffs, one part being a fixed fee to recover average costs and another variable fee that is set close to marginal cost.

<sup>6</sup> P17, <http://www.electricityinquiry.govt.nz/submissions/306.pdf>

**Figure 2: Price profiles for DHC and ODV**

STA suggests that consumers would prefer the jagged price path created under DHC rather than the smoother price path under ODV. Their argument is that under ODV consumers would be "trading the certainty of higher prices today for the possibility of higher prices tomorrow, i.e. to avoid a future rate shock, the rate shock is implemented immediately. It would be difficult to convince consumers of the benefits of this course of action." (*Lining up the Charges*, p22).

STA has mixed up two separate issues, the first being whether consumers would prefer smooth versus jagged price profiles and the second being the issue of switching valuation methods part way through asset lives. The latter issue is discussed in Section 4.

On the first issue, the graph illustrates that consumers would initially face lower rather than higher prices if ODV is chosen at the beginning of the asset life. Thus, relative to DHC, ODV offers consumers to "trade" lower prices in the early period for the uncertain possibility of higher prices (relative to DHC) in future years. This has two potential benefits:

- Consumers who are risk averse would prefer the smoother price path implied by ODV. This is consistent with observed long-term contracts and recorded consumer and producer price series for most goods and services that typically are very smooth relative to underlying shocks to demand and supply.
- The ODV price path is time-consistent in the sense that the supplier has no incentive to switch to DHC in later years of the asset life. Conversely, consumers would be concerned that the DHC price path has the risk that the supplier either unilaterally or by convincing the regulator may switch from DHC to ODV in later years. The discussion in STA (*Lining up the Charges*, p23) is an example of the time-inconsistency problem with DHC.

#### 5.1.4 Over-collections

STA (written submission, p18) suggests that the ODV approach based on past process of unilateral asset revaluation by electricity lines businesses would permit "*continued over-collections*". Similarly, STA (*Lining up the Charges*, p23) refers to rules in the ODV Handbook that allow the asset owner to assume tariffs may be increased up to the level where consumers would disconnect, provided that the ODRC ceiling for the asset valuation is not exceeded in the process. STA suggests that pricing based on ODRC allows the asset owner to extract the "*theoretically maximum monopoly rent ... without providing the opportunity for a new entrant to duplicate the facilities and enter the market*" (*Lining up the Charges*, p23).

Over-collections do not occur under ODV approach provided it is applied correctly. As STA states in its submission to the Ministerial Inquiry into the Electricity Industry, the "*owners and users of the grid should be largely indifferent between alternative valuation procedures when the choice is viewed at the time of installation of the assets and there is a guarantee that the rule chosen will be consistently applied*" (STA, 2000, p100).

STA is also incorrect in its claim that ODV-based prices are the theoretical maximum monopoly price. The maximum monopoly price is determined by the market demand whereas the replacement values in the ODV formula relate to conditions of supply of the network asset.

Further, as discussed in section 6 below, the evidence of excess profits provided by STA are at best uncertain and probably incorrect.

## 5.2 Production efficiency

### 5.2.1 Business operations

STA (written submission, p7) comments that "*neither the [Commission's] discussion paper, nor submissions to date, provide any basis for assigning a very large figure to the potential gain in productive efficiency that might be achieved by adopting ODV rather than DHC*". STA assumes a 1% efficiency gain under ODV, amounting to \$10m per annum.

A general point (that applies also to discussions of allocative and dynamic efficiency) is that the efficiency merits of DHC and ODV cannot be determined in isolation to the other policies and parameters that would determine the prices applying under each case. In relation to production efficiency, the incentive to strive for efficiency gains will depend on policies that determine how those gains are shared between the asset owner and consumers and over what period. The valuation method used to determine capital asset values is likely to be important, but secondary.

### 5.2.2 Administration cost

Given that the ODV approach has been in place for some years, the Commission raised a question as to the incremental cost of implementing the DHC system. STA (written submission, p6) has submitted to the Commission a one-off cost for implementing DHC of \$10m.

The Vector/UnitedNetworks submission on the asset valuation review identifies a number of serious impediments to implementation of the DHC method:

- That it is infeasible to reference valuations to the historical records at the time of vesting (around 1992) due to the very poor quality of the records kept prior to vesting, the inconsistent manner in which vesting values were determined, and a lack of maintenance of vesting asset records since vesting (as they were superseded by replacement cost information);
- That for similar reasons it is infeasible to reference historical cost records at the time of the retail split from lines businesses, or from the lines business' most recent financial statements.

We note that the STA cost estimate refers only to the Commission's cost. Given the poor quality of data, the cost to the industry would also be substantial.

In addition, implementing DHC would impose an ongoing incremental cost as ODV is now institutionalised through its use in the information disclosure regime, financial reporting, local authority ratings, and voting and fee allocations proposed in the Electricity Governance arrangements. Thus, the DHC methodology would require developing a new system of some kind and maintaining it in addition to the information systems already established.

### 5.3 Dynamic efficiency

#### 5.3.1 Investment incentives

STA (written submission, p8) makes the point that both investment and innovation are forward-looking activities driven by the incentives faced by investors in the present and future. It states that *"those incentives are affected by the regulatory regime in place, but not by the asset valuation methodology in use, provided only that the methodology is chosen from the set of options that are consistent with financial sustainability of the regulated activities going forward."* STA concludes that *"... rate base methodologies based on replacement cost offer no advantage over historic cost in terms of dynamic efficiency."*

As noted in section 5.2, the impact of alternative valuation methods on investment incentives can be considered only in the wider context of other policies that determine the evolution of prices.

An important point is that although pricing based on either DHC or ODV can equate the *expected* present value of revenues and costs, neither approach guarantees that the present value of actual revenues will equal the present value of actual costs. In other words, unexpected events may cause a mismatch *ex post* between revenue and cost, arising for example from shocks to the inflation rate, relative prices, demand, technology and also measurement risk. DHC and ODV possess different risk allocation properties that could affect dynamic efficiency.

Evans and Guthrie (2002) develop a theoretical model of sunk cost investments that suggests that the choice between ODV and DHC depends on whether demand and supply shocks are correlated positively or negatively.

We would note that DHC applied without optimisation (as assumed by STA) may have the undesirable property of creating incentives for businesses to over-invest so as to increase their rate base (assuming a return above their actual cost of capital can be achieved). Optimisation procedures, or "used and useful" tests have been developed to mitigate this risk.

### 5.3.2 Regulatory risk

STA argue that DHC is subject to lower regulatory risk:

*"A DHC rate base is in fact likely to provide greater certainty for investors ... than is the case with an ODV methodology. This is due to ODV's dependence on investment being optimised to an unknown extent, and to technical progress potentially lowering asset values for past investments"* (written submission, p8).

and

*"The standard definitions of regulatory risk all refer to the effect of regulatory decisions on the cost of capital for the regulated industry.... Regulatory risk is increased by any regulatory procedure that has the potential to "strand" assets in the future .... It is ironic in the extreme that regulatory risk should be used by proponents of the ODV valuation methodology to advance their case, given that the optimisation procedure built into ODV involves the deliberate stranding of assets by the regulator whenever technical progress occurs that reduces the optimised replacement cost"* (written submission, p17).

STA appears to advocate that regulatory policy should minimise the risk on the supplier. However, the more substantive policy issue is to choose the valuation method (and other policies) to allocate risk efficiently while avoiding introducing unnecessary risks. In contrast to STA (written submission, p17), the objective is to choose the most efficient method, not necessarily the method with the lowest WACC.

STA mistakenly associates changes in demand and supply conditions as regulatory risks, whereas in fact they are market risks. However, this does not deny that the optimisation procedure designed to approximate the evolution in market conditions will be subject to measurement or estimation error. But it does imply that even in the presence of 100% accurate optimisation procedures the cost of capital for regulated businesses would still include a risk factor for changes in market conditions - and that this would be economically efficient.

### 5.3.3 Data quality

STA suggests that DHC reduces uncertainty by using more objective data and is less reliant on subjectivity.

DHC is only more reliable if the starting values are reliable. We note in section 4 the lack of reliable historic cost data.

With poor quality historical data, the risk is that errors are introduced through erroneous starting values and these are carried forward into successive years. In contrast, ODV has the property that estimates of closing values can be prepared independently each revaluation period, so that errors are carried forward one period at most. However, we recognise the accuracy of ODV is in part dependent upon the completeness and currency of the asset schedules. Also, we would note ODV (in its current form) does not allow for inclusion of intangibles such as most easements, brands and intellectual property.

## 6 Impact of mid-stream switching costs

The previous section compared the net benefits of DHC and ODV from an *ex ante* perspective where the valuation method is chosen prior to investment in network assets. In reality, however, the development of a new regulatory regime puts the Commission in the situation of being required to choose a valuation method where network assets inevitably are part way through their economic life.

As a matter of efficiency, if switching valuation method mid-stream would cause additional cost, then even if the new valuation method would be more efficient from an *ex ante* perspective (for reasons discussed in section 5) the switch should only be made if the efficiency gains are large enough to outweigh the switching cost.

### 6.1 Dynamic efficiency

#### 6.1.1 Regulatory opportunism

STA's submission devotes a large part of section 5 to rebutting the Commission's concern that a switch now from ODV to DHC could be interpreted by investors as opportunism on the part of the Commission:

*"If investors were to consider that the Commission's opening asset values signalled an increased regulatory risk through values being set 'too low', this could reduce incentives for investors to undertake efficient investments in the future"* (p10, Commission discussion paper)

STA (written submission, p14) responds with the argument that DHC valuation lies within the internationally accepted range of sustainable rate-base methodologies and hence cannot be said in principle to be 'too low'. In response to the specific concern about opportunistic switching of valuation method, STA claim that DHC is the status quo: *"we submit that no such switch in regime is implied by adoption of DHC"* (written submission, p15).

STA confuses the *ex ante* choice of valuation method – where DHC valuations cannot in principle be 'too low' – with the issue of switching valuation method mid-stream. If prices are set according to ODV in the initial years and are switched to DHC towards the end of asset lives then clearly the valuation would be 'too low' in the context of providing adequate returns to the asset owner.

It is possible to construct a time-consistency argument in favour of ODV as presenting less risk of mid-stream switching of valuation method. If we begin by assuming an asset owner has been pricing consistent with ODV during the early years of an asset's life, the argument has two parts:

- The asset owner has no incentive to switch mid-stream to DHC since this would reduce expected returns below long-run average cost (refer Figure 2 and section 5.1.3);
- The regulatory body faces countervailing incentives in the sense that the windfall gains to consumers that would occur at the time of a mid-stream switch to DHC would be offset by the prospect of a very large spike up in prices when the asset is replaced at the end of its useful life. A large price spike risks

bringing the regulatory regime and the regulatory body itself into disrepute with consumers and politicians, perhaps to the point of causing a regime change.

#### 6.1.2 Consistency across industries

STA (written submission, p16) refers to World Bank and NECG studies that suggest several principles for keeping regulatory risk to a minimum, in particular they refer to a principle that the regulator should be consistent across the various industries within its jurisdiction, so that investors can read clear signals. STA infers that the Commission carry over to the electricity and gas industries the principles set out in its airfields report.

While consistency across industries is a relevant factor, it is likely to be far less important than consistency over time for a particular sector. Particular reasons to maintain continuity in the current ODV method for the electricity sector at least for the information disclosure requirements, include:

- The ODV method was selected by the Government of the day following extensive research and debate at the time. The reasons for its acceptance remain valid.
- The ODV method enjoys wide acceptance locally and is credible internationally.
- The Commission's audit of ODVs earlier this year resulted in the approval of most valuations with no or minimal change.
- Continuity is crucial in performance monitoring systems.
- Lines businesses have invested heavily over the last 10 years to meet their information disclosure obligations.

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