frontier economics

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# WHY TOTEX?

## DISCUSSION PAPER

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# 1 INTRODUCTION

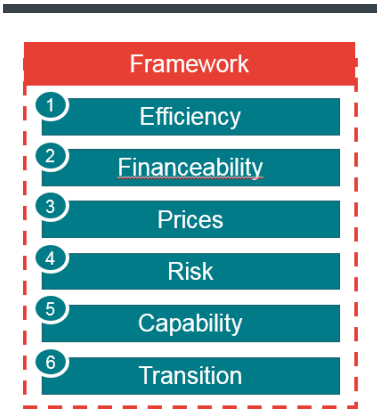
Frontier Economics has prepared this report for Energy Networks Australia on the key drivers, benefits, costs and trade-offs involved in moving to a total expenditure or 'Totex'-style regulatory approach for Australian energy network businesses (NSPs). Under a Totex approach, the setting of totex allowances would replace the current assessment and establishment of separate allowances for capital (capex) and operating expenditure (opex) for regulated energy networks subject to the National Electricity and Gas Laws and Rules.

The two key factors driving the recent attention given to adopting a Totex regulatory approach for Australian energy networks are:

- A common perception of a NSP 'capex bias', which has led to policy and rule interventions targeting perceived over-investment in network assets, and;
- Changes in the technological environment, whereby less capital-intensive options are becoming increasingly available to reliably meet time-varying demands for network services. In such a world, more flexible regulatory frameworks – such as Totex – are likely to better promote optimal outcomes for consumers.

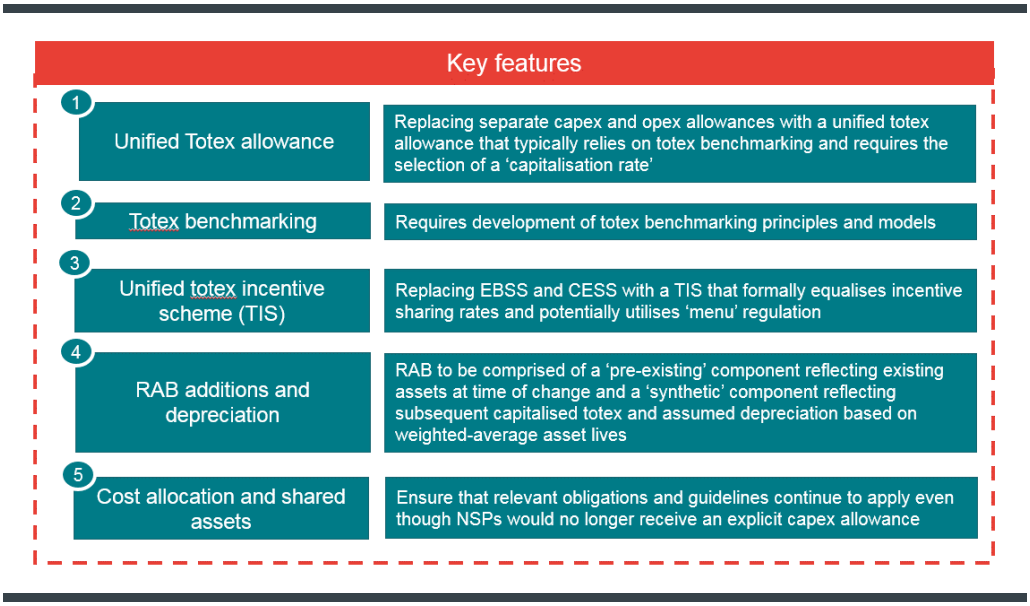
Our analysis of the potential adoption of a Totex regulatory approach applies a framework comprised of the following criteria:

- ***Efficiency:*** Consistency with the National Electricity and Gas Objectives
- ***Financeability:*** Enables network businesses to retain an investment grade credit rating
- ***Prices:*** Avoiding or minimising any increase in network charges on customers
- ***Risk:*** Avoiding or minimising any unintended increase in networks' investment and regulatory risks
- ***Capability:*** Within the practical resource and technical capacity of governments and their agencies to implement and administer
- ***Transition:*** Avoiding or minimising any transitional difficulties, costs and drawbacks



# 2 KEY FEATURES OF A TOTEX APPROACH

The key areas of difference between the current 'building block' regulatory approach applying to energy networks and a Totex regulatory approach are described below.




For each of these areas, this section:

- Discusses the key elements of a Totex approach and the changes they would represent from the current regulatory regime, and
- Examines the potential positive and negative effects of each of the key elements according to our assessment framework, drawing on overseas experience. This includes raising possible mitigatory measures in response to the risks of any adverse outcomes.

## 2.1 Unified totex allowance

### 2.1.1 What would be different?

Current regulatory arrangements for energy networks in Australia are based on a 'building block' approach, under which capital expenditure and operating expenditure allowances are determined separately and used to derive the network business's total revenue for a regulatory period. A Totex framework would involve the AER approving an overall total expenditure allowance rather than individual capex and opex allowances. However, it may be possible – and desirable – to at least initially maintain the traditional building block approach whereby the totex allowance would be derived through the separate assessment of capex and opex forecasts. This separate assessment could be undertaken in the current manner, drawing on different approaches for capex and opex, or make greater use of capex- and opex-specific benchmarking methodologies. The separate capex and opex allowances would be summed to generate a totex allowance and the NSP would then be free to incur capex or opex as it

finds most beneficial, having regard to the incentives it faces to reduce costs and improve service quality. While a separate assessment approach has commonly been adopted initially to support transition from the traditional building block regime, this has commonly evolved to an approach that involves deriving an overall totex allowance. Under this approach, as has been applied by Ofgem and Ofwat in Great Britain, the regulator approves an overall totex allowance on the basis of totex benchmarking (see below).

In addition, the AER would need to devise an appropriate 'capitalisation rate', which defines the proportion of the totex that is:

- ***Expensed*** – recovered in the year in which it is incurred, also known as 'fast money', and
- ***Capitalised*** – recovered over a number of years or regulatory periods via a depreciation allowance, with the residual amount earning a regulatory rate of return, also known as 'slow money'.

The 'speed of money' under a Totex approach reflects both the choice of capitalisation rate as well as the weighted-average asset life used to derive the depreciation allowance on capitalised expenditure – and hence the pace of slow money.

### 2.1.2 Potential benefits and risks to mitigate

The key benefit of a unified totex allowance is a reduced focus by the regulator on second-guessing NSP's business decisions and a greater focus on setting an appropriate overall cost allowance – which is ultimately what both NSPs and consumers care about.

A totex approach should provide greater freedom for NSPs to make efficient opex-capex trade-offs. NSPs would ideally face no differential consequences in future regulatory periods if they incurred capex rather than opex or vice versa in a previous period. To the extent that NSPs currently face any residual pro-capex bias, this would diminish further – and in Britain, regulators Ofgem and Ofwat consider that their totex approaches have been successful in this regard. Further, anecdotal evidence shows that companies are engaging with the changes and shifting their focus to totex rather than separate opex and capex allowances. In combination with appropriate cost and service quality incentive mechanisms, this should improve economic efficiency, promoting the NEO and NGO.

A key drawback is increased risks of regulatory error, especially during the implementation and transition phases. Another risk is that a Totex framework could create new spending biases, which could occur if a NSP's past capex and opex decisions could influence its future totex allowances or capitalisation rate.

A risk to consider with the adoption of a Totex approach is that it could result in a net increase in risks borne by NSPs without a commensurate adjustment to the allowed regulatory return. If this occurred, it could distort or harm incentives to adequately invest in or maintain the grid. These risks could be mitigated by moving towards a Totex approach gradually or adopting some elements before others to ensure that modifications to the risk bargain are dealt with appropriately.

## 2.2 Totex benchmarking

### 2.2.1 What would be different?

A key component of moving to a Totex regulatory approach is likely to be the adoption of totex benchmarking techniques.

Since the 2012 changes to the NER, which required the AER to have regard to the latest annual benchmarking reports when assessing NSPs' expenditure forecasts, the AER has undertaken benchmarking analysis of both opex and capex for both electricity DNSPs and TNSPs. However, to

date, only the AER's opex benchmarking of DNSPs has played a significant role in its assessment of expenditure allowances.

Under a Totex approach, it may be possible to maintain the existing approaches to setting capex and opex allowances and simply sum the allowances to derive a totex allowance. However, while such an approach could encourage more efficient expenditure decisions during a regulatory period, it is unlikely to achieve the full benefits of a 'purer' Totex approach. This is because if NSPs were obliged to split their totex forecasts into the existing capex and opex categories, the use of different assessment approaches for different categories could perpetuate many of the same biases NSPs could exhibit in the absence of a Totex approach. For example, if – notwithstanding a move to a Totex regime – the AER continued to apply more stringent assessment approaches (such as benchmarking) to opex forecasts than capex forecasts, there may be an incentive for NSPs to make decisions that are inefficient, even though such conduct may not be consistent with the long-term interests of consumers. In Great Britain, both Ofgem and Ofwat utilise totex benchmarking to avoid creating perverse incentives for network businesses.

In moving to a Totex regime, the AER would likely need to develop suitable totex benchmarking models, which would involve consultation on a number of matters such as the measurement of capital, the selection of cost drivers, the selection of comparator firms, and the choice of benchmarking technique.

Consultation would also be necessary on the appropriate weights given to various benchmarking models, including the current econometric benchmarking and any new totex benchmarking models.

### 2.2.2 Potential benefits and risks to mitigate

As totex benchmarking is relatively unaffected by trade-offs between activities and reporting differences, it avoids the need to define the cost boundaries within the cost base, which might otherwise give rise to measurement error or create perverse reporting and operating incentives. Furthermore, totex benchmarking is high-level and simple by its nature as it does not delve into the detail of the cost structure of any business. This aids comprehensibility and reduces the risk of error.

While totex benchmarking would be more robust than current partial expenditure benchmarking, the adoption of totex benchmarking could be detrimental if designed inappropriately. In particular, there is a risk the regulator could set an excessively low totex allowance due to the flawed application of totex benchmarking. This would financially harm NSPs, as well as encourage underspending on the provision of network services and ultimately lower service quality for consumers. The risk of error would be heightened due to the small sample of Australian NSPs that could be used.

Another potential issue is that unpredictability around how benchmarking is applied in future could dampen NSPs' incentives to respond appropriately. For example, in both the British energy and water sectors, previous benchmarking approaches had been more focussed on opex than capex and therefore probably encouraged substitution away from opex. Ofgem and Ofwat's new totex models address this concern, although the use of disaggregated modelling and uncertainty around future cost assessment methods may be distorting incentives and decisions now. This issue could be mitigated if the regulator commits to a particular method of cost assessment for future reviews.

## 2.3 Moving to a Totex Incentive Scheme (TIS)

### 2.3.1 What would be different?

Electricity NSPs are presently exposed to different incentive schemes for reducing capex and opex.

Under the past approaches to regulation, NSPs faced a natural incentive to reduce capex and opex because their regulated revenue was approved at the start of a regulatory period and any expenditure savings against the approved amounts could be retained by the business until the start of the following regulatory period. However, this natural incentive to make savings was not consistent over time – it used to be relatively high at the start of a regulatory period and declined over the course of a period as the length of time the business could retain savings diminished.

To address this problem and ensure that NSPs face consistent incentives to make any expenditure savings throughout a regulatory period – and hence to make savings as early as possible rather than defer making savings until the start of a new period – the NER provides for the AER to implement opex and capex incentive schemes.

Both the Efficiency-Benefit Sharing Scheme (EBSS) for opex and the Capital Expenditure Sharing Scheme (CESS) for capex are designed to provide NSPs with an approximate 30% symmetric exposure to the present value of any savings or overruns they make at any time in a regulatory period. The remaining 70% of the present value of cost savings and overruns is captured or borne by the NSP's customers. These schemes are designed to offer continuous incentives to reduce costs.

Implementing a unified TIS would require consolidation of the EBSS and CESS so as to:

- Formally equalise incentive sharing rates
- Remove the existing focus in the NER on addressing incentives for the capitalisation of opex
- Remove the scope for retrospective reviews of capital expenditure spend in excess of allowances, and
- Potentially allow for the use of 'menu regulation' to set the applicable combination of totex allowances and incentive sharing rates, as has been done in Great Britain.

### 2.3.2 Potential benefits of a unified incentive scheme

The adoption of a totex incentive scheme could overcome some of the asymmetries between the existing incentive regimes for capex and opex applying to energy NSPs, which may presently be biasing incentives for cost savings.

For example, given current regulatory rates of return, NSPs can capture a larger share of the present value of capex savings (under the CESS) than of opex savings (under the EBSS). The experience from Great Britain energy and water is that strong incentives for cost reductions under a Totex approach combined with appropriate setting of capitalisation rates have ensured that NSPs see no value in over-spending their allowances.

At the same time, a TIS would not itself be capable of addressing ongoing or new biases and risks arising through the setting of totex allowances, capitalisation rates and other totex parameters.

## 2.4 RAB additions and depreciation

### 2.4.1 What would be different?

Under the NER and NGR, the RABs of energy NSPs are adjusted at the start of each regulatory period to reflect actual or 'conforming' capex, respectively, as well as any asset disposals and cost reallocations made, during the previous regulatory period. The NER and NGR also provide for NSPs' RABs to be reduced each year to account for depreciation on the basis of schedules conforming to particular requirements that reflect the nature and economic life of the relevant assets. In rolling forward the RAB to a new regulatory period, the AER is permitted to base depreciation on either actual or forecast capex.

Under a Totex framework, a NSP's RAB value would become comprised of a:

- 'Pre-existing' RAB reflecting pre-Totex approach assets only, adjusted over time in accordance with asset-specific depreciation schedules, disposals and redundancies, and
- 'Synthetic' RAB reflecting:
  - The addition of new 'assets', being the proportion of totex that is capitalised, which in turn would be derived from the allowed level of totex, the capitalisation rate and actual totex and its treatment under a TIS, and
  - 'Depreciation' of new assets based on approved weighted-average network asset lives, which determine the pace at which 'slow money' is returned to a NSP.

### 2.4.2 Managing risks of a changed approach

If done well, the treatment of changes to the RAB should reinforce incentives under a Totex approach for NSPs to make efficient cost and service quality trade-offs.

The key risk is that flawed capitalisation rates or average asset lives could lead to financeability or customer price shock problems. For example, excessively long presumed average asset lives – resulting in an excessively slow return of capitalised totex – may cause financeability issues for NSPs, while short presumed lives could lead to price shocks for consumers. Another risk is that errors in the setting of these parameters could bias NSPs' spending decisions. However, all of these potential drawbacks could be mitigated by a suitably gradual move towards a Totex regulatory framework, including for example trialling of the approach.

## 2.5 Cost allocation and shared assets

### 2.5.1 Outline of changes

Electricity NSPs are subject to obligations in the NER and AER guidelines in relation to cost allocation, shared assets and ring-fencing. Gas NSPs are subject to ring-fencing obligations in the NGL and NGR and the AER's shared asset guideline.

The main requirement of a shift to a Totex regulatory approach is to ensure that the relevant obligations and guidelines concerned with cost allocation and shared assets continue to apply even though NSPs would no longer receive an explicit capex allowance.

### 2.5.2 Implications and potential mitigatory measures

Moving to a Totex approach does not confer incremental advantages in these areas. Rather, the changes required would seek to preserve the existing benefits to the community of these obligations.

**Table 1:** Potential effects of key elements of a Totex approach

| KEY CHANGES | POTENTIAL BENEFITS | POTENTIAL COSTS OR RISKS |
|---|---|---|
| Unified assessment of totex | Reduced intrusiveness – less project- and programme-specific focus, reducing risk of regulatory error (Efficiency, Capability)<br><br>Greater scope for and ease in making efficient capex-opex trade-offs (Efficiency)<br><br>Reduce any residual capex bias to 'grow the RAB' (Efficiency, Prices) | Risk of regulatory error in the form of an insufficient totex allowance due to flawed application of new techniques and methodologies (e.g. totex benchmarking – see below) (Capability, Risk, Efficiency, Transition)<br><br>Increased spending biases – scope for new biases or a more general over- or under-spending incentive to be introduced depending on the way the totex allowance, capitalisation rate and WACC are set (Efficiency, Prices, Capability, Transition)<br><br>Flawed capitalisation rate could compromise financeability if too high or lead to price shocks if too low (Financeability, Prices)<br><br>Incomplete consideration of total risk bargain (Risk, Efficiency)<br><br>*These drawbacks and risks could be mitigated by implementing a Totex approach gradually, participating actively in the design and implementation of the new regime and by the regulator erring towards conservative parameters (e.g. through the use of a lower capitalisation rate).* |

| KEY CHANGES | POTENTIAL BENEFITS | POTENTIAL COSTS OR RISKS |
|---|---|---|
| Totex benchmarking | Robustness – reinforces incentives to make efficient capex-opex trade-offs (Efficiency)<br>Simplicity – does not delve into details of NSPs' cost structures (Capability, Transition) | Risk of regulatory errors due to:<br>(i) Extension of AER's approach to benchmarking opex to totex<br>(ii) Data for totex benchmarking currently unavailable and small sample size<br>(iii) Challenging to benchmark capex (and hence totex) due to lumpiness of capex. Need to derive a long-term average of capital expenditures or a measure of capital consumption<br>(Capability, Risk, Efficiency, Transition)<br>*Some of these drawbacks and risks could be mitigated by a relatively conservative application of totex benchmarking by making benchmarking only one factor in setting totex allowances and by using a range of totex benchmarking models.* |
| Unified totex incentive scheme (TIS) | Addresses current (minor) asymmetry between EBSS and CESS sharing rates, reinforcing incentives to make efficient trade-offs (Efficiency)<br>Avoids opex capitalisation debates (Efficiency, Capability, Transition)<br>Avoid ex post reviews of capex overspending (Risk, Capability)<br>Scope for stronger efficiency incentives under menu regulation (Efficiency, Risk)<br>Reduced complexity due to replacing EBSS and CESS with TIS (Efficiency, Capability) | Scope for other potential biases to remain – TIS cannot overcome biased and inefficient incentives derived from the setting of the totex allowance, capitalisation rate and WACC (Efficiency, Prices, Capability)<br>Loss of 'safety valve' – compared to not having any incentive schemes (Risk)<br>Regulatory error arising from flawed implementation of menu regulation (Risk, Capability, Transition)<br>*These drawbacks and risks could be partially mitigated by setting the parameters of any new menu regulation and/or TIS conservatively.* |
| RAB additions and depreciation | Reinforces incentives to make efficient trade-offs (Efficiency) | Regulatory error due to inappropriate capitalisation rates or average asset lives (Financeability, Prices)<br>May bias capex towards longer-lived assets (Efficiency) |
| Cost allocation and shared assets | Preserve existing benefits of these provisions (Efficiency, Prices). | Transition to and monitoring of amended provisions (Transition) |

*Source: Frontier Economics*

# 3 OVERALL EFFECTS OF A TOTEX APPROACH

The previous section considered the potential advantages and disadvantages of adopting specific aspects of a Totex regulatory approach. Stepping back from those specific effects, a Totex framework could offer broader benefits and costs.

On the one hand, moving to a Totex approach could improve the flexibility available to NSPs to manage their inputs in ways that maximised service performance while minimising the present value of costs. This would promote the NEO and NGO, as well as help keep network tariffs sustainably low.

On the other hand, the implementation of and adjustment to a new regulatory approach would require NSPs and other stakeholders to participate in another lengthy consultation process. And given the number of novel features of a Totex approach, this will naturally require a substantial consultation process. There is also a likely increased risk of regulatory errors during the implementation and transition phases of the new regime.

While moving to a Totex regulatory approach may not resolve all the issues experienced under the current regulatory regime, it could offer substantial benefits to consumers, businesses and the regulator at a time of uncharacteristically rapid technological change in the energy sector. This has certainly been the experience of the electricity and water sectors in Great Britain, which provide useful precedents and lessons for the transition from building block regulation to a Totex approach. Gradual but steady implementation of change is likely to avoid most of the problems that could arise.

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