



Vector Limited
101 Carlton Gore Road
PO Box 99882, Newmarket
Auckland 1149,
New Zealand
www.vector.co.nz
Corporate Telephone
+64-9-978 7788
Corporate Facsimile
+64-9-978 7799

Regulation Branch
Commerce Commission
PO Box 2351
Wellington

Sent by email to: regulation.branch@comcom.govt.nz

11 November 2011

Submission on Information Disclosure and Cost Efficiency

1. Vector welcomes the opportunity to respond to the Commerce Commission's ("Commission") consultation paper *Information Disclosure: Approaches for Understanding EDB and GPB Cost Efficiency: Technical Paper for Consultation*, dated 7 October 2011.

Overview and recommendations

2. The Commission is proposing to assess the cost efficiency of electricity distribution businesses ("EDBs") and gas pipeline businesses ("GPBs") in terms of operational expenditure, capital expenditure and the trade-offs between operational and capital expenditure. It has yet to reach firm views on how to carry out these assessments and is seeking feedback on methods and approaches for assessing EDB and GPB cost efficiency.
3. Vector is concerned that the proposed approach could be very costly and the results unreliable. Further, this approach is likely to have relatively limited impact in terms of achieving the relevant purpose statements and statutory requirements.
4. Vector recommends the Commission take a step back and consider whether analysis of cost efficiency is necessary, desirable or proportionate in terms of meeting the Part 4 Purpose or the Purpose of Information Disclosure regulation. The Commission should also consider whether there are alternative approaches which would better meet the relevant purposes and be better suited to a light handed form of regulation.

5. However, there may be some cost efficiency information that could be of use to regulated suppliers. Vector would be happy to work with the Commission to develop a more pragmatic and useful set of disclosure requirements to provide cost efficiency information that could be of real and practical value to the industry and interested parties.
6. We recommend the Commission:
 - a) clearly defines the objective of its cost efficiency performance analysis. Without a clear objective, it is difficult to judge the scope and detail of information that is required;
 - b) develop a cost-benefit analysis to compare the value of any additional information to the cost of providing it before making any decisions on requiring additional information; and
 - c) consider Vector's preferred approach; that is, information disclosures for the 2013 regulatory year should rely on information currently provided through information disclosure, supplemented by AMP data where necessary. For future years, the Commission should work with the industry to identify a set of cost efficiency information that would be of value to regulated suppliers and interested parties. We emphasise that this data must be of value to regulated suppliers for industry buy-in to be achieved.
7. Vector also invites Commission staff to visit Vector in order to get a better understanding of the information we hold and the way it is used in order to manage our business.
8. Without prejudice to this position Vector responds to the Commission's questions in **Appendix A**.

Statutory framework and context

9. The purpose of information disclosure is to ensure sufficient information is readily available to interested persons to assess whether the purpose of Part 4 is being met. Information disclosure is not, therefore, intended to promote the Purpose of Part 4 itself, which is a contrast from the purpose of information disclosure under the previous Part 4A. Information should only be required under Part 4 where it is clearly necessary to meet the purpose of information disclosure.
10. A key question for consideration is the extent and type of information required in order to achieve the applicable purposes and requirements in the Act.
11. Relevant to this question is the wider statutory context. Information disclosure is intended to be the most light-handed form of regulation under

Part 4. This is in the context of a regime that is tailored to New Zealand's small size and, overall, is intended to be relatively low-cost. It is of note that the purpose of information disclosure refers to "sufficient" information and information that is "readily available" to interested persons. Vector considers that it is implicit in the Act and in the wording of the purpose that the information sought (in terms of the resources and cost involved in providing it) should be proportionate to the benefit or value it will bring.

12. The Commission appears to have taken a view that the requirement in section 53B(2)(b) (specifically, to provide a summary and analysis for the purpose of promoting greater understanding of individual suppliers' relative performance) requires a cost efficiency performance analysis using comparative benchmarking.
13. The section 52P determination must, among other things, set out the information to be disclosed. Section 53B(2)(b) provides that the Commission:

must, as soon as practicable after any information is publicly disclosed, publish a summary and analysis of that information for the purpose of promoting greater understanding of the performance of individual regulated suppliers, their relative performance, and the changes in performance over time.
14. Importantly, section 53B(2)(b) does not require a detailed assessment of cost efficiency between suppliers. While the Commission must publish a summary and analysis of certain information that is provided by regulated suppliers under information disclosure, a greater understanding of performance can be promoted by less resource intensive and costly means. Further, if the Commission's analysis demonstrates that more information is required, the Commission has information gathering powers to allow it to conduct more rigorous analysis and investigation.
15. It is also relevant that under section 53P(10) the Commission is prohibited from using comparative benchmarking for setting starting prices, rates of change, quality standards or incentives to improve quality of supply. It therefore seems unlikely that the Commission can use cost efficiency information in any significant way under a default price-quality path ("DPP"). We also consider that it would be very challenging to use cost efficiency benchmarking to set a customised price-quality path ("CPP") as the Commission will be likely to have far more information about the supplier making the CPP application than it will have about other regulated suppliers. Cost efficiency analysis would, therefore, likely be only of relevance to information disclosure regulation. While cost efficiency studies may be used in the UK and Australia, these regulatory regimes include cost benchmarking as part of the price control regime, which does not apply in New Zealand.

16. In addition, comparative benchmarking was prohibited in section 53P(10) because of concerns about the volume of material required to be produced and the difficulty of properly correcting for different circumstances.¹ These concerns are also of concern in the context of information disclosure
17. We discuss further below:
 - a) the (limited) potential use of cost efficiency information;
 - b) the need for caution when assessing cost efficiency results;
 - c) data for cost efficiency studies; and
 - d) Vector's preferred approach.

Potential use of cost efficiency information

18. The Commission notes that "the development of robust models for assessing cost efficiency takes time and requires repeated iterations involving extensive industry input."² We agree that it is likely to take some iterations before any cost efficiency model is relatively robust. We have concerns that the need for iterations will lead to changing information demands from the Commission, leading to repeated system and process changes for regulated suppliers. The Commission should also be cautious about using the information from early iterations to form views on necessary regulatory actions as early results are particularly at risk of error.
19. As set out above, comparative benchmarking is unlikely to be able to be used for the purpose of DPP or CPP regulation and, accordingly, its use is limited to information disclosure purposes.
20. Cost efficiency benchmarking is therefore presumably to be used as a form of light-handed regulation where the relative inefficiency of a particular supplier, as revealed through information disclosures, serves as an incentive for improvement. We consider that to be a relatively weak incentive and thus the impact of the cost efficiency disclosure on delivering the Part 4 Purpose is likely to be muted. On that basis, it would be concerning if the costs to suppliers of providing the relevant information, or the costs to the Commission of assessing and compiling it, were large. Where a regulatory requirement is likely to have a limited impact only, the cost of complying with the requirement should similarly be limited.
21. If the Commission truly intends to drive efficiency improvements across regulated suppliers, we submit it would have more success if it provided

¹ Ministry of Economic Development, *Commerce Amendment Bill, Response to issues raised by Commerce Committee*, 21 July 2008, p 2.

² Consultation paper, paragraph X.5

improved incentives to suppliers to achieve efficiencies through DPP and CPP regulation. If the publication of comparative benchmarking data did drive efficiency gains, regulated suppliers should benefit from the gains for a time before sharing with consumers. In our view, the efficiency incentives under the most recently proposed DPP settings (i.e. 100% removal of the efficiency gains at the next reset) are inadequate to drive significant improvements.

22. In considering the potential use of cost efficiency information, it is instructive to consider the example of comparative benchmarking of EDB asset management plans ("AMPs"). Where EDB A finds that it is judged to have weaker asset management practices than EDB B, it is able to review the AMP of EDB B for ideas on how to improve. However, if EDB A is judged to be less cost efficient than EDB B it is not clear what EDB A would do with that information. It would not be clear how EDB B had become more cost efficient or what aspects of its operation drove the more efficient outcomes so the learnings for EDB A may be limited. This is a further reason why there are limits on what can be achieved in a meaningful sense from cost efficiency information.
23. While AMPs include considerable data on EDB opex and capex, this is provided with contextual information and explanations in order that the data can be understood. It appears that the Commission is seeking AMP-style data but without the accompanying explanations. This is likely to lead to misinterpretations.
24. The costs of providing the additional information are likely to be substantial. They must be assessed against a clear and quantifiable benefit and compared to the net benefits of alternative approaches before any decision is made on implementing the cost efficiency information requirements.
25. The consultation paper assumes that all of the information that may be required will be held by the business anyway. This misses the point. While information may be held, the formats and structure of information is likely to vary widely across EDBs and standardisation will impose costs on all (or at least most) EDBs. In addition, the information may be held at a standard that is suitable for internal management purposes but may need to be improved to match external audit requirements. This also carries a cost.

Need for caution when assessing cost efficiency results

26. The Commission goes some way to acknowledging the inherent difficulty in deriving robust results from comparative cost efficiency studies. The Commission is correct to note:³

³ Consultation paper, pages 3-4.

it is important to account for [size of network, customer composition and geography] so as not to confuse inefficiency with differences in operating circumstances

An assessment of cost efficiency requires the specification of the economic model... One of the key requirements is that the model must be able to explain the variation in costs across EDBs and GPBs...

It is important that the models are thoroughly tested prior to making any conclusions about the efficiency of a supplier.

27. It is important to recognise that any direct comparison of “raw” expenditure or performance information between utilities generally has little meaning due to the different operating conditions. Appropriate normalisation and careful interpretation of the information is necessary to allow reasonable conclusions. Unless the limitations, or appropriate manner of interpreting a comparison are made very clear, there is a real danger that non-expert third parties may draw mistaken and potentially damaging conclusions.
28. However, based on the consultation paper, the Commission seems to be overly optimistic that the difficulties it highlights can be overcome and the results that are provided can be reliable and useful. The Commission also seems to be proposing the development and iterative review of a series of models, which is unlikely to be a low-cost process. Further to our comments above, the value of cost efficiency comparisons has not been demonstrated to be high enough for significant resources to be devoted to this.
29. The risks of comparative benchmarking were demonstrated under the Part 4A regime, the Commission engaged Meyrick and Associates to undertake comparative benchmarking studies of productivity among EDBs. Meyrick published assessments of comparative productivity of EDBs in December 2003 and reviewed those assessments in December 2007. The two assessments produced very different results.⁴ Using updated EDB-specific capital shares, Electricity Invercargill was ranked as the most efficient EDB in 2003 but the 24th, 26th or 29th most efficient EDB in 2007 (depending on which timeframe was considered). Other EDBs also saw dramatic changes in their ranking. In an industry characterised by long-lived assets it is highly unlikely that such changes would only have occurred due to changes in management decisions and operating efficiency in the intervening three years.

⁴ Meyrick and Associates, *Electricity Distribution Business Productivity and Profitability Update*, 7 December 2007, Table 7. We note that if the 2003 Meyrick specification is used there was less change in the rankings of different EDBs. A case can be made for either specification to be more reliable. The most relevant point, however, is that the change in a particular input variable can have substantial impacts on model outputs and the risk of this is significant.

30. Such variations may not be avoidable, at least in early years of comparative studies, which by necessity involve some subjective judgements and simplifications. However, the experience of the Meyrick studies must serve as a warning to interested parties not to place a great deal of weight on the results of comparative benchmarking studies and to use them in decision-making only with a great deal of caution and after full consultation with stakeholders.

Data for cost efficiency studies

31. For the CPP Input Methodologies, data templates were developed in consultation with the industry to cover cost, service and asset categories. Vector would be extremely concerned if the cost efficiency requirements were inconsistent with the CPP data requirements as this would force regulated suppliers to operate duplicate information systems for information disclosure and for considering whether to apply for a CPP. This, in our view, would be inconsistent with the overarching aim of Part 4 of promoting outcomes that are consistent with outcomes produced in competitive markets as no competitive market would be likely to operate in such a way.
32. In Appendix A of the consultation paper, the Commission helpfully summarises a variety of New Zealand and overseas studies that have examined, in one way or another, cost efficiency of regulated energy network businesses. In Appendix B the Commission lists the inputs into these studies and compares them to data that is available under current information disclosure requirements.
33. There is a risk that Appendix B could be misleading. Of the 31 inputs used in overseas studies for electricity distribution cost efficiency studies 15 are currently provided under the information disclosure requirements for EDBs. This should not, in any way, be taken to imply that the information currently provided under information disclosure is inadequate or limited.
34. Of the studies cited in Appendix A, judging from the Commission's summary none used more than 11 inputs in their analysis and the average amount of inputs used across the studies was six. In addition, some inputs used overseas do not appear to be as relevant to the New Zealand context (e.g. inputs relating to average temperature and precipitation), while other items such as price indices have already been produced for the Commission to inform starting price adjustment decisions. In our view, the 15 items of information that are already produced under electricity information disclosure requirements should be sufficient to conduct a study of cost efficiency, should it be necessary.

35. For gas, there is a need for further information to be provided, but it is not clear that this needs to be more than is necessary to bring the gas information disclosures up to the level of the current electricity information disclosures.

Preferable approach

36. There may be some cost efficiency information that could be of use to regulated suppliers. Vector would be happy to work with the Commission to develop a more pragmatic and useful set of disclosure requirements to provide cost efficiency information that could be of real and practical value to the industry and interested parties.

37. It will not be possible to develop robust indicators within the Commission's timeframe for finalising information disclosure requirements (with a draft decision to be published in December 2011 and a final determination in March 2012). However, the Commission itself recognises that the development of cost efficiency measures would be an iterative process. In our view, it would be preferable for the information disclosures for the 2013 regulatory year to include no new cost efficiency data requirements, while the Commission works with the industry to develop relevant indicators for implementation in the 2014 regulatory year.

38. Vector also invites Commission staff to visit Vector and meet with staff in order to get a better understanding of the information we hold and the way it is used in order to manage our business. This may be useful in terms of sharing views and experience regarding the practicality of certain information requirements.

Contact details

39. If you require further information, please contact me on 04 803 9038 or at bruce.girdwood@vector.co.nz.

Yours sincerely,



Bruce Girdwood
Manager Regulatory Affairs

Appendix A: Answers to Commission questions

Q1 How much insight would an assessment of operating expenditure based on NZ comparators alone provide, for EDBs and for GPBs?

Vector agrees there are sufficient EDBs in New Zealand to derive comparisons of cost efficiency, provided the data can be suitably normalised. For GPBs, there may be insufficient operators in New Zealand to allow for meaningful comparison.

Q2 How insightful could international comparators be in assessing EDB and GPB expenditure?

In our view the consideration of international comparators is inconsistent with Part 4. Section 53B(2)(b) provides for the promotion of understanding of the relative performance of individual regulated suppliers. Overseas firms are not regulated suppliers in the context of Part 4 and therefore a comparison with those overseas firms is not permitted under this section. The comments below are without prejudice to this view.

The use of international comparators is fraught with risk due to different legal, regulatory and business environments. Any use of international data will need to be done with a great deal of caution to ensure that different operating conditions internationally do not skew the results. Different regulatory environments and factors such as purchasing power parity (rather than mere correction for exchange rate) would also have to be accounted for.

The regulatory differences are not just in relation to differences of industry and economic regulation (although these are of course important – for example, we note that some greenfield development Australian pipelines are exempt from price control for some years after commissioning). There are also differences in health and safety, financial and planning regulations that can drive different expenditure profiles. To ensure comparison with overseas companies is meaningful, it is necessary to understand what is being compared, the environment the companies operate in, and the reasons behind any differences in performance. Commentary on the differences in performance will be as useful as the quantitative comparison.

Also, where infrequent but high-impact events occur (such as the recent outage on the Maui pipeline) in international comparator companies, such incidents could affect the data from those companies and would need to be suitably normalised.

Some GTB networks are one-way pipes, others are more meshed, sometimes crossing state or national boundaries. They can therefore be governed by different contracts/regulation on different sides of the border, leading to different cost structures. It may be difficult to reliably adjust for this type of factor.

Where mergers and acquisitions occur, the time series of data may be difficult to interpret reliably in order to maintain comparators with New Zealand regulated suppliers.

Q3 What companies, countries or datasets should be included in the analysis?

Australia and the United Kingdom (and to a varying extent some other European Union member states) are the jurisdictions which have the most common design approaches and network standards to New Zealand so would be the most appropriate international comparators. There is potential for learnings from other jurisdictions such as the United States, but the different design approaches and network standards mean that it would be even harder to develop meaningful comparisons.

Q4 How appropriate are sub-company comparisons of costs?

Sub-company comparisons may be inconsistent with section 53B(2)(b). The section refers specifically to promoting understanding of the relative performance of "individual regulated suppliers", not the relative performance of different parts of a single regulated supplier.

Q5 How feasible and costly would it be to collect sub-company cost and characteristic data to enable sub-company comparisons?

Certain sub-company data is already disclosed by EDBs under the 2008 information disclosure requirements. However, the Commission appears to be contemplating expanding the scope of sub-company reporting.

Information systems are set up to reflect a company's business model (depending on the size of the company and how they want to run the company). It is costly to change these systems, especially where system changes affect business processes. The Commission should move cautiously before making detailed reporting requirement changes due to the potential cost and process impacts on regulated suppliers.

The allocation of shared costs among regions would also be challenging. It is already costly to allocate shared costs against the different business units, let alone the regions within each business. It must be clear that the costs of sub-company reporting are outweighed by the benefits before this is progressed.

Q6 What factors (outside management control) drive industry wide opex?

The relevant factors include:

- availability and supply of skilled workforce;
- material and labour cost inflation;
- exchange rates;
- weather events and acts of God;
- regulatory and legal compliance;
- historical obligations and historical levels of investment;
- average energy demand per consumer;
- consumer density;
- energy density;
- consumers' service expectations; and
- size of the company.

Investment history and growth rates are likely to vary across networks and are largely outside of (current) management control.

Also, for gas transmission businesses we understand that contract carriage is perceived as more costly to operate (compared to common carriage) due to negotiating and contractual transaction costs. But contract carriage may be the only form that could work in some overseas markets (i.e. where there are not enough market participants to make common carriage work).

Q7 To what extent does the current information disclosure data capture these factors?

These factors are not generally captured in current information disclosures, although some can be deduced from data provided in the disclosures.

Q10 What factors (other than changes in input prices) influence opex over time?

The relevant factors include:

- quality of service;
- internal reliability targets;
- true competition among service providers;
- efficiency;
- regulatory incentives;
- innovation;
- planning requirements (RMA);
- capital investment;
- network undergrounding programmes;
- asset renewal programmes;
- changing safety requirements;
- risk appetite; and
- consumers' expectations.

We note that paragraph 3.13 suggests that gas and electricity volumes conveyed may be an opex driver. However, opex comparisons based on energy volume only are not very meaningful. Network density must also be taken into account.

Q11 To what extent should quality be taken into account when assessing cost efficiency?

Maintenance costs are incurred to maintain (or enhance) the level of service to customers and/or to maintain (or enhance) performance of assets. Asset performance is one of the key factors for service delivery. It is not possible to make meaningful cost efficiency assessments without taking into account the quality of service delivered.

Another factor that should be considered is long term vs. short term. An organisation can lower costs in the short term to produce apparent short term cost efficiency, but will suffer in the long run, especially if quality of service is taken into account.

Q12 What level of opex should be assessed? Should the current sub-categories of EDB and GPB opex (e.g. general management, administration and overheads) be separately assessed, should further disaggregated cost data beyond these categories be collected and assessed, or should the analysis focus on total opex only?

Vector does not support a further disaggregation of business cost data. The benefits of such an approach have not been shown to outweigh the costs. It may also be difficult to disaggregate common costs for comparison due to the cost allocation of these common costs by the different EDBs. It is unlikely that the categories in which regulated suppliers currently capture the costs would match the new sub-categories. Systems and processes would need to be put in place to capture costs against the new sub-categories and this would create costs for all suppliers.

We do not see why the categories would need to be different from those listed as opex categories in Schedule D of the relevant Input Methodologies Determination.

Q13 What components of opex should be separately benchmarked?

It should be sufficient to compare costs that are directly related to the assets (plus shared costs) to understand the bigger picture. As noted above, the opex categories in the Input Methodologies Determinations are suitable.

Any disclosure of pass through costs in this context is not supported. Pass through costs are not controllable by the regulated supplier.

Q14 How much insight would external comparisons of common functions provide?

This will depend on fully understanding and appreciating the different operating and regulatory environment and data sets. There will be a significant risk of inaccurate interpretation of data and attempts to overcome these difficulties will be challenging and may not succeed.

Q15 What functions should be benchmarked and how easily available is cost data at a function-level?

Vector suggests the Commission, at least initially, only compares total costs rather than the individual functions, given the potential difference in interpretation of the sub components (e.g. different accounting treatments for cost allocation across different business units within a company).

Q16 What industries and operators should be included when benchmarking these functions?

Even within the New Zealand electricity distribution industry the cost structures (IT, HR, management, etc) for asset management functions and field services provision are very different. The form of regulation (exempt or non-exempt) will also significantly impact on the cost of compliance and regulatory management. Internationally, even where it is the same industry, the demarcation within the supply chain could be different.

Q17 Should nature-of-work comparisons be further considered in assessing EDB and GPB opex efficiency? If so, what sectors should be included in the analysis?

It is unclear what value this would add to the process.

Q18 To what extent should assessments of historical capex based on direct comparisons be considered as part of summary and analysis?

Capex (and opex) cannot be compared directly between companies as business situations and practices will differ and skew the results. For example:

- growth capex needs to be normalised by growth rate;

- suppliers can keep deferring capex and appear to be more capital efficient but they are running at a higher risk; this would be indicated by increased asset utilisation;⁵
- replacement capex is related to the condition and performance of assets in use. But the level of replacement capex can be affected by the capex-opex trade off and the performance of the assets; and
- maintenance costs of an underground network is generally less than that of an overhead network, but the capital investment is higher.

Capex and opex need to be normalised by the corresponding drivers and compared over a period of time (given the lumpy nature of some capital projects). Short term comparisons are much less meaningful.

Q19 What are the material assets and activities that should be included in a capex assessment?

Assets for meaningful comparison should include either:

- sub-transmission assets such as zone substations, power transformers, cables and overhead lines; or
- mass volume assets such as distribution cables, substations, transformers, poles, overhead lines.

Any comparison should take into account factors such as customer (residential, industrial, etc) expectations of service level, customer and/or energy density of the network, geographical characteristics (urban, rural, etc), Local Authority requirements (overhead, underground, etc).

Q20 What are the drivers of activity on these assets?

Relevant drivers of activity include:

- Network security standards (these have a major impact on capex requirements);
- Demand growth;
- New customer connections (subdivisions, substations, connections, etc);
- Replacement to preserve performance or risks/condition;
- Regulatory compliance (HSE and environmental); and
- Relocation (including undergrounding above ground assets).

Q21 How capex effectiveness can be measured?

⁵ However, in some cases it can be deliberate and appropriate to increase asset utilisation (and hence have lower than normal growth capex rates). In assessing growth capex it would therefore be important to take into account network utilisation as well (and to have a good measure for this).

It is difficult to measure capex efficiency in a lumpy investment environment where assets are built with sufficient capacity to cater for growth over a long period. As the investments are in long lived assets it is necessary to measure the long term effectiveness (trends, rolling averages, etc) rather than year on year measurements. It will also be necessary to consider several different indicators, such as network utilisation, age profile, reliability, fault rates, etc.

Some capex should be excluded from comparisons. For example, comparing expenditure on relocations is meaningless as this is externally driven and normally does not create any material network improvement or benefit that can be measured.

Correction should also be made for the type of investment involved. For example, to install an undergrounded asset is far more expensive than overhead, but the impact on network capacity, for example, may be similar.

Q22 How suitable is the proposed approach for assessing capex?

As discussed above, we are not convinced that it is necessary to provide this data and the Commission has not made it clear why it believes it needs the data.

It is not clear what level of detail will be required. A good deal of relevant information is available in disclosure AMPs, but it may not be standard across all suppliers so there may need to be additional effort and resources devoted to standardising the information. It is also not clear how the comparisons are to be made.

If this approach is implemented, there would need to be clear and concise definition of the data to be collected and the format in which data is to be presented. Data would also need to be audited. Depending on the changes necessary to meet the requirements, it could be a costly exercise to set up information systems and modify business processes.

We note the Commission acknowledges that disaggregated data is unlikely to be available from overseas. This could make the comparisons somewhat meaningless.

Q23 To what extent do suppliers consider the opex-capex trade-off could distort an assessment of expenditure that is based on separate reviews of opex and capex?

The amount of distortion depends on the volume (and dollar value) of any trade-offs being made. The Commission should only be concerned about the overall

benefit in the long term (NPV of the overall capex and opex rather than individual capex or opex) rather than taking a shorter term view.

The application of starting price adjustments will bring about further distortions as the benefit of any trade-off will be truncated at the start of the new regulatory period.

Q24 Which components of expenditure have significant opex-capex trade-offs?

There are numerous aspects of expenditure with significant opex-capex trade-offs, including:

- underground networks cost more to construct but less to maintain (and provide better quality of service) compared with above ground networks;
- refurbish or replace;
- repair or renew;
- pay to improve reliability or pay to manage faults; and
- vegetation management (trim trees or invest in assets that are less likely to be affected by trees).

Q25 How should the cost analysis take into account any opex-capex trade-offs?

Any process for cost analysis and comparison needs to be relatively low cost, uncomplicated, scalable, comprehensible and meaningful.