Submission on

The Commerce Commission 'Powerco Customised Price-quality Path' Draft Decision' - Cross-submission

Date: 19 January 2018

Powerco cross-submission on submissions to the Commerce Commissions Powerco CPP Draft Decision

1. This is Powerco's cross-submission on submissions to the Commerce Commission's (Commission) draft decision[1] on Powerco's, Customised Price-quality Path (CPP) proposal published on 18 December 2017.

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3. No part of this submission is confidential.

4. Thank you for the opportunity to make a cross-submission on the draft decision submissions of the Powerco's CPP proposal. We appreciate the Commission's ongoing engagement with stakeholders and thorough consideration of our CPP application.

5. We consider the number and quality of submissions to the draft decision by interested parties is positive and essential in ensuring CPP applications are tested robustly and the final decision meets the expenditure objectives. We are also encouraged by the continued engagement by interested parties and the interest shown on a number of key areas of our proposal.

6. The following submission responds to a number of points raised by submitters to the draft decision where we consider further clarification and explanation will benefit submitters understanding of issues.

7. The application process has been ongoing over the last two years and the analysis and thinking underpinning the expenditure forecasts and outcomes have been subject to robust and detailed challenge by multiple independent parties. The result of this and the final proposal has resulted in significant material being produced and discussions held.

8. Naturally the volume of material produced over a period of time can result in difficulties for interested parties to have a full awareness and knowledge of information relating to individual topics. This is magnified by the relationships and complexity of the areas covered by a CPP application. As a consequence it appears that a number of submission points to the draft decision are a result of conclusions drawn from incomplete knowledge of a topic.

9. We have therefore kept our cross submission focused on those parts of submissions to the draft decision that we believe require priority consideration prior to the final determination and have been concluded as a result of a partial

[1] Published on 16 November 2017

view of related information.

A Price – Quality trade-off

10. Several submissions discussed the price-quality trade-off suggestions of the draft decision. In the decision, the Commission has set an unplanned quality path that targets improved quality over time, as opposed to our proposal, which essentially is based on reliability remaining at historical levels. Submitters questioned why, in the absence of a customer preference for improved reliability, the Commission has not rather targeted decreased investment, while maintaining current unplanned quality levels in the CPP period.

11. The development of our proposal underwent significant internal and external scrutiny that included public consultation and review by an independent verifier. During this process customer expectations were challenged and confirmed, expenditure was tested to be justified and efficient for the work we proposed, and the impact on anticipated network reliability was also assessed. The overall result of this process was what we believe to be a reasonable price-quality balance, achieved in line with customer expectations, as proposed on our submission of 12 June 2017.

12. In its review of our proposals, the verifier noted that they believe Powerco's network reliability to be improving over time and that the additional expenditure proposed would accelerate this. The Commission concurred with this view. As we have maintained in our submissions, we fundamentally disagree with this conclusion, not only with the assessment of a historically improving reliability position, but also from an understanding of how the deteriorating (ageing) asset base is increasingly putting network performance under pressure.

13. We do not believe that any new evidence has been brought to light that materially alters our view, or the price-quality trade-off we proposed. We stand by our CPP application and remain certain that our proposed expenditure plans are essential to maintain reliability at existing levels, as expected by our customers, but would not fundamentally improve network reliability.

14. Importantly, while the bulk of our proposed additional expenditure will be targeted at asset renewal, a large part is also addressing increased electricity demand or to ensure our network remains safe for the public and our staff. Reliability benefits from these categories of expenditure would be of a secondary nature only.

15. Due to its importance, the price-quality trade-off challenge was considered in-depth in the development of our final proposal. Customers gave us a clear mandate to manage the network to a safe and resilient standard while maintaining the level of unplanned quality they historically experienced. We submitted a proposal that contained efficient expenditure to achieve these customer led goals while ensuring the safety of the network. While some reliability improvements are likely to result from the proposed activities, this

was not a primary driver of the CPP application.

16. In the draft decision the Commission reduced expenditure to 96% of what we proposed. This reduction was predominantly in areas that potentially have limited short term impact on quality levels or network safety, mainly in Network Evolution and the Tauranga ripple relay replacement. Accordingly, we believe that the expenditure approved in the draft decision is still appropriate to stabilise Powerco's network performance, maintaining reliability at historical levels and keeping the network safe.

17. Additionally however, the Commission proposed a 10% (SAIDI) and 5% (SAIFI) reduction in targets. While we do not consider that these targets are feasible to achieve within the CPP period, as noted in our submission, we appreciate the Commission's intent to ensure that customers benefit more immediately from the increased network investment.

18. We do not agree with the view expressed in submissions that the Commission's proposed quality improvement could be negated, in exchange for a reduced level of expenditure. Not only do we, as noted above, not believe that the required reliability improvement is likely to be achieved, but we also disagree with the premise that that there is a simple, direct relationship between network reliability and investment where the one could easily be offset for the other.[2] Such a direct trade-off is not practically achievable, especially in the short to medium term.

19. In our submission to the draft determination, we suggested that if reliability targets are to be lowered, these targets should be split between the financial incentive and compliance requirements. This would provide a strong incentive to target reliability improvements in the CPP period, but would not put us in a position where we would be in breach of regulatory quality requirements arising from a situation over which we have very limited control. Importantly it would then also avoid overly strong incentives to change the proposed investment plan to avoid such a breach (for example, stopping work in rural areas in preference of urban areas, where SAIDI/SAIFI gains are more available).

20. We therefore strongly urge the Commission to consider the revised quality proposals included in our submission on the draft determination.

B Network Evolution

21. We note the support for our Network Evolution initiatives from submissions by Contact and Aurora Energy. Contact's submission in particular highlights the need for networks to understand new technology, and the benefits they can provide to customers.

[2] While there is clearly a relationship between network expenditure and supply quality, this relationship is multi-factorial and complex, and only evident over time. In addition, short-term fluctuations in network reliability as caused by weather and other external events, generally far outweigh the short-term impact of incremental network investments.

22. As a leader in the sector, and having the scale to trial and drive the uptake of new technologies, we are committed to forwarding the benefits of emerging technology in New Zealand. As such we continue to stand behind the proposed programme of initiatives detailed in our CPP proposal. We also note again the international evidence on the major benefits being realised from network innovation, as discussed in the report from Allan Miller Consulting[3] that we provided with our submission on the draft decision.

23. All these projects are ultimately required in order to optimise future investments that would be required to improve our service offerings to consumers, or to keep network operation stable. International evidence overwhelmingly shows that innovative solutions are substantially more efficient at achieving this, than sticking to traditional network investments to achieve the same. The development of innovative solutions however requires us to pilot, trial and test new technologies, and to challenge the status quo in a controlled manner. Our customers supported our Network Evolution programme in our CPP consultation by requesting that we continually innovate[4].

24. It is therefore disappointing that the Commission do not appear to accept the benefits that the proposed network evolution programme is expected to offer our consumers. In reconsidering this, it may be worth viewing the overall proposed programme in two broad groups (accepting that there is considerable overlap in the benefits from both categories).

    a. Firstly, some of the proposed activities are targeted at better understanding newly available network based and distribution edge technology that would expand the benefits the network can provide to customers. The benefits of these projects to customers would be realised in a relatively short term window.

    b. The second group relates more to technologies that will enhance the operation of the network, and ensure its ongoing stable and safe operation as new grid edge devices, particularly those generating electricity at highly variable levels, are connected at much higher numbers, or where customers' demand patterns change materially.

25. We recognise that the benefits of the second category of investment would be less immediate to customers, and while we consider them an integral part of our networks development, there is less certainty around benefit realisation timing.

26. Appendix B contains a list of Network Evolution projects we proposed in our CPP proposal. This list has been categorised into those network based projects with shorter term benefits for customers, and those targeted at the longer term stability of the network.

[3] http://www.comcom.govt.nz/dmsdocument/16031, Allan Miller consulting on behalf of Powerco – Submission on Powerco CPP Draft Decision – 15th December 2017

[4] Powerco CPP Proposal – CPP Consultation Report, 12 June 2017, pg19.

27. We also wish to re-iterate that we are committed to sharing what we learn from the proposed network evolution programme with other New Zealand EDBs and interested stakeholders. We are also committed to a high level of transparency of the delivery of our CPP though the Annual Delivery Report. Additionally, we will hold an annual technical workshop open to all stakeholders to share our findings from our network innovation and evolution initiatives.

C Whangamata Project

28. Throughout the consultation process Contact has continued to focus on the proposed Whangamata project. To support their understanding of our proposed solution, and the process we have undertaken to arrive at it, we have engaged with them outside of the submission process. We have used the face-to-face engagement opportunities to discuss how Powerco intends to further its collaboration with third parties on projects were non-network solutions may exist as part of a solution, notably Whangamata. From a Powerco perspective and the subsequent on-going engagement with Contact, we think the discussions have been positive and will be looking for them to continue.

29. In its submission to the draft decision, Contact has again raised the choice of the selected option to address the network security issues at Whangamata. We continue to stand by our chosen battery storage / diesel backup solution, followed by an additional 33 kV overhead line at a later stage (once the required route access can be obtained). Our option analysis clearly indicated that this configuration is net beneficial and had the greatest benefit of all the available alternatives. This remains the case even after the error identified by Contact in the Whangamata Options Analysis concerning the treatment of the TAI-3 Hikuai fault[5] is corrected.

30. In addition, there are many additional non-quantified benefits from the selected solution. These include:

    a. Benefits of trialling a grid-scale battery storage system, as these are likely to become more prevalent in use. In this instances, it also includes the operation of a substantial distribution network in fully islanded mode, automatic network reconfiguration and automatic restoration once the main supply is restored

    b. Learning how to operate, manage and maintain these types of systems and their impact to the grid through their operations

    c. Improved support for multiple use case trials (planned outage impact mitigations, thermal limit management, and potential to extend storage

[5] Contact also noted an additional 'error' regarding Battery Opex costs. However, this is related to a simplification in the model, rather than an error. Opex costs are only able to be applied as a percentage of total capital cost on the project. The Battery storage system has low to zero opex costs as the proposal is for a turnkey solution with a service contract built into the purchase price. The 1.0% reflects the fact that we don't expect much opex until the second line is built post the CPP period. This is in effect an average rate.

with other forms of commercially tendered generation)

d. Environmental benefits of reduced reliance or avoidance of diesel generation (compared with a diesel only option)

e. Expectation of community buy-in for a solution that is innovative in alleviating security of supply concerns, and will minimise the use of non-renewable energy

f. Increased delivery certainty compared to overhead line (e.g. no line route / easement issues)

g. Enabling Whangamata to become a 'centre of excellence' for asset management where a number of projects related to demand management can be piloted in parallel, to further learning and our ability to defer network reinforcement (which could be beneficial for all parts of our network).

31. As this is our first network project that incorporates grid-scale battery storage, and the project is also unusually complex (involving automatic islanding, network reconfiguration, load shedding, and automatic restoration), there is significant technical learning and expertise to be gained from all phases of the project. To maximise this benefit, and thereby supporting the easier and more efficient roll-out of similar installations in future, it is important that our staff retain close oversight and intimate involvement with all facets of the project. This requires Powerco to own and manage the project, as opposed to outsourcing the work to a third party provider. We do note however, that in principle we understand and support open market involvement in helping to provide optimal energy solutions to our customers. On this basis, we fully intend to open up future similar projects to market testing and, where such offerings prove more beneficial, will adopt these in preference to in-house solutions. (Indeed, our ability to scope, evaluate and implement market-led solutions will be enhanced by our experience from the initial in-house project.)

32. It is also important to note that this proposed project is intended to address security of supply issues in Whangamata, by providing local capacity when the single bulk supply line to the town fails. As such, the battery will have to be fully charged at all times, to ensure that the required capacity is available when needed. This is an unusual application for large scale battery storage applications, which are normally directed at peak demand reduction, providing reactive support and voltage stability, or other market-driven applications, which allow regular charging and discharging, with associated commercial benefits. The latter applications also allow storage solutions through the combined control of multiple smaller units (typically owned by consumers), which further supports commercially viable offerings. Where batteries have to be kept fully charged, the scope for such offerings is greatly diminished.

33. Contact submitted that distributed residential scale battery storage solutions could in aggregate provide the backup supply required by Whangamata. As noted above, this would not be compatible with the particular requirements for

the Whangamata solution. In addition, during outage situations, the network will be reconfigured to ensure that the commercial sections of the town retain supply, while residential feeders could be disconnected. This means that, for a solution relying on multiple small storage units, all these units would have to be connected to a limited part of the network – a solution that is not considered practically feasible. In addition, many small scale battery storage solutions aren't designed to work in network island modes, and instead disconnect themselves from the grid when an upstream outage occurs. The additional capability to work in a distributed islanded mode, providing suitable voltage and frequency references for other loads, would add significant complexity and expense.

34. Given the technical features of the required solution, and the considerable qualitative benefits listed above, it is clear that the proposed battery/diesel hybrid solution outweighs the alternative options proposed.

35. We will in future investigate options to expand the storage capacity of the battery unit, as this may well hold considerable further potential technical and commercial benefits, beyond serving the basic need for supply security. Should such an expanded solution be pursued, we intend to invite market offers to participate in providing additional capacity and other service offerings to the Whangamata community.

36. In compliance with our options analysis process, we also considered other non-network solutions. Fuel switching to gas was considered, but with no reticulated gas available in Whangamata bottled gas would need to be used and unlikely to have much uptake and therefore ability to influence load reduction. Demand side response was also considered, but this would not address the total loss of supply conditions which the project is targeted at. It is however intended to trial more demand response options in future, to extend the use of the available storage capacity.

D Tauranga focused major projects

37. All proposed major projects go through an extensive options analysis process, documented in our Asset Management Plans and CPP proposal. The process and outcomes of our major projects options analysis process has been subject to robust and detailed challenge by multiple independent parties, in particular by the Commission and the independent verifier.

38. In addition to having the benefit of viewing all the project overviews documents and having access to Powerco engineers as part of their assessment process, the Commission and independent verifier also had access to further relevant project information, including our Network Development Plan which explained the network constraints for our various network areas, the options considered to address these constraints and our selected solutions.

39. With their enhanced ability to analyse our project proposals in depth, both the Commission and the verifier confirmed the veracity of these proposals. Accordingly, these projects were approved as part of the draft determination.

This included expenditure related to major projects planned in the Tauranga region during the CPP period, namely the Papamoa, Northern Tauranga Reinforcement (Omokora) and Pyes Pa projects.

40. The approval of these major projects were identified and challenged in the Contact submission on the draft decision. As the suggested non-network alternatives to the projects have been thoroughly tested and found not to be feasible for the high-growth areas and new developments involved, we cannot agree with Contact's suggestions. We believe that their suggestion may be based on a lack of sufficient background information (which the reviewers had access to), or insufficient consideration of the longer term life-cycle requirements of electricity supply to the region.

41. Appendix A is provided to give greater insights into the reasons for excluding non-network options from the feasible project shortlist.

42. Market driven alternatives to network solutions may be feasible in some instances, especially where relatively small distribution capacity or performance increments are required, or where investment deferral is economically beneficial. We are accordingly committed to, and working on, processes to invite commercial offerings as network alternatives, where these could be feasible. It should be noted that for the large majority of our investment decision cases, non-network alternatives are not feasible. This is especially the case for many asset renewal and network upgrades, for expansions in areas with no or limited supply redundancy, for new greenfield developments, or where major load growth is expected.

43. The primary responsibility and expertise for operating the distribution network safely, reliably and efficiently, with a full appreciation of the long-term network requirements, lie with Powerco. As such, and as also reflected under current regulatory rules, it remains our responsibility and judgement to determine where conventional network solutions, or in-house driven innovative solutions, are the most appropriate,[6] and to implement the most cost-effective means of achieving the required outcome. A requirement to seek alternative external offerings for our day-to-day investment decisions, especially where most of these do not readily lend themselves to non-network alternatives, would not only introduce considerable delays in implementing solutions, with associated customer impact, but would in the majority of cases be unlikely to provide material cost or technical benefits. This could seriously impede our ability to effectively operate our network and provide the service our customers expect.

44. The Tauranga major network projects are examples where projects have been thoroughly evaluated and where non-network alternatives are not to be economically or technically feasible. The recommended investment options, which ae network based solutions, have been selected as part of our assessed options analysis process and we remain certain they represent the best

[6] With present technology, asset pricing and customer requirements, conventional network solutions are still the most cost effective and reliable means of providing electricity supplies to the large majority of our customers.

technical and economical outcomes to meet the growing needs of the region in the short and longer term.

45. On an associated aspect, the NZIER submission on behalf of MEUG raised concerns with our options analysis treatment of VoLL being based on peak demand, if there is no alternative capacity. NZIER is correct in that calculating VoLL based on peak demand would overstate the value as outages do not always occur at peak loading. However, we believe NZIER has misinterpreted the mechanics of our models[7]. A load duration curve calculation is always applied to the peak demand to calculate an average load at risk.[8] Therefore the net benefits we have calculated are based on average expected conditions, and should not be scaled down. We are happy to discuss the mechanics of these models with NZIER and MEUG. [9]

E Reactive Opex

46. The Fonterra submission raised concern that the reactive Opex forecast is 7% higher than historical levels.

47. Our investments in asset renewal and preventive and corrective maintenance are intended to stabilise fault trends, as opposed to reducing them. We still expect faults to occur on our network in the future, but at manageable levels.

48. The reactive Opex forecast was built as a base-step-trend model. We expect reactive Opex to remain generally flat and in-line with historical levels, as per the point above. As such we set our base forecast level at recent historical levels.

49. We have however allowed for a small number of additional standby fault personnel to assist in managing the increasing number of faults being experienced on the network, to manage increasing fault restoration times. This represents a small step increase in our forecasted reactive Opex.

50. Our network also continues to experience growth, requiring additional assets and translating into additional network length and ICPs. We modelled the maintenance impact of this as a small compounding trend factor in the forecast expenditure model.

51. It is noted that we have included a top down efficiency adjustment to our reactive Opex forecast in years four and five of the CPP period. This reflects the efficiencies we expect to gain in maintenance from asset management and process improvements, as well as our increasing investments in asset

[7] NZIER requested from the Commission copies of our options analysis economic models for all our major projects.

[8] NZIER's point that if there is no alternate capacity then the peak demand is applied to the VoLL calculation is technically correct, however data validation prevents a value of zero being entered into the firm capacity fields and rather a value of 0.001 is required as per the comment field in the model.

[9] We accept our models could be better documented and laid out to prevent these misinterpretations from occurring, though the models when developed were not built with an external audience in mind. We intend to refine these models over time to make them both easier to use and more transparent to stakeholders.

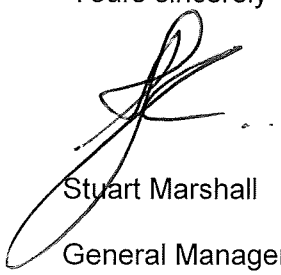
renewal, preventive and corrective maintenance. This adjustment resulted in a 3% reduction by 2023.

52. The combined effect of these modelling assumptions is a forecast 7% increase compared to a 2014-2018 average. However the overall expenditure trend is generally flat, and as a proportion of our overall spend it drops significantly during the CPP period.

D Conclusion

53. We are pleased to see continued stakeholder engagement in our proposal. The limited issues raised in submissions to the draft decision indicate broad support for the majority of the proposal. The submissions to the draft decision also reinforce the need for a post-final decision review of the CPP framework and process as many or the points raised are more appropriate for this than consideration in assessment of the Powerco proposal.

Yours sincerely



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Appendix A

Tauranga Projects – Reasons for excluding non-network options from shortlist

Papamoa

The project is driven by substantial ongoing greenfield suburban development, carefully planned as part of a joint Tauranga City Council and Western Bay of Plenty District Council urban growth strategy, steered through a joint working group, 'Smartgrowth'. The Council development plans have shaped the future of the area through substantial consultation over the last 10 plus years.

The three non-network options (distributed generation, fuel switching and demand side response) were not shortlisted on the following basis:

- Renewable generation sources are often not viable due to their intermittent nature and cost. Viable renewable generation options are also limited by the fact that the load on the Te Maunga/ Papamoa cable-spur is winter peaking. Fossil fuelled generation is technically viable but not shortlisted due to cost, environmental and consenting and issues. At no stage during the Council's extensive consultation has any alternate energy source been raised as a possibility by any of the major generators.
- Fuel switching and demand side response (DSR) are considered to be deferment strategies and their viability is uncertain. The greenfield development at Papamoa is inherently not viable for fuel switching and DSR as there are no existing customer to switch / control load. Powerco presently uses a mains borne ripple control system to control significant amounts of existing hot water cylinder load on the Te Maunga / Papamoa cable-spur. No significant/additional winter peaking consumer loads have been identified for control and given the greenfield nature & rate of the developing load DSR is not considered to be viable.

Pyes Pa

The development at Pyes Pa is similar to that of Papamoa in that the development is suburban greenfield in nature, has been widely consulted and is now also part of the joint council 'Smartgrowth' initiative. Powerco have worked with the developers to deliver a solution suited to the needs of the developer, and have done so in a competitive environment (The developers sought alternate reticulation solutions from other lines companies in direct competition to Powerco).

The three non-network options (distributed generation, fuel switching and demand side response) were not shortlisted on the following basis:

- Renewable generation sources are often not viable due to their intermittent nature and cost. Viable renewable generation options are also limited by the fact that the load on the southwest Tauranga area is winter peaking. Fossil fuelled generation is technically viable but not shortlisted due to cost, environmental and consenting issues.

- Fuel switching and demand side response (DSR) are considered to be deferment strategies and their viability is not certain. Powerco uses a mains-borne ripple control system to control significant amounts of hot water cylinder load on its network. During peak loading periods most hot water cylinders are turned off. The demand reduction, however, is not sufficient to alleviate the constraints. No significant/additional winter peaking consumer loads have been identified for control.

Tauranga Northern Reinforcement (Omokoroa)

The Tauranga Northern Reinforcement project is primarily driven by greenfield suburban development from council growth strategies.

The three non-network options (distributed generation, fuel switching and demand side response) were not shortlisted on the following basis:

- Renewable generation sources are often not viable due to their intermittent nature and cost. Viable renewable generation options are also limited by the fact that the load on the northwest Tauranga area is winter peaking. Fossil fuelled generation is technically viable but not shortlisted due to cost, environmental and consenting issues.
- Fuel switching and demand side response (DSR) are considered to be deferment strategies and their viability is not certain. Powerco uses a mains-borne ripple control system to control significant amounts of hot water cylinder load on its network. During peak loading periods most hot water cylinders are turned off. The demand reduction, however, is not sufficient to alleviate the constraints. There are no major industries in the Northern Tauranga area that would provide an opportunity for fuel switching or DSR.

Appendix B: Network Evolution Projects

The table below categorises our Network Evolution projects into those network work based innovation projects that will offer benefits in the short term to consumers, and the projects are more evolutionary and target the longer term network stability. (We note that there is a considerable degree of cross-over between these benefits – for example, customers will also benefit from a stable quality of supply, or effective control of EV charging will also help ensuring network stability).

Short-term customer benefit Initiatives	Benefits
Automatic fault detection and location	• Reduced outage times (especially in rural areas) • Avoid remote safety issues • Improved reliability • Enhanced performance of worst performing feeders • Reducing costs by increased contractor efficiency
Self-healing networks	Build on automatic fault detection pilots to: • Improve restoration times • Allow islanded networks • Improve supply resilience • Reduced network cost by deferring reinforcements
Integrating community energy schemes	• Enhanced incentives for use of distributed generation • Enhanced incentives for energy storage or other demand management means • Increased supply resilience • Maximise customer energy use flexibility • Peer to peer trading
Electric vehicle charging control systems	• Avoid restrictions on charging • Avoid network reinforcement cost • Facilitate vehicle to grid energy exporting
Demand management	• Avoid or defer network reinforcement cost • Downward pressure on energy prices
Longer term network stability benefits	**Benefits**
Energy storage	• Increase asset and network utilisation • Avoid or defer network reinforcement or asset renewal • Improve network stability • Access potential for ancillary support services from customer sources
Real time asset ratings	• Increase asset and network utilisation • Avoid or defer network reinforcement or asset renewal • Increase asset lives
State estimation and network automation	• Allows higher asset and network utilisation • Improved outage management and post-fault response • Allow capacity and demand matching

	• Increased network utilisation
Voltage support applications	• Maintain power quality within regulated levels • Maintain network stability • Potentially lower cost sources of VAR compensation
Smart meter data analysis	• Improved network planning • LV outage indication • Network utilisation information and demand curves • Consolidation of network power flows
Network Insights	• Avoid or defer network reinforcement • Improved asset utilisation / load factor • Enhanced fault location • Enhanced load flow & asset utilisation analysis