Understanding Network Quality Requirements and Customers' Views on Planned Outages

Authors:

Matthew Ogier* [1], Richard Fletcher [2]
[1] Consultation Manager, Powerco
[2] General Manager Regulation and Government Relations, Powerco

Presenters: As above

EEA Conference and Exhibition 2014, 18 – 20 June, Auckland

ABSTRACT

The electricity industry exists to serve customers. Customers in turn expect a safe, reliable, high quality energy supply at a fair price. They also expect adequate communication about the services they receive and the prices that they pay.

Over recent years, customer views on what constitutes a reliable supply of electricity and the definition of adequate communication have changed. Regulators internationally are also placing greater emphasis on the extent to which regulated electricity businesses engage with their customers; particularly around network reliability issues, typically measured by the number and duration of supply interruptions.

However, engaging with customers on these matters is challenging given the complexity of the industry. Members of the public require large amounts of background knowledge to offer informed opinions. Education is therefore an essential component of consultation. Powerco has a long-term focus on encouraging meaningful dialogue with customers. Our aim is to ensure we develop plans, systems and processes capable of meeting evolving customer expectations.

This paper will be presented in two parts. Firstly it will provide an overview of a recent industry initiative by the Electricity Networks Association (ENA) in New Zealand to establish a working group to review the technical options for measuring the level of quality delivered by network businesses in New Zealand and the implications for the regulatory regime going forward.

The ENA group's initial report **"Pathway to Quality"** was finalised in February 2014 and presents a number of observations and recommendations for refining the way "quality" is currently measured and incentivized. It also makes suggestions for engaging further with "customers" going forward to assess, both qualitatively and quantitatively, their value preferences with regards to network quality outputs.

By way of a <u>case study</u>, the paper will then provide an overview of a recent (and ongoing) customer engagement initiative put in place by Powerco. Its purpose has been to inform customers on what drives the need for planned outages and how work is assessed and prioritised by the Company. This initiative, which is ongoing, also aims to research customers' views on how the process for managing planned outages can be improved.

For example, planned outages should theoretically have a lower impact on customers than unplanned outages. However, given the disruption that any supply outage can cause (which will be different for different users) it is inevitable that planned outages will cause some customer dissatisfaction. Not surprisingly therefore, planned outages constitute a significant proportion of the complaints Powerco receives. Through the aforementioned consumer engagement process we are starting to identify where simple process improvements around the planning and notification process should reduce complaints going forward. The paper will share some of Powerco's preliminary observations in this area.

Understanding Network Quality Requirements and Customers' Views on Planned Outages

PART 1:
ELECTRITY INDUSTRY WORKING GROUP ON NETWORK QUALITY

1 Introduction

Electricity is an indispensable part of modern life. As the demand for electricity has grown over recent years and its use is becoming more diversified, society's expectations around what constitutes an acceptable level of service quality is also changing. Consumers increasingly expect to have an opportunity to have a say in the level of service they are paying for and in some cases provide input directly into the price / quality trade-off decision making processes of regulated businesses.

Regulators internationally are also placing greater emphasis on the extent to which regulated electricity businesses engage with their customers; particularly around network reliability issues, typically measured by the number and duration of supply interruptions.

Understanding the balance between cost and service delivered is one of the key aspects of managing an electricity network. It forms an integral part of an EDB's asset management system, which is expected to demonstrate least whole of life cost outcomes to deliver a given set of network outputs. As noted by the Brattle Group in 2012, "In designing and maintaining reliability, planners focus on ensuring that the right mix of capital investment, and operations and maintenance (O & M) practices produce the desired levels of security and reliability [and customer service]."[1] The regulatory framework in New Zealand is also driving much greater transparency around how regulated companies are managing their assets and the steps they are taking to enhance their asset management maturity as measured against international good industry practice.

Existing ways of measuring network quality have developed over time. These arguably reflect the performance of conventional networks, asset configurations and service models. More recently, however, increasing evidence is emerging of changes to the energy delivery environment, supported by emerging electricity technologies on both the customer and network side. The overall impact of these factors on New Zealand networks is minimal at present. However, in time, it is likely that these changes could materially alter the way in which electricity is provided, quality is measured, and information is conveyed to end consumers.

There are therefore a number of new and emerging drivers on EDBs (i.e. financial, consumer, technological and regulatory) to understand the level of "quality" that networks will be required to deliver over the longer term and how these outputs will be specified and measured to meet the expectations of different consumer groups.

[1] The Brattle Group Ltd, "Approaches to setting electric distribution reliability standards and outcomes", January 2012, pg. 21

1.1 Quality of the Supply and Incentives Industry Working Group (ENA)

In 2013, the Commerce Commission (the Commission) signalled an intention to review the way distribution network quality will be regulated under the Part 4 Default Price / Quality Path (DPP) for the second regulatory control period covering the period 2015 to 2020 (RCP2).

The Electricity Networks Association (ENA) identified an opportunity to review, at an industry level, the current arrangements for reporting on and regulating network quality performance. The ENA Board established a Quality of Supply and Incentives (QoSI) Working Group (the Working Group) with representatives from the Commission and the Electricity Authority (EA) in attendance in the capacity of observers.

1.2 Role and Purpose of the Industry Working Group

The purpose of the industry working group was to review those aspects of quality that matter to consumers, the technical options for measuring the level of quality delivered by EDBs in New Zealand (both over the short and long term) and the implications for the regulatory regime going forward.

In summary, the working group aimed to address the following broad questions:

a. What is quality and what does it mean for consumers?

b. What service characteristics do consumers value the most?

c. What are the main technical options available for measuring quality?

d. What are the implementation considerations (short and longer term context)?

e. What are the priority recommendations for the 2014 DPP reset process?

This paper focuses on providing a summary of the working group's observations related to items a, and b above (and a high level summary of c). A copy of the ENA group's initial report **"Pathway to Quality",** finalised in February 2014, can be found on the ENA website at www.electricity.org.nz.

1.3 Defining quality in the context of distribution activities

One of the important initial observations from the group was that, to date, the term "quality" has been used within the regulatory context to describe the level of service provided by EDBs to their customers. Given the primary role of a distribution network is to transport electricity from the bulk supply points to local consumers, quality of service metrics have largely focused on how well electricity has been transported.

The group determined that any review of "quality" from a consumer perspective should extend beyond the simple function of transportation. Quality typically covers such aspects as the differentiated levels of service provided in different locations, how a company interacts with its customers on a day to day basis, fault response times and the delivery of information during supply interruptions, to name a few.

1.4 Assessing what service characteristics consumers value the most

In an ideal world each electricity consumer would always receive exactly the level of service they are willing to pay for. However, an individually differentiated service is not possible as the physical characteristics of electricity networks mean that:

- The service received by customers connected to the same part of each network is highly correlated. This means that if an investment is made to increase the service level, all customers connected to the same piece of the network benefit. The converse is also true.
- The future performance of the network is a function of the network that currently exists. Networks consist of long life assets and as such the future performance is based on the mix between the current network and future investment. This means that the service is not immediately scalable to varying customer requirements from year to year.
- Network augmentation typically requires lumpy investments. In other words the investment required for an increase in service often requires step changes in consumer prices.

As such, for all but the largest electricity consumers who generally directly fund the assets used to supply their operations, a price / quality trade-off must be made for larger groups or communities of consumers.

The starting point to inform these trade-offs should be to understand the wants and needs of the different aggregated "groups" of consumers being supplied. Many EDBs routinely undertake consumer surveys targeted at understanding the various aspects of the services they provide.

The Working Group reviewed the results from several of these surveys and developed a suggested list of priority services deemed to be valued most by consumers.

In summary:

1. Duration of interruptions;
2. The number of interruptions;
3. Providing high quality power supply;
4. The time it takes to respond to a power cut;
5. The time taken to answer the telephone;
6. Providing information on reasons for and the likely duration and the extent of a power cut;
7. Processing applications for new connections; and
8. Sufficient notice of planned shutdowns.

For the purpose of describing customer value preferences within the NZ regulatory quality regime, the eight aspects of quality can be categorised into three broad areas:

- The reliability and resilience of the network. Reliability and resilience are general descriptors for the primary drivers of interruptions within a network (Items 1 and 2 above).

- Customer service. This covers the qualitative aspects of service provided by EDBs (Items 4 to 8 above and additional measures around services such as new connection and complaints).
- Power quality (Item 3 above).

It is worth noting that there were some differences in the relative importance of these attributes between commercial and residential customers, with commercial customers placing a higher importance on the duration and the number of interruptions than residential customers. While the results from the different surveys appeared to be consistent, the constraints on timeframes for the Working Group were such that the information was not able to be verified or further quantified (in dollar value terms)[2].

1.5 Summary of short and medium term recommendations

The Pathway to Quality report makes a number of recommendations, which cover both general observations for refining current quality metrics and suggestions (and a process) for assessing the benefits of developing an extended set of "quality" metrics over the longer term. Effective consumer engagement underpins both the group's short and long term recommendations. The following summarises some of the group's key recommendations (for full details of the group's conclusions and recommendations refer to the Pathway to Quality report).

Recommendations for short term improvements

As noted above the Working Group considered that, from a consumer perspective, ensuring the reliability and resilience of the network was a priority quality output expected from EDBs. Reliability and resilience are general descriptors for the primary drivers of interruptions within a network. The group therefore recommended that for practical reasons, quality reporting over the short term should continue to be based on network averages for SAIDI and SAIFI. The group did however recommend a number of refinements to the way the current measures are specified. These are summarised in the table below.

Summary of recommended "quality" options for the next DPP reset (2015-2020)

Measure / Option	Value to customer (Current)	Data Availability	Incentive for timely investment	Ease of implementation
SAIDI as a metric	✓✓✓	✓✓✓	✓✓✓	✓✓✓
SAIFI as metric	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Unplanned outages (%wt)	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Planned outages (% wt)	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Company averages	✓✓	✓✓✓	✓✓	✓✓✓
Allowance for natural variation	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Adjustment for major events	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Revenue linked incentives	✓✓✓	✓✓✓	✓✓✓	✓✓

[2] One of the key recommendations from the working group was that further work is undertaken, at an industry level, to further assess and if possible quantify consumer value preferences / willingness to pay.

Recommendations for longer term improvements

The working group identified that disaggregating the current interruptions measures and / or extending the existing measures to include new metrics could provide a more meaningful picture of overall network quality performance. However, this should be a longer term objective. The group noted the following:

- The extension of existing measures and the introduction of new measures is not costless; there must be a clearly defined benefits case prior to introducing new requirements
- Extended reporting around new measures does not necessarily need to form part of an EDB's regulatory quality path (i.e. the important thing is to ensure that the right information is made available to consumers)
- Practical implementation issues need to be considered before introducing new requirements on EDBs; not least the availability of data in a consistent format across all EDBs needs to be assessed
- Importantly, the starting point for any service quality scheme is to understand the wants and needs of consumers being supplied and the value that different groups place on the various aspects of the services they receive. Enhanced consumer engagement at both a company and industry level is a key recommendation (refer Part 2 of this Paper).

Summary of potential quality metrics over the longer term (2020 onwards)

Measure / Option	Value to customer (Current)	Data Availability	Incentive for timely investment	Ease of implementation
CAIDI	✓✓✓	✓✓✓	✓	✓✓✓
Energy not supplied	✓✓✓	×	✓✓	×
Capacity availability	✓	×	Unknown	×
Expected number and duration of outages	✓	×	Unknown	×
Identified by customer location	✓✓✓	✓	✓✓✓	✓
Worst served customers	✓✓✓	✓	✓✓✓	✓
Customer satisfaction	✓✓✓	✓	✓✓✓	✓
Quality of information provided during an outage	✓✓✓	×	✓✓✓	✓
Processing of new connection applications	✓✓✓	✓	✓✓✓	✓
Timely notification of planned outages	✓✓✓	✓✓✓	✓✓✓	✓✓
Forward looking benchmarks	✓✓✓	✓	✓✓✓	✓

PART 2:
POWERCO NETWORK QUALITY (PLANNED OUTAGE) RESEARCH

2. Introduction

This second part of the paper provides an overview of a recent initiative by Powerco to inform consumers on what drives the need for planned interruptions to supply and to communicate how work is assessed and prioritised by the company. The initiative, which is still in progress, also aims to research consumers' views on Powerco's planned "outage" processes, including communication effectiveness.

The initiative aligns well with the core conclusions and recommendations from the industry working group. It can be considered an initial step in trying to establish more detailed consumer value preferences to inform future planning and investment (albeit in the specific area of planned outages).

To recap, the industry working group concluded:

- That, on balance, it was appropriate to retain SAIDI and SAIFI metrics which include both unplanned and planned interruptions.

- Consideration should be given as to whether or not planned outages should be equally weighted (in regulatory targets) or have a lower weighting than unplanned outages; reflecting a perceived difference in consumer value weighting.

2.1 Powerco's Planned Interruption Statistics

In aggregate, taken over the last five years, planned interruptions made up around 20% of Powerco's total SAIDI. However, the percentage has been increased significantly over the past ten or so years reflecting the increased level of work now taking place across our networks. In 2004 planned outages comprised only 5% of SAIDI, but in 2013 the figure was closer to 35%. Planned outages also make up a significant proportion of the consumer complaints received by Powerco. For the year ending 31 March 2014, planned outages were associated with approximately 18% of complaints.

Powerco's current Asset Management Plan signals an anticipated need to lift network investment materially over the next few decades to maintain network average reliability at current levels. In the short term, and while detailed thinking is progressed to ensure that our future investments have been fully assessed, we believe that we can manage our networks to achieve levels of reliability in line with our regulatory targets. However, given the increased level of expenditure required on the network (from around 2017/18 onwards) and the nature of the work itself, we anticipate significant future pressure being placed on the planned interruption component of our overall SAIDI target.

2.2 Aims of the consumer research initiative:

The main objective of the research programme was to provide sufficient direct feedback from customers on their previous engagements with Powerco during periods when their supply has been interrupted intentionally (planned), as well as gain an insight into those aspects of

Powerco's related services they value the most. The results feed directly into the company's on-going process improvement programmes aimed at optimising the scheduling of planned outages for customers.

An ancillary objective was to understand (and to an extent validate our working assumption) how consumers perceive planned outages relative to unplanned outages. This sort of feedback will ultimately help to inform the level of weighting which might be applied to different types of interruption metrics when establishing future regulatory targets.

2.3 Approaches applied to seek consumer feedback

Powerco uses a variety of tools to routinely consult with its customers and stakeholders to understand their views and take these into account when making planning and operational decisions. Some of the issues around planned outages and associated price / quality "trade-off" considerations over the short and longer term are complex, which can make it difficult for non-technical people to participate meaningfully. For this reason the consumer research initiative was centred around three different communication channels, each designed to provide a degree of baseline "education" in order to establish a context for issues being researched. Namely:

- Field days / exhibition survey
- Focus groups
- Online video / survey

2.3.1 Field days and Exhibition survey

Powerco attends agricultural field days and various expositions as part of its annual consumer consultation programme. In 2013, Powerco participated at three separate events – Central Districts and Mystery Creek agricultural field days and the New Plymouth Home and Lifestyle Exposition. At each event consumers were questioned via touch screen surveys (self-selected) on various topics including quality of supply and perceptions around planned and unplanned outages

- Three separate events held in 2013 – photo attached is the Powerco stand at Mystery Creek in 2013.
- Over 2150 respondents completed a touch pad questionnaire
- Respondents split by 46% urban, 52% semi-rural and 2% remote rural.

2.3.2 Consumer Focus Groups

The use of focus groups is an integral part of gauging public perceptions as they have some obvious benefits over quantitative surveys. Powerco, operating via a professional researcher, can interact with participants, pose follow-up questions or ask questions that probe more deeply on particular issues. Qualitative results and opinions from focus groups supplement the “hard” statistical data from quantitative surveys to provide a robust overall data set.

In 2013, Powerco engaged a market research company, Key Research, to set up and conduct five consumer focus groups. To be eligible for participation on a group, members were required to have their electricity network services supplied by Powerco.

- Five focus groups established in Paeroa, Te Puke, Tauranga, Coromandel and Matamata
- Each group comprised between 7 and 16 people (male / female)
- Age of focus group members ranged from 25 to 60 plus
- Members were residential or commercial (not large industrial)

The primary objective of the focus groups was to develop a better understanding of consumers’ views on planned and unplanned outages. To ensure that discussions were informed each group was provided with background information on Powerco’s activities. This included an explanation of the structure of the wider electricity industry, details of Powerco’s operational footprint, an outline of general make-up of a retail energy bill and various factors driving supply interruptions on Powerco’s networks.

2.3.3 Online video and survey

In early 2014, an online survey was conducted, which built on the previous information obtained from the field days surveys and the focus groups. By allowing the use of free form question responses the online survey allowed participants time for more considered responses which were used to complement the results from the more quantitative questions.

To ensure that respondents were informed prior to completing the survey an accompanying video was produced by Powerco. It provided some basic education on the planned outage process and the drivers for the annual work on the network undertaken by Powerco.[3]

[3] A copy of the video is available on Powerco’s website at www.powerco.co.nz

- Newspaper adverts were placed to advise consumers about the online survey
- An incentive was provided to encourage people to spend 10 minutes watching the video and completing the survey (competition with $3000 equivalent prize)
- Over 460 people responded to the survey with a good demographic spread – all respondents had watched the video

2.4 Key Findings

This section summarises some of the main findings from the consumer engagement imitative. Many findings were as anticipated. The survey confirmed our presumptions on how customers perceived planned outages and provided direct feedback on where and how the company's process of engagement can be improved.

2.4.1 Perceptions of planned outages vs. unplanned outages

An overwhelming majority (around 97% or 452 people) of respondents to the online survey consider planned outages to be generally more acceptable than unplanned outages. A similarly large majority would also support an increase in the frequency of planned outages if they reduced the risk of unplanned ones, providing Powerco communicated effectively in advance. This is illustrated in the following figures.

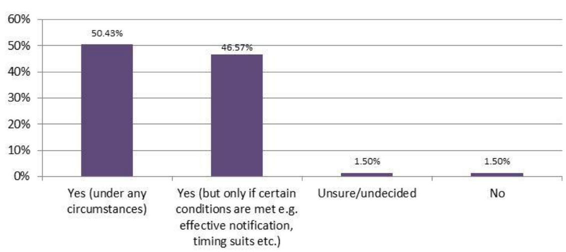

Figure 1: Do you think PLANNED power cuts (notified in advance) are generally more acceptable than unexpected power cuts (Online survey – 467 responses)

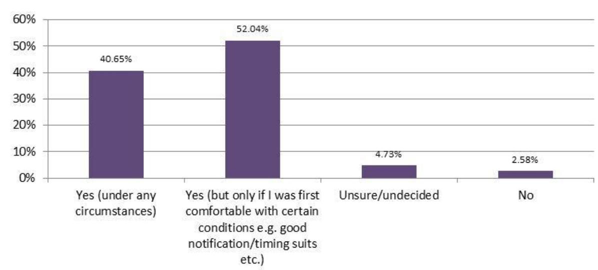

Figure 2: Would you prefer more PLANNED power cuts (notified in advance) than you currently experience if they reduced the risk of UNEXPECTED power cuts? (Online survey – 466 responses)

When asked about the frequency and duration of planned vs. unplanned outages, the results also indicated a preference for planned outages. In summary:

Figure 3: Preference metrics table – planned vs. unplanned

Area	**Question**	**Average response**
Acceptable number of Planned outages	How many PLANNED power cuts (notified in advance) would currently be acceptable to you over one year?	3.04
Acceptable number of unplanned outages	How many UNEXPECTED power cuts would currently be acceptable to you over one year?	2
Accepable duration of planned outage	What length of time would you consider acceptable to be without electricity during EACH PLANNED power cut?	Up to 3.87 hours
Acceptable duration of unplanned outage	What length of time would you consider acceptable to be without electricity during EACH UNEXPECTED power cut?	Up to 2.59 hours

2.4.2 Perceptions around satisfaction with the planned outage process

The majority (over 77%) of respondents who had experienced a planned outage over the previous two years were either very satisfied or satisfied with the outages they had experienced. However, that leaves nearly a quarter of the 184 respondents being either neutral or dissatisfied with some aspect of their overall experience.

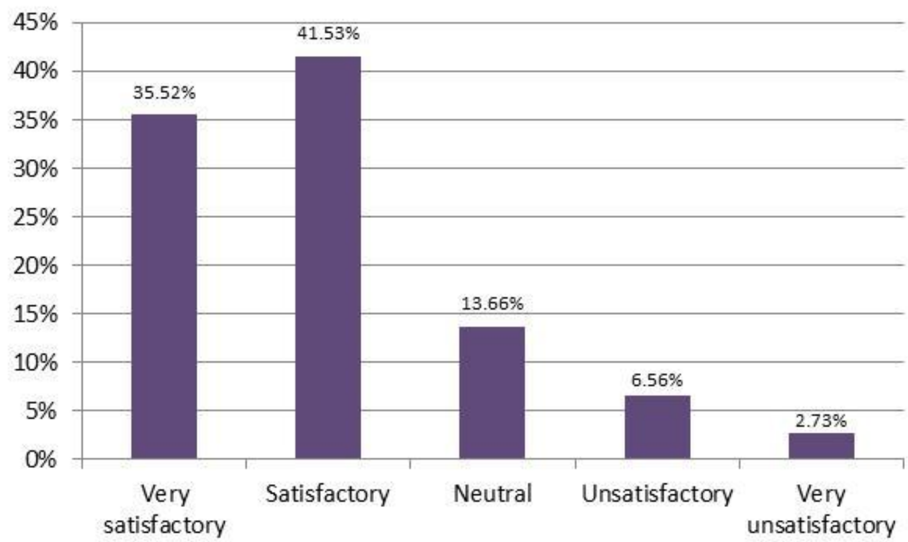

Figure 4: When considering the entire process from notification through to the actual power cut, how would you rate the experience? (Online survey – 184 responses)

Not surprisingly, most dissatisfaction related to perceptions of poor communication. This finding was supported by anecdotal feedback from the focus groups. It should also be noted that timing of planned outages will always cause dissatisfaction for some consumers. It was clear that consumers wish to be informed in formal notifications about why any planned outage is necessary, what benefits there would be from the work as well as details about the outage itself (time / duration etc.).

2.4.3 Perceptions around short vs. long term trade-offs

Most respondents were prepared to take a longer term view than was anticipated when it came to considering the impacts of supply interruptions. Most would be prepared to accept increased planned outages now if this reduced the risk of unplanned outages in the future; with the proviso that Powerco and retailers meet certain conditions. Namely, notification must be effective; outages should be scheduled with consideration for the different needs of consumers, times specified for outages should be adhered to and changes to scheduled outages, for unforeseen circumstances, should be communicated to consumers as soon as practicable (refer to Figure 5).

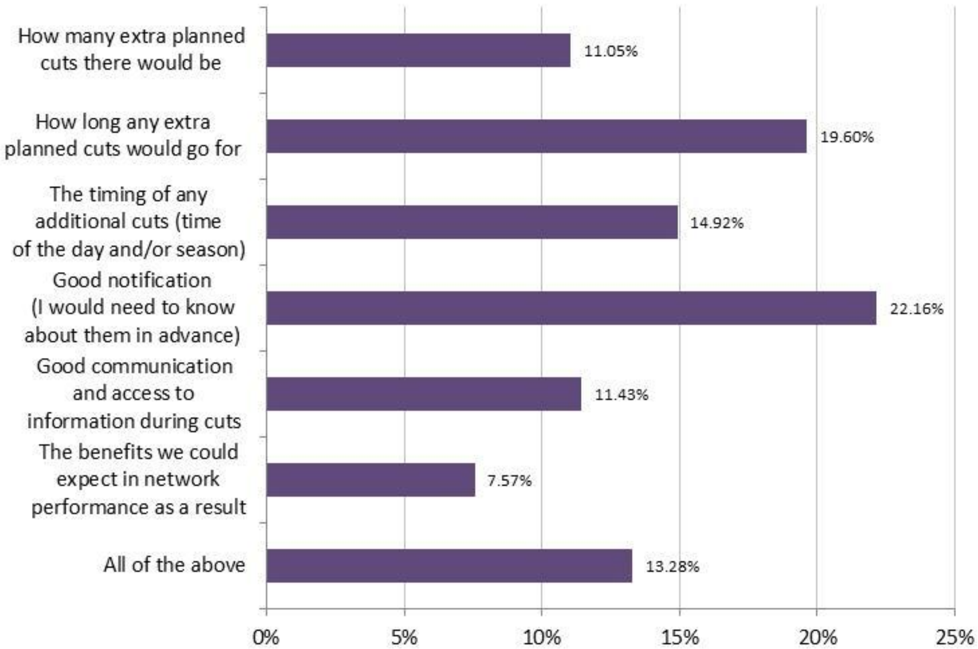

Figure 5: Which of the following conditions would you need to be comfortable with to accept an increase in planned cuts? – SELECT ALL THAT APPLY (field days surveys – 1837 responses)

2.4.4 Perceptions of preferred communication channels

Around 65% of the 467 respondents who completed the online survey noted that they expected the primary channel for communication on scheduled power outages to be with their retailer. However, rural consumers, farmers and businesses expect a closer relationship with Powerco as the network service provider.

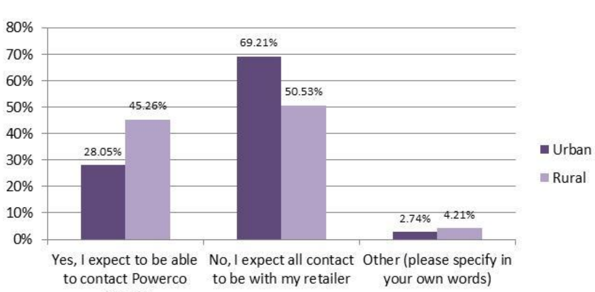

Figure 6: Do you expect to have any contact with Powerco at any stage of the PLANNED power cut process (Online survey, urban vs. rural – 467 responses)

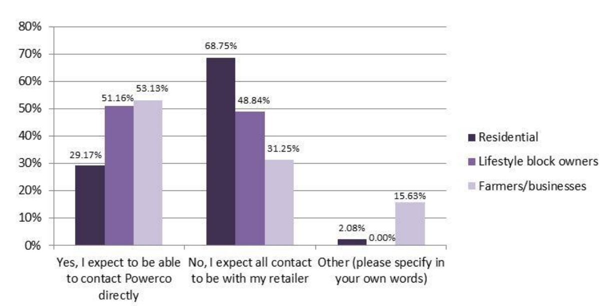

Figure 7: Do you expect to have any contact with Powerco at any stage of the PLANNED power cut process (Online survey, by consumer type – 467 responses)

2.4.5 Perceptions on information to be provided during notifications

Although not conclusive the responses from the surveys, summarised in Figure 8 below, indicate that consumers placed a slightly higher priority on receiving information explaining the benefit of particular outages rather than details of the work to be carried out per se.

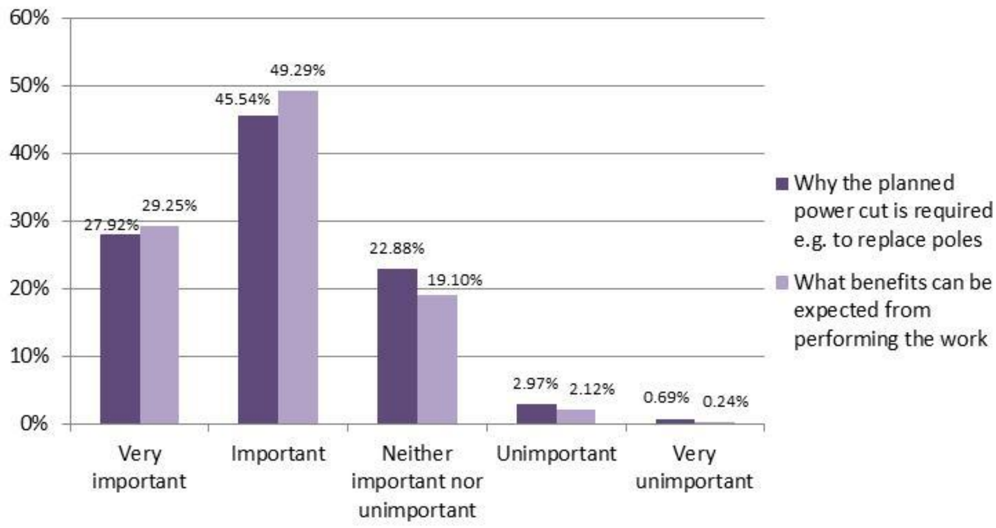

Figure 8: How important is it to you for PLANNED power cut notifications to contain information on the following? (Online survey – 437 and 424 responses)

3. Conclusions

Powerco entered into this research project with some preconceived ideas about how its consumers' perceived planned outages and their preferences around planned vs. un-planned outages. To a large extent the research has validated these assumptions and provided some additional assurance that Powerco's processes for engaging with consumers are effective.

Perhaps a more surprising conclusion was that consumers surveyed were prepared to take a longer term view than was anticipated; insomuch that they would be prepared to accept increased planned outages now if this reduced the risk of unplanned outages in the future. It is noted that this position was heavily caveated and predicated on the needs case for increased levels of planned outages being communicated and effective engagement by Powerco both pre, during and post an outage period.

Specific conclusions drawn from the research engagements were.

- There was general satisfaction with how scheduled power outages are currently conducted, with some communication improvements desired.
- All focus group participants thought that planned power cuts are more acceptable than unexpected power cuts.
- Participants overwhelmingly preferred an increase in planned power cuts if they reduced the risk of unexpected power cuts.

- Effective notification is the most important condition specified by participants who would conditionally accept an increase in scheduled outages. A mix of communication channels is desired during both scheduled and unexpected outages.
- Most participants expected communication regarding a scheduled power cut to be with their retailer. However, businesses and farmers expect closer a relationship with Powerco or contractors.
- There was a widespread perception amongst participants that scheduled power cuts cannot be changed, and that they will not please everyone.

Finally, the results lend some support to one of the recommendations proposed by the industry working group, which advocated considering placing a greater level of importance (or % weight) on the regulation of “unplanned” outages relative to “planned” outages. Customers’ generally higher preference for planned outages would tend to support such a move.