The Authority's final decision on claim of an undesirable trading situation

Claim submitted 12 December 2019 by Haast Energy Trading, Ecotricity, Electric Kiwi, Flick Electric, Oji Fibre, Pulse Energy Alliance, and Vocus

22 December 2020

Executive summary

The Electricity Authority regulates the electricity industry. Its statutory objective is "to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers." The Electricity Industry Participation Code 2010 (the Code) sets the rules for the industry. Part 5 of the Code provides the Authority with obligations to identify and correct undesirable situations in the wholesale market.

An undesirable trading situation (UTS) is a situation outside the normal operation of the electricity market that threatens, or may threaten, confidence in, or the integrity of, the wholesale market and which cannot be addressed by other provisions of the Code (aside from the High Standard of Trading Conduct (HSOTC) provisions. The UTS provisions of the Code provide the Authority with the ability to address such situations and restore the normal operation of the market.

In December 2019 the Authority received a claim from seven market participants that a UTS had arisen and was ongoing. At the time of this claim, the Authority had already initiated our own market review having noticed spilling activities and high offers. Something unusual was occurring and the Authority decided to take a closer look. The occurrence of something unusual does not alone mean there is a UTS, but it was the trigger for the investigation that has now been completed.

The Authority has considered the situation, and the submissions we have received on that situation, in depth. We have decided that a UTS did occur between 3 and 27 December 2019. The Authority considers that, if market outcomes such as levels of excess spill and resulting prices become too far removed from underlying supply and demand conditions, including because competitive pressure is not operating as it normally would, then confidence in the market may be threatened. This is what happened during the UTS period.

The situation in December 2019 was exceptional. The South Island had extreme rainfall, record high inflows in South Island lakes and South Island hydro generators had to spill excess water to manage water levels and flows. Water was abundant, cheap and available for generation. Indeed, Sapere, in a submission made on behalf of Meridian Energy Limited (Meridian) said that "…the massive increase in fuel available to hydro generation would have increased, not decreased, competitive pressure in the wholesale market." The Authority agrees the abundance of fuel *should* have increased competitive pressure but the analysis undertaken by the Authority shows it did not.

It is reasonable to expect high prices when there is scarcity of supply – we saw this relationship described in response to the 2018 UTS claim. However, in December 2019, there was a surplus of supply, yet wholesale electricity prices did not come down; they remained high for an extended period. The Authority has found a confluence of factors existed that reduced the normal competitive pressure in the wholesale market. This resulted in unnecessary spill and prices remaining abnormally high when compared against the supply and demand conditions. The Authority considers this separation of prices and other market outcomes from underlying supply-demand conditions may have threatened participants' confidence in the market.

The 2019 UTS claim

The Authority's primary function is to regulate New Zealand's electricity markets. High-performing markets have a direct link to innovation, investment and increased levels of competition – providing opportunities for participants and giving consumers access to more choice.

The Authority closely monitors the electricity markets – we observe what is occurring and we act if need be. We noticed the spilling activities and offers in early December 2019 and opened a market review. A day later we received the UTS claim.

The Authority received the UTS claim on 12 December 2019. The claimants submitted a UTS had begun on 10 November 2019 and was continuing at the time of the claim. The claim was made by seven market participants: Haast Energy Trading Limited (Haast), Ecotricity, Electric Kiwi Limited, Flick Electric Limited, Oji Fibre Solutions (NZ) Limited, Pulse Energy Alliance LP and Vocus.

The UTS claim focused on the spilling and offer behaviours of Meridian and Contact Energy Limited (Contact). The Authority extended the investigation to include Genesis Energy Limited (Genesis) because it was also spilling significantly from its South Island lakes during the period of investigation.

The Authority opened an investigation and released a preliminary decision on 30 June 2020. The preliminary decision outlined our approach to the investigation and key considerations we had identified. We released a supplementary consultation in November 2020 to seek further feedback on particular matters, including elements of our analysis, some additional supporting empirical work and a proposal to extend the timeframe for any UTS. These consultations formed part of a rigorous investigation and analytical process.

While the Authority and claimants identified issues with how the market was operating early in December 2019, the situation was complex with many factors to consider. These included resource management constraints on generators, as well as complexities in assessing what had occurred against the normal operation of this market. We have taken the time to collect information, consider all the evidence and all the submissions, and test our thinking. On request, we have provided additional time for interested parties to submit their points of view. We appreciate the time and resource dedicated to the process.

Our approach

The Authority has responsibility for deciding whether there is a UTS. The UTS provisions are broad and exist to respond to situations which threaten, or may threaten, the confidence in or integrity of the wholesale market. While the UTS legal test is the same for each claim, the circumstances of each claim are likely to vary and may require the Authority to consider other lenses, or frameworks for analysis, through which to assess whether market confidence or integrity may have been threatened.

As a starting point, the Authority first considered whether something unusual had occurred that warranted further investigation. We identified a confluence of factors that we considered made the situation unusual. We then identified what it was about the unusual situation that may have threatened market confidence and/or integrity. In this case we considered that the confluence of factors had resulted in a reduction in competitive pressures below levels observed when the market is operating normally. We then assessed whether this reduction in competitive pressure had led to the market operating otherwise than it would normally, with reduced competition leading to excess spilling and abnormally high prices given the supply conditions.

The Preliminary Decision Paper (PDP) outlines our initial analysis. In response to submissions, we supplemented this analysis with a further supporting empirical analysis which is set out in the Supplementary Consultation Paper (SCP). This empirical analysis operated as a cross check for what already appeared to be unexpected market outcomes. Having identified a discrepancy, we looked to establish the magnitude and duration of that difference.

We then used our analyses to inform our judgement as to whether the situation threatened, or may have threatened, confidence in, or the integrity of, the market.

There was a confluence of factors that made the situation unusual

At the centre of our investigation were the circumstances between 3 and 27 December 2019. Specifically, we identified factors that, together, we consider created an unusual situation.

The factors we identified were:

(a) the extreme rainfall and high inflows;

(b) the pending outage of the HVDC and Pohokura gas field;

(c) Contact using new automated spill gates for the first time during a flood event and therefore wishing to avoid being the marginal generator and the consequent need to frequently change dispatch;

(d) Meridian's decision to withhold generation to avoid the HVDC binding; and

(e) Genesis operating as a price taker in the South Island.

The collective impact of these factors is the key point. Individually, some of these factors may not have been unusual. Some parties submitted that each factor alone was normal or should have been expected. However, the Authority considers all factors combined to produce a set of circumstances the industry would not have reasonably expected. As Contact submitted "We agree that collectively this confluence of circumstances were unusual."

The Authority appreciates that a major focus of generators was ensuring the health and safety of their staff and the surrounding communities, looking after plant and complying with resource management and other constraints. This goes to the confluence of factors that arose (particularly high inflows) that made this situation unusual and required further investigation, and has been taken into account in the Authority's analyses.

The situation reduced competition

Just because a situation is unusual or unexpected does not necessarily mean it may threaten confidence in, or the integrity of, the market.

Here, the Authority considers the confluence of factors resulted in competitive pressure not operating in the spot market in the way normally observed. Specifically, the extreme rainfall caused issues with the operation of Contact's spill gates under the Clutha flood rules. These flood rules govern how Contact manages the Clutha River during a flood including obligations to facilitate sediment flushing. The combination of the rules and Contact's spill gates at Clyde limited its ability to compete at the margins.

The pending HVDC outage meant North Island generators were seeking to conserve fuel, further reducing competitive pressure. Genesis has said that it is a price taker in the South Island, which implies that it could not substantially affect the marginal price because of its size. Meridian withholding generation meant higher South Island prices. This in turn meant that the HVDC was not at its full capacity. The failure of the HVDC to bind meant prices between the islands did not separate. When prices separate under the conditions such as those that prevailed at the time, there is downward pressure on South Island spot prices.

This confluence of factors indicates to us that competitive pressure may have been reduced for the duration of the UTS period. These factors allowed prices generally to stay high for an extended period (when prices did eventually fall, this was due to demand changes, rather than a change in the above factors).

However, we still needed to consider whether this change from normal levels of competition affected the way that the market operated. We looked to market outcomes, which are dependent on the competitive pressures identified above and are likely to be the mechanism by which participants assess how the market is operating. Short periods during which competitive pressure is reduced may not necessarily translate into significant changes in market outcomes, but longer periods causing significant deviations in market outcomes from what is expected by market participants may threaten confidence in the market.

We conducted an assessment of how the market operated during the UTS period against how it might reasonably be expected to operate normally. This assessment was set out in the PDP and further explained in the SCP. Our analysis involved an objective assessment of this market. The assessment is not against a concept of perfect competition but against how this market, with its existing characteristics, may have been expected to operate. In response to submissions, we provided further quantitative analysis, using correlations to examine the difference between the comparator (i.e. normal market outcomes) and the outcomes observed in December 2019. These correlations were used to look at the relationships between variables expected in the normal market, for example that more expensive North Island thermal generation decreases as South Island hydro generation increases, which were then compared against what did in fact happen.

Rather than the expected outcomes, both our analysis in the PDP and our analysis in the SCP found a breakdown in the relationships that are usually observed when the market is operating normally. Not only was the market behaving differently from the benchmark reflecting normal competition levels set out in the comparator but, in our empirical analysis, across the UTS investigation period, it was moving in exactly the opposite direction in nine out of ten cases.

The Authority concluded the lack of competitive pressure resulted in market outcomes that would not have been reasonably expected by market participants given the underlying conditions in December 2019.

The situation was of significant scale and duration

Confidence in the market is unlikely to be affected by small deviations from the normal operation of the market. We therefore needed to consider the scale of the difference in outcomes (including both their magnitude and duration) to determine if the situation may have threatened confidence in the market.

All South Island stations were spilling during December and our investigation found water was being spilled in preference to being used to generate. As part of our analysis, we undertook an empirical assessment of the extent of the spill at Benmore station to provide a robust calculation that took into consideration the mitigating factors such as Resource Management Act 1991 (RMA) and operational requirements.

During trading periods when Meridian could have generated more at Benmore, we estimated that at least a third of the water spilled could have been used for generation. Had this generation been dispatched, our analysis indicates there would have been a significant impact on electricity spot prices as well as reducing the use of North Island fuel that would otherwise have been conserved for the upcoming HVDC outage period.

The duration of the situation is also important. Having considered submissions on the relevant time period, our view is the relevant period for the UTS was from 3 to 27 December. This reflects the period during which market outcomes significantly deviated from those reasonably expected of the normally operating market, particularly given the substantial spilling during that period, the high prices and the fact that thermal generation was running. Prices did fall after 18

December 2019 in response to a fall in demand. However, the spilling continued, and South Island generation would still have been expected to displace North Island thermal and hydro generation if the market had been operating normally, but did not do so.

Confidence in the market may have been threatened

Having considered all of the evidence, the Authority has decided the situation was such that confidence in the wholesale market was, or may have been, threatened. We consider market outcomes during the UTS period were significantly different from what would reasonably be expected if the market had been operating normally. Our view is that reduced competition, caused by the confluence of factors at the time, allowed excess spill and prices to become separated from the underlying supply-demand conditions and remain higher than they should have given the abundant supply of water.

If this had been a small event, or of short duration, it may not have threatened confidence in the market. Transient losses of competitive pressure do occur and will not necessarily significantly affect market outcomes or participant confidence. However, the magnitude and duration of this situation were sufficiently large that, in our judgement, it may have threatened confidence. While not conclusive, the fact that the Authority received a complaint from seven different complainants at the time, supports this view.

The Authority has previously identified, in our decision on the 2011 UTS, that where participants observe that prices are greatly divorced from supply-demand conditions and are excessively higher than underlying costs, they may lose confidence in the integrity of the market. This is what we consider happened here.

The Authority does not reach a decision of this nature lightly. The purpose of the UTS provision is to allow the Authority to take steps when we consider market confidence or integrity may have been threatened. The Code does not foresee all eventualities. We have not identified any other mechanism under the Code that could address this situation. We therefore consider that, for the period 3 to 27 December 2019, there was a UTS.

Next steps – actions to correct

Our decision brings to an end a long investigation and consultation process. This is a contentious issue and there were many and varied opinions. The Authority appreciates the dedicated time and resource by interested parties during this process. The submissions have been detailed and aspects have informed our thinking.

The Authority is currently working on an ‘actions to correct’ paper which will seek to correct the UTS of 3 to 27 December 2019. We expect to release a draft paper in February 2021 for consultation.

In a separate stream of work, the Authority continues to investigate potential breaches of the HSOTC provisions in the Code in response to allegations made in the 2019 claim. We expect to complete these investigations in early 2021.

The Authority is in the process of considering changes to the high standard of trading conduct provisions of the Code and may also consider other changes as a result of our market review.

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1 Introduction

1.1 A UTS is a situation that threatens, or may threaten, confidence in, or integrity of, the wholesale market – and which cannot be resolved via other mechanisms under the Code (aside from the high standard of trading conduct provisions). The Code provides the Authority powers to take corrective action if it considers a UTS has developed or is developing.

1.2 The Authority received a claim from seven participants on 12 December 2019 that a UTS had begun on 10 November 2019 and was continuing at the time of the claim. After considering the matter, the Authority opened an investigation into the allegations made in that claim.

1.3 The Authority released a preliminary decision in relation to the claim on 30 June 2020. The preliminary decision concluded that the situation did constitute a UTS, because spot market outcomes differed markedly from what was expected given the underlying supply and demand conditions, and the scale of this difference was large, threatening the confidence or integrity of the spot market.

1.4 Based on submissions and cross submissions received in response to this preliminary decision, the Authority decided to also release a SCP on 9 November 2020. This supplementary consultation sought further submissions on three matters that the Authority considered would be useful to receive submissions on. The SCP sought feedback on the extent of the impact of reduced competition, comments on the further empirical analysis, and extending the period of the UTS from 3 to 18 December (as in the PDP) to 3 to 27 December.

1.5 This final decision paper (FDP) sets out why we have not ultimately changed our conclusion that there was a UTS.

1.6 This is a contentious issue and there are a range of diverse opinions. The Authority has carefully considered all submissions and cross submissions on the PDP and the submissions on the SCP. We are conscious that all parties want to see this matter resolved in a timely fashion, but we needed to follow a robust process to ensure we reached an appropriate and reasoned decision. The situation alleged by the complainants is over a longer duration than other claimed UTS periods previously considered by the Authority, with many factors impacting market outcomes.

1.7 Our focus in reaching our final decision has been on whether the situation was a UTS, not on assigning fault. A number of parties have commented on the nature of the behaviour of certain market participants. However, while blameworthy behaviour by participants may be a factor in a UTS investigation, it was not our focus in the present case as we considered that our assessment could be made without determining whether blameworthy conduct had occurred. We also note the separate HSOTC investigation that is in progress in relation to the actions of Meridian Energy and Contact Energy.

1.8 For completeness, we set out below the key process steps we have taken.

Step	Date
Market review opened	11 December 2019
UTS claim received	12 December 2019
Authority published UTS claim	13 December 2019
Information and relevant data collected including from Meridian, Contact and Genesis	December 2019 – April 2020
Fact check round 1 sent to Meridian, Contact and Genesis	4 March 2020
Fact check round 1 responses	18 March 2020
Fact check round 2 sent to Meridian	5 May 2020
Fact check round 2 response	25 May 2020
Preliminary decision paper consultation published	30 June 2020
Preliminary decision paper extension granted	3 August 2020
Preliminary decision paper consultation closed	18 August 2020
Cross submission extension granted	1 September 2020
Cross submissions on preliminary decision paper closed	16 September 2020
Supplementary consultation paper published	9 November 2020
Supplementary consultation paper extension granted	12 November
Supplementary consultation paper consultation closed	24 November
Final decision paper published	22 December 2020

2 Legal framework

2.1 This section examines:

(a) the test for a UTS; and

(b) aspects of its application in this case.

2.2 Clause 1.1 of the Code requires that, for there to be a UTS, the following criteria must be met:

(a) there must be a situation which involves the wholesale market

(b) that situation threatens, or may threaten, confidence in, or integrity of, the wholesale market

(c) the situation cannot be satisfactorily resolved via another mechanism of the Code (aside from the HSOTC provisions).

2.3 Clause 5.1(2) of the Code provides examples of situations that the Authority may consider constitute a UTS. However, as noted in clause 5.1(3) this list is not exhaustive, nor will the examples provided constitute a UTS unless they also fall within the definition provided in clause 1.1.[1]

2.4 The economic rationale behind UTS-type provisions is to assist in achieving operationally efficient and competitive markets by providing a mechanism for unexpected issues to be addressed. They recognise that market providers cannot foresee all eventualities and that some practices or events may be difficult to predict and prevent in advance. UTS-type provisions therefore often give market providers broad discretion to address practices which may threaten the market but which have not been expressly addressed in the rules.

2.5 We disagree with Sapere's submission on the SCP that this economic rationale means that two additional tests must be read in to the UTS definition: that the event/circumstances must be unforeseen or rare and that the standard of behaviour required from participants can be imputed by establishing the terms the rule drafters would have specified if they had provided a specific rule. While, as noted below, a finding of a UTS will likely be rare, neither of these two proposed additions form part of the requirements of a UTS under the Code. Further, the UTS provisions operate on an implicit acceptance that some things may never be capable of specific rule drafting, so a retrospective hypothetical rule drafting exercise is neither an appropriate nor a necessary element to establishing whether there has been a UTS. If all participants are behaving normally (and within the provisions of the Code), this may be relevant to a UTS inquiry, but it does not by itself exclude a UTS arising: there may be other factors or combinations of factors that create a situation which threatens confidence or integrity. For this reason, the Authority also disagrees with Meridian's argument that normal participant behaviour should create a UTS safe harbour.

2.6 The existence of a UTS provision in the Code is also consistent with the Authority's statutory objective, which, as noted above, is "to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers."

[1] A separate paper will be published by the Authority to address the Code provisions relating to actions to correct the UTS.

2.7 Some submissions responding to the Authority's consultations have used different and various terminology to describe the conditions for a UTS, including a requirement for "aberrant behaviour" and/or a need for market dysfunction.[2] In the Authority's view, while such matters may prompt a finding of a UTS in some cases, trying to import such language into the legal test risks unduly limiting the ambit of the UTS provisions as set out in the Code. However, this is not to say that a UTS will be a common occurrence – the requirement that the situation may threaten market confidence or integrity means that a finding of a UTS will likely be relatively rare.

2.8 Sapere also argues that the fact that it is possible to regulate for a factor implies that the circumstance cannot be a UTS. We disagree. The UTS provisions do not impose this limitation and such a limitation would be contrary to the purpose of the UTS provisions, which is to return the market to normal operation where a situation is causing or may cause a loss of confidence or integrity. This may arise from the absence of regulation. An example of such a situation was the 2011 UTS, which contributed to the introduction of the HSOTC provisions (clauses 13.5A and B of the Code).

2.9 Determining whether there is a UTS always requires a judgement by the Authority as to whether market confidence and/or integrity may have been threatened. The analyses the Authority undertakes to inform and support that judgement may take different forms depending on the particular situation.

(a) In some situations, the Authority can measure changes in confidence or integrity directly, for example by showing failings in parts of the wholesale market. Actual changes in confidence or integrity are a good indicator that the situation threatened or may have threatened confidence or integrity.

(b) Similarly, there may be situations where the impact on and reaction of participants in the wholesale market provides clear indications that there has been a UTS (for example, where participants exit the forward market due to uncertainty).

(c) Where a direct observation is not possible or participant reactions may not provide clear indicators, the Authority will look to alternative forms of assessment. In particular, it may assess how market outcomes are different from what may reasonably have been expected based on market fundamentals and then consider whether such changes have been sufficiently significant such that they threaten, or may threaten, confidence or integrity.

2.10 It is the latter approach the Authority has primarily adopted in the PDP, the SCP and in this FDP. We used an objective comparator to assess what normal market outcomes would reasonably have been expected and assessed these against what was observed during the UTS investigation period.

2.11 This assessment is an objective one, considering what outcomes participants might reasonably have expected and assessing what actually occurred against those outcomes.[3] In doing so, the Authority looked to establish a comparator, representing the

[2] See for example Meridian's submissions on the PDP and SCP.

[3] Compared to, for example, Meridian's submission on the PDP, which suggested that the Authority's approach had been based on its subjective expectations.

normal operation of the wholesale market based on an analysis of previous observations.[4]

2.12 Undertaking the above steps provides a framework to assist the Authority in reaching a final judgement on whether confidence or integrity was, or may have been, threatened by the situation that arose.

2.13 Further discussion of our approach, and the framework we used for our analysis, is contained in section 3.

2.14 We reiterate that in assessing this particular UTS allegation, we are not looking to establish particular blameworthy conduct by participants as might be required to establish some of the specific examples set out in clause 5.1(2) of the Code. While identifying particular blameworthy conduct may in some cases form part of the UTS process, in this instance we consider it is not necessary to do so.[5] The appropriate mechanism for alleging and addressing potential Code breaches is the compliance process. By contrast, the purpose of the UTS process is to correct situations which threaten, or may threaten, confidence in, or the integrity of, the wholesale market.

2.15 The Authority notes that we have undertaken two rounds of consultation (plus cross-submissions on the PDP) before reaching our decision on this UTS. We are satisfied that the process which has led to this decision is comprehensive and robust.[6]

[4] This is consistent with submissions, including from Meridian and Contact, that a UTS requires something outside of the normal operation of the market. However, the Authority notes it is the operation of the market as a whole that is at issue, rather than whether individual participants were acting normally.

[5] We disagree with Meridian's characterisation of the UTS test as something that may be "coupled with aberrant behaviour". Our focus is on outcomes not on behaviour in this case.

[6] Meridian submits that the time taken to reach a final decision on this matter may indicate that no UTS exists. It says that a situation constituting a UTS "by definition is an obvious and significant problem capable of ready identification and immediate correction". We disagree. That something unusual was occurring in the market was indeed obvious at the time. What the reasons for that were and whether the resulting situation was one that differed markedly from the norm to the extent that it may have threatened confidence in the market are, however, more complex matters that have benefited from a thorough investigation and the consultation process.

3 Our approach to assessing whether there was a UTS in this case

3.1 In this section we:

(a) set out our approach to assessing the UTS in this case, with respect to the spot market and the forward market

(b) outline how our approach is consistent with previous decisions.

3.2 As noted in the legal framework section, a decision as to whether a UTS has occurred is a matter of judgement for the Authority. In this case, the Authority received a complaint from seven participants regarding the situation in December 2019, as well as having ourselves observed that there appeared to be issues with how the market was operating. Given the complexities at play, including complicated resource management requirements for South Island rivers, the Authority considered that further analysis would be useful in order to inform our ultimate decision.

3.3 In this section, we set out our approach to the analyses we used to support our judgement. In particular, we looked specifically at the spot market and the forward market because between them they represent most of the value of the wholesale markets.

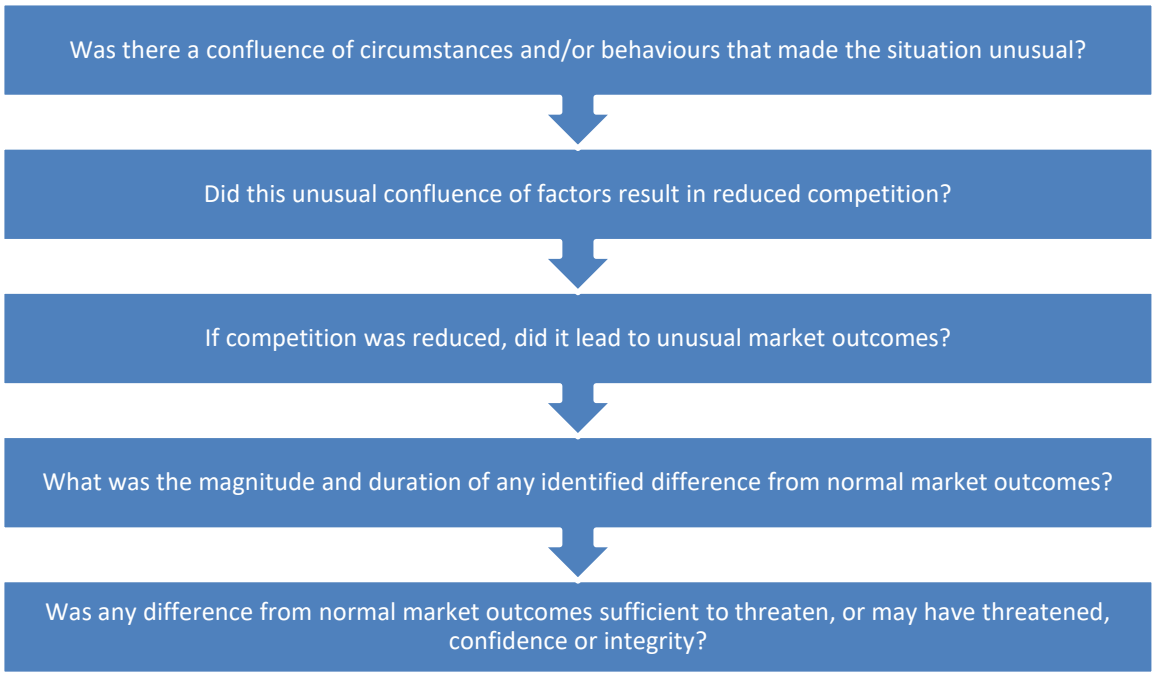
Spot market

3.4 As set out in the PDP, analysis of the spot market is complicated as participation in the spot market is not voluntary. This means that participation, or indeed volumes of trading, on the spot market cannot be used to measure confidence or integrity and an alternative method must be found.

3.5 In the PDP, the Authority set out the analysis we had used to support our preliminary view that a UTS had occurred in December 2019. In response to submissions, which suggested some misunderstanding of the Authority's approach, we provided further detail in the SCP, along with an opportunity for participants to comment further. The steps we took in our analysis were summarised in the flow chart reproduced in Figure 1 below.

3.6 We discuss the analysis in more detail in this section. However, it needs to be borne in mind that applying this framework for analysis does not create a new or different test for a UTS. The UTS test is as set out in the Code. This framework is the tool we have used to determine whether a situation arose that did or may have threatened confidence or integrity in the market.

Figure 1: Process used for assessing whether there was a UTS in this case



Was there a confluence of factors that made the situation unusual?

3.7 As a first step, the Authority considered whether something unusual had occurred to warrant further inquiry and, if so, what were the elements making up that unusual situation.

3.8 Some submitters noted that "unusual" circumstances are not enough to give rise to a UTS.[7] We agree – the test for a UTS is whether a situation threatened or may have threatened confidence in, or the integrity of, the wholesale market. The fact that circumstances are unusual will not necessarily mean they reach this threshold. However, the analysis the Authority undertook was not simply to ask whether the circumstances in late 2019 were unusual.

3.9 Rather, this was simply a first step to identify what the situation was that had given rise to concern. This is also why such a step is not necessarily apparent in previous Authority decisions – in other cases it simply went without saying that the Authority had identified factors which were unusual. However, given the variety of views presented by submissions around the Authority's approach to this UTS, we considered it would assist submitters if we were to provide an additional level of granularity in this case.

Did the unusual confluence of factors result in 'reduced competition'?

3.10 As a second step, we have then sought to establish what it was about the situation that may have threatened market confidence and/or integrity. As indicated by the flow chart, in this case, the concern we identified was a reduction in competitive pressure far below normal levels, which allowed prices to become dissociated from underlying supply-demand conditions.

3.11 Again, this was not a new approach. In some cases, it may be apparent exactly what it is about a situation that has driven concerns. However, again, given the views expressed in submissions, we thought it preferable to set out this step.

[7] See for example Meridian's submission on the SCP.

3.12 In its submission on the SCP, Meridian argued that reduced competition is not relevant to the test for a UTS and a UTS could be found without it. This is of course correct – not every UTS will arise due to a reduction in competitive pressure and the Authority could simply have moved directly to consider whether the confluence of factors we identified threatened confidence in, or the integrity of, the market. However, the Authority considered that it would assist participants for us to identify what it was about the confluence of factors that made it problematic, such that it may threaten participants' confidence in, or the integrity of, the market at an early stage in our analysis.

3.13 The Authority's concern that a lack of competitive pressure may result in a threat to confidence in the market is consistent with our 2011 UTS decision, where we noted that:[8]

> It is in the public interest to have an electricity market in which all participants can be confident prices are competitively determined. If participants observe that prices are greatly divorced from supply-demand conditions and are excessively higher than underlying costs, they will lose confidence in the integrity of the market arrangements and the incentive structures surrounding the wholesale market for electricity may be greatly damaged.

3.14 Meridian has also argued that it is inappropriate for the Authority to have considered reduced competition because competition is an ongoing process, rather than an outcome. However, the Authority's analysis has not looked to determine whether the market as a whole is competitive. Rather, we asked whether the factors we identified resulted in a lack of competitive pressure during a specified period of time, compared with what would be observed if the market was operating normally. That is, we were not looking to assess (or indeed improve) long-term competition in the market, but rather whether a particular feature of the normal market (i.e. usual levels of competitive pressure) was absent during that relevant period of time.

3.15 Submissions also made reference to concepts of workable and perfect competition, with Meridian suggesting that the Authority had applied a standard of perfect competition.[9] This is incorrect. The Authority assessed the competitive pressures in place during the UTS period against those which would reasonably be expected if the market was operating normally. This is why we referenced 'reduced' rather than workable competition. This UTS decision does not seek to assess whether competition in the market was 'perfect' or 'workable', either normally or during the UTS period.

Did this lead to unusual market outcomes?

3.16 Having established that there were factors that made the situation unusual and that the combination of these factors was potentially capable of threatening market confidence, the Authority then looked to assess whether these factors had led to the market operating otherwise than it would normally. We did this because failure of the market to operate normally can threaten confidence in the market.

3.17 However, assessing whether the market as a whole is operating normally is difficult, the market being made up of a multitude of interacting elements, some of which will have a greater impact on the whole than others. The Authority's analysis therefore focused on

[8] At paragraph 150.

[9] Meridian submission on the SCP.

market outcomes, such outcomes being the product of the market's operations.[10] Such an analysis is also useful from the perspective of assessing confidence since participants' focus will often be on market outcomes such as price (as evidenced by the complaint in this case).

3.18 We note that some submissions focused on whether the behaviour of one or more participants during the relevant period was 'normal'.[11] While certain types of behaviour may trigger a UTS,[12] the UTS test focuses on whether a situation may have threatened confidence in, or the integrity of, the wholesale market as a whole. It is therefore not an answer to say that a particular participant was (or indeed all participants were) acting 'normally' or in such a manner as might be expected in particular circumstances. If participants cannot have confidence that the market as a whole is operating normally, for example because competitive pressure has reduced to a point that prices are no longer being competitively determined, then there may still be a UTS.

3.19 In order to assess market outcomes, the Authority looked to establish what normal market outcomes would look like – this would then act as a 'comparator' against which it would compare the outcomes observed during the UTS investigation period. In the PDP, the comparator was established, and the comparison conducted. In the SCP, we added further to the quantitative assessment in our comparator analysis.

3.20 As noted above, the approach in the PDP and reiterated in the SCP and here is an objective one. That is, contrary to submissions on the PDP,[13] the Authority was not, and is not, comparing what occurred against how it wishes the market to operate. Rather, we are using our knowledge as an expert regulator, supported by empirical analysis, to identify what outcomes participants might reasonably expect when this market is operating normally.

3.21 Similarly, the Authority's analysis does not look to engage in 'market optimisation'.[14] Instead, we are looking to establish what would reasonably be expected when this market is operating normally. This is why the Authority's analysis is grounded in an assessment of what has happened in the market previously and in historical data – we are looking to establish how the market has normally reacted, rather than how a hypothetically perfect market would react.

Magnitude and duration of any difference

3.22 However, just because market outcomes are abnormal does not mean there is necessarily a UTS, for example, if the difference is slight or of too short a duration. The Authority therefore considered the magnitude of any difference in outcomes and its duration.

3.23 In terms of the magnitude, as set out in the PDP, the Authority looked to analyse this through the lens of unnecessary spill. We did this because, in our view, that wasted spill

[10] Note that our definition of "market operations" for the purposes of this decision does not refer to the physical market processes alone (such as SPD finding a pricing solution, the clearing and reconciliation processes, the dispatch process etc), but more broadly to how participants and circumstances interact to produce outcomes such as the resulting nodal price levels and generation shares.

[11] See for example Meridian's submissions.

[12] See the examples given in cl 5.1(2) of the Code.

[13] See Meridian's submission on the PDP.

[14] See Meridian's submission on the SCP. See also Meridian's submission on the PDP and Russell McVeagh's analysis appended to Meridian's cross-submission, which refers to the Authority attempting to amend the Code by stealth.

could be seen as representing the product of the lessening of competitive pressure and, if it had been used for generation, would have resulted in a reduction in price. Once we had calculated the amount of wasted spill, we were then able to calculate the impact this would have had on price. There are some complexities to our calculations given the particular circumstances at issue; nevertheless, the Authority is satisfied as to the robustness of our results.

3.24 The Authority also considered (and specifically consulted on) the timeframe for the UTS. Again, the timeframe is important as the longer a problematic situation continued the more likely it would be to threaten confidence in the market.

Overall assessment: was market confidence and/or integrity threatened?

3.25 Ultimately, the question the Authority has to answer is whether there was a situation which threatened, or may have threatened, confidence in, or the integrity of the wholesale market. The final step in the Authority's analysis was therefore to consider whether, in light of the various assessments we have undertaken, this threshold was met.

Forward market

3.26 As set out in the PDP, unlike in the spot market, participation in the forward market could sometimes be used as an indicator of confidence or integrity. If confidence has been undermined, then participation may materially change – either falling as participants exit or rising due to lost confidence in the spot market leading to increased insurance against spot market exposure. To the extent that these effects outweigh each other, this may limit the extent to which participation in the forward market, at least in the short term, is a reliable indicator of confidence or integrity. However, in principle, a change in participation in the forward market may signal an issue with confidence and/or integrity.

3.27 We therefore undertook an analysis of participation in the forward market – this is presented in the PDP. Submissions did not identify any alterations or areas for expansion on this that required further analysis and, therefore, it remains as set out in the PDP.[15] The implications of this analysis are set out below at section 8.

Previous decisions

3.28 In its various submissions, Meridian raised concerns that the approach the Authority has taken in this case has differed from the approach we have taken in respect of previous UTS claims. There will inevitably be differences in the precise approach to be taken between different UTS claims given the different circumstances from which the situation will have arisen. Further, in this case, the Authority's analysis has been complicated given the particular circumstances at issue. But the Authority does not agree that our approach is a material departure from what we have done in the past.

3.29 In particular, we consider that our assessment of whether a reduction in competitive pressure led to a loss of confidence in the market is not new. This was also an issue in the 2011 UTS investigation (an appeal against which was rejected by the High Court in *Bay of Plenty Energy Ltd v Electricity Authority*).[16] Our 2018 UTS decision also noted

[15] Meridian pointed out that participation in the FTRs market also remained steady during December 2019, and prices in the ASX were within the ordinary variance. As mentioned in the PDP, we did not examine participation in the FTRs market because the spot market and the forward market together represent most of the value of the wholesale markets.

[16] *Bay of Plenty Energy Ltd* v *Electricity Authority* [2012] NZHC 238.

that if spot prices and outcomes are consistent with market fundamentals, this suggests that the market has integrity and participants can have confidence in it.[17]

3.30 We note that the Authority's previous assessments of UTS claims have also considered market outcomes, even if they have not always been expressed as such. In the 2011 UTS decision, for example, aside from various claims of manipulative conduct etc., the Authority considered whether the exceptional prices it identified threatened trading.[18] Such prices represent a market outcome. Market outcomes were also assessed in the 2016 UTS decision.[19]

3.31 In assessing the 2018 UTS, the Authority again considered spot market prices, and whether those prices moved in a direction predicted by observed supply and demand (i.e. whether they were consistent with market fundamentals.)[20] As here, in that case, the Authority looked at correlations between market outcomes, including the use of thermal generation versus hydro generation historically, and compared that against what had happened during the period under investigation.

3.32 This is not to say that all of the same analyses could or should be conducted in each case – each UTS allegation is unique and will need to be assessed in a manner appropriate to its own particular facts. However, the Authority is satisfied that the approach we have taken in this case is not novel when compared to the approach we have taken in previous cases.

[17] At paragraph 10.3.

[18] At paragraph 149.

[19] See paragraph 8.2 onwards.

[20] See paragraphs 10.3 to 10.4.

4 There was a confluence of factors that made the situation unusual

4.1 As set out above, the first part of our assessment involves identifying whether there were circumstances which were unusual and warranted further inquiry. In this case, it is not just one factor that we consider may have contributed to the unusual situation, but a confluence of factors.

4.2 We set out in this section what we said in the PDP and SCP regarding the confluence of factors that existed and the submissions we received in response.[21] We then set out our final views on this aspect of the analysis.

What the Authority said in the PDP

4.3 The Authority's PDP included consideration of a number of factors which contributed to the situation arising in December 2019. In particular, it identified that hydro storage had increased significantly due to spring rain and snow melt causing high inflows in November and December 2019 – section 10 of the PDP provides evidence of this. The resulting flood event in December 2019 was considered to be significant, with few comparable events on record.[22] The Authority further noted the significance of the impending HVDC outage meaning that maintaining high storage in the North Island was important for system security.[23]

4.4 As part of the assessment of offer behaviour, the PDP also undertook an extensive review of the resource consent conditions and other resource management issues at play for the various hydro schemes to determine whether these had caused any of the issues observed. This is set out in some detail in section 12 of the PDP. In particular, the Authority looked at the Clutha hydro scheme, operated by Contact, and the various rules agreed by the Otago Regional Council. While flood rules will always be in place and could therefore not be considered unusual, the Authority did observe that the interaction between the spill gates Contact uses to control water levels (and therefore comply with its resource management obligations), the Clutha flood rules, and the December flood event being the first significant flood event for which they had been in operation, caused the spill gates to operate frequently. The gates had ultimately operated more frequently than anticipated and Contact had tried to minimise operations going forward to avoid wear and tear, including by increasing its offers to avoid being marginal and needing to change output in response to dispatch instructions. These issues arising in combination were unusual.

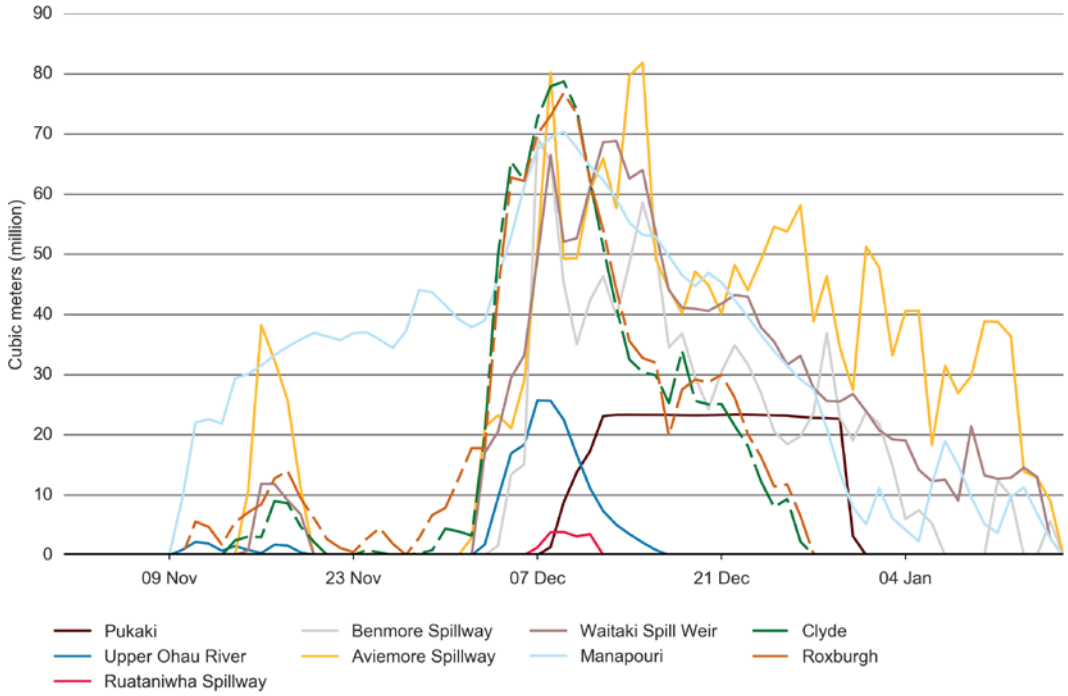
4.5 Figure 2 shows the timing of spill at different stations and structures in the South Island during the UTS investigation period. It shows that the majority of spill happened in December when there were exceptional inflows and large quantities of spill across the island.

[21] We note that key submissions are presented and discussed in each of this section 4 to 8 (and elsewhere in the body of this paper). Other comments on submissions are found in Appendix C.

[22] See PDP at page iii.

[23] See PDP at paragraph 10.12, 11.20.

Figure 2 Spill during the UTS investigation period



4.6 The Authority in the PDP also considered Meridian's activities during the relevant period. We reviewed Meridian's offer behaviour in detail[24] and identified sections of internal documents which suggested that Meridian had been actively managing the HVDC transmission constraint.

Main points from submissions on the PDP

4.7 Submissions and cross-submissions in response to the PDP commented on whether the flood event in late 2019 was unusual, but otherwise focussed primarily on individual behaviours and whether these behaviours were normal or not. The main themes raised in submissions included:

(a) Whether the situation was unusual, such as:

(i) MEUG stated that the flood event was at the extreme of historic inflows, i.e. they were not normal.

(ii) Meridian commented that while the rainfall event was exceptional, the way the market responded was consistent with normal market operations. The Sapere report commissioned by Meridian also pointed out that the "UTS provisions are a mechanism to enable the normal operation of existing market rules during unforeseen or exceptional situations", and that the events described in the PDP are neither unpredictable nor rare.

[24] See PDP at section 12.

(iii) Meridian argued that the Authority missed key features of the market in our analysis, and if these are taken into account, it is predictable that offer prices will not fall to low levels despite spill occurring.[25]

(iv) Contact questioned whether the circumstances were outside the normal operation of the market, and noted normal operation resumed in the current circumstances without any intervention. It said that competitive pressure remained, albeit that the competitive dynamics differed from what would ordinarily occur as a result of South Island hydro generators managing the flood event.

(b) Whether offer behaviour was normal, such as:

(i) Trustpower noted that Concept Consulting's finding (during work undertaken as part of the review of the HSOTC provisions) suggests offering to avoid transmission constraints binding is not outside the normal behaviour of the market.

(ii) Contact argued that the offer behaviour observed can be explained by the extreme operating conditions, has frequently occurred in the past, and produces price outcomes within the ranges that occur under normal operation of the market, and so cannot constitute a UTS. It argued that non-zero prices at a time of spilling are not uncommon (as shown by other submissions).

(iii) Meridian argued that its offer behaviour was consistent with a workably competitive market, previous spill periods, normal operation of the market, and other generators' behaviour. The Sapere report commissioned by Meridian also argued that it is common for excess supply to be wasted, using examples of low quality and perishable goods, and examples where no markets exist to match supply and demand. Meridian further argued that it did not at any stage during the relevant period withhold capacity and instead made offers for its entire operational capacity taking into account constraints.

(iv) The claimants argued that the way Meridian defines 'normal' is novel (i.e. both new and incorrect) and includes that if the practice is similar to past behaviour that was not investigated and/or not found to be a UTS, then it cannot be found to be part of a UTS in the future. The claimants submit that this is incorrect and that Meridian is effectively trying to rewrite the UTS Code provisions.

[25] These features of the market included:

- The spot market operates like a balancing market
- Generation is highly concentrated regionally
- Some generators are poorly diversified regionally and by broad fuel categories
- Short-term demand responses are very inelastic
- It is difficult for generators to accurately predict changes in their supply and demand
- FTRs and ASX contracts are coarse instruments for managing certain spot market risks.

(c) Whether energy-only markets justify higher offer prices, such as:

(i) Nova said it supports the argument that even in circumstances when spill is necessary, offer prices may not necessarily equal short run marginal cost (SRMC).

(ii) The claimants submitted that Meridian has previously argued that participants will lose confidence in the market if prices are excessively higher than underlying cost.

(iii) Meridian argued that offer prices above SRMC are regularly observed in New Zealand, and there is no requirement for offers to reflect SRMC. Thus, its conduct was expected under New Zealand's market design.

(iv) Contact argued that offer prices need to exceed SRMC frequently enough, and by enough, to recover fixed and marginal costs in an energy only market.

The Authority's assessment of submissions on the PDP

The situation was unusual

4.8 The Authority agrees with submissions, (e.g. those from MEUG), that the flood event which occurred in late 2019 was extreme and therefore unusual – we have therefore included this in our confluence of unusual factors as set out below. We similarly agree with Contact that circumstances were different from what would ordinarily occur in the market, in part due to the flood event (although we address the issues raised regarding competition in section 5).

4.9 As to Meridian's argument that the rainfall event was unusual but the market responded to it in normal ways, as noted above in section 3, we do not consider that, simply because individual participants were behaving in a way which might be considered normal, this precludes there being a UTS. We further consider that, because of the confluence of factors, including the fact that Contact's ability to apply competitive pressure was limited by its issues with its new spill gates and North Island generators were preparing for the HVDC outage, the market was not operating normally at the time. As to Meridian's assertion that it did not withhold any operational capacity, Meridian's use of what it terms "non-clearing tranches" means that generation is effectively withheld from the market.

4.10 Regarding Meridian's submission that the Authority has failed to take into account key features of the market which would have revealed that offer prices do not fall to low levels during spilling, the Authority agrees that the list of generator characteristics provided by Meridian is accurate (the "key features of the market" Meridian considers the Authority has ignored). However, we consider that the existence of such features does not negate the fact that observed outcomes differed markedly from historic norms. In addition, we consider that:

(a) When a hydro station is spilling, there is no need to predict inflows into that reservoir.

(b) While FTRs and forward contracts may be coarse instruments, we expect generators to use available risk management products or bear the cost of the risk if it eventuates.

It is overall outcomes that matter

4.11 As set out in section 3 above, the Authority considers that, simply because a participant is behaving "normally" (i.e. consistently with what might be expected of a commercial party in a particular set of circumstances) does not mean that there may not be a UTS. Whether there is a UTS will depend whether, in light of all of the circumstances, there is a situation that may threaten market confidence or integrity.

4.12 Sapere argues that prices above SRMC are regularly observed in the market, and there is no requirement that offers reflect SRMC.[26] Sapere's characterisation of the Authority requiring pricing at SRMC is not correct and ignores the context of the event. The event – as described below - is a confluence of factors. It is not realistic to describe this set of factors as regularly observed. The flood rules for the Clutha, the consequent spill gate issues Contact had, the upcoming HVDC and Pohokura outages, and the scale of the inflows together with the observed offer behaviour mean that this confluence of factors is not only unusual, but has not previously been observed.

4.13 Sapere is correct that a primary function of markets is price discovery. The issue in this case is whether the prices that were discovered in combination with the other factors may have threatened confidence and/or integrity in the wholesale market.

4.14 Sapere uses examples of markets of low quality or perishable goods to make the point that waste can still occur in workably competitive markets (e.g. fruit that does not meet export standards is sometimes dumped).[27] However, in this situation, the excess spill was not of low quality. The excess spill was perishable (i.e. no longer able to be used if spilled), but the transaction cost of using it to generate was zero.[28] Other examples given by Sapere involve markets that have impediments for matching supply with demand, such as hotel rooms being empty while there are people living on the street, or people looking for work while employers seek to fill positions. Unlike in the first example, there is a market to match supply with demand for generation every half hour. And unlike the labour market, water and the potential energy it embodies is interchangeable with other water with potential energy and there are no transaction costs associated with searching and selecting it for generation. That transaction costs and difficult-to-address perishability exist in other markets is not a justification for contending that they exist in hydro generation or for the waste observed during the period in question. In fact in our view, this attempted comparison by Sapere actually supports our overall view that the waste that occurred in this market was not justified and was well outside of normal operations.

Some offers far exceeded requirements for a return on capital in an energy only market

4.15 As set out above, offer behaviour was only one of the factors that made up the confluence of factors characterising the situation. Offers were higher than they were

[26] Sapere state that "The outcomes observed by the Authority—generator offer prices exceeding the Authority's estimate of generator short-run costs—are regularly observed in the New Zealand wholesale market. These differences between short-run operating costs and market prices occur because the New Zealand market is designed to allow price discovery—to establish the price at which generators are willing to make sufficient generation available to meet demand. There is no requirement that offers reflect short-run operating costs."

[27] We note that, as per our comments above, we are not actually assessing here whether the market was workably competitive or not.

[28] Note that transaction costs are not the same as operating costs. Transaction costs are the costs associated with executing that transaction. For example, the transaction costs associated with buying a house include things like lawyers' fees, agent fees, and building inspection costs.

reasonably expected to be – even within the context of an energy-only market – given the supply and demand situation at the time, and we consider that the likely reason for this is reduced competition (as set out later in this decision paper).

4.16 NERA's report (commissioned by Contact) suggests that generators should be allowed to "take what opportunities they can to recover their (substantial) fixed costs". We agree that hydro plant have high capital but low operating costs, and that in an energy only market like New Zealand, such plant require prices *at times* above SRMC to recover their capital costs. Generators are able to obtain such prices when they are inframarginal. Hydro generators are inframarginal when plant with high operating costs such as thermal generators are marginal, which is frequently the case. In addition, during dry periods when the opportunity cost of using water for generation is high, hydro generators can and should be able to make offers that reflect that water is scarce, and so can receive prices during these periods that contribute to recovery of capital costs.

4.17 In this instance, however, the opportunity taken involved withholding generation and raising prices that was able to occur because of the lack of competitive pressure due to the confluence of factors we have identified. As noted in the SCP, the Authority is not suggesting that the exercise of transitory market power of itself will necessarily constitute a UTS. However, the NERA report ignores the fact that where the outcomes of such events are large and / or for a long duration this may threaten market confidence or integrity in the wholesale market.

4.18 We agree with Meridian that there is no requirement for generators to offer at SRMC. At no point have we suggested that offer prices should have been at SRMC, long run marginal cost (LRMC), or any other variation of cost. Our method is to estimate the excess spill and calculate the offer price needed to clear the generation that could have been produced with this excess spill (see section 7). We do not build this price from a set of costs that generators face. The logic set out in some submissions – that if offer levels are greater than SRMC and are regularly observed then there cannot be a UTS – ignores the context of the event, i.e. widespread spilling.

4.19 During the event, Meridian offered generation at circa $900/MWh. These offers are described by Meridian as non-clearing tranches, and therefore cannot be for the purpose of recovering fixed costs. Meridian does explain that non-clearing tranches are used during times of spill as a way of adhering to operating and RMA constraints, but our analysis demonstrates that, even after taking these constraints into account, there was still a substantial volume of excess spilling. Such offers may also be appropriate in circumstances where a hydro generator is able to and wishes to retain water for future periods, but this is not the case when a generator is spilling.

What the Authority said in the SCP

4.20 Following the PDP consultation, in the SCP the Authority looked to clarify the confluence of factors it considered made the situation unusual. Specifically we identified these as:

(a) There was a series of very large inflow events. Total inflows into several catchments were amongst the highest since records began.

(b) Contact was using its automated spill gates for the first time during a flood event under Clutha flood rules. This resulted in Contact trying to avoid being the marginal generator and the consequent frequent changes in dispatch. Contact has submitted that it was more motivated than usual to avoid being marginal. As

a result, competition was reduced and Contact did not participate in price discovery.

(c) The scheduled HVDC outage and a planned Pohokura outage during the first quarter of 2020 meant Mercury Energy Limited (Mercury) was trying to conserve water in anticipation of future high prices that were evident in the forward curve.

(d) Genesis stated in its submission that it was a price taker in the South Island due to its scale.

(e) Meridian's internal reporting indicated it was withholding generation to avoid the HVDC binding, at a time when there was widespread spilling and an abundance of water.

4.21 The SCP suggested that this confluence of factors may have resulted in reduced competition which then resulted in unnecessary spilling and higher prices.

Main points from submissions on the SCP

4.22 The claimants submitted that all of the factors set out above do not need to be satisfied for there to be reduced competition or a UTS. They argued that the principal reason there was less competitive activity was Contact's and Meridian's South Island offer strategies. They considered it was this behaviour that undermined confidence or integrity, not the confluence of factors. They also stated that both the Authority's and the claimants' modelling show that Contact's and Meridian's behaviour is central to the UTS.

4.23 Trustpower submitted that while the confluence of factors could constitute a UTS, a confluence of factors also generally results in the determination of market prices. It also notes that the period may simply be a situation where generators were bidding at the prices at which they were willing to supply. It did however agree that the confluence of factors set out in the SCP is the most likely reason for the market operating differently from usual.

4.24 Meridian submitted that each of the factors was not unusual in and of itself. It also stated that these factors were part of the normal operation of the market.[29] Sapere submitted that the set of factors were neither rare nor unforeseen. Its definition of rare or unforeseen refers to circumstances that are such that the market ceases to operate normally due to the absence of a Code provision that addresses the situation.

4.25 Meridian set out evidence that the Clutha generators and Tekapo were marginal at times during the UTS period, and submits that these generators did participate in price discovery even when they were not marginal. That is, low-priced inframarginal offers do matter in terms of price discovery. Meridian further noted that it had itself been generating at record-breaking levels during the period in question.

4.26 Sapere submitted that the market was operating normally because generators submitted offers that were cleared.

4.27 Contact agreed that the factors as set out in the SCP were collectively unusual. However, it stated that "For any trading period at any node across the country, there are likely to be outages (whether planned or unplanned), transmission constraints, operational, safety and regulatory requirements, and different competitor generation and

[29] Meridian also noted that large inflow events do occur frequently and are a feature of the market. However, as submitters have generally acknowledged, the inflow event of late 2019 was exceptional and it is this, in conjunction with the confluence of factors, which the Authority is concerned with.

demand profiles, that will make it unique." It also stated that it would be useful for the Authority to provide as much clarity as possible on the applicable threshold for an unusual situation given the dynamic nature of the market.

The Authority's final view

4.28 It is the Authority's view that the confluence of factors described above was unusual enough to warrant further inquiry.

4.29 We agree with the claimants that all of the factors that we consider constitute the confluence of factors may not need to be in effect to result in reduced competition. However, a UTS requires that confidence in or integrity of the market may have been threatened – this is discussed below in section 8.

4.30 We disagree with Sapere that the set of factors occurring simultaneously was not rare or unforeseen.[30] While individually some of the factors are not unusual, the combination of these factors is. Both the very high inflows and the associated spilling, and the impending 3-month HVDC outage are unusual individually. Combined with the flood rules and consequent spill gate issues at Clyde, and the other factors we have identified, this makes the set of factors unlikely to have been foreseen.

4.31 In response to Meridian's submission that it generated at record levels during December, the issue is not what Meridian generated (in the context of record inflows), but what it did not generate and this is what our analysis assesses.

4.32 We agree with Contact that during any trading period there may be generation outages and a number of other considerations at play. However, this particular combination of outages, operational constraints and other matters made this situation unlikely to have been foreseen. This resulted in outcomes that were far removed from a normal market response to the prevailing circumstances, and persisted for a reasonably long duration.

4.33 Contact has submitted that it was more reluctant than usual to be marginal. The PDP also showed that Contact reduced its quantity weighted offer price (QWOP) for its Clutha stations once it started spilling. Contact was offering the majority of its volume at low prices. This can be seen from the analysis in the PDP that shows most of the capacity at Clyde and Roxburgh being dispatched during the day. Overnight, Contact shifted some of its capacity to high priced tranches to avoid being marginal. It is difficult to avoid being marginal 100 percent of the time as shifting demand and other factors make ensuring that generator offers are not marginal difficult. As Meridian has submitted: "it is difficult for generators to accurately predict, more than a few days ahead of real-time, changes in their demand and supply". The same is true for Genesis's Tekapo plant. We therefore disagree with Meridian's submissions that Contact and Genesis were in fact participating in price discovery to any significant degree.

4.34 Sapere submitted that any situation where offers are made and cleared is precluded from being a UTS because this is normal. This implies that no dispatch can threaten confidence or integrity in the wholesale market. This is not part of the test for a UTS as provided for in the Code and in fact, Sapere's argument is undermined by some of the examples in clause 5.1(2) of the Code, which encompass the notion of the market being dispatched. Market manipulation, for example, cannot happen unless the market is

[30] Note that "rare" is not used in the Code definition of a UTS and "unforeseen" is only used as one example of what may constitute a UTS.

trading. Further, the 2011 UTS involved the market being dispatched (although the prices were not finalised until the actions to correct the UTS).

4.35 In response to Trustpower, we agree that many factors determine price in every trading period. In this case, the underlying supply and demand conditions suggested there should have been more generation and less spill in the South Island and low prices throughout the UTS period, but the unusual confluence of factors meant that this was not realised.

5 This unusual combination of factors resulted in reduced competition

5.1 Having identified a confluence of factors which we considered made the situation unusual, the next stage of our analysis involved identifying what about the situation may have threatened market confidence and/or integrity, specifically in this case that the confluence of factors brought about a reduction in competitive pressure, affecting market outcomes.

5.2 We set out in this section what we said in the PDP and SCP regarding the impact of the confluence of factors on competitive pressure and the submissions we received in response. We then set out our final views on this aspect of the analysis.

What the Authority said in the PDP

5.3 As set out in section 4 above, we identified in the PDP that the exceptional inflow event had created issues for the operation of Contact's new spill gates combined with the Clutha flood rules, causing it to seek to avoid being marginal, to prevent its gates from having to operate more frequently. The result of this would be that it was less likely to compete at the margin. Similarly, we noted in the PDP the significance of the impending HVDC outage, which meant that North Island hydro generators were looking to conserve water to ensure sufficient supply. Again, the natural consequence of this is that North Island generators were less able to apply competitive pressure to South Island generators during the UTS period.

5.4 This view, that competitive pressure had been reduced and was causing issues in the market, was supported by what we observed in terms of offer prices. In particular, we noted in the PDP that, while some stations decreased offers in response to the flood spill, offer prices on the Waitaki chain were already high and began increasing from 13 December. Figure 3 shows how Meridian's offers for its Waitaki stations increased through December while these stations were spilling. Offers for these stations were high compared to those at Contact's Clutha stations shown in Figure 4 below. Note also that Contact's offers fell substantially when its Clutha stations started spilling.

Figure 3: Quantity Weighted Offer Price and spill for Meridian's Waitaki stations

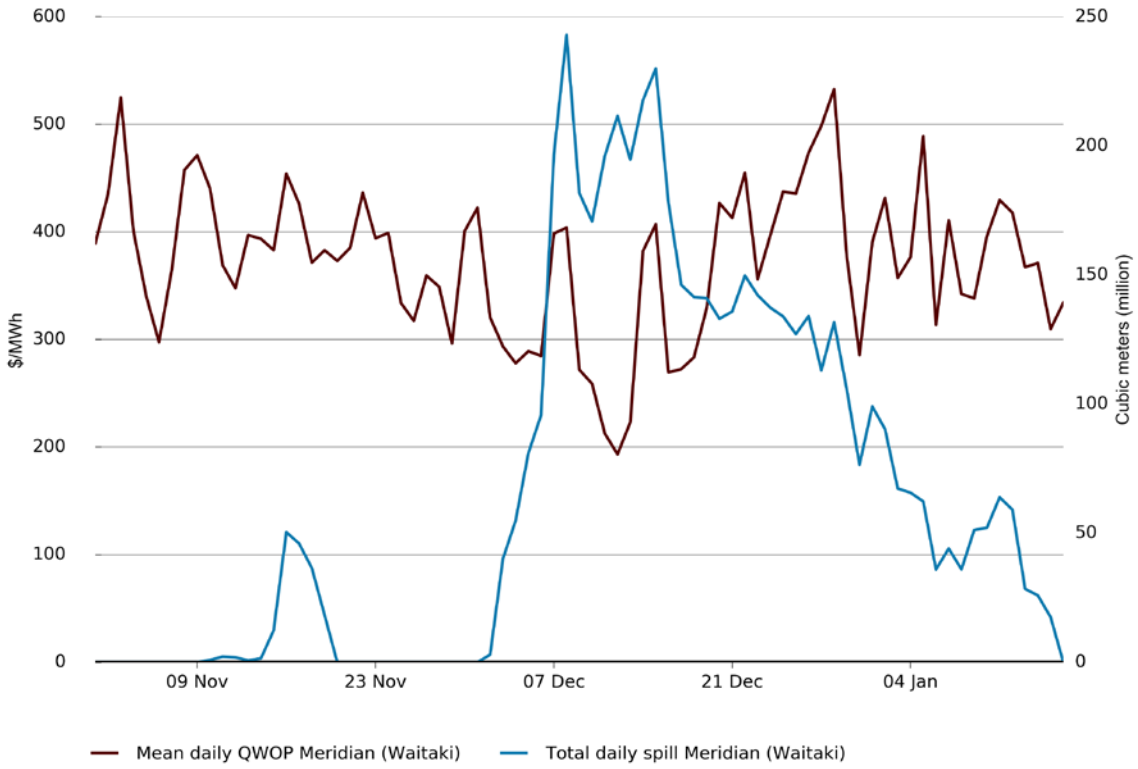
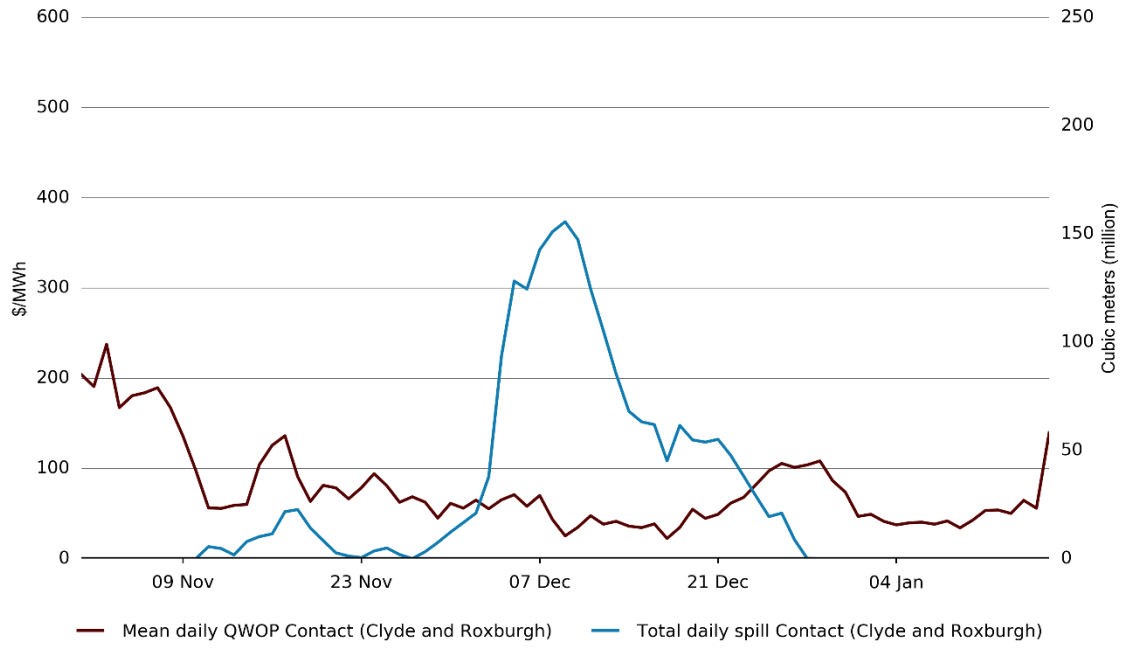


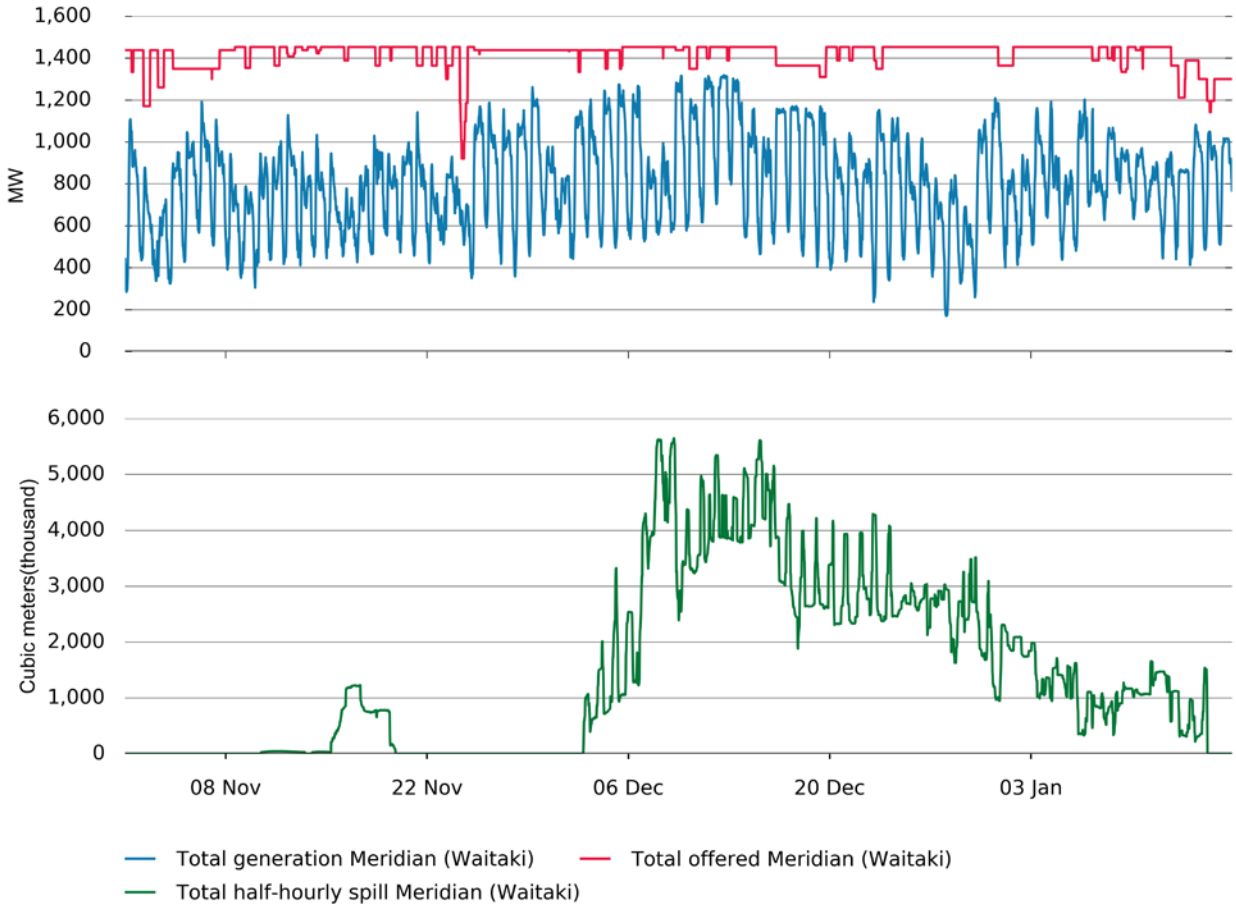
Figure 4: Quantity Weighted Offer Price and spill for Contact's Clutha stations



5.5 The effect of these high and increasing offer prices was that there was substantial unused generation in the Waitaki. This is shown in **Figure 5** below. The red line is the offered capacity for Meridian's Waitaki stations and the blue line is what was dispatched. The gap between these is the unused generation.

5.6 In the PDP we recognised that there would necessarily be some unused generation capacity. We went on to show that some of this capacity could have been used without changing how generators were managing the flood conditions—this latter analysis is explored further in section 7.

Figure 5: Spill, offer quantities, and dispatched quantities



5.7 The disconnect between offer prices on the Waitaki in particular, and underlying supply-demand conditions (i.e. the large amount of water available), suggested to us that issues had arisen within the market. Specifically, the confluence of factors we had identified appeared to have removed the usual competitive pressure provided by Contact's Clutha operations and North Island hydro generation, which enabled Meridian's offer prices to increase and remain high.

5.8 We also noted in the PDP that, when prices did eventually fall in late December, contemporaneous statements from both Meridian and Contact suggested that the decline was due to falling demand (rather than the high levels of supply).[31] We noted that "[t]his suggests that prior to the drop in demand there was a lack of competitive

[31] Energy News 15 January 2020.

pressure on these generators to reduce their offers in response to high inflows and consequent spilling."

Main points from submissions on the PDP and the Authority's assessment

5.9 Submissions and cross-submissions on the PDP did not explicitly comment on whether the UTS investigation period was one of reduced competition, except for Contact which said that competitive dynamics differ during periods of spill. Specifically, Contact argued that competitive pressure remained in place during the UTS period, although it recognised that the competitive dynamics differed from what would ordinarily occur due to the need for South Island generators to manage the flood event.

5.10 The Authority agrees with Contact that competitive dynamics did change as a result of the flood event. However, it considers that the effects of those changes in this case when combined with other factors, were to decrease competitive pressure.

5.11 While not specific to the particular circumstances of the UTS, the Authority also received a submission from Genesis that it is a "price taker" in the South Island the vast majority of the time, setting nodal prices less than 10% of the time and noting that work done in the context of the Market Development Advisory Group's review of the HSOTC provisions suggested that Genesis is never pivotal in the South Island as a whole. While a comment on Genesis' position more generally, we consider that this submission is relevant to our view of the competitive pressures during the UTS period, since it suggests that, even though Genesis did not have the same practical issues in competing as Contact, it was too small to apply effective competitive pressure in the South Island and actively compete at the margin throughout most of the UTS investigation period.

5.12 In terms of the degree of competition more generally, Meridian submitted that the Authority's approach imposed an unrealistic view of competition in a complex market. It further submitted that the Authority had failed to properly apply the principle of workable competition by focusing on short-term spot market outcomes. Sapere also submitted that competition is a market design issue, rather than a structural one. We address submissions in respect of market outcomes in section 6 below. However, as noted above, the Authority's approach was not to assess whether levels of competition in the market were workable or otherwise; rather, it was to consider whether competitive pressures had fallen below their usual levels.

What the Authority said in the SCP

5.13 In light of submissions, we assessed it would be helpful to engage in a further consultation, and released a more detailed discussion of our views and analysis in the SCP. Specifically, we set out our view in more detail that the confluence of factors as set out in the previous section resulted in a reduction in competitive pressure (which then in turn resulted in the unnecessary spilling and higher prices). We described that the issues with Contact using its automated spill gates for the first time under the current flood rules during an exceptional flood, and its consequent desire to avoid being marginal, meant that competition was reduced as Contact did not participate in price discovery. We again noted the scheduled HVDC outage meant that North Island generators with storage were trying to conserve water in the North Island.

5.14 In addition to the matters mentioned in the PDP, the SCP noted as part of the confluence of factors Genesis' position as a price taker in the South Island due to its scale. As noted above, while we recognise that Genesis' position is not specific to the

UTS period, we think it is relevant to our assessment that competitive pressures were reduced below normal levels.

5.15 As part of the SCP, the Authority also set out further empirical analysis to examine the outcomes seen when the market is operating normally, by establishing a comparator. These outcomes were considered to be consistent with competitive outcomes in this market. We then assessed whether outcomes observed in late 2019 differed from these normal – competitive – outcomes. We consider this analysis in further detail in section 6 below.

Main points from submissions on the SCP

5.16 The claimants agreed with the Authority that there was reduced competition during the UTS investigation period (although they contend this extended from 10 November to 16 January, and was directly attributable to Contact's and Meridian's offer strategies, rather than the confluence of factors).

5.17 Trustpower stated that "…there may have been a lessening of competition" during the period in question. However, Trustpower queried "if this period of potentially reduced competition is sufficient to form the basis for a claim that the statutory test in the Code for a UTS is met", as it is a high threshold.

5.18 Others disagreed with the Authority's view that the confluence of factors had reduced competition. Neil Walbran argued that competition was strong between North Island and South Island generators during the UTS period. He stated that "the Authority has misunderstood the nature of competition which occurs when a transmission constraint is close to binding." He considered competition during such periods relates to the HVDC constraint, with South Island generators trying to avoid it binding and North Island generators trying to get the constraint to bind. He suggests such locational competition is important for long term locational signals that reflect cost.

5.19 Meridian also disagreed with the Authority's assessment, submitting that there was no evidence that the circumstances resulted in reduced competition. It argued that:

(a) competition is a process not an outcome, and that the process of competition during the UTS period was not reduced, since there remained the same number of market participants and competitive uncertainty as to how participants would offer;

(b) reduced competition is not relevant to the test for a UTS – a UTS could be found without a reduction of competition;

(c) reduced competition is consistent with workable competition (so any reduction in competition is not sufficient to establish a UTS), but the Authority applies a perfect competition benchmark; and

(d) the Authority has made a critical error of assuming the correlations of the comparator are different from the UTS investigation period *because of* a lessening of competition (also discussed in section 6 below). Correlations are not sufficient to infer causal relationships.

5.20 Sapere, in support of Meridian, argued that "the massive increase in fuel available to hydro generation would have increased, not decreased competitive pressure in the wholesale market" and that there was an outward shift in the supply curve.

5.21 For its part, Contact suggested that, given the differing levels of competition that can occur at each node for each trading period (as illustrated by their arguments in the previous section), the Authority should provide greater clarity in its decision on how it defines the market, and what materiality threshold applies for reduced competition.

The Authority's final view

5.22 Having considered all submissions, we remain of the view that the confluence of factors resulted in a reduction in competitive pressures below the levels observed when the market is operating normally. In particular, in our judgement, North Island generators needing to conserve water; the flood event and relatedly Contact's desire to avoid operating its spill gates too frequently; Meridian's withholding of generation; and Genesis being a price taker in the South Island, and too small to substantially affect price at the margin meant that there had been a reduction in the competitive pressures ordinarily present in this market.

5.23 We therefore agree with the claimants' view that competition was reduced during the UTS period. However, we do not agree that this reduction was such as to cause a UTS throughout the UTS investigation period from 10 November to 16 January. We address issues of the duration of the UTS in section 7 below.

5.24 In relation to Trustpower's query as to whether this period of potentially reduced competition was sufficient to constitute a UTS, we go on in sections 6 and 7 below to show how the issues we have identified resulted in market outcomes far different from what would reasonably be expected if the market was operating normally. As we set out in section 8, it is this evidence as a whole (not just the views set out above in relation to reduced competition) which forms the basis for our judgement that there was a UTS.

5.25 We disagree with Neil Walbran's characterisation of competition across the HVDC during the investigation period. While Mercury may usually "compete" to try and bind the HVDC (as asserted by Mr Walbran), we consider that this did not occur during the UTS period. This was because Mercury was trying to conserve water in anticipation of the scheduled HVDC outage and high prices during the first quarter of 2020. This is evidenced by Mercury's reserve offers (as well as our correlation analysis set out in section 6 below, which shows the positive relationship between North Island storage and generation breaks down during the investigation period). We therefore consider that the competitive pressure provided by North Island generation was reduced below normal levels during the UTS period.

5.26 In response to Meridian's submission, the issue is not whether observed competition is consistent with a benchmark of workable or perfect competition. Rather, the question is whether the observed level of competition and the resulting outcomes were different from normal market operations in this market and material enough to threaten (or may threaten) confidence in or integrity of the wholesale market. The reduction in competition is only part of the assessment and, ultimately, to reach the threshold of being a UTS, the situation must threaten (or may threaten) confidence or integrity, as discussed in subsequent sections.

5.27 The Authority also recognises that competition is indeed a process; however, it considers that this process produces outcomes that can be observed. This is what the Authority seeks to do in section 6 below. We found outcomes during the UTS period were inconsistent with what we normally observe and different from what market participants would have expected to observe if this market was operating normally.

5.28 This is consistent with what the confluence of factors observed at the time: Contact's reluctance to be marginal; Genesis as a price taker in the South Island and therefore too small to exert effective competitive pressure, Meridian's decision to withhold generation, and North Island generators conserving fuel for the first quarter of 2020 (and so not providing competitive pressure on South Island generation during the UTS period).

5.29 While the structure of the market did not change, the conduct and performance of the market did change. We saw no evidence of pressure on Meridian to dispatch its withheld generation during the UTS period, and when prices did fall Meridian stated that it was as a result of a fall in demand. Meridian was able to increase its offer prices and withhold generation when spilling despite what Sapere terms "the massive increase in fuel available to [South Island] hydro generation".

5.30 Regarding Sapere's view that there was an outward shift in the supply curve, we note that an outward shift in the supply curve in the spot market (with all other factors held constant) should imply lower offer prices, lower spot prices, increased South Island generation, increased export over the HVDC and less spill. However, as the analysis set out in the PDP, SCP and section 6 below demonstrates, the opposite occurred. We have identified no evidence that the market responded in the way that Sapere expected that it should (given the increase in fuel supply).

5.31 As to Contact's submission regarding a threshold for competition, the Authority understands Contact's desire for certainty. It is important to note during the investigation period the level of competition moved in the opposite direction to what would be expected given the underlying supply conditions. As Sapere points out, an increase in available fuel should have shifted the supply curve outwards, implying lower offers, lower prices, and more generation from South Island generators. But, in the event, the opposite happened. In this case, we consider that the scale and duration of the excess spill and disconnect between prices and underlying supply-demand conditions was significant enough that it threatened or may have threatened confidence in the market. Whether similar future events meet the threshold for a UTS will depend on the nature of the event. However, we do note that the confluence of factors which led to the current finding of a UTS was exceptional, stemming from a record-breaking flood event, as well as an impending HVDC outage and Contact's issues with its automated spill gates. We therefore do not expect such circumstances to recur with any frequency.

5.32 We have therefore reached a view that as a result of an unusual confluence of factors there was a reduction in competitive pressure leading to market outcomes that would not have been reasonably expected by market participants given the conditions (as assessed in section 6). However, while a focus on reduction in competition is helpful to explain how these market outcomes may have arisen, the scale (magnitude and duration) of these unexpected outcomes nonetheless may have threatened confidence or integrity in the wholesale market (see section 7 below).

6 There were unusual market outcomes during the UTS period

6.1 Having identified a confluence of factors which made the situation unusual, and assessed that these factors caused a reduction in competitive pressure below the levels seen when the market operates normally, the next stage of our analysis was to consider whether these factors and associated reduction in competitive pressure had caused the market to operate in ways which were different from normal. To do this, we looked to market outcomes, such outcomes being the result of market processes and also a mechanism by which participants might commonly judge how the market is operating. Specifically, we looked to compare outcomes which might be reasonably expected when this market is operating normally against what was observed during the UTS investigation period.

6.2 We therefore set out in this section what we said in the PDP and SCP regarding our comparator analysis and the submissions we received in response. We then set out our final views on this aspect of the analysis.

What the Authority said in the PDP

6.3 In the PDP, the Authority first sought to establish the comparator i.e. what outcomes might reasonably be expected if the market were operating normally. We did this by undertaking a primarily qualitative assessment, considering what outcomes might reasonably be expected based on underlying supply and demand conditions. That is, what would reasonably be expected when there was abundant cheap fuel for South Island hydro generators. Specifically, the outcomes assessed included:

(a) offer prices (generator offer behaviour as set out in the PDP is set out above in Section 5)

(b) spot prices and price separation

(c) thermal generation

(d) transmission constraints, and

(e) HVDC flows.

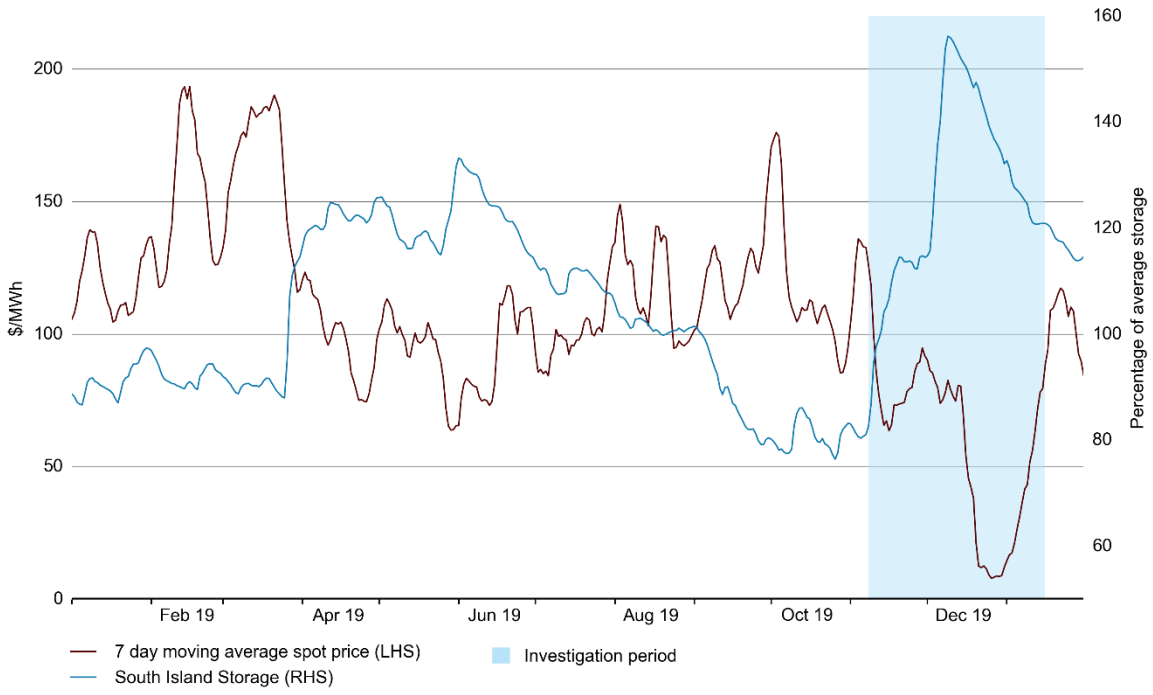
6.4 In the PDP, the Authority's view was that, when the market was operating normally, prices should reduce when there is widespread spilling, because of ordinary supply-demand principles. The opportunity cost of water (distinct from its offer price) would fall to zero (since if water was not used for generation, it would be spilled and produce no value), suggesting greater levels of generation and lower prices.[32] Such a view was also supported by the Authority's empirical assessment of the correlation between spot prices and hydro storage. However, when the Authority compared this against what actually occurred, it found that the normal relationship between spot price and water storage broke down during the UTS investigation period.

6.5 Figure 6 shows the relationship between the spot price and storage. As set out in the PDP, "[d]espite an initial drop in price as storage rose, there was a period in late-November / early-December where the price levelled out and even rose slightly, as hydro storage continued to increase. When prices did eventually fall in late December,

[32] The Authority acknowleges that in some such cases the opportunity cost of spilling water may not be zero, if generating would lower prices and there is therefore an advantage in spilling. This is discussed in C16 of Appendix C.

both Contact and Meridian claimed the reason was falling demand, rather than the abundant supply which can be seen clearly in the chart below." This contrasted with what we considered would reasonably be expected if the market was operating normally. We would normally expect the market, if faced with abundant cheap supply, would see prices fall as suppliers competed for market share.

Figure 6: South Island storage and spot price

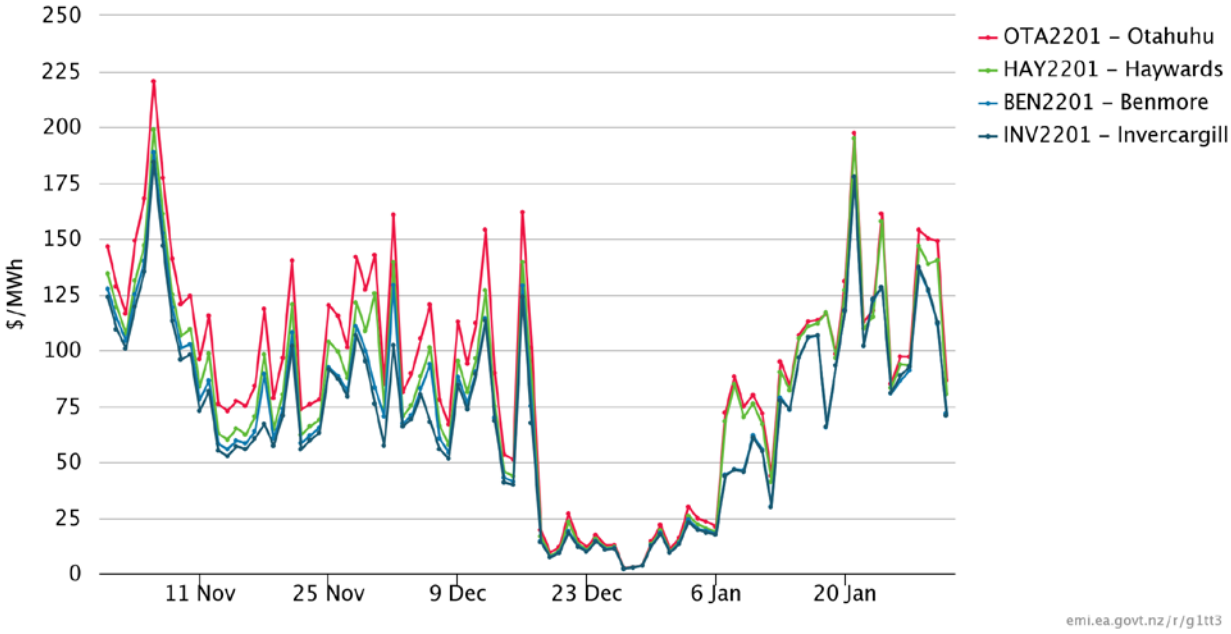


6.6 The Authority also considered, based on the supply-demand principles ordinarily observed when the market is operating normally, that abundant supply for South Island hydro should lead to price separation between the North and South Islands. This would occur as participants subject to normal competitive pressures would compete to be dispatched and South Island generation would exceed the capacity of the HVDC to export to the North Island. This would in turn cause the HVDC constraint to bind (i.e. the HVDC link between the two islands would reach its maximum capacity) and prices to fall in the South Island, which would have much greater supply compared to its demand. However, we found very little observable price separation during the UTS investigation period. As we noted in the PDP "[o]n some days there are signs of price separation. For example, on 7 January 2020, when the HVDC outage started, there was price separation between the South Island and the North Island. Contrary to our expectations, the chart [Figure 7 below] suggests the abundance of hydro fuel in the South Island did not cause price separation."

6.7 Note that Figure 7 shows a lack of price separation when the prices at the different locations shown are close together which they are most of the time. The chart shows some price separation in November and early December both between the islands and

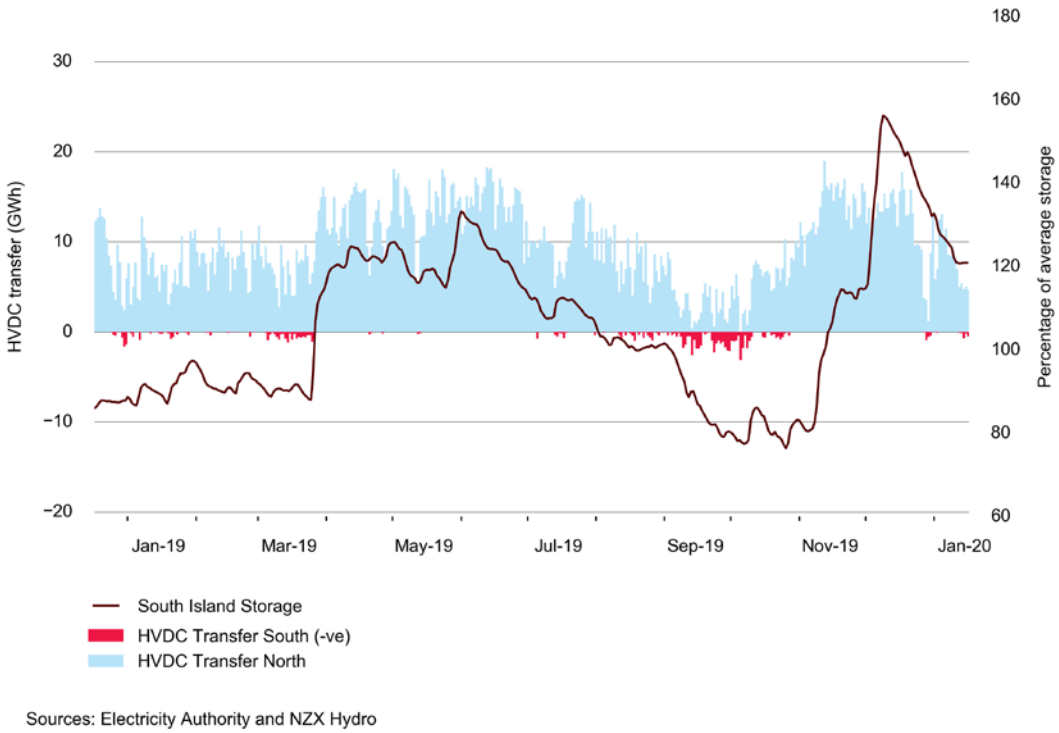
within the North Island. This price separation falls around 9 December until the start of the HVDC outage on 6 January 2021.

Figure 7: Daily (generated weighted) average price by reference node



6.8 Connected to the issue of price separation, we also set out in the PDP how transfer over the HVDC did not respond as would normally be expected to the increase in South Island storage. The HVDC connects the North and South Islands. Supply-demand principles suggest that the HVDC link should have been at capacity more often as cheaper South Island hydro generation was sent north during the UTS investigation period when South Island supply was abundant. However, “Figure 8 below shows average daily north and south flows over the HVDC and South Island hydro storage. In previous years, northward flow occurred most of the time. Southward flow occurred when South Island storage was low and North Island generation was needed to meet South Island demand. This pattern continued in 2019.” Further “[t]he northward flow on the HVDC did not increase in response to the increase in storage in December.”

Figure 8: HVDC flows and hydro storage



Sources: Electricity Authority and NZX Hydro

6.9 We also discussed in the PDP the relationship between thermal and hydro generation. We considered that, when the market was operating normally, it would reasonably be expected that an abundance of water for hydro generation would result in cheaper hydro generation displacing more expensive thermal generation. We further set out some empirical analysis of the correlation between hydro and thermal generation, noting "the negative correlation between thermal generation and hydro generation (rather than storage). A negative correlation indicates when one increases, the other decreases and vice versa. From 2013 to 2017 the correlation between thermal generation and hydro generation was -0.41 (calculated using daily data). In September and October 2018 when there was a lack of thermal fuel due to gas outages the correlation was -0.01. For the investigation period the correlation was 0.15. This is statistically different from the correlation from 2013 to 2017. This is the opposite of what we would expect as it implies that as hydro fuel becomes more abundant, the more thermal generation operates."

Main points from submissions on the PDP

6.10 There were a range of views submitted on the PDP in relation to this part of our approach. The key themes raised in submissions and cross submissions were:

(a) Whether market outcomes during the UTS period were different from what might reasonably be expected if the market was operating normally, such as:

(i) The claimants stated that "The prices and outcomes from 10 November to 16 January were not consistent with supply and demand conditions".

(ii) Contact argued that price outcomes were within the ranges that occur under normal operations.

(iii) MEUG stated that "Nothing in submissions undermined the fact that as spilling persisted spot prices in the South Island increased. That is not an outcome expected in normal workably competitive markets when lakes are spilling…".

(iv) Meridian said that "The events being investigated by the Authority did not cause unusual outcomes in the spot market". It also argued that since prices were already high post-Spring 2018, it is not surprising that prices did not fall quite as low during spilling in 2019 as they did in previous periods of spill.

(b) Whether the benchmark the Authority used for the comparator was correct, such as:

(i) Contact and Meridian argued that the Authority should not compare against a counterfactual of workable competition, as this is a long-term concept.

(ii) Alternatively, MEUG submitted that the Authority *should* use a counterfactual that attempts to estimate workable competition.

(iii) Meridian also said the Authority appeared to be using a subjective assessment of market expectations.

(iv) The claimants thought SRMC is the appropriate benchmark to use.

(v) EPOC argued that the Authority should compare against the benchmark of perfect competition.

(vi) Genesis argued that outcomes are a result of decisions made in extraordinary circumstances in real time.

The Authority's assessment of submissions on the PDP

Market outcomes were different from those reasonably expected

6.11 The Authority agrees with the claimants that the prices and outcomes observed during the UTS investigation period were not consistent with supply and demand conditions (and therefore what might reasonably be expected if the market was operating normally). We similarly agree with MEUG that continued spilling while spot prices increased was not an outcome expected in a normally operating market (although we note, as set out above, that our assessment compares against this market with its usual levels of competition as opposed to one which is "workably competitive").

6.12 Specifically, while prices may have remained within a range normally seen within the market (as pointed out by Contact), they did not fall in response to the underlying supply situation as normally happens. Furthermore, while average prices may have been high since spring 2018 (as pointed out by Meridian), this does not mean that prices have through that period been divorced from the underlying supply and demand conditions.[33] If the market is operating normally then the reasonable expectation would be that spot prices should fall when there is an abundance of water, as during the UTS investigation period when spilling was widespread in the South Island.

[33] Although they may have been more volatile given the higher uncertainty around gas supply and prices at the time.

Our benchmark is outcomes that are normal for this market

6.13 We did not in the PDP – and we do not in this final decision – use a label for competition (perfect, workable, or otherwise).[34] We do not consider that it is necessary to define a standard of competitive pressure beyond what has been observed in the past in the spot market. This is what was used as the comparator. To the extent that the spot market operates under some degree of competition – and therefore that market outcomes reflect underlying supply and demand conditions – the comparator includes normal competitive outcomes. The Authority therefore disagrees with submissions that the Authority improperly compared against workable competition. We also disagree with submissions that we should not consider competition as it is a long-term concept. The Authority is not looking to assess the long-term efficacy of competition in the market. Rather, we were assessing whether the competitive pressures ordinarily present in the market had reduced (with a view, in subsequent stages, to determining whether the impacts of this reduction were sufficiently large to potentially threaten confidence in the market).

6.14 The comparator the Authority has used is not a subjective one but, objective, and based on actual market observations and expectations. We have not used the comparator analysis as a mechanism to achieve 'market optimisation'.

6.15 The Authority also disagrees with suggestions that offer prices should have been compared against SRMC, LRMC, or any other conceptualisation of cost. The Code does not impose maximum offer prices and it is not the role of these UTS provisions to do this. Rather, we considered the appropriate approach in this case was to compare what had occurred against what might reasonably be expected if the market was operating normally.

6.16 We note that Meridian uses the phrase "non-zero offer prices" to describe offers which it says are consistent with the normal operation of the market.[35] However, this phrasing risks obscuring the fact that the level of offer prices – the highest of which Meridian describes as "non-clearing tranches"– effectively withheld generation from the market, at a time when there was widespread spilling. Deviation of offers from zero is not the issue so much as the circumstances allowing high offer prices – some at circa $900/MWh in Meridian's case – when stations are spilling, for reasons other than operating or resource management constraints. Even if this non-clearing tranche had been priced lower (ie, the same as other South Island generators' non-clearing tranches), the circumstances would still have permitted generation to be effectively withheld from the market (with the consequence that the marginal price increased) and the QWOP for its Waitaki stations would still be the highest amongst South Island generators.

6.17 Regarding Genesis's argument about outcomes being the result of decisions made in extraordinary circumstances, we consider that we have accounted for this by measuring a lower bound for excess spill at Benmore, respecting all operational and resource management issues (discussed further in section 7 below). We used Benmore as the basis for these calculations because additional generation at Benmore would not have breached resource consent requirements or run up against issues with Contact's spill gates.

[34] Save in the abstract as in footnote 6 of the PDP.

[35] Contact also refer to "non-zero" prices in their cross submission.

What the Authority said in the SCP

6.18 In light of submissions regarding our approach to establishing the comparator, the Authority undertook further empirical analysis to check our approach.

6.19 Specifically, in the SCP, the Authority set out empirical indicators derived from historical data to assess whether what occurred during the UTS investigation period was comparable to what might reasonably be expected if the market was operating normally. The empirical indicators that were identified in the SCP, and reiterated here, build on those set out in the PDP.

6.20 The Authority used historical data to calculate the correlations between pairs of variables to form reasonable expectations of how the market operates normally. It then calculated an equivalent correlation for the investigation period and compared the two. This analysis supports the analysis in the PDP. The Authority found that spot market outcomes were different from historic spot market outcomes across a wide range of dimensions.

6.21 Table 1 below expands on why the Authority considers that the empirical observations set out in the SCP are consistent with the view we had taken in the PDP of what might be reasonably expected if ordinary levels of competitive pressure are present in the market. In particular, we consider our empirical analysis showed that market outcomes generally reflect underlying supply and demand conditions, which is consistent with what might reasonably be expected in this market with normal levels of competition.

Table 1: Outcomes under the comparator

Market dynamic	The link to competitive outcomes and the expected relationship
The relationship between South Island hydro generation and South Island hydro storage	Normally, South Island hydro generation increases with South Island hydro storage, as the opportunity cost of water decreases and offer prices decrease to reflect this abundant cheaper fuel. This in turn means cheaper South Island hydro generation competes to be dispatched in preference to higher cost generation, increasing the amount of hydro generation that is dispatched.
The relationship between thermal generation and hydro storage and hydro generation	Usually, thermal generation decreases as South Island hydro storage increases because an abundance of cheaper renewable energy in the South Island means lower offers and lower spot prices. This in turn means cheaper South Island generation competes to be dispatched in preference to higher cost thermal generation, reducing the amount of thermal generation that is dispatched. In contrast, as water gets scarce and South Island hydro storage falls, North Island thermal generation displaces South Island hydro generation.
The relationship between the spot price and hydro storage and hydro generation	While storage (fuel supply) and price are negatively related and this relationship is well known, usually more South Island hydro generation has little effect on spot prices. This suggests that South Island hydro generators are not setting the price.
The relationship between South Island hydro storage and northwards flow over the HVDC	Usually, as South Island hydro storage increases, northwards flow over the HVDC increases. As South Island storage increases, so does South Island hydro generation. This lower cost generation then displaces other higher cost North Island generation leading to more export to the North Island over the HVDC.
The relationship between North Island hydro generation and North Island hydro storage	Usually, as with South Island hydro generation and storage, North Island hydro generation increases with increasing North Island storage. However, during the UTS investigation period it might reasonably be expected that North Island hydro operators would be wanting to store water for later use (given the impending HVDC constraint) and therefore be raising their offer prices (and hence being dispatched less). This was an expected response to known information so the normal relationship would be expected to reverse during the UTS investigation period.

The relationship between South Island hydro storage and generation and transmission constraints and price separation	When there is abundant cheap fuel, it would reasonably be expected that stations with abundant cheap fuel would have low offer prices and for these stations to be dispatched accordingly. This will increase generation in the area where the abundant fuel is located. If this increased generation exceeds the transmission capacity of the available lines for exporting this generation, the transmission constraint will bind. This causes prices to be different at different points in the network and this variation in prices at different locations is one of the reasons for having a nodal market. However, as pointed out in submissions on the PDP, generators may manage these lines conservatively to avoid them binding. If this behaviour is usual, then we would expect no relationship between price separation and storage. Otherwise we would expect to see more price separation as storage increases. This could be local, for example: • an increase in lower South Island storage compared to price separation between Invercargill and Benmore; or • interisland price separation with an increase in total South Island storage.

6.22 As noted above, the Authority's approach uses correlation coefficients. A correlation measures how two variables change in relation to each other. By using correlations, it is possible to compare the typical dynamics of the market with the dynamics observed during the UTS investigation period. This helps understand the data from the perspective of competitive interactions between market participants.

6.23 Bivariate correlations do not capture the relationships between more than two variables. However, analysing a number of correlations provides a comparison that the Authority considers assists in indicating abnormal market outcomes, when combined with the other parts of the Authority's approach (that is, the confluence of factors explaining why there may have been reduced competition, and the scale of the excess spill). More information about correlations – and why the Authority did not use regression analysis – is provided in the SCP.

6.24 This empirical analysis supported the earlier findings that market outcomes during the investigation period were substantially different from historic outcomes. This supported our view that reduced competitive pressure had led to the unexpected outcomes during the investigation period, specifically generation being withheld, electricity not being exported northwards, North Island hydro generation not being displaced and the spot price not falling during a period of surplus South Island supply.

6.25 Table 2 shows the results of the correlation analysis, as presented in the SCP. The Authority computed correlations using data from 1 June 2011 to 9 November 2019 to provide the comparator (1 June 2011 was when the transfer of Tekapo A and B to Genesis was completed). The reason for using data over all past periods (back to 2011) is correlations measure the change in one variable in relation to another. To be meaningful, both variables need to change. Using the long comparator period captures the most variation available providing as much insight as possible into the dynamics between any two variables.

6.26 As discussed in the SCP, for the UTS investigation period the Authority only included data for the correlations up to 6 January 2020, rather than to 16 January 2020 when spilling stopped.

6.27 In response to submissions and cross submissions on the PDP the Authority also compared outcomes to those during previous periods of high South Island storage – this is set out at Appendix A.[36] Results from this comparison suggested that some of the normal relationships do appear to break down during periods of high storage (compared to the relationships over all time periods from 1 June 2011 to 9 November 2019) as they did during the UTS investigation period. However, this effect was more pronounced during the UTS investigation period. Also, some key differences remain between the UTS investigation period and past periods of high storage.

6.28 The Authority also computed the correlations for the comparator using only data from the same period (the same dates in each year) as the UTS investigation period for the previous years (back to 2011), to control for seasonality. The correlations calculated using data restricted to these months are very similar to correlations using the full range of historical data available (2011 to 9 November 2019), so we did not present the results of this analysis in the SCP (and we do not here). These results were made available on Github.[37]

[36] This was the analysis at Appendix B to the SCP.

[37] https://github.com/ElectricityAuthority/2019UTS

6.29 The correlations in Table 2 show that:

(a) South Island hydro generation normally increases with South Island hydro storage. This is what usually happens, as shown by the positive correlation in Table 2. During the UTS investigation period this relationship broke down – more storage led to no change in or slightly less generation (a weakly negative correlation). This is consistent with what was set out in the PDP – that Meridian was not offering as much generation at a price that participants would have expected given the circumstances – particularly that of widespread spilling, when there is an abundance of water. This is unusual and consistent with South Island generation not competing to be dispatched as it usually would, despite the abundant fuel that was available.

(b) Normally, thermal generation has a negative relationship with South Island hydro generation. During the UTS investigation period, this relationship reversed, suggesting thermal generation and South Island hydro generation were not substitutes during this time. The fact that abundantly fuelled South Island hydro was not displacing North Island thermal generation as it usually would is unusual and consistent with reduced competition.

(c) The spot price usually decreases with increasing South Island storage but has no relationship with South Island hydro generation (as indicated by the near-zero correlation for the comparator). However, during the UTS investigation period, prices increased when South Island hydro generation increased. This outcome seems incongruous given the supply conditions at the time in the South Island. This is symptomatic of South Island hydro generation not using its abundant fuel to compete to be dispatched. On the other hand, the relationship between the spot price and storage remained consistent with previous periods over the UTS investigation period – that is, as storage increased, the spot price decreased. However, the fall in price in late December was mainly due to a fall in demand, coinciding with the increase in storage. This is supported by correlation analysis using data before and after 18 December – the correlation between storage and price was 0.06 before 18 December and -0.20 after[38].

(d) Northwards flow over the HVDC decreased when South Island storage increased during the UTS investigation period. Again, this is incongruous given the supply conditions in the South Island: usually the opposite occurs. This is symptomatic of South Island hydro generation not using its abundant fuel to compete to be dispatched.

(e) In normal circumstances North Island generation increases with North Island hydro storage shown by the positive correlation for the comparator in Table 2. During the UTS investigation period, North Island hydro generators were conserving water, as indicated by the negative relationship between North Island hydro generation and North Island hydro storage during this time (although this relationship is quite weak, indicating that North Island generators were conserving water). This would have been expected due to the impending HVDC outage and the high forward prices in the first quarter of 2020.

(f) Despite generators actively managing transmission constraints, empirical evidence shows that usually price separation (between islands, and between the

[38] We acknowledge these particular estimated statistics are subject to volatility because of the small sample size.

lower South Island and upper South Island) increases (that is, the ratio of the exporting region nodal price to the importing region nodal price decreases) as South Island storage increases. The opposite occurred for price separation between Benmore and Haywards and for price separation between Invercargill and Benmore during the UTS investigation period.

6.30 These correlations suggest that, during the UTS investigation period, the market was operating differently from normal.

6.31 The Authority also compared the UTS investigation period to the spill that happened in the middle of 2019 in Table 2 below. We did this because Meridian advised us that the outcomes in April-June 2019 were similar to the UTS investigation period. The results of this comparison are discussed in the SCP.

Table 2: Results

Market dynamic	Correlation between	1 June 2011-9 November 2019 (Comparator)	UTS investigation period (to 6 January)	April-June 2019
The relationship between South Island hydro generation and South Island hydro storage	South Island hydro generation and South Island hydro storage	0.53	-0.16*	0.21*
The relationship between thermal generation and hydro storage and hydro generation	Thermal generation and South Island hydro generation	-0.52	0.71*	0.40*
	Thermal generation and South Island hydro storage	-0.37	0.00*	-0.53
The relationship between the spot price and hydro storage and hydro generation	The spot price and South Island hydro generation	-0.10	0.79*	0.44*
	The spot price and South Island hydro storage	-0.26	-0.46	-0.25
	The spot price and North Island hydro generation	-0.01	0.54*	0.34*
The relationship between South Island hydro storage and northwards flow over the HVDC	South Island hydro storage and northwards flow over the HVDC	0.56^	-0.39*	0.24*

Market dynamic	Correlation between	1 June 2011-9 November 2019 (Comparator)	UTS investigation period (to 6 January)	April-June 2019
The relationship between North Island hydro generation and North Island hydro storage	North Island hydro generation and North Island hydro storage	0.53	-0.17*	0.68*
The relationship between South Island hydro storage and price separation	Correlation of the ratio of Benmore nodal price to Haywards nodal price and South Island hydro storage.	-0.33^	0.24*	-0.19
	Correlation of the ratio of Invercargill nodal price to Benmore nodal price and South Island hydro storage.	-0.35^	0.35*	-0.37

^This only includes data back to 2014, when Pole 3 came into operation

*Significantly different from 2011-2019 correlation at the 5% level. Cells highlighted in orange are those where the correlation was a different sign to the correlation from the comparator period (2011-2019).

We also tested significance of the correlations between the UTS period and the April to June period. All were significantly different at the 5% level except the correlation between South Island storage and price, and the correlation between North Island hydro generation and price.

The correlations are based on daily data, as storage data is only available daily. Generation is the daily sum, price the daily load weighted average, price separation the daily average ratio, and northwards flow over the HVDC the daily average.

Main points from submissions on the SCP

6.32 The claimants agreed with the Authority's view, as supported by its analysis, that market outcomes were unusual and did not reflect competitive outcomes. They went further than this, stating that "competitive market outcomes should have been *stronger* than normal during the UTS period" (emphasis added). Trustpower submitted that the correlation analysis as set out in the SCP is evidence that the market was operating differently from usual.

6.33 However, other submitters disagreed with the Authority's approach and/or conclusions. Neil Walbran argued that outcomes were normal for periods when transmission constraints were close to binding. He further argued that the Authority should have

looked at periods when transmission constraints are close to binding to provide the comparator.

6.34 Meridian submitted that:

(a) The Authority did not establish that the correlation analysis shows reduced competition. Specifically, it said "The Authority has made the critical error of assuming the correlation coefficients of the "objective comparator" are different to the correlation coefficients of the…UTS investigation period…*because of* a lessening of competition…" [emphasis in original].

(b) The variation in monthly correlations shows that there is a wide variety of correlations possible on a monthly basis. As such, Meridian says this undermines the idea of an "objective comparator": "(i)n reality there seems a high likelihood that any one month is likely to look just as supposedly "unusual" as the alleged UTS period."

(c) The Authority should have used a regression analysis to account for omitted variable bias and that the correlation analysis is "ultimately superfluous analysis that gives a veneer of science to the decision". It noted the Authority dismissed the regression approach owing to the presence of autocorrelation, but contended that this is a common issue and there are well established methods to account for this.

(d) The grounds for rejecting the mid-year spill period in 2019 as a comparator apply to the comparator the Authority constructed using data from 2011-2019. That is, the comparator includes periods of demand and thermal fuel supply that are very different from the period in question, as did the mid-year 2019 spill period. Along the same lines, Meridian submitted that excluding the part of the UTS investigation period when the HVDC was on outage invalidates the comparator as, during some of the nine years used, the HVDC was also on outage. It argued that the Authority appeared to be "cherry picking" which factors to control for when calculating the comparator and UTS investigation period correlations.

(e) The Authority's dismissal of periods of similar storage as a comparator is illogical because not all the correlations include storage, controlling for storage would mean that any differences identified would be due to a reduced number of factors, and the Authority could have used periods leading up to high storage to capture variation in storage.

(f) Using a long timeframe as a comparator means that the correlations will reflect broad seasonal trends that are absent from shorter time periods (such as the UTS period). It further noted that short-term drivers will be very different from long-term drivers. In Meridian's view, it is therefore misleading to compare such different periods of time and effectively ignore the short-term variability that is an expected part of the New Zealand electricity market. It stated that the sensitivity to timeframe is indicated by the different correlations for the UTS investigation period compared to the alleged UTS period. Sapere also submitted that there is no reason to expect short term correlations to be the same as long term correlations due to idiosyncratic variation in market conditions over time. These variations tend to average out in long term correlations. Even if such correlations should be similar, a divergence from the correlation may just represent the market responding to new information.

(g) The correlations for the alleged UTS period (3 – 27 December) and the UTS investigation period (10 November – 6 January) are never outliers in the distribution of monthly correlations. Rather, "for every correlation looked at by the Authority there are other months that look more "unusual" than the alleged UTS period and UTS investigation period."

6.35 Sapere submitted that the correlation does not include statistical inference.

The Authority's final view

6.36 The Authority considers that the market outcomes observed during the UTS investigation period were significantly different from what would reasonably be expected if the market was operating normally. This view is supported by the analysis the Authority set out in the PDP. That analysis of generator offer behaviour during the UTS shows that offers for Meridian's Waitaki stations were high and increased during the UTS period. This is despite widespread spilling in the South Island implying an abundance of water. As set out above, this is inconsistent with supply-demand principles which the Authority considers participants would reasonably expect the market (operating with its ordinary levels of competitive pressure) to comply with.

6.37 This view is also consistent with the further correlation analysis undertaken in the SCP, which used a comparator representing ordinary market operations to compare against the UTS investigation period.

6.38 We consider that the correlations set out in the SCP for the comparator are consistent with the supply-demand conditions expected in this market when it is operating with normal levels of competition. Table 1 sets this out.

6.39 The analysis set out in Table 2 above shows a stark and almost universal contrast between the comparator representing normal market outcomes and the UTS investigation period. During the UTS investigation period, in nine out of ten cases the correlations have the opposite sign (positive/negative) to the correlation coefficients set out in the comparator. Not only was the market behaving differently from the competitive benchmark set out in the comparator, but it was moving in *exactly the opposite direction* in nine out of ten cases.

6.40 While the correlation analysis on its own is not definitive, it is consistent with the evidence set out in the PDP that the spot market was operating under conditions of reduced competition enabling spilling in place of generation, prevent the HVDC binding, reducing export to the North Island. The result of that was higher prices and a reduced ability for North Island generators to conserve fuel for the planned HVDC outage.

6.41 In terms of the submission from Neil Walbran, as set out in section 5 above, we disagree that outcomes were normal for periods when transmission constraints were close to binding because competition over the HVDC was affected by the HVDC outage planned for the first quarter of 2020. North Island generators had unusually weak incentives to try to prevent the HVDC from exporting more generation to the North Island. Mercury increased its reserve offer quantities at lower prices during December, providing evidence to support this conclusion. For this reason we also disagree with Mr Walbran's suggestion that periods when transmission constraints were close to binding would be a suitable comparator.

6.42 As to Meridian's submission that the Authority's analysis has not established reduced competition, we acknowledge that correlation analysis does not establish causality. However, we consider this evidence – along with the evidence from the confluence of

factors and the evidence set out in the PDP – sufficient to establish that outcomes during the period were different from the outcomes reasonably expected from normal market operations and that they are consistent with a reduction in competitive pressure. As discussed in section 5, it is not a requirement that the Authority shows that the difference in market operations arose because of a reduction in competitive pressures; rather the Authority considered that it would assist participants for us to identify what we thought it was about the confluence of factors which made it problematic such that it might threaten confidence in the market.

6.43 Meridian and Sapere both suggest that what is observed is simply variation due to idiosyncratic market conditions. The Authority acknowledges that significant variation is possible in the market. However, as we have identified significant differences with what would reasonably be expected of a normal market across the vast majority of the correlations observed, and this accords with our analysis based on supply-demand principles, the Authority considers that we have enough information to reach the judgement that this was more than simply a case of idiosyncratic market conditions and that in fact reduced competitive pressures meant that the market was operating differently from normal.

6.44 Meridian has submitted that the variation in monthly correlations invalidates the use of correlations. Its analysis shows that there are a wide range of outcomes that are possible. There will inevitably be periods of time when outcomes may deviate from the correlations we have identified due to different supply and demand conditions. However, by looking at a wide range of correlations, the Authority is able to assess how pervasive those differences in outcomes are.

6.45 We further note that using a long-term comparator as the Authority has done is a way to average out the various idiosyncrasies of the spot market when it comes to each of the different outcomes the Authority has assessed. That is, while the comparator may include periods that were unique (such as the 2018 event—the subject of a UTS claim at the time—when some of these relationships also broke down, but in a way consistent with the underlying supply and demand conditions), taking a long-term analysis of the market smooths out the effects of these short-term fluctuations to obtain the underlying relationship. Thus, even if there are periods when the market operates in a manner different from normal, these are taken into account in calculating the strength of the correlation.

6.46 That being said, we agree that many factors impact on the UTS investigation period correlations. We have therefore attempted to control for one by using the UTS investigation period up until the HVDC went on outage. We did this because, as set out in the SCP, once the HVDC went on outage, we started to observe price separation between the North and South Island. In addition, Mercury was no longer conserving water for the HVDC outage as it was already happening. Contact was no longer avoiding being marginal as it had stopped spilling at Clyde, and as shown in Figure 2 above, spill was falling and stopping altogether at different generators. As a number of the underlying conditions that define this event ceased, we truncated the investigation period to 6 January 2020.

6.47 As to Meridian's submission that we should have undertaken a regression analysis instead, we agree with Meridian that a regression analysis may be useful but we have outlined the difficultly of doing this given the nature of the data. As set out in the SCP, when dealing with autocorrelated disturbances, we can adjust the variances, or add

autoregressive terms. If we do the former without the autoregressive terms, the model lacks the necessary explanatory power. If we do the latter then our model explains more of the variation in price, but relationships between the fundamentals are overwhelmed by the autoregressive terms. In short we were unable to construct an adequate regression model to examine conditions relevant to the UTS.

6.48 However, we note for completeness that the Authority has published regression analysis[39] for a different purpose as part of our market performance quarterly review for Q2 2020, which shows results which are consistent with some aspects of the comparators used in this UTS analysis. Specifically, it found that spot price falls as storage increases, spot price increases with increased demand, spot price decreases with increased wind generation and spot price increases with the gas price. These conclusions are consistent with those derived from our correlations analysis. It also provides evidence that underlying supply and demand drive the spot price. The results for wind and the gas price indicate that when the cost of fuel changes, so does the spot price. The case of additional wind generation is analogous to increased hydro generation during the UTS investigation period: as there is zero opportunity cost to wind as it can not be stored. Again, this is consistent with our correlations-based analysis.

6.49 Regarding Meridian's submission that the Authority improperly dismissed using periods of similar storage as the comparator. There is no reason to limit the comparator to high or rising levels of storage. A correlation measures the change in one variable with respect to another. For example, as storage increases and HVDC transfer increases, this is a positive relationship. The converse—storage and HVDC transfer both falling—is also a positive relationship. A review of storage data shows that storage rises and falls and the long term comparator includes all of this variation, ie it incorporates periods of similar storage. We also want to know – for the comparator – what the long-term trend is, rather than the effect of short-term fluctuations. Then we can compare whether the short-term fluctuations in the UTS investigation period are consistent with these long-term trends.

6.50 We therefore consider that it was not necessary for us to undertake an analysis comparing against periods of high storage. However, for completeness, we have included this analysis in Appendix A to this paper and we also undertook some further analysis, set out in Appendix B, for the 3 to 27 December period. Appendix A shows that the UTS investigation period is more starkly different from the comparator than the set of high storage periods. Note also that the evidence in Table 2 shows that the period of spill during mid-2019 was statistically different from the UTS investigation period. Appendix B repeats this analysis on just the time period from 3 to 27 December and suggests that a number of the relationships remain statistically different but is limited in its explanatory power because of the smaller sample size.

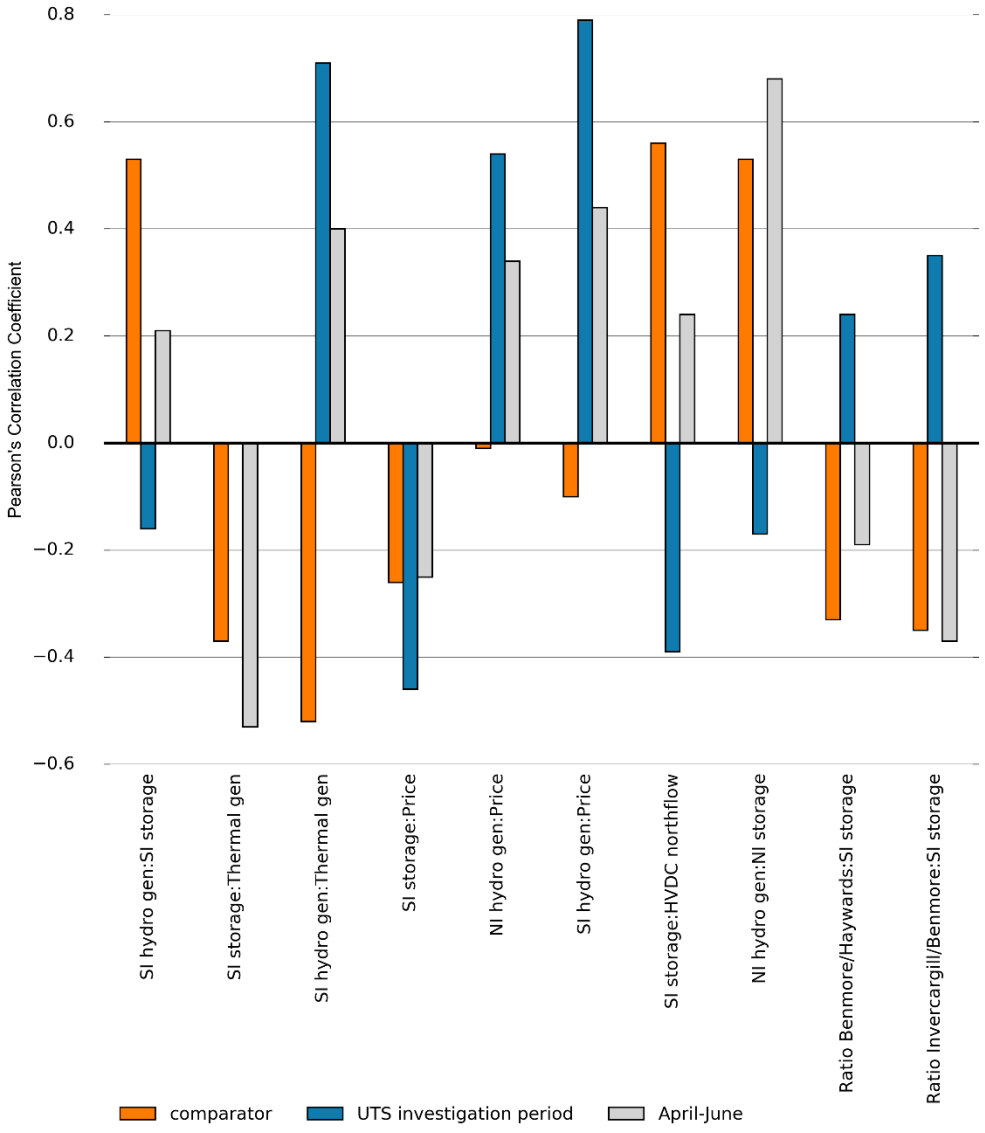
6.51 Meridian also points out that the use of Pearson's correlation coefficient is flawed since the input variables are not normally distributed, it assumes a linear relationship, and it is sensitive to outliers. Since Meridian establishes non normality and significant outliers in the data, we have also calculated the correlations using Spearman's rank correlation, which does not assume normality, is robust to outliers and does not assume a linear

[39] https://www.ea.govt.nz/assets/dms-assets/27/27142Quarterly-Review-July-2020.pdf

relationship. We found very similar results.[40] The charts below show the results of using both Pearson's and Spearman's correlations.

6.52 Figure 9 shows the Pearson's correlation used in Table 2 and Figure 10 shows the Spearman's correlation as suggested by Meridian in Figure 10. The charts are very similar reflecting similar results. These correlations are two ways of looking at the same relationships.

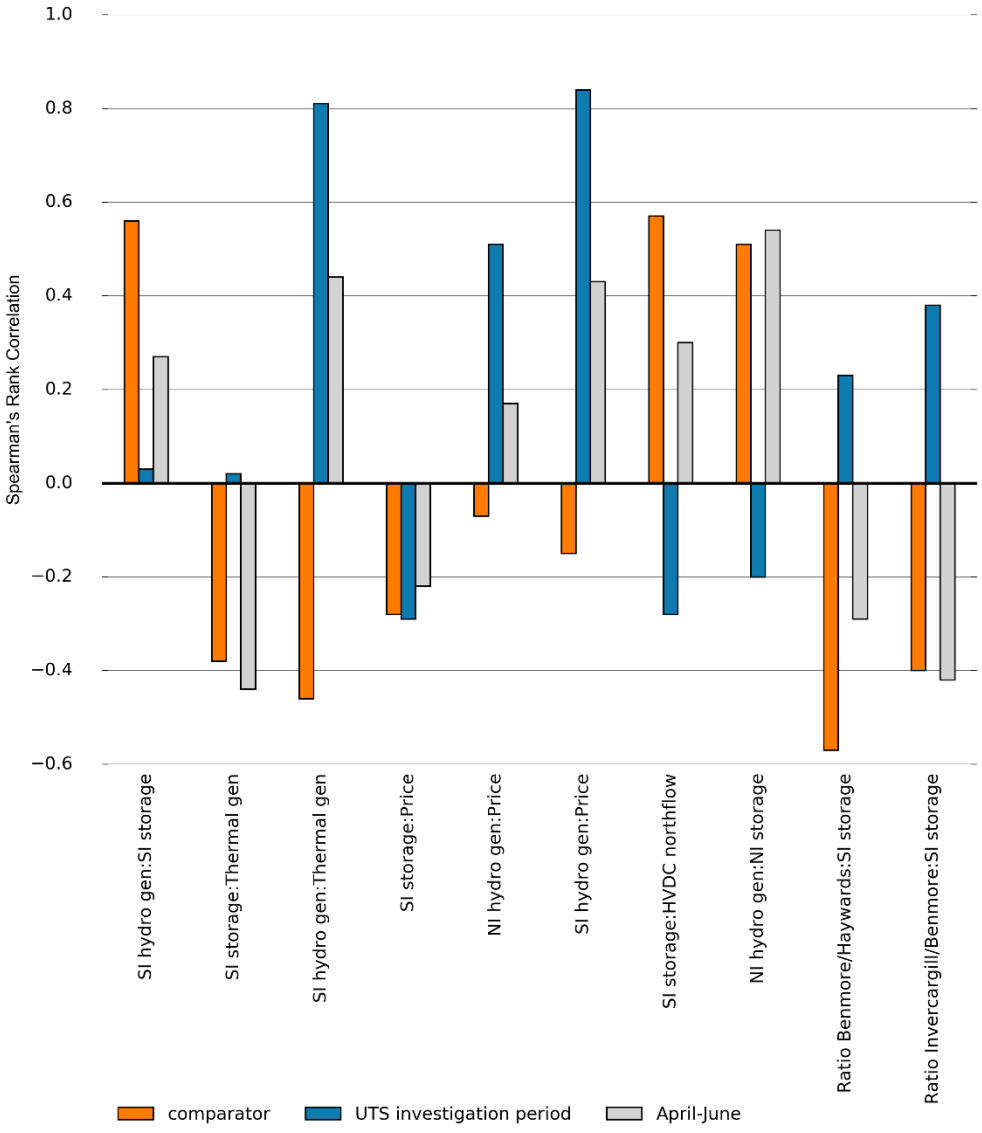
Figure 9: Pearson's correlation comparisons[41]



[40] Note that the correlation between South Island hydro generation and South Island hydro storage is slightly positive (0.03) using Spearman's rank correlation for the UTS investigation period, whereas it was slightly negative (-0.16) using Pearson's correlation coefficient. This does not change the view set out in the SCP for this correlation comparison.

[41] We examined the difference in the Spearman's rank correlations using bivariate regressions on the UTS and comparator samples and heteroscedastic and autocorrelation consistent standard errors. Confidence intervals for the correlations were computed from the regressions, and the confidence intervals were then compared. The confidence intervals do not overlap, except for the regression of price on South Island hydro storage (the same

Figure 10 Spearman's correlation comparisons



6.53 The Authority therefore considers that the analyses it has conducted supports its judgement that outcomes observed during the UTS investigation period were different from those that would reasonably be expected when the market is operating normally.

result as in the SCP), and the regression between thermal generation and South Island storage (this last result differs from what was presented in the SCP). When the confidence intervals do not overlap, the results conservatively indicate that the correlations in the UTS investigation period are different from those of the comparator period.

7 The scale of the event was large

7.1 Having found that market outcomes were different from what would reasonably be expected by market participants if the market was operating normally, the Authority considered whether this difference was such that the situation threatened, or may have threatened, confidence in, or the integrity of, the market. We considered the magnitude and duration of the event is relevant to that assessment.

7.2 In this section we set out our assessment of the magnitude and duration of the excess spill (section 8 then considers what this means for whether market confidence may have been threatened). In particular, we set out the position put forward in our PDP and SCP as well as the submissions we received on those papers. We then set out our final view on the magnitude and duration of the event.

7.3 We found that the UTS extended from 3 December 2019 to 27 December 2019. During this time, we estimate that Meridian could have generated more at Benmore in 60 percent of trading periods. During these 704 trading periods we estimate the average extra generation Meridian could have achieved is 82MW, and around one third of the spill at Benmore could have been used to generate. We estimate the spot market impact of this was $70m.

What the Authority said in the PDP

7.4 As part of its consultation on its preliminary decision, the Authority estimated there was at least 51MW[42] of excess spill that could have been used for generation throughout December, or 38GWh.[43] This was an estimate for the whole of December.

7.5 The details of the methodology used are included in section 14 of the PDP. The method used to calculate this excess spill also respects the RMA and river management issues outlined in the PDP, and satisfied market constraints (such as transmission constraints and the level of generation the market could absorb).

7.6 As set out in the PDP, in the Authority's view, such a high level of excess spill (noting that we consider such an estimate to be conservative[44]) suggested spot market outcomes were far removed from what might reasonably be expected in the normal operation of this market. The PDP therefore concluded that "spot market outcomes differed markedly – for a sustained period – from what we expect given the underlying supply and demand conditions, and the scale of this difference is large."

7.7 In the PDP we also discussed the impact on the security of supply. This is the North Island generation that could have been displaced had the excess spill been used to generate. This was estimated to amount to 17MW of North Island hydro generation. We discussed security of supply in the context of the UTS because if the market is placing the power system in a less secure state, this may threaten confidence and integrity.

7.8 As to the relevant period of time for any UTS, the analysis we set out in the PDP suggested that this was 3 to 18 December 2019. This period was proposed because the Authority's analysis indicated that it was during this time that water was being spilled when instead it could have been used for generation and this would have lowered

[42] The PDP reported this figure as 55MW; however, this was corrected to 51MW as part of the technical briefing materials after outages at Benmore were taken into account.

[43] Originally reported as 41GWh before accounting for outages at Benmore.

[44] See paragraph 7.18 and 7.62 – where we explain why it is conservative.

prices. After 18 December, prices began to fall, although as we noted in the PDP this was due to a fall in demand rather than anything else.

Main points from submissions on the PDP

7.9 Key points raised in submissions and cross-submissions in relation to this part of our approach included:

Magnitude

(a) Whether Contact's spilling should be factored into any assessment of the scale of the event, such as:

(i) The claimants argued that Contact's spill gate challenges need to be scrutinised, and that Contact also had significant excess spill, so this excess spill should be included in any measure of the scale of the event.[45]

(ii) Contact disagreed with this, stating that it was unable to maximise generation and its actions did not threaten confidence or integrity.

(b) Whether environmental impacts should be included in any measure of the scale, such as:

(i) The claimants argued that environmental impacts should be quantified.

(ii) Meridian argued that environmental impacts of market actions are an irrelevant consideration in a UTS investigation - there is no plausible link between CO2 emissions and wholesale market confidence or integrity.

(c) Whether the scale was significant, such as:

(i) MEUG stated that the magnitude of the estimated over-charging during the UTS period was staggering.

(ii) Meridian argued that the Authority's estimated excess spill figure is inconsequential in relation to all spill that occurred, and there would be an immaterial difference to spot prices if prices were reset.

(iii) The claimants submitted that the impact on the market is a greater order of magnitude than the 26 March 2011 UTS, and resulted in more wasted resource.

(d) Whether there were issues and/or limitations with the Authority's and the claimants' modelling of the scale of the event, such as:

(i) Meridian submitted that the Authority's average excess spill was an average over the whole of December, and that the Authority failed to take into account planned outages at Benmore. Once these two things are accounted for, its analysis suggested that the updated price to clear the excess spill is $35/MWh. It also argued that the Authority's analysis was overly simplistic and sought to impose the Authority's idealised view of the market, and that the claimants' modelling is of limited utility.

(ii) The Brattle report commissioned by Meridian argued that the claimants' and the Authority's models should be calibrated against historical market outcomes to ensure the models can accurately replicate the market. It also

[45] The claimants also suggest that we include Tekapo spill in our modelling (see paragraph 7.10).

argued that the benefit of hindsight diminishes the uncertainty of real-time hydro management.

(iii) The claimants argued that their modelling approach should be preferred over the Authority's trial and error approach to estimating the offer price used to calculate excess spill. They further consider that it should have estimated SRMC and assumed this was the appropriate price for generation from the spilled water.

(iv) Contact agreed with the Authority's approach of accounting for operational and resource consent constraints on the Clutha when calculating excess spill. It also argued that the claimants' modelling has significant limitations as it ignores real-time flood management, models an unachievable standard, and assumes perfect information ex post.

(v) Genesis also argued that the claimants' analysis is not sufficiently sophisticated.

(vi) Mercury argued that the analysis in the PDP was static, and as such does not factor in all the variables that influence and impact the generation levels of competing generators.

(e) Whether hedge positions are irrelevant to the estimation of the impact of the event, such as:

(i) The claimants stated that hedge positions should be ignored in the calculation of the financial impact of the UTS, and that the financial cost will flow through to retail prices regardless of risk management products.

(ii) Nova stated that regardless of hedge positions, spot prices in December will impact consumers because contracts for difference (CfD) prices will be directly impacted by the higher prices in December 2019, and higher CfD prices can be expected to translate directly into higher retail prices in the long run.

Duration

(f) The period of the possible UTS, such as:

(i) The claimants argued for a UTS period of 10 November to 16 January.

(ii) Russell McVeagh (on behalf of Meridian) submitted that the proper interpretation of clause 5.1A precludes the Authority from finding a UTS occurred any earlier than ten working days prior to the commencement of the Authority's investigation (although it acknowledged this was not relevant given the period the Authority identified as a potential UTS was within that timeframe).

The Authority's assessment of submissions on the PDP

Additional spill by Contact should not be included in the estimate of the event's impact

7.10 The claimants suggested that the Authority had improperly omitted some further spilling, particularly by Contact, from its modelling and therefore underestimated the magnitude of the event. Some of this spill happened in November, and for the reasons we explain below, we do not take this into account.

7.11 By contrast, the claimants' modelling excludes consideration of the operational and resource management constraints faced by generators. While this modelling was useful to highlight the sorts of issues that were happening during the UTS investigation period, we consider that it cannot be relied upon as it is likely to produce an outcome that is not achievable in reality without compromising safety and the integrity of generating structures.

7.12 As to the claimants' argument that Contact's spill gate challenges should be scrutinised, the Authority considers that it has done this through its investigation and consultation processes and that the Authority has appropriately taken into account the challenges Contact faced in our analysis.

Environmental impacts

7.13 In response to the claimants' view that we should value emissions that occurred because South Island generation was withheld, we have not done this separately because this cost is reflected in the foregone opportunity to displace North Island thermal with South Island renewable hydro.

The scale of the event was significant

7.14 The Authority agrees with MEUG and the claimants that the situation in late 2019 was significant, as evidenced by its calculations as to the magnitude of unnecessary spill. Meridian could have generated more at Benmore in around 60% of trading periods between 3 December and 27 December. During these trading periods, a third of the water spilled at Benmore could have been used for generation. The modelled effect on prices had this generation been dispatched is large, consequently the impact on the spot market was large. In the Authority's view, the scale of the event is large enough to have a material effect on confidence in the market. This is explained in more detail below.

Our method to estimate the scale of the impact is robust

7.15 The Authority has considered the arguments against its approach to modelling the impacts of the event and remains of the view that its approach was robust.

7.16 In regards to Meridian's suggestion that it was inappropriate for the Authority to average spill across the whole of December, we have now presented our analysis below by trading period and for the period from 3 December to 27 December, which addresses Meridian's arguments in this regard. We have also addressed its submissions regarding the generation outages in the updated figures below.

7.17 As to suggestions that the Authority's modelling is overly simplistic or else attempts to impose the Authority's view of how the market should work, the Authority has not applied a perfect competition standard in our vSPD analysis, nor imposed a cost-based offer price on generators. We estimated the price that would clear the extra generation that would have occurred had some of the excess spill at Benmore been used to generate.[46]

7.18 Our analysis takes account of real-world hydro management as we only include Benmore and hold output from all other stations constant, therefore respecting operational and RMA requirements.[47] While we acknowledge that this analysis does not factor in competitive response, we consider that our estimate is conservative because it does not require any changes to river management, just a substitution of controlled spill

[46] Satisfying both market and hydro constraints as set out in the PDP.

[47] This is discussed in more detail below and in the PDP.

for generation at Benmore. As such, our measure does not account for the benefit that generators have in real time to use reservoirs to manage flows. Also, our analysis does not require perfect hindsight. It simply requires Meridian to substitute controlled spill for controlled generation at Benmore.

7.19 As for Brattle's submissions that the Authority's modelling should have been calibrated against historical market outcomes. We have accounted for historical market outcomes in our assessment as to whether what occurred in late 2019 differed from what might reasonably be expected if the market was operating normally. We note that the confluence of events was extremely rare, without an exact historical precedent.

7.20 As to the claimants' modelling, as previously noted, we consider that it ignores relevant RMA and operational constraints that generators face. We therefore consider that it overestimates the scale of the event. We therefore agree with submissions from Contact and Genesis that it would have been inappropriate for us to rely on the claimants' modelling. We further consider that it would have been inappropriate for the Authority to have modelled cost implications based on SRMC as there is no requirement in the Code for generators to price at SRMC.

Hedge positions are irrelevant for the calculation of the impact

7.21 We agree with submissions that hedge positions, or net positions in general do not assist in determining whether a UTS has occurred here – i.e., for calculating the scale of the event – for the reasons put forward by the claimants and Nova.

The period of the UTS should not include November

7.22 The Authority disagrees with the claimants' submission that the period of any UTS should be extended into November. As noted above, the Authority considers that the claimants' modelling ignores the operational and resource management constraints that generators face and therefore should not be relied upon to extend the UTS investigation period. For its part, the Authority's modelling is unable to provide grounds for extending the period into November - we explain such issues further below.

7.23 However, the Authority does agree that the period for any UTS should be extended later into December. This was consulted on as part of the SCP and is explained further below.

What the Authority said in the SCP

7.24 The Authority did not propose any revision of its estimates of the scale of the event in the SCP. However, it did consult on an extension to the timeframe for any UTS, from the 3 to 18 December 2019 period consulted on in the PDP, to the period from 3 to 27 December 2019.

7.25 As noted above, prices fell on 18 December 2019, and this date defined the boundary of the period the Authority considered a UTS in the PDP. This decision was based in part on the effect that withholding generation to manage the HVDC constraint had on the spot price. So, a key outcome the Authority considered was the spot price paid by purchasers.

7.26 In their submissions on the PDP, the claimants pointed out that after 18 December North Island hydro generation and thermal generation could still have been displaced by South Island generation, albeit with little impact on the spot price (given prices had already declined). Had this displacement happened the overall dispatch would have been more efficient (that is to say, consistent with underlying supply-demand conditions which reflect efficiency) because:

(a) North Island water was valuable at the time—certainly more valuable than a spilling South Island hydro station—because of the impending HVDC outage;

(b) North Island thermal generation would be more costly than spilling hydro.

7.27 We noted this efficiency cost in the PDP but did not consider it when we narrowed the UTS investigation period to between 3 December and 18 December. This narrower period was based on the spot price difference between what we estimated the spot price would be if excess spill was used to generate, and what actually happened.

7.28 When prices fell in mid-December, both Contact and Meridian stated in the media that prices fell due to a reduction in demand. As we noted in the PDP, this implies that a return to normal competitive pressures was not the reason for the fall in prices. This in turn suggests that the confluence of factors leading the market to operate other than it would normally was still in place.

7.29 The Authority considered this situation was ongoing until Clyde stopped spilling on 27 December and Contact was no longer required to manage its spill gate in the same way, thus increasing the competitive pressures present in the market.

7.30 Extending the UTS period until 27 December would therefore be consistent with our assessment of the interaction between thermal and hydro generation as one of the key market outcomes which indicates whether the market was operating normally. Our analysis shows that the reduction in competitive pressures arising from the confluence of factors was preventing North Island thermal and hydro generation being displaced and that this was inconsistent with what might reasonably be expected in a normally operating market for the period from 19 to 27 December 2019. We therefore proposed to extend the period we considered may be a UTS until 27 December.

7.31 The SCP also noted that the confluence of factors and the consequent reduction of competition and impact on normal market operations was not as pronounced in November, and the same logic would not support extending the period of any UTS back earlier in time than 3 December.[48]

Main points from submissions on the SCP

7.32 The claimants submitted that the UTS period should be 10 November to 16 January. They argued that the main reason for the UTS was Contact and Meridian's offer behaviour, and this was observed from 10 November to 16 January. Additionally, they contend that their modelling indicated the outcomes in November were also harmful.

7.33 The claimants also argued that the effect of Mercury's behaviour (conserving water for the upcoming HVDC outage) resulted in outcomes being worse than they otherwise would have been.

7.34 MEUG stated that the Authority should examine the correlations based on 3 to 18 December and 3 to 27 December to see if there is any difference between these compared to the comparator. If the nine extra days resulted in correlations that are statistically significantly different to the comparator, this would be evidence to support increasing the length of the UTS.

[48] Note that the claimants submitted that November should be included in the UTS period, and that the spill gate reason given by Contact – and hence their avoidance of being marginal – may have been circumvented by using the must-run dispatch auction or specified low ramp rates.

7.35 For its part, Meridian made a number of submissions critical of the Authority's approach to the relevant period. In particular, Meridian submitted that:

(a) No participant has had the opportunity to submit on the Authority's analysis of the scale of the event and whether this constitutes a UTS (steps 4 and 5 of the flow chart in Figure 1 above) in relation to 18 to 27 December. Meridian also submitted that the test for a UTS cannot be any situation where with perfect hindsight and access to a full market dataset, dispatch could have been more efficient as "the floodgates would be opened to any number of self-interested or vexatious claims for the Authority to find a UTS…".

(b) The Authority's logic is flawed when extending the UTS to 27 December, because (even assuming Contact's behaviour was unusual and lessened competition) Contact's behaviour is only one of the five factors identified in the confluence of factors. The Authority's reasoning suggests that without Contact's behaviour there was no UTS, regardless of the other factors persisting, when previously the Authority notes the confluence of factors "together or alone, were unusual". Meridian has also submitted that the Authority does not apply the same logic when defining the start of the UTS period, when again the only factor missing in the confluence was Contact's operation of its spill gates.

(c) North Island generation may not have been displaced and that South Island hydro generator offer prices would have to be low – lower than operating costs - for such displacement to occur (and also assuming a static market). It also argued that the contract positions of generator retailers may mean that the result of displacing those generators may well be sub-optimal from the perspective of those generators.

(d) It would be extraordinary for a UTS to be found in late December when prices over a relatively short period of time were, if anything, *lower* than one might have expected given the levels of South Island hydro storage at the time. It states that "it would be extraordinary if confidence in the market was deemed to be threatened merely because the Authority considered some rearrangements of the merit order of dispatch would have been more efficient, with no significant effect on final prices."

(e) The scale of the inflows across December meant it was forced to spill water even though it was generating hard. It also argued that this spill was necessary and mostly unavoidable to maintain integrity of hydro structures, reduce risk of damage, and preserve safety. However, it does acknowledge that "…with the benefit of perfect hindsight, a relatively small fraction of this spill - about 12GWh - might have been avoided …[or] only about 0.3% of the total amount that Meridian alone had to manage across the relevant period." This was within the margin of error for spill reporting.

7.36 Contact submitted that it disagrees with the claimants' assertion that Contact's spill gate issues could have been circumvented by using the must run dispatch auction (MRDA) or specified low ramp rates (this had been raised in earlier submissions). Contact stated that the MRDA would not reduce the frequency of adjustments at spill gates. Also, lowering ramp rates to a level that minimises marginal running hinders the System Operator's ability to manage security violations and results in running hydro generators within rough running ranges for extended periods of time. Such rough running causes excessive vibrations and creates risk such as collapsing vortices.

The Authority's final view

7.37 The Authority considers that the situation which caused the market to operate in ways which could not be reasonably expected had the market been operating normally persisted from 3 to 27 December 2019. During this time, it considers that the confluence of factors it identified resulted in a reduction of competitive pressures, allowing the market to operate in ways, and produce outcomes, which would not occur if it had been operating normally. The Authority further considers that these events were of significant magnitude.

The relevant period

The relevant circumstances extended to 27 December 2019

7.38 We consider, for the reasons set out above and in the SCP, that the relevant circumstances endured from 3 to 27 December 2019. While prices began to decline from 18 December 2019 due to a fall in demand, the confluence of factors remained in place and reduced competitive pressure until Contact's spill gate issues were resolved around 27 December.

7.39 While the fall in demand meant the impact on price was lessened (because prices were already lower), the effects are still observable in market outcomes which were different from what might reasonably be expected based on underlying supply-demand conditions. Specifically, Meridian continuing to withhold generation and reduce export over the HVDC meant that opportunities for North Island generators to store fuel for the impending HVDC outage were foregone. This placed the North Island in a less secure supply state than would otherwise have been the case.

7.40 In response to Meridian's submission that participants have not had the opportunity to submit on the implications of a revised timeframe for the UTS, Meridian—in its submission on the PDP—used the Authority's analysis (that was published on Github) to show the impact of a shorter UTS period. It did this by creating a version of the analysis to use any two dates to estimate the amount of wasted spill at its Benmore station. Meridian could have repeated this analysis on any period.

7.41 The Authority disagrees that our logic was flawed when we extended the UTS period to when Contact stopped spilling, since Contact's behaviour was only one of the factors. In particular, Meridian quotes the Authority's SCP as saying the factors "together or alone, were unusual". However, we note that the SCP goes on to say that "In this case, it is not just one factor that we consider may have contributed to the unusual outcomes, but a confluence of factors." We consider that it was all of these factors together which contributed to the reduced competition and therefore the unusual outcomes. In the Authority's judgement, it was only when Contact's spilling ceased that the circumstances were sufficiently different to consider that the overall situation changed and the effect on competitive pressures was significantly ameliorated.

7.42 That offer prices would have to be low for North Island generation to be displaced is consistent with what Sapere described as "*the massive increase in fuel available to* [South Island] *hydro generation"*.

7.43 As for Meridian's submission that it would be extraordinary to find a UTS when spot prices are low, we note that low spot prices do not, in and of themselves, preclude a UTS finding. As the claimants have submitted, excess spill continued throughout December. While spot prices were low, the scale of the excess spill was not. The fact

that this had implications for system security in the first quarter of 2020 could have threatened confidence in or integrity of the wholesale market.

7.44 In terms of MEUG's submission, when we use the time period 3 December to 27 December, we get similar results from our correlation analysis (six of ten compared with nine of ten correlation results are different from the comparator) to using the UTS investigation period. Note that we have used the correlation analysis over the UTS investigation period as a way to determining whether outcomes during this timeframe are normal or not. We have not used it to define the UTS period as 3 December to 27 December.

Other issues

7.45 Meridian submitted that if the Authority were to find a UTS in the period from 18 to 27 December, it would be doing so without proper regard to the basic requirements of natural justice. We note that:

(a) Meridian and other parties had an opportunity to specifically comment on this proposed extension in the period under consideration as part of the SCP. That SCP set out the rationale for extending the period to 27 December and how this related to the Authority's underlying analysis.

(b) Indeed, Q4 of the SCP specifically asked "Do you have any comments on whether our analysis supports the timeframe for any UTS which may be found being 3 to 27 December and the reasons for this?" We have addressed the technical concerns raised by Meridian in its response earlier in this section.

(c) The Authority provided further data and coding on Github which provided additional support for the rationale provided in the SCP for the extension of the period until 27 December 2020.

(d) The time period was also the subject of significant submissions and cross submissions on the PDP.[49]

Extending the UTS into November

7.46 While we have extended the period under consideration out to 27 December, we remain of the view that it should not be extended to include November 2019.

7.47 In particular, the factors we listed in Section 4 as part of the confluence of factors do not all apply during November. In contrast to December, it is not clear that there was excess spill, and if there was, what the price effect would have been had the water not been wasted – we set out below more detail on why this is not clear.

Spilling in the South Island in November was not as widespread as it was in December

7.48 As shown in the PDP, from 9 November, there was spilling in the lower South Island at Manapōuri and from 11 November on the Clutha. There was also spilling at some Waitaki stations for about four days in November. However, there was not the widespread sustained spill that occurred in December.

7.49 This is evidenced through total South Island controlled storage not passing the mean until 13 November 2019. By 24 November 2019 South Island controlled storage was at the 73rd percentile, and by 1 December it was at the 79th percentile. South Island storage

[49] The materials provided on Github allowed submitters to assess the impact of different time periods.

reached nominal full on 5 December. Until this point there were controlled reservoirs in the South Island that could have stored water.

7.50 Both Lakes Tekapo and Pukaki could have stored more water in November, which means that the opportunity cost of water was not zero during this time. Extra generation from the lower South Island could therefore displace Waitaki generation, filling reservoirs and causing spill sooner in December, or it could have displaced North Island hydro or thermal. It is therefore unclear as to what would happen if there was more generation from the lower South Island in November.

7.51 Contact was spilling water from its Clutha stations during November, including at Clyde from 14 November. As set out in the PDP, Contact's spill gate control and the Clutha flood rules were both relatively new, and the combination of these meant that the spill gate at Clyde was at risk of failure. The quantity of spill at Contact's Clutha stations during November was smaller than during December. Offers at Contact's stations on the Clutha fell when these stations started spilling. During the times when Contact was spilling at Clyde, it was avoiding being marginal and therefore not playing any part in price discovery at the margin. The Authority's view is that acting to ensure that its spill gate remained operational was appropriate in the circumstances due to the difficulty of managing the flood should the spill gate fail, and was not the result of the market failing to operate normally.

7.52 As we set out in the PDP, while Meridian was spilling at Manapōuri in November it would either need to spill at Manapōuri or Ōhau, and it preferred to spill at Manapōuri and be dispatched at Ōhau. We have validated Meridian's claim, finding that at the time it would be difficult for both the Ōhau stations and Manapōuri to be fully dispatched in November.

7.53 Ultimately, when viewed through the lens of excess spill (representing a disconnection from underlying supply-demand conditions and a potential price impact), it is therefore not possible to be confident that any waste occurred during November.

There was less potential to export to the North Island in November

7.54 North Island generators' incentives to conserve fuel increased as the HVDC outage approached. This suggests less potential for export to the North Island in November, and also that North Island generators were less restricted in their ability to compete with South Island hydro generators. This factor of the confluence was therefore not as strong.

It is unclear what spot market outcomes would have been (and whether they would have been different from normal) if more generation occurred in November

7.55 More generation in the lower South Island could have changed spot prices. This effect could have been local to the lower South Island if transmission constraints bound. Or it could have been more widespread depending on the competitive response by other generators. Because there was still storage available in South Island reservoirs, the range of competitive responses was wider than in December when all stations were spilling. It is therefore uncertain as to what the outcomes would have been even if there was more generation from spilling generators in November. This presents issues for our supporting analysis, which considers to what extent outcomes during the period in question differed from what would be reasonably expected if the market was operating normally.

7.56 As noted above, the claimants submitted that the principal cause of outcomes differing from normal was the offer behaviour of Contact and Meridian. Specifically, the claimants submitted that Contact could have either adjusted its ramp rates or participated in the

must-run auction which would have alleviated its spill gate issues and allowed it to generate more instead of spilling.[50] Contact has submitted that neither of these options would reduce the frequency of operation of the spill gates. Adjusting ramp rates would alter the magnitude of spill gate operations, but not the frequency. Adjusting ramp rates would reduce the flexibility that the system operator has to manage security, and may result in generators running in their rough ranges for longer.[51] It may also increase system costs though constrained on costs for plant substituting for slow ramping plant as happens in the North Island at times.

7.57 Must run dispatch auctions are used by run of river and geothermal plant that needs to run. The quantity of must run rights auctioned is limited. If Contact were able to procure enough must run rights to ensure that its Clutha stations were fully dispatched then the outcomes would depend on how other generators responded. Genesis for example submitted that must run generation was keeping Tekapo from being fully dispatched at times during December. It is therefore possible that if Contact had used must run auction rights, the net result would have been spill at a different location. We observed during November 2019 was Meridian preferring to spill at Manapōuri than at its Waitaki stations. A response by Meridian consistent with this would mean spill at Contact's Clutha stations would shift to Manapōuri. The ultimate effect on spot prices is uncertain as storage lakes still had room to store water meaning that the opportunity cost of water was not zero.

7.58 Contact have also submitted that even generation with must-run rights can be dispatched for lower quantities when constraints bind.

7.59 We therefore consider that it has not been established that changes in Contact's conduct were either realistic or could have reduced the level of excess spilling and affected market outcomes.

Magnitude

7.60 The magnitude of the event was estimated in the PDP based on the excess spill throughout December at Benmore. In the SCP the Authority corrected for some minor adjustments as pointed out in submissions. That is, the figures incorporated planned generation outages that occurred at Benmore.

7.61 Strong inflows were happening throughout the UTS investigation period causing spill at hydro stations. These inflows were accompanied by increased offer prices by Meridian on the Waitaki, which effectively withheld generation from the spot market (Contact also effectively withheld generation through its offers, although as set out above this was mainly to address issues with its spill gates). While much of this withheld generation was due to RMA and operational constraints (as discussed in the PDP), the Authority estimated that some of this spilled water could have been used for generation instead, despite the RMA and operational constraints. That is, there was some level of spill that was in excess of the spill required to meet RMA consents or avoid operational issues. Meridian also acknowledges that some spill could have been used to generate (see the executive summary of its submission on the SCP). However, the Authority only measured excess spill at Benmore, due to the complex RMA and operating constraints that hydro generators need to abide by. This is discussed in more detail in the PDP.

[50] Ramp rates represent the speed with which a generator can change its output. The must run auction allocates rights for generators to offer at $0.00 and thus make it more likely they will be dispatched.

[51] Rough running for extended periods of time results in risks to plant safety.

7.62 The Authority's method to estimate spill was a simple substitution of spill for generation. In reality, Meridian could use block dispatch and the reservoir behind Benmore to make better use of spill than the Authority could in its simulation. These factors mean the Authority's estimate of excess spill was a lower bound (i.e. a conservative estimate).

7.63 The PDP presents the excess spill estimates as monthly averages. This was done to make the results more accessible.

7.64 However, presenting these results by trading period (as was suggested by Meridian) makes the scale of the waste at Benmore more obvious. Using this lower bound of excess spill, the Authority estimated that during of the UTS period between 3 December and 27 December:

(a) 704 out of 1200 trading periods could have resulted in less spill and more generation at Benmore (59%).

(b) During these 704 trading periods the average amount of extra generation possible at Benmore was 82MW (or an average of 46.7MW/28.0GWh over the UTS period).

(c) During these 704 trading periods, if Benmore had generated more, we estimated that the average amount of displaced North Island thermal generation would have been 46MW, and the average amount of displaced North Island hydro generation would have been 32MW.[52]

(d) During these 704 trading periods, we estimate that 30% of the spill at Benmore could have been used to generate.

7.65 These numbers are different from the PDP as the PDP used all of December. The numbers above use the period from 3 December to 27 December. This shorter period yields different numbers, although the data used to calculate them is the same as used in the PDP. Note in particular that the excess spill at Benmore is about a third of total spill.

7.66 The above figures are not based on generators offering at SRMC as assumed in several submissions. The method is as set out in the PDP —the Authority uses a one cent/MWh offer at spilling hydro generators to simulate how much North Island generation could have been displaced. Then we estimated how much of this generation could have taken place at Benmore. We then used a trial and error approach to determine the offer price which would have been needed to clear this extra generation.

7.67 This resulted in an average of $13.70MWh[53] from 3 December to 27 December. As noted above, this price is different from the PDP because of the different timeframe used. In the PDP we calculated that the spot market impact was $80m for all of December. Using the period from 3 December to 27 December, the corresponding impact is $70m.

7.68 The Authority considered that this method was a robust method for estimating the scale of the excess spill. As mentioned above, this is a lower bound estimate for the excess spill.

[52] This does not add to 82MW as we did not include all generation that could have been displaced.

[53] We note Meridian's submission about the size of these estimates relative to cost, this will be dealt with in the actions to correct consultation.

7.69 The Authority acknowledged the issues raised in the PDP and in submissions on the PDP about this simulation not including a competitive response. In response, the Authority has used a conservative estimate of the excess spill. As this method yields prices similar to those that prevailed in late December, we are confident it is not unrealistic.

7.70 Meridian submitted in response to the PDP that the excess spill figure reported in the PDP was only 0.3% of all South Island spill. Meridian has calculated this figure by limiting the waste to the UTS period in the PDP then dividing it by total South Island inflows throughout December. This method of calculating the scale of the excess spill neglects the fact that the estimate is for Benmore only, not all South Island stations. So the appropriate denominator is spill at Benmore. The resulting number is set out above: 30% of the spill at Benmore could have been used to generate during the trading periods when Benmore could have generated more. As set out above, this is a conservative number.

7.71 Finally, we note that, throughout our investigation into the alleged UTS we have endeavoured not to second guess generators' real time management of the flooding. As pointed out in submissions, safety of people, plant, and environments was the paramount concern of hydro generators during the flooding.[54] Our estimate of excess spill relies on a substitution of controlled spill for generation at Benmore while all other South Island plant is held constant. We agree with a number of submitters that it is not realistic or reasonable to expect generators to behave perfectly with respect to their offers in these circumstances, given their priorities.

7.72 In light of all of the above, we have therefore concluded that the situation which caused the market to operate differently from normal and in ways which could not be reasonably expected persisted from 3 to 27 December 2019 and that these events were of significant magnitude.

[54] See Meridian's, Contact's and Mercury's submissions.

8 Confidence in the spot market may have been threatened

8.1 In this section we set out our reasoning for our view that confidence in the wholesale market was, or may have been, threatened by the events during the UTS investigation period. We discuss the impact on the spot market and also summarise our views on the forward market.

8.2 The Authority's analysis has identified a confluence of factors which we consider has led to a reduction in competitive pressure in the spot market below levels normally observed and experienced. This, in turn allowed unnecessary spilling to occur and prices to remain higher than they would otherwise have been. We have assessed the market outcomes observed during the UTS period against those which would reasonably be expected if the market was operating normally, and found a clear deviation of prices from supply-demand principles. We have also sought to estimate the scale of the event, finding excess spill throughout all of December. It has also determined that the situation endured for more than three weeks, from 3 to 27 December 2019.

8.3 The final question is whether, in light of the above analysis, the Authority considers that the situation as it existed may have threatened confidence in, or the integrity of, the market.

8.4 In the Authority's judgement, and after reviewing all submissions, the situation between 3 and 27 December in the spot market may have threatened participants' confidence in the wholesale market. As the Authority found in its 2011 UTS claim, and as it has reiterated since,[55] participants need to have confidence that prices in the market are competitively determined; if they see that prices are greatly divorced from supply-demand conditions, they may lose confidence in the market[56]. This is what the Authority considers happened here – the confluence of factors we identified significantly reduced normal competitive pressure. Spill took place which would not normally have occurred, prices remained high when they should have fallen and other market outcomes were affected, with cheaper hydro generation failing to displace more expensive North Island thermal generation.

8.5 Moreover, that excess spill was significant, with the Authority estimating at a minimum 46.7MW of excess spill could have been used for generation. Such a level of spill would have had a significant impact on price. Furthermore, this spill occurred over a prolonged period of time. This was not simply a situation in which competitive pressure was reduced for a short time and the market then corrected itself. The circumstances which allowed excess spill endured for most of December 2019. The Authority considers that such a high level of excess spill, over such a lengthy period, may have threatened confidence in the market.[57]

8.6 The conclusion that there was or may have been a threat to confidence is also supported by the fact that the complaint was made by seven parties.[58] It is also

[55] See 2018 decision at paragraph 10.3-10.4.

[56] See paragraph 3.13 of this decision, which sets out a quote from the 2011 UTS decision.

[57] We note that confidence and integrity are naturally linked, but, given that we have found that *confidence* in the market may have been threatened, it is not necessary for us to also identify separate threats to market integrity.

[58] Meridian noted the self-interest of the claimants in this regard. Be that as it may, the Authority does not consider the complaint a determinative factor of a UTS but considers the fact of the complaint still suggests something occurred of sufficient concern for a number of parties that they felt it worthy of lodging a formal complaint.

supported by the modelling Haast has provided (referred to in section 6). Notwithstanding the issues identified with this modelling, it points to expectations of the spot price that were far from the realised spot price. Additionally, some submissions supported the view that confidence or integrity has been impacted. Both Winston Pulp and MEUG stated this explicitly in their submissions. The submission by MEUG (representing a range of energy users) noted that confidence by end users and small retailers and generators was eroded and has not been restored once spilling stopped.

8.7 For completeness, we also reiterate our views on the possible impacts in the forward market. Our PDP presented our analysis on the forward market. Following submissions on the PDP, we have not refined that analysis further. We do not consider anything raised in submissions was relevant to add to that earlier analysis.

8.8 We still consider that, while the analysis showed no material change in participation in the forward market, it is possible that confidence or integrity of the forward market may be threatened over the longer term because the outcomes in the spot market were far removed from normal outcomes. However, we recognise the difficulty in isolating the UTS as the main determinant of any change in the forward market (especially as the forward market saw changes to market making in early 2020).

8.9 Prices on the forward and FTR markets are determined by expectations of the spot price and previous experience. Spot prices that are inconsistent with normal market operations may have caused confidence or integrity of the forward market to be threatened over the long term. In particular, there is a risk that inefficiently high spot prices will flow through to forward prices, leading to withdrawal from the forward market over time. Inefficiently high prices in the South Island would also reduce pay outs on northwards (particularly inter-island) FTRs, which could affect confidence in that market.

8.10 While the above considerations are our observations and opinion, our finding of a UTS does not rely on this opinion. We consider that our conclusion that confidence in the spot market may have been threatened is sufficient to show that confidence of or integrity in the wholesale market may have been threatened.

8.11 A finding of a UTS in this case is also consistent with the rationale behind the provisions. As noted above, UTS provisions are designed to address the fact that not all outcomes can be predicted. Here, the Authority has found that competitive pressure was reduced below normal levels causing outcomes far from what would reasonably be expected if the market was operating normally, and that this may have threatened participants' confidence in the market. This is exactly the sort of situation the UTS provisions are designed to address.

8.12 The Brattle report commissioned by Meridian suggests that a UTS finding in this case will create regulatory uncertainty which will in turn impact generation investment. The Authority acknowledges the importance of regulatory certainty. However, it disagrees that a finding of a UTS in this case would create undue uncertainty. As highlighted above, the confluence of events which give rise to a UTS in this case is unique and extreme (and the UTS provisions are well-known and designed for exactly these kinds of situations). The Authority therefore does not anticipate such events will recur with any frequency and so does not expect its decision to cause significant uncertainty. It will consider any future allegations of a UTS on their own merits based on the particular facts at issue.

8.13 Meridian has also submitted that a finding of a UTS in this case would be inconsistent with the Authority's decision in respect of the 2016 UTS claim. The Authority disagrees

with this view. While there may be some limited commonalities (specifically, limited capacity in the North Island increasing the risk of price separation and potentially similar conduct by Meridian), the Authority considers that the range of factors at play during the UTS period, coupled with the extreme and sustained nature of the event, make the December 2019 UTS event unique. In 2016, the same limitations on competitive pressure were not evident – while there was scarcity in the North Island, the other factors in the confluence were not present and multiple parties were therefore pricing highly in light of the prevailing conditions. The issues that were the subject of the complaint were also only present for three trading periods, whereas we have found the 2019 UTS existed for more than three weeks. In light of all of these factors, we consider that our decision here is not inconsistent with our decision in 2016.

8.14 We therefore consider that a situation existed between 3 and 27 December 2019 which may have threatened confidence in the wholesale market.

9 The issue cannot be satisfactorily resolved by any other mechanism available under the Code

9.1 As described in section 2, in determining whether there is a UTS, the Authority will consider:

(a) whether the situation affects the wholesale market;

(b) whether the situation threatens, or may threaten, confidence in, or the integrity of, the wholesale market; and

(c) whether the situation may be resolved by any other mechanisms available under the Code (aside from the high standard of trading conduct provisions).

9.2 Our final conclusion is that the situation threatens, or may threaten, confidence in the wholesale market.

9.3 In the PDP, we explained that since the outcomes that resulted from the situation related to offering behaviour, other than the trading conduct provisions, there are no other provisions in the Code that address this. No submissions commented on this aspect of the test for a UTS, apart from suggesting that the issues raised by the PDP during the period should be dealt with through a Code amendment or the trading conduct provisions, rather than the UTS provisions (discussed further below). We remain of the view that there are no other provisions in the Code to address the situation. Some of the behaviours that arose in this situation are also separately being considered as a potential breach of the trading conduct provisions – however, this is a separate process from the UTS investigation and, per clause 1.1 of the Code, an investigation for a breach of the high standards of trading conduct provisions are not to be regarded as another mechanism for satisfactorily resolution of a situation when identifying a UTS.

9.4 We note that some submitters, including Meridian, have suggested that the appropriate mechanism to address the issues raised during the UTS period is through a Code amendment. However, the Authority's view is that the particular situation at issue here – characterised by the confluence of factors identified above - is one that could not have been readily anticipated and addressed in advance. Furthermore, even if the Authority could have passed (and could still pass) a Code amendment which might address such a situation in the future, such a hypothetical amendment is not a mechanism available under the Code at the relevant time.[59] What matters is that the situation at issue meets the threshold of a UTS and at the time the UTS occurred, the Code contained no rule (excluding the HSOTC rule as this is specifically excluded from the definition of a UTS in Part 1 of the Code) that could have responded to this situation. The 2011 UTS did result in work leading to a subsequent Code change addressing the issue (trading conduct provisions).

9.5 Other concerns regarding behaviour may be addressed through future consultation, separate to this investigation. As set out in the SCP, these include the:

(a) Review into 2019/20 wholesale market prices - the Authority actively monitors the market and may initiate an enquiry, review or investigation in various circumstances. At the time of the UTS claim, there was an ongoing review into wholesale market prices in 2019/20. This review is distinct from and focusses upon some issues that are not covered by, the UTS investigation.

[59] *Bay of Plenty Energy Ltd* v *Electricity Authority* [2012] NZHC 238 at [274]-[275].

(b) Review of the HSOTC provisions - Part 13 of the Code includes the HSOTC provisions. These are intended to encourage wholesale electricity market participants to carry out appropriate trading behaviour. These are currently under review.

9.6 As the Authority has found that a situation existed which may have threatened confidence in the wholesale market, and that this situation cannot be satisfactorily resolved by any other mechanism under the Code, we consider that a UTS existed between 3 and 27 December 2019.

Appendix A Comparing to previous periods of high storage

A.1 In this appendix we present further empirical analysis using periods of high South Island storage as a proxy for spill, as we do not have all historical spill data.[60] These periods of high storage occurred mainly in January to February and May, so we again note that these results do not control for all factors that affect supply and demand, and as such should be treated with caution.

A.2 As part of our comparator assessment, we identified relationships over all time periods from 1 June 2011-9 November 2019. Some of these relationships do appear to break down during periods of high storage as they did during the UTS investigation period, but this effect was more pronounced during the UTS investigation period. Also, some similarities with the comparator remain for the periods of high storage, but differ for the UTS investigation period.

A.3 The correlations show that:

(a) South Island hydro generation normally increases with South Island hydro storage. This is what usually happens with the positive correlation shown in Table 2. During the UTS investigation period this relationship broke down. This relationship breakdown also seems to happen during any period of high storage.

(b) Normally, thermal generation has a negative relationship with South Island hydro generation. This is also true during past periods of high storage. During the UTS investigation period, this relationship reversed.

(c) Normally, thermal generation also has a negative relationship with South Island hydro storage. During the UTS investigation period this correlation was zero. Similarly, during past periods of high storage, this relationship was weakly positive.

(d) The spot price usually decreases with increasing South Island storage but has no relationship with South Island hydro generation. However, during the UTS investigation period, and during past periods of high storage, prices increased when South Island hydro generation increased. This was more pronounced during the UTS investigation period than during past periods of high storage.

(e) The relationship between price and storage was about the same over the UTS investigation period as normal, and more strongly negative compared to past periods of high storage. However, as noted in section 6, the fall in price in late December was mainly due to a fall in demand, coinciding with the increase in storage. This is supported by correlation analysis using data before and after 18 December – the correlation between storage and price was 0.15 before 18 December and -0.24 after (Spearman's Rank correlations).

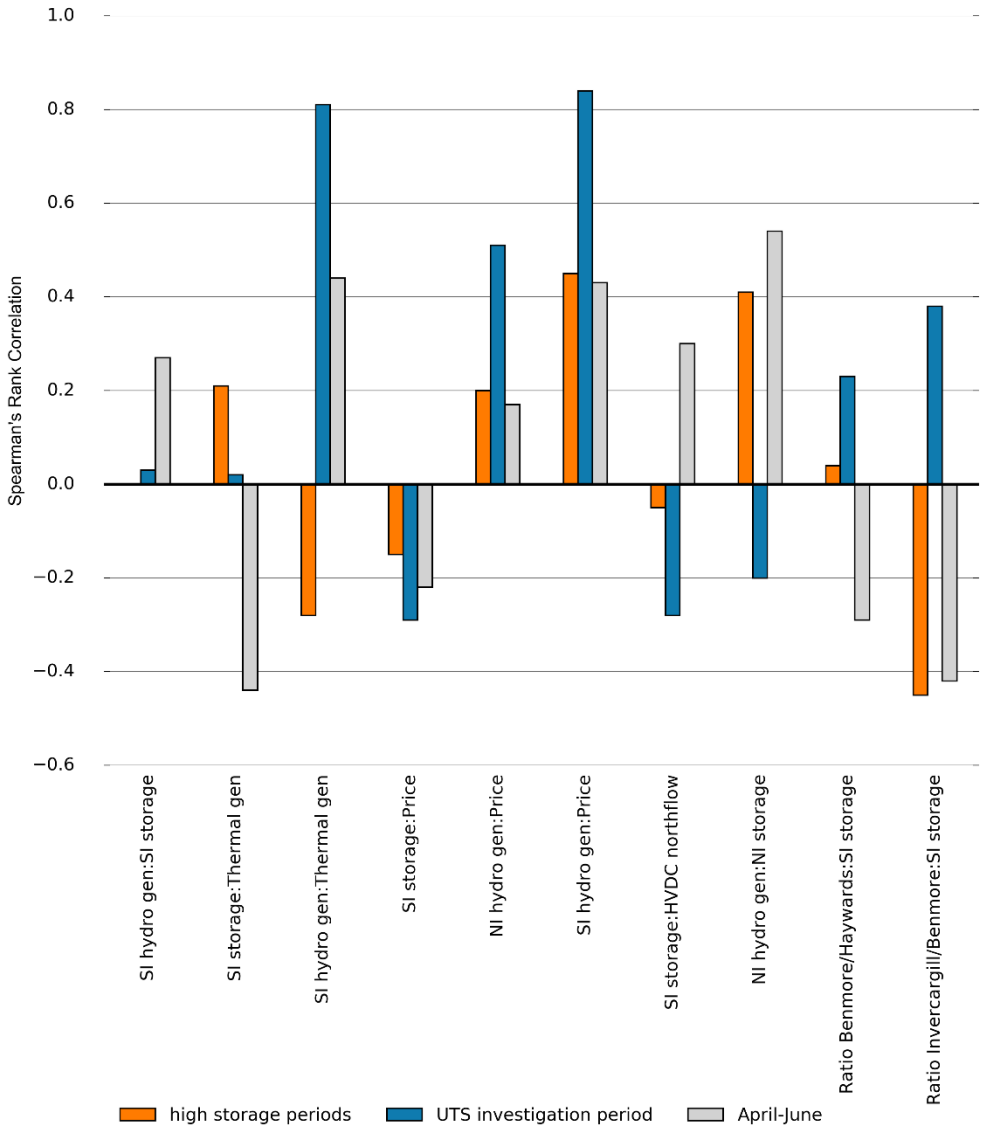
(f) Northwards flow over the HVDC decreased when South Island storage increased during the UTS investigation period. Usually the opposite occurs, and during other periods of past spill there has been no relationship between these two variables.

(g) We would normally expect North Island generation to increase with North Island hydro storage. This is what happens usually with the positive correlation shown in Table 2. It is also what has happened during past periods of high storage. During the UTS investigation period, North Island hydro generators were conserving water

[60] We include periods where South Island storage was greater than 2750GWh, from 1 June 2011 to 31 March 2019.

as indicated by the negative relationship between North Island hydro generation and North Island hydro storage during this time.

(h) Despite generators actively managing transmission constraints, we see from empirical evidence that usually price separation (between islands, and between the lower South Island and upper South Island) increases (that is, the ratio of the exporting region nodal price to the importing region nodal price decreases) as South Island storage increases. The opposite occurred for price separation between Benmore and Haywards and for price separation between Invercargill and Benmore during the UTS investigation period. The normal relationship was evident for past periods of high storage for price separation between Invercargill and Benmore, but there was no relationship between South Island hydro storage and price separation between Benmore and Haywards.



Appendix B Comparing 3 to 27 December to the UTS investigation period and our comparator

B.1 In this appendix we present further empirical analysis comparing the analysis presented above in section 6 against a similar analysis for the period 3 to 27 December 2019.

B.2 Having decided on a duration and magnitude, we used the same method we used in section 6 to replicate our correlation analysis for the final UTS period – 3 to 27 December 2019 (as opposed to the UTS investigation period). We include this information for completeness, and set it out below.

B.3 In section 6, we applied the correlation analysis to the investigation period to 6 January 2020 to answer the question: "were market outcomes unusual?" Repeating this analysis on just the time period from 3 December to 27 December shows that six out of ten correlations differ from the comparator (with five statistically significant).

B.4 This compares with nine out of ten for the UTS investigation period. These differences are not unexpected due to the smaller sample size in the UTS period.

B.5 The Authority still considers there were unusual market outcomes during the UTS period. Five correlations remain statistically significantly different to our comparator. These are the relationships between:

(a) thermal generation and South Island hydro generation

(b) thermal generation and South Island hydro storage

(c) spot price and South Island hydro generation

(d) spot price and North Island hydro generation

(e) North Island storage and North Island hydro generation.

B.6 One correlation, the relationship between spot price and South Island hydro storage, has become *less* consistent with the comparator, and now has the opposite sign.

B.7 These indicate there were still material inconsistencies with the normal operation of this market. Importantly, at a time of excess spill South Island hydro generation was not displacing more expensive thermal generation.

B.8 Three correlations are now more consistent with the comparator. These correlations are the relationships between:

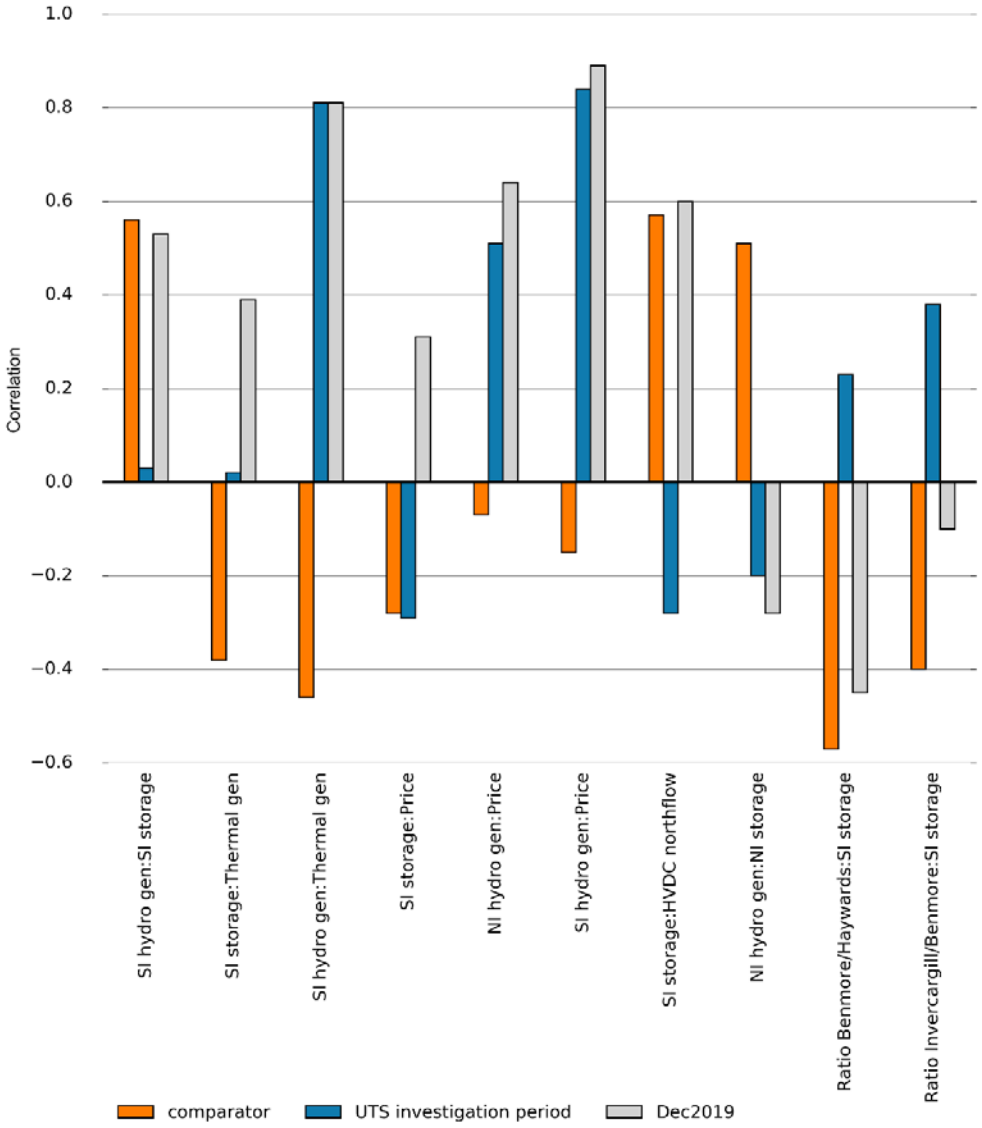
(a) South Island hydro generation with South Island hydro storage

(b) northwards flow over the HVDC and South Island storage

(c) price separation and South Island storage.

B.9 In our view, these similarities with the relationships indicated by the comparator can largely be explained by the significant drop in demand that occurred part way through the UTS period, coinciding with a decrease in South Island hydro generation and South Island hydro storage.

B.10 As noted above, the impact of this drop in demand on the correlations is magnified by the smaller sample size.


1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6
Correlation
SI hydro gen:SI storage
SI storage:Thermal gen
SI hydro gen:Thermal gen
SI storage:Price
NI hydro gen:Price
SI hydro gen:Price
SI storage:HVDC northflow
NI hydro gen:NI storage
Ratio Benmore/Haywards:SI storage
Ratio Invercargill/Benmore:SI storage
comparator
UTS investigation period
Dec2019

Appendix C Other matters raised in submissions

C.1 Table below sets out other themes or arguments raised by submitters that may not be covered in the main text and the Authority's response.

Theme	Which submissions discussed this	Arguments from submissions	Authority's response
C1 Impacts on consumers	Contact Meridian MEUG Nova	**Contact** said in its cross submission that submissions on the PDP collectively explain that "the overall impact on consumers of the offer strategies adopted was not material". **Meridian** argues that most consumers were not impacted since the vast majority of consumers are on fixed price contracts with retailers, and those retailers in turn manage the fluctuations in the wholesale market. The period in question did not deliver high prices out of the range of usual hedging arrangements. It also states in its response to the SCP that one year down the track, there is still no evidence that the events of December 2019 have had any impact on retail prices. **Nova**, in its original submission, states that Meridian in effect increased expected long term average spot prices (particularly in the South Island), and that this will have a direct impact on South Island consumers as retailers pass on these higher prices over the long term (irrespective of whether retailers were hedged in the South Island at the time or not).	The Authority considers that whether consumers are directly exposed to the spot price is of limited significance. It agrees with Nova and MEUG that longer term contract prices are an average of expected daily spot prices (adjusted for risk) and higher spot prices will therefore propagate through into the longer term fixed prices paid by the majority of mass market consumers. In addition, spot exposed consumers and sellers of CFDs would have benefited from lower spot prices. The Authority has set out further details of its analysis of the impact of the event in section 7 above. As to the point Meridian makes about impact on retail prices subsequent to the UTS, the Authority has not been assessing current prices as the basis for its analysis. Further even if it is the case that current prices have not been impacted, that would not have prevented the situation from

		It argues this again in its cross submission, stating that it disagrees "with Meridian's view that because most market participants were close to fully hedged, that the electricity spot prices in December 2019 do not impact on consumers." Contracts for Differences (CfD) prices refer to historical spot prices (and the ASX forward price curve) and as such, are directly impacted by the December 2019 spot prices – i.e. it will be higher than they would otherwise be if flood prices were lower. Higher CfD prices can be expected to translate directly into higher retail prices. **MEUG** disagrees with Meridian that there was no effect on consumers – it argues there were both immediate direct effects, and longer term indirect effects (agreeing with Nova's comments and analysis of the harm on spot prices across the market, and in the South Island in particular) – both for retail prices and for hedge market prices, and also for investment.	undermining confidence at the time of the UTS.
C2 Market manipulation/power	claimants Genesis Meridian MEUG Winstone Pulp International	The **claimants** "…consider that withholding of capacity and unnecessary spill of water is an abuse of market power", and that "Evidence of misuse of market power and market manipulation can be used to establish a UTS." They also state that avoiding price separation through offer prices constitutes manipulative trading activity. They argue that explicit consideration of the extent to which market power was used, and whether the offer behaviour constituted manipulative or attempted manipulative trading activity, would strengthen the case for a UTS. They also argue that "Market participants should not be allowed to abuse either transient/short term market power or enduring market power. High prices	The current UTS finding identifies a confluence of factors that the Authority considers resulted in the UTS. As the Authority considers that these factors, together, threatened or may have threatened market confidence, there is no need for the Authority to consider whether any of the examples of possible UTS in cl 5.1(2), which include manipulative or attempted manipulative trading activity, are made out. Given the basis on which it has made its decision, the Authority also considers that it is unnecessary for it to address

		arising from weak competitive pressure can undermine confidence in pricing outcomes." They further argue that a UTS can be determined by considering the purpose of the trading conduct, as well as the outcome. They draw on the Commerce Act to make this argument. The claimants also consider that the absence of tools to hedge locational risk is not a defence against the misuse of market power. "We consider responsible trading behaviour is to cover risk using risk management products where they are available, and where they are not by bearing the cost of the risk internally." Independent retailers have no alternative options in the face of inadequate hedging options. They argue again in their response to the SCP that "manipulative or attempted manipulative trading activity" is one of the elements of this UTS, and the Authority should be explicit about all elements of the trading situation that were undesirable, including fault. They say that it is "artificial and imprecise to say the undesirable market outcomes were due to "reduced competition" over the period without attributing blame or responsibility when the weaker competitive market outcomes were directly a consequence of Contact and Meridian's offer strategies/withholding of capacity (including by way of offer price)." **Genesis** argues that Meridian remains (even after the switch of Tekapo A and B to Genesis) gross pivotal in the South Island the majority of the time. It expects that the outcome of this UTS process in the	submissions regarding whether it can or cannot consider issues of market power. However, it notes, for completeness, that the assessment the Authority must undertake under the UTS provisions, i.e. whether a situation has arisen which threatens (or may threaten) confidence in, or the integrity of, the market, is distinct from any assessment the Commerce Commission may undertake under the Commerce Act 1986. In considering whether a UTS occurred, the Authority will apply the relevant test as set out in the Code. As for issues of attributing blame or responsibility, we have set out our views on this at paragraph 2.14 above. As to submissions received regarding the structure of the market and/or of particular participants (including the proportion of the time parties are pivotal), these raise issues beyond the scope of the UTS investigation. The Authority's analysis in this case considered the market as it currently operates. For completeness, we also note that the Authority does not consider that there is an absence of tools for South Island generators to manage locational price risk. A range of tools are, in fact, available including FTRs, over-the-counter hedge contracts, and ASX futures, which other participants make extensive use of,

		first instance will provide some safeguard against the exercise of unfettered market power by pivotal generators, but longer term, more enduring solutions may be required. **Meridian** states that it is factually incorrect that it is gross pivotal 100% of the time in the South Island (estimates vary widely depending on what methodology is used). Further, focussing on gross pivotal status ignores the existence of a retail contract book, which significantly limits the ability of any vertically integrated generator who may temporarily be gross pivotal from misusing its gross-pivotal status to the detriment of consumers. Meridian argues (in the Russell McVeagh opinion) that the Authority has no jurisdiction to hear cases on market power abuse under the Commerce Act provisions. It states that "It is not clear how an allegation of misuse of market power is in any way relevant to whether confidence in, or the integrity of, the wholesale market has been threatened." It also argues that there is no reasonable basis on which to assert that Meridian's conduct breaches s36 of the Commerce Act, because: • Meridian faced vigorous competition during December 2019 • Meridian's conduct did not constitute a "taking advantage" of any alleged market power • Meridian was not acting with any of the proscribed purposes listed in s36(2) of the Commerce Act.	suggesting they should also be adequate for the purposes and needs of South Island generators. However, as we have said above, in this case there is no need to consider whether any behaviour was manipulative or an abuse of market power and similarly no need to consider any potential link with trading strategy/the availability of FTRs.

		In its cross submission, Meridian also questions the relevance of the parallels drawn by the claimants between the UTS provisions and the Commerce Act cartel provisions. Meridian states that it is entirely unclear what the relevance of a different prohibition under a different legislative framework is to the UTS investigation. In its response to the claimants' statement about the absence of tools to hedge locational risk being no defence against the misuse of market power, Meridian argues that this absence of tools is a legitimate business justification why any firm – not just those with market power – would use offers to manage this risk. Thus market power is not causative of the trading strategy. **MEUG** argues in its cross submission that Meridian's statement in its submission about speculation in the FTRs market (page 28) implies only suppliers with a physical presence should be able to operate in the FTR market. This reinforces the already perceived or actual oligopolistic modus operandi of the largest vertically integrated suppliers. **WPI** argues in its cross submission that the behaviour during the UTS investigation period is a repeat of previous events where Meridian had market power to dictate constraints on HVDC flows, and that Meridian continue to do this. Because of this behaviour, WPI incurred additional electricity costs. WPI's view is that the Authority needs to address both the immediate issues relating to this UTS, but	

		also the fundamental underlying problem that it has highlighted.	
C3 Management of transmission constraints	claimants Contact EPOC Genesis Mercury Meridian Neil Walbran Winstone Pulp International	**Contact** argues that the management of transmission constraints to avoid price separation can be consistent with efficient operation in a competitive market. It also discusses how it was unable to offer all capacity at a low price since this would constrain transmission lines out of the lower South Island and result in Contact being the marginal generator in that region (which it wanted to avoid). It also states that forecasting whether a transmission line will bind is difficult. In its cross submission, Contact argues that HVDC constraints were not a material consideration during the UTS period, both for Meridian and Contact. It states that "Contact did not actively manage HVDC transmission constraint during the UTS allegation period." Contact also states that submissions collectively explain that offer strategies purposefully designed to avoid basis risk are common across generators. Contact also argues that "the HVDC concerns raised by the Authority are not material to whether a UTS was caused." It also further elaborates on its original argument that managing transmission constraints is not inconsistent with a competitive wholesale energy-only market, and can be consistent with workable competition. The NERA report commissioned by Contact identifies some benefits from using offers to manage locational	The purpose of the UTS process is not to determine whether management of constraints is appropriate, but rather whether a situation arose which may have threatened confidence in, or the integrity of, the market. The Authority considers that, in this case, one of the confluence of factors which, when combined with the other factors identified, led to the UTS arising was Meridian's withholding of generation. However, as noted above, we have not needed to address whether any particular conduct was blameworthy, nor have we needed to consider the significance of the availability of FTRs. Both Meridian and Contact have submitted about the difficulty of managing constraints in real time. However, we note that, within such a context, it would make sense for a party wishing to avoid HVDC constraint binding to offer so as to ensure the HVDC was well under its capacity. Such analysis is consistent with the material from Meridian's internal documents set out in the PDP, and with Meridian's analysis that the HVDC did not come close to binding very often. We note that Meridian has also accepted in its submission on the SCP that it agrees that some degree of spill could have been avoided if generation offers had

		price risk, in addition to FTRs which have some limitations. The benefits include: • A reallocation of the congestion rent without material (or indeed any) changes in dispatch/short run efficiency • Increased costs if this option is not available (e.g., reduced retail competition) NERA further states that "there may be net costs from an effective ban on using physical offers to manage constraint risk, even between nodes where an FTR exists." NERA also notes Mercury's comment that demand side participants can respond physically to high prices by, for example, switching off its assets. NERA questions how this situation is distinguishable from generators physically managing price constraints. Contact's view is that managing transmission constraints is outside the scope of the current UTS proceeding. The **claimants** disagree that the limitations of FTRs is an excuse to manage locational price risk through offers. They also show that price separation was suppressed prior to 3 December (using their modelling) and hence that this period should be included in the UTS. That is, they argue that managing transmission constraints is relevant to the UTS investigation (see market manipulation/power arguments above). Since price separation was also suppressed between the Lower South Island and the Upper South Island	been structured differently (albeit the Authority and Meridian disagree on the extent of avoidable spill). The short point is that if more generation had been forthcoming HVDC transfer would have been higher. We respond to Sapere's submission in paragraph 7.55.

		(based on their modelling), they point out that the argument in the PDP that confidence in the FTR market could be impacted would also relate to other FTRs such as between Invercargill and Benmore. In their cross submission, they also state that they think the Authority did not overstate Meridian's ability to influence the HVDC. Instead, they think that "Both the Authority and Haast modelling provide clear and reasonable evidence Meridian's trading conduct resulted in substantial suppression of nodal price differences across the HVDC and between intra-island nodes." **EPOC** argues that there is strong evidence of strategic offering by South Island generators to manage HVDC flows to avoid price separation, although this behaviour is not confined to the UTS period. It agrees with the Authority that such offering behaviour has knock-on effects on investment in generation and transmission. However EPOC's submission does not comment on the relevance or otherwise of this strategic offering to the finding of a UTS. **Genesis** argues that FTRs are not available in sufficient volume and are being purchased by speculators, further diminishing the volume available to participants. This can leave the structure of offers as the only economically rational option to manage locational price risk. **Mercury** also argues that it is appropriate, and has been a feature of the NZ market since inception, for generators to adjust offers to manage absolute price	

		and basis risk exposures. FTRs and futures are good, but do not cover everything and are expensive. As in the NERA report, it also points out costs from being unable to do this, such as reduced retail competition in exposed regions, or inefficiently spilling water. It also points out that the use of physical market offers to manage transmission constraint risk is highly distinct from situations where participants are in a position of market power. In its cross submission, Mercury again makes the distinction between managing risk and exploiting market power, but it does not consider the UTS as the appropriate mechanism to provide the necessary analysis of this issue. **Meridian** argues that managing basis risk through generation offers is part of the normal operation of the market (and other generators do this also). As with Mercury, the Sapere report commissioned by Meridian also argues that this type of offer behaviour can be viewed as in the long-run interest of consumers. Meridian also argue that previous Authority investigations of this behaviour have indicated the behaviour does not constitute a UTS. Meridian also argues that the HVDC risk was not a major factor in their decision making during the period, and that the PDP overstates the degree to which Meridian is able to influence the HVDC. It also states that the PDP arbitrarily distinguishes between the HVDC and other transmission constraints.	

		In its cross submission, Meridian states that several submissions acknowledge that managing basis risk through generation offers does not constitute a UTS. The Sapere report also argues that the Authority appears to assume that participants, other than the South Island generators, would behave in ways not consistent with experience. That is, the argument made in the PDP that if the HVDC had bound "a competitive response from North Island generators would more than likely lower prices, benefiting North Island consumers" may be incorrect. **Neil Walbran** agrees that Meridian did appear to manage its offers to avoid the HVDC binding, but that the lack of depth in North Island reserves and thermal fuel supply markets, at times, undermines the efficiency of risk management tools. If this offer behaviour is constrained, he predicts that there will be unintended costs. That is, historical evidence suggests that the competitive response assumed by the Authority (when the HVDC constraint binds) from North Island generators may be an inaccurate assumption. Walbran suggests that the investigation should therefore account for a wider competitive framework. **WPI** argues that Meridian could easily have structured their offers to ensure HVDC capacity northwards was fully utilised.	
C4 Offers and dispatch	claimants Contact EPOC	The **claimants** disagree that Meridian should be able to manage its generation fleet as a portfolio, as this distorts locational marginal prices and is an abuse of market power. It is the role of the System Operator to	The UTS test concerns whether confidence and/or integrity have been or may have been threatened. The Authority's analysis has taken the current structure of

		dispatch generation. They state that the Authority should test Meridian's administration of Lake Ohau versus Manapouri dispatch and pricing outcomes against what would happen if Lake Ohau and Manapouri generation stations were owned and operated by separate generators. **Contact** argues that it needed to price its offers higher overnight to avoid transmission constraints binding and thus reduce the likelihood of being the marginal generator (to maintain stable lake levels and ensure steady flows). Uncertainty of future spot market conditions limit an operators' ability to absolutely maximise generation without putting the plant on the margin. Due to total available generation being greater than demand in the LSI during a flood event, Contact argues that it is not able to offer all Clutha generation at a low price, as it is likely the Clutha assets would have been the marginal generator within the LSI most of the time. It suggests that the only other option available to it to limit marginal running would be removing capacity from its offers, but this risks inconsistency with the HSOTC rules. **EPOC** agrees that Contact offering TCC at below marginal cost during the UTS period was a reasonable position to take (a rational economic strategy), but not a valid argument under perfect competition, as all generation would be offered at marginal cost under perfect competition.	the market as a given. Our counterfactual is based on what we normally observe rather than what we might observe if the structure or rules for operation of the market were different. We comment on Contact's offering to avoid being the marginal generator in section 4.
C5 Consistency with past decisions	claimants Contact	The **claimants** argue that there are tight linkages between the Authority's conduct findings, and the high price event on 2 June 2016 where Meridian	As previously stated in the SCP and as noted above, there are two different processes and two different tests to be

	Meridian MEUG	used its South Island pivotal position to manage basis risk. They argue that the Authority should reach the same conclusions as for this previous event (that Meridian's conduct breached the HSOTC rules). They consider that the trading behaviour in December 2019 is an example where the conduct is in breach of both UTS and HSOTC provisions. **Contact** argues that in May 2017, Meridian adopted a similar offer strategy and this was not found to be a UTS. Contact also argues that the Authority's preliminary view would result in a material departure from its previous view on price discovery in an energy only market. **Meridian** argues that the preliminary decision is inconsistent with and contradicts previous decisions. A decision of a UTS would erode confidence as generators would not know how to offer. It would also reverse or limit the effect of the 2016 UTS decision. The Authority needs to address this contradiction and explain what has changed since 2016. The Brattle report commissioned by Meridian states that "The Authority has previously found these trading strategies [to manage risks and maximise revenue] to be acceptable and consistent with the workable competition framework of New Zealand's energy-only power market." **MEUG** states that the same models (as used in the Authority's PDP) would not be appropriate for other claimed UTS for a defined number of trading periods where there was no over-supply and, as expected in	applied in relation to the UTS and the HSOTC. A breach of one does not automatically imply a breach of the other. As for submissions that a finding of a UTS in the current situation would be inconsistent with the Authority's decision that there was no UTS in June 2016, these are addressed in paragraph 8.14 above. In terms of submissions focusing on Meridian's conduct and whether or not this was normal, these issues are addressed at paragraph 3.18 above.

		competitive markets, prices would for some period need to be above SRMC to provide suppliers with a margin for a return on and return of capital. Thus the models used in the PDP were appropriate to inform the Authority's decision in this instance.	
C6 Relationship with the Code amendment process	Contact Genesis Mercury Meridian Trustpower	**Contact** argues that any policy or rule changes the Authority considers may be required to address the concerns raised in the PDP should not be made through the UTS process, but rather through a Code change. Until any such Code change, there is no basis to challenge the behaviour of generators under the period in question. If the Authority deems it necessary to address how transmission constraints are managed, and/or change rules around the construction of offer stacks for spilling hydro generators, this would require significant consultation and further consideration to the range of operational, environmental and hydrological constraints. Contact also refers to the Brattle report commissioned by Meridian, which notes that if the Authority sought to limit generators offers to SRMC, alternative market design options would be required. In the Nera report commissioned by Contact, Nera argues that there may be net costs from an effective ban on using offers to manage constraint risk. A full cost-benefit analysis would be required, and the UTS is not the appropriate forum for this. Rather, the behaviour should be reviewed through a code change process. **Genesis** states that guidance from the Authority is needed regarding managing basis risk through offers,	This UTS decision does not seek to ban offering to manage transmission constraints, nor to reach a view on their appropriateness one way or the other. Rather, it considers the particular circumstances of the situation (which may include what participants were doing at the relevant times) and looks to assess whether those circumstances as a whole threatened, or may have threatened, confidence in, or the integrity of, the market. The Authority disagrees with submissions that, by finding a UTS in these circumstances, it is confusing its role in determining whether there was a UTS with its Code making functions and is attempting to reform the market by means of a UTS finding. Rather, the Authority's process for determining whether there was a UTS in this case has involved it identifying the outcomes reasonably (and objectively) expected when the market is operating normally (as opposed to any subjective view on how the market should best be operating) and comparing what occurred against those expectations of

		and should have been regulated in the time since the 2 June 2016 high price event. **Mercury** also shares Genesis's concern that the Authority's ambiguity around when it is acceptable to manage transmission constraints through offers – and determining this ex post – is not a workable standard. "Mercury does not consider the UTS is the appropriate mechanism to provide the necessary analysis of this issue." **Meridian** argues that the Authority has role confusion between its Code making functions and its UTS functions. When investigating a UTS, the Authority must leave its reform agenda out of its judicial role. "This flaw in the Authority's preliminary decision is evident in the treatment of numerous examples of similar offer prices across the market, during spilling. Those other examples were not found to be a UTS." Meridian also states that a known area of concern must trigger a Code reform process, not a UTS. A UTS analysis that does not take into account prior examples of the same behaviour fails to take into account the market's expectations in regard to that behaviour, and so fails to properly evaluate any impact on market confidence. The Authority cannot alter 'normal market operations' through a UTS. The PDP "…finds that such normal, rational behaviour is no longer appropriate. A new normal is therefore proposed whereby market participants must read this preliminary decision, not the Code, to understand how they can act in the market." If the Authority wants to change the way the	normal operation. Further views on such issues are set out at paragraphs 3.21 and 9.4 above.

		market operates, it needs to assess whether such a change would actually benefit consumers in the long term, and if so, amend the Code. The UTS provisions are designed to remedy a dysfunctional situation, not to evolve market trading rules. The PDP proposes changes that could only be implemented via Code changes, such as requiring generators to offer in accordance with SRMC, or no longer being able to manage locational risk via offers. Only a proper Code amendment process could identify and weigh the costs and benefits of any changes and any potential unintended consequences. The Authority's findings suggest there may be potential for design improvements, but a conclusion of imperfect market design does not lend support for a claim of a UTS. The Sapere report commissioned by Meridian states that "Market participants are not responsible for adjusting their actions to ameliorate imperfections in market design." The Brattle report commissioned by Meridian argues that if the Authority requires generators to always offer at SRMC when spilling, alternative market design options that provide generators the opportunity to recover capacity costs would need to be investigated. "If the Authority wishes to change the conduct of generators…the correct way to do that is not through a UTS investigation but, rather, through consultation with market participants…". In its cross submission, Meridian also argues that most submissions had limited relevance to the UTS investigation. Instead, they are about market reform options. Meridian argues that there is a general	

		consensus amongst most submitters that a UTS decision is not the appropriate tool for market reform. In its response to the SCP, Meridian also states that it has taken steps to ensure it will minimise or eliminate avoidable spill in the future, and would welcome an initiative to reflect this in the Code either by clarifying how hydro generators offers should be structured during spill, or obligations to eliminate avoidable spill. It also states that a Code change is the proper means of introducing measures intended to make the market more efficient. **Trustpower** argues that any reset of the boundaries for behaviour within the market should occur through an appropriate regulatory instrument (such as a Code change or issuance of guidelines), not indirectly introduced via the Authority's compliance activities.	
C7 The need for clarity between UTS and HSOTC provisions	Claimants Contact Mercury Meridian MEUG Trustpower	The **claimants** argue that the HSOTC and UTS Code provisions overlap, and behaviour can be in breach of both. Any evidence of conduct that the Authority has used previously to determine a breach of the HSOTC rules could form part of its finding of whether there was a UTS in this instance. Specifically, using offers to manage locational price risk. **Contact** would welcome guidance on the interaction between the compliance and UTS processes. Contact is concerned that the HSOTC compliance process and the UTS investigation are running to different timelines, as there is likely to be significant overlap between the decisions and any actions arising from them. It acknowledges that the broader	A number of submitters commented on the relationship between the UTS and HSOTC provisions. The Authority appreciates that parties wish various matters (including the UTS and the HSOTC investigations) resolved in a timely fashion. However, it notes that, although the investigations relate to the same underlying facts, the tests to determine whether there has been a UTS and whether there has been a breach of the HSOTC are distinct – the former focuses on whether the circumstances as a whole have threatened or may have threatened market confidence and/or integrity, while the latter considers whether individual participants have

		question of managing transmission constraints through offers is being considered as part of the MDAG's review of the HSOTC rules. **Mercury** supports any situations where participants are in a position of market power and may exploit offers to earn excessive profits being addressed through clear conduct provisions. It does not consider the UTS provisions as the most appropriate arrangement through which to address issues of market conduct compared to transparent and effective conduct provisions. The UTS provisions are designed for instances when no other remedy is available. Mercury also states that it does not consider the UTS as the appropriate mechanism to provide the necessary analysis to distinguish between managing risk and exploiting market power. **Meridian** points out in its cross submission that the Authority's notice of its HSOTC investigation of the same period is completely irrelevant to the question of whether there was a UTS in this period. "To proceed as the complainants suggest [to treat a breach of the HSOTC as a proven breach of the UTS standard] would cast serious doubt on not only the legitimacy of the UTS decision but also on the Authority's ability to investigate the alleged HSOTC breach in an impartial manner. The Authority correctly notes in the preliminary decision "the test for a UTS is separate and a breach of the HSOTC provisions does not imply or require a UTS". **MEUG** argues that having parallel workstreams on the same event is not unusual, and what matters is that any actions (if the UTS decision is upheld)	complied with the requirements of the Code. A finding that one test has been met does not necessarily mean the other will be. The Authority therefore has, and continues to, conduct an investigation into potential breaches of the HSOTC separate from this UTS investigation.

		improve the long-term benefit of consumers. The Authority will be incentivised to avoid making "double jeopardy" decisions because to do so will undermine confidence in the regime. **Trustpower** argues that the HSOTC and UTS investigations should be coordinated (considered at the same time and decided by the same "judge") to avoid double jeopardy. Further, the Authority should consider using an independent barrister to oversee investigations to ensure independence between the UTS and the breach processes.	
C8 Regulatory certainty	Contact Mercury Meridian	**Contact's** cross submission notes Meridian's argument that the preliminary decision is inconsistent with past decisions, and argues that if finalised, it would create significant uncertainty and be inconsistent with quality regulation. It also states that "New rules cannot be crafted on an ad hoc basis to suit particular parties' commercial positions." In its cross submission, Contact states that "The concerns raised by submitters demonstrate that the UTS preliminary decision is inconsistent with best practice and predictable regulation." **Mercury** also notes in its cross submission that several submitters highlighted the inconsistency with past decisions which undermines regulatory certainty. The Sapere report submitted on behalf of **Meridian** as part of its original submission argues that changes by regulators need to be credible and predictable, and confidence would be undermined where the UTS	The Authority has set out its views on issues of uncertainty at paragraph 8.12 above.

		provisions afforded the Authority with a broad and loose-textured discretion. The Sapere report also argues that electricity wholesale markets are especially vulnerable to behavioural uncertainty by regulators. Also, “If the UTS provision afforded the Authority a broad and loosely-textured discretion, it would increase the scope for subjectivity, and hence for arbitrariness, and undermine confidence in the market. Fortunately, the economic tests bind the Authority to figuring out how the existing market (not the market it or others might prefer) should operate during unforeseen or rare events.” In its cross submission, Meridian states that it is a common thread of submissions (including the claimants) that confidence in the market is undermined when there are not clear rules as to what conduct is permitted, and it is important to have clear rules applied consistently. In the Brattle report commissioned by Meridian, it states “If Meridian’s offers are deemed to constitute a UTS, the Authority would need to consider the broader implications…, including the regulatory uncertainty that would create adverse effects on generation investment.” In its response to the SCP, Meridian argues that the Authority’s approach to the UTS regime is so unclear and inconsistent as to itself damage confidence in the market and its regulation. If the UTS regime is	

		used to “correct” signals from changes in competitive dynamics, market operation will suffer.	
C9 Consequences of a UTS finding	Contact Energy Link Mercury Meridian Neil Walbran	**Contact** is concerned that making a reduction in competitive pressure a ground for a UTS will incentivise more UTS claims from those exposed to the spot market in high price events, while not compensating those who obtain hedges or generators otherwise exposed to low price events for prolonged periods. It is also concerned about the wider potential impact on an energy-only market if generators are unable to manage transmission constraints or recover their costs in the long term through offers. **Energy Link** argues that the PDP does not consider whether finding a UTS in this case may cause lakes to be managed less conservatively to reduce the probability of spilling. It argues that if Meridian decided to run its lakes lower to avoid spilling, shortages may be more likely in the future, if all other things are held equal. It also has the view that the high level of retail competition and the swaption between Meridian and Genesis is likely factored into Meridian’s storage management strategy, and suggests that the Authority’s analysis should consider this in order to avoid unintended consequences. **Mercury** shares Contacts concern that the finding of a temporary reduction in competitive pressure as grounds for a UTS will risk incentives for those exposed to the spot market to lodge UTS claims whenever high prices occur, not compensate those who have obtained hedges, and not provide	The Authority notes that high price events can be consistent with competitive pressure (as in the 2018 event where a UTS was not found). As noted above at paragraph 4.17, the exercise of transitory market power of itself will also not necessarily constitute a UTS. We further note that there is no one circumstance that constitutes this UTS, but a confluence of factors. Withholding generation is one of these factors and it contributed to reduced competition during the period. None of these factors in and of itself is a UTS in this case. We consider that hydro generators are unlikely to manage reservoirs differently in the future given the range of incentives that they face and the uncommon nature of the context that prevailed at the time. It is not the fact that there was spilling that was problematic, but excess spill and the consequent higher than necessary spot prices in circumstances where this was inconsistent with the normal operation of the market. Furthermore, as noted above, the impact of any decision is unlikely to be generalised due to the unique confluence of factors that prevailed at the time.

		compensation for generators who are otherwise exposed to low price events for long periods. **Meridian** argues that the effective rule change as a result of any UTS finding would likely have material consequences for the operation of (including future investment in) the New Zealand electricity market. The Brattle report commissioned by Meridian also argues that an unintended consequence of a UTS finding in this case may adversely impact system reliability due to more conservative lake management to avoid spilling. In its response to the SCP, Meridian also states that "the floodgates would be opened to any number of self-interested or vexatious claims for the Authority to find a UTS in a range of unremarkable situations where perfect hindsight, information, and extended analysis might enable the identification of a slightly more efficient outcome." **Neil Walbran** argues that by-passing the rule making process (and using the UTS as a proxy) could have very high unintended consequences. His comments are specifically in relation to effectively banning (through a UTS finding) the use of offers to manage transmission constraints. His "very rough" estimate of the costs this would impose is derived from the additional costs North Island consumers might have been exposed to if the HVDC had bound more often in the past. But these costs may be higher in the future if Tiwai closes and constraints on new gas exploration remain.	The Authority has addressed submissions that it is confusing its role in determining whether there was a UTS with its Code making functions in row C.6 above.

C10 The Authority's previous letter	claimants Meridian MEUG	The **claimants** argue that the extent that the Authority considers Meridian's conduct – which they have been warned about in the past - is repeated and/or ongoing should weigh against Meridian in both the UTS decision and the HSOTC investigation. It is no defence for Meridian to suggest that because it has behaved in the same or a similar way in the past the behaviour should be treated as permissible. They quote the Authority as saying in their warning that "Any further non-compliance will almost certainly result in a higher-level intervention." **Meridian** argues that a UTS test should not include the Authority's prior warnings, as it is irrelevant and was issued under a different prohibition and process (ie, in the context of the Authority's HSOTC jurisdiction). The UTS regime is focussed on correcting a situation that has arisen in the market as a whole, so considering Meridian's conduct in isolation as evidence to support a UTS decision is inappropriate. Further, "The preliminary decision relies on the Authority's own prior warning letter to require Meridian to act in a way that is artificially "blind" to constraints and price separation. The UTS regime does not require that outcome." Also, the views expressed by the Authority in the warning letter were never concluded views tested and established through proper processes. The Authority does not have jurisdiction to determine a breach of the HSOTC, and therefore the warning letter has no formal legal status.	Contrary to Meridian's submissions, the Authority's decision is not based on its previous warning to Meridian regarding its conduct. Rather, the Authority's analysis considers whether the circumstances as a whole threatened, or may have threatened, confidence in, or the integrity of, the market. Its focus is on the impact on the wholesale market and it has not viewed Meridian's conduct in isolation. Similarly, in respect of submissions arguing that Meridian should not be permitted to repeat conduct simply because it has done so before, the Authority notes that its focus is not on Meridian's conduct per se, but rather whether the factors which existed, as a whole, were sufficient to meet the threshold for a UTS. As noted above, allegations of breach of the Code are addressed through the compliance process.

		Meridian also states in its cross submission that concerns were raised by other submitters regarding the Authority's use of the UTS regime to enforce previous warnings. **MEUG** argues that Meridian's ambivalence to the warning letter warrants a response and contributes to a further erosion in confidence. It is normal in New Zealand for regulators to take a light-handed approach and signal to the market behaviour not considered acceptable thereby leaving an opportunity for participants to find non-regulated solutions. It is not normal, however, for market participants to not heed warnings, and then expect the regulator or other participants to stand by when they repeat that behaviour.	
C11 The need for prompt action	MEUG New Zealand Steel	**New Zealand Steel** is concerned with the time taken in investigating both the UTS claim and alleged breach of the HSOTC. "…given the implications relating to confidence in the markets, processes need to be developed and resourced to have these investigations completed in a matter of weeks not months." **MEUG** also said that the scale of the Authority's estimate of over-charging calls for prompt action in order to avoid a repeat of this event.	The complexity of the UTS meant that it took time to do the appropriate level of analysis. See the steps taken in this investigation set out at paragraph 1.18 above. See also footnote 6 above.
C12 The need for clear boundaries	claimants Genesis Meridian	The **claimants** argue that the Authority should decide that unnecessary spill of water is unacceptable, and should consider how much withholding of capacity is permissible. Otherwise, the Authority risks introducing a safe harbour regarding any amount of unnecessary spill that is not significant	The test for a UTS is set out in clause 1.1 of the Code. While the Authority understands participants' desire for complete clarity as to what will or will not constitute a UTS, any assessment of whether there has been a UTS depends on

		enough to constitute a UTS. Similarly, the decision needs to focus on whether the size of any price changes align with expected behaviour in a workably competitive market, not just the expected direction of the price changes. In their cross submission, they also state that Meridian's submission reinforces the risk of creating a de facto safe harbour, as Meridian comment on what they see as an arbitrary distinction in the PDP between Contact and Meridian. Meridian noted "Offer prices somewhere around Contact's offers do not constitute a UTS, while offer pries for Meridian's Waitaki generation do constitute a UTS according to the preliminary decision." They also repeat their argument in their response to the SCP that the Authority risks setting a precedent that withholding of capacity/unnecessary spill is only undesirable under certain "unusual" circumstances. They state that if the Authority "wants to avoid a repeat it needs to be very clear about what caused the UTS and what behaviour needs to change in the future." **Genesis** urges for this matter to be settled quickly, and in a manner that provides clear direction to participants regarding appropriate trading behaviour during spilling. Genesis "urge the Authority to provide clarity on the principles participants should apply when pricing generation during spilling events." **Meridian** argues that the PDP does not specify exactly what offers constitute a UTS – just somewhere between Contact's offers and Meridian's	a careful analysis of all of the circumstances at issue. The Authority therefore considers that it is simply not possible to explicitly identify what will or will not constitute a UTS ahead of time, nor is it necessary to do so in this case.

		offers, which potentially represent an unknown tipping point. Meridian states that "This uncertainty makes market participants liable to repeat the behaviour the preliminary decision considers amounts to a UTS." And "The Authority does not specify what a generator's offer should look like or even the sorts of costs that a generator may take into account when forming offers during a time of spill…". Also, the approach in the PDP "…adds a new materiality analysis meaning that a small amount of the newly discovered undesirable behaviour is acceptable but at a certain unspecified scale or severity the same conduct will not longer be acceptable and will constitute a UTS." Meridian also states that it is unclear how much "avoidable spill" might constitute a UTS. It claims that the Authority's analysis of the large scale deviation from a competitive benchmark primarily reflects the length of the flood event rather than a normalised measure of deviation. This leaves market participants in a position where they must offer to avoid a level of spill that is "too large" seemingly regardless of the scale of the flood event.	
C13 The Authority's interpretation of the UTS provisions	claimants Contact Meridian Trustpower	The **claimants** state in their cross submission that Meridian's description of the UTS Code provisions imports language that is not actually found in the UTS Code provisions. "Meridian appears to be attempting to import an additional safe harbour that does not exist in the Code: "Normal market operation is a UTS safe harbour"." Other language that Meridian use that is not found in the UTS Code provisions include:	The Authority agrees with the claimants that the UTS test does not require a dysfunctional market or aberrant behaviour, and we have set out our views in this respect in paragraph 2.7 above. One of the quotes Meridian use from the Authority's past decisions has at the end of the quote "That this type of offer behaviour has occurred regularly in the past, without

		• The UTS Code provisions are a "test [that] has always required aberrant behaviour or a dysfunctional market" • "qualitative threshold [is] required by the Code's terms" • "the concept of a UTS [is] an unusual market situation that can be immediately recognised and requires immediate rectification". **Contact**, in its cross submission, argues that the claimants – by asking the Authority to apply a rule of "too much" and "too long" - appear to read in novel UTS rules which do not exist in the Code. Contact also argues that other submitters share the view that the Authority appears to be amending the definition of a UTS, and the established approach to assessing whether or not market confidence has been adversely impacted. It agrees with Meridian that the language used in the Code suggests a UTS has to be an exceptional circumstance, outside of normal operations of the market. **Meridian** argues that the Authority has changed the definition of what a UTS is and has interpreted and applied the UTS provisions unlawfully. The reasons it gives for this are: • A test of "spot market outcomes that do not meet the Authority's expectations" is inconsistent with the text and purpose of the Code	creating a UTS, suggested that the behaviour alone was not sufficient to warrant a UTS finding…" (2016). This is consistent with the decision in this case, as it is not the offer behaviour alone – but rather a confluence of factors – that we find led to unusual outcomes (and hence impacted confidence and/or integrity). The 2016 event saw outcomes that were consistent with the underlying supply and demand fundamentals (TCC outage, high demand etc). Meridian's behaviour in that case was also only one element. "Final North Island energy prices were consistent with a situation where there is a known shortage of generation." The Authority has otherwise fully explained its approach to the application of the UTS test in this case in the body of this paper.

		• Behaviour that is part of normal market operations cannot be found to be a UTS as the Authority has previously acknowledged. • The test applied in the PDP is different to that used previously by the Authority, is subjective, and in reality seeks the optimisation of the wholesale market rather than correction of a UTS • The test applied in the PDP is arbitrary • Even if "meeting the Authority's expectations" was the test for a UTS, the Authority fails to properly apply the principle of workable competition. Meridian argues that "the UTS provisions have only been applied when there has been a major departure from normal market operations and the market has become dysfunctional." And, "The text of the UTS definition clearly sets a high threshold for finding such a situation. Mere difference from the Authority's expectations does not reach that threshold." Also, "The UTS regime exists as a rule of last resort to fix aberrant behaviour or serious market disfunction." It is not "to apply the Authority's expectations of spot market efficiency" or "evolve market trading rules." For its second point above about behaviour that is part of normal market operations, Meridian quotes the Authority as saying in previous UTS decisions that "…a UTS must be a situation outside of the normal operation of the wholesale market". They argue that "To find a UTS now would be contrary to the normal market operations safe harbour that has	

		rightly been an integral part of previous UTS investigations." In its response to the SCP, it states that the Authority is incorrectly applying the UTS regime as a market optimisation rule, which risks undermining the market's ability to engage in price discovery. It also says that substituting the commercial judgement of generators with the Authority's view of a better outcome does not restore the normal operation of the market, but replaces it. It also argues that the five step test is not consistent with the Code, and results in too low a threshold for a UTS. Unusual circumstances occur quite frequently. Sapere, as part of Meridian's submission in response to the SCP, argues that the Authority appears to infer that the UTS provides for it to intervene when outcomes differ from those it expects on average. It states that perhaps the Authority intended to "identify were circumstances and or behaviour…so unusual such that the market ceased to *operate* normally. This is of course a very different test…". It also states that the Authority has not identified any evidence that any South Island generator was precluded, in December 2019, from submitting offers they perceived were in their commercial interest and could be filled safely, and that these offers were dispatched in accord with the normal operation of the market. **Trustpower**, in its response to the SCP, questions whether the UTS Code provisions operate as a last resort measure for exceptional circumstances, or "a tool for inquiry and intervention whenever there are	

		price outcomes which do not match the regulator's, or claimants', expectations of what might reasonably be expected to occur with levels of normal competition."	
C14 The PDP's criteria for a UTS	claimants Meridian	The **claimants** argue that 2.9(a) and (b) in the PDP (referring to the impact on confidence and/or integrity from spot market outcomes differing markedly from what could have been expected given the underlying supply and demand conditions, and the close link of the forward market to the spot market) are sufficient for a UTS, regardless of the HVDC issues raised under (c) and (d). **Meridian** argues that it is vague and unclear as to what amounts to a UTS in the PDP, or what legal test is being applied. The PDP "fails to isolate the specific actions, either alone or in combination, that amount to a UTS". It states that it is unclear whether it was Meridian's behaviour or market outcomes that caused the UTS finding, or whether one of the factors listed in the PDP constitute a UTS or they collectively constitute a UTS. Meridian also states that the Authority has not identified trading periods when some, none, or all of the factors listed in the PDP apply. In the Russell McVeagh report submitted as part of Meridian's cross submission, the report argues that there is no explained link between the purported purpose of Meridian's actions (to avoid transmission constraints binding) and the test for a UTS. The Authority can only consider the purpose of a participant's actions if it is demonstrated to be	The criteria for a UTS is a situation that threatens for may threaten confidence in or integrity of the wholesale market. There is no need to isolate specific causal actions. Following submissions on the PDP, the Authority clarified that it was a confluence of factors that led to outcomes that threatened or may threaten confidence or integrity. The confluence of factors establishes the uniqueness of the event, the comparator shows how far from normal it is, and our estimate of scale measures the impact on the market. The Authority notes that its analysis of the UTS does not rely upon Meridian's (or any other party's) purpose in acting as they did; rather, it focused on the effects of participants' conduct and whether these contributed to the confluence of factors it identified. It notes that, as evidenced by the examples of potential UTS identified in cl 5.1(2) of the Code, a participant's intention may sometimes be relevant; however, it was not necessary for the Authority to rely on any of these examples in the present case.

		relevant to the test for a UTS (i.e. the purpose was relevant to whether a situation occurred that impacted confidence or integrity). The claimants have failed to demonstrate this.	
C15 The Authority's approach in the PDP and SCP	claimants Contact Genesis Meridian MEUG New Zealand Steel Nova	The **claimants** agree with the logic of the Authority's analysis that wholesale market conduct or outcomes that are not consistent with underlying supply and demand conditions may risk undermining confidence and integrity, but also argue that unnecessarily spilling water to raise prices or avoid price separation is undesirable, regardless of whether the behaviour is not successful at raising prices. They also argue in their cross submission that Meridian's criticisms of the Authority's approach to the UTS test are mistaken and not a reasonable interpretation of the Authority's preliminary decision. Specifically, the claimants suggest that the Authority has not adopted a perfectly competitive market test. They also state that it is entirely appropriate for the Authority to make judgements about how far removed market outcomes need to be from what would be expected in a competitive market to trigger a UTS. "Adopting competitive market benchmarks provide an orthodox framework for reviewing market behaviour and outcomes." Additionally, the claimants considered the Authority adopted an orthodox and sound set of parameters to conclude that market outcomes deviated by too much or for too long compared to what should reasonably be expected from a competitive market.	The Authority has set out our approach, and the reasons for it, in section 3 above, including why we consider our approach was objective. We have further, in paragraph 3.28 and following, set out why we consider our approach is not inconsistent with that taken in previous UTS decisions. In relation to Sapere's argument that the Authority models offers Meridian and Contact could have made, if forced, the Authority considers this risks mischaracterising our estimate of excess spill. It is calculated in two parts: firstly understanding what extra quantity could have been generated at Benmore while respecting operational and resource management constraints, and then calculating how much of this could be absorbed by the market. We then estimate a clearing price that would dispatch this extra generation. In making this calculation, we make no judgements about the impact of the opportunity cost of water on offers, or fictitious rules or competitors. The Authority is aware of the threshold for the finding of a UTS. Our estimate of the

		Contact argues in its cross submission that the test for a UTS is not an assessment of the Authority's preferred outcomes. "Instead, something that threatens, or may threaten, confidence in, or the integrity of, the wholesale market needs to have occurred…". Contact note that other submitters share the view that the Authority appears to be amending the established approach to assessing whether or not market confidence has been adversely impacted. **Genesis** agrees with the test that the Authority has used, specifically whether: • spot market outcomes reflect changes in underlying supply and demand conditions; and • there was a material change in the futures market that may indicate a loss of confidence in the forward market. **Meridian** argues that the Authority has used the wrong test and that it is inconsistent with the Code and previous analysis. Specifically, it should not be about workable competition (as this is a long-term concept, so this cannot be tested by looking at short-term outcomes) and the Authority's expectations, but rather about an unusual market situation (outside of normal operations) and a rule of last resort. The examples in the Code suggest it needs to be a situation that is "contrary to the public interest". The Code sets a high threshold for a UTS, and "Mere difference from the Authority's expectations does not reach that threshold."	cost of the UTS is a way of quantifying impacts.

		Meridian also argues that the Authority should use objective measures like it has done in the past (not "measuring offer behaviour against its own subjective expectations"). "The Authority's expectations are not an appropriate or reasonable measure of market confidence or integrity." The market's true confidence as measured through things such as prudential requirements or material change in the trading of risk management products were given insufficient or no weight. Meridian argues that the Authority's approach equates a loss of confidence with any outcome that differs from its expectations, and therefore "wrongly disregards the settled meaning of a UTS (a dysfunctional market) and the settled approach to assessing a lack of confidence (event studies) and replaces both steps with a subjective test of whether market outcomes diverge sufficiently from the Authority's "expectations"." Meridian also argues that the Authority's test is arbitrary in three ways: • It is not clear what offer prices when spilling would constitute a UTS • What is considered "too large" in terms of unnecessary spill is undefined and seemingly unrelated to the scale of a flood event • The use of QWOP is inappropriate. Sapere, in support of Meridian's submission, also argues that "[t]he Authority does not assess whether normal market operations continued during the period of high inflows. Rather, the Authority models the offers that Meridian and Contact could have	

		made, if they were forced—by competitors or rules that do not exist—to price their output at the Authority's estimate of the opportunity cost of water (which the Authority assessed at close to nil), rather than at the price at which they were willing to sell." In its cross submission, Meridian also argues that a test that can only assess conduct retrospectively with the full benefit of hindsight is unprincipled and unworkable. In its response to the SCP, Meridian argues that submissions on the PDP pointed out a number of errors in the Authority's approach, but instead of engaging with these submissions, the Authority has added new steps to the new UTS test it has adopted in the SCP. Meridian argues that it is unsure why the Authority has introduced yet another framework, which seems unlikely to affect the Authority's view on whether a UTS has arisen, because it does not change the final two steps of the proposed approach. Meridian believe that this change adds complexity and confusion to an incorrect application of the UTS provisions, and still differs from historical application by the Authority. It also argues that the "reduced competition" limb of the Authority's approach is not relevant. A UTS can be found without a reduction in competition. Adding this step conflates (inappropriately in Meridian's opinion) the Authority's view of sub-optimal market operations with a UTS by saying any reduction from workable, or really perfect, competition could be sufficient to establish a UTS. It makes little sense to discuss reduced competition within a workably	

		competitive market over a timeframe of weeks. The short period focus ignores the proper understanding of a workably competitive market. Meridian also states that it appears that the Authority's approach to the test for a UTS has been to work backwards from a belief that more generation could have occurred in December 2019 to finding a UTS, rather than starting with the Code, ascertaining what it means, and then applying it. The Authority's approach would result in a new test being applied retrospectively to participants who potentially face significant penalties for breaching a rule that they did not know existed at the time. The approach adopted amounts to a retrospective penalty. Also, the Authority's approach cannot be used by market participants to guide their conduct. The analysis cannot be undertaken by market participants at all, let alone in real time response to changes in the fast-moving wholesale electricity market. The UTS test must be formulated with sufficient precision to enable market participants to regulate their conduct in accordance with the test. The Authority's approach can be characterised as involving a legal test that has been in flux (including between its PDP, and supplementary paper). Using a "confluence of 'unusual' factors" framework that has no fixed or predictable content means that market participants can't know what factors the Authority will consider sufficiently "unusual" to warrant consideration in a future UTS investigation. Further, market participants cannot know in real time all of the factors the Authority would look at given many relate	

		to confidential commercial decisions and operational/commercial constraints. It claims that the approach is driven by hindsight-based empirical analysis. **MEUG**, in its cross submission, states that it agrees with the Authority's use of a counterfactual which attempts to estimate a workably competitive market. It states that it is important that: • The Authority uses analytical tools that are relevant to the circumstances of the UTS claim; and • The Authority exercises judgement and does not rely solely on the outputs of a modelled counterfactual MEUG go on to say that it sees no evidence the Authority intends to make a final decision based solely on the modelled outputs. It agrees the Authority's models were appropriate to inform their decision. In its submission in response to the SCP, it reiterates this point by stating that it assumes the Authority will weigh calculable empirical evidence with an informed view on material subjective factors also, as data on some important factors are not available (such as confidence in the market). **New Zealand Steel** agrees with the framework used and the factors considered by the Authority. In particular, the Authority's approach of considering whether outcomes reflect underlying supply and demand conditions.	

		Nova stated that the framework used by the Authority for the analysis was robust.	
C16 Other	Energy Link EPOC Genesis Mercury Meridian	**Energy Link** argues that the concept of opportunity cost of water does not just relate to the short run. That is, in the longer term there are trade-offs between spill and security, and these are taken into account by market participants. However, if spilling was inevitable given any credible storage scenario (ie, even if lakes were at low levels prior to spilling), there would be a stronger case for the assertion that the opportunity cost of water was zero while spilling. It argues that the PDP does not consider if this was the case in November and December. **EPOC** argues that if the Authority upholds the UTS decision, the Authority has a duty to implement more rigorous market monitoring to provide evidence of strategic offering that is less obvious than that reported in the 3 to 18 December 2019 period, including when reservoirs are not spilling, and hedge contracts and retail positions affecting spot market offering behaviour. It reinforces this argument by its analysis using risk-adjusted opportunity values of stored water to simulate perfectly competitive offers in vSPD. Its results show that in 2017 there could have been lower South Island prices, more energy from the Waitaki system, and more times when the HVDC constraint bound. **Genesis** agrees that its behaviour did not undermine confidence, and therefore did not meet the test for constituting a UTS. It also states that the conclusion of the virtual asset swap agreements from 2024 will release additional uncontracted volume to Meridian,	The scale calculated was 'excess' spill – ie, spill that could have been used to generate instead. Some spill however was unavoidable as the event was extreme. Thus the assertion of zero opportunity cost of water holds in this case (at least in December, when all South Island stations were spilling), which the Mercury submission appears to support. In response to EPOC: • We are not using a perfect competition benchmark • We are here only analysing the UTS investigation period. One of the tasks with this UTS was to measure the extent of the impact. The length of time needed to develop a method to do this is independent of whether the UTS was obvious or not. The relationship between market structure and competition is not relevant to our UTS decision. Water can either be stored or used to generate. When hydro generating stations are spilling, water cannot be stored. So the choice to use water is between either generation or spilling. If we assume that spilling has no cost, then the opportunity

		the closure of Tiwai will increase Meridian's South Island capacity, and the expected rise in the price of emissions will increase the cost of thermal generation, all of which will mean the impact of events like this one will be greater in the future. **Mercury** argues that the Arapuni example of managing transmission constraints presented by Meridian in its submission is not a relevant comparison to the UTS claim. Mercury claims that its offers in this instance reflected its view of the opportunity cost of using scarce water to generate at a more efficient level, and as the PDP notes, the opportunity cost of water in the UTS was likely to be at or near zero. The Sapere report commissioned by **Meridian** argues that market participants are not responsible for adjusting their actions to ameliorate imperfections in market design. "There is no requirement in the Code for market participants to forego profitable transactions to achieve better market outcomes." The Sapere report also argues that the value of water is not the only element in determining the opportunity cost faced by hydro generators. Rather, the opportunity cost to a generator includes the impact of a clearing offer on the market price and accordingly on revenue from inframarginal quantities. The Authority conflates the opportunity cost of water with the opportunity cost of offers. Meridian argues that the length of the investigation (using complicated economic modelling and with the benefit of 20/20 hindsight) is itself evidence that there	cost of using water to generate is zero as this is the cost of the alternative. However, as Sapere point out, to the extent that a generator has market power and can affect the market price, there may be an opportunity cost to generating rather than spilling if generating causes the clearing price to fall. This implies that a generator in such a situation would price its offers high to reflect that it preferred to spill rather than generate. When a generator faces such incentives we rely on competition to place downward pressure on its offer prices. However, during the UTS period there was reduced competitive pressure, which allowed Meridian to withhold generation which resulted in it spilling some of the water it could have used for generation. Regarding speed of adjustment, there was no adjustment by market participants during any stage of the UTS investigation period. Prices fell on 18 December due to falling demand. So throughout the entire 6 week long spilling event, there was no adjustment to the abundant fuel supply. In contrast, in spring 2018 shortages of gas and storage led to high prices almost immediately. In terms of the consultation process, the Authority considers that its process has been robust. The SCP responded to requests in submissions, including from

		was no UTS requiring urgent restorative action. "…a genuine UTS event would be immediately apparent, because it threatens confidence in the market." The Sapere report submitted with Meridian's cross submission argues that there is an ambiguous relationship between the structure of a market and the intensity of competition. Rather, creating conditions for active competition is one of the main tasks of market design. Thus, the Sapere report argues that Genesis's view that restructuring of generation has the best potential to strengthen competition does not accord with published literature. The Brattle report also said that it is economically rational for generators to structure their offers in a way that anticipates the level of the system marginal price in order to maximise revenue. And since the NZ market is concentrated, this means many generators are potentially price-setting and therefore prices deviate from SRMC. The Brattle report also argues that the speed and extent of adjustments to changing supply and demand conditions may not be predictable ex ante in the NZ electricity market. In response to the SCP, Meridian argues that the supplementary consultation occurred in a twilight zone, where market participants did not know what of the prior consultation had been accepted or rejected. It argues that this uncertainty, along with the short timeframe for submissions, suggests that the Authority has remained fixed on its approach in the PDP and has not considered with an open mind the submissions and cross-submissions.	Meridian, for more clarity as to why the Authority considered there was a UTS. Since the SCP only addressed three matters, the Authority considers the time provided was adequate for submitters to respond to the SCP (and the Authority notes that it has received detailed and comprehensive submissions during this process). The Authority has engaged fully with submissions with an open mind, as demonstrated in the FDP.

C17 Actions to correct	Various parties	Some parties have made submission relevant to actions to correct	The Authority will address submissions made on issues relevant to actions to correct in the paper that will now follow on that issue in 2021.