Scarcity pricing - Overview

27 October 2011

Introduction

The Authority will publish in the Gazette on 28 October 2011 amendments to the Electricity Industry Participation Code 2010 (Code) to provide for scarcity pricing.

Scarcity pricing refers to arrangements to modify prices in the wholesale electricity market (spot market) when the system operator reduces demand through administrative action.

The scarcity pricing Code amendment gazetted by the Authority provides for the introduction of a $10,000/MWh price floor and $20,000/MWh price cap to the spot market when an electricity supply emergency causes forced power cuts (called emergency load shedding) throughout one or both islands.

Although emergency load shedding is very unlikely to occur, the $10,000/MWh price floor is intended to give investors in last-resort generation plant (and investors in demand response capability) confidence that emergency load shedding will not undermine the business case for investing in those resources. This promotes reliable supply by the electricity industry, which reduces the risk of emergency load shedding occurring.

The scarcity pricing Code amendment increases the imperative for all parties exposed to spot market prices to carefully assess their exposures and obtain sufficient hedge cover to achieve their desired risk levels. The initiative is also expected to enhance competition for the provision of last-resort resources.

The problem

Like many other developed countries, New Zealand uses a wholesale electricity market (spot market) as the primary means of coordinating offers by generators to sell electricity, and bids by wholesale purchasers (including retailers and large industrial users) to buy it.

In any given half hour trading period, if the amount of generation available increases and demand for electricity remains the same, then this tends to cause spot prices to fall. Conversely, if the amount of generation decreases the supply of electricity becomes relatively scarcer and this causes spot prices to rise.

Higher spot prices encourage generators to make more of their existing generation available, and it encourages retailers and other purchasers to reduce power use or shift their consumption to lower price periods. Over time, spot prices provide longer-term signals which influence investment decisions by wholesale electricity purchasers and generators.

Although spot market prices generally signal the state of demand and supply conditions appropriately, on rare occasions generation capacity can become so scarce that forced power cuts are required. Normally, when a good or service becomes scarce, demand is rationed by increasing the price. However, forced power cuts reduce spot prices for electricity, undermining

the financial incentive for wholesale parties to make arrangements with consumers to voluntarily conserve power and for generators to maximise available supply.

Future investment decisions may also be affected. Wholesale participants make their decisions based on expected spot prices. If they expect spot prices to be suppressed below a competitive level in a supply emergency, this will reduce their incentive to make decisions to build last-resort generation plant, invest in demand-response capability and/or enter into future supply contracts that can underpin generation investment.

Finally, while price suppression is the main concern, when the system is at the limit of its capability there is also a possibility that spot prices will settle well above the level expected in a workably competitive market.

Scarcity pricing solution

After comprehensive consideration of this problem and options to address it, the Authority has made Code amendments that will modify the pricing process to provide more certainty about spot prices during instances of widespread emergency load shedding. Scarcity pricing comes into force on 1 June 2013 and will apply if forced power cuts are required because there isn't enough generation to meet electricity demand in one or both islands.

From 1 June 2013 onward, if scarcity pricing is triggered, the generation weighted average spot price (GWAP) will first be calculated for the affected island(s) based on existing pricing processes. If the GWAP is lower than $10,000/MWh, all prices within the affected island(s) will be scaled up so that the GWAP reaches $10,000/MWh. If the GWAP based on existing pricing processes is more than $20,000/MWh, all prices will be scaled downwards so that GWAP is $20,000/MWh.

The price floor has been set at the level roughly equivalent to the price required to cover the costs of a last-resort generation station. Setting a price floor at this level should give investors in last-resort resources confidence that emergency load shedding will not undermine the business case for investing in those resources. This promotes reliable supply by the electricity industry.

The price cap reflects an upper estimate of the value of forgone consumption during emergency load shedding. It has been adopted to address consumer concerns that imposing a price floor for emergency load shedding situations may embolden providers of last-resort plant to charge prices above what would occur in a workably competitive market.

In combination, the floor and cap mechanism during scarcity will give improved revenue certainty for providers of last resort resources (generation and demand response), while also giving more assurance to wholesale purchasers that spot prices in emergency load shedding will not settle well above the level expected in a workably competitive market.

Furthermore, scarcity pricing will increase incentives for consumers and net-retailers to enter into hedge arrangements with providers of last resort resources, increasing competition in the provision of these resources.

A stop-loss mechanism will halt the application of scarcity pricing if the average price over any rolling seven day period is greater than $1,000/MWh. Beyond this limit, normal pricing processes would apply.

How would electricity consumers benefit?

From the standpoint of an electricity consumer, it is important to consider both the visible cost of electricity observed in power prices, and the hidden cost that results from any forced power cuts.

At present, the hidden costs of forced power cuts are not being properly factored into decisions by generators and spot market purchasers as forced power cuts reduce spot prices for electricity rather than increase them. This increases the potential for forced power cuts to occur, the costs of which are borne by electricity consumers in the form of lost production, greater inconvenience from power outages, and reduced standards of living. Scarcity pricing ensures spot prices remain high enough to given investors confidence that emergency load shedding will not undermine the business case for investing in last resort generation or demand response capability.

This should ensure forced power cuts occur only when they are economically justified. It will also help to underpin the development of voluntary demand side alternatives, such as retailers entering into arrangements that reward customers for providing interruptible demand. In this context, it is compatible with the Authority's recent announcements on Code amendments to introduce dispatchable demand[1].

There is not expected to be significant effect on the visible costs of electricity, especially as a transition period is being provided for spot market parties to adjust their plans. Scarcity pricing is not expected to have any significant effect on average spot prices over time. While it is likely to put further upward pressure on spot prices during periods when supply conditions are tight and prices are high, this increase is expected to be offset by downward pressure at off-peak times. Modelling work undertake by the Authority suggests the impact could be between nil and 1 percent on delivered electricity prices in the medium term, depending on the load profile of a residential consumer.

Related initiatives

Scarcity pricing for emergency load shedding follows on from changes made in early 2010 to the reserves market to avoid price collapses during tight supply situations. A model-based solution was adopted that avoided the need to set price floors for the reserves market, but a similar approach wasn't possible for emergency load shedding situations.

The Authority has considered scarcity pricing for other supply emergencies, such as public conservation campaigns (PCCs) and rolling outages, and has decided not to proceed with that initiative in those cases. The Authority was unable to find a model-based solution, leaving it with the option of introducing a $500/MWh price floor for the duration of PCCs (which could last several months).

The Authority decided a price floor for PCCs:

- risks creating perverse incentives for thermal generators to withhold supply in the lead up to PCCs to hasten the triggering of the price floor;
- would be very intrusive to market operations due to the extended periods for which PCCs can occur; and
- is unlikely to provide credible signals for investment in last-resort resources due to concerns about the durability of the price floor – that is, it could easily be removed or reduced in the lead up to, or during, PCCs. The Authority expects price floors for emergency load shedding situations to be more durable as emergency load shedding situations are very rare, occur very rapidly and have very short durations.

---

[1] http://www.ea.govt.nz/document/15236/download/about-us/news-events/market-briefs-media-releases/21Oct11/

It also considered that the concerns associated with PCCs have already been addressed to a large degree by other measures, including the customer compensation scheme, and the remaining concerns are better addressed by the stress testing regime.

Section 42(3) of the Act provides for the Authority to adopt alternative measures where it believes they would better serve the long-term interests of consumers. As a result, the Authority has prepared Code amendments to introduce a stress testing regime, which will be gazetted on 3 November 2011. The details of the stress testing regime are provided in an accompanying overview paper.