**ORDC Parameter Review and Discussion**

**NRG Comments**

The ERCOT region relies on an effective scarcity pricing mechanism to create appropriate incentives for short-term and long-term behavior by resources and loads. The Public Utility Commission of Texas directed the implementation of the Operating Reserve Demand Curve (ORDC) to improve scarcity price formation in ERCOT. In October of 2015, Commissioner Anderson requested review of ORDC performance with an eye towards “minor adjustments” needed to address out-of-market influences.[[1]](#footnote-1) In response to this request, NRG has evaluated ORDC performance and agrees that its implementation has improved scarcity price formation, but also believes modifications are justified to address challenges presented by the current market design, system operation, and various externalities. NRG appreciates the opportunity to review the performance of the ORDC and provide the comments below.

**Principles vs. Objectives: Challenges in the ERCOT market**

NRG recognizes the difficulty in upholding economic principles in market design while also meeting important, but unrelated objectives. This is especially true in power markets where the necessary influences of operating reliability and other well-intentioned objectives often interfere with rational market outcomes. The urge to avoid the scarcity events that are required to send effective price signals in power markets will never diminish and, therefore, must be managed from a pricing perspective. When reviewing market outcomes since ORDC implementation, NRG observes the impact of out-of-market actions and various externalities on ORDC performance and scarcity price formation. NRG also identifies design features which negatively impact market participation. The following challenges in the ERCOT market are observed:

* Out-of-market reliability actions continue to influence scarcity price formation in ERCOT: As reserves fall below 3,000MW, ERCOT begins to take actions which influence market outcomes (although minor) through the issuance of advisories. However, once reserves reach Energy Emergency Alert (EEA) Level 1 at 2,300MW, ERCOT follows procedures which execute numerous reliability actions that influence prices and reserve levels.[[2]](#footnote-2) Reliability actions are necessary and should be expected, and an effective scarcity pricing mechanism must take all of these actions into consideration.
* ORDC performance and scarcity price formation are also influenced by externalities intended to achieve other objectives: Scarcity price formation and ORDC price performance in ERCOT are significantly influenced by non-market behavior driven by 4CP transmission cost allocation. 4CP demand reduction is not a response to expected or actual real-time energy prices. Instead, it is a methodology to allocate transmission costs in the ERCOT region. ERCOT recently estimated average 4CP response to be between 400MW-600MW during peak summer month hours.[[3]](#footnote-3) In addition, Transmission and Distribution Service Providers (TDSPs) procure and deploy Load Management Programs as part of state-mandated energy efficiency programs. In the past, TDSPs in the ERCOT region typically procured over 200MW to fulfill this mandate.[[4]](#footnote-4) Both 4CP and TDSP Load Management Programs are examples of behavior motivated by incentives external to market forces that exert influence on scarcity price formation.
* The ERCOT market is exposed to periods of crippling volatility that has far reaching impacts throughout the industry: A high level of volatility is expected in a well-designed energy market that exhibits scarcity prices which approach the Value-of-Lost-Load (VOLL). However, the ERCOT market possesses other features that exacerbates volatility and impairs liquidity.[[5]](#footnote-5) When considering ORDC design changes, satisfying objectives such as partial mitigation of volatility should be considered.

**NRG Proposal**

1. Set the ORDC parameter value of X to be 2,500MW in the summer months of June, July, August, and September.
2. In all other months of the year, set the value of X to be 2,300MW.
3. Maintain the value of X as a static number and do not adopt a methodology that varies X.
4. Set the ORDC parameter VOLL to be $18,000/MWh, but maintain the effective price cap at no higher than $9,000/MWh.
5. Increase the minimum Responsive Reserve Service (RRS) procurement amount to be higher than the EEA Level 1 quantity of 2,300MW.
6. Implement these set of changes on June 1st, 2017.

**Discussion**

Value of X

As explained above, out-of-market actions and externalities significantly influence ORDC performance and scarcity price formation in ERCOT. NRG proposes that the value of X be set no lower than 2,300MW to reflect the heavy influence of out-of-market actions at EEA Level 1 (EEA1). NRG observes that by the time Physical Responsive Capability (PRC) degrades and EEA1 is declared, ERCOT is taking reliability actions to avoid load shed events which substantially influences pricing results. Therefore, sending an effective price signal at EEA1 reflects those actions and motivates the desired behavior.

NRG is also concerned about the impact of externalities on crucial price formation during the summer months. The 4CP transmission cost allocation mechanism results in significant non-market behavior during the four summer months of June, July, August, and September. Trends of increasing transmission costs point to increasing participation in 4CP behavior in the future. In addition, the TDSP Load Management Programs are active in the summer months as well, although they are typically deployed during EEA events.[[6]](#footnote-6),[[7]](#footnote-7) Both 4CP and TDSP Load Management Programs are examples of behavior motivated by incentives external to market forces that exert influence on scarcity price formation. To account for these influential factors at critical times in the summer, NRG proposes to increase the value of X to be 2,500MW during the months of June, July, August, and September. Although ERCOT’s estimation of 4CP response could justify a value of X higher than 2,500MW (~2700MW-2900MW), NRG is concerned that distortionary effects on energy price from higher levels of X could lead to irrational market behavior. In addition, NRG recognizes that non-market behavior such as 4CP response will fluctuate and therefore a conservative adjustment to X such as 2,500MW is appropriate.

Maintain X as a Static Value

NRG proposes that X be a static value as described above and not vary by hour. Pricing outcomes are highly sensitive to the value of X and intra-day changes to X will cause hourly price swings that could be large, difficult for market participants to manage, and irrational. Price uncertainty resulting from varying the value of X in real-time would therefore negatively impact volatility and should be avoided.

Address Volatility

The current design of the ERCOT market will inherently be accompanied by extreme price volatility during scarcity events. One of the most important objectives to address in this ORDC parameter review is volatility. As noted by Commissioner Anderson, the current shape of the ORDC produces a step change in price as reserves approach the value of X.[[8]](#footnote-8) The market struggles to react to such binary pricing outcomes which contributes to the excessive volatility observed in ERCOT. NRG proposes increasing the VOLL to $18,000/MWh to moderate that step change in the price curve, but agrees that the effective price cap should not be increased and should be no higher than $9,000/MWh.

Increase Minimum RRS Quantity to Force Convergence of PRC and ORDC Prior to EEA1

NRG recognizes that a gap exists between how PRC is measured and how reserves are measured in ORDC. Because out-of-market reliability actions are triggered by PRC levels, it is important to address this gap to ensure the ORDC is sending appropriate price signals at the right times. In the summer of 2015, this gap caused PRC levels to approach EEA1 even though reserve levels in ORDC remained relatively robust. The gap is primarily caused by approximately 1,000MW of Quick Start Resources that were included in ORDC reserves due to their ability to start in 10-minutes, but were not reflected in PRC since they were not actually online. These Quick Start Resource offers typically sit near the end of the SCED offer stack. Because the LMPs produced by SCED were not high enough to dispatch the Quick Starts, they remained offline causing a significant gap between PRC and ORDC reserves even as PRC dipped near EEA1. Increasing the minimum Responsive Reserve Service (RRS) quantity above EEA1 would remove capacity from SCED and effectively shift the dispatch order by requiring SCED to exhaust all offers prior to reaching EEA1 (including the Quick Start offers which closes the gap). While increases to the value of X and VOLL are more important and given the lack of a better solution, NRG would support increasing the minimum RRS quantity to above EEA1 (i.e. 2,500MW) to address the gap between PRC and ORDC prior to reaching EEA1. If increasing the minimum RRS quantity is not desired, an alternative to address the gap between PRC and ORDC reserves would be to require Online NSRS to commit during NSRS deployments. However, this approach could introduce price reversal issues that would need to be managed.

Proposed Implementation Date

NRG proposes that any changes to the ORDC be implemented on June 1st 2017. Being only six months away from summer of 2016, Market Participants have already hedged a significant portion of their business and load contracts for the critical summer periods of 2016. Therefore, an implementation date sufficiently in the future and prior to the summer of 2017 would avoid “change in law” provisions in customer contracts potentially coming into play.

1. <http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/40000_667_868214.PDF> [↑](#footnote-ref-1)
2. http://www.ercot.com/content/news/presentations/2015/Energy%20Emergency%20Alert%20Communications%20Matrix%202013\_4262013.pdf [↑](#footnote-ref-2)
3. http://www.ercot.com/content/wcm/key\_documents\_lists/54223/11.\_\_RMS\_PriceResponsiveLoadERCOT\_100615.pptx [↑](#footnote-ref-3)
4. http://interchange.puc.texas.gov/WebApp/Interchange/application/dbapps/filings/pgSearch\_Results.asp?TXT\_CNTR\_NO=40891&TXT\_ITEM\_NO=19 [↑](#footnote-ref-4)
5. http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/40000\_421\_758185.PDF [↑](#footnote-ref-5)
6. <https://centerpoint.anbetrack.com/etrackcnp/PortalOpenfile.aspx?FilePath=http://172.16.2.237:8081/CNP/Production/Miscellaneous/2016%20Commercial%20Load%20Management%20Program%20Manual%20FINAL.pdf> [↑](#footnote-ref-6)
7. https://drive.google.com/viewerng/viewer?url=https%3A%2F%2Fwww.oncoreepm.com%3A8095%2Feepmdocs%2FPublished%2520Documents%2FApogee%2FCLM%2520Program%2520Manual.pdf [↑](#footnote-ref-7)
8. http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/40000\_667\_868214.PDF [↑](#footnote-ref-8)