December 16, 2013

Public Utility Commission of Texas
1701 North Congress Street
Austin TX 78711

RE: Project Code 40000

Dear Chairman Nelson and Commissioners,

These comments are offered in response to the Questions issued by Chairman Nelson in this project on October 25, 2013 (Project 40000, item number 522) and to Questions issued by Commissioner Anderson on November 15, 2013 (Project 40000, item number 559).

These comments also supplement prior comments in this project (item numbers 276 and 329) from Regulatory Assistance Project.

The Regulatory Assistance Project ("RAP") is a global non-profit company based in Montpelier, Vermont providing policy development and technical assistance services to governments involved in power sector regulation. Senior RAP personnel are former government energy regulators. RAP is supported by grants from foundations and government and represents no private interests.

We have followed with great interest the discussions taking place in Texas regarding electricity market design and resource adequacy. We are involved to varying degrees in similar deliberations in various markets around the world but the depth and quality of the enquiry in Texas is extraordinary. In hopes of making a constructive contribution to the PUCT's deliberations, and further to our previous submissions regarding Project 40000, we respectfully submit the following suggestions for consideration on two dimensions of the reliability matters currently before the Commission: first on the question of how to evaluate "resource adequacy" in terms that ultimately matter most to Texas businesses and consumers, and second on the question of properly defining the product one is trying to deliver before intervening in the market to deliver it.

What constitutes an "adequate" level of resources?

Much ink has already been spilled on the questions of what level of resources is "adequate" and which type of mechanism would be able to deliver a given level of reserve margin most reliably and most cost-effectively. A recent example is the 27 August 2013 Charles River Associates report commissioned and submitted by NRG Energy, Inc., followed by an extensive analytical critique of that report by R.E. Wakeland at the request of Commissioner Anderson. The important context within which this recent exchange has occurred is the impending consideration of the costs and benefits of different approaches to ensuring "resource

adequacy," however that might be defined. Within that context we believe it is crucial – as the Wakeland analysis effectively reminds us – that the Commission widen its focus to encompass not just the question of how most cost-effectively to deliver a reserve margin designed to meet an historical loss-of-load-expectation (LOLE) but to examine critically the costs and benefits of the presumptive LOLE itself. While it received too little attention at the time, this topic was broached early on in the original Brattle Group report filed with the Commission in June 2012 (beginning at page 100), and the fundamental issues raised in that discussion were helpfully revisited in the Wakeland analysis.

The reality highlighted in these and other filings before the Commission is that, contrary to the public impression promoted by various stakeholders, the objective is not and cannot be that service would never be interrupted because of a shortage of available resources. The objective is rather to reduce the likelihood of such service interruptions to an acceptable level. That may seem obvious but it is often obscured in the public discussion, and it is worth repeating since it reminds us of why it is so important to then ask: a level acceptable to whom and why? As the ongoing debate has made clear, pat answers like "one load-shed event in ten years" are no longer sufficient to guide policy and regulation in a system where markets and variable supply resources have become entrenched realities. Texas businesses and consumers deserve a hard-nosed evaluation of:

1) The "value of lost load" – that is, what various businesses and consumers would pay in $/MWh to avoid involuntary service interruptions;
2) The level of service reliability actually enjoyed by the vast majority of Texas businesses and consumers;
3) The root causes and timing of service interruptions actually experienced by Texas consumers;
4) The true costs, in $/MWh of load loss avoided, of various measures intended to reduce the likelihood of involuntary service interruptions due specifically to a shortage of available resources at a given moment; and
5) (To bring it back to the original question) whether such costs are justified based on the actual value of the load loss thus avoided.

We are not suggesting that this is the only basis upon which the Commission might adjudicate the question of resource adequacy. Cost is only ever one of a number of public policy considerations that properly enter into such a deliberation. But where possible the discussion should be grounded in a fact-based consideration of costs and benefits. We acknowledge that until demand is able to participate fully in the electricity markets the true value of lost load for most electricity consumers will remain somewhat debatable. However Mr. Wakeland's analysis is only the most recent of many such analyses suggesting that the true value of lost load for the vast majority of loads falls within a range that is orders of magnitude below the level put forward in the Charles River Associates report commissioned by NRG Energy. In a similar vein, and as discussed in the June 2012 Brattle Group report, in all likelihood the true value of lost load in most instances falls within a range that is orders of magnitude below the level implied by the "one load-shed event in ten years" standard.

Defining the reliability product

As we and others have demonstrated previously, the growth of variable renewable supply on the Texas system that has already occurred, much less the growth that can be expected in the future, will drive a step change in demand for the kind of system services best provided by flexible resources[1] – that is, by some mid-merit gas-fired CCGTs and reciprocating engines, by peaking plants, and by demand response. Yet proponents of pure capacity-based market interventions continue to presume that energy and ancillary services markets that (in their view) cannot accurately express the value of long-term investment in added firm capacity will nonetheless accurately express the value of long-term investment in added system resource flexibility. This is an extraordinary claim, and extraordinary claims demand extraordinary evidence. Such evidence is lacking.

The importance of this point is also evident in the fact that, in recent years, most ERCOT load events have occurred outside of the summer peak season and even to a great extent outside of peak hours. These events often arise due to both expected and unexpected variability in system demand. The problem arises not necessarily because there is not enough firm capacity available, but because much of the capacity that is available (and particularly the capacity that is dispatched online) is not flexible enough. The impact of expected and unexpected variability in supply will be much the same. In other words, a lack of sufficient flexibility in the portfolio of system resources can lead to the need for an additional layer of highly flexible resources called upon only during those brief periods when they are needed to cover the slower response of other thermal resources, something that (because it so often occurs away from peak hours) will not be captured by a capacity market. Size still matters, but increasingly the best answer to the question "how much?" will depend on the answer to the question "what kind?"

It is therefore important to define the problem before diving into the question of whether or not to intervene to drive investment to solve it. If the problem is to ensure a layer of firm reserves over and above the economic level of capacity margin a properly functioning energy market would naturally deliver, then a primarily capacity-denominated metric may well be appropriate. In that case however, a new ancillary service targeted at what is often termed "strategic reserves" might be more appropriate than a broad-based capacity market designed to accomplish a very different objective. Such a strategic reserve service would complement the existing portfolio of operating reserves, contingency reserves and black start capability. A strategic reserve market would target a specific type of resource (both new and existing) in a specific quantity and possibly in specific locations. Furthermore, unlike a broad-based capacity market it would firmly insulate the energy market from undue distortion by prohibiting the strategic reserves from participating in the energy market; it would instead attach a strike price for dispatching the reserves that is set at or near the "value of lost load," or at the price at which the energy market would no longer be expected to clear. (The new ERCOT offer cap of

[1] E.g., see "How Do High Levels of Wind and Solar Impact the Grid? The Western Wind and Solar Integration Study" at www.nrel.gov/docs/fy11osti/50057.pdf (GE and NREL, Dec. 2010; also see attached RAP slide deck for a brief overview of relevant issues (http://www.raponline.org/resource/RAP_Hogan_CommentsTexasProceeding40000_2013_DEC_16.pdf).

$9000/MWh is probably below the true value of lost load but is certainly much closer than what we find in most markets.)

Alternatively, if the problem is to ensure that the market delivers investment in enough of the *right kind* of resources needed to provide an economic level of reliability *at least cost,* the primary focus of any market intervention (if intervention is deemed necessary) should be on the quantity of resources capable of providing critical system services. It is reasonable to view the current work around an Operating Reserve Demand Curve (not only in ERCOT but also in PJM) as one example of such an instrument, albeit one of very limited duration and that serves equally to improve the robustness of energy and services market price signals. More forward procurement of critical services may prove useful or attractive. (An example is the Short Term Operating Reserve auction that was conducted for many years in the Great Britain market, which in some instances resulted in purchase commitments of up to 15 years forward.) Ultimately the need for such forward mechanisms should be demonstrated by transparent forecasts and analysis of net load against current and expected system resource investment. As with the rationale for capacity markets, intervention should be a response to evidence that investment in *needed* resources is not viable under current market conditions. This is why we have in the past called for forecasts of net load 5-10 years into the future under a range of plausible scenarios (including continued growth in wind generation plus a ramping up of investment in solar PV) as a critical first step. In our experience the combined resources of the PUCT and ERCOT are unusually well suited to undertake this task.

The common theme is the focus on *needed services*. Increasingly reliability at least cost in deregulated markets is no longer simply about piling up enough firm generating capacity to meet economically dubious resource adequacy standards. Frankly it never was – integrated resource planning was just as concerned with ensuring the right mix of resources, and at its best it evaluated supply-side needs in close coordination with the development of cost-effective demand-side resources. But many of the loudest voices in the current debate seem interested only in resurrecting the one dimension of that richly complex process that is of most immediate value to them.

Conclusion

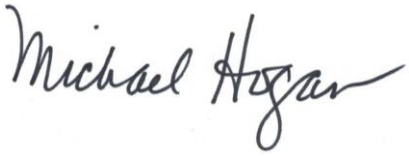
Without minimizing the challenge posed by continued growth in the ERCOT market and the timing issues that presents, we are recommending that the Commission focus its efforts and the efforts of ERCOT staff:

1) First, on properly defining the level of reliability, and more specifically the level of investment in firm resources, that makes good economic sense for Texas businesses and consumers (one would certainly expect the impending Brattle Group report to be very helpful in this regard, but the final judgment will obviously rest with the Commission);
2) Second, on transparently forecasting and analyzing net load, not only based on a plausible range of supply-side scenarios (including expansion of wind and solar production) but also reflecting a range of plausible scenarios for exploitation of cost-effective demand-side resources over the forecast period;

3) Third, on ensuring that the existing and expected portfolio of supply- and demand-side resources is capable of meeting the expected growth in demand for certain mission-critical system services, if necessary by introducing specific new market mechanisms designed around the need for such services;
4) Fourth, on whether or not there is a case to be made for providing an extra layer of firm capacity resources over and above what the energy and services markets are delivering and can be expected to deliver (once current improvements in areas like scarcity pricing, locational pricing and demand-side participation become more well established), and whether that additional "insurance" service is best provided by a broad-based capacity mechanism or by a more targeted strategic reserve ancillary service market; and
5) Finally, if a broad-based capacity mechanism is pursued, on structuring an auction process that prioritizes capacity resources (supply- and demand-side) into at least two tranches, where the first tranche would be open to existing and new resources that meet minimum flexibility criteria and subsequent tranches (if needed) to all other resources.

As always RAP stands ready to support the Commission in any way we can in further developing these ideas. Thank you for your consideration.

Yours Respectfully,



Richard Sedano
Principal, Director US Programs
Regulatory Assistance Project

Michael Hogan
Senior Advisor
Regulatory Assistance Project