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NRG Comments/Concerns with Houston Import Project

April 8, 2014 ERCOT Board of Directors Meeting

Item 8
ERCOT Public

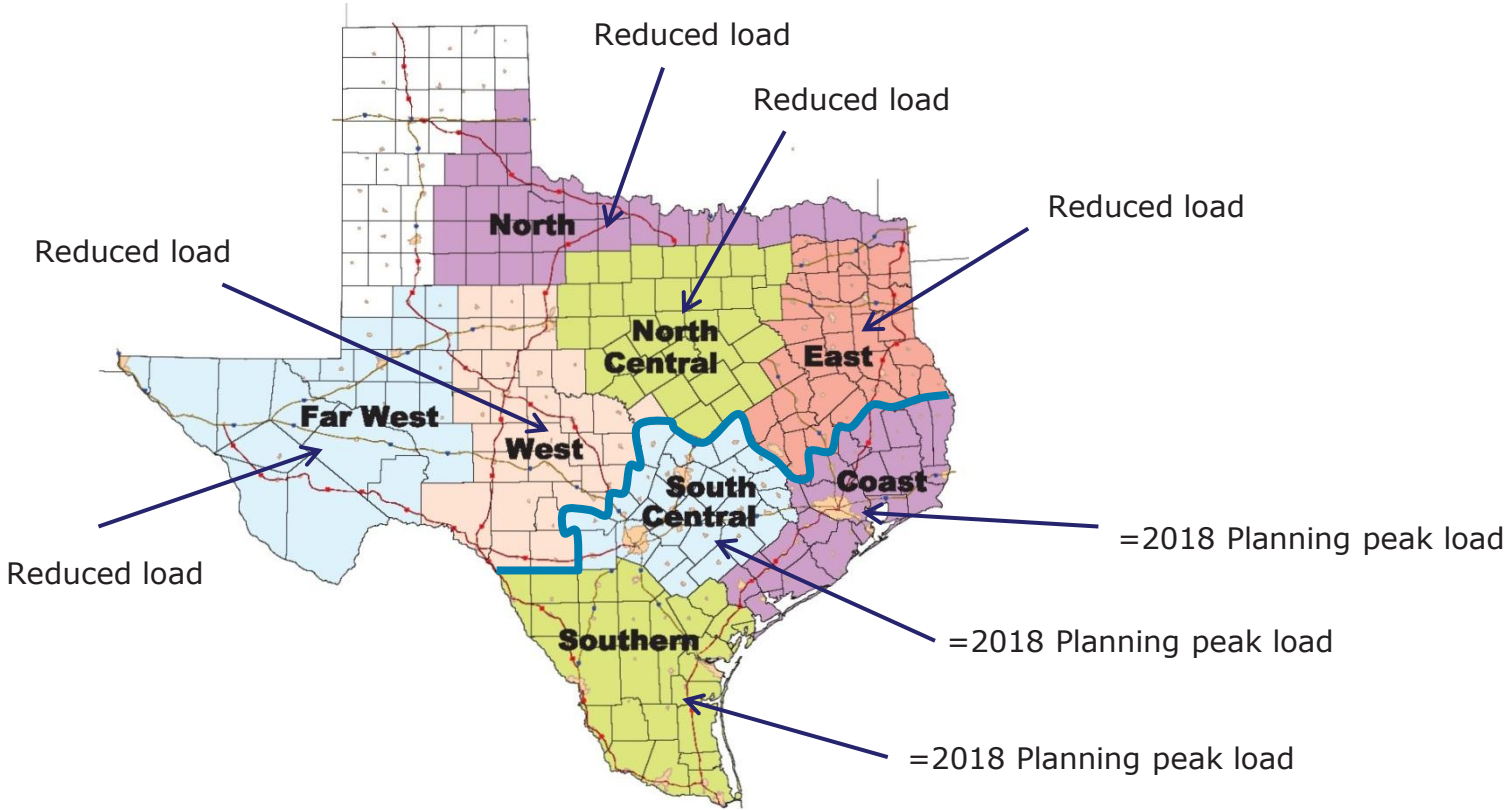
Introductory Remarks

- The Houston Import Project ("HIP") being recommended by ERCOT is the most expensive transmission expansion project since CREZ. The estimated cost is $590 million, and if approved it is scheduled to be in service in 2018.
- NRG and others, as witnessed by the TAC vote and the numerous comments filed during the HIP's Regional Planning Group process, have voiced their concerns with the ERCOT recommendation to proceed with the HIP transmission addition.
- Commenters have stated they believe the assumptions used in the HIP analysis are leading to a result that could lead to significant and unnecessary costs being placed on consumers.
- The goal of this presentation is to try and simplify ERCOT's extremely detailed and voluminous HIP analysis in order to highlight some of the planning assumptions that are driving the results.

Concerns with the HIP Analysis

- NRG believes ERCOT's analysis shows the problem being addressed in 2018 by the HIP is a lack of generation, not a lack of transmission infrastructure.
- In fact, ERCOT's final report states there is not enough generation to meet the SSWG Planning non-coincident peak load in 2018, so ERCOT utilized a "load reduction" scaling methodology to handle the problem. From ERCOT's HIP Final Report:
  - *"In transmission planning analysis the amount of generation available in the base case may not be enough to meet the summed non-coincident peak load of all areas of the system. In order to solve this challenge… ERCOT split the 2018 summer peak case into two study areas, the so-called NW and SE areas. For each study area the load level was set to the forecasted peak load for that area while load outside of the area was scaled down until there was enough generation to meet the load plus an operational reserve of approximately 1375 MW."*
  - *"In the 2018 SE summer peak case…the load levels for the East, Coast, South Central, and Southern weather zones were set to their forecasted peak load levels. The load levels in the North, North Central, West, and Far West weather zones were reduced…from the peak load levels of the SSWG base case."*
- The "SE" (Southeast) case was used in the HIP analysis. Because of their relative sizes, the loads in the Houston (Coastal) and Dallas/Ft. Worth (North Central) weather regions are the load assumptions that drive the HIP results. Loads in the Coastal region were held at peak, while loads in the North Central region were reduced.
- A planning assumption of reduced load in one area of the state is electrically equivalent to adding that same amount of generation in that area.

SE Case: Weather Zones with Load Reduced and Weather Zones with Load Equal to 2018 Planning Peaks



Load Scaling Assumptions Used in the HIP Analysis

- ERCOT justified the North Central load reductions based on a "top ten" table that calculated the coincident peaks of the other weather zones relative to the top ten hourly Coastal peak conditions in 2011, 2012 and 2013.

Average %of peak load of each weather zone during the top ten hourly peak load conditions at the Coast Weather Zone							
Year	East	South	South Central	Far West	West	North	North Central
2011	97.46%	98.21%	96.38%	93.75%	83.70%	67.86%	93.37%
2012	96.32%	95.58%	96.08%	93.23%	92.93%	78.55%	85.56%
2013	76.77%	98.62%	97.42%	95.81%	78.23%	90.88%	88.81%

- Using this table, ERCOT decreased the North Central (D/FW) load to approximately 85% of the forecasted 2018 peak load for that region, even though the above table indicates 85% is too low. A swing of 7.8% in the North Central peak load (93.37%-85.56%) equates to approximately 1,950 MWs.
- NRG and others questioned ERCOT as to why they used a 10 hour average peak when historical planning has always been concerned with a peak hour.
- The data on the next slide shows how multi-hour averages can skew the results when compared to the hourly peak conditions.

Why a 10 Hour Average Instead of the Coincident One Hour Peak?

- The data below shows how the one hour coincident peaks are almost always a higher percentage relative to the Coastal one hour peak than are the 10 hour average values used in the HIP analysis, especially in the North Central zone, which has the greatest load scaling impact.

Average % of peak load of each weather zone during the top ten hourly peak load conditions at the Coastal weather zone

Year	East	South	South Central	Far West	West	North	North Central
2011	97.46%	98.21%	96.38%	93.75%	83.70%	67.86%	93.37%
2012	96.32%	95.58%	96.08%	93.23%	92.93%	78.55%	85.56%
2013	76.77%	98.62%	97.42%	95.81%	78.23%	90.88%	88.81%
avg.	**90.18**	**97.47**	**96.63**	**94.26**	**84.95**	**79.10**	**89.25**

Average % of peak load of each weather zone during the top HOUR peak load condition at the Coast Weather Zone

2011	97.60%	95.30%	96.70%	91.20%	92.00%	88.30%	95.50%
2012	97.60%	98.70%	97.90%	95.10%	97.70%	90.30%	94.60%
2013	92.70%	98.10%	98.10%	98.60%	95.20%	87.10%	90.20%
avg.	**95.97**	**97.37**	**97.57**	**94.97**	**94.97**	**88.57**	**93.43**

Source for Peak Hour data: 2011, 2012 and 2013 ERCOT Demand and Energy Report

What do these Assumptions Mean?

- NRG understands that when there is not enough generation in a study case, assumptions have to be made to solve the load flow analysis. In the HIP case, load reduction techniques were used, but only in certain regions of the state. By automatically scaling the load in only one region, while keeping the load at peak in another, the load flow analysis will undoubtedly lead to a conclusion that major transmission infrastructure is needed across the two regions. NRG doesn't believe these types of assumptions are realistic.
- By reducing the load in the North Central region to an 85% coincident peak value relative to the Coastal region, ERCOT has made an "electrically equivalent" generation assumption that approximately 2,000 MWs of generation will be added in the North Central weather zone by 2018, while none will be added in the Coastal region.
- NRG believes the scaling models were beyond reasonable limits and thus drive the unrealistic HIP results. For the HIP project to work there has to be something to transfer from the North into Houston, and there is no available data indicating more generation will be built in the northern and western portions of the state than in the coastal and southern regions.

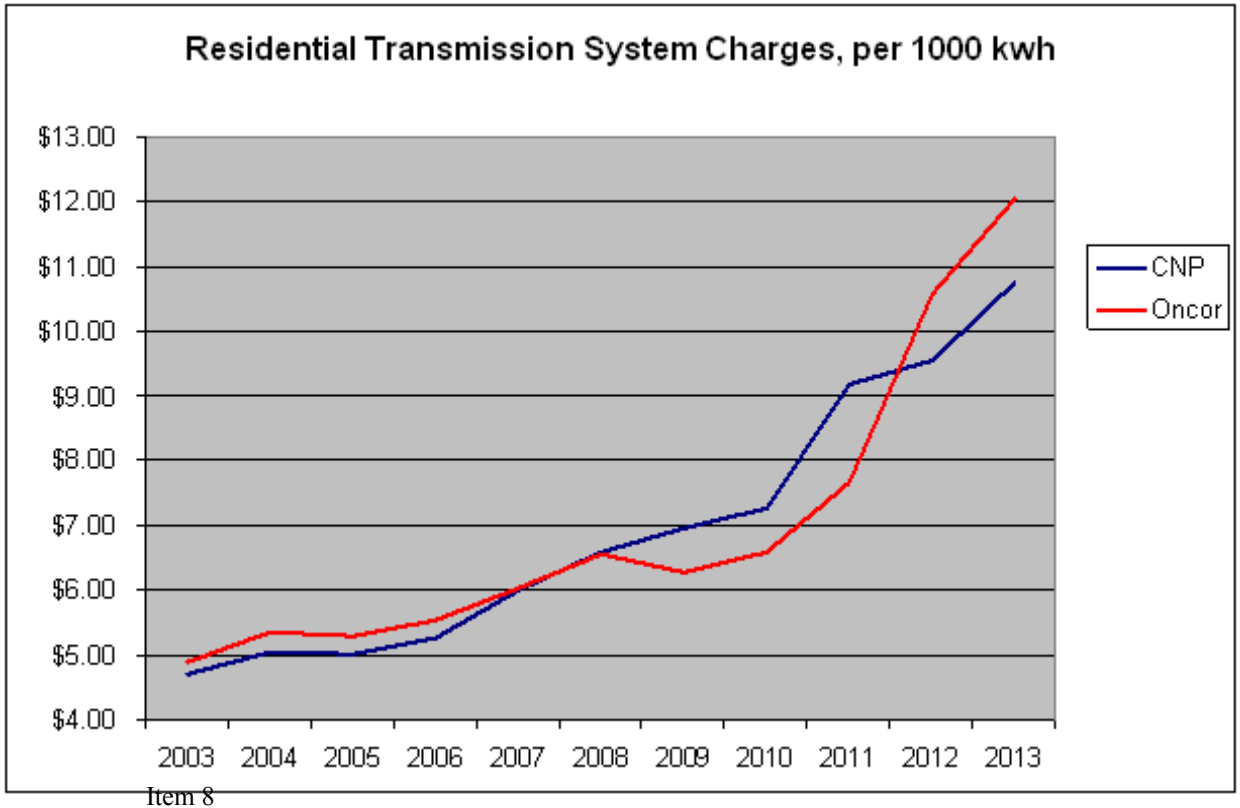
Additional Issues with Load Forecasts

- The recent resource adequacy debate has resulted in significant changes being made to ERCOT's load forecast methodology.
- NRG and others have noticed a substantial difference in the load forecasts used in the HIP analysis (provided by TSPs) vs. the ERCOT load forecasts used for other purposes, like the CDR.
- For example, the peak load in 2018 for the Coastal region in the HIP analysis is 26,355 MWs. ERCOT's 90/10 (extreme weather) forecast from the 2013 Regional Transmission Plan ("RTP") shows a 2018 peak load in the Coastal region of 24,475 MWs.
- The North Central weather zone peak load in 2018 in the HIP analysis is 25,895 MWs, while ERCOT's 90/10 forecasted peak in the RTP is 29,512 MWs.
- These differences in the load forecasts exacerbate the load scaling issues described in this presentation (an example is provided on the next slide).
- Should one load forecast be used when discussing generation reserve margins in the CDR, while another load forecast is used to plan transmission?
- NRG believes the answer is No.

Using ERCOT's Load Forecast Indicates No Need for the HIP in 2018

- The data on the previous slide can help illustrate how the various load forecasts impact the HIP analysis.
- If the ERCOT 90/10 (extreme weather) load forecast for 2018 is used instead of the TSP's HIP load forecasts, and even retaining the questionable load scaling assumptions used in HIP (coast at peak and north central at 85% of its peak), it would "lower" the coastal load by 1,880 MWs (26,355-24,475) and "increase" the North Central load by 3,074 MWs (85% of 29,512 vs. 85% of 25,895).
- This is a total swing in the load scaling assumptions of 4,954 MWs in a direction that would completely negate the need for the HIP!
- ERCOT's final HIP report states an addition of only 1,800 MWs in the Coastal region alone could defer the HIP project to at least 2019. As shown above, simply using ERCOT's 90/10 extreme weather load forecast in the coastal weather zone only, instead of the HIP coastal weather zone forecast, provides over 1,800 MWs.

Residential Transmission Charges for Oncor and CNP



- Transmission System Charges are the sum of the distribution tariff Transmission Charge and the Transmission Cost Recovery Factor
- CNP is up 127% from 2003
- Oncor is up 146% from 2003
- 2014 transmission costs will be even higher as all of CREZ costs are captured in the TCRF

Conclusions

- Load scaling in one region is electrically equivalent to adding that same amount of generation in that region.
- NRG believes ERCOT's assumption to scale the weather zones in the north and western portions of the state while the Coast is peaking, based on an average of the "top ten" hours, is not a realistic load scaling assumption. Peak planning cases should be based on the peak hour, not averages.
- The historical coincident peak hour for the North Central weather zone when the Coastal weather zone is at peak has been as high as 95% (in 2011), and has averaged over 93% from 2011-2013. This is much higher than the assumed 85% level used in the HIP analysis.
- Even assuming an 85% load scaling assumption is correct, using ERCOT's 90/10 extreme weather load forecast, instead of the TSP's transmission planning forecasts, would completely negate the need for the HIP project in 2018.
- More logical, realistic assumptions for the load reduction (electrically equivalent to generation addition) scenarios in the HIP analysis across the regions, combined with a consistent use of ERCOT's load forecast, would provide a vastly different result and will lead to a more cost-effective utilization of consumer dollars.

Recommendations

- NRG recommends the Board defer consideration of the HIP project and direct ERCOT to:
  - reconcile the differences in the ERCOT CDR and transmission planning load forecasts;
  - reconsider whether the HIP assumptions based on multi-hour coincident peak averages, instead of a coincident peak hour, is appropriate; and
  - determine whether the use of load scaling in only one region, while keeping the load at peak in another, is an appropriate technique.