

# Holistic Approach to Congestion Irresolvable By SCED

TAC Advocate Presentation

# Context

- Most of the time, ERCOT can resolve congestion by re-dispatching generation (constraint is active and binding in SCED)
- Sometimes, ERCOT re-dispatches all available generation and the constraint remains violated (constraint is violated and irresolvable by SCED)
- Why does this issue involve the Shadow Price Cap?
  - Shadow Price is the cost calculated by SCED to resolve an additional MW of congestion on a constraint
  - Each constraint has a Shadow Price Cap – the maximum cost calculated by SCED to resolve an additional 1 MW for the constraint
    - Base Case/Voltage Support      \$5000 per MWh
    - 345 kV      \$4500 per MWh
    - 138 kV      \$3500 per MWh
    - 69 kV      \$2800 per MWh
  - When a constraint is violated and irresolvable the Shadow Price Cap value influences locational marginal prices
    - $LMP = \text{Energy Component} + \text{Congestion Component (shift factor} * \text{shadow price for the constraint)}$
- *The crux of this issue is determining the appropriate price signal when congestion is irresolvable by SCED*
- Congestion irresolvable by SCED is not unique to the Valley Import Constraint, but recurring violation of the Valley Import Constraint during the February event was the catalyst of this initiative
  - Valley Import Shadow Price Cap set at \$5000 per MWh (Base Case/Voltage Support level) upon implementation of nodal market
  - TAC and Board approved proposal to implement on an interim basis a \$350 per MWh Valley Import Shadow Price Cap effective May 25, 2010
  - The \$350 per MWh Shadow Price Cap for the Valley will sunset upon approval of a holistic solution

## TAC Discussion Regarding STEC Analysis

- STEC's analysis is hypothetical and based upon flawed assumptions
  - **STEC Flawed Assumption:** All South Zone load will purchase energy at the load zone in real-time
  - **FACT:** Most consumers are purchasing energy in the bilateral and/or day-ahead market to hedge real-time electricity price exposure and hedged energy has exceeded the day-ahead load forecast in some months
  - **STEC Flawed Assumption:** Valley Import Constraint will violate for 50 hours per year
  - **FACT:** 40 of 50 violation hours in 2011 occurred during February extreme weather event and in 2009 and 2010 the constraint violated for less than 20 hours
  - **STEC Flawed Assumption:** STEC analysis does not offset congestion cost with revenues allocated to load from the sale of Congestion Revenue Rights (CRR)
  - **FACT:** Revenue from sale of CRRs will offset congestion – *See Position Statement submitted by EDF Trading for details*
- **Question:** What is the cost to consumers if ERCOT implements the TAC recommendation?
- **Answer:** Any attempt to calculate a cost to consumers is hypothetical
- To illustrate this point assume all South Zone load already has hedged their entire energy needs for the term of the STEC analysis in the forward market, then hypothetically the cost to consumers in the South Zone if ERCOT implements the TAC recommendation would be zero
- **TAC Conclusion:** STEC analysis is flawed and incomplete

## Basis of TAC Recommendation

- The crux of this issue is determining the appropriate price signal for generation and load when congestion is irresolvable by SCED
- When congestion is irresolvable by SCED that means SCED has exhausted generation that can relieve the constraint
- TAC believes congestion irresolvable by SCED represents a local scarcity condition
- What is the appropriate price signal for a local scarcity condition?
- TAC believes the determination of the price signal should be consistent with the energy-only market design and the scarcity pricing concepts in PUC Subst. R. 25.505, *Resource Adequacy in the Electric Reliability Council of Texas Power Region*
- TAC believes the determination of the price signal should be consistent with marginal cost pricing specified in PUC Subst. R. 25.501 – the marginal cost of reliably serving load when all resources are exhausted is to curtail load (Value of Lost Load)

## Summary of TAC Holistic Solution for Congestion Irresolvable by SCED

- Shadow Price Cap should be adjusted for a constraint if congestion on a non-competitive constraint is consistently irresolvable by SCED
- How does TAC recommendation identify when constraint is consistently irresolvable thus requiring an adjustment of the Shadow Price Cap?
  - ERCOT shall modify the Shadow Price Cap if the non-competitive constraint is not resolved by the SCED dispatch or overridden for more than two consecutive hours on more than 4 consecutive operating days or more than 20 hours in a rolling thirty day period
- How does the TAC recommendation determine the value of the Shadow Price Cap for the non-competitive irresolvable constraint?
  - Modified Shadow Price Cap shall not be higher than current shadow price caps pursuant to Section 3.5, *Generic Values for the Transmission Shadow Price Caps in the ERCOT Business Practice Manual for Setting the Shadow Price Caps and Power Balance Penalties in SCED*
  - Modified Shadow Price Cap must maximize the dispatch of generation
    - Calculation of shadow price cap needed to maximize dispatch of generation
      - *Mitigated Offer Cap of lowest shift factor unit / shift factor of lowest unit used to resolve constraint*

## Summary of TAC Holistic Solution for Congestion Irresolvable by SCED

- Modified Shadow Price Cap should rely on scarcity pricing concepts from the Commission Resource Adequacy Rule and provide existing generation an incentive to perform when needed and provide generation developers an adequate incentive to build
  - To meet this objective the Modified Shadow Price Cap for the irresolvable constraint has a floor of \$2000 per MWh
- Why did the TAC chose a floor of \$2000 per MWh?
  - Congestion irresolvable by SCED represents a scarcity condition and the Modified Shadow Price Cap should send a scarcity price signal
  - \$2000 is consistent with the system-wide scarcity price signal of \$3000 per MWh
  - \$2000 is a conservative assumption for value of lost load
- There must be a back-stop in place to protect consumers from inefficient transfer of wealth to resources
  - TAC recommendation uses peaker net margin concept from Commission Resource Adequacy Rule and if peaker net margin exceeds \$95,000 per MW/year, then the Modified Shadow Price Cap will lower to the higher of the LCAP pursuant to the Commission Resource Adequacy Rule (currently \$500 per MWh) or the Shadow Price Cap necessary to dispatch generation but shall not exceed \$2000 per MWh
    - The Shadow Price Cap will reset to the Modified Shadow Price Cap on January 1<sup>st</sup> of the next calendar year
    - The \$95,000 per MW/year net margin threshold was selected because it represents the annualized fixed cost recovery needed for peaking units as identified in the 2011 ERCOT State of the Market Report

## Conclusion

- TAC believes the TAC recommendation balances the interests of the market as reflected by the 23 – 5 vote in support of the TAC recommendation with support from consumer segment.