Price Responsive Load Survey

Draft Results

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Brattle Group report

- **Price-based demand response is currently provided only by LSEs, but not through ERCOT.**
- **REPs and public power entities can create incentives for price-based DR by providing lower rates to customers who use less or curtail when spot prices are highest.**
  - We understand from our interviews with REPs that many large industrial customers are on “block-and-index” pricing, where all consumption above a certain amount is exposed to real-time prices.
- **We also understand that few smaller customers are exposed to prices or engaged in any type of demand response.**

- **Unfortunately, the extent of price-response programs is difficult to quantify exactly because pricing arrangements are a private contractual matter between REPs and their customers.**

Brattle Group report (cont.)

- **Price-based load reductions were likely a major contributor to the 1,700 MW ERCOT load forecasting error in 2011 when prices reached $3,000/MWh.**
  - The error may also be attributable in part to 4CP response, voluntary public response to conservation appeals, and load forecast model error.
- **ERCOT's 2007 survey identified only 431 MW of curtailable load on real-time pricing.**
- **Small customers account for more than 70% of peak load, and they currently provide little demand response, especially in the retail-choice areas of the ERCOT region.**
- **We believe that quantifying price-responsive demand in ERCOT is an important area for further study.**

LSE Survey: basis and overview

- **PUC Subst. Rule §25.505(e)(5):**
  - Load serving entities (LSEs) shall provide ERCOT with complete information on load response capabilities that are self-arranged or pursuant to bilateral agreements between LSEs and their customers.

- **ERCOT sent electronic survey to all LSEs in June-July seeking customer counts on dynamic pricing/demand response contracts**
  - 'Your response to the survey will assist ERCOT have a better understanding of the amount of responsive Load and numbers of retail energy consumers actively responding to Load reduction signals'

Survey Goals

- **Quantify current customers in the ERCOT region subject to retail price response/demand response products**
- **Establish a benchmark for measuring growth**
  - 1.5 years into the Nodal market
  - AMI deployment nearing completion in competitive choice areas
- **Start by gathering tallies of customers who are contracted with their LSEs for various types of products:**
  - Time of Use pricing
  - Critical Peak pricing/rebates
  - Real-Time pricing
  - Direct Load Control
  - 4CP response

- **Survey did not ask for MWs or strike prices**

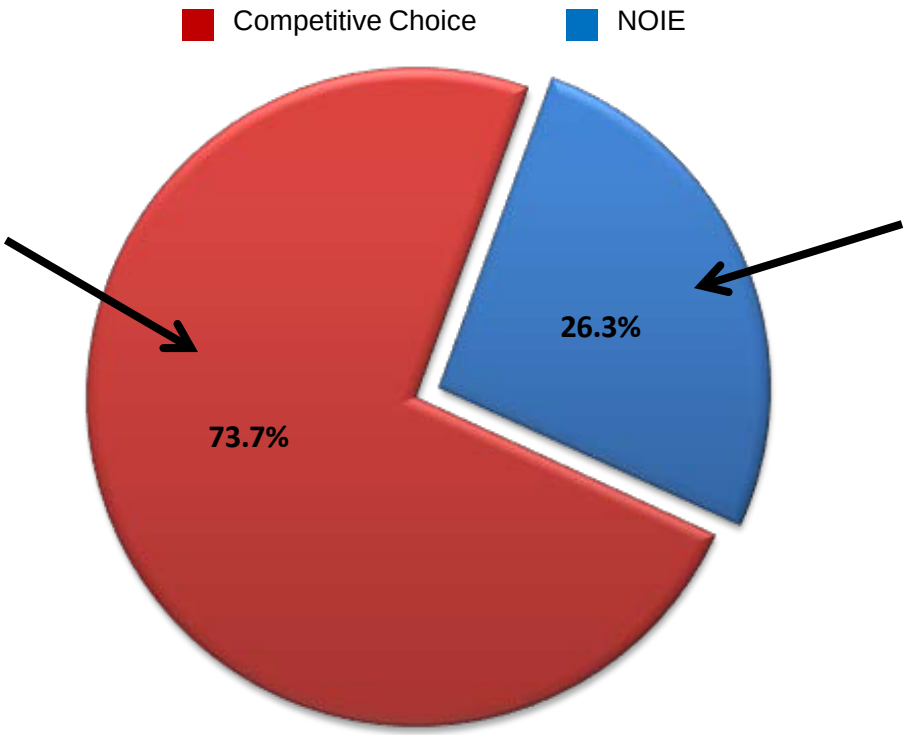
Variations in questions based on the '2 ERCOTs'

Retail Competitive Choice

AMI deployment nearly complete

ESI IDs settled on their 15-minute interval data

Customers >700kW have IDR meters and are subject to 4CP transmission tariffs



MWh 12/1/10 thru 8/11/11

Non-Opt In Entities

Some existing and developing smart grid initiatives:
-- AMI
-- Smart thermostats
-- Other DLC

NOIE boundary meter Load subject to 4CP tariffs

Respondents

- **86 REPs responded:**
  - 96.4% of the total ESI IDs in the competitive market
  - 94.7% of the residential ESI IDs in the competitive market
- **40 NOIEs responded**
- **REPs and NOIEs that responded represent 95.8% of total ERCOT Load**

Key Findings

- **Total of 79,069 customers on some type of dynamic pricing contract**
- **Total of 9.46 million meters reported**
- **Total of 0.83% of total customers on dynamic pricing/DR products**
- **However, a number of LSEs are considering adding new DR/price response products in the future**

See Appendix for aggregate results for each survey question

Dynamic pricing under consideration

- LSEs were asked if they have plans to initiate products in the future:

Real-Time Pricing	YES		NO	
	REPs	NOIEs	REPs	NOIEs
Large C&I	34	4	37	36
Small Commercial	24	1		
Residential	25	1		

Critical Peak Products	YES		NO	
	REPs	NOIEs	REPs	NOIEs
Large C&I	23	6	58	33
Small Commercial	16	3		
Residential	14	3		

Time of Use	YES		NO	
	REPs	NOIEs	REPs	NOIEs
Large C&I	17	14	49	27
Small Commercial	23	12		
Residential	28	11		

Lessons Learned

- **Any survey can be depended on to produce one specific result: the surveyors learn they should have asked better questions**
- **ERCOT will publish full version of the survey questions and will post to today's meeting page**

- **Caveats:**
  - Best efforts to avoid double-counting, but no guarantees!
  - Categories of large vs. small commercial may not have always been consistently reported by LSEs
  - Others, no doubt

Next Steps

Why it's important to understand retail DR & price response

- **Resource adequacy concerns**
  - Brattle report underscores the important role of DR in the ERCOT markets
  - Limits on the amount of DR that the ISO can contract for (e.g., Ancillary Services and ERS)

- **Advanced metering**
  - Enablement of DR is an important element in the return on the AMI investment

- **Ability to track growth of these products is a key metric in measuring the success of the ERCOT retail market**

The need to dig deeper

- **Phase 1 – Survey**
  - Sharing results today
- **Phase 2 – Data collection**
  - Transition into this phase today
  - Begin discussion with market on what and why
- **Phase 3 – Analysis of price elasticity and how it affects:**
  - Load forecasting
  - Wholesale market price formation
  - Resource adequacy

Phase 2 – Data collection

- **Thanks to the survey, now we know:**
  - About how many customers are on retail contracts for dynamic pricing and/or demand response

- **What we don't know:**
  - Who they are
  - Whether they respond
  - What the DR impacts are

What details do we need and why?

- **ERCOT would like to correlate customers to the types of products they are on**
  - TOU – Time of Use
  - DLC – Direct Load Control
  - CPP – Critical Peak Pricing
  - CPR – Critical Peak Rebates
  - RTP – Real Time Pricing
  - B&I – Block & Index
  - OTH – Other Demand Response Product

- **Ideally, the process could remain flexible to accommodate new product types as they may be added**

- **Potential formation of subgroup for discussion**

Options for the REP vehicle?

- **One option is to leverage an existing submission from REPs to ERCOT**

- **Customer Billing Contact Information File**
  - Protocols 15.1.3.1: Customer Billing Contact Information
  - RMG 7.11.3: Customer Billing Contact Information

- **Why this file vs. something new?**
  - Already provided monthly (required in case of mass transition)
  - Likely comes from the same REP systems that have the DR/price response product information for billing purposes
  - Could simply add fields to the existing detail records
  - May be less impact to implement now (as programs are starting to roll out) rather than later

- **There may be other options – we're willing to listen**

Options for the NOIE vehicle?

- **ERCOT is open to suggestions on how to quantify price response and retail DR in the NOIE areas**
  - No ESI IDs
  - No customer-level data submitted to ERCOT today
  - No 15-minute metering requirements (although many NOIE customers are equipped with advanced metering)

- **One option: mimic data submission process used in ERS**
  - Customer-level data directly from NOIE TDSP, or
  - Customer-level data attested by a PE

- **Potential formation of subgroup for discussion**

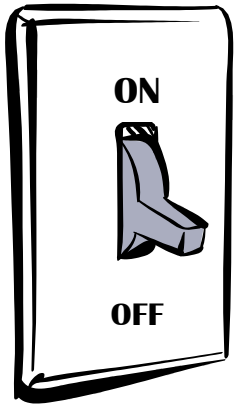
Future ERCOT analysis

- **Collecting customer-level data on these retail products would allow ERCOT to quantify retail DR and track trends:**
  - Chart market growth in participation for each product type
  - Develop models (baselines) for the customer load based on historical usage
  - Compare the baselines to usage on days with likely DR events, depending on identified triggers:
    - High LMPs (for Real-Time or Critical Peak products)
    - Probable 4CP signals (for 4CP products)
    - Energy Emergency Alerts
  - Evaluate TOU customers' peak usage vs. baselines and/or control groups
  - Provide periodic progress reports to the market on an aggregated basis

Collaboration

- **ERCOT proposes to work with MPs to develop vehicle for regular LSE communication identifying customers on dynamic pricing and DR-related products**

Questions?



Appendix

Real Time Pricing

Real Time Pricing Contracts	REP Customers	NOIE Customers
Large C&I	2,276	1
Small Commercial	32,627	0
Residential	5,670	0
Totals	40,573	1

Critical Peak Pricing

Critical Peak Pricing	REP Customers	NOIE Customers
Large C&I	77	0
Small Commercial	100	0
Residential	0	0
Totals	177	0

Critical Peak rebate products

Critical Peak Rebates	REP Customers	NOIE Customers
Large C&I	79	21
Small Commercial	11	46
Residential	0	0
Totals	90	67

Time of Use pricing

Time of Use (TOU) pricing	REP Customers	NOIE Customers
Large C&I	2	69
Small Commercial	186	432
Residential	37,465	7
Totals	37,653	508

Customers billed on interval data

Billed on interval data (rather than monthly energy usage)	# Customers reported by REPs	Total ESI IDs by class in the competitive market *	% of total
Large C&I	2,833	3,684	76.9%
Small Commercial	73,790	965,435	7.7%
Residential	131,297	5,759,107	2.3%
Totals	207,920	6,728,226	3.1%

NOTES:

- 5.3M AMS ESI IDs included in settlement as of 6/20/2012
- 84.7% of total ERCOT load settled with 15-minute interval data

* as of 7/31/12

Use of SMT portal vs. ERCOT provided extracts

How does your company retrieve Advanced Meter interval data?	REPs
ERCOT provided extracts	52
Smart Meter Texas Portal	39
Both	30
Our company does not retrieve AMS data	25

Use of SMT portal vs. REP websites

Where is customer sent to find detail view of usage history?	REPs	% of total ESIIDs
Smart Meter Texas Portal	58	38%
REP Website	23	62%

Advanced metering in the NOIEs

Customer type	Customers with AMI	Total customers reported by NOIE	% of total
Large C&I	1,297	3,076	42.2%
Small Commercial	138,120	341,898	40.1%
Residential	1,006,630	2,391,003	42.1%
Totals	1,146,047	2,735,977	41.9%

Direct load control by NOIEs

Customer type	4CP response direct load control	Critical peak price response direct load control
Large C&I	23	5
Small Commercial	964	2
Residential	118,465	0
Totals	119,452	7

- No REPs reported using direct load control for these purposes

4CP predictor signals

- **Transmission tariffs based on 4 coincident peak usage apply to two load types:**
  - IDR-metered customers (≥700kW) in competitive choice areas
  - NOIEs
- **14 REPs are providing 4CP predictor signals to 1,412 customers**
- **8 NOIEs are providing 4CP predictor signals to 1,140 customers**
- **Plans to initiate 4CP services in future:**
  - 19 REPS
  - 18 NOIEs

Direct Load Control for other purposes

- How many customers are subject to direct load control by the LSE with deployment criteria other than those covered in other questions?

Other DLC Programs	REP Customers	NOIE Customers
Large C&I	103	20
Small Commercial	27	45
Residential	14,000	50,845
Totals	14,130	50,910