



Overview of Demand Response in ERCOT

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Various categories of Demand Response

- Administered by ERCOT
- ✓ Load Resource Participation in ERCOT's Ancillary Services and Real-Time energy market
 - ✓ Emergency Response Service (ERS)
- Non-ERCOT Administered
- ✓ TDSP Load Management Programs
 - ✓ 4-Coincident Peak (CP) Load Reduction
 - ✓ Price-responsive Demand response
 - ✓ Distributed Generation Price Response

Demand Response (administered by ERCOT)

Load Resource Participation in ERCOT's Ancillary Services and Real-Time energy market

- Controllable Load Resources (CLR) – Load Resources capable of following SCED base points
 - 18 CLRs \approx 940 MW of registered capacity
 - Does not include Energy Storage (charging CLRs)
- Non-Controllable Load Resources – Blocky loads with both a 10-minute ramp capability for manual deployments and automatic deployment through Under Frequency Relay
 - 575+ Load Resources with \approx 8,300 MW of registered aggregate capacity
 - General observation across Summer Peak
 - Willing Participation (Offers+Self Arranged) \approx 3,500 MW
 - Actual Participation (Awards+Self Arranged) \approx 1,380 MW
 - Available Quantity from Willing Participation \approx 1,720 MW

Demand Response (administered by ERCOT)

- Emergency Response Service (ERS)
 - Four ERS service types:
 - Non-Weather Sensitive in 10 and 30 minute ramps
 - Weather Sensitive in 10 and 30 minute ramps
 - Four Standard Contract Terms (SCT) per year
 - 4-month SCTs for high-risk: Winter and Summer
 - 2-month SCTs for shoulder: Spring and Fall
 - Capacity is purchased for 8 time periods per SCT
 - Hourly blocks of varying length based on risk of deployment
 - \$75M per year spend limit, with addition \$25M for renewals in case of exhaustion
 - Exhaustion occurs when deployment exceeds a total of 24 hours in the December-March SCT and 12 hours in all other SCTs
 - Typically 900-1,000 MW per time period and >24k sites participating
 - Weather Sensitive service type dominated by >10k residential aggregations

TDSP Load Management Programs (Summer)

- Programs administered by the 4 Transmission and Distribution Service Providers (Oncor, CenterPoint, AEP, TNMP)
- Available
 - Weekdays only from June 1 through September 30
 - Between the hours of 1 p.m. to 7 p.m.
- Historically \approx 250-350 MW available
- Summer 2022 Participation \approx 269 MWs
- Summer 2023 Projected Participation - 198 MWs
- Can be deployed through ERCOT instruction during Energy Emergency Alert Level 2
- No deployment events in 2022

TDSP Load Management Programs (Winter)

- Winter programs are relatively new (2021 and 2022 winter seasons)
- Programs administered by the 4 Transmission and Distribution Service Providers (Oncor, CenterPoint, AEP, TNMP)
- Winter Availability
 - Varies by TDSP with start dates ranging from 10/1/2022 to 12/1/2022 and end dates ranging from 2/28/2023 to 3/31/2023
 - All hours during program period
- Winter 2022 Participation \approx 35 MWs
- Winter 2023 Projected Participation - 69 MWs
- Deployment through ERCOT instruction during Energy Emergency Alert Level 2

4-Coincident Peak (CP) Load Reduction

- The Four Coincident Peaks in ERCOT are the highest-Load 15-minute settlement intervals in each of the four summer months (June, July, August, September)
- Current estimated value of 1 MW 4CP load Reduction for a Transmission connected IDR customer on Oncor's system ~\$38,000
- There were 41 Near CP Event Days during 2022

4CP Days

Date	ESIDs	HE 17 Reduce MW	NOIEs	HE 17 Reduce MW	Total
23-Jun	4,005	1,863	18	1,275	3,138
20-Jul	3,525	1,915	21	1,771	3,687
2-Aug	3,326	1,616	15	1,068	2,684
20-Sep	4,602	2,002	17	978	2,980

*The 4-CP days in the tables above are from 2022

REP/NOIE Demand Response + 4CP

- July 11, 2022 – Largest system wide DR response in 2022 – 4,710 MW
- 4CP day with high prices in all zones
 - High price > \$200
- Greatest contributor was 4CP response

Day	Day Type	Total System DR	4CP Competitive	4CP NOIE	Indexed Real-Time (IRT)	Indexed Day-Ahead (IDA)	NOIE Price Response	Peak Rebate (PR)	Other Direct Load Control (OLC)	ERS Load Competitive	Category Total	Overlap
11-Jul-22	NearCP, High Prices All Zones	4,710	1,947	2,507	1,018	31	2,370	57	89		8,019	3,310

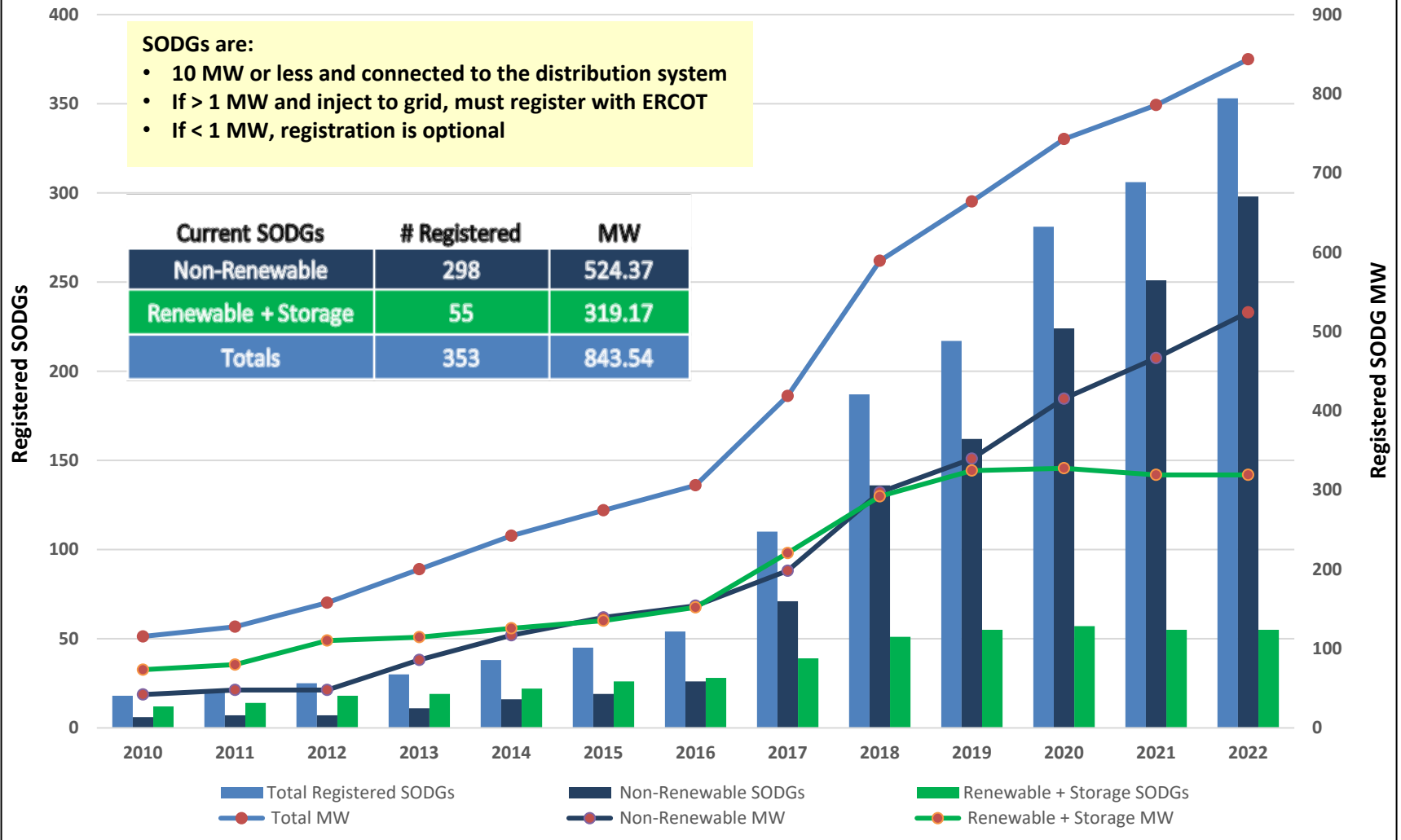
Observation: High price days rarely occur on 4CP days during years with greater reserve margin

Settlement-Only Distribution Generators

SODGs are:

- 10 MW or less and connected to the distribution system
- If > 1 MW and inject to grid, must register with ERCOT
- If < 1 MW, registration is optional

Current SODGs	# Registered	MW
Non-Renewable	298	524.37
Renewable + Storage	55	319.17
Totals	353	843.54



FERC Order 2222

- This rule enables DERs to participate alongside traditional resources in the regional organized wholesale markets through aggregations, opening U.S. organized wholesale markets to new sources of energy and grid services.
- This rule also allows several sources of distributed electricity to aggregate in order to satisfy minimum size and performance requirements that each may not be able to meet individually.
- ERCOT has implemented rules pertaining to Distributed Generation separately from Demand Response
- ERCOT is closely monitoring development in other regions

Key Issues for Demand Response

- Price Responsive Demand Response misaligned with local reliability objective
 - Demand Response today responding to Zonal price versus Locational Marginal Price (LMP) signal
 - Demand Response can play more effective role in resolving local reliability issues
 - Misalignment may be exacerbated by sharp increases in localized loads (e.g., construction of large data mining facilities)
- 4-Coincident Peak (CP) Load Reduction
 - Historically, Peak Load hours and energy scarcity hours coincided
 - Scarcity hours in summer continue to shift from Peak Load hours to Net-Peak Load hours, which raises a question about the long-term efficacy of 4-CP Load Reduction
- Explore removal of 60% limit on Load Resources providing RRS
 - Requires NPRR
 - Minimum 1390 MW of RRS must come from PFR type Resources based on NERC Assessment, requirement will continue to remain

Recent Demand Response Developments

- Enable NCLRs to participate in Non-Spin
 - NPRR1093 Load Resource Participation in Non-Spinning Reserve was implemented in May 2022 – slow initial response is picking up
- ERCOT Contingency Reserve Service (ECRS) is scheduled for implementation in June 2023 which will enable more Load Resource participation in ERCOTs Ancillary Services Markets
- Aggregated Load Resources
 - Pilot Project initiated in early 2023 to aggregate small Distributed Energy Resources, including energy storage. Participation includes TDSPs to evaluate effects on distribution systems



Thank You!

