

#### Residential Demand Response Program Workshop I

ERCOT Staff May 2, 2025

#### **Purpose**

# Consult with ERCOT stakeholders on the design of a program to incentivize additional residential Demand Response at times of system need



#### Agenda

- Context and need for residential demand response
- Conceptual program overview
- Key design elements, preliminary options and rationale
- Discussion, feedback and next steps



#### **Need for Residential DR**

• With the anticipated growth in load, utilizing additional capacity, particularly at times of high net load will be critical.



#### **Need for Residential DR**

- Residential Demand Response (DR) represents a source of capacity that is not fully enabled today
  - This includes increasing DR capacity from 'smart' devices (ie thermostats, EV charges, batteries, water heaters and pool pump switches)
- There is an opportunity for ERCOT to collaborate with stakeholders to develop a program that can incent and grow residential DR capacity as an additional resource that can help support system reliability
  - Developing a Residential DR Program is a key ERCOT corporate priority for 2025
- Program design should aim to adhere to the following framework
  - ✓ Quick to develop
  - ✓ Simple to administer
  - ✓ Popular to join
  - ✓ Cost-effective



#### **Conceptual Overview**

- A residential DR program that provides an incentive payment to Retail Electric Provider (REP) (as well as Non-Opt-In Entity (NOIE)) Qualified Scheduling Entities (QSEs) based on Residential Demand Response performance at times of system need
  - Focus on high seasonal net load hours
  - Targets participation from smart/programmable devices in residential households
  - Incentive payment to encourage participation and offset program development and administration costs
- Participation is voluntary and REPs/NOIEs are free to utilize the DR capacity in the program to respond on other days and for other needs (e.g. avoided cost during high price days)
- Performance measurement uses ESIID data\* to determine the kWh load reduction from a baseline during the highest net peak load hours in each season

\*data-sharing framework with NOIE areas tbd



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# Design Elements, Preliminary Options and Rationale



#### **Key Design Elements**

- Next slides will go through some of the key design elements of the program
- Each issue area includes a description of the issue along with a recommended option and rationale
  - Options are not finalized, and stakeholder feedback will be essential to inform the design of this program
- Design evaluation framework is important to keep in mind:
  - ✓ Quick to develop
  - ✓ Simple to administer
  - ✓ Popular to join
  - ✓ Cost-effective
- Design elements not exhaustive but provide the basis for a high-level design iteration which can be subsequently refined with further details based on stakeholder discussion
  - Feedback welcome on any key design elements missing from this list



#### **Key Design Elements**



## **Eligibility**

#### **Issue Description**

• Who is eligible for this program?

#### **Option/Recommendation**

- Scope is limited to demand response from residential households not participating in any other Distribution Service Provide (DSP) or ERCOT program;
- Specific target in the competitive area is Retail Electric Provider (REP) responsive device/appliance programs as specified in 25.186 of PUCT substantive rules.
- Participation is via REP/LSE QSE (see next slide re: NOIE participation)

#### Rationale

• Program objective to is to incent additional demand response capacity and to avoid any double-counting from other programs and pilots



#### **NOIE Participation**

#### **Issue Description**

 The participation of residential customers in non-competitive areas will require a data-sharing and verification framework between ERCOT and the individual utility

#### **Option/Recommendation**

 Issue(s) related to NOIE participation as a separate design stream to be developed in concert with stakeholders

#### Rationale

 Allows ERCOT and stakeholder to continue to develop and refine an overall design while addressing NOIE-specific issues in a separate forum



#### **Program Trigger**

## **Issue Description**

 How should times of system need under the program be defined?

## **Option/Recommendation**

Highest net load hours
a) Highest *forecasted* net load hours?
b) Highest *actual* net load hours?

#### Rationale

 Recommendation will need to balance predictability with value to system



#### Allocation

#### **Issue Description**

 How many net load hours should be considered and how should these be allocated?

#### **Option/Recommendation**

- ERCOT seasonal allocation using a highest DR performance in x of y, for example:
  - Winter/Summer (best 3 of 5 highest net load hours)
  - Spring/Fall (best 1 of 2 highest net load hours)

#### Rationale

Balance of some risk mitigation for participants against benefit to system



• What is the basis for payment for demand response?

## **Option/Recommendation**

 Pay for performance in \$/kwh based on measured demand response for each x of y per season

## Rationale

 Incentive is tied to actual measured performance during times of need; no forward commitment or administration



#### **Incentive Payment con'd**

#### **Issue Description**

• What is the payment amount for demand response performance?

#### **Option/Recommendation**

• 
$$\frac{X}{No.of \ events/year} \times \sum_{1}^{No. \ of \ events/season} DR \ Performance$$

 Where x = lesser of CONE (\$140/KW-Year) and historical 3-year rolling average Peaker Net Margin (PNM)

#### Rationale

• Provides a predictable financial incentive to participants calibrated to market conditions



**Performance Duration** 

# **Issue Description**

• What should the duration be for assessment?

# **Option/Recommendation**

1 clock hour duration per event

# Rationale

 Aligns with hourly net load performance trigger



#### **Performance Assessment**

## **Issue Description**

 How should hourly demand response performance be assessed?

## **Option/Recommendation**

- Use ERCOT's Matching Sites Baseline Methodology
  - Baseline MWh Actual MWh
  - Only demand reductions measured

#### Rationale

 Standard methodology used in many demand response programs



• How should data submissions be formatted, submitted, validated with ERCOT?

## **Option/Recommendation**

Utilize same format and process as per 25.186
 of PUCT substantive rules

# Rationale

• Established process minimizes new administrative complexity





• When should program settlement occur?

## **Option/Recommendation**

Settlement on a seasonal basis

## Rationale

 Seasonal clearing reduces challenges associated with financial exposure as compared to annual clearing





On what basis should program costs be recovered?

## **Option/Recommendation**

 Load ratio share on the basis of top performance hours

## Rationale

• Net peak reductions provide a system-wide benefit to all load in the ERCOT region





• What framework should be used for implementation of the program?

## **Option/Recommendation**

Program enshrined in NPRR

## Rationale

• NPRR developed through stakeholder process is the most transparent and appropriate framework



# **Illustrative Example**



#### Example

Summer	Winter	Spring	Fall
<b>3</b> hours of each QSE's performance for the <b>5</b> highest net load hours	Top <b>3</b> hours of each QSE's performance for the <b>5</b> highest net load hours	Top 1 hour of each QSE's performance for the 2 highest net load hours	Top 1 hour of each QSE's performance for the 2 highest net load hours

- Payment is a function of min(CONE, 3yrPNM) / 8 measured hourly events
- Assuming CONE, max payment/kwh of demand reduction

= 140/8

= \$17.5/kwh per event



#### Example Con'd

Example 1 - Summer	Example 2 - Fall
Assumptions: • A single 0.5 kW device • Performance in top 5 hours: • 0.5 kWh • 0.4 kWh • 0.3 kWh • 0.2 kWh • 0.2 kWh	Assumptions: • A single 0.5 kW device • Performance in top 2 hours: • 0.4 kWh • 0.2 kWh
Payment = $\frac{\$140/kW \cdot year}{8 \text{ events}} \times (0.5 + 0.4 + 0.3)kWh$ = $\$21$	$Payment = \frac{\$140/kW \cdot year}{8 \text{ events}} \times 0.4 \text{ kWh}$

Payments are aggregated to be at the QSE level for all ESIIDs in their portfolio and for the entire season.



#### **Next Steps**

- Questions and feedback on design elements and options requested by Friday May 23
  - Feedback can be submitted to <u>ryan.king@ercot.com</u>
     and <u>mohamed.el-Madhoun@ercot.com</u>
- NOIE-specific issues meeting to be scheduled mid-May
- Individual meetings also an options
- Second workshop in mid-June to present more detailed design refinements and timeline for a draft NPRR

