



July 30, 2018

The OMS Board of Directors initiated the first OMS DER Survey in February of 2018. The survey built on the priorities identified in the [DER Overview Statement and Work Plan](#) (DER Work Plan) approved by the Board in June 2017. The DER Work Plan highlighted the important role of state and local regulators in ensuring the efficient and reliable integration of DER on the state- and local-jurisdictional distribution systems into the Bulk Electric System (BES). The Board identified the need for a greater understanding of the location and type of DER that is deployed throughout the footprint in order to assess and maintain regional reliability and market efficiency. This will continue to be a priority as DER growth continues.

Responses were received from 41 Load Serving Entities (LSEs). The LSEs were located in all states and Local Resource Zones within the MISO footprint.

Although the responses indicated a wide-variety of experiences with DER throughout the footprint, several general themes emerged:

1. DER penetration is relatively limited within the MISO footprint;
2. Limited visibility into DER operation on LSE distribution systems exists today;
3. LSEs are in the very beginning stages of incorporating DER into distribution system planning processes, if at all;
4. LSE resource planning either accounts for DER indirectly through its impact on load, or directly when required by a state mandated resource planning process;
5. Almost no impacts on the transmission system have been observed from DER at the current penetration level and most LSEs are not anticipating near-term impacts from additional DER.

This survey is intended to support future development of a framework to ensure regional visibility into DER deployment. The information gathered by OMS was submitted by LSEs voluntarily and should not be viewed as a comprehensive data point. Not all LSEs within the footprint provided responses.

The results highlight the wide-ranging experiences with DER throughout the region and provide insight into where more attention may be needed in the future. Results are summarized in the attached presentation.

Organization of MISO States



## OMS DER Survey Results

---

Public Summary  
July 2018

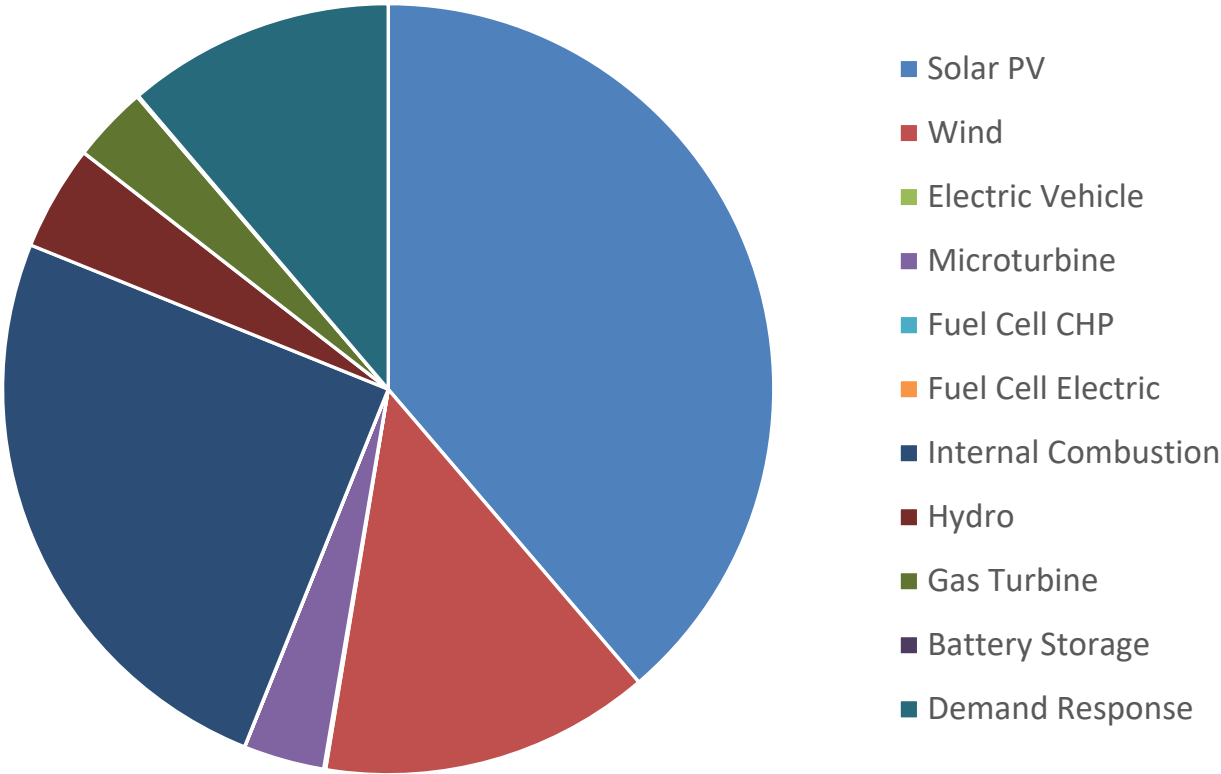


## Participation Level

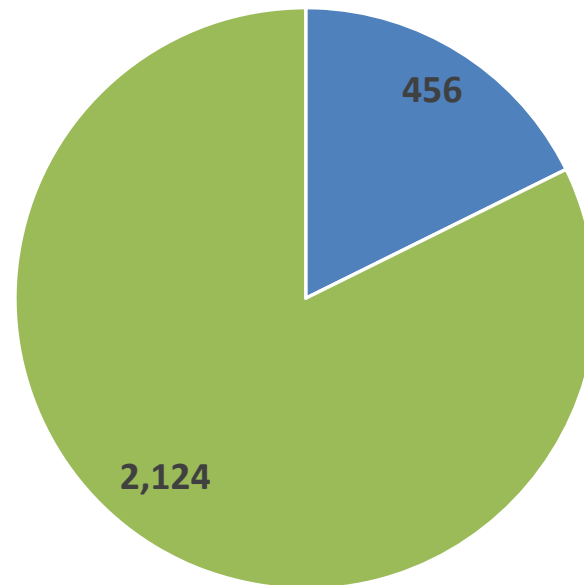
- 41 different responses were submitted
  - All LRZs and states were covered
  - represents the majority of load
- Difficult to see how many muni's and co-ops were covered as part of an aggregated submission
- Need to review list of non-responders to assess potential for further reach in future



# Survey results showed 2.6 GW of DER



## Majority of reported DER capacity was non-residential

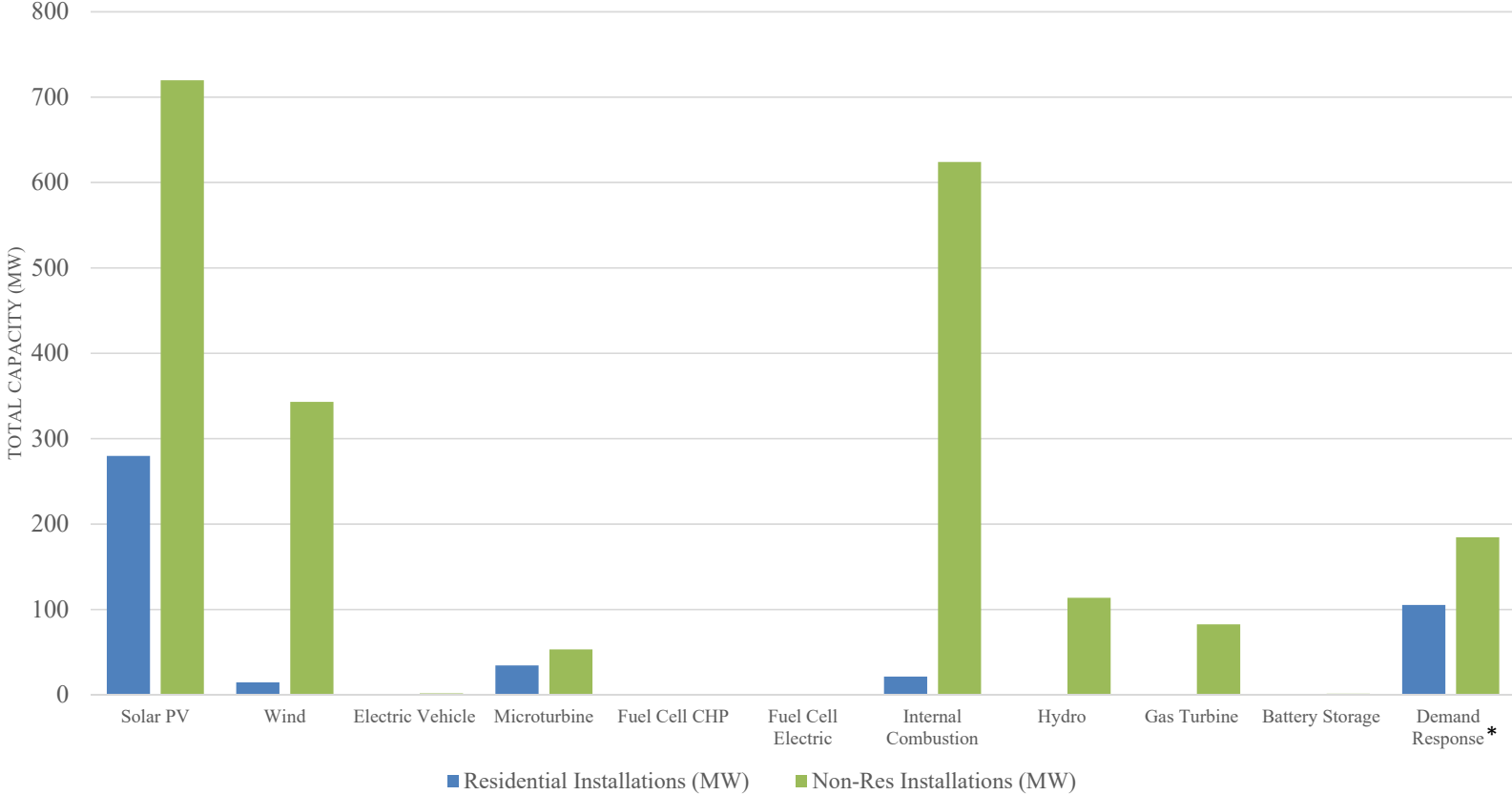


■ Residential Installations (MW)

■ Non-Res Installations (MW)



# Residential and non-residential varied in both total capacity and technology type

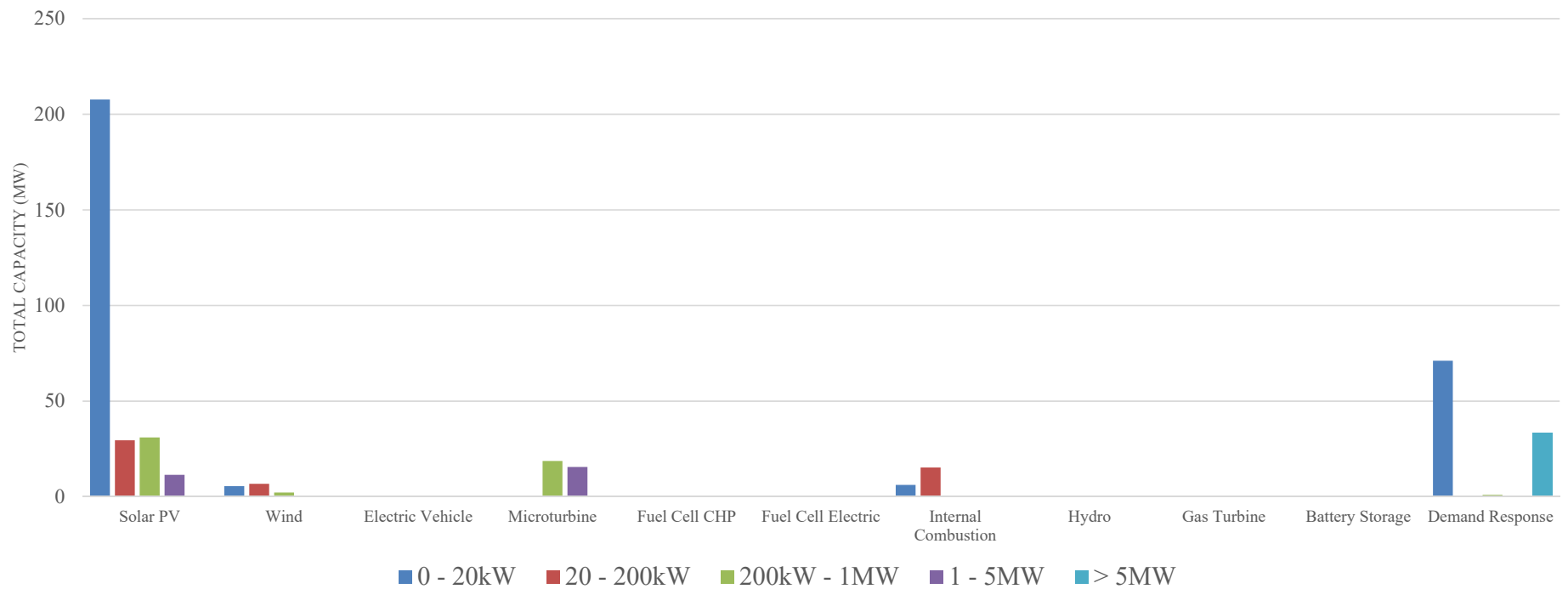


\*Demand response total does not include MISO-registered DR capacity (e.g., LMRs)

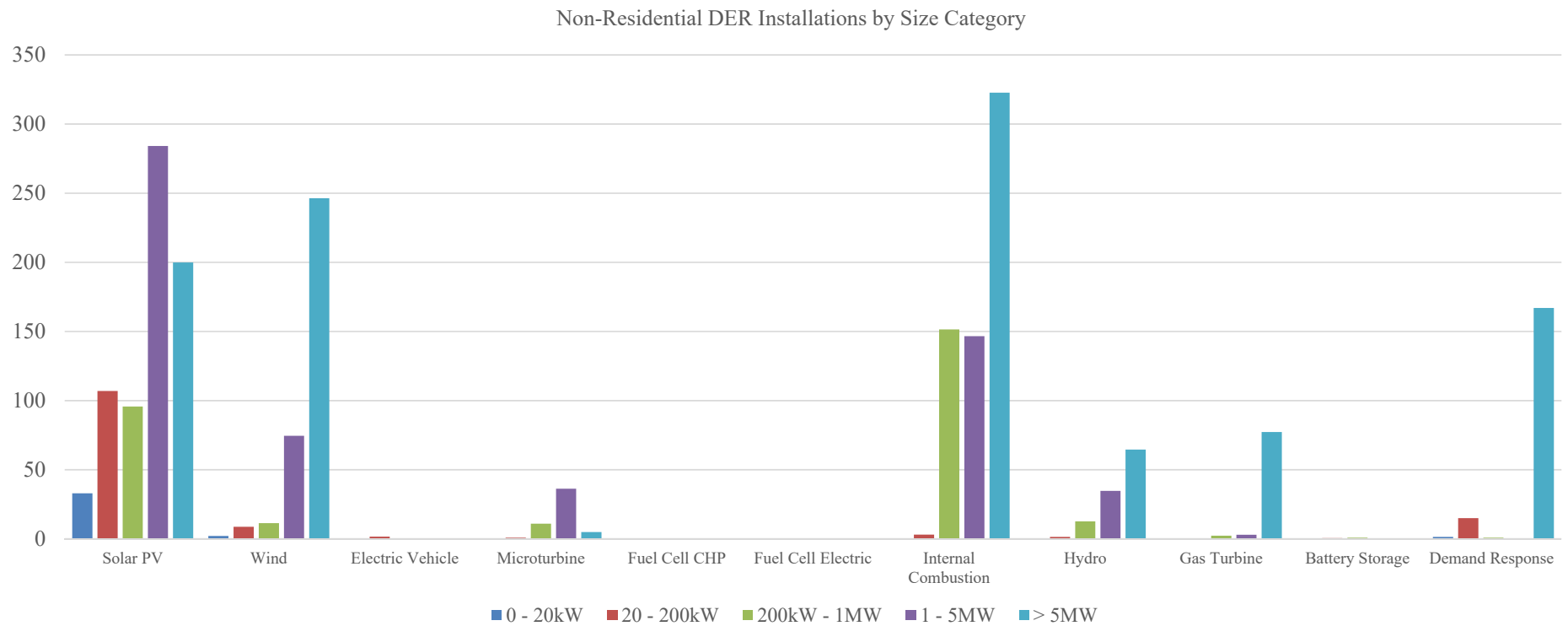


# The majority of residential DER was small-scale solar PV

Residential DER Installations by Size Category



# Non-residential DER has much greater variation in size and technology type





The responses to the list of questions were summarized by OMS members and staff to extract key pieces of information. 28 utilities provided written responses in addition to providing data.

## WRITTEN RESPONSE ANALYSIS

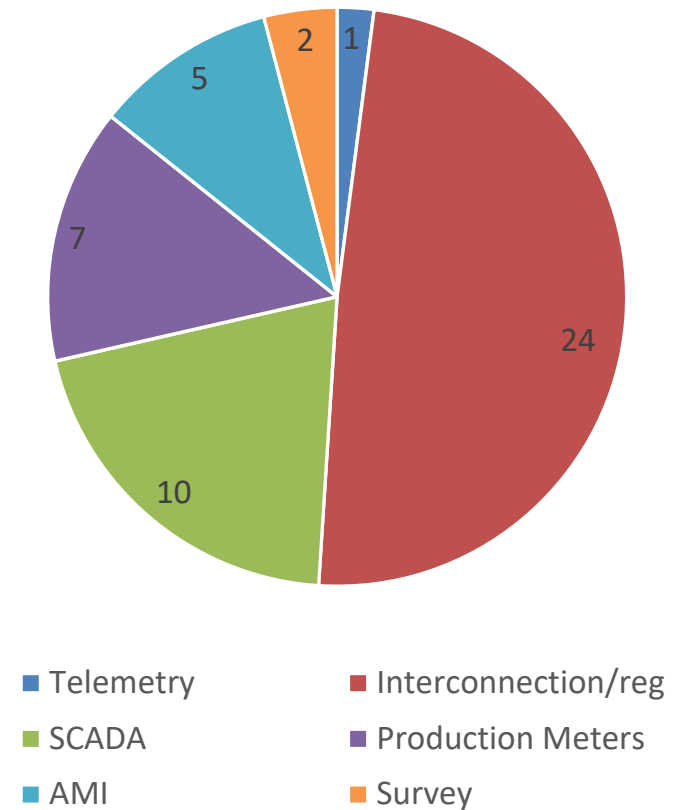


Organization of MISO States

## Question 1: What is understanding of DER on system, and how is visibility achieved?

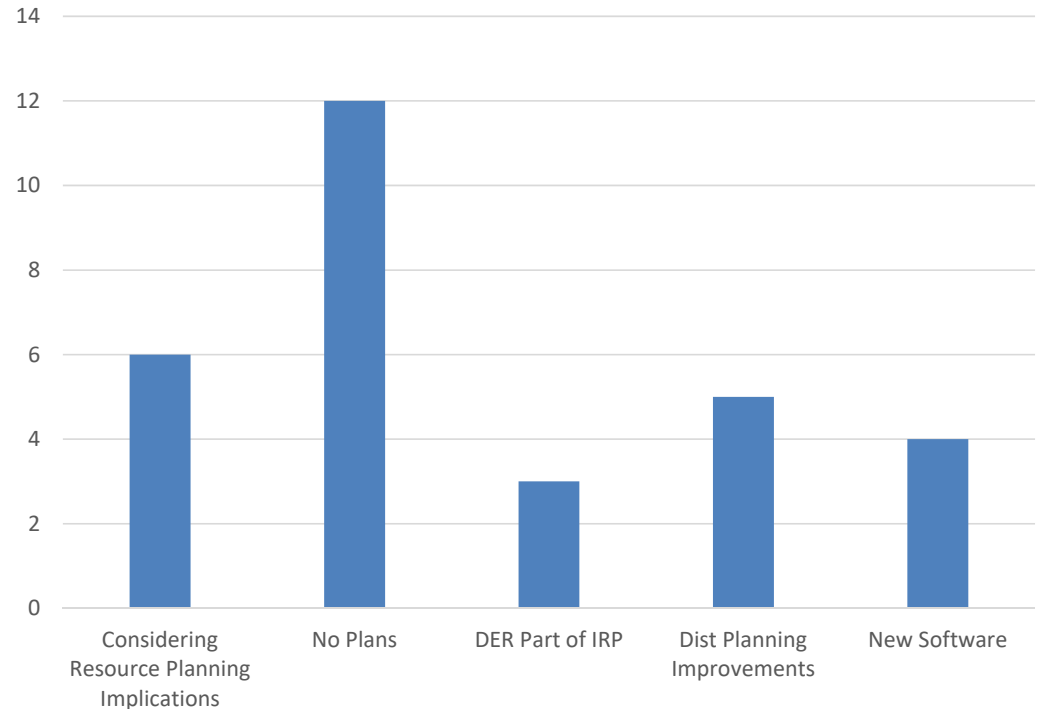
- Almost all responses mentioned interconnection process as main source of visibility
- SCADA for large customers only
- Net-metering muddles AMI data, complicating visibility for the very smallest DERs
- Many reported mix of both production metered & net metered solar
- No operational visibility into smaller DERs reported, which was < 18% of total capacity reported
- No DERMS in operation
- Several stated PowerClerk used to manage interconnection requests

Number of times mechanism is mentioned in responses



## Question 2: Considering changes to how DER is incorporated into planning or operations?

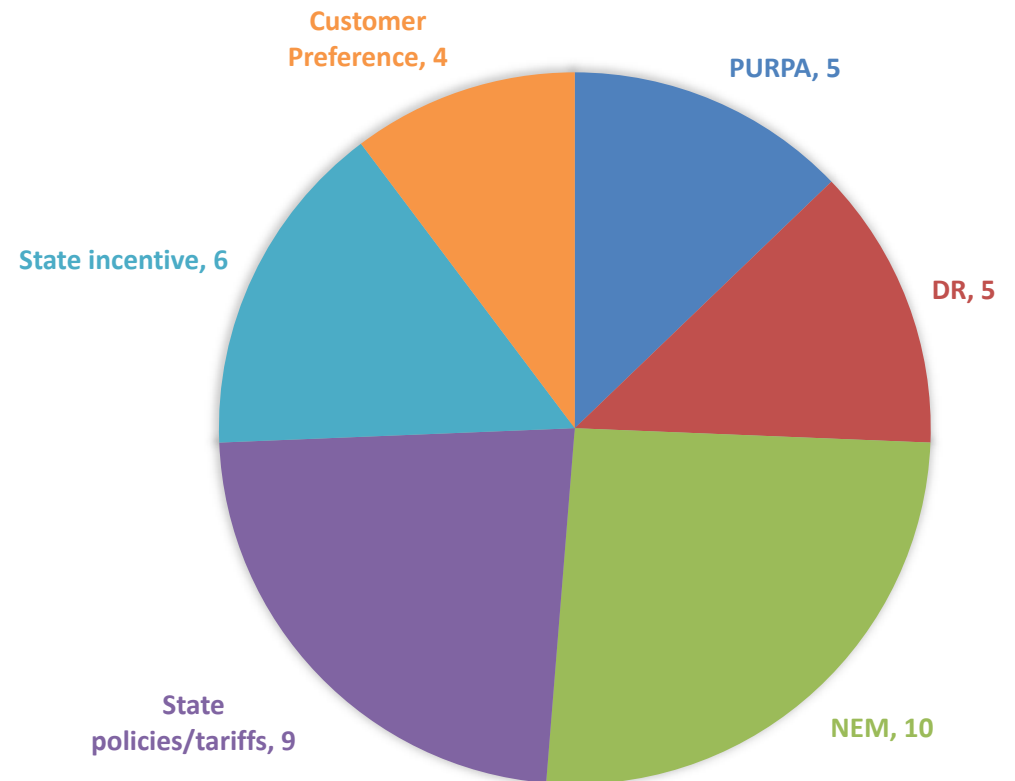
- Many responses indicated there were no specific plans
- Some utilities are considering new software tools
- Some are required to consider DER as part of IRP



### Question 3: What are the drivers behind DER deployment in your footprint?

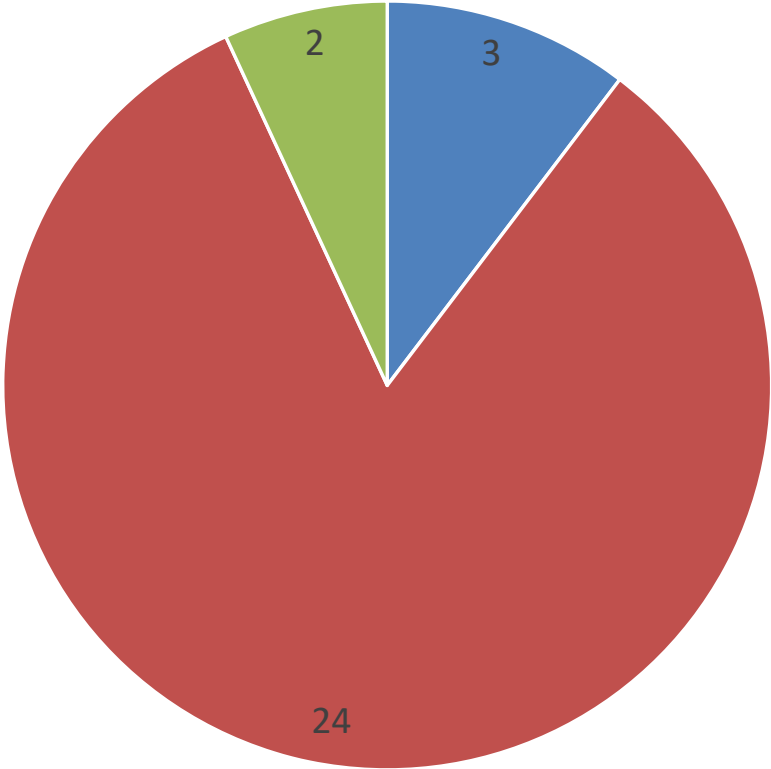
- Note – many respondents didn't indicate a main driver
- Only 4 of 28 LSEs listed customer desire as a driver

### NUMBER OF TIMES DRIVER MENTIONED IN RESPONSES



**Question 4:** Have you observed impacts from DER on the transmission system?

- Very few utilities have noticed impacts at transmission-system level
- Those that have observed impacts indicated that they were minimal and easily managed
- Only two stated that impacts were expected in the future



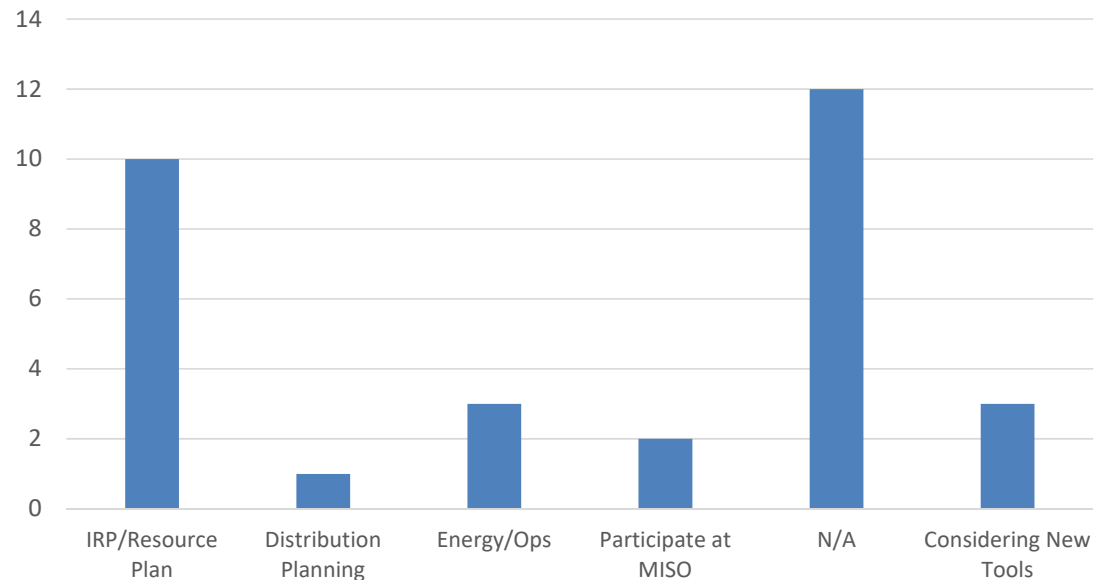
■ Impacts Observed   ■ No Impacts   ■ Expect Impacts



## Question 5: How are you incorporating DER into planning processes?

- IRPs were a common way for resource planning considerations
- Most continue to plan for distribution system peak without DER taken into account – only use controllable resources to meeting planning criteria
- Many stated DER is considered in energy forecasts indirectly through impacts on historical load data
- Often only a subset of DER are considered in resource planning

How is DER Incorporated in Planning Processes?



# APPENDIX



Organization of MISO States

	Residential Installations (MW)	Non-Res Installations (MW)	Total Installed Capacity (MW)
Solar PV	280	720	999.7
Wind	15	343	357.8
Electric Vehicle	0.3	1.8	2.0
Microturbine	35	53	87.8
Fuel Cell CHP	0	0	0.0
Fuel Cell Electric	0	0	0.0
Internal Combustion	22	624	645.7
Hydro	0.09	114	113.8
Gas Turbine	0	83	82.6
Battery Storage	0.06	1.5	1.6
Demand Response	105	184	289.8
<b>Total</b>	<b>456.3</b>	<b>2124.4</b>	<b>2580.7</b>

