BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Establishment of a Working Case Regarding FERC Order 2222 Regarding Participation of Distributed Energy Resource Aggregators in Markets Operated by Regional Transmission Organizations and Independent Systems Operators	))))))	File No. EW-2021-0267

RENEW MISSOURI'S COMMENTS

COMES NOW Renew Missouri Advocates ("Renew Missouri"), pursuant to the Commission's February 24, 2021 *Order Opening a Working Case to Consider the Commission's Response to FERC Order* 2222, and submits the following comments:

1. As the Commission's order summarizes, the Federal Energy Regulatory Commission ("FERC") issued its Order No. 2222 on September 17, 2020. That order amends FERC's regulation to remove barriers to the participation of distributed energy resource aggregators in the capacity, energy, and ancillary service markets operated by Regional Transmission Organizations and Independent System Operators ("RTO/ISO").

2. On February 24, 2021 the Commission asked the Electric IOUs and other interested stakeholders to submit comments on how to comply with the new mandates by March 31st.

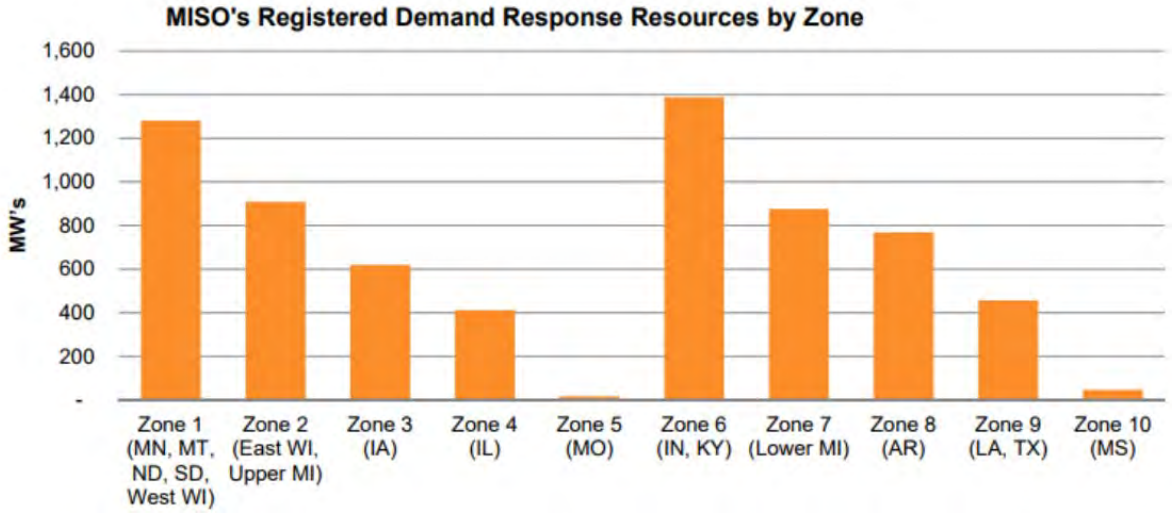
The Commission should revisit its policies on demand-response aggregation

3. In the past several years, demand-response aggregation has been an issue in several workshops opened to examine whether the Commission should reconsider its March 31, 2010 *Order* Temporarily *Prohibiting the Operation of Aggregators of Retail Customers* in Docket No. EW-2010-0187.

4. The most recent effort to revisit the Commission's approach to demand-response aggregation occurred in File No. EW-2017-0245, a working case to explore emerging issues in

utility regulation. There, Commission Staff's *Report* issued on April 5, 2018 summarized parties comments highlighting the need to revisit the policy:

> In this emerging issues docket, the stakeholders explored the Commission's previous order and discussed statutory or rule revisions necessary to encourage DR aggregation in Missouri. According to AEMA, the goal should be "to develop a model that maximizes reliable, cost-effective customer participation through ARC-utility collaboration".
>
> The November 20, 2017 "Increasing Demand Response in Missouri" presentation by Advanced Energy Management Alliance ("AEMA") provides the following graph of MISO's registered demand response. Missouri shows minimal DR resources.



> Some of the electric utilities suggest the Commission's prohibition on third party ARCs does not need to be revisited. Other stakeholders suggest it is time for the Commission to reconsider its third party ARC prohibition. **Staff recommends the Commission revisit the order issued in the EW-2010-0187 docket to determine whether it should allow the order to remain in effect or if it should be rescinded.** Staff analyzed, as an alternative, a model referred to as the "Indiana Model," which as explained below, would be a permissible alternative for Missouri. Utilities should be involved in DR, whether utility-scale or through third parties, to ensure system reliability (emphasis added).[1]

[1] File No. EW-2017-0245, Staff's Report on Distributed Energy Resources, *Iss'd* April 5, 2018, p. 20

5. Even though Staff recommended revisiting the Order, Renew Missouri is unaware that the Commission took such action. Instead, the Commission followed the Staff's secondary recommendation to "encourage the electric utilities to submit tariffs similar to the Indiana Model."[2]

6. FERC Order 2222 defines DERS broadly as "any resource located on the distribution system, any subsystem thereof or behind a customer meter." Adding that "[t]hese resources may include, but are not limited to, resources that are in front of and behind the customer meter, electric storage resources, intermittent generation, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment—as long as such a resource is "located on the distribution system, any subsystem thereof or behind a customer meter."[3]

7. Order 2222 also appears to prohibit retail regulatory authorities – like the Commission - from excluding DERs from participating in regional markets. However, relevant to these comments, FERC noted that "we clarify that this final rule does not affect the ability of relevant electric retail regulatory authorities to prohibit retail customers' demand response from being bid into RTO/ISO markets by aggregators."[4] In the same section, FERC re-iterates it was not obligated to provide such an opt-out but rather did so as an exercise of its discretion.

8. Renew Missouri understands that the RTOs covering Missouri's Electric IOUs are in the process of developing the required tariffs that will implement the new regulations. In this interim period, the Commission should re-evaluate its approach to demand response aggregation so that the relevant RTOs can develop more robust and clear governing tariffs on DER aggregation in the

[2] Id. at 22.
[3] FERC Order 2222, paragraph 114. Available at: https://www.federalregister.gov/documents/2020/10/21/2020-20973/participation-of-distributed-energy-resource-aggregations-in-markets-operated-by-regional
[4] Id at paragraph 59.

marketplace. Included as **Attachment 1**, is a March 8, 2021 slide deck on Order 2222 and Demand Response by the MISO DER task force. One of the "Key takeaways" is that "**FERC Order 2222 allows for demand response to be a part of a DER Aggregation**, but specifically preserves Order 719/745" (emphasis added).

9. Demand response technologies, services, and capabilities are rapidly evolving and improving. In 2010, the Commission initiated a proceeding to consider questions relating to the participation of customer demand-side resources facilitated by Aggregators of Retail Customers ("ARCs") in RTO and ISO markets. The Commission identified a number of legal and policy questions to consider, initiated a workshop process to address them, and placed a temporary prohibition against RTOs and ISOs accepting bids from retail customers or ARCs who aggregate electric utility customers' demand response load reductions.[5]

10. As the FERC Order 2222 exemplifies, another development in law and markets has occurred since the Commission's last review of the opportunity. Although Missouri's IOUs have generally attempted to manage their own demand response programs (especially through MEEIA programs), there is a market opportunity to have third-party aggregators operate in Missouri.

11. Demand response is a valuable tool in not only reducing utility system peak demand-related costs, but also in facilitating high penetration of variable renewable resources such as distributed solar and increasing system reliability.[6] Demand response is useful in improving load diversity, distribution system asset utilization, and system load factor—all of which can result in lower cost of service. Demand response offers an excellent opportunity to introduce market forces into the

[5] *See, e.g.*, Docket No. EW-2010-0187, *Order Temporarily Prohibiting the Operation of Aggregators of Retail Customers* (March 31, 2010), at p. 6.
[6] *See* Jim Lazar, "Teaching the 'Duck' to Fly," Regulatory Assistance Project (2d. Ed, Feb. 2016). Shortened version attached as Appendix C. Available at: http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-teachingtheduck2-2016-feb-2.pdf

electric system. Finally, demand response aggregation offers an increasingly valuable tool for empowering customers to engage with the grid and reduce their electric bills while contributing to system-wide cost reductions for all customers.

12. With the potential benefits demand response aggregation may bring to Missouri, the Commission should take this opportunity to revisit its policy at a time when RTOs are developing tariffs to implement the market aggregation services under FERC Order 2222.

WHEREFORE, Renew Missouri respectfully submits its Comments for the Commission's consideration.

Respectfully,

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Certificate of Service

I hereby certify that copies of the foregoing have been mailed, emailed or hand-delivered to all counsel of record this 31st day of March 2021:

/s/ Tim Opitz

Attachment 1

Order 2222 Demand Response and Double Counting Introduction

Michael Robinson, Michael Kessler
IR070 - DER Task Force
March 8, 2021

Purpose & Key Takeaways

Purpose:

Introduce concepts for discussing double counting, and review MISO's current demand resource types and treatment

Key Takeaways:

- FERC Order 2222 allows for demand response to be a part of a DER Aggregation, but specifically preserves Order 719/745
- The term "double counting" can be used to describe multiple circumstances
- The FERC Order allows for regional flexibility in determining the means of ensuring double counting does not take place

Order 2222 requires

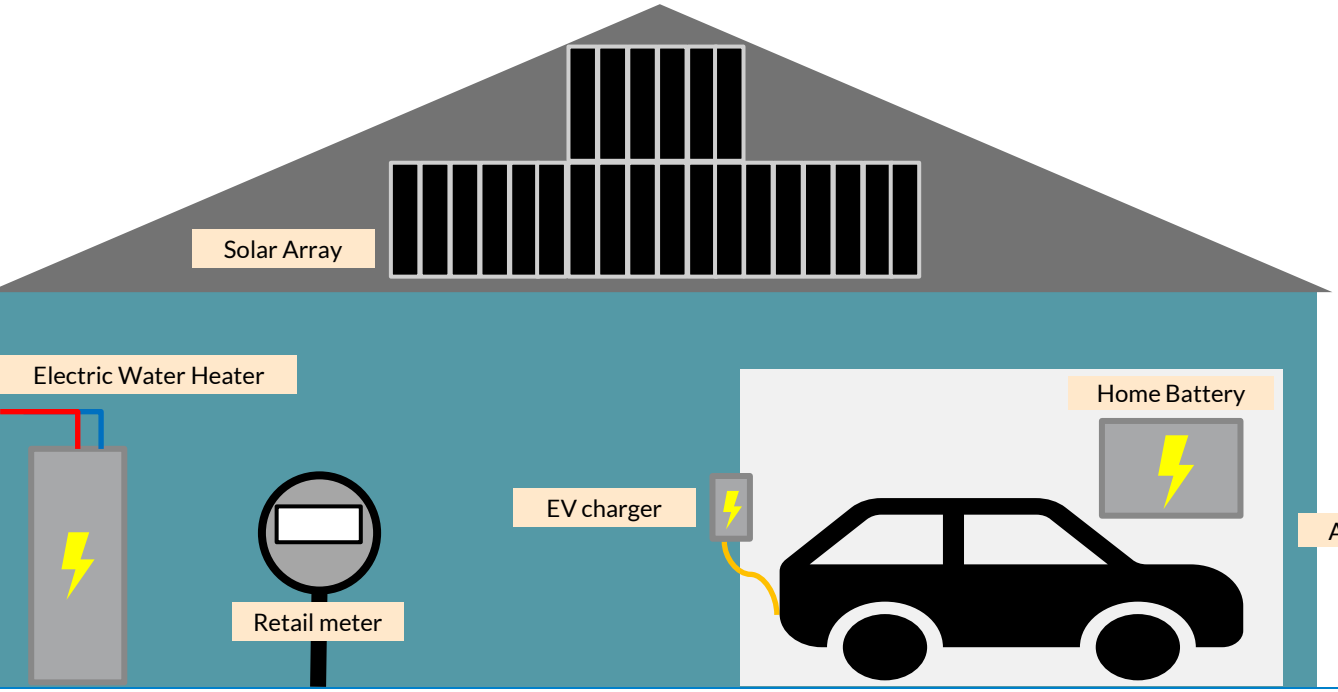
- An aggregation may include, *but is not limited to*, resources that are in front of and behind the customer meter (e.g., customer sites capable of demand reduction), electric storage resources, intermittent generation, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment

- Understanding how to measure multiple activities behind a single retail meter is important; how can "settlement quality data" be collected/transferred?

- Double counting of services (PP160-164)
  - DERs may participate in both retail and wholesale markets
  - If RERRA permits
  - Cannot be compensated twice for "same service"
  - May provide multiple wholesale services

Imagine a house

- Connected home may be enrolled in multiple programs, and both utility programs or 3rd party aggregators may sell different services to retail and wholesale markets
- Understanding how to measure multiple activities behind a single retail meter is important; how can "settlement quality data" be collected/transferred?



- Also raises questions of WHO has the information and WHAT needs to be done?
- We are addressing only wholesale sales, though DC's perspective is critical

Demand Response FERC Orders

Order	Date	Description
Order 719	October 17, 2008	- The Commission will require RTOs and ISOs to: (1) accept bids from demand response resources in their markets for certain ancillary services, on a basis comparable to other resources; (3) permit ARCs to bid demand response on behalf of retail customers directly into the RTO's or ISO's organized markets
Order 745	March 15, 2011	- When a demand response resource participating in an organized wholesale energy market administered by a RTO/ISO has the capability to balance supply and demand as an alternative to a generation resource and when dispatch of that demand response resource is cost-effective as determined by the net benefits test described in this rule, that demand response resource must be compensated for the service it provides to the energy market at the market price for energy, referred to as the locational marginal price (LMP)
Order 2222	September 17, 2020	- Allow distributed energy resource aggregators to register distributed energy resource aggregations under one or more participation models that accommodate the physical and operational characteristics of the distributed energy resource aggregations; - We require that each RTO's/ISO's rules do not prohibit any particular type of distributed energy resource technology from participating in distributed energy resource aggregations. - We clarify, however, that the participation of demand response in distributed energy resource aggregations is subject to the opt-out and opt-in requirements of Order Nos. 719 and 719-A

Order 719

On 28 April 2009, MISO submitted a compliance filing that responded to Order 719 requirements related to:

- Ancillary services provided by demand resources
- Eliminating deviation charges during system emergencies
- Price formation during periods of operating reserve shortage
- Reporting of barriers to comparable treatment of demand resources
- Long-term power contracting
- Market monitoring

RERRA approval for ARC participation plus

- Allow multi–part operating reserve offer curves for demand response resources (DRRs)
- Introduce maximum daily regulation and contingency reserve deployment limits for DRRs

Order 719 - ARC

ARCs are Market Participants that combine the abilities of one or more retail customers to "provide" electricity in the wholesale markets

- Demand response resources (DRR and DR) "provide" energy by reducing the amount of electricity purchased from the grid
- Behind-the-meter generation supplies energy

ARCs can combine customers, but only under certain circumstances

- All customers receive service within a single LBA
- The relevant electricity retail regulatory authority (RERRA) must allow customer participation (either directly or implicitly)

An example of an ARC might be a business entity that combines several large retail businesses, each of which is able to turn off lighting in certain areas of their buildings

- ARC registration instructions are included in BPM-001

Order 745

To implement the net benefits test described herein, we direct each RTO and ISO to develop a mechanism as an approximation to determine a price level at which the dispatch of demand response resources will be cost-effective.

The RTO or ISO should determine, based on historical data as a starting point and updated for changes in relevant supply conditions such as changes in fuel prices and generator unit availability, the monthly threshold price corresponding to the point along the supply stack beyond which the overall benefit from the reduced LMP resulting from dispatching demand response resources exceeds the cost of dispatching and paying LMP to those resources.

This price level is to be updated monthly, by each ISO or RTO, as the historic data and relevant supply conditions change

Order 745

DRR compensation and cost allocation

Credit LMP for economic energy when LMP > NBPT

NBPT: price at which reductions in LMP from implementing demand response results in a reduction in the total amount consumers pay for resources is greater than the money spent acquiring those demand response resources at LMP,

NBPT: point where the energy supply curve becomes inelastic

NBPT: calculated monthly

Demand Resource Types

Categories of Demand Resources

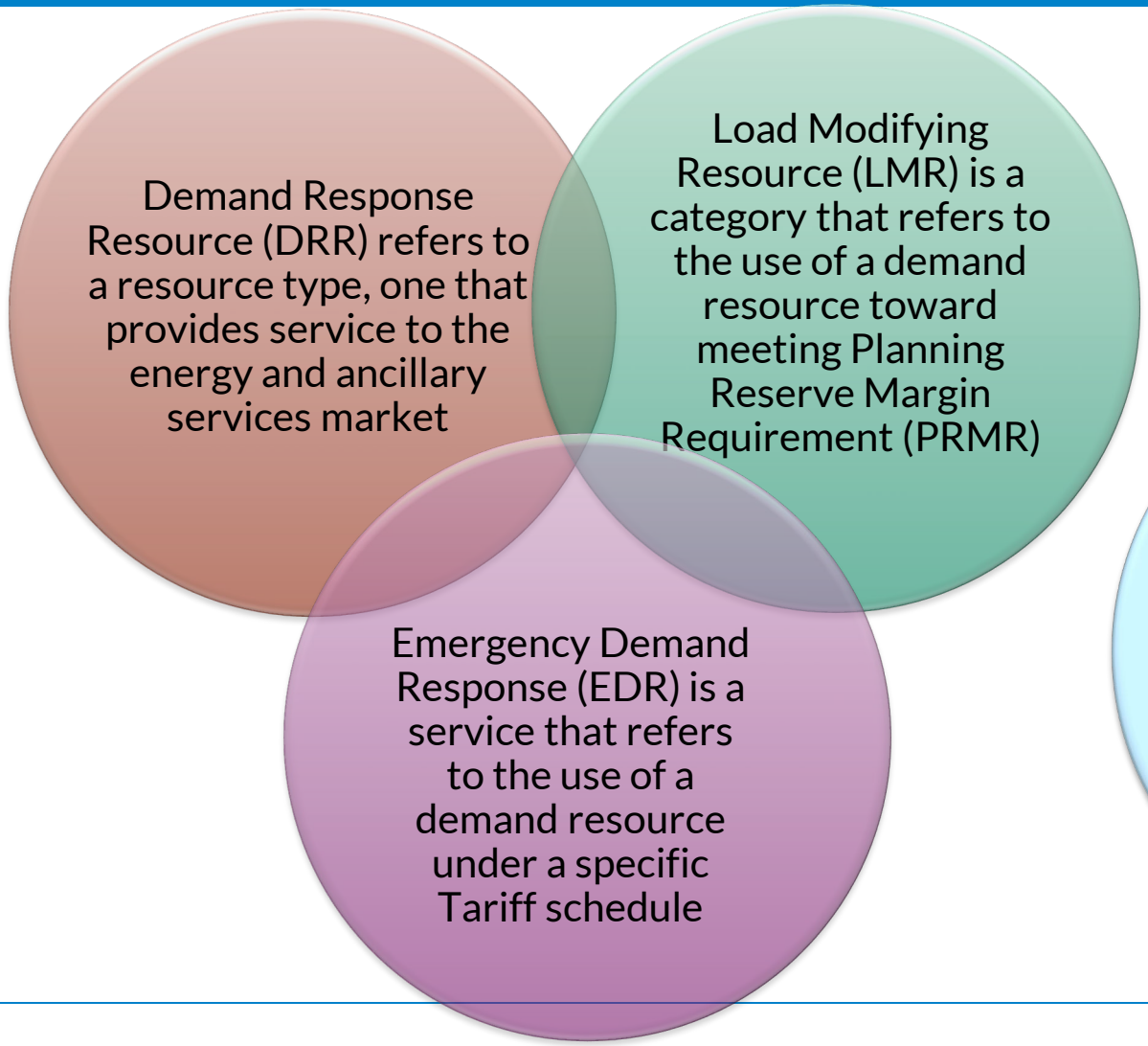
The terminology surrounding demand resources can be confusing:

- Several categories use similar words
  (e.g. demand resources, demand response resources)
- Not necessarily exclusive definitions
  (e.g. an LMR can also provide EDR service)
- Same words used both generically and specifically (per Tariff)
  (e.g. demand resource and Demand Resource, btmg and BTMG)

Classification ultimately depends on two issues:

1. What are the physical capabilities of the resource?
   - Can the resource perform at varying levels of power/ energy?
   - Metering capability
2. What responsibilities is the resource operator willing to accept?
   - Will the resource be available during a system emergency?

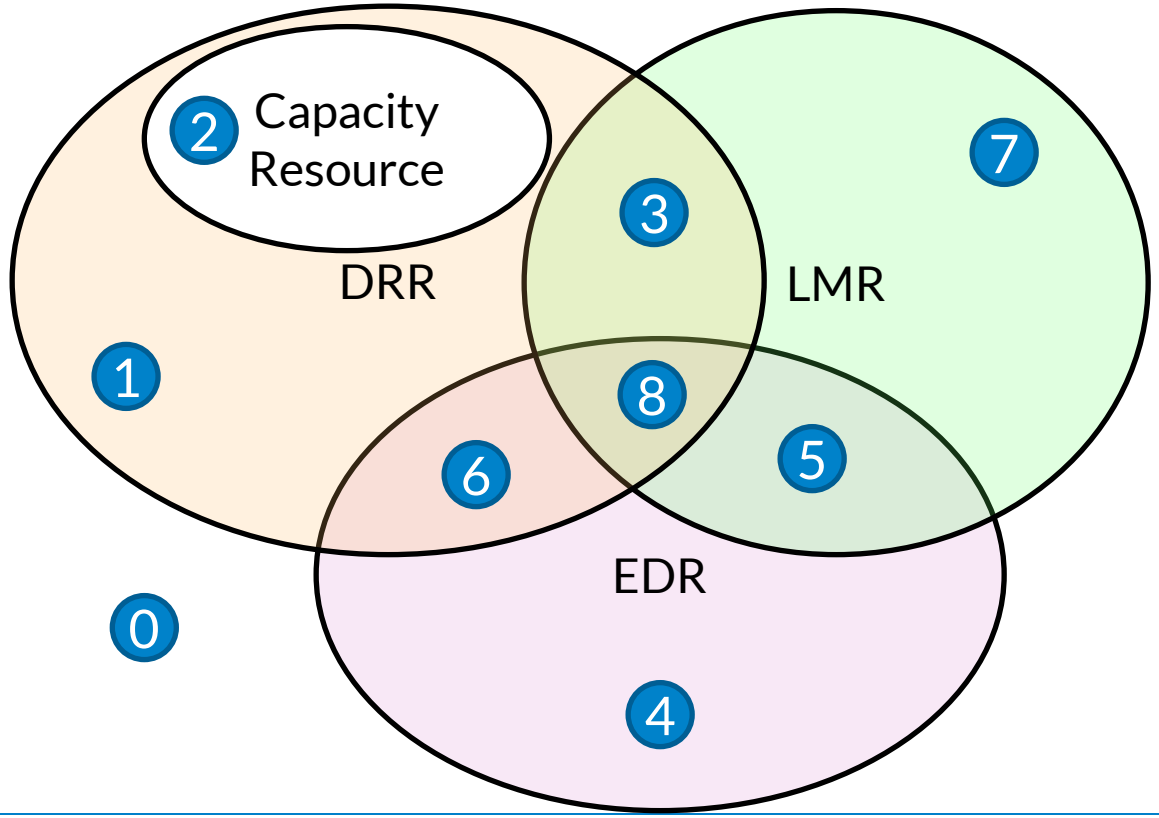
Resources, categories, services



DER aggregations could include demand response, and be eligible to participate in the energy, ancillary services, and capacity markets

Demand Resource Registration Options today

As this figure shows, there are many options available for demand response registration. Note that not all these configurations have been used by MISO Market Participants, but they are available if desired



#	Comments/Notes
0	Not MISO registered
1	There is no DRR "must offer" requirement here, since there are no capacity credits
2	Uncommon approach for DRR "must offer" in energy & AS markets
3	LMR receives capacity credits and resource can optionally offer into the energy & AS markets
4	EDR only. No capacity credits or "must offer" requirement
5	LMR that optionally provides an EDR offer for emergency energy
6	Similar to "1", but can optionally participate in emergencies
7	LMR only. Not involved in energy and AS markets
8	Similar to "5" but can optionally participate in energy & AS markets

DRR-Type I

- Capable of supplying a specific quantity of energy to the market through physical load interruption or behind-the-meter generation
- Is an "on/off" resource; provides 0 MW or target demand reduction amount
- Can provide spinning or supplemental reserves, if qualified
  - Not capable of providing regulation or ramp capability product
- Can be included in MISO Transmission Expansion Planning (MTEP) (long-term) capacity planning
- Can be counted towards Resource Adequacy Requirements (RAR)
- Has a "must offer" requirement (must make its capacity available to the Day-Ahead or Real Time commitment processes) if it clears as a Capacity Resource

DRR-Type II

- Capable of supplying energy to the market through behind-the-meter generation or controllable load
- Can be committed and dispatched similar to generation resources
  - Can provide regulation, spinning, supplemental reserves and ramp capability product, if qualified
- Can be included in MTEP (long-term) capacity planning
- Can be counted towards Resource Adequacy Requirements (RAR)
- Has a “must offer” requirement (must make its capacity available to the Day-Ahead or Real Time commitment processes) if it clears as a Capacity Resource

Load Modifying Resources

- LMR is a category of demand resources created for resources that either cannot or do not wish to qualify as Capacity Resources, but *do* wish to be considered as Planning Resources (and thus capable of helping to satisfy PRMR)
  - DRR can qualify as LMR, or as a Capacity Resource
  - Demand Resources would include resources such as interruptible load or direct load control management; can qualify as an LMR
  - Behind the Meter Generation can also be classified as an LMR

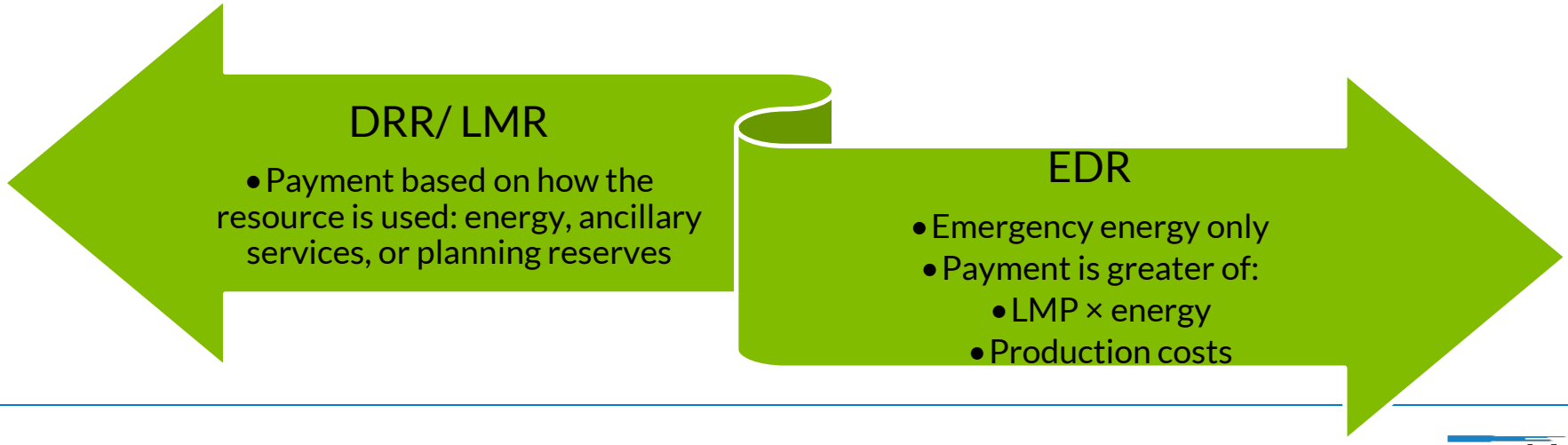
- LMRs *must* make themselves available to the system during Emergency conditions, but not otherwise
  - LMRs can optionally dual-register as Emergency Demand Response resources

Emergency Demand Response (EDR)

- While not technically a "category," EDR was created to enable more demand resources to help the system during emergency conditions, without necessarily qualifying for the more involved categories

- EDR resources submit information describing their costs incurred to reduce load (or provide energy) during an emergency event
  - As submitted, an EDR resource is then *required* to respond during an emergency
  - EDR can change its offer and availability day-by-day

- An LMR can dual-register as an EDR



Market Design Elements

	DRR-Type I	DRR-Type II	LMR	EDR
Demand response type	btmg/(interruptible/ curtailable) load	btmg/ dispatchable load	BTMG / DR	BTMG / DR
Size/ impact	≥ 1 MW	≥ 1 MW	≥ 0.1 MW	≥ 0.1 MW
Real time telemetry	No	Yes, for regulation service	No	No
In-network model	Through load	As negative gen	Through load	Through load
In-commercial model	Yes	Yes	Through load	Through load
Treatment in DART market process	On/ off, not continuously dispatchable for energy	Dispatchable	N/A	N/A
Aggregation in DART	Allowed within single LBA	Allowed under single EPNode	N/A	N/A
Capacity payment	eligible	eligible	eligible	ineligible

Economic Energy and Ancillary Services Evaluation Framework

Existing resource model	Multi-node	0.1 MW resource size	Capacity	Energy	Reg	Spin/ on-line sup	Off-line sup	Ramp capability	STR	MISO commit	MISO dispatch	Risk
DRR I	yes	no	yes	yes	no	yes	no	no	yes	yes	block	Under evaluation
ESR#	no	yes*	yes	yes	yes	yes	yes	yes	yes	self-commit	yes	
DRR II	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	
DIR	no	yes*	yes	yes	no	no	no	yes	no	yes	yes	

ESR in development, not yet in place

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Settlement issues

Most of the current issues revolve around M&V procedures (measurement and verification), including but not limited to:

- *How to observe the counterfactual consumption level?*
- *Adverse selection problem*
- *Moral hazard problem*

Attachment TT (consumption baselines)

- Metered generation baseline (BTMG)
- Meter before/ meter after
- Firm service level
- Calculated baseline
  - 10 in 10
  - With symmetric adjustment
  - With weather adjustment
- Direct load control baseline
- Custom baseline

Relevant Terms: Order 2222

- Double Counting
- Missing Money Problem
- Reconstitution

Double Counting

Double Counting – three potential cases

- Is the end-use customer account already registered as part of an asset in MISO's markets?
  - If already registered in one market, can a DERA register this account in another?
  - If an end use customer facility/ premise has multiple accounts at its site, can separate accounts be registered by different MPs?

- How is it determined that an end-use customer account is providing the same service at the retail & wholesale level?
  - Example: community solar facility receiving a value of solar rate, which may include "capacity" payment – utility using this facility to lower capacity requirement
  - Example: can an end-use customer on a PTR schedule be used to decrement the load obligations of an LSE and also qualify as a planning resource?

- Compensating a DERA for following a dispatch instruction and compensating an LSE because its metered load withdrawal is less as a result of an action taken by a DERA

- Who is responsible for figuring these questions out? Who has the data?

Demand Response can cause a “Missing Money Problem”

- Power balance met
- Revenue adequacy met
- Forecast for next interval shows load of 120 MW

Load = 100 MW
DRR = 0 MW
Net Load = 100 -0
= 100 MW
Gen = 100 MW
LMP = $20

- Dispatch DRR to 20 MW
- Power balance met
- Revenue inadequacy exists
- Pay $3000 to Gen and $600 to DRR but charged only $3000 (30x100) load
- Where does the other $600 come from?

'Load' = 120
MW
DRR = 20 MW
Net Load = 120 -20
= 100 MW
Gen = 100 MW
LMP = $30

Missing Money

Missing Money

Missing Money, or sometimes referred to as “revenue inadequacy”

- MISO compliance with FERC Order 745 addressed this
- Primarily occurs due to generation injections or load non-withdrawals (demand response) at the distribution level
  - DER generation injections onto the BES not at issue
- Can occur in two separate ways
  - If the requisite LSE has cleared a DA schedule for the load behind the DER asset
  - Even without an LSE having a cleared DA schedule for the load behind the DER asset
- Load reconstitution is the approach to address this

Missing Money and load reconstitution

- MISO compliance with FERC Order 745 addressed this

- Net Benefit Test determines when load is reconstituted
  - LMP below Net Benefits Price Threshold (NBPT): the appliable load node is reconstituted (DRR metered “injections” added into the LSE's metered load volumes
  - LMP above NBPT: the **buyers in the RT market** who benefited from the DRR 'injection' are charged
  - Buyers include:
    - Load serving entities whose Real-Time schedules exceed Day-Ahead schedules
    - Generation whose Real-Time schedules are less than Day-Ahead schedules
    - Cleared virtual supply schedules

Problems with load reconstitution: who pays?

At the wholesale level:

- If modeled as a net resource in the market system/ EMS with required RT visibility/ metering, load reconstitution is not required. The net resource is credited/charged based on metered volumes
- If not modeled as a net resource in operational systems (BTMG as DER or settlement only resource), resource paid for x MW and load must be charged for x MW
  - Load MWs should be at the same location as the resource for congestion and loss balancing
  - Avoid using load increase as load zone since load distribution factors and load zone prices are assigned in market system without DER awareness. Not practical to reestablish load distribution factors and load zone prices

Appendix

Tariff Definitions From Module A

Demand Response Resource (DRR)-Type I:

- Resource owned by a single Load Serving Entity, or an ARC within the MISO BAA and that (i) is registered to participate in the Energy and Operating Reserve Markets, (ii) that is capable of supplying a specific quantity of Energy, Contingency Reserve or Capacity … through Behind the Meter Generation and/or controllable Load, (iii) is capable of complying with the Transmission Provider's instructions, and (iv) has the appropriate metering equipment installed.

Demand Response Resource (DRR)-Type II:

- Resource owned by a single Load Serving Entity, or an ARC within the MISO BAA and that (i) is registered to participate in the Energy and Operating Reserve Markets, (ii) is capable of supplying a range of Energy, Operating Reserve, Up Ramp Capability and/or Down Ramp Capability...through Behind-The-Meter generation and/or controllable Load, (iii) is capable of complying with Transmission Provider's Setpoint Instructions and (iv) has the appropriate metering equipment installed.

- **Behind the Meter Generation (BTMG):**
  - Generation resources used to serve wholesale or retail load located behind a CP-Node that are not included in the Transmission Provider's Set-point Instructions and in some cases can also be deliverable to Load located within the Transmission Provider Region using either Network Integration, Point-To-Point Transmission Service or transmission service pursuant to a Grandfathered Agreement. These resources have an obligation to be made available during Emergencies.
- **Demand Resource (DR):**
  - Interruptible Load or Direct Control Load Management and other resources that can reduce Demand during Emergencies.
- **Emergency Demand Response (EDR):**
  - The commitment and dispatch of Load reductions, Behind the Meter Generation Resources and other Demand Resources during an Emergency, in accordance with Schedule 30.
- **Load Modifying Resource (LMR):**
  - A Demand Resource or Behind the Meter Generation Resource.

Acronyms

ARC	Aggregator of Retail Customers
BPM	Business Practices Manual
BTMG	Behind the Meter Generation
CPNode	Commercial Pricing Node
DADS	Demand Response Availability Data System
DERA*	Distributed Energy Resource Aggregator (not in MISO tariff today)
DR	Demand Resource
DRR	Demand Response Resource
EDR	Emergency Demand Response
EDRI	Emergency Demand Response Initiative
EEA(1, 2, 3)	NERC Energy Emergency Alert levels
EOP	Emergency Operations Procedures
FERC	Federal Energy Regulatory Commission

Acronyms (continued)

GADS	Generating Availability Data System
IMM	Independent Market Monitor
LBA	Local Balancing Authority
LMP	Locational Marginal Price
LMR	Load Modifying Resource
LSE	Load Serving Entity
MECT	Module E Capacity Tracking tool
Module E-1	MISO EMT module regarding Resource Adequacy
MP	Market Participant
MTEP	MISO Transmission Expansion Planning
NAESB	North American Energy Standards Board
NERC	North American Electric Reliability Corporation

Acronyms (continued)

PRA	Planning Resource Auction
Power GADS	MISO GADS database
PRMR	Planning Reserve Margin Requirement
RA	Resource Adequacy
RAR	Resource Adequacy Requirement
RASC	Resource Adequacy Subcommittee
RSG	Revenue Sufficiency Guarantee
ZRC	Zonal Resource Credit