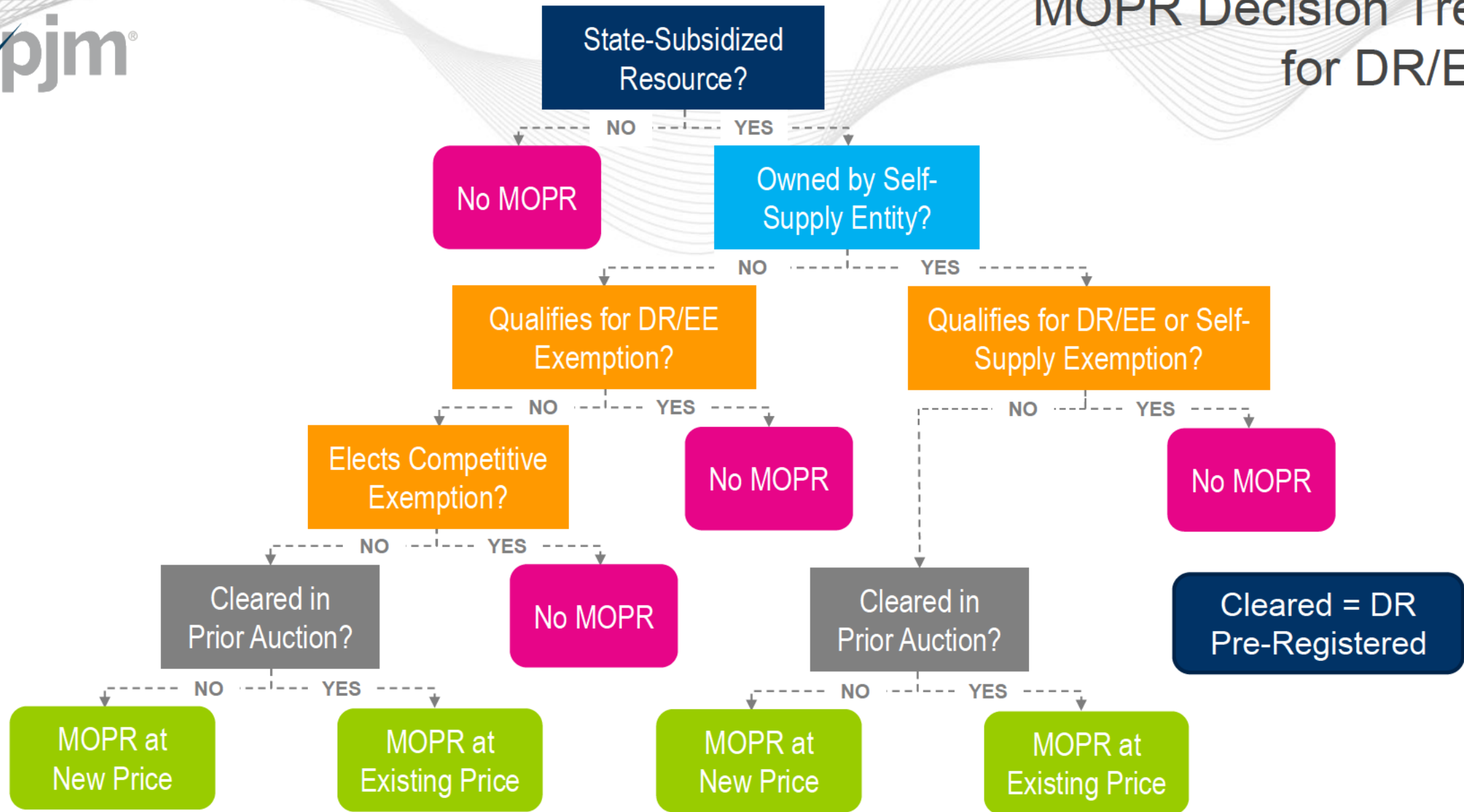


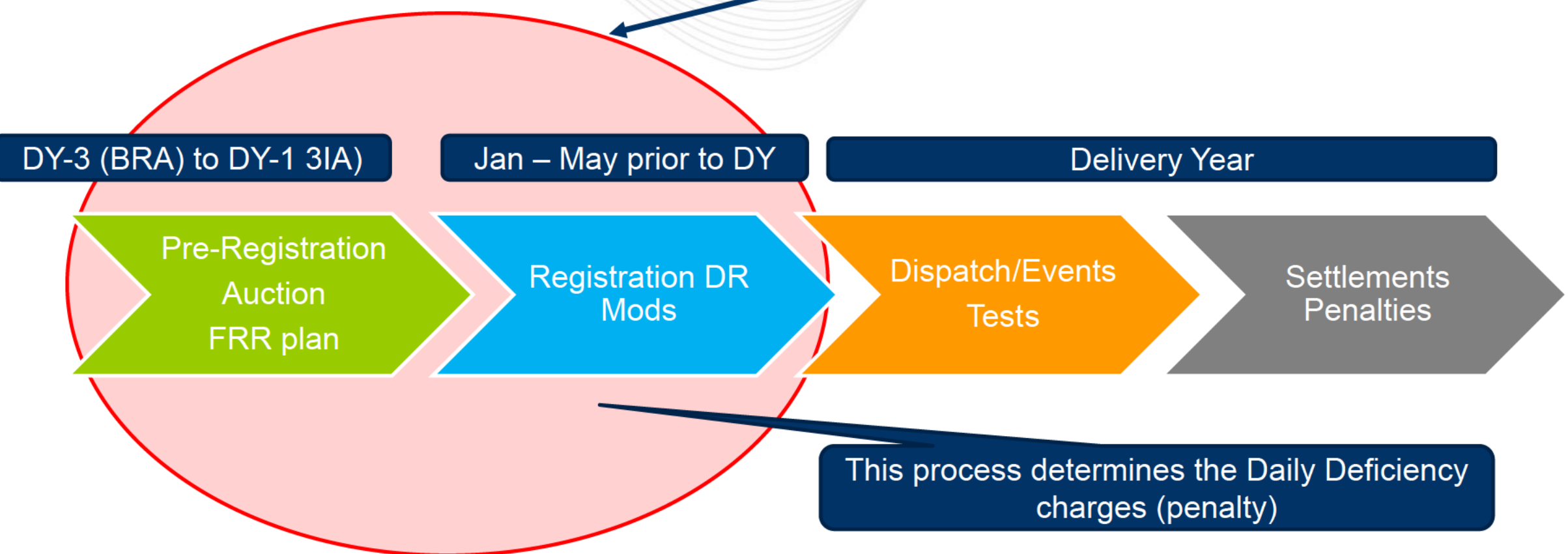
Potential impact of MOPR order on DR resources (Updated for FERC April Rehearing Order)

DRS
6/11/2020

- Overview of MOPR order impact to DR
- Subsidies
- MOPR existing resource
- MOPR price structure
- DR process and MOPR order

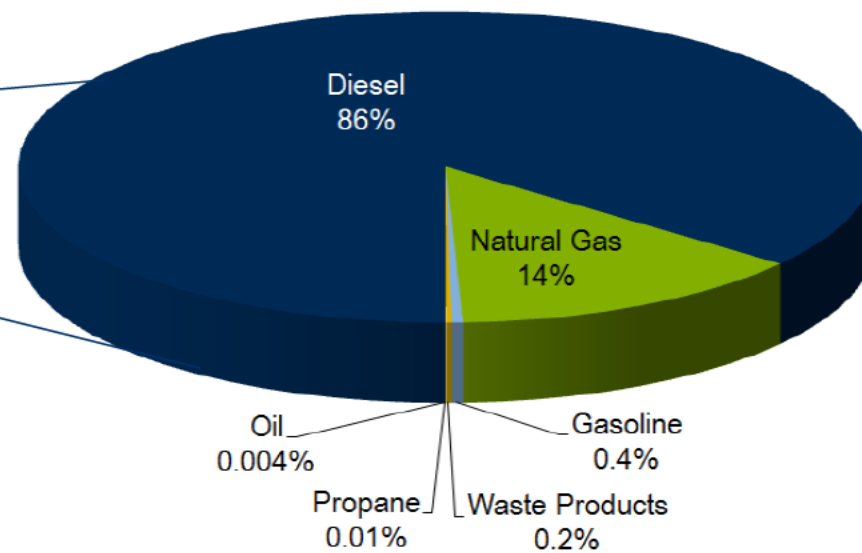
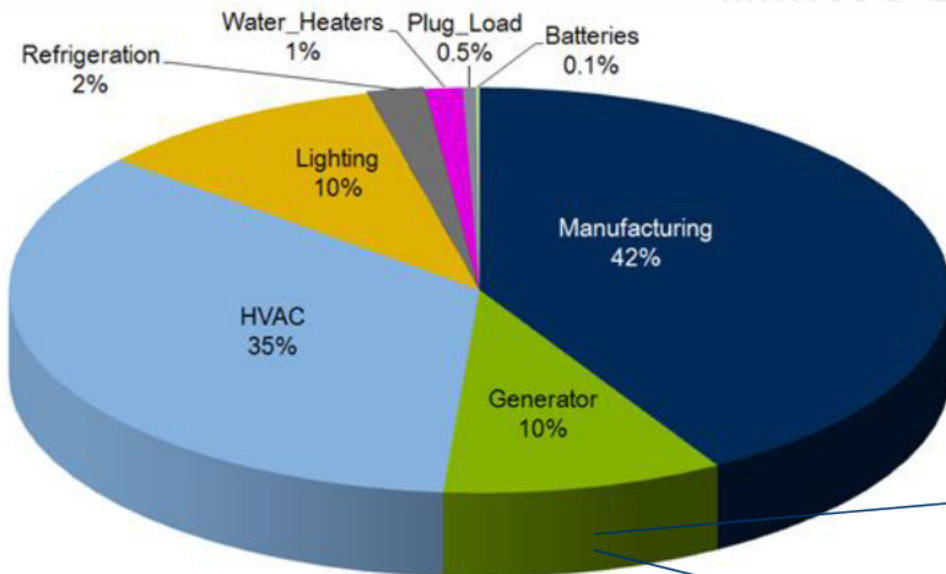
This is a work in progress which will evolve and needs to be approved by FERC





- GenDR
 - New (netCONE) - \$254
 - Existing (netACR) - \$3
- LoadDR
 - New – weighted average offer from last 3 BRAs by LDA.
 - PJM to use Load DR amount from Pre-registrations tied to offers for calculation.
 - Existing – \$0

GenDR breakdown (19/20 registrations) based on CSP reported capability





GenDR breakdown (19/20 registrations) based on CSP reported capability

Count of LOCATION_ID	Column Labels								
Row Labels	Diesel	Gasoline	Natural Gas	None	Oil	Propane	Waste Products	#N/A	Grand Total
Combustion Turbines	11	6	19				5		41
Internal Combustion Engine	1,622	1	339		1	9	4		1,976
Steam Engines and Cogeneration Units	4		38	2			7		51
#N/A								48	48
Grand Total	1,637	7	396	2	1	9	16	48	2,116

2,033 units are Gas or Diesel engines

Sum of MAX_OUTPUT KW	Column Labels								
Row Labels	Diesel	Gasoline	Natural Gas	None	Oil	Propane	Waste Products	#N/A	Grand Total
Combustion Turbines	61,918	3,986	36,895				700		103,498
Internal Combustion Engine	1,585,129	68	142,529		35	302	812		1,728,875
Steam Engines and Cogeneration Units	7,804		49,326	7,000			27,183		91,313
#N/A								-	-
Grand Total	1,654,851	4,054	228,750	7,000	35	302	28,695	-	1,923,687

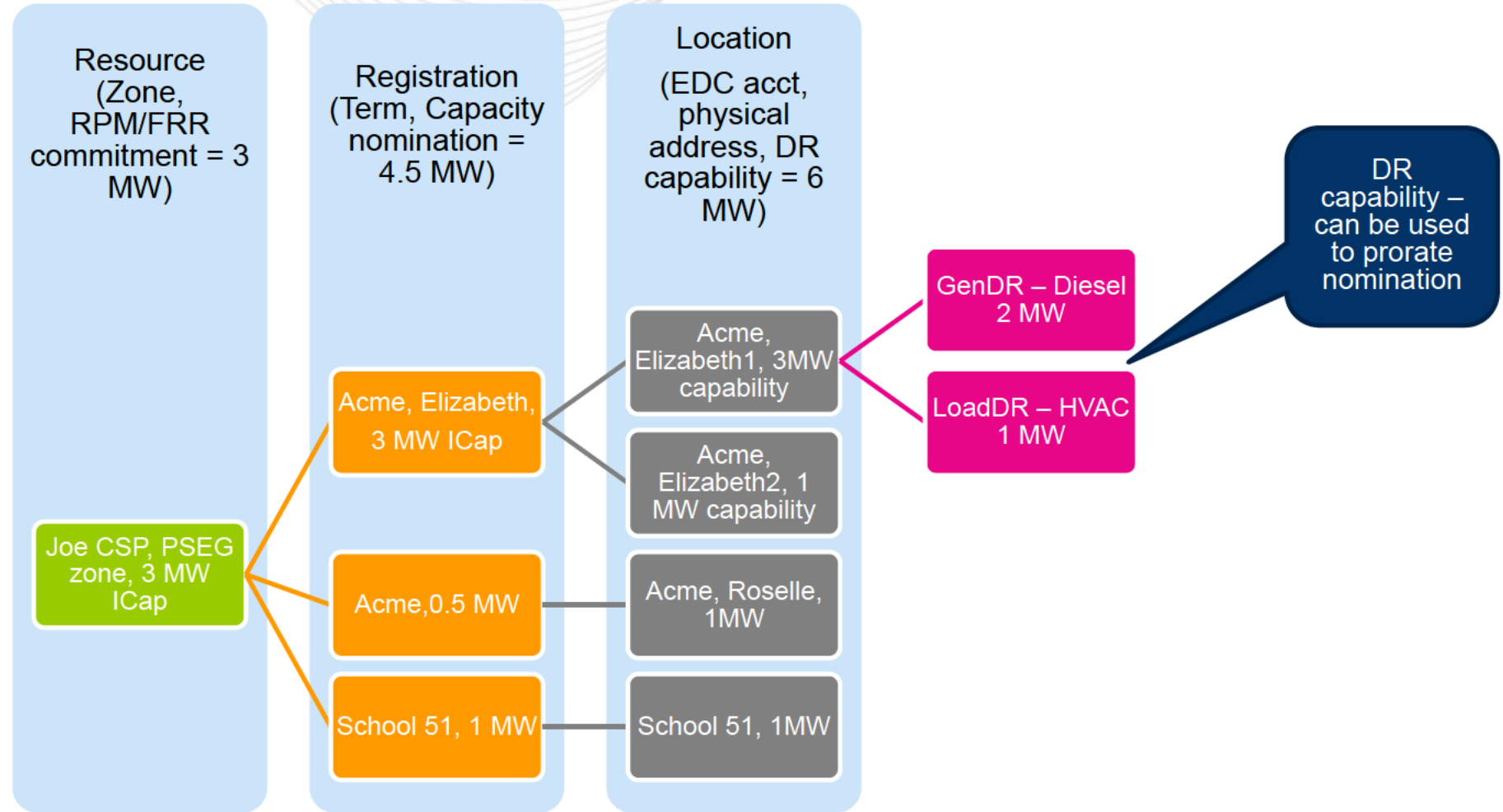
Priorities: 1) RICE – Diesel, 2) RICE – Gas, 3) CT – Gas, 4) Cogen/Steam - Gas

A direct or indirect payment, concession, rebate, subsidy, non-bypassable consumer charge, or other financial benefit that is (1) a result of any action, mandated process, or sponsored process of a state government, a political subdivision or agency of a state, or an electric cooperative formed pursuant to state law, and that (2) is derived from or connected to the procurement of (a) electricity or electric generation capacity sold at wholesale in interstate commerce, or (b) an attribute of the generation process for electricity or electric generation capacity sold at wholesale in interstate commerce, or (3) will support the construction, development, or operation of a new or existing capacity resource, or (4) could have the effect of allowing a resource to clear in any PJM capacity auction.

New slide

- Process under development and discussed at MIC.
- Requests should be submitted through MIRA (see IMM toolpage)
- Please see the following slides for directions
 - <https://www.pjm.com/-/media/committees-groups/committees/mic/2020/20200805/20200805-item-06-mopr-subsidy-guidance.ashx>

Existing Process - Resource => Registration => Location



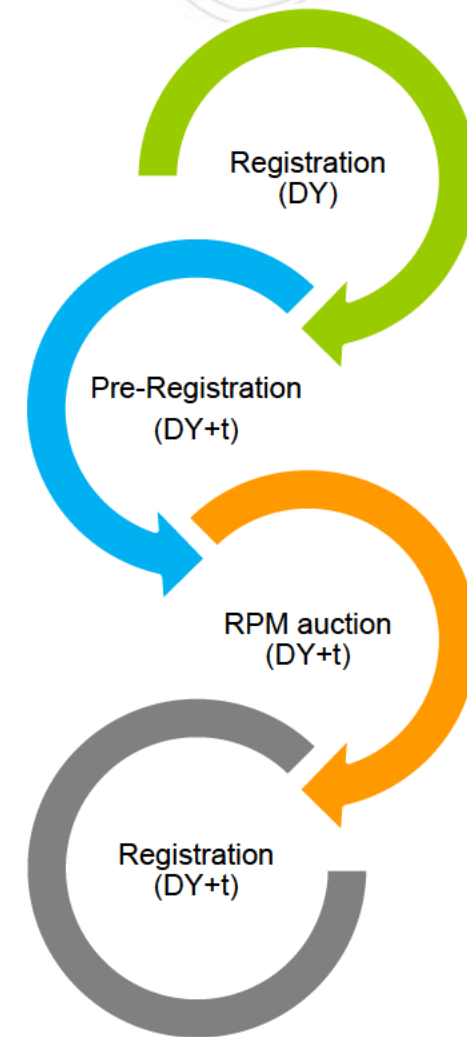
- CSP submits DR plan for “new” and “existing” resources
 - Existing resources criteria (currently registered and expect to be registered for future DY:
 - BRA (may) – Newer CSP (greater of DY and DY+1 MW)
 - 1st IA (sep) – current DY CSP (greater of DY and DY-1 MW)
 - 2nd IA (jul) – current DY CSP (greater of DY and DY-1 MW)
 - 3rd IA (feb)– Newer CSP (newer of DY and DY+1 MW)
 - Planned/New resource – Load reduction capability currently not registered
- CSP offers DR MWs into auction for typically 1 resource for each zone/LDA
 - When we had multiple products, a resource was created for each product
 - CSP would have multiple resources per zone

New slide

- BRA delay for 2 installation periods
 - Eligibility for 2 DYs instead of typical 4 DYs
 - Forecast already incorporated 2 or 4 DY impact
- Resource modelling (work in progress)
 - Expect to model as different resources if they are associated with different MOPR prices
 - Need to work out resource vs resource category details for Capacity Exchange

Updated slide

- CSP allocates registration Nominated capacity to LoadDR and if investment was needed for increase load reduction capability
 - Exempt, new, existing
 - Only 1 Location per Registration
- CSP certifies Subsidy status in Pre-Registration Process
- CSP participates in auction
- CSP links registrations to DR resource based on MOPR/Subsidy status
 - Exempt, new, existing



- **Exempt**

- Maximum nominated Icap for Location* that was registered for one of the following DYs:
 - 14/15 through 19/20, or
 - Location registered before 14/15 will still qualify as exempt if CSP provides PJM with supporting documentation
 - 20/21 to support MWs cleared in BRA/1rstIA/2ndIA, or
 - 21/22 to support MWs cleared in BRA/1rstIA
- For Exempt Locations: Future Nominated ICap > Exempt Nominated ICap is exempt if CSP certifies that no investment was made to increase the load reduction capability in the capacity market.
 - For example - PLC increase, expanded load at facility but same process to reduce, etc.
- *PJM will track by EDC account number, CSP to report any EDC account number changes.
- *Historic registration nominated Icap will be prorated to locations on aggregate registration based on proportion of Location's load reduction capability.
- *Mass market utility programs will be based on maximum number of locations previously registered.

“Existing” for credit will be different than Existing for MOPR

New Slide

- 20/21 to support MWs cleared in BRA/1rstIA/2ndIA
 - PJM will reach out to CSPs that increased their commitment in the 3rd IA
 - CSP required to identify registrations used to support 3rd IA commitment
 - If Location was registered for the first time in 20/21 and used to support 3rd IA commitment then Location is not exempt.
- 21/22 to support MWs cleared in BRA/1rstIA
 - Same process as above but CSP must identify registration used to support 2nd and 3rd IA commitments.
 - CSP may need to do registrations in January – registration timing depends on when the BRA is conducted

New Slide

- Exemption based on maximum number of customers previously registered
- PJM will reach out to CSPs with mass market programs to validate exemption amount & associated EDC account number(s) that will be used in the future

- CSP to notify PJM of EDC account number changes prior to Registration in DR Hub
 - This will allow PJM to transfer MOPR status to new EDC account number with same address (same CSP or across CSPs)
 - Exempt, New, Existing
 - Subsidy
 - Competitive Exemption
- Interim Process – CSP will need to email dsr_ops@pjm.com
 - EDC, zone, old and new EDC account number
 - Reason for account number change
 - Email from EDC that verifies the change

- CSP is required to review and update State Subsidy status during the Pre-Registration process in Capacity Exchange
- CSP is required to notify PJM of any change in status within 5 days (this could get extended to 30? days in final order)
 - CSP should email dsr_ops@pjm.com of any change in status to meet this requirement
 - CSP should formally review status and provide any necessary updates during the DR Hub registration process prior to the DY
 - If there are significant number of changes, PJM will add formal review and sign off to DR Hub in the future.

MOPR status administration (Pre-Registration process for Auctions)

- **New**
 - Location Pre-Registered for DY and was not previously linked (through Pre-Registration process) to RPM cleared resource or “Existing” reclassified as “New” if did not offer in subsequent BRA.
 - Nominated kW in DY > Nominated kW in DY-1 (Exempt + Existing) and CSP made investment to increase load reduction capability to participate in capacity market
 - Only subject to MOPR if there is a subsidy
- **Existing**
 - (Change from new to existing) Location Pre-Registered for DY-1 that did not claim competitive exemption (or clear above netCONE) and linked (through Pre-Registration process) to RPM cleared resource
 - (maintain existing) Existing in DY and Location Pre-registered for DY+1 and associated with offered RPM resource.
 - Once you are existing, you maintain existing status as long as location is offered in the BRA.
 - If location is not offered in DY+1 BRA, the location will revert back to New status (for DY+1 and all future DYs)
 - For example, a resource not offered in the 2023/2024 BRA will lose the Existing status for all MW for the 2023/2024 DY and beyond.
 - » Existing status will be retained in the 2022/2023 1st, 2nd or 3rd Incremental Auctions.
- PJM will make Location status (Exempt, New, Existing) transparent to CSP for Pre-Registration process

- Manage ~120 days before the auction
 - Subsidy – Unit Specific Exemption
- Manage during Pre-Registration process for each auction
 - No Subsidy
 - Subsidy – Competitive Exemption
 - Subsidy
- CSP notifies PJM within 5 days of subsidy effective date
 - Subsidy
- **Banned New/Existing** – if previously designated as No Subsidy (or Competitive Exemption) but then takes the Subsidy for the DY or prior DY. Location is banned through DYx.
- Reference back to tariff definitions
 - Cleared Capacity Resource with State Subsidy: MOPR Status = Existing, Subsidy Status = Subsidy or Subsidy – Competitive Exemption
 - New Entry Capacity Resource: MOPR Status = New, Subsidy Status = Subsidy or Subsidy – Competitive Exemption

5 different statuses

- Competitive exemption allows a location that receives a subsidy to forgo the subsidy and therefore not be subject to MOPR
- Track by Location by kW during Pre-Registration process & compare to prior Pre-Registration status
 - If location elects Competitive exemption (forgo subsidy) OR indicates that location is NOT eligible for subsidy and clears capacity and then subsequently receives a subsidy then:
 - Existing location is not allowed to receive capacity revenue for entire DY
 - Unless it could demonstrate under the Unit-Specific Exemption that it would have cleared in the relevant auction
 - New location kW is banned from market for default asset life (“20 years”)

- New, Ban for 20 years, forfeit revenue (DY1 plus any future DY commitments)
 - Pre-Registered: Location A, New – No subsidy (or Subsidy with Competitive Exemption) – clears in DY1
 - Pre-Registered: Location A – **CSP verifies subsidy received in DY1, (or prior DY)**, Banned for 20 years, forfeit revenue
- Existing, forfeit revenue (DY2)
 - Pre-Registered DY1: Location A, New – No subsidy or clears at netCONE – clears in DY1
 - Pre-Registered DY2: Location A, Existing – No subsidy (Subsidy with Competitive Exemption) – clears in DY2
 - Pre-Registered: Location A, Existing – **CSP verifies subsidy received in DY2**, Forfeit Revenue

Location (no subsidy) switches from New to Existing and back to New because it did not pre-register for BRA.

Registration Process 1					Auction Process							
CSP	Registrations				Linked to cleared resource	Pre-Registrations			MOPR Status	Subsidy Status	Resource Type	Resource Cleared
	Registration	Location	DY	NomMW		Auction	DY	MW				
JoeCo	1	B	22/23	3	Y	BRA	25/26	3	New	NoSub	NonMOPR	Y
SueCo	2	B	23/24	3	Y	BRA	26/27	3	Existing	NoSub	NonMOPR	Y
SueCo	3	B	24/25	3	Y	BRA	27/28	3	Existing	NoSub	NonMOPR	N, but offered
SueCo	4	B	25/26	3	Y	BRA	28/29	3	Existing	NoSub	NonMOPR	N, not offered
SueCo	5	B	27/28	3	Y	BRA	29/30	3	New	NoSub	NonMOPR	Y

Location (subsidy) switches from New to Existing and back to New because it did not pre-register for BRA.

Registration Process 2					Auction Process							
CSP	Registrations				Linked to cleared resource	Pre-Registrations			MOPR Status	Subsidy Status	Resource Type	Resource Cleared
	Registration	Location	DY	NomMW		Auction	DY	MW				
JoeCo	1	B	22/23	3	Y	BRA	25/26	3	New	Sub	NewGen	Y
SueCo	2	B	23/24	3	Y	BRA	26/27	3	Existing	Sub	ExistingGe	Y
SueCo	4	B	24/25	3	Y	BRA	27/28	3	Existing	Sub	ExistingGe	N, but offered
SueCo	5	B	25/26	3	Y	BRA	28/29	3	Existing	Sub	ExistingGe	N, not offered
SueCo	6	B	27/28	3	Y	BRA	29/30	3	New	Sub	NewGen	Y

Location indicates no subsidy or competitive exemption as New but then take subsidy for same DY or prior DY.

Registration Process 3						Auction Process						
CSP	Registrations				Linked to cleared resource	Pre-Registrations			MOPR Status	Subsidy Status	Resource Type	Resource Cleared
	Registration	Location	DY	NomMW		Auction	DY	MW				
JoeCo	1	B	22/23	3	Y	BRA	25/26	3	New	NoSub	NonMOPR	Y
SueCo	2	B	23/24	3	Y	BRA	26/27	3	Bann4Life	Sub: DY-1	MOPR	Y
										Sub: DY		

Location indicates no subsidy or competitive exemption as New, changes to existing but then takes subsidy for same DY or prior DY.

Registration Process 4						Auction Process						
CSP	Registrations				Linked to cleared resource	Pre-Registrations			MOPR Status	Subsidy Status	Resource Type	Resource Cleared
	Registration	Location	DY	NomMW		Auction	DY	MW				
JoeCo	1	B	22/23	3	Y	BRA	25/26	3	New	NoSub	NonMOPR	Y
SueCo	2	B	23/24	3	Y	BRA	26/27	3	Existing	NoSub	NonMOPR	Y
SueCo	3	B	24/25	3	Y	BRA	27/28	3	Forfeit Rev Sub		MOPR	N, but offered

New slide

Capacity

Peak Load Contribution (kW)

Measurement Method

Summer Managed Load (kW)

Capacity Loss Factor

Summer Nominated ICAP (kW)

Summer Only

Number of Participants

Winter Peak Load (kW)

Winter Managed Load (kW)

Winter Weather Adj. Factor

Winter Nominated ICAP (kW)

Resource Type

Product

Lead Time

30 Minute Lead Exception

State Subsidy: Yes, No, Banned, Null

Competitive Exemption: Yes, No, Null

State Subsidy

Competitive Exemption

DRLoad (kW)

Exempt (kW)

Existing (kW)

New (kW)

DRLoad Auction Resource

DRGen (kW)

Exempt (kW)

Existing (kW)

New (kW)

DRGen Auction Resource

- Location is registered and Summer Nominated ICAP is calculated
- DR Hub will check the MOPR Registry to see if the registration has been previously registered and to get the max exemption, state subsidy status and competitive exemption if applicable
- DR Gen and DR Load are distributed by the ratio of generator vs. total load reduction on the location
- CSP can adjust ratio by updating the DR Load KW field
- Other MOPR fields are distributed based on MOPR Registry values



Registration Nominated Kw change in status

New slide

Step	Location	
	DRGen	DRLoad
1 - Calc split, CSP verifies	75%	25%
3 - Calc split, CSP verifies	25%	75%
5 - Calc split, CSP verifies	75%	25%

Step	DY Start	DY End	SuperLocationID	Summer Nominated Icap (Kw)	Uprate Investment	DRGen Exempt kW	DRGen New kW	DRGen Existing kW	DRLoad Exempt kW	DRLoad New kW	DRLoad Existing kW
0 - Historic Max Nomination				500							
2 - Register	6/1/2021	5/31/2022	1111	1000	no	750			250		
4 - Register - Higher amount	6/1/2022	5/31/2023	1111	1500	yes	250	125		750	375	
6 - Register - Existing amount remains but reallocated, exempt for incremental amount	6/1/2023	5/31/2024	1111	2000	no	1125		375	375		125



Registration > Pre-Registration > Resource

Use Case	CSP	Location	GenDR Capability	LoadDR Capability	Reg DY	Status Admin			Summer Nomination								Winter Nomination					Pre-Registration CapExchg		Resource						
						DR Hub Orig	Revised Exempt	Uprate	FSL	NomIcap Summer	Uprate Summer	LoadDR%	LoadDR Total	LoadDR Uprate	GenDR* Total	GenDR* Uprate	WPL	FSL Winter	NomIcap Winter	LoadDR% Winter	LoadDR Total	GenDR* Total	MOPR status	Subsidy Status	NoMOPR	LoadDR New	LoadDR Exist	GenDR New	GenDR Exist	
						Exempt	NomIcap	Status	PLC	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Winter	Winter	Winter	Winter	Winter	Winter	Winter	Winter	Winter	Winter	Winter	Winter	Winter
Exempt, No Sub	Joe CSP	1	25	75	23/24	80	na	na	100	50	50	0	75%	37.5	0	12.5	0	120	50	70	75%	52.5	17.5	Exempt	na	50				
Exempt, Sub	Joe CSP	2	25	75	23/24	80	na	na	100	50	50	0	75%	37.5	0	12.5	0	120	50	70	75%	52.5	17.5	Exempt	na	50				
Exempt, uprate, Invest, NoSub	Joe CSP	3	25	75	23/24	80	Invest	Invest	100	0	100	20	75%	75	15	25	5	120	50	70	75%	52.5	17.5	Exempt	NoSubsidy	100				
Exempt, uprate, no invest, Sub	Joe CSP	4	25	75	23/24	80	100	NoInvest	100	0	100	0	75%	75	0	25	0	120	50	70	75%	52.5	17.5	Exempt	Subsidy	100				
Exempt, uprate, invest, sub	Joe CSP	5	25	75	23/24	80	Invest	Invest	100	0	100	20	75%	75	15	25	5	120	50	50	75%	37.5	12.5	Exempt	Subsidy	80	15		5	
Sub, New	Joe CSP	6	25	75	23/24	0	na	na	100	0	100	0	75%	75	0	25	0	120	50	70	75%	52.5	17.5	New	Subsidy		75		25	
Sub, Exist	Joe CSP	7	25	75	23/24	0	na	na	100	0	100	0	75%	75	0	25	0	120	50	70	75%	52.5	17.5	Existing	Subsidy			75		25

Notes:

GenDR and LoadDR amount default (by season by uprate or non-uprate) is based on Location DR load reduction capability. CSP may override if there is more accurate information

Exempt MW is based on max nominated Icap in past 6 DY and may increase if no investment. Residential locations based on max # of customers in program over prior 6 years

Exempt/Existing NomIcap based on Summer Nom Icap

Subsidy status = Subsidy, No Subsidy, Subsidy-CompetitiveExempt, Subsidy-UnitSpecExempt

MOPR status = Exempt, New, Existing, Banned

An uprate is defined as increased MW beyond the exempt amount when uprate does requires an investment.

Uprate will be based on DY2>DY1 for summer nomination.

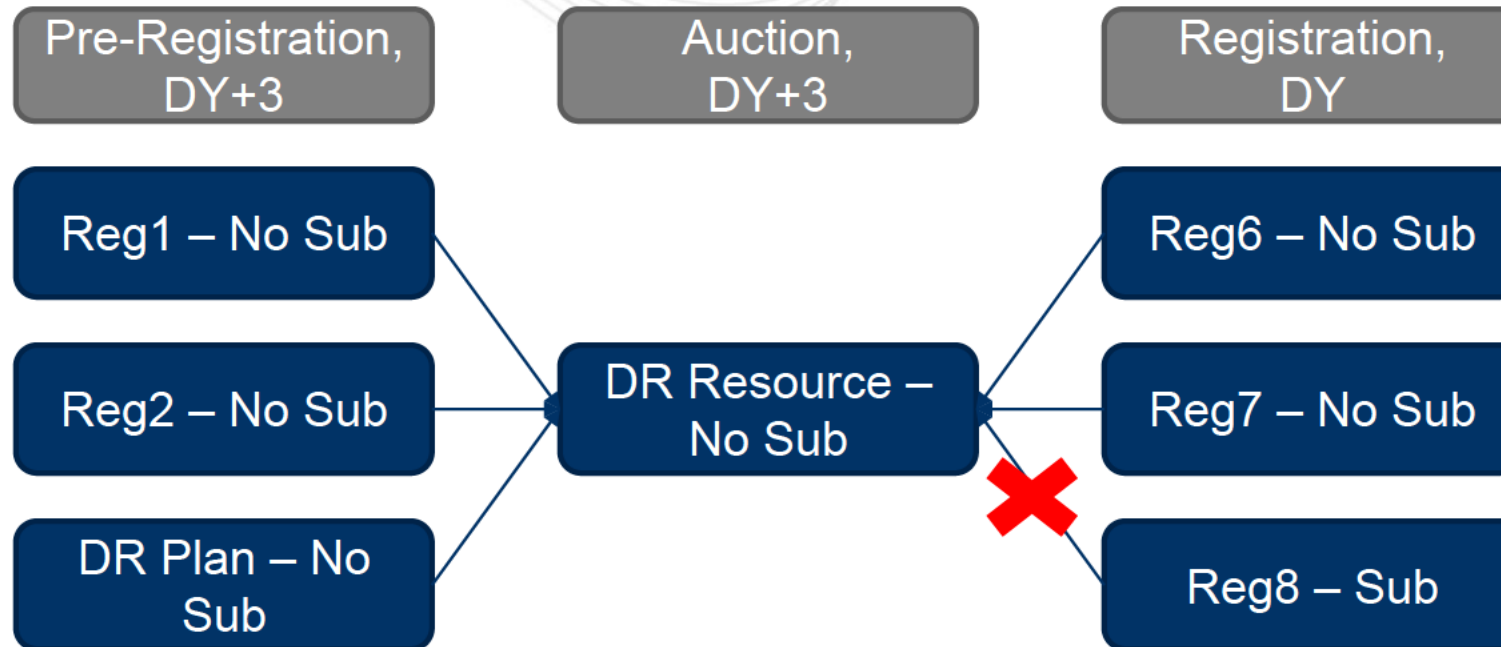
New changes to existing if cleared in auction for prior auction DY (this also include uprate vs non-uprate kw)

Type	Category	RPM Resource
DR – Load and Gen	Exempt	PJM PECO DR
	No Subsidy	
	Competitive Exemption	
DRLoad	State Subsidized-New	PJM PECO DR LOAD SUB
	State Subsidized-Existing	
DRGen	State Subsidized-New	PJM PECO DR GEN SUB
	State Subsidized-Existing	

Plus any unit specific exemptions

Registrations used to fulfill DR resource commitment (simple example)

Updated slide



CSP will be required to accurately link registrations to same resource type
If CSP violates above then location could be banned

Updated
slide

	DR Resource	DR Resource by Category	MOPR Price	GrossCo ne/ACR	Est NetCone/ ACR	Cleared Price	Cleared MW	Registration type that can be linked	Sum of Registration Nominated Icap	Position
	1	LoadDR or GenDR (Exempt + No Sub - New/Exist + Comp Exemption)	none			\$120	100	LoadDR (Exempt + No Sub - New/Exist), GenDR (Exempt + No Sub - New/Exist)	120	20
Subsidized Registrations by Type	2	LoadDR New (Sub)	netCone	\$65	\$65	\$120	4	LoadDR New (Sub)	0	-4
	2	LoadDR Existing(Sub)	netACR	\$0	\$0	\$120	2	LoadDR Existing(Sub)	3	1
	3	GenDR New (sub)	netCONE	\$254	\$254		3	GenDR New (sub)	1	-2
	3	GenDR Existing (sub)	netACR	\$3	\$3	\$120	2	GenDR Existing (sub)	0	-2
	4	GenDR unit specific_Gen123	X	\$254	\$100	\$120	1	GenDR unit specific_Gen123	0	-1

Replacement transaction may be used to cover positions if same PJM organization

- Process
 - <https://www.pjm.com/-/media/committees-groups/subcommittees/drs/2020/20200611/20200611-item-08-mopr-exception-process.ashx>
- System - IMM MIRA
 - <https://www.pjm.com/-/media/committees-groups/subcommittees/drs/2020/20200611/20200611-item-08b-unit-specific-mopr-requests.ashx>

- Commercial
 - Time/MW weighted average MOPR price

Resource	Summer MW	Winter MW	MOPR Price
Solar	30	2	290
Gen Back DR	2	1	254
WF	4	33	0
Total	36	36	\$ 140.43

$$\text{MOPR Price} = \left(\frac{((\text{Solar Summer MW} * \text{MOPR Price}) + (\text{Gen DR Summer MW} * \text{MOPR Price}) + (\text{WF Summer MW} * \text{MOPR Price}))}{\text{Total Summer MW}} * \text{Days in Summer} \right) / \text{Days in DY} + \left(\frac{((\text{Winter Summer MW} * \text{MOPR Price}) + (\text{Gen DR Winter MW} * \text{MOPR Price}) + (\text{WF Winter MW} * \text{MOPR Price}))}{\text{Total Winter MW}} * \text{Days in Winter} \right) / \text{Days in DY}$$

Or $((30 * 290) + (2 * 254) + (4 * 0)) / 36 * 184/365 + ((2 * 290) + (1 * 254) + (33 * 0)) / 36 * 181/365 = \$140.43/\text{MW-Day}$

- Facilitated
 - Annual MOPR price used for Summer or CP DR

- MOPR will be supported in the next DR Hub release
 - Load Management registrations for the 2021/2022 DY will have new fields in the Capacity section to split the Summer Nominated ICAP into the necessary Load and Gen fields
 - A new XSD will be required to create and modify Load Management registrations through Web Services
 - The MOPR fields are needed for the pre-registration window of the 2022/2023 BRA and all subsequent auctions
 - DR Hub will keep track of unique locations by EDC/EDC Account Number/Zone and their maximum exemption, subsidies and competitive exemptions

- MOPR rehearing order impacts

- (No Change) 265 Track MOPR by location not by “resource”.
- (Change) 172, 398 Track MOPR status by Location **by MW**, as needed
 - Uprate MW = Nominated MW in excess of Existing MW (exempt or nonexempt)
 - Subsidized Uprate MW will be subject to MOPR if location made investment to increase the load reduction capability to participate in the PJM capacity market
 - For example, a location invests in new BTMG in order to participate in Capacity Market with additional MWs.
 - PJM intends to only allow 1 location on a registration to be able to administer nominated MW.
- (Change) Existing location that is not Pre-Registered with cleared RPM resource for 1 DY will go back to New status with netCONE price (NOT remain existing)

- (Change) 400 Bilateral transaction impact (discussed at MIC)
- (No change) 259 DR can use Competitive Exemption
- (No change) 187-189, 193 Gen DR – BTMG that is used to reduce load.
 - MOPR price is same as front of the meter generator and does not include avoided cost
 - Avoided cost may be included in unit specific review
- (No change) 266 – DR is not required to contract with all customers prior to offering into the auction.