

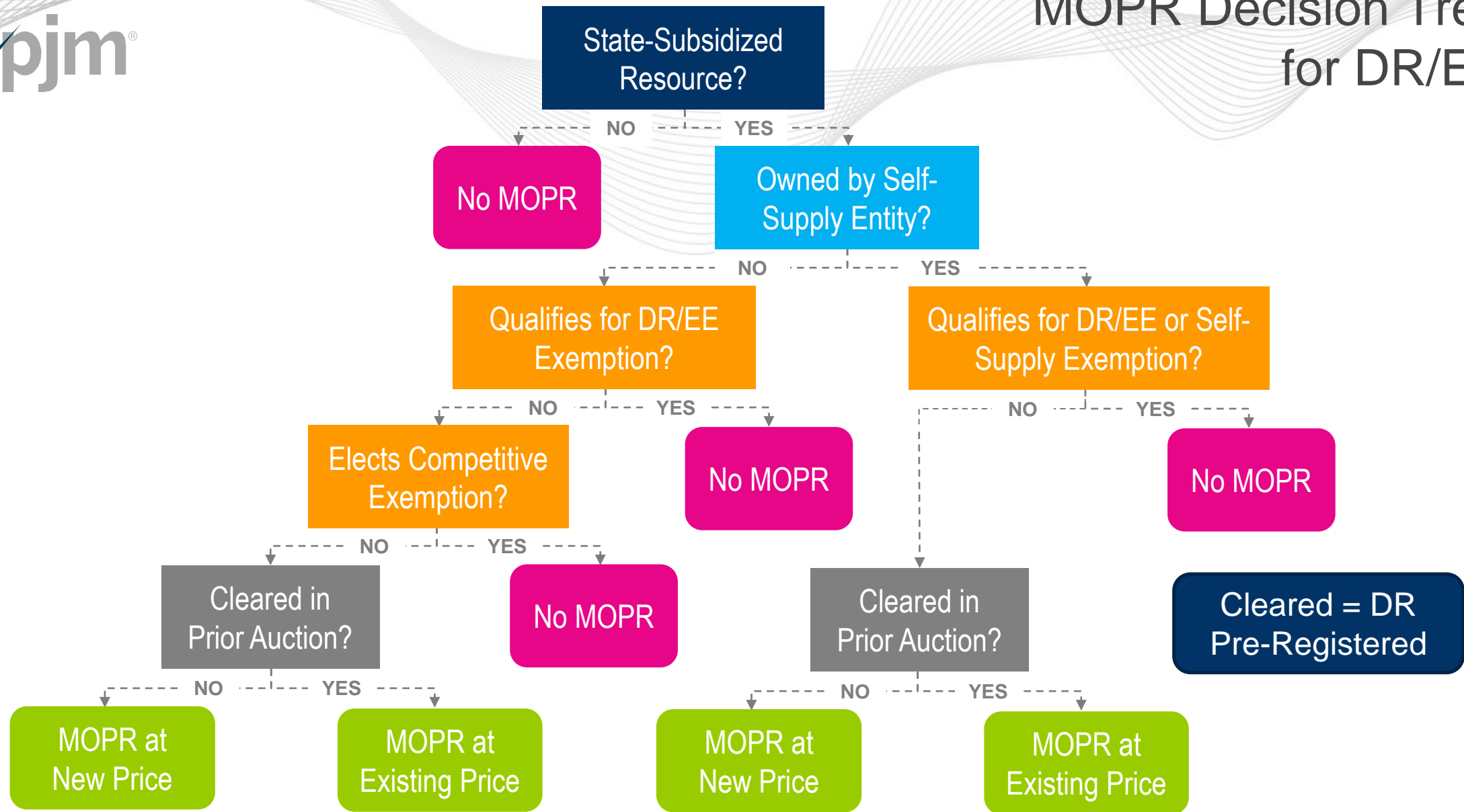
# Potential impact of MOPR order on DR resources (Updated for FERC April Rehearing Order)

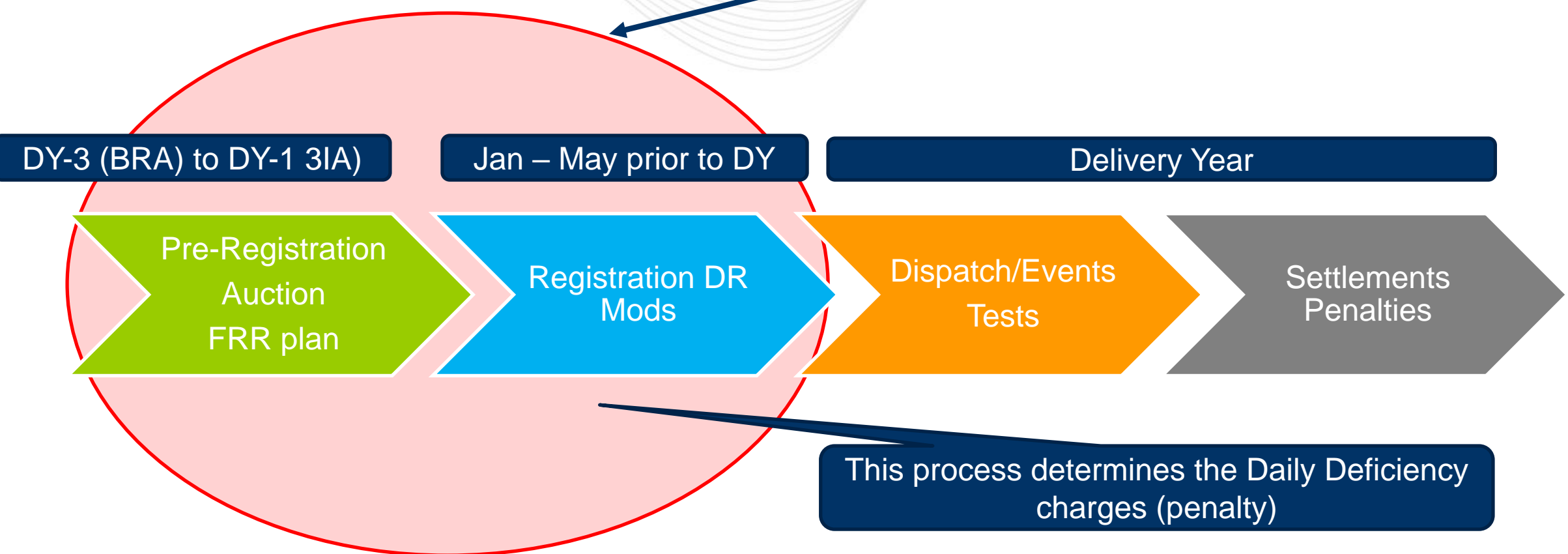
DRS

6/11/2020

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

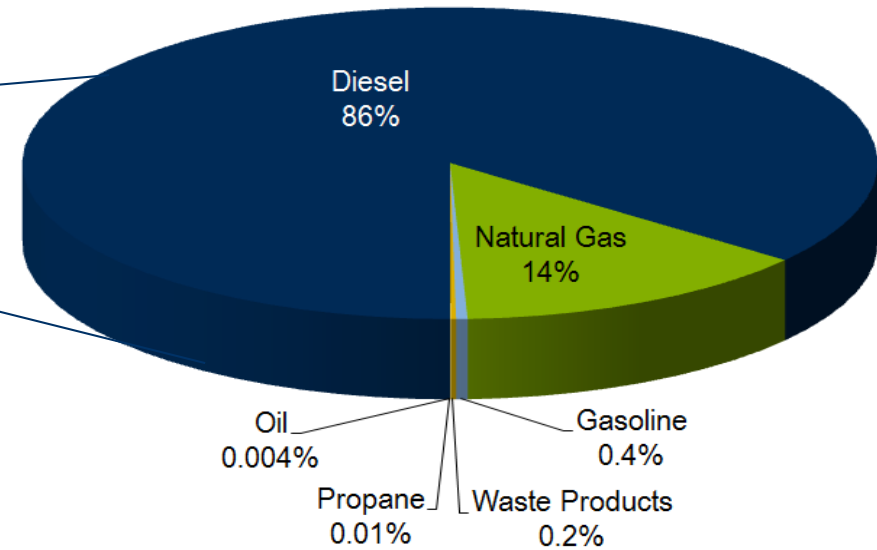
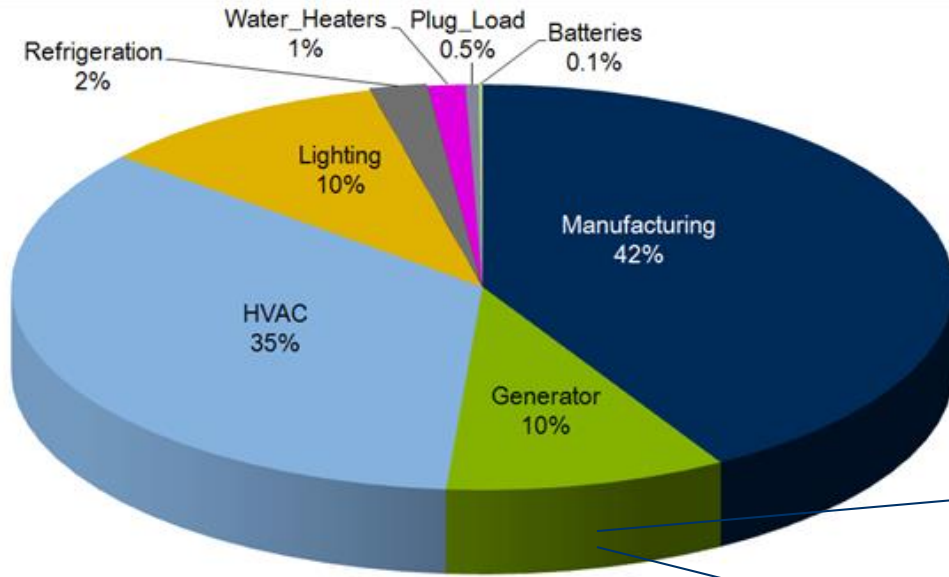
This is a work in progress which will evolve and needs to be approved by FERC





- 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	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
<b>Grand Total</b>		<b>1,637</b>	<b>7</b>	<b>396</b>	<b>2</b>	<b>1</b>	<b>9</b>	<b>16</b>	<b>48</b>	<b>2,116</b>

2,033 units are Gas or Diesel engines

Sum of MAX_OUTPUT KW	Column 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									-	-
<b>Grand Total</b>		<b>1,654,851</b>	<b>4,054</b>	<b>228,750</b>	<b>7,000</b>	<b>35</b>	<b>302</b>	<b>28,695</b>	<b>-</b>	<b>1,923,687</b>

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

- (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)

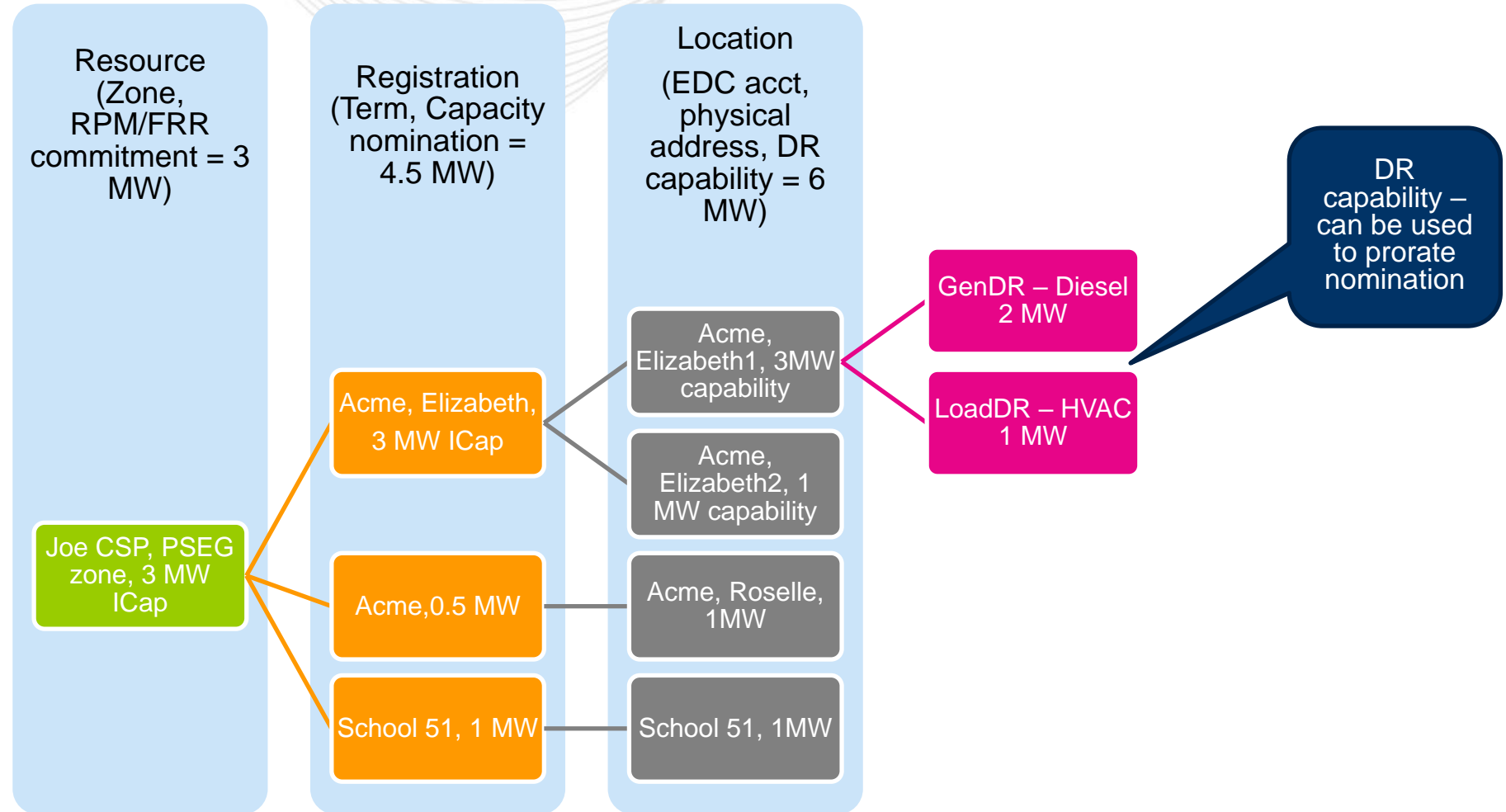


- (Change) 400 Bilateral transaction impact (discussed at MIC)
- (No change) 259 DR can use Competitive Exemption
- (No change) 187-189, 193 Gen DR – BTMG that is used to reduce load.
  - MOPR price is same as front of the meter generator and does not include avoided cost
  - Avoided cost may be included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

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.

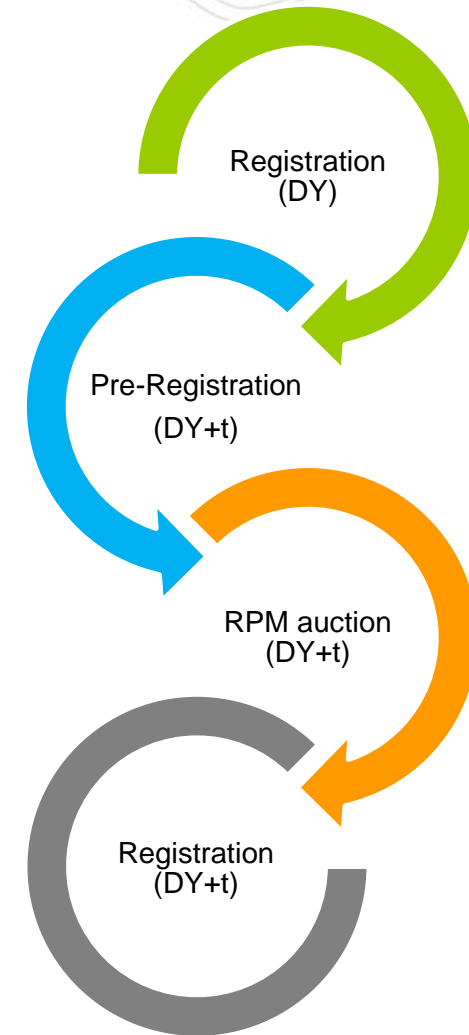
- Process is being developed and should be available in July.

# 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

- CSP allocates registration Nominated capacity to LoadDR
- CSP views MOPR status & verifies Subsidy status
- PJM MOPR status registry
  - EDC Account number changes
  - MOPR rule violation – ban
  - CSP “old” registration exception
- CSP links registrations to DR resource based on MOPR/Subsidy status

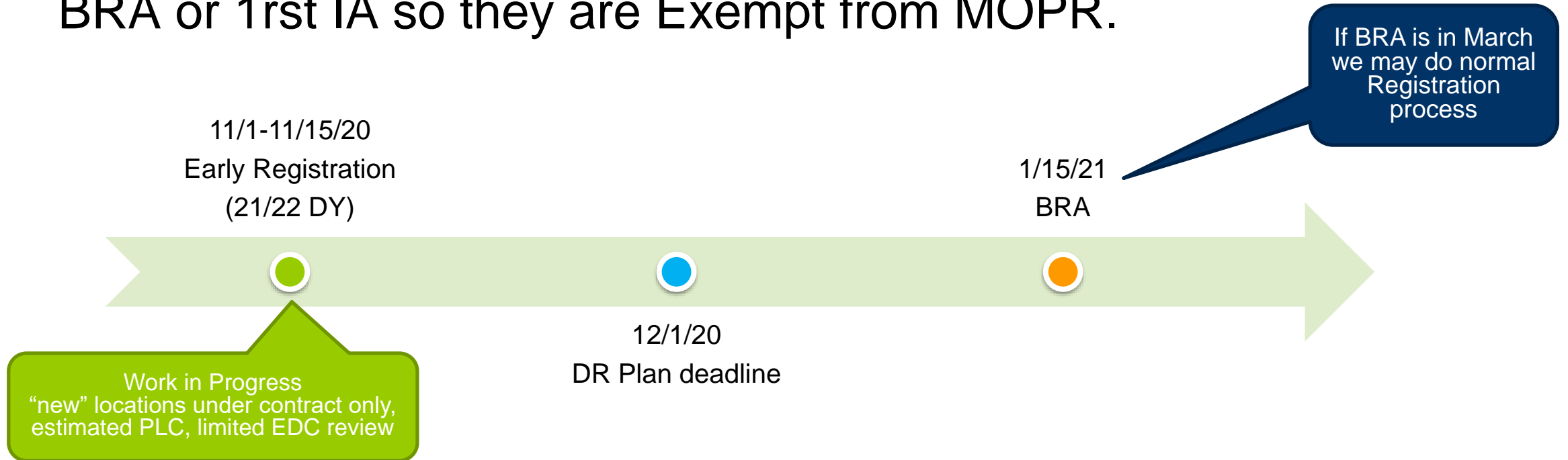


- **Exempt**

- 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
    - PJM may need to develop an interim process to allow CSPs to register early for 21/22 depending on timing of BRA.
- 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.
- \*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

- PJM may need to implement an early registration process so CSPs can identify Locations (**never previously registered by any CSP**) used to support '21/22 Capacity commitments from the BRA or 1rst IA so they are Exempt from MOPR.





# 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 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.
  - For Existing Locations: Future Nominated ICap > Existing Nominated ICap is Existing if CSP certifies that no investment was made to increase the load reduction capability in the capacity market.
- 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
- 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		MW	MOPR Status	Subsidy Status	Resource Type	Resource Cleared
	Registration	Location	DY	NomMW		Auction	DY					
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		MW	MOPR Status	Subsidy Status	Resource Type	Resource Cleared
	Registration	Location	DY	NomMW		Auction	DY					
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	ExistingGen	Y
SueCo	4	B	24/25	3	Y	BRA	27/28	3	Existing	Sub	ExistingGen	N, but offered
SueCo	5	B	25/26	3	Y	BRA	28/29	3	Existing	Sub	ExistingGen	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

# GenDR vs LoadDR – CSP to allocate on registration (expect only 1 location per registration)

Capacity

Peak Load Contribution (kW)

Measurement Method

Summer Managed Load (kW)

Capacity Loss Factor

Summer Nominated ICAP (kW)

Summer Only

Winter Peak Load (kW)

Winter Managed Load (kW)

Winter Weather Adj. Factor

Winter Nominated ICAP (kW)

Resource Type

Product

RPM DR Resource

Lead Time

		LoadDR %	GenDR%	LoadDR kW	GenDR kW
Summer kW	2,757	75%	25%	2,068	689
Winter kW	365	75%	25%	274	91

- PJM to provide registration default allocation based on CSP reported GenDR vs LoadDR location load reduction method %.
- CSP can adjust default allocation to improve accuracy, as needed
- Allocation will be used for MOPR amount and LoadDR MOPR price calculation



new slide

# 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 Exempt	Revised Exempt	Uprate Status	PLC	FSL Summer	NomIcap Summer	Uprate NomIcap Summer	LoadDR% Total	LoadDR Uprate	GenDR* Total	GenDR* Uprate	WPL	FSL Winter	NomIcap Winter	LoadDR% Total	LoadDR Total	GenDR* Total	MOPR status	Subsidy Status	NoMOPR	LoadDR New	LoadDR Exist	GenDR New	GenDR Exist	
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 NoInve	NoInve	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

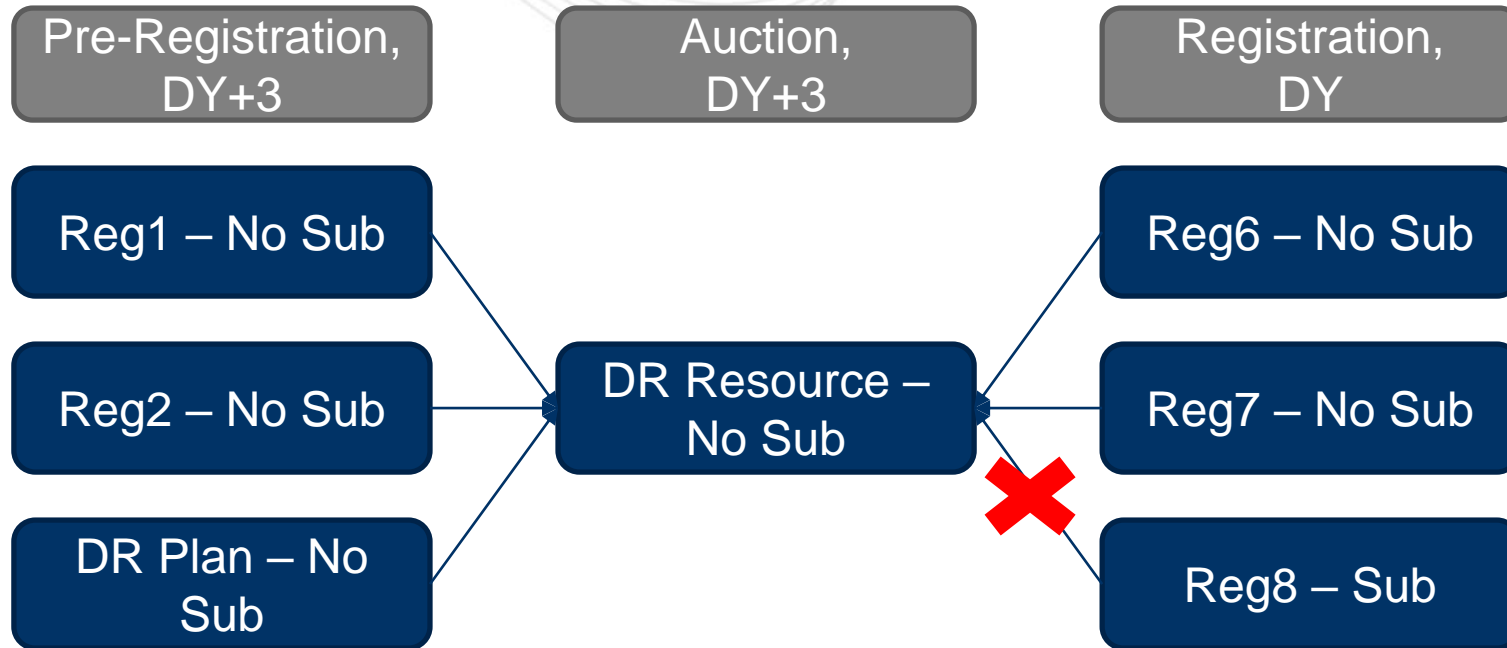
An uprate is defined as increased MW beyond the exempt amount when uprate does requires an investment.

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)



# Registrations used to fulfill DR resource commitment (simple example)



# Registration to DR Resource rules (work in progress)

	DR Resource	DR Resource Type	MOPR Price	GrossCone/ACR	Est NetCone/ACR	Cleared Price	Cleared MW	Registration type that can be linked	Sum of Registration Nominated Icap	Position
	1	LoadDR (Exempt + No Sub - New/Exist), GenDR (Exempt + No Sub - New/Exist)	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
	3	LoadDR Existing(Sub)	netACR	\$0	\$0	\$120	2	LoadDR Existing(Sub)	3	1
	4	GenDR New (sub)	netCONE	\$254	\$254		3	GenDR New (sub)	1	-2
	5	GenDR Existing (sub)	netACR	\$3	\$3	\$120	2	GenDR Existing (sub)	0	-2
	6	GenDR unit specific_Gen123	X		\$254	\$100	\$120	1	GenDR unit specific_Gen123	0

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

- see separate slide deck

- 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
<b>Total</b>	<b>36</b>	<b>36</b>	<b>\$ 140.43</b>

$$\text{MOPR Price} = \left( \frac{((\text{Solar Summer MW} * \text{MOPR Price}) + (\text{Gen DR Summer MW} * \text{MOPR Price}) + (\text{WF Summer MW} * \text{MOPR Price}))}{\text{Total Summer MW}} * \text{Days in Summer} / \text{Days in DY} + \frac{((\text{Winter Summer MW} * \text{MOPR Price}) + (\text{Gen DR Winter MW} * \text{MOPR Price}) + (\text{WF Winter MW} * \text{MOPR Price}))}{\text{Total Winter MW}} * \text{Days in Winter} / \text{Days in DY} \right) \text{ Or } \left( \frac{((30 * 290) + (2 * 254) + (4 * 0))}{36} * \frac{184}{365} + \frac{((2 * 290) + (1 * 254) + (33 * 0))}{36} * \frac{181}{365} \right) = \$140.43/\text{MW-Day}$$

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