

## DER and Inverter-based Resources Subcommittee

WebEx Only

May 19, 2021

9:00 a.m. – 4:00 p.m. ET

### Administration (9:00 – 9:05)

1. Scott Baker, PJM, opened the meeting and reviewed the agenda.
2. Hamad Ahmed, PJM, reviewed the meeting participation guidelines. The minutes from the last DIRS meeting were approved with 0 objections and 0 abstentions.

### Order 2222 – EDC Coordination Workshop (9:05 – 11:00)

3. Distribution utility representatives provided feedback on the PJM straw proposal.
  - a. Chris Wehr, First Energy, and several stakeholders discussed several topics within PJM's straw proposal such as min/max size requirements, Metering, Settlements, double counting, EDC definition, Registration/utility review and Operations coordination.
  - b. Wanda Reder, PPL, discussed Operations coordination within the PJM straw proposal.
  - c. Michelle Farhat, PJM, discussed points on operational model intricacies while reviewing flowchart for base and alternative Operations coordination.
4. Stakeholders will work offline with PJM facilitation team to finalize topics for June 11<sup>th</sup> EDC coordination workshop.

### Order 2222 – Straw Proposal (11:15 – 2:00)

5. Stakeholders provided feedback on PJM proposal.
  - a. Bruce Campbell, CPower and on behalf of the Advanced Energy Management Alliance, discussed AEMA's comments on PJM's initial DER strawman. Bruce discussed recommendations on issues not addressed by PJM on several topics such as PJM planning requirements, opt-in, location and Operations, weighting factors, Telemetry, Operational needs, Market participation model, min/max size, metering and use cases.
  - b. Catherine Tyler, IMM, presented feedback on the straw proposal. Catherine discussed numerous guiding principles, concerns around nodal DERs and registration process. Catherine provided IMM's feedback on several topics such as Energy Market cost based offers for DERS, participation model, min/max size requirements, DRs in DERA and double counting.
6. Scott Baker lead a discussion on draft use cases that will be used to provide additional details about the DERA market participation model using more specific examples. Scott presented four use cases and associated key points. Stakeholders were asked to consider these use cases and provide

additional comments to PJM staff offline. Additional use case discussion will continue at the June 28<sup>th</sup> meeting.


## Solar-Battery Hybrid Resources (2:00 – 3:55)

7. Andrew Levitt, PJM, presented PJM staff’s position on solar-battery hybrids offering synchronized reserves, and reviewed the PJM proposal in the solutions matrix.
  - a. Andrew reviewed PJM’s package regarding Reserves and made modifications to PJM’s package for Modeling Energy/Ancillary Services and Resource Classification Process. Andrew stated that PJM will make the rest of the changes offline.
8. Jim Davis and Bill Coyle, Dominion, discussed a new solution option under design components 5 – Regulation.
  - a. Jim and Bill presented Dominion Energy’s new design component for Regulation and reviewed example of solar irradiance running counter to regulation signal. Dominion indicated they may add an additional solution package that includes this solution option.
9. Sharon Thomas provided feedback on the proposals on behalf of the Energy Storage Association.
  - a. Sharon provided strong support on definitions and Capacity Market must-offer, preferences on reserve design component, concerns regarding resources classification process and Modeling Energy/Ancillary Services and clarifications on open-loop and closed-loop hybrids.
10. Stakeholders discussed decision-making in order to recommend a proposal up to the Markets Implementation Committee (and the Operating Committee) for a first read.
  - a. Scott Baker proposed a tentative timeline for reviewing final proposals at the June DIRS, and if feasible, recommending them to the MIC and OC in July. If not feasible, the proposal(s) will be taken to the MIC and OC in August for a first read.

## Action items and next meeting agenda (3:55 – 4:00)

11. The facilitation team reviewed action items from the meeting and took requests for future agenda items.

### [Issue Tracking: Solar-Battery Hybrid Resources](#)

<i>Future Meeting Dates and Materials</i>			Materials Due to Secretary 	Materials Published
<i>Date</i>	<i>Time</i>	<i>Location</i>	<b>5 p.m.</b>	<b>4 p.m.</b>
<i>May 19, 2021</i>	9:00 – 4:00	WebEx	<b>May 11, 2021</b>	<b>May 14, 2021</b>
<i>June 11, 2021–EDC Coordination workshop</i>	10:00 – 12:00	WebEx	<b>June 3, 2021</b>	<b>June 8, 2021</b>
<i>June 28, 2021</i>	9:00 – 4:00	WebEx	<b>June 18, 2021</b>	<b>June 23, 2021</b>
<i>July 15, 2021–EDC Coordination workshop</i>	2:00 – 4:00	WebEx	<b>July 7, 2021</b>	<b>July 12, 2021</b>

<i>July 23, 2021</i>	9:00 - 4:00	WebEx	<b>July 15, 2021</b>	<b>July 20, 2021</b>
<i>August 10, 2021–EDC Coordination workshop</i>	3:00 – 5:00	WebEx	<b>August 2, 2021</b>	<b>August 5, 2021</b>
<i>August 16, 2021</i>	9:00 – 12:00	WebEx	<b>August 6, 2021</b>	<b>August 11, 2021</b>
<i>September 14, 2021</i>	9:00 – 12:00	WebEx	<b>September 3, 2021</b>	<b>September 9, 2021</b>
<i>September 21, 2021–EDC Coordination workshop</i>	3:00 – 5:00	WebEx	<b>September 13, 2021</b>	<b>September 16, 2021</b>
<i>October 22, 2021</i>	9:00 – 4:00	WebEx	<b>October 14, 2021</b>	<b>October 19, 2021</b>
<i>November 9, 2021-EDC Coordination workshop</i>	3:00 – 5:00	WebEx	<b>November 1, 2021</b>	<b>November 4, 2021</b>
<i>November 22, 2021</i>	9:00 – 3:00	WebEx	<b>November 12, 2021</b>	<b>November 17, 2021</b>
<i>December 9, 2021-EDC Coordination workshop</i>	3:00 – 5:00	WebEx	<b>December 1, 2021</b>	<b>December 6, 2021</b>
<i>December 21, 2021</i>	9:00 – 4:00	WebEx	<b>December 13, 2021</b>	<b>December 16, 2021</b>

Author: Hamad Ahmed

## WebEx Meeting Attendance

Name	Company Name	Sector
		Transmission Owner
Aguilera, Jorge	Duke Energy Ohio, Inc. (EDC)	
Ahmed, Hamad	PJM Interconnection	None
Ainspan, Malcolm	NRG Curtailment Solutions, Inc.	Other Supplier
		Transmission Owner
Allen, William	Commonwealth Edison Company	
Anders, David	PJM Interconnection	None
		Transmission Owner
Arnold, Katelyn	PPL Electric Utilities Corp. dba PPL Utilities (LSE)	
		Transmission Owner
Arsalan, Qamar	Public Service Electric & Gas Company	
Baker, Jeff	PJM Connect	
		Transmission Owner
Beam, George	PPL Elec Utilities Corp dba PPL Utilities (PPL POLR Small C&I)	
Beban, Madalyn	PJM Interconnection	None
Benchek, Jim	FirstEnergy Corporation	
Bennett, Stephen	PJM Interconnection	None
Bernabeu, Emanuel	PJM	
Berner, Aaron	PJM Interconnection	None
		Transmission Owner
Berton, Tyler	AEP Appalachian Transmission Company, Inc.	
		Transmission Owner
Bhana, Rajesh	Exelon Business Services Company, LLC	
Bielak, Donnie	PJM Interconnection	None

Borkoski, John	MD Public Service Commission	
Bowring, Joe	Monitoring Analytics	
Boyle, Glen	PJM Interconnection	None
Breidenbaugh, Aaron	Rodan Energy Solutions (USA) Inc.	Other Supplier
Brodbeck, John	EDP Renewables North America LLC	Generation Owner
Brooks, Richard	Reliable Energy Analytics LLC	
Bruno, Patrick	PJM Interconnection	None
Bryson, Michael	PJM Internal	
Buhler, Thomas	PJM Connect	
Burnham, Kat	Advanced Energy Economy (AEE)	
Burns, Kevin	Open Access Technology International, Inc.	None
Butler, Michelle	Guidehouse	
Callen, Zachary	Illinois Commerce Commission	Other Supplier
Campbell, Bruce	Enerwise Global Technologies, LLC	Transmission Owner
Canter, David	Appalachian Power Company (AEP Generation)	
Caspary, Jay	Electric Power Engineers, Inc.	Other Supplier
Chakragiri, Mohan	ENGIE Energy Marketing NA, Inc. (Bluestone)	
Cham, Edrissa	Savion, LLC	Other Supplier
Chang, Sean	Shell Energy North America (US), L.P.	
Chee, Yee Hong	MCG Energy Solutions	
Chen, Hong	PJM Interconnection	None
Chen, Yang	PJM Interconnection	None
Chilukuri, Kalyan	Power System Consultants	
Christopher, Mahila	Public Utilities Commission of Ohio	
Chu, George	PJM Interconnection	Transmission Owner
Circelli, Roseanne	Public Service Electric & Gas Company	Transmission Owner
Collette, Lucas	Duquesne Light Company	
Comeau, Jeremy	IN Utility Regulatory Commission	Transmission Owner
Connelly, Nancy	Duke Energy Ohio, Inc.	Transmission Owner
Coyle, Billy	Dominion Virginia Power	
Croop, Danielle	PJM Interconnection	None
Currier ES, Jeff	Dominion Virginia Power	Transmission Owner

		Electric Distributor
Dailey, Michael	Northern Virginia Electric Cooperative (NOVEC)	
		Transmission Owner
D'Alessandris, Louis	American Transmission Systems, Inc.	
Davis, Elizabeth	PJM Interconnection	None
		Generation Owner
Davis, James	Dominion Energy Generation Marketing, Inc.	
Delaney, Liz	Borrego Solar	
DeLosa, Joseph	New Jersey Board of Public Utilities	
DeVita, Thomas	PJM Interconnection	None
Dibert, Meredith	Pennsylvania Department of Environmental Protection	
DiNicola, Laura	firstenergy	
		Transmission Owner
Diong, Mamadou	Dominion Virginia Power	
Dixon, Chad	Customized Energy Solutions, Ltd.	None
		Transmission Owner
Domian, Christin	Duquesne Light Company	
Drom, Rick	Rick Drom	
Dropkin, Ilyana	PJM Interconnection	None
		Transmission Owner
Dugan, Chuck	East Kentucky Power Cooperative, Inc.	
Dumitriu, Nicolae	PJM Interconnection	None
EJEBE, GABRIEL	Open Access Technology International, Inc.	None
		Transmission Owner
Elkins, Rachel	American Transmission Systems, Inc.	
		Transmission Owner
Ellis, David	Public Service Electric & Gas Company	
Ericson, Christine	Illinois Commerce Commission	
fan, zhenyu	PJM Interconnection	None
Feldman, Brett	Other	
		Transmission Owner
Felt, Justin	Baltimore Gas and Electric Company (Residential)	
Filomena, Guy	Customized Energy Solutions, Ltd.	None
Fink, Regan	Pine Gate Renewables	
Fitzpatrick, Brian	PJM Interconnection	None
Fleisher, Madeline	Dickinson Wright PLLC	
		Other Supplier
Foladare, Kenneth	Geenex Solar LLC	
Foley, Sheila	PJM Interconnection	None
		Electric Distributor
Ford, Adrien	Old Dominion Electric Cooperative	

		Transmission Owner
Foster Cronin, Denise	East Kentucky Power Cooperative, Inc.	
Frogg, Darrell	PJM Interconnection	None
		Generation Owner
Fuess, Christian	PBF Power Marketing, LLC	
Gahimer, Michael	Indiana Office of Utility Consumer Counselor (IN OUCC)	
		Transmission Owner
Garnett, Bryan	Duke Energy Ohio, Inc.	
		Transmission Owner
Gates, Terry	Appalachian Power Company (AEP Generation)	
Genuario, Gabrielle	PJM Interconnection	None
		Other Supplier
Gilani, Rehan	ConEdison Energy, Inc.	
Glatz, Suzanne	PJM Interconnection	None
Glazer, Craig	PJM Interconnection	None
		Electric Distributor
Gouin, Marlena	Pennsylvania Electric Company	
		Transmission Owner
Granstrand, Luke	Dominion Virginia Power	
Greening, Michele	PJM Interconnection	None
		Other Supplier
Greiner, Gary	PSEG Energy Resources and Trade LLC	
		End-Use Customer
Guntle, Vince	American PowerNet Management, L.P.	
Hanser, Erik	Michigan Public Service Commission	
		Transmission Owner
Hartman, Gary	PPL Electric Utilities Corp. dba PPL Utilities (LSE)	
Hasan, Prusha	Advanced Energy Economy	
Hauske, Thomas	PJM Interconnection	None
Heinle, Frederick	Office of the Peoples Counsel	
		Transmission Owner
Heitmeyer, Chad	Appalachian Power Company (AEPSCO)	
Herel, Suzanne	PJM Interconnection	None
Hilderbrand, Rebecca	PJM Interconnection	None
		Generation Owner
Hoatson, Tom	West Deptford Energy, LLC	
		Generation Owner
Hohenshilt, Jennifer	Talen Energy Marketing, LLC	
		Electric Distributor
Holdbrook, Ruth	Northern Virginia Electric Cooperative (NOVEC)	
Horning, Lynn Marie	Customized Energy Solutions, Ltd.	None
		Transmission Owner
Horstmann, John	Dayton Power & Light Company (The)	

Hull, Gerit	American Municipal Power, Inc.	Electric Distributor
Hunter, Benjamin	BSHunter	
Hyzinski, Tom	gtpghyzinsk	
Iler, Arthur	Indiana Office of Utility Consumer Counselor	
Janicki, Diane	Boston Energy Trading and Marketing LLC	Other Supplier
Jardot, Gina	NRG Curtailment Solutions, Inc.	Other Supplier
Jett, William	Duke Energy Business Services LLC	Transmission Owner
Jewell ES, Kelsi	Dominion Virginia Power	Transmission Owner
Jha, Monica	PCI	Transmission Owner
Johnson, Augustus	Dominion Virginia Power (EDC)	Transmission Owner
Johnson, Bethany	PPL Electric Utilities Corp. dba PPL Utilities (TO)	Transmission Owner
Johnson, Carl	Customized Energy Solutions, Ltd.	None
Johnson, Nathaniel	Appalachian Power Company (AEP Generation)	Transmission Owner
Johnston, David	Other	Other Supplier
Kauffman, Brian	Enel X North America, Inc.	Other Supplier
Kayne, Samuel	Delaware PSC	Other Supplier
Kelly, Stephen	Brookfield Renewable Trading and Marketing LP (BSMH)	Other Supplier
Kennedy, Thomas	Commonwealth Edison Company	Generation Owner
Kilgallen, Kevin	Avangrid Renewables, LLC	
Knodel, Brook	Iowa Utilities Board	Transmission Owner
Koehler, Nicolas	Appalachian Power Company (AEP Transmission)	Other Supplier
Kogut, George	New York Power Authority	None
Kovler, Ed	PJM Interconnection	None
Kozhuharov, Dimitar	State Commissions	
Lee, Lori Murphy	PJM Interconnection	None
Lee, Thomas	Enerwise Global Technologies, LLC	Other Supplier
Legates, Katherine	Appalachian Power Company (AEP Generation)	Transmission Owner
Levitt, Benjamin	IHS Markit	
Lieberman, Steven	American Municipal Power, Inc.	Electric Distributor

Long, Glenn	PJM Interconnection	None
Lopez-Lopez, Anthony	Hill Top Energy Center, LLC	Generation Owner
Lousos, Alexandros	AMP Transmission, LLC	Transmission Owner
LOWE, CONNIE	Dominion Virginia Power	Transmission Owner
Lyakhovich, Leonid	Public Service Electric & Gas Company	Transmission Owner
Mabry, David	McNees Wallace & Nurick LLC	
Marcino, Angelo	PJM Interconnection	None
Mariam, Yohannes	Office of the People's Counsel for the District of Columbia	
martin, Valerie	Federal Energy Regulatory Commission	
mason, julie	Duke Energy Ohio, Inc.	Transmission Owner
MASON, Ray	Other	
McCormick, Katharine	Illinois Commerce Commission	
McInerney, Timothy	Commonwealth Edison Company	Transmission Owner
meridionale, Kevin	Jersey Central Power & Light Company	Transmission Owner
Midgley, Sharon	Exelon Business Services Company, LLC	Transmission Owner
Nester, Mike	Dominion Virginia Power (EDC)	Transmission Owner
Newman, Jonathan	AES Energy Storage, LLC	Generation Owner
Nix, Emma	Jersey Green Energy LLC	Other Supplier
Norton, Chris	American Municipal Power, Inc.	Electric Distributor
Ondayko, Brock	AEP Energy Partners, Inc. (AEP Gen Resources)	Transmission Owner
Parker, Amanda	Pennsylvania Electric Company	Electric Distributor
Parkison, Sara	University of Delaware	
Peoples, John	Duquesne Light Company	Transmission Owner
Phillips, Darlene	PJM Interconnection	
Pilong, Christopher	PJM Interconnection	None
Pilong, Melissa	PJM Interconnection	None
Polka, Joseph	Duquesne Light Company	
Pratt, Nicholas	PPL Electric Utilities Corp. dba PPL Utilities (TO)	Transmission Owner



Price, Ruth	Delaware Division of the Public Advocate	
		Electric Distributor
Proconiar, Jason	Buckeye Power, Inc.	
		Transmission Owner
Purdie, Michael	Dominion Virginia Power	
		Transmission Owner
Quier, David	PPL Electric Utilities Corp. dba PPL Utilities (TO)	
Rahimi, Farrokh	Open Access Technology International, Inc.	None
Rahmes, Lawrence	Electric Power Engineers	
Reagan, Ryann	New Jersey Board of Public Utilities	
Reder, Wanda	PPL	
REILLY, Jim	Reilly Associates	
Robinson, Becky	vistra energy	
Rodriguez, Tomas	Organization of PJM States, Inc.	
		Electric Distributor
Rohrbach, John	Wabash Valley Power Association, Inc.	
		Transmission Owner
Rooney, Alexa	PPL Electric Utilities Corp. dba PPL Utilities (TO)	
		Transmission Owner
Rosenblatt, Alex	Duquesne Light Company	
		Transmission Owner
Rouland, James	PPL Electric Utilities Corp. dba PPL Utilities (LSE)	
		Transmission Owner
Rumsey, Amanda	PPL Electric Utilities Corp. dba PPL Utilities (TO)	
		Transmission Owner
Rutigliano, Tom	Natural Resources Defense Council	
		Transmission Owner
Sailers, Bruce	Duke Energy Ohio, Inc. (EDC)	
Sarkel, Edward	New Jersey Board Of Public Utilities	
Sasser, Jonathan	Customized Energy Solutions, Ltd.	None
		Generation Owner
Scarpignato, David	Calpine Energy Services, L.P.	
		Other Supplier
Schisler, Kenneth	Enerwise Global Technologies, LLC	
Schuyler, Ken	PJM Interconnection	None
Schweizer, David	PJM Interconnection	
		Transmission Owner
Segner, Sharon	Silver Run Electric, LLC	
		Transmission Owner
Seireg, Bahaa	Rockland Electric Company	
		Transmission Owner
Sharkazy III, William	PPL Electric Utilities Corp. dba PPL Utilities (LSE)	
		Transmission Owner
Shearer, Evan	Duke Energy Business Services LLC	

Skumanich, Bill	RTR Energy Solutions LLC	None
		Transmission Owner
Smith, Mark	AEP Energy Partners, Inc. (AEP Retail)	
		Transmission Owner
Sorrels, James	AEP Appalachian Transmission Company, Inc.	
Stair, Kyle	Peak Power Inc	
Stefanowicz, Vincent	PJM Interconnection	None
		Electric Distributor
Stein, Ed	Ohio Edison Company	
		Transmission Owner
Stern, Alexander	Public Service Electric & Gas Company	
		Generation Owner
Stupar, Rob	Invenergy Energy Management LLC	
		Transmission Owner
Svenson, Heather	Public Service Electric & Gas Company	
		Other Supplier
Swalwell, Brad	Tangent Energy Solutions, Inc.	
Sweeney, Rory	GT Power Group, LLC	None
		Transmission Owner
Taylor, Robert	Commonwealth Edison Company	
Thomas, Sharon	Energy Storage Association	
		Generation Owner
Thundiyl, Kevin	Exelon Generation Co., LLC (NEV_XLON)	
Tighe, Andrea	CAPS	
Tobia, James	FirstEnergy Services	
Tribulski, Jennifer	PJM Interconnection	None
Tyler, Catherine	Monitoring Analytics	
Walker, Jacqueline	Duke Energy Business Services LLC	
		Transmission Owner
Warchol, Jerry	Dominion Virginia Power (EDC)	
		Other Supplier
Watson, Betty	Affirmed Energy LLC	
		Other Supplier
Webster, John	IceTec.com, Inc.	
Wehnes, Kathleen	Maryland Department of the Environment	
		Electric Distributor
Wehr, Christopher	Ohio Edison Company (EDC)	
Wharton, Matthew	Guidehouse Inc	
Whitehead, Jeffrey	GT Power Group	
		Transmission Owner
Whitmoyer, Bernie	Jersey Central Power & Light Company	
Wiley, Amy	Delaware Public Service Commission	
		Other Supplier
Wisersky, Megan	Madison Gas & Electric Co.	

Wray, Gizelle	Solar Energy Industries Association (SEIA)	
Xenopoulos, Damon	Other	
Yeaton, Andrea	PJM Interconnection	None
Yi, Jin An	jinan	
Yoo, Kyungjin	Monitoring Analytics	
Younes, Vivian	PPL Electric Utilities Corp. dba PPL Utilities (LSE)	Transmission Owner

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DRAFT