

Distributed Energy Resource (DER) Scenarios

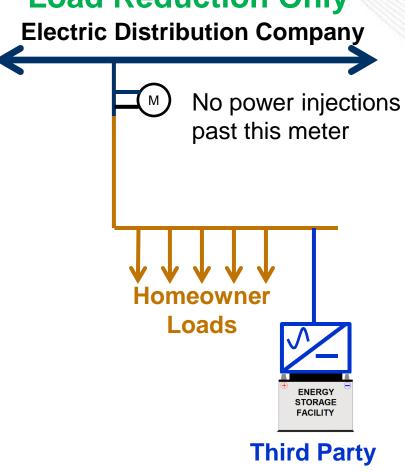
David Egan
Manager, Interconnection Projects
Andrew Levitt
Sr. Market Strategist
Markets and Reliability Committee
Special Meeting - DER
June 17, 2016

www.pjm.com PJM©2016



State Jurisdictional Interconnections

Load Reduction Only



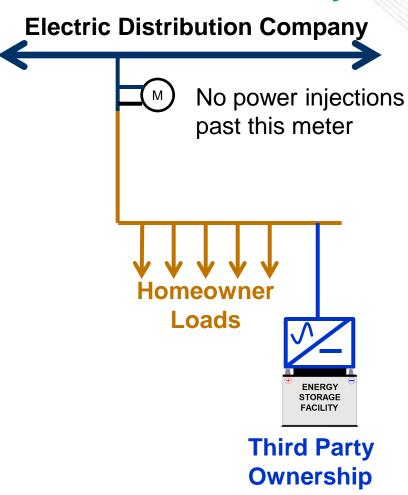
Ownership

	Resource Location→	Load Metered		PJM Generation Metered	Off-Grid		
Service	Service Jurisdiction ↓	Not DR	DR				
PJM Energy Sales	Federal		✓	✓			
PJM Capacity Sales	Federal		✓	✓			
PJM Ancillary Services Sales	Federal		✓	✓			
Bill Reduction: Consume Less Energy	Federal/State	✓	✓				
Bill Reduction: Capacity	Federal/State	✓					
State Sale/Credit: Inject Energy (including Net Metering)	State	X					
Distribution Constraint Management	State	✓	✓	√*			
Distribution Voltage Support	State	✓	✓	√ *			
Emergency Backup for Customer	State				√*		



PJM Demand Response Regulation Participation

Load Reduction Only



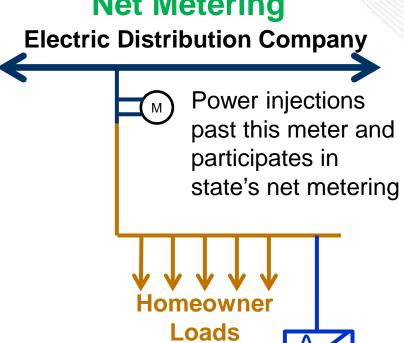
	Resource Location→	Load Metered		PJM Generation Metered	Off-Grid
Service	Service Jurisdiction ↓	Not DR	DR		
PJM Energy Sales	Federal		✓	✓	
PJM Capacity Sales	Federal		✓	✓	
PJM Ancillary Services Sales	Federal		✓	✓	
Bill Reduction: Consume Less Energy	Federal/State	✓	✓		
Bill Reduction: Capacity	Federal/State	✓			
State Sale/Credit: Inject Energy (including Net Metering)	State	✓			
Distribution Constraint Management	State	✓	✓	√*	
Distribution Voltage Support	State	✓	✓	✓*	
Emergency Backup for Customer	State				√*

www.pjm.com 9JM©2016



State Jurisdictional Interconnections

Net Metering



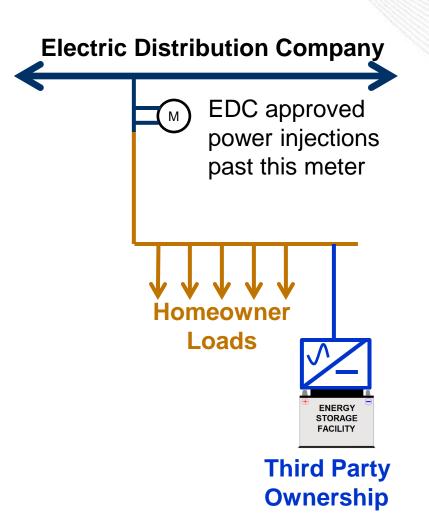
Third Party Ownership

STORAGE **FACILITY**

	Resource Location→	Load Metered		PJM Generation Metered	Off-Grid			
Service	Service Jurisdiction ↓	Not DR	DR					
PJM Energy Sales	Federal		✓	✓				
PJM Capacity Sales	Federal		✓	✓				
PJM Ancillary Services Sales	Federal		✓	✓				
Bill Reduction: Consume Less Energy	Federal/State	✓	✓					
Bill Reduction: Capacity	Federal/State	✓						
State Sale/Credit: Inject Energy (including Net Metering)	State	✓						
Distribution Constraint Management	State	✓	✓	√ *				
Distribution Voltage Support	State	✓	✓	√ *				
Emergency Backup for Customer	State				√*			



PJM Demand Response Regulation Participation



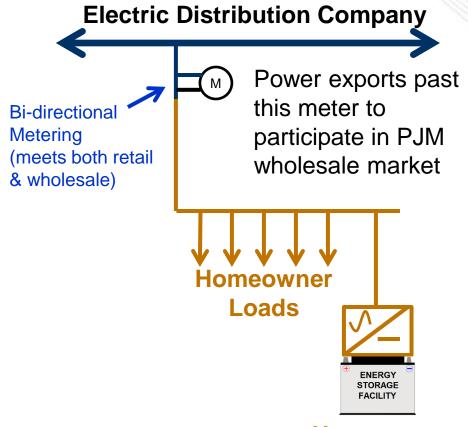
	Resource Location→	Load Metered		PJM Generation Metered	Off-Grid
Service	Service Jurisdiction ↓	Not DR	DR		
PJM Energy Sales	Federal		✓	✓	
PJM Capacity Sales	Federal		✓	✓	
PJM Ancillary Services Sales	Federal		✓	✓	
Bill Reduction: Consume Less Energy	Federal/State	✓	✓		
Bill Reduction: Capacity	Federal/State	✓			
State Sale/Credit: Inject Energy (including Net Metering)	State	✓	0		
Distribution Constraint Management	State	✓	✓	√*	
Distribution Voltage Support	State	✓	✓	√*	
Emergency Backup for Customer	State				√*
			1		

Can toggle, however can only be DR during non-injection hours.
Capacity DR must be available in market to meet RPM commitments.



PJM Interconnection Request for Regulation or Generation

Generation Metered Wholesale Sales



	Resource Location→	Load M	letered	PJM Generation Metered	Off-Grid
Service	Service Jurisdiction ↓	Not DR	DR		
PJM Energy Sales	Federal		✓	✓	
PJM Capacity Sales	Federal		✓	✓	
PJM Ancillary Services Sales	Federal		✓	✓	
Bill Reduction: Consume Less Energy	Federal/State	✓	✓		
Bill Reduction: Capacity	Federal/State	✓			
State Sale/Credit: Inject Energy (including Net Metering)	State	✓			
Distribution Constraint Management	State	✓	✓	√*	
Distribution Voltage Support	State	✓	✓	√*	
Emergency Backup for Customer	State				✓*

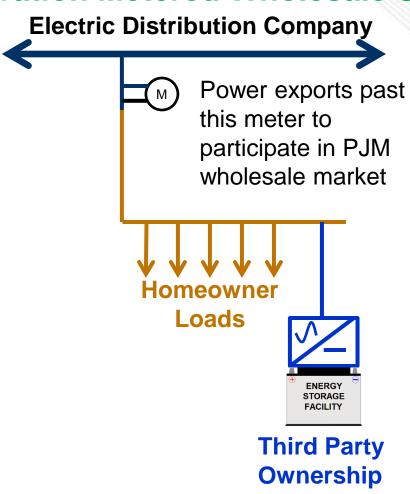
Homeowner **Generator**

www.pjm.com PJM©2016 6



PJM Interconnection Request for Regulation or Generation

Generation Metered Wholesale Sales



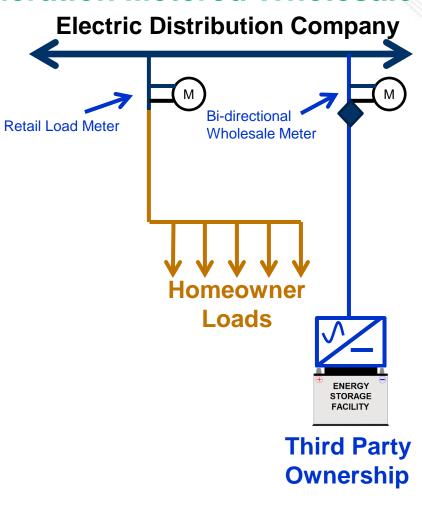


www.pjm.com 7 PJM©2016



PJM Interconnection for Regulation or Generation

Generation Metered Wholesale Sales



	Resource Location→	Load Metered		oad Metered Metered		Off-Grid	
Service	Service Jurisdiction ↓	Not DR	DR			I	
PJM Energy Sales	Federal		✓		✓		
PJM Capacity Sales	Federal		✓		✓		
PJM Ancillary Services Sales	Federal		✓		✓		
Bill Reduction: Consume Less Energy	Federal/State	✓	✓				
Bill Reduction: Capacity	Federal/State	✓					
State Sale/Credit: Inject Energy (including Net Metering)	State	✓					
Distribution Constraint Management	State	✓	✓		√*		
Distribution Voltage Support	State	✓	✓		√ *		
Emergency Backup for Customer	State						√*

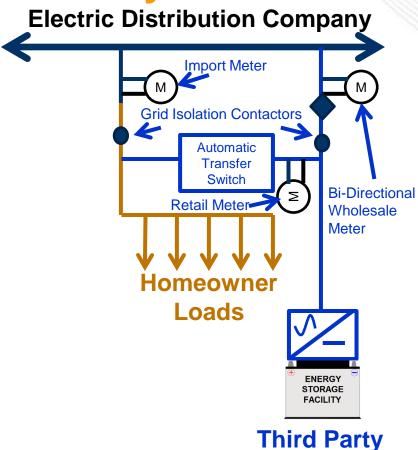
Third Party leases land from homeowner and enters PJM queue to sell power in PJM market. * Storage may only use energy bought at wholesale for PJM Energy, Capacity and Ancillary Services.

www.pjm.com 8 PJM©2016



PJM Interconnection for Regulation or Generation

May be allowed



Ownership

	Resource Location→	Load N	Metered	Ρ.	JM Generation Metered	Off-Grid
Service	Service Jurisdiction ↓	Not DR	DR			
PJM Energy Sales	Federal		✓		✓	
PJM Capacity Sales	Federal		✓		✓	
PJM Ancillary Services Sales	Federal		✓		✓	
Bill Reduction: Consume Less Energy	Federal/State	✓	✓			
Bill Reduction: Capacity	Federal/State	✓				
State Sale/Credit: Inject Energy (including Net Metering)	State	✓				
Distribution Constraint Management	State	✓	✓		√*	
Distribution Voltage Support	State	✓	✓		√*	
Emergency Backup for Customer	State					√ *
					Con	taggle
Third Party leases land	trom				Can	toggle

Third Party leases land from homeowner and enters PJM queue to sell power in PJM market. On loss of grid, Third Party serves homeowner through automatic transfer switch.

^{*} Storage may only use energy bought at wholesale for PJM Energy, Capacity and Ancillary Services.