



# PJM New Services Queue Developer Education

***Presented by:***

*Lisa Krizenoskas – Interconnection Projects*

*Komal Patel - Interconnection Projects*

*Stacey Nestel - Interconnection Projects*

*Ian Mundell – Information Technology - Planning*

*Jonathan Thompson - Interconnection Projects*

## Why New Services Requests?

**Provide access to PJM markets while ensuring the continued reliable operation of the Transmission System.**

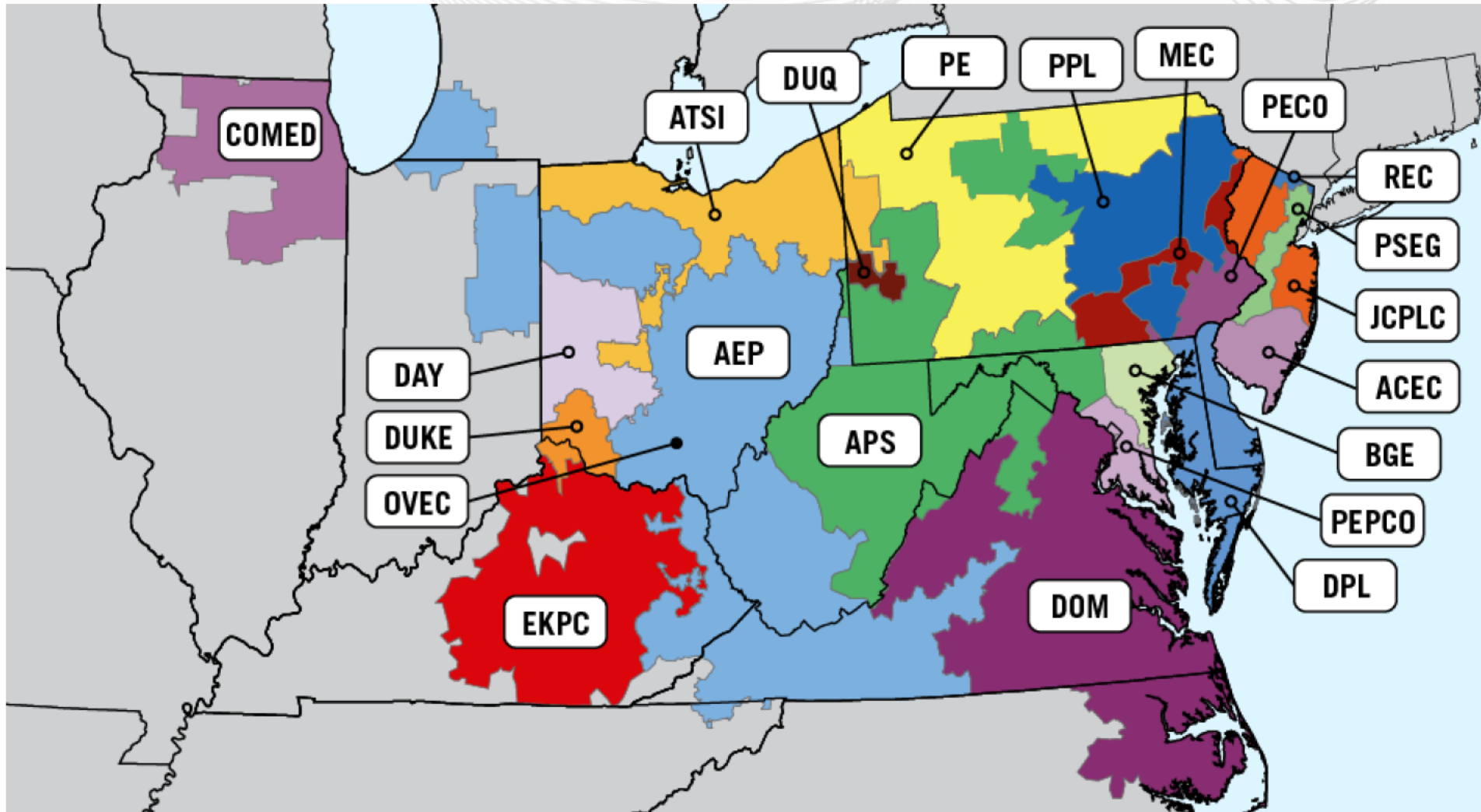
- Evaluations (studies) must be conducted to identify the transmission system upgrades to allow a project to come into service and maintain reliable, secure and safe operations.
- Identify system upgrades required to physically interconnect the project to the Transmission System, if required.
- Project specifics and study results are captured in a three party agreement executed by the Interconnection Customer (IC), Transmission Owner (TO), and PJM.

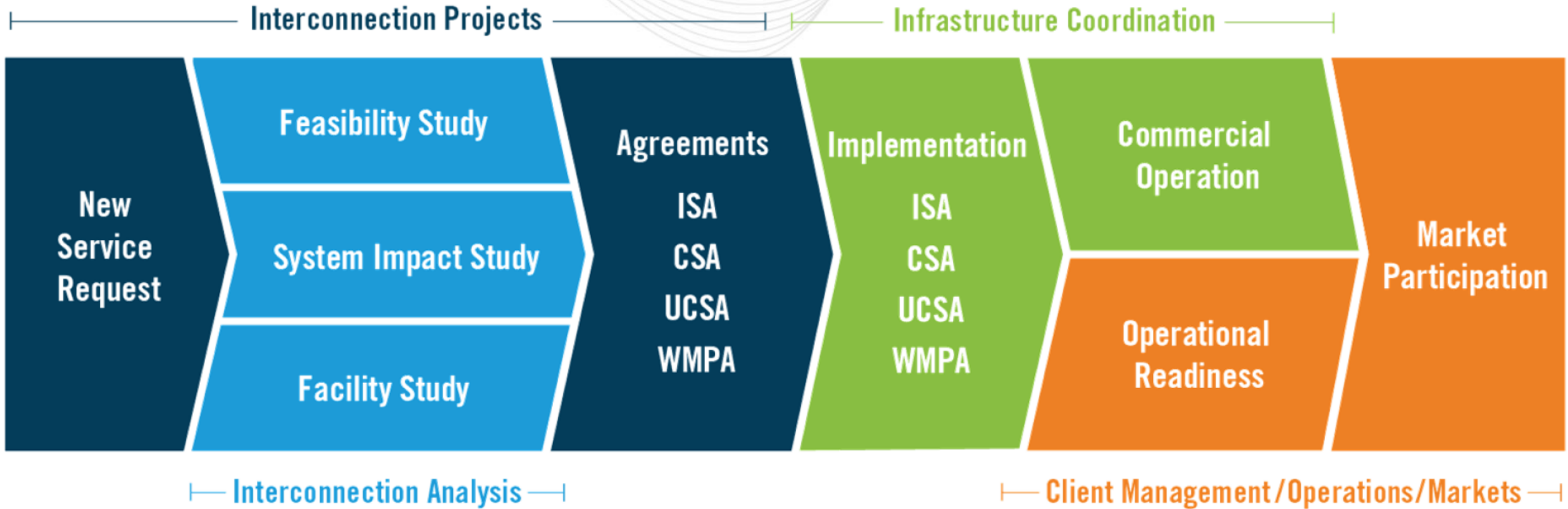
**It all starts when an Interconnection Customer submits a complete New Services Request (application) to PJM.**

## Gain better understanding of New Services Request (NSR) Process including:

- NSR Windows
- Types of NSR Customers
- NSR Process Overview
- NSR Applications
- Class Average Capacity Factors
- Deposit Calculation/Structure
- Site Control Requirements
- Site Plan Requirements
- Single Line Diagram Requirements
- Application via Queue Point
- Study Process Timeline
- New Services Studies Performed
- Interim Deliverability
- Project Modifications
- Output Reduction Rules
- Types of Network Upgrades
- Security Calculation
- Option to Build
- Types of Agreements

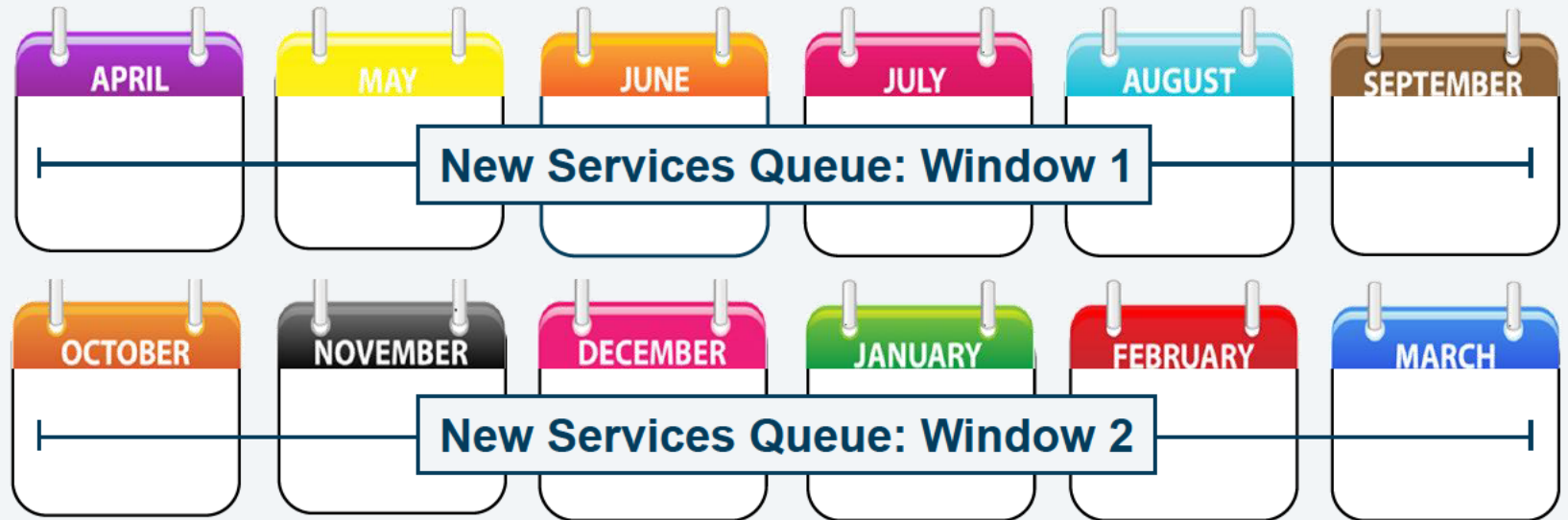
- **CAM** = Company Account Manager
- **CIR** = Capacity Injection Rights
- **CSA/ICSA** = Interconnection Construction Service Agreement
- **IC** = Interconnection Customer, Generator
- **IARRs** = Incremental Auction Revenue Rights
- **ISA** = Interconnection Service Agreements
- **MFO** = Maximum Facility Output
- **TO** = Transmission Owner
- **UCSA** = Upgrade Construction Service Agreement
- **WMPA** = Wholesale Market Participation Agreements





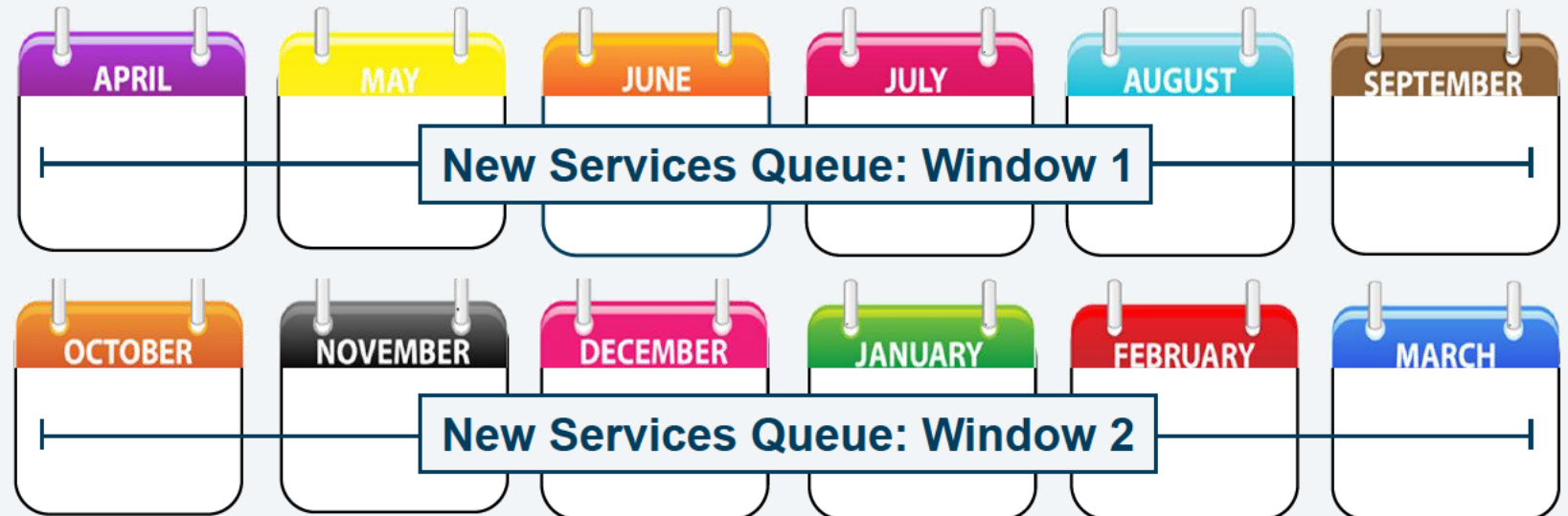


- New Service Requests are submitted in two queue windows
- Deficiency Review occurs in this phase
- If application is accepted, kick off call must occur within tariff timelines





- Projects may drop out of queue at any time.
- Project size may be **reduced** per Tariff rules (explained later) but not increased!





New Service Customer	Sub-Type	OATT Reference
<b>Generation Interconnection Customer</b>	New generation/Uprates, Any size, capacity	Attachment N
	New generation, 5MW or less, and energy-only	Attachment Y
	New generation, 10kW or less, inverter based generation, energy-only	Attachment BB
<b>Transmission Interconnection Customer</b>	New Merchant Transmission Facilities	Attachment S
	Merchant Network Upgrades	Attachment EE
<b>Upgrade Customer</b>	Incremental Auction Rights Request	Attachment EE
<b>Eligible Customer</b>	Long Term Firm Transmission Service	Attachment PP

# New Services Requests Process Overview



## OATT Attachment N, Y, BB, S, EE\*

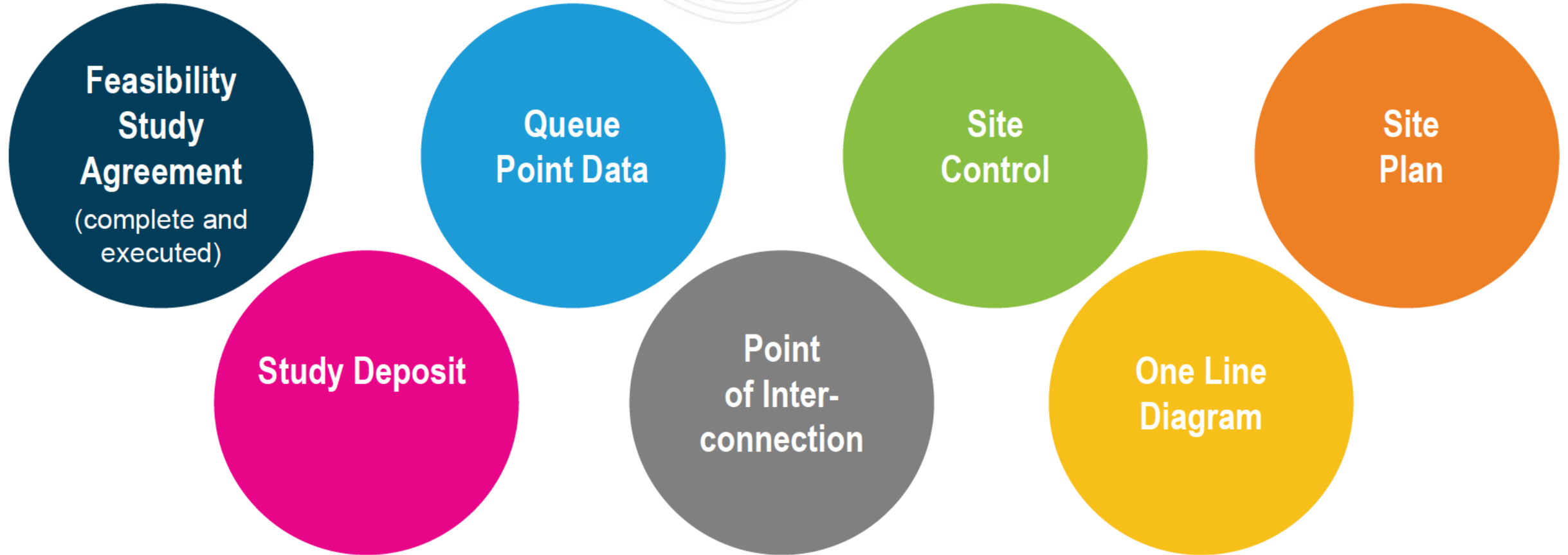
- N – Generation
- Y – Generation ( $\leq 2$  MW synchronous,  $\leq 5$  MW inverter based, and energy-only)
- BB – Generation ( $\leq 10$  kW inverter based & energy-only)
- S – Merchant Transmission
- EE – Upgrade Request
- PP - Long Term Firm

## Required Information

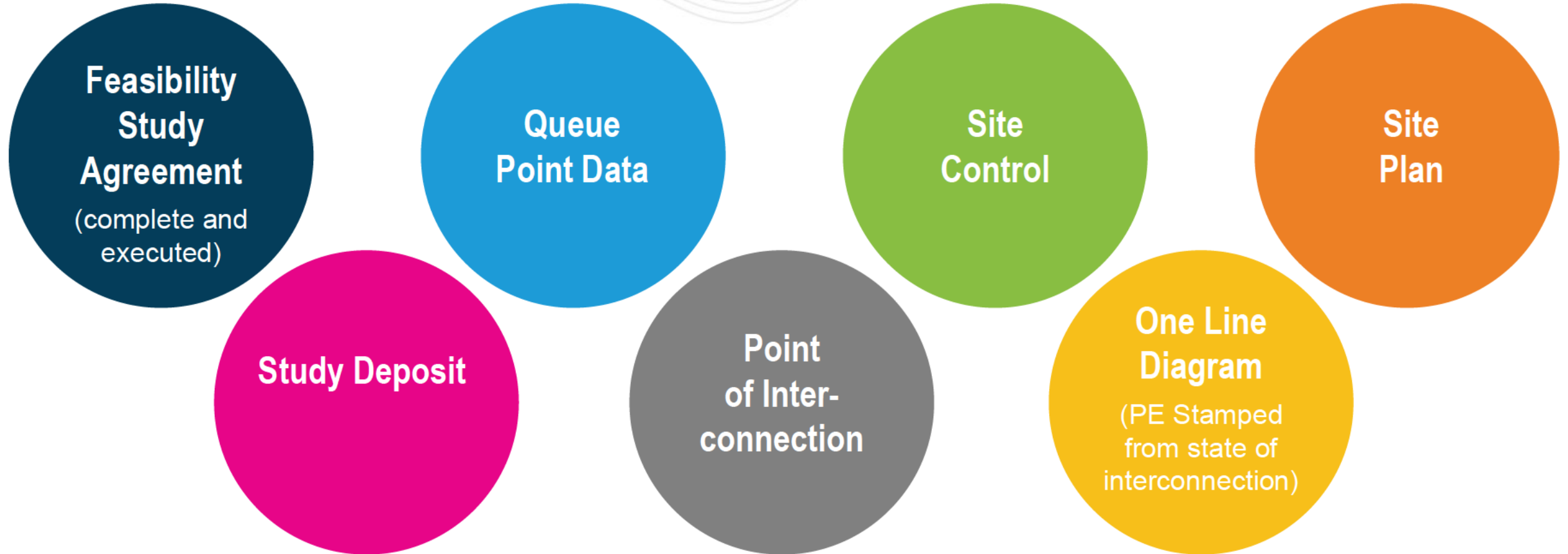
- Location
- Project Size
- Ownership (site control for interconnection requests)
- Equipment Configuration
- Planned In-Service Date
- Deposit
- Queue Point Data

\* **NOTE:** Transmission service requests are received through OASIS and are then communicated to System Planning for inclusion in the New Services Queue with remainder of the New Service Requests.

## Information Required to Achieve Queue Position:



## Information Required to Achieve Queue Position:



# Attachment BB: Small Inverter Facility

(Certified Inverter-Based Generating Facility No Larger Than 10 kW)

## Information Required to Achieve Queue Position:

**Feasibility Study Agreement**  
(complete and executed)

**Contact Information**

**Small Inverter Facility Information**

**Site Control**

**Processing Fee - \$500**

**Legal Name of Owner of Facility**

**Certification of Small Inverter Facility**

## Information Required to Achieve Queue Position:

**Feasibility Study Agreement**  
(complete and executed)

**Location of Merchant Transmission Facilities**

**Nominal Capability or Increase in Capability**

**Requested Rights**

**Study Deposit**

**Description of Proposed Facilities**

**Planned In-Service Date**

## Information Required to Achieve Queue Position:

### Feasibility Study Agreement

(complete and executed)

### Study Deposit

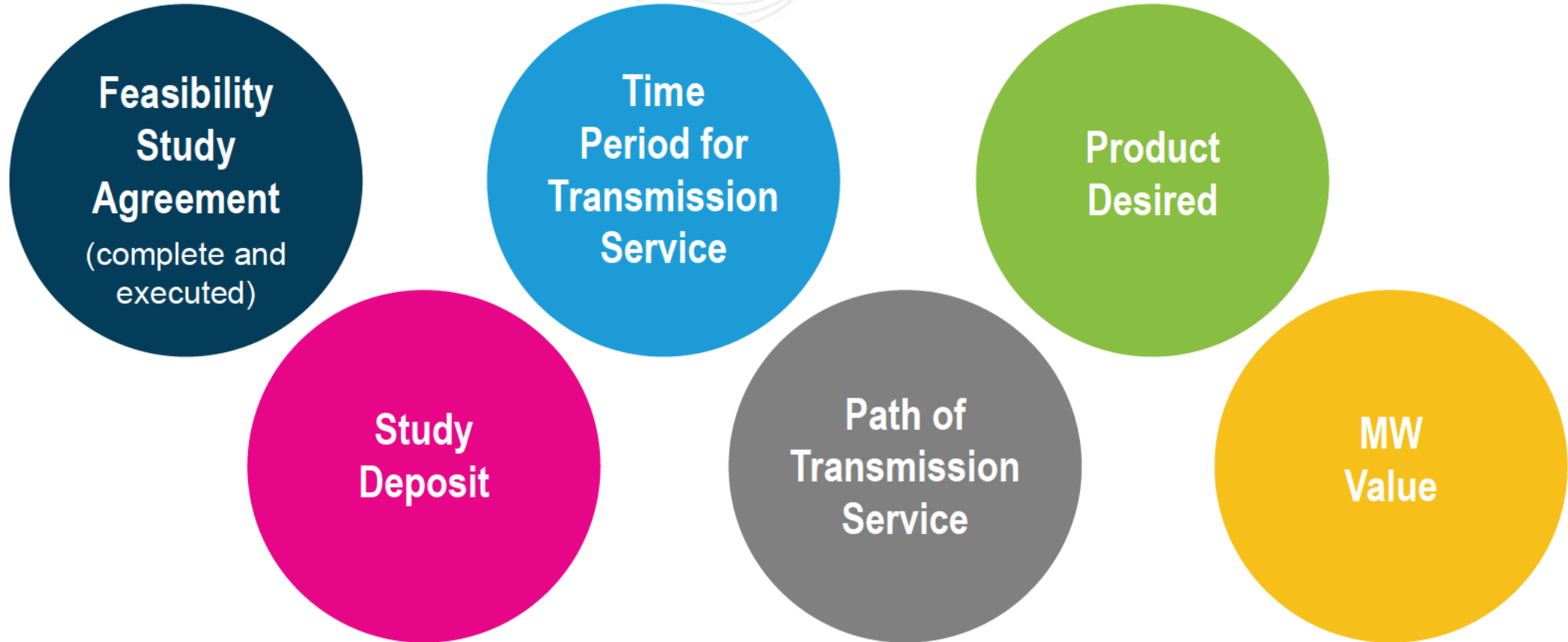
### IARRs

Provide Source and Sink Location, MW and IS Date

### Merchant Network Upgrades

Identify Transmission Facility and provide increase in rating with IS date

## Information Required to Achieve Queue Position:







# Class Average Capacity Factors: Wind & Solar

## PJM Interconnection LLC

### Class Average Capacity Factors: Wind & Solar Resources

(Effective June 1, 2007 )

#### Wind Class Average Capacity Factors

Wind Farm Location	Capacity Factor
In Mountainous Terrain	14.7%
In Open/Flat Terrain	17.6%

#### Solar Class Average Capacity Factors

Solar Installation Type	Capacity Factor
Ground Mounted Fixed Panel	42.0%
Ground Mounted Tracking Panel	60.0%
Other Than Ground Mounted	38.0%

<https://www.pjm.com/-/media/planning/res-adeq/class-average-wind-capacity-factors.ashx?la=en>

————— **Currently based on 10 hour contiguous battery run time:** —————

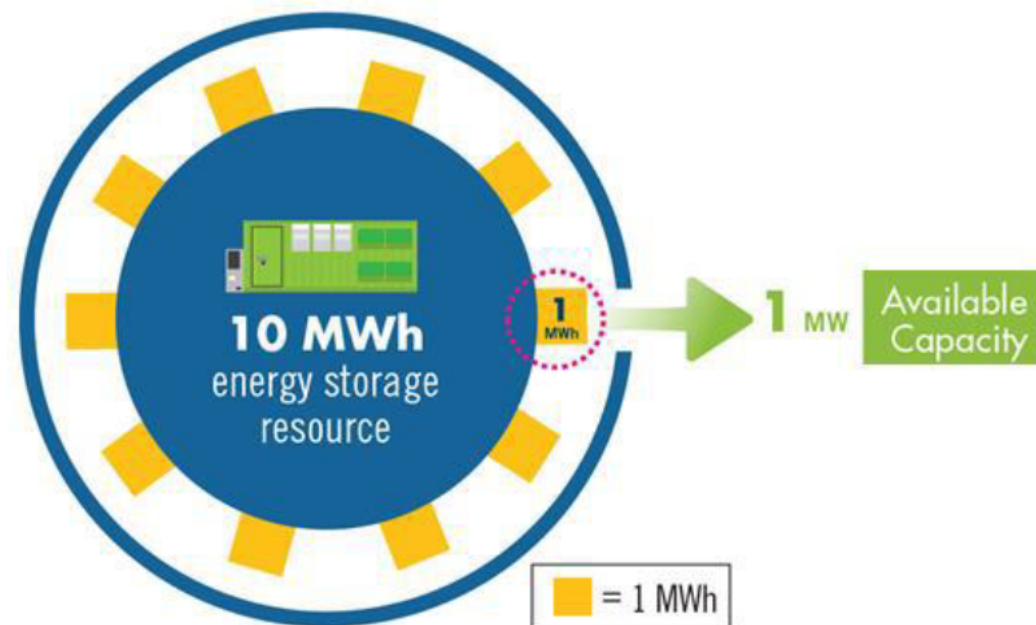
## Capacity Factor : Battery Storage

### EXAMPLE:

10 MWh battery stockpile

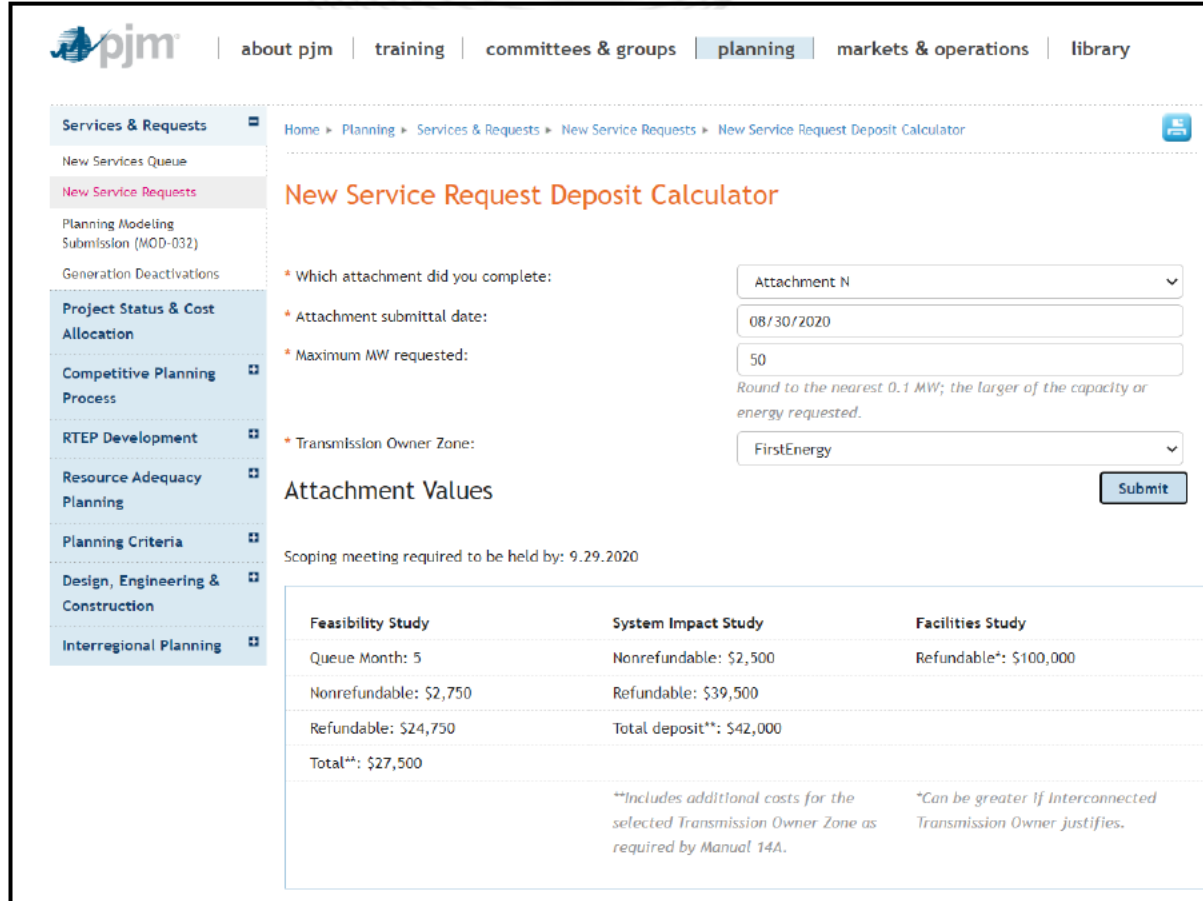
$10 \text{ MWh} / 10 \text{ hours} = 1 \text{ MW Capacity}$

1 MW Capacity for 10 hours contiguous



# **New Services Queue Application Fee**

## PJM New Services Queue Page:



The screenshot shows the PJM website's "New Service Request Deposit Calculator" page. The page includes a navigation menu with links for "about pjm", "training", "committees & groups", "planning", "markets & operations", and "library". The "planning" link is active. The breadcrumb trail is: Home > Planning > Services & Requests > New Service Requests > New Service Request Deposit Calculator.

The main content area is titled "New Service Request Deposit Calculator" and contains the following form fields:

- Which attachment did you complete:** Attachment N (dropdown menu)
- Attachment submittal date:** 08/30/2020 (text input)
- Maximum MW requested:** 50 (text input)
- Transmission Owner Zone:** FirstEnergy (dropdown menu)

A "Submit" button is located at the bottom right of the form. Below the form, the text "Attachment Values" is displayed, followed by "Scoping meeting required to be held by: 9.29.2020".

Feasibility Study	System Impact Study	Facilities Study
Queue Month: 5	Nonrefundable: \$2,500	Refundable*: \$100,000
Nonrefundable: \$2,750	Refundable: \$39,500	
Refundable: \$24,750	Total deposit**: \$42,000	
Total**: \$27,500		

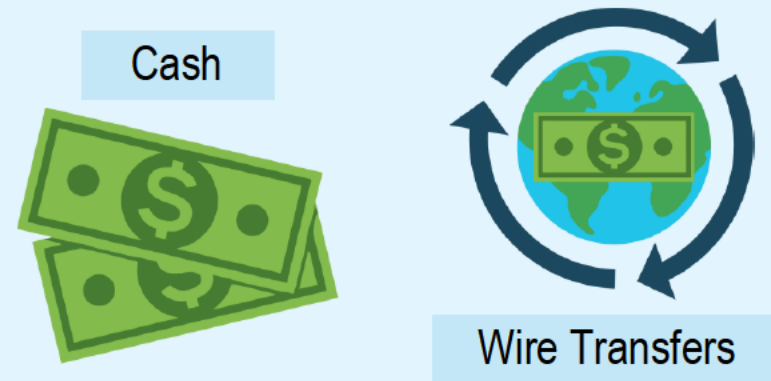
Footnotes:

- \*\*Includes additional costs for the selected Transmission Owner Zone as required by Manual 14A.
- \*Can be greater if interconnected Transmission Owner justifies.

<https://www.pjm.com/planning/services-requests/new-service-requests/deposit-calc.aspx>

## STUDY DEPOSITS

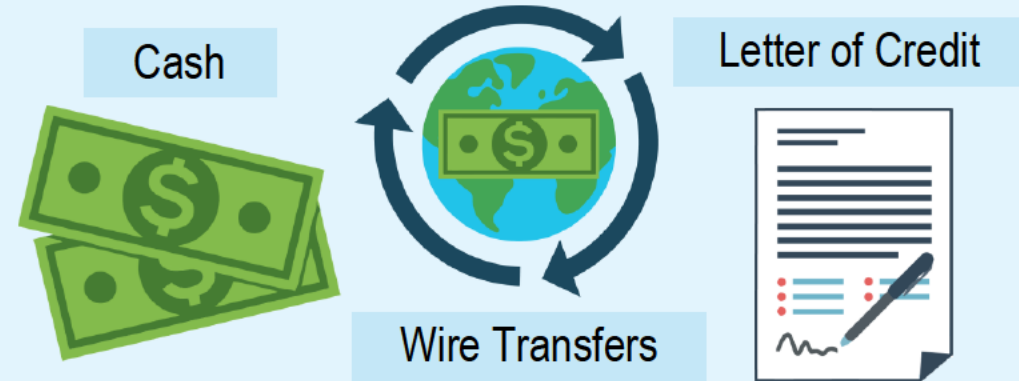
Deposits can be in the form of:



*Deposits are due at the same time as each subsequent agreement*

## FINAL AGREEMENT SECURITY

Deposits can be in the form of:



*Security is due at the same time as the final agreement is due*

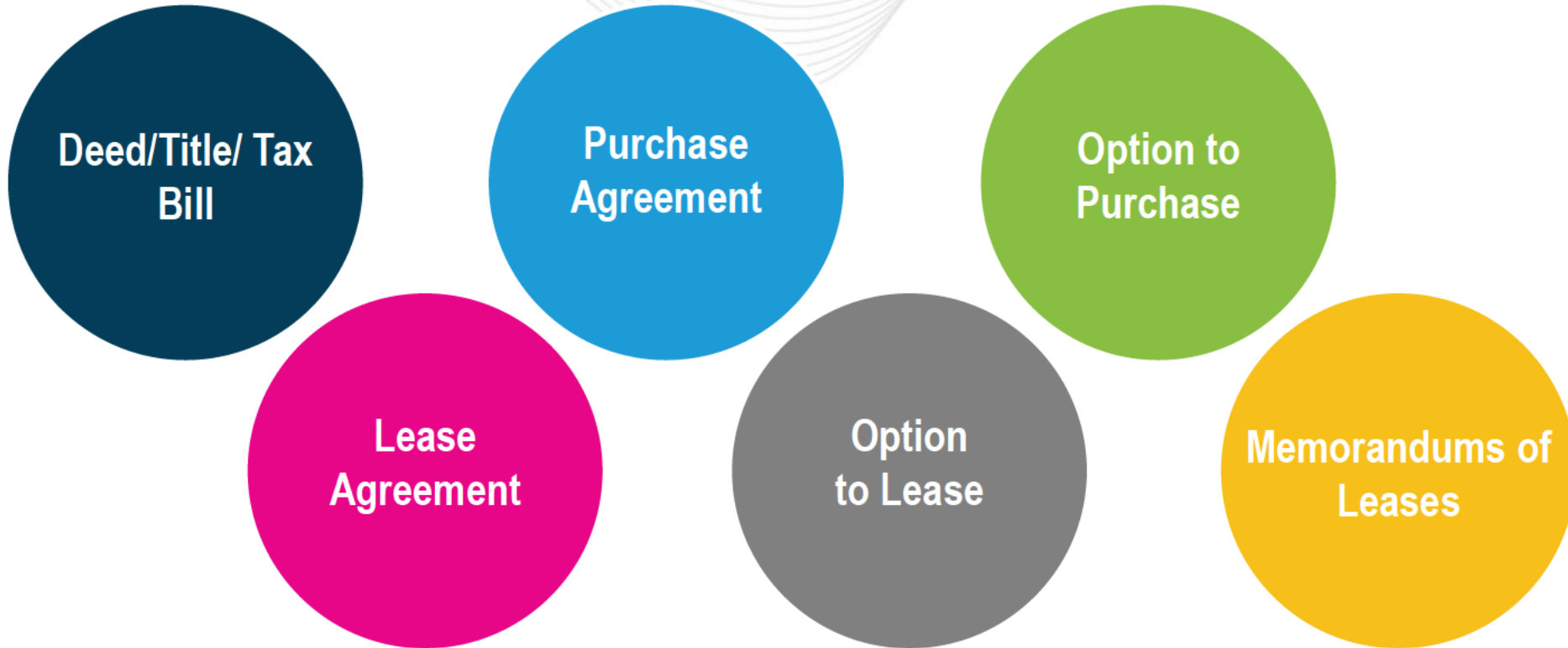
## Refunds will be issued:

- 90 days after close of each study phase
- 120 days after closing out an ISA



# Site Control

## Acceptable Forms of Site Control



PJM needs assurance that the customer holds control of the site where the generation is to be located.



## When are Memorandums Accepted?

1. Explicitly states the memorandum is memorializing the underlying option/lease agreement.
2. Fully executed by same parties that are parties to underlying agreement.
3. Contains key terms for conveyance, exclusivity and term.
4. Memorandum indicates that underlying option/lease agreement was already fully executed.
5. Memorandum indicates that the underlying option/lease agreement contains same terms as memorandum.

## Site Control must be in the name of the Interconnection Customer

### EXCEPTION:

PJM will accept the site control in another name only if you can demonstrate the business relationship between the entity that has site control and the interconnection customer.

The IC must provide Officer Certification, operating agreement or other documentation demonstrating the affiliate relationship.

### FOR EXAMPLE:

#### **Company A**

Interconnection Customer

#### **Company B**

Entity with Site Control

If **Company A** is a wholly-owned subsidiary of **Company B**, then the site control is acceptable with an Officer Certification.

## Required Components:

PJM looks for ***three specific components*** in the site control:

A large, solid dark blue circle containing the word "Conveyance" in white text.

Conveyance

A large, solid blue circle containing the word "Exclusivity" in white text.

Exclusivity

A large, solid green circle containing the word "Term" in white text.

Term

## CONVEYANCE

**Conveyance** is accomplished through the deed, lease agreement, purchase agreement, option to lease, option to purchase, etc.

This document conveys the property to the Interconnection Customer.

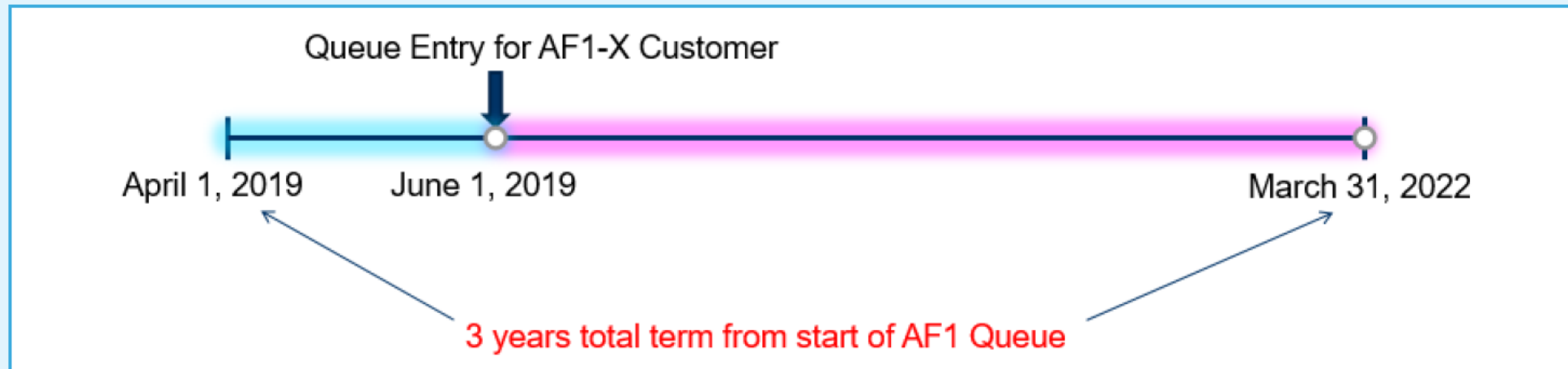
## EXCLUSIVITY

- Interconnection customer must have “exclusive use” of the property.
- Site control must explicitly indicate exclusivity.

***Officer Certification can be used for verification in addition to site control document.***

## TERM

Site control for a generator must have a term of at least 3 years (or 2 years for 20 MW or less) past the first day of the New Services Queue in which the Interconnection Customer submits its Generation Interconnection Request.



## TERM EXTENSIONS:

Extensions to site control term must have been already exercised by the Developer at the time site control evidence is provided to PJM.

*(If initial term is less than the required 2 or 3 year term)*

***Officer Certification can be used for verification in addition to site control document.***

## OFFICER CERTIFICATION

- Does not replace evidence of site control
- Used for verification of conveyance, exclusivity and term in addition to site control documentation.



## Acreage Requirement:

- **Solar:** 5 acres/MW
- **Wind:** 10 acres/MW
- **Battery:** PJM may request a PE-stamped site plan from the state in which the interconnection is made.



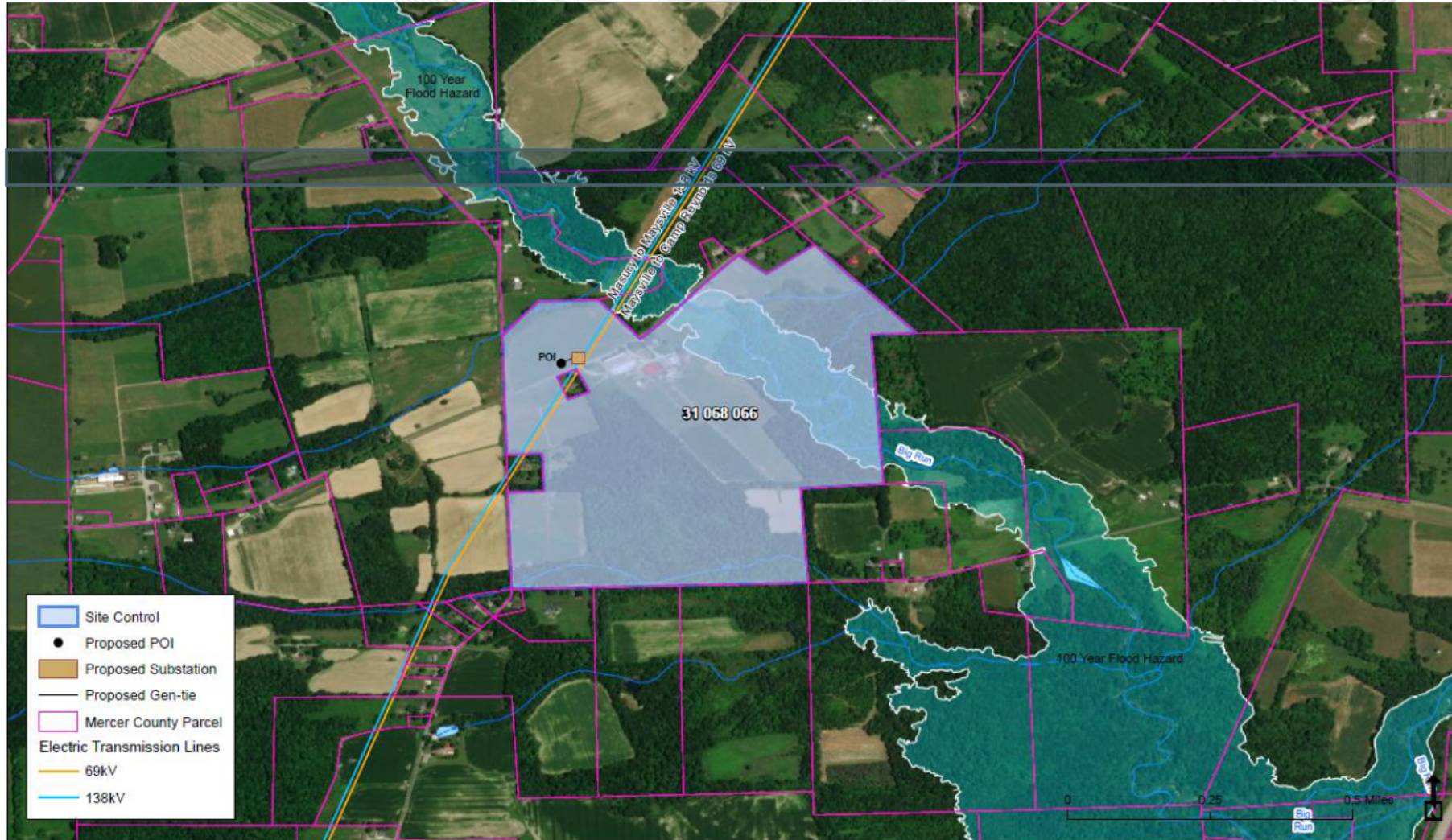

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**Note:** If your site control does not meet the expected acreage requirements, PJM will accept a PE-stamped site plan from the state in which the interconnection is made.

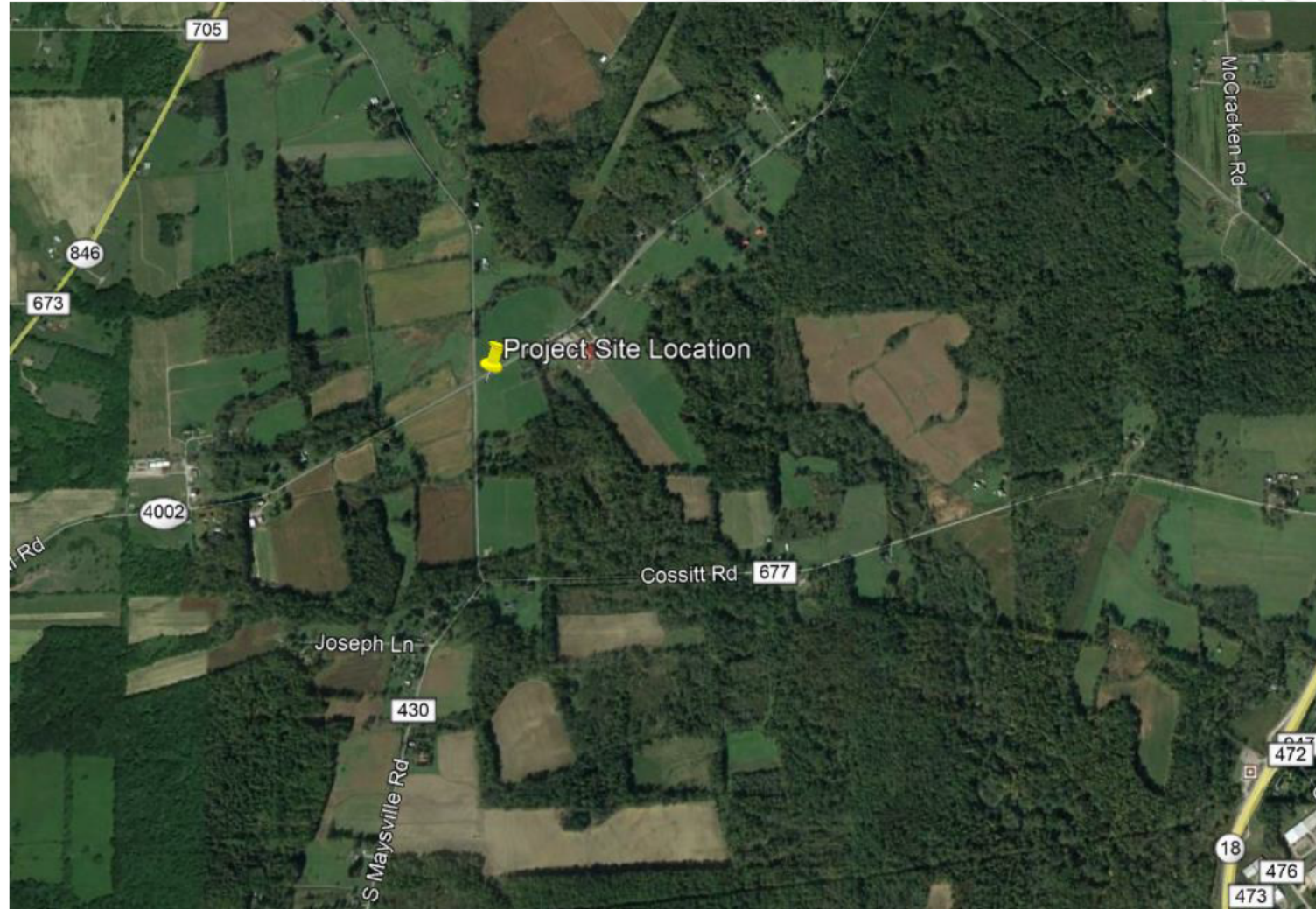
# Site Plans

## Site Plans should identify:

- Site boundaries
- Layout of customer facilities
- Location of collector bus
- Location of interconnection switchyard (if applicable)
- Location of Point of Interconnection to Transmission Owner's system



Please don't provide just this:



# Single Line Diagrams

## Single Line Diagram should show:

- Point of Interconnection to the Transmission Owner's system
- High Side Generator Step-up Transformer (GSU) with voltages, MVA rating and winding configuration
- High Side Circuit Breaker (CB)
- Metering between High Side CB and GSU
- Generator Collector Bus
- Individual Generating Unit's Step-Up transformers and breakers
- Generators

## Examples of one line submissions that are not acceptable:

Non-standard connections to the TO facility (need to check on posted TO standards)

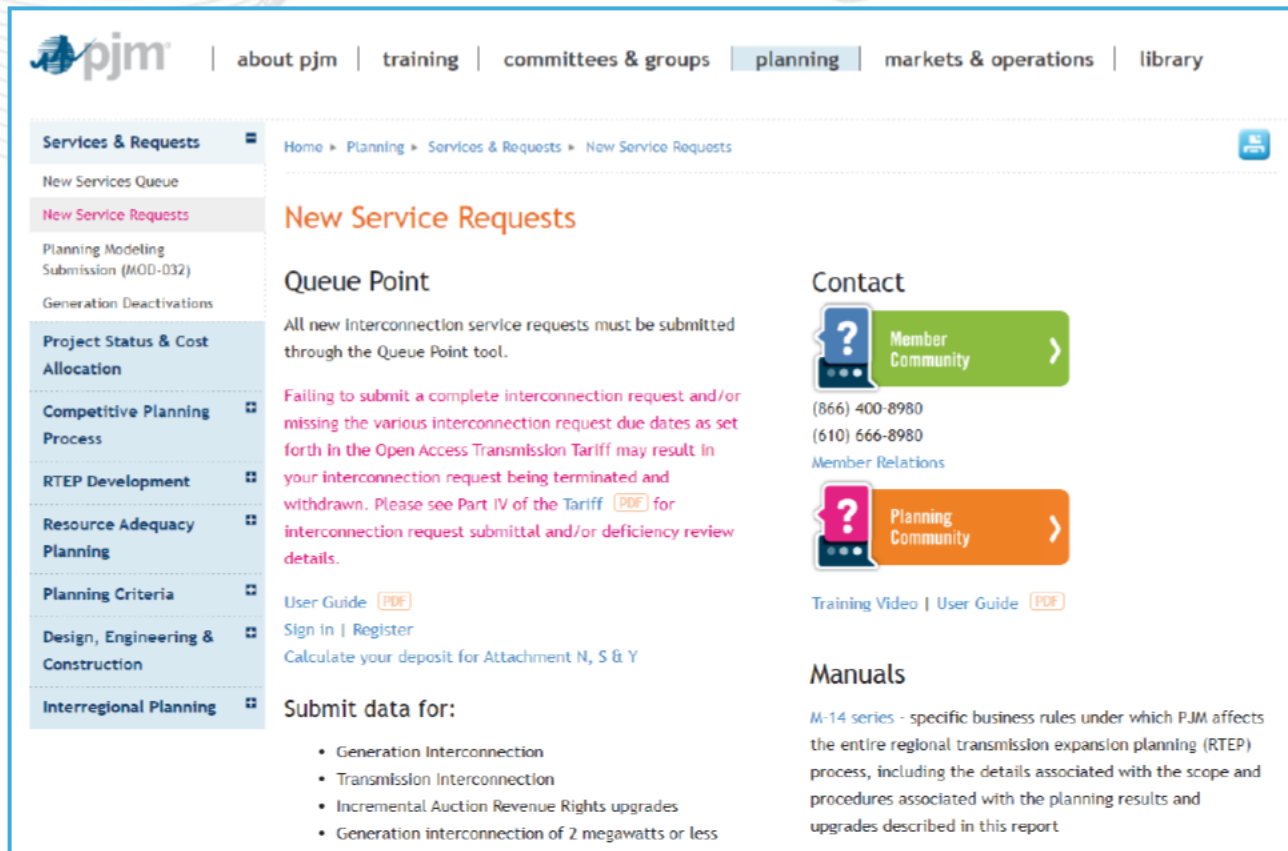
- GSU winding configurations
- Metering location
- High side interrupting device



# Queue Point

## Navigating to Queue Point

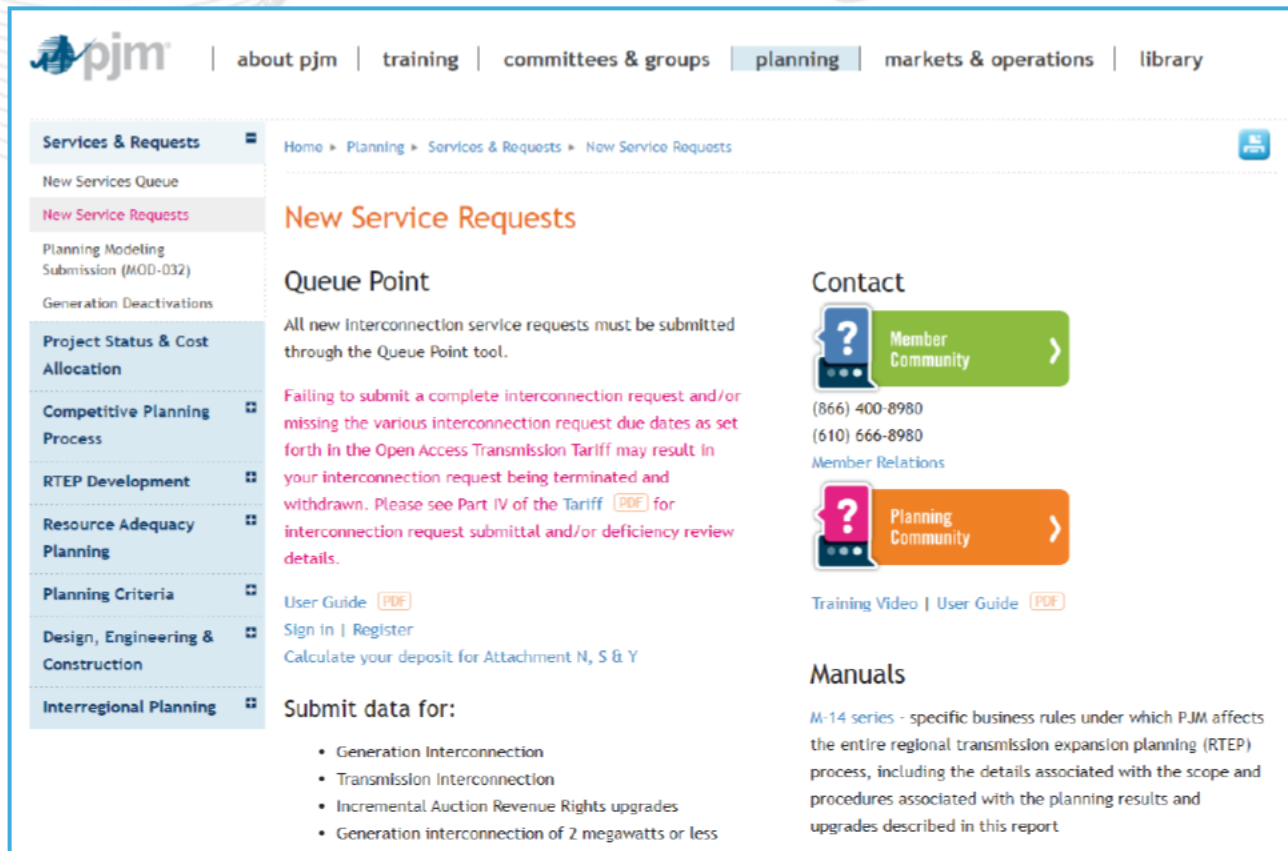
- Use direct link:  
<https://planningcenter.pjm.com/>
- From <https://pjm.com>
  - Select “Planning” from top level menu
  - Select “Services and Requests” from left menu
  - Select “New Service Requests”



The screenshot shows the PJM website interface. At the top, there is a navigation menu with links for 'about pjm', 'training', 'committees & groups', 'planning', 'markets & operations', and 'library'. The 'planning' link is highlighted. On the left side, there is a sidebar menu with categories like 'Services & Requests', 'Project Status & Cost Allocation', 'Competitive Planning Process', 'RTEP Development', 'Resource Adequacy Planning', 'Planning Criteria', 'Design, Engineering & Construction', and 'Interregional Planning'. The 'New Service Requests' link under 'Services & Requests' is highlighted. The main content area shows the 'New Service Requests' page, which includes a 'Queue Point' section with a warning message about interconnection requests. There are also links for 'User Guide', 'Sign in', and 'Register'. On the right side, there are 'Contact' and 'Manuals' sections.

## New Service Request Page

- Information about Queue Point
- **Links to:**
  - Login page
  - Register for an account
  - User guide
  - Related manuals and agreements
  - Deposit calculator



The screenshot shows the PJM website's "New Service Requests" page. The navigation bar includes links for "about pj", "training", "committees & groups", "planning" (which is highlighted), "markets & operations", and "library". A left-hand menu lists various services and requests, with "New Service Requests" highlighted in pink. The main content area features a breadcrumb trail: "Home > Planning > Services & Requests > New Service Requests". The page title is "New Service Requests". Below the title is a section for "Queue Point" which states: "All new Interconnection service requests must be submitted through the Queue Point tool." A warning message in pink text reads: "Failing to submit a complete interconnection request and/or missing the various interconnection request due dates as set forth in the Open Access Transmission Tariff may result in your interconnection request being terminated and withdrawn. Please see Part IV of the Tariff [PDF] for interconnection request submittal and/or deficiency review details." Below this is a "User Guide [PDF]" link and "Sign in | Register" options. A "Calculate your deposit for Attachment N, S & Y" link is also present. A "Submit data for:" section lists:
 

- Generation Interconnection
- Transmission Interconnection
- Incremental Auction Revenue Rights upgrades
- Generation interconnection of 2 megawatts or less

 On the right side, there is a "Contact" section with two community buttons: "Member Community" (green) and "Planning Community" (orange), both with question mark icons and right-pointing arrows. Below these are phone numbers: (866) 400-8980 and (610) 666-8980, and a "Member Relations" link. Further down is a "Training Video | User Guide [PDF]" link. At the bottom right is a "Manuals" section with a link to an "M-14 series" report, which describes business rules for RTEP.

<https://pjm.com/planning/services-requests/new-service-requests.aspx>

## Not a PJM Member

- Register for a CAM account
- Check box that says “my company is not listed”

## PJM Member

- Request access permissions in Account Manager
- Planning Center Queue Point Read/Write
- Granted by your company CAM

## Homepage - Attachments

Find out the appropriate attachment form for your project.

Start your Attachment N Feasibility Study submission here.

- › Specify a project queue number to begin System Impact Study submission.
- › Project information entered during Attachment N Feasibility Study will display on this form.

View sample before beginning your submission.

## Homepage – Existing Requests

All your saved and submitted projects will display here.

Queue Number	Project Name	Reference Number	Phase	Status	Project Manager	Submitted	Actions
ACI-003	Project 1	13958087	Attachment N - Feas	Under Review	PJM Project Manager	12.12.2016	
N26	Project 2	7613213	Attachment N - Feas	Accepted	PJM Project Manager	12.12.2016	
L05-CE22	Project 3	14699604	Attachment N - Feas	Accepted	PJM Project Manager	12.12.2016	
Not Assigned	Project 4	7121120	Attachment Y	Submitted	PJM Project Manager	12.12.2016	
ACI-003	Project 5	5887571	Attachment N - Feas	Under Review	PJM Project Manager	12.12.2016	
A2-015	Project 6	10066968	Attachment Y	Under Review	PJM Project Manager	12.12.2016	

Edit project

View project

Begin System Impact Study submission

Copy existing Feasibility Study data into a new request.

Delete unneeded submissions

*“I want to keep working on a submission, but my work isn’t there when I go back to it.”*

## SOLUTION:

User is selecting the green “start a new study” button. This starts a new submission every time.

- Use the green buttons one time to start a new submission.
- To edit an in progress submission, navigate to the Existing Requests tab and selecting the Edit button.

“My File uploads  
won’t save.”

## SOLUTION:

Look for the red error message  
at the top of the page.

### **File extensions must be in lowercase**

- site-diagram.PDF will give an error
- site-diagram.pdf will be accepted

### **Apple Macs may add extra payload data to some files (e.g. PDF files).**

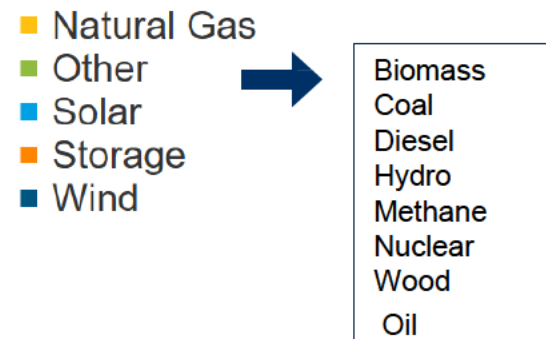
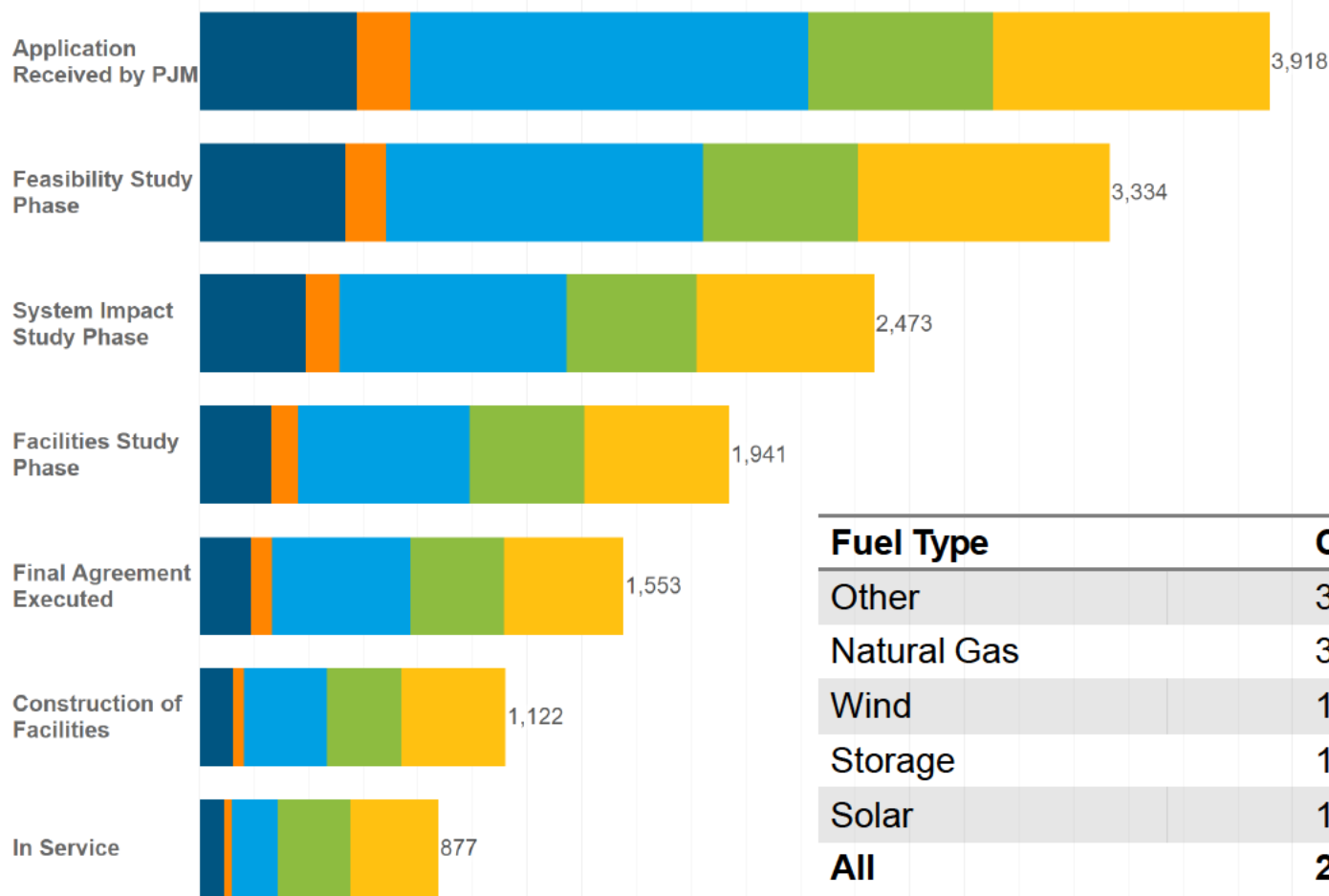
- Try saving the PDF on a PC





# Volume of Projects in a Queue Reduces through Study Process

All Generation Requests (A – AF1)



Fuel Type	Completion Rate*
Other	39%
Natural Gas	32%
Wind	16%
Storage	13%
Solar	12%
<b>All</b>	<b>22%</b>

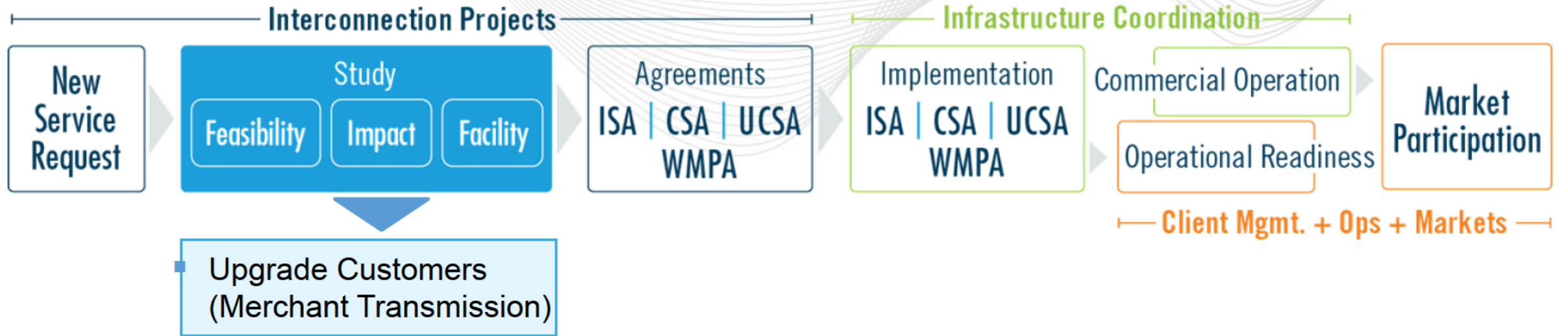


- Gen/Trans Interconnection Customers
- Eligible Customers (LTF)
- Upgrade Customers (IARRs)

Queue	2019												2020												2021											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
AF1				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█												
AF2																																				
AG1																																				
AG2																																				

- █ PJM Receives Queue Requests
- █ PJM Model Build
- █ Feasibility Study Period
- █ 30 Day Review and Agreement Return by Customer
- █ System Impact Study Period

Rule of Thumb for Study Issue Dates		
	FEAS	SIS
Queue Ends with 1	JAN	AUG
Queue Ends with 2	JUL	FEB



Queue	2019												2020												2021											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
AF1				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█												
AF2																																				
AG1																																				
AG2																																				

- PJM Receives Queue Requests
- PJM Model Build
- Feasibility Study Period
- 30 Day Review and Agreement Return by Customer
- System Impact Study Period

Rule of Thumb for Study Issue Dates		
	FEAS	SIS
Queue Ends with 1	JAN	AUG
Queue Ends with 2	JUL	FEB

# Feasibility Study Phase

## Table 5.1.2-1: Large New Services Request Process Deposit Requirements

Month of New Services Queue	Deposit Requirement Fixed Deposit	Deposit Requirement Per MW Portion of Deposit	Portion Held as Non-Refundable	Maximum Deposit
1 <sup>st</sup> – 4 <sup>th</sup>	\$10,000	\$100	10%	\$110,000
5 <sup>th</sup>	\$20,000	\$150	10%	\$120,000
6 <sup>th</sup>	\$30,000	\$200	10%	\$130,000

**Note:** The per MW value is the maximum of the Capacity or Maximum Facility Output requested.

\*10% of deposit is non-refundable

—Table 5.1.2-2: Larger New Services Request Process expected costs—

Transmission Owner Zone	Expected Costs
AEP	\$26,000
BGE	\$15,000
ComEd	\$15,000
Dayton	\$13,000
Dominion	\$12,000
Duquesne	\$19,000
FirstEnergy	\$23,000
AEC/DPL/Pepco	\$12,000
PPL	\$20,000
PSEG	\$17,000

## Attachment S

Queue Month	Deposit Calculation*	Max Deposit
1-4	\$10,000 + \$100 per MW	\$110,000
5	\$20,000 + \$150 per MW	\$120,000
6	\$30,000 + \$200 per MW	\$130,000

\*10% of deposit is non-refundable

## Attachment EE Deposits

**Flat Deposit**

\$50,000

\*Merchant Network Upgrade Skips Feasibility and goes right to System Impact

\*\*IARR Request requires both Feasibility and System Impact Study





## Required

- Deposit for Interconnection Requests based on request receipt timing and MW size
- Site control for generation requests
- In-service date within 7 years of entering queue
- Customer can select a primary and secondary Point of Interconnection (POI)
- **Study Completion:** Target approximately 120 Days after close of queue
- **Study participants:** PJM & TO (Contractor under TO)

## Results

- Attachment Facilities Needed for Interconnection
- **Powerflow Analysis** - Identify thermal overloads and Required Upgrades (Costs and Construction Schedule Estimates for primary POI)
- **Powerflow Analysis** - Identify thermal overloads with secondary POI (no cost/schedule estimates)
- **Short Circuit Analysis**
- Customers receive a Feasibility Study Report and have 30 days to sign a System Impact Study Agreement (SISA)

# System Impact Study Phase

**Table 5.2.1-1: System Impact Study Costs**

Project Size	Required Deposit Fixed Portion	Required Deposit Per MW Portion	Portion of Deposit that is Non-Refundable	Maximum Deposit
>20MW	None	\$500/MW	10%	\$300,000
>2MW and ≤20MW	\$10,000	None	10%	\$10,000
≤2MW	\$5,000	None	10%	\$5,000

**Table 5.2.1-2 System Impact Study PJM Expected Costs**

TO Zone	Expected Cost (\$) Requests > 20 MW	Expected Cost (\$) Requests ≤ 20 MW
AEP	\$46,000	\$16,000
BGE	\$50,000	Bounded
ComEd	\$99,000	\$32,000
Dayton	\$25,000	Bounded
DL	\$23,000	Bounded
Dominion	\$26,000	\$15,000
FE	\$42,000	\$16,000
PECO	\$17,000	Bounded
PHI	\$28,000	\$15,000
PPL	\$31,000	Bounded
PSEG	\$38,000	Bounded

\*PJM expects the standard Tariff deposit will cover the System Impact Study costs

## Attachment EE

Project Type	Flat Deposit
Merchant Upgrade*	\$50,000
IARR Request**	\$20,000

\*Merchant Network Upgrade Skips Feasibility and goes right to System Impact

\*\*IARR Request requires both Feasibility and System Impact Study



- **Required**
  - Deposit based on MW size
  - Initial Air Permit Application (N/A for solar/wind projects)
  - Ownership (Transmission Interconnection Requests)
- Customer must select a single POI (if 2 were evaluated in the Feasibility Study)
- **Study Completion:** Target 120 days after start of queue study or execution of Impact Study Agreement
- **Study participants:** PJM & TO (Contractor under TO) and Affected Systems (FSA)
- **Results**
  - Summer Peak Powerflow Analysis
  - Light Load Powerflow Analysis (if applicable)
  - Short Circuit Analysis
  - Other Powerflow Analyses as applicable
  - Cost Estimates and Allocations
- Customers receive an Impact Study Report and have 30 days to sign a Facility Study Agreement (FSA)

# Facilities Study Phase

**Table 5.3.3-1: Facilities Study Costs**

Project Size	Required Deposit
>20MV	The greater of: \$100,000 or estimated amount of Facilities Study cost for the first three months
>2MW and ≤20MV	\$50,000
≤2MW	\$15,000



# Facilities Study (Initial Engineering Review)



- Conduct governed by procedures as set forth in Attachment D of Manual M-14A
- Required
  - Deposit based on MW size
- Completion
  - Dependent on individual Transmission Owner zone and queue volume
- Study By
  - TO (or Contractor under direction of TO)
  - Affected System study
- Potential for Impact Study re-tool analysis
- Stability Analysis
- Additional studies as required by type of technology being connected
- Facility Study Report: Conceptual Design
- Attachment Facilities
- Network Upgrades
  - Cost Estimates
  - Preliminary Engineering and Construction Schedule

# Combined Feasibility/System Impact Study

- Small Projects ( $\leq 20$  MW)
- If Customer requests acceleration
- Are not permitted when the project:
  - causes or contributes to a system constraint; or
  - requires stability analysis, light load analysis; or
  - requests secondary Point of Interconnection be studied.
- Perform AC analysis for combined study.
- Combined report and associated agreement will be issued by the Feasibility Study due date per the PJM Tariff.



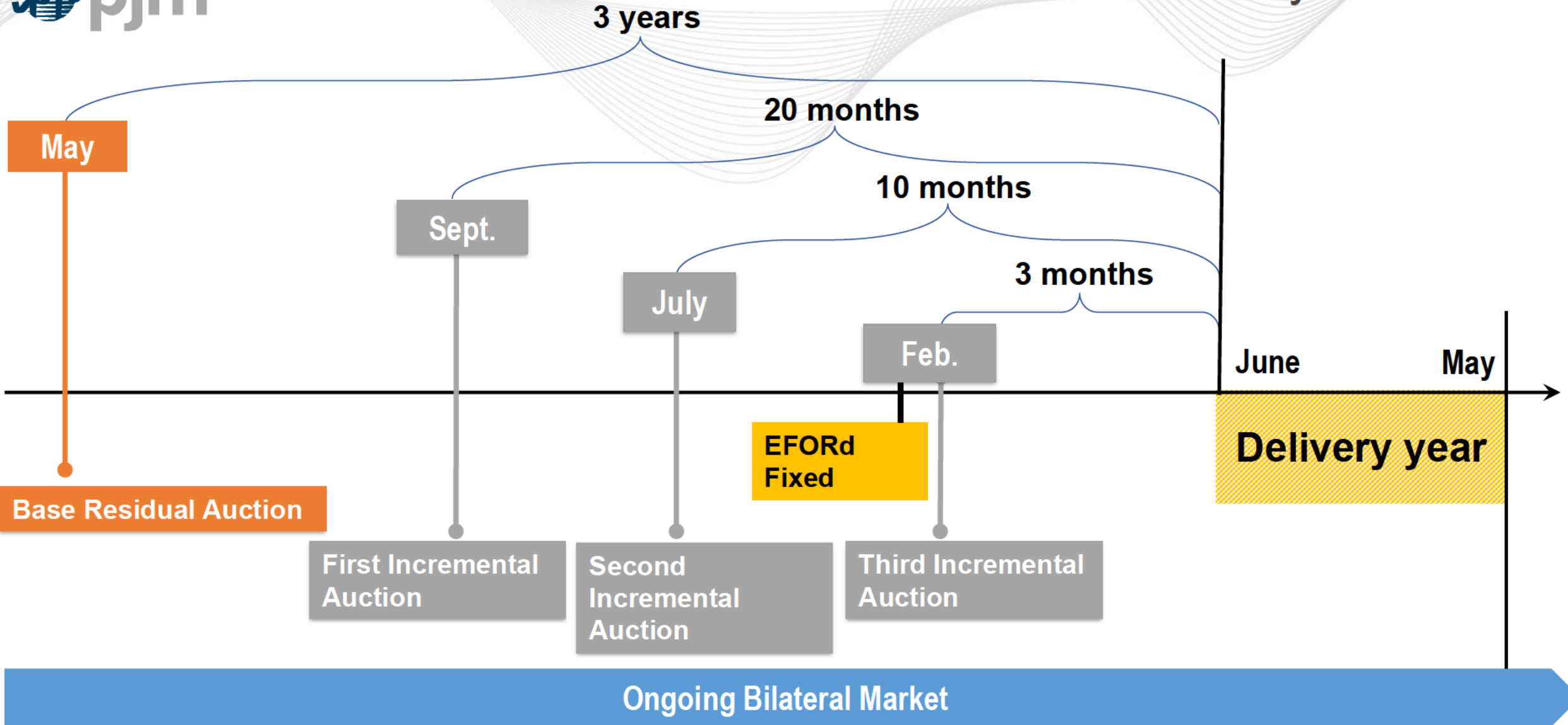
# Interim Deliverability Study

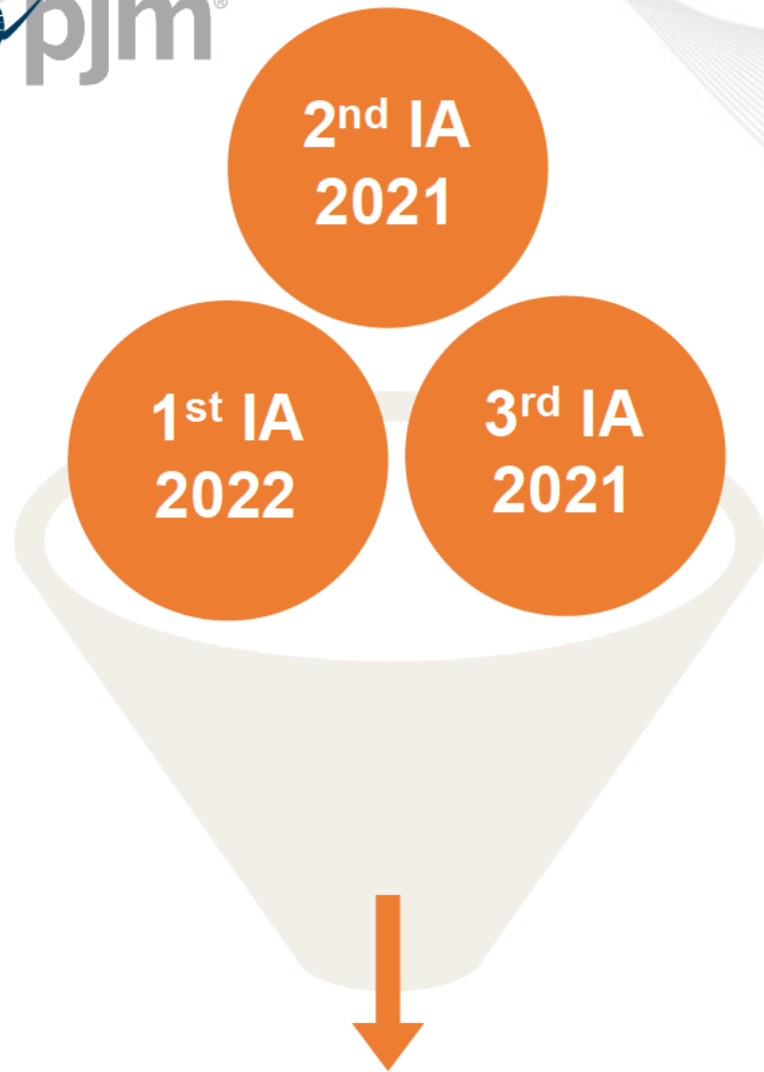
## **Interim Deliverability Study is targeted towards:**

- Projects coming into service prior to the impact study year
- Projects that are dependent on a network or baseline upgrade that expect the dependent reinforcement to be not completed at the time of the project coming online\*

\*Only facilities identified at constraints in the impact study will be monitored

# Incremental Auction Study Timeline





Scheduled Interim Studies



\*BRA studies are performed as needed

# Project Modifications/ Output Reduction Rules



**Material Modification:** a change that has a material adverse impact/effect to any later subsequently queued project in relation to scope, cost, or time.

- Changes that result in a Material Modification will not be accepted by PJM for current queue position held.
- A project may never increase the MFO or CIR without an additional new service request.
- A change in fuel type would require a material modification review.
- Significant changes to POI are considered material. Project must be withdrawn and a new Interconnection Request submitted for the modification.  
(Tariff Section 36.2A.3)

# Permissible Technological Advancement: New Tariff Section 36.2A.22

A Technological Advancement submitted to PJM no later than the return of an executed Facilities Study Agreement (or return of an executed ISA if a Facilities Study is not required) is classified as a **Permissible Technological Advancement** if the proposed change does not:

- Increase the capability of the Generating Facility
- Represent a different fuel type or
- Cause any material adverse impact(s) on the Transmission System.

If a proposed technological advancement is deemed a Permissible Technological Advancement, then the proposed change will not be considered a Material Modification and no additional PJM study will be required. All other proposed technological changes will require a study to determine if the change would constitute a Material Modification.

## Modification Prior to the Commencement of the Feasibility Study (Tariff Section 36.2A.1.1)

Interconnection Customer may reduce its project by up to **60%** of the electrical output. Timing of the announcement depends on which month of the queue they entered:

- i. For projects that enter the queue in Months 1-5, customer must identify the change prior to the close of business on the last day of the sixth month.
- ii. For projects that enter the queue in Month 6, the customer must identify the change no later than close of business on the day following the completion of the scoping meeting.

## Modification After the start of the Feasibility Study but Prior to Executing a System Impact Study Agreement (Tariff Section 36.2A.1.2)

Interconnection Customer may reduce its project by up to **15%** of the electrical output. For a request to reduce by more than 15%, customer must request PJM to determine whether such a change would be a material modification. PJM will allow the customer to reduce the size of its project:

- i. to any size if PJM determines the change is not a material modification, or
- ii. by up to **60%** of the electrical output if PJM determines it is material, however, in this case the project would be removed from its current position and be assigned a new queue position at the beginning of the subsequent queue and your future studies will be performed consistent with the timing of studies for projects submitted in the subsequent queue.

## Modifications After the System Impact Study Agreement but prior to Executing an Interconnection Service Agreement (Tariff Section 36.2A. 2)

Interconnection Customer may reduce its project by the greater of **10 MW or 5%** of the electrical output. For a request to reduce by more than this, customer must request PJM to determine whether such a change would be a material modification. PJM will allow the customer to reduce the size of its project:

- i. to any size if PJM determines the change is not a material modification, or
- ii. by up to the greater of **50 MW or 20%** of the electrical output if PJM determines it is material, however, in this case the project would be removed from its current position and be assigned a new queue position at the beginning of the subsequent queue and a new **System Impact Study** will be performed consistent with the timing of studies for projects submitted in the subsequent queue



Agreement Type	New Service Customer	FERC Jurisdictional ?
Interconnection Service Agreements (ISA)	Generation/Transmission Interconnection Customer	Yes
Wholesale Market Participation Agreements (WMPA)	Generation Interconnection Customer	No
Interconnection Construction Service Agreement (CSA)	Generation/Transmission Interconnection Customer	Yes
Upgrade Construction Service Agreement (UCSA)	Transmission Interconnection Customer (Merchant Network Upgrades)	Yes



## FERC Jurisdictional Facilities

- Any facility that is part of the Transmission System
- Any distribution facility where there has been a prior wholesale sale
- Any facility that self certified to FERC as a Qualified Facility

## Interconnection Service Agreement

- Grants rights to interconnect and generate
- Defines project milestones
- Describes the project's point of interconnection
- Describes system upgrades and costs
- Outlines metering requirements
- Security requirement
- Persists after construction

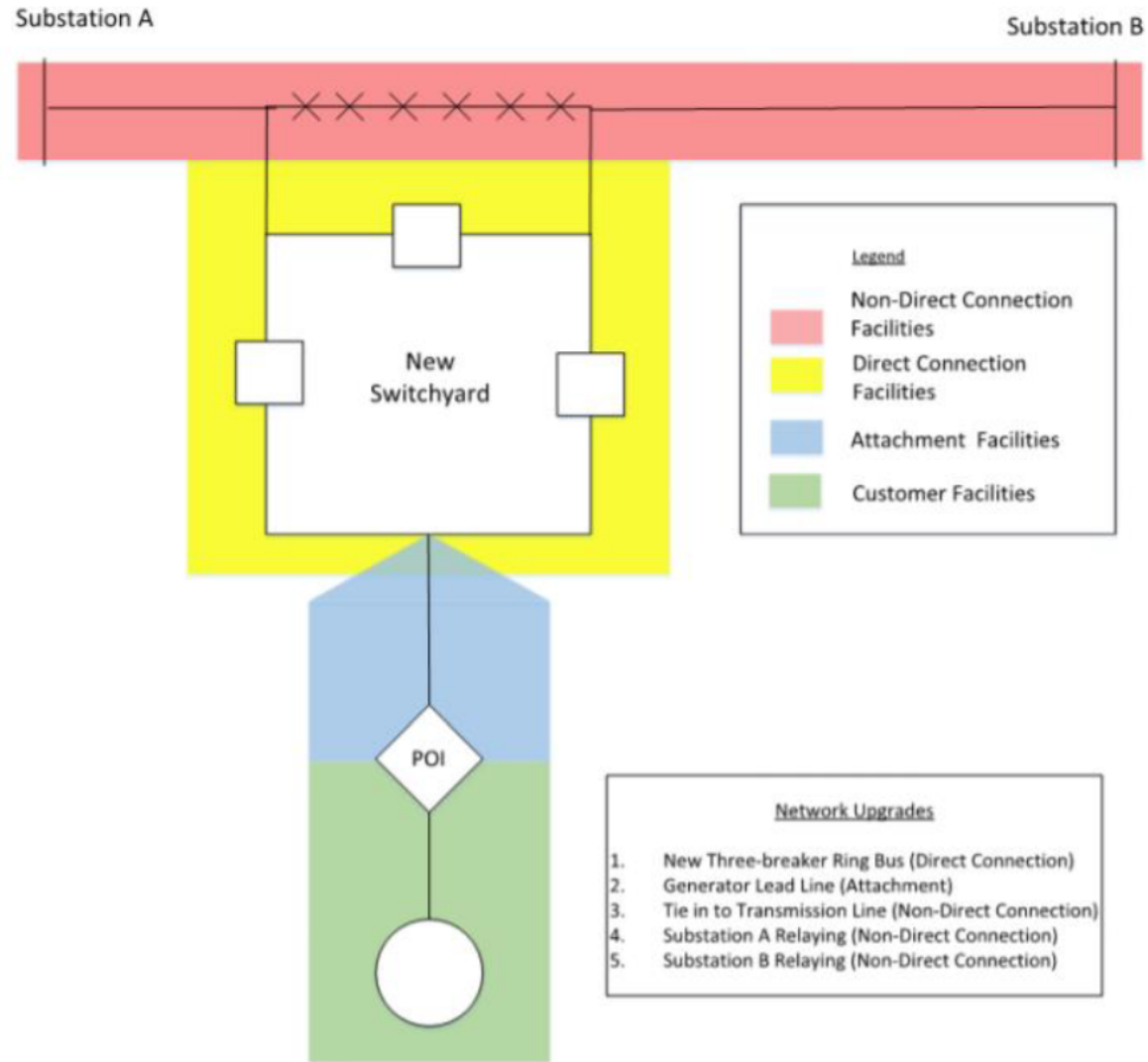
## Construction Service Agreement

- Outlines construction responsibility
- Contains upgrade construction schedule
- Contains notification and insurance obligations
- Terminates after construction



## Wholesale Market Participant Agreement

- Connects to distribution line
- No prior wholesale sales
- Requires customer to pursue a two-party Interconnection Agreement with TO
- Grants rights to participate in PJM's market
- Persists after construction



## Attachment Facilities

- Carry generator flows only (Generator lead line)

## Direct Connection Facilities

- No outage of existing facilities required to construct (Greenfield Interconnection Switchyard)

## Non-Direct Connection Facilities

- Modifications to existing TO facilities

## How Security is Calculated for ISA:

The Security amount is determined by PJM and is estimated to be the sum of the cost of:

- Required Non-Direct Network Upgrades.
- Any Network Upgrades that Transmission Owner(s) will be responsible for constructing that the customer has cost allocations towards.
- Required Attachment Facilities and Direct Connection Network Upgrades work that the Interconnected Transmission Owner expects to complete during the first three months of construction work.

## Customer can select Option to Build (OTB)

- Up to 30 days after receiving the Facilities Study.
- Customer can only build Direct Connection Facilities (facilities that can be built without interrupting existing Transmission Owner facilities)

# Interconnection Service Agreement Implementation

# Agreement Implementation (Construction)



## PJM's Responsibilities:

- Periodic construction status meetings
- Outage coordination
- Billing and cost tracking for each Network Upgrade Number
- Metering and telemetry from IC to PJM
- Test energy injection
- Project close out

## KEY TAKEAWAYS

- Participation in the PJM markets requires a New Services Request.
- New Services Application type depends on the customer type (PJM M14A).
- Customer must have a complete application including an executed agreement, requisite deposit and required Queue Point data.
- Feasibility, System Impact and Facilities Studies are performed.
- Modifications to New Services projects must follow PJM Tariff 36.2A rules.
- Final agreement received depends on FERC jurisdiction and customer type.