Introduction to NYISO Onboarding

Intended for Wind and Solar Resources

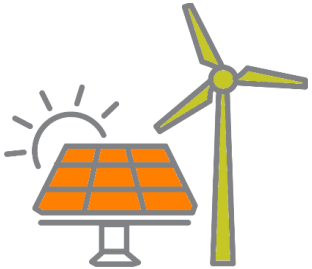
Market Training Team

Market Training, NYISO

Onboarding of New Resources – Wind & Solar Education Suite

December 2023

Remote Learning



Module Topics

INTRODUCTION TO NYISO ONBOARDING

ONBOARDING CHECKLIST

ONBOARDING OF NEW RESOURCES: WIND & SOLAR EDUCATION SUITE CONTENTS

USEFUL WEBSITE INFORMATION

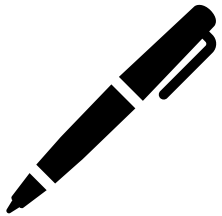
COMMERCIAL PARTICIPATION INSIGHTS

Introduction to NYISO Onboarding

- Wind & Solar Resource (aka Intermittent Power Resource or IPR) applicants seeking to sell Energy, Capacity and/or Ancillary Services into the NYISO-Administered markets must complete the formal NYISO onboarding process
- The onboarding process consists of a series of steps to be taken by the applicant, in collaboration with multiple NYISO departments
- The Wind & Solar onboarding education suite has been designed to help guide new Wind & Solar resources through that process

Onboarding Checklist

In no particular order…



- ☐ Interconnection Process
- ☐ Buyer-Side Mitigation (BSM)
- ☐ Customer Registration Packet
- ☐ Establishment of Forecasting
- ☐ Operations Modeling Info
- ☐ Capitalization & Credit Forms
- ☐ Reference Levels Established
- ☐ Outage Scheduling Submitted
- ☐ ICAP Enrollment Complete
- ☐ Familiarize w/NYISO Invoicing

Onboarding of New Resources: Wind & Solar Education Suite Contents

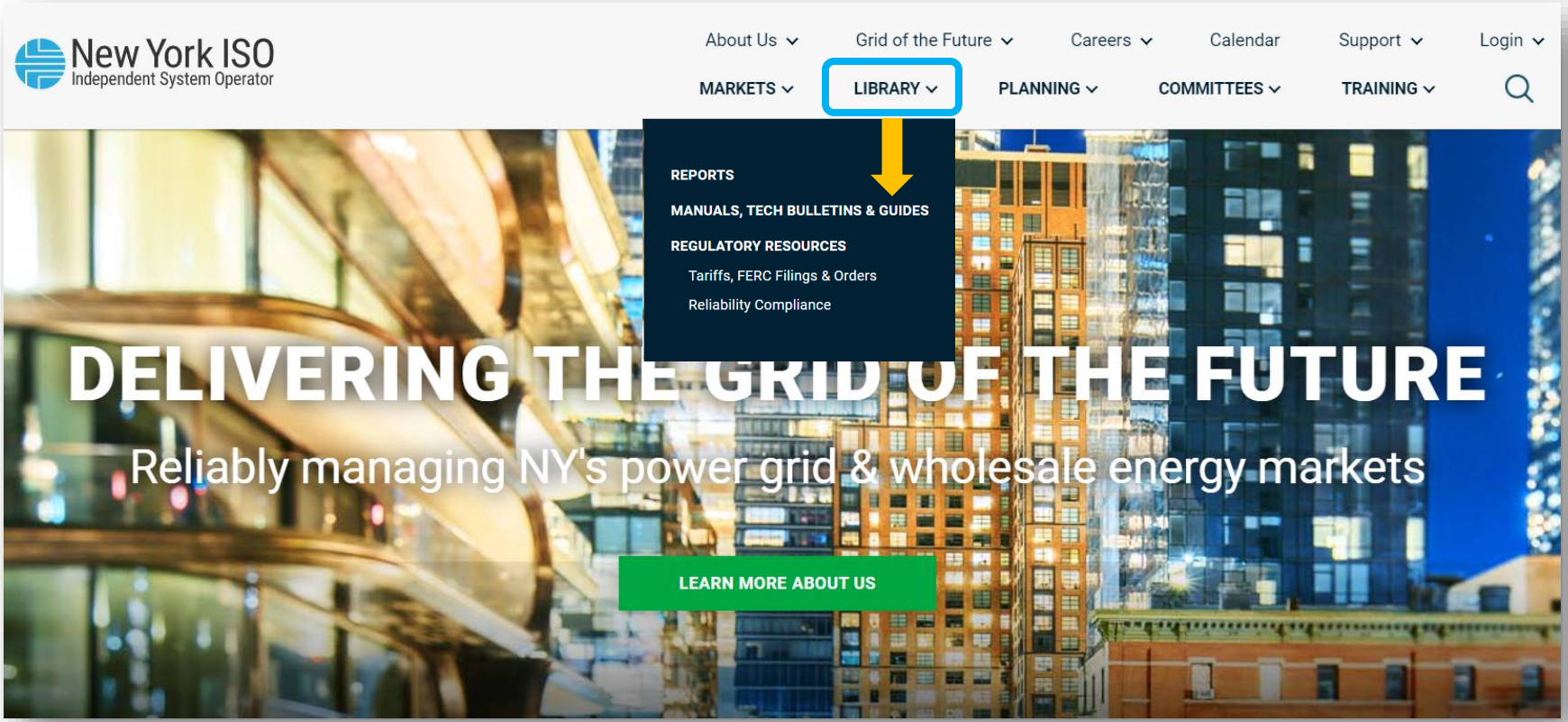
Wind & Solar Education Suite Table of Contents

New York ISO

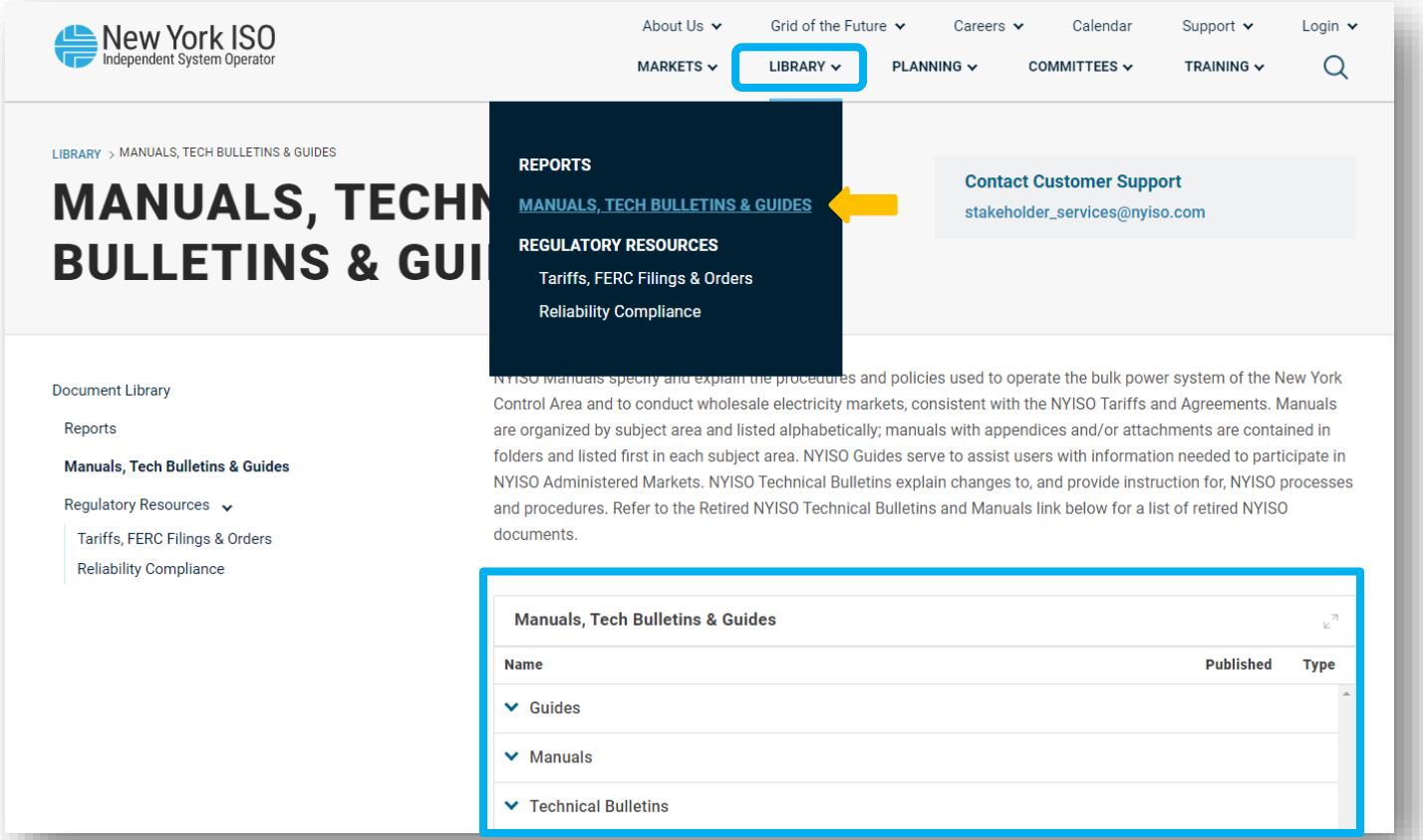
Topic	Resource Mode
Introduction to Onboarding	eLearning Module
1. Interconnection and BSM	Fact Sheet (PDF)
2. Customer & Resource Registration Process	eLearning Module
3. Establishment of Forecasting	Fact Sheet (PDF)
4. Resource Modeling, End-to-end communications testing and Pre-Commercial testing	Fact Sheet (PDF)
5. Credit Requirements	Fact Sheet (PDF)
6. Market Mitigation & Analysis Reference Levels	Info Graphic (PDF)
7. Outage Scheduling Submission	Fact Sheet (PDF)
8. Installed Capacity (ICAP) Participation Enrollment	Fact Sheet (PDF)
9. Metering Requirements	Info Graphic (PDF)
10. Metering for Settlements	Info Graphic (PDF)
11. Financial Settlements	Quick Reference Sheet (PDF)
12. Resource Appendix: Onboarding of New Wind & Solar Resources	PDF

NYISO Website Information

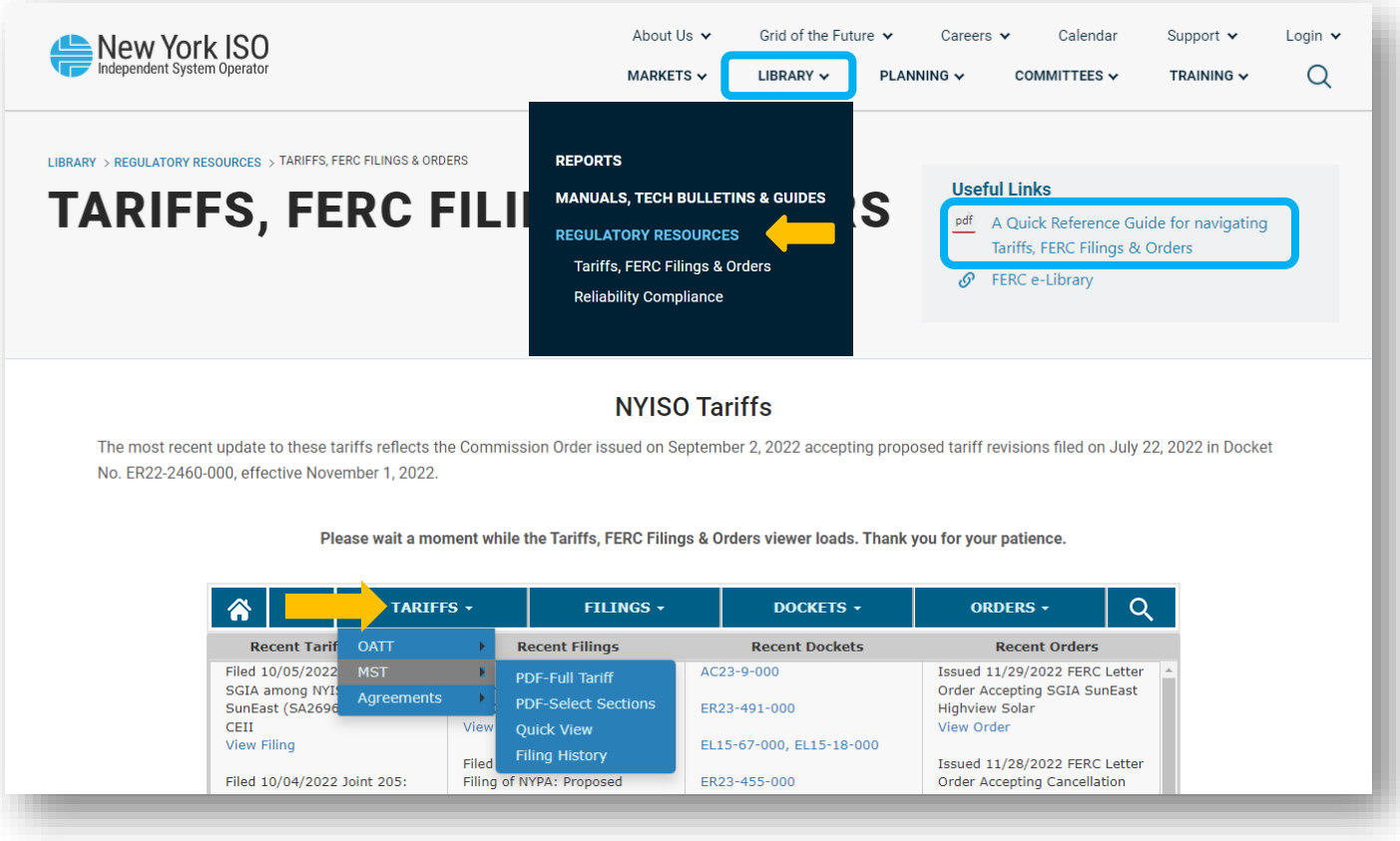
NYISO Document Library



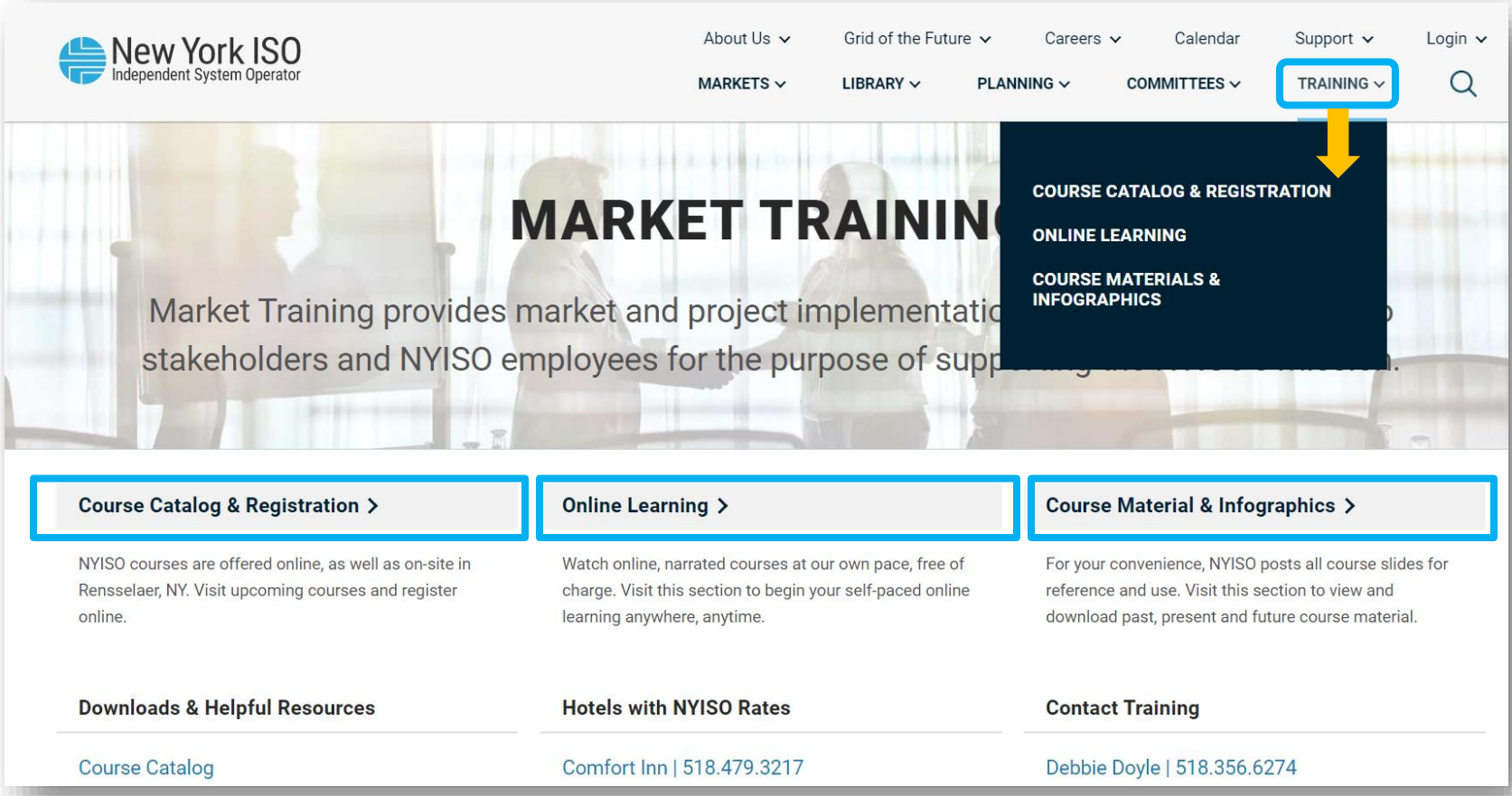
NYISO Manuals, Tech Bulletins & Guides



NYISO Regulatory Resources



NYISO Market Training Resources



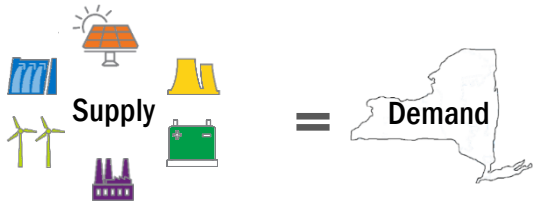
Commercial Participation Insights

Wind & Solar Participation Requirements

- **Qualifying for wholesale market participation requires that IPRs:**
  - Meet a minimum offer size requirement of 1 MW
  - Comply with all metering requirements
    - Meters must:
      - Be approved by Metering Authority
      - Provide revenue-grade hourly metering information
      - Provide six-second telemetry
      - Comply with minimum acceptable accuracy standards
  - Account for energy withdrawals that serve Station Power
  - Must be able to respond to economic curtailment signals from the NYISO (via their Transmission Owner)

Commercial Participation

- **Wholesale Energy Markets**
  - Energy production from power suppliers participating in the NYISO's energy markets are used to meet demand in New York
  - IPRs may enter supply offers into:
    - **Day Ahead Market: To procure supply to meet the forecasted load for the next operating day**
    - **Real Time Market: The Balancing Market to meet any differences between the Day ahead scheduled energy and Real Time demand**



Commercial Participation cont'd

- **Ancillary Services**
  - Power Suppliers providing Ancillary Services
    - **Support transmission of energy from resources to loads**
    - **Maintain reliable operation of NY State power system**
  - IPRs may provide:
    - **Voltage Support Service**
      - To ensure sufficient supply of Reactive Power to maintain desired voltage levels on the NYCA Transmission System in real time operations

Commercial Participation cont'd

- **Installed Capacity Market**
  - Power Suppliers participating in the NYISO's Installed Capacity Market
    - **Contribute to procuring sufficient resource capability to meet expected maximum energy needs plus an added margin**
  - IPRs that participate in the Installed Capacity (ICAP) Market as suppliers offer to sell capacity:
    - **Through NYISO administered auctions and are awarded monthly capacity payments that go toward recovering a portion of their fixed costs, *or***
    - **Engage in Bilateral Capacity Transactions**

Next Steps

Post Onboarding Next Steps

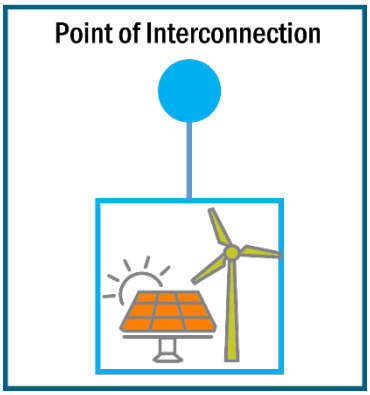
- **Continued Education Opportunities**
  - Access Bid-to-Bill eLearning module
    - Wind & Solar Intermittent Power Resources Participation Model
  - Register and Attend NYISO Instructor-Led Training
    - New York Market Orientation Course (NYMOC)
    - LBMP In-Depth
    - Intermediate Installed Capacity Course
    - Accounting & Billing Workshop
- **Customer Support**
  - Reach out to NYISO Stakeholder Services with your questions
    - stakeholder_services@nyiso.com
    - 518-356-6060
- **Member Relations Services**
  - Participate in NYISO Shared Governance
    - customer_registration@nyiso.com
      - Meeting Attendance only, ***or***
      - Paid Membership with voting rights

New York ISO

Wind/Solar Intermittent Power Resource Interconnection

Interconnection of a new Wind or Solar IPR to the NY Transmission System or FERC-jurisdictional Distribution System

- A wholesale Wind or Solar IPR can connect to the NY Transmission System or FERC-jurisdictional Distribution System through the NYISO's interconnection process
- Series of studies and detailed analyses to determine:
  - Whether adding the new resource creates reliability issues on the system
  - System upgrades that may be required to maintain system reliability if a project impacts system reliability
  - Cost of the upgrades
- The steps in an IPR's Interconnection process are the same as for other Generators submitting an Interconnection Request
- A Wind or Solar IPR's ERIS and CRIS values will be determined through the Interconnection Process



ERIS

- ERIS is the basic Interconnection service allowing a Developer to interconnect their wholesale IPR to the NYCA Grid
- In accordance with NYISO Minimum Interconnection Standard
- Allows for Energy market participation to enable wholesale grid to receive electric energy from the resource
- All resources must obtain ERIS either through NYISO's Interconnection process or obtain an ERIS equivalent value through Transmission Owner's Interconnection process

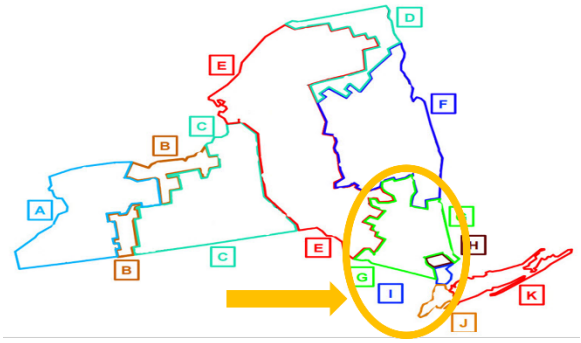
CRIS

- CRIS is one of the eligibility requirements allowing a Developer to participate as an Installed Capacity Supplier
- Allows for Installed Capacity Market participation to enable the resource to offer capacity as a supplier
- Resource larger than 2 MW must obtain CRIS through deliverability studies as part of the NYISO's Interconnection process
  - Resources smaller than 2 MW do not need to participate in a Deliverability Study to obtain CRIS

Wind/Solar Intermittent Power Resource Buyer Side Mitigation

When does the Buyer Side Mitigation evaluation take place?

- The purpose of Buyer Side Mitigation: Prevent uneconomic entry from artificially suppressing Installed Capacity prices
  - Buyer Side Mitigation rules only apply for the Mitigated Capacity Zones (New York City and Zones G-J)
- BSM evaluation process occurs concurrently with the NYISO deliverability studies, where the CRIS request is evaluated



How are Wind and Solar IPRs evaluated for Buyer Side Mitigation?

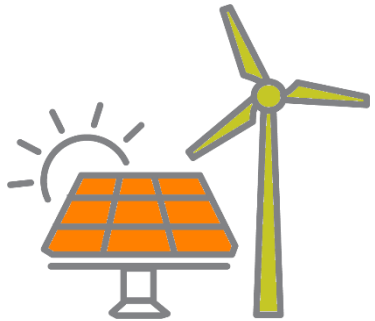
- A Wind or Solar Intermittent Power Resource is considered an Excluded Facility as it is qualified to satisfy the goals specified in the New York State Climate Leadership and Community Protection Act (CLCPA)
- Therefore, IPRs will not be subject to review by the NYISO under BSM rules or otherwise be subject to an Offer floor

NYISO Customer Registration and Resource Registration

Intended for Wind and Solar Intermittent Power Resources (IPRs)

Market Training Team
Market Training, NYISO

Onboarding of New Resources – Education Suite
December 2023
eLearning Module



Overview of NYISO's Registration Process

- The NYISO's Registration process for a new applicant entity/organization that owns or operates a Wind or Solar Intermittent Power Resource (IPR) and wishes to participate in NYISO's markets consists of two streams:
  - NYISO Customer Registration Process
  - Resource Registration Process
- An entity/organization that is already a NYISO customer, and would like to register a Wind or Solar IPR for NYISO market participation needs to only go through the Resource Registration Process

NYISO Customer Registration

- Must be completed by any new applicant that wishes to become a NYISO customer
- Applicant must comply with the terms and conditions set forth in the NYISO tariffs and is qualified to take the services provided for in the NYISO tariffs
  - Open Access Transmission Tariff (OATT)
  - Market Administration and Control Area Services Tariff (MST)
- Applicant must complete all Registration requirements to qualify

NYISO Customer Registration

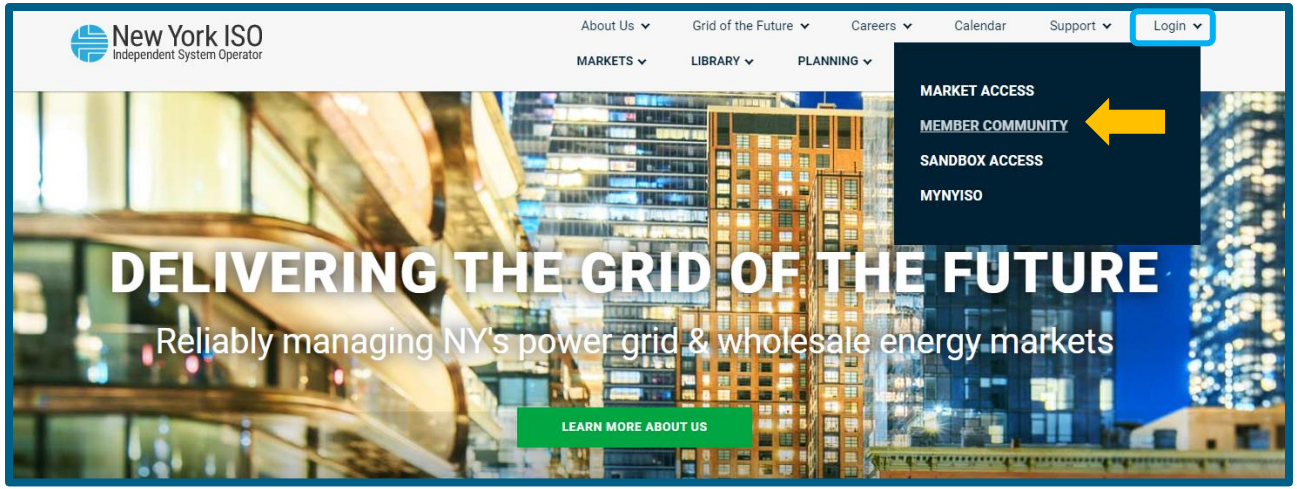
- No Registration, membership, or other fee for a new applicant registering to be a NYISO Customer
  - Please note that applicants will have specific credit requirements*
- Once approved as a NYISO Customer, the applicant will incur a share of:
  - NYISO's Operational Costs
  - Other financial obligations pertaining to their role of participation in qualified NYISO markets
- Calculations of Rate share and other financial obligations determined according to Tariffs

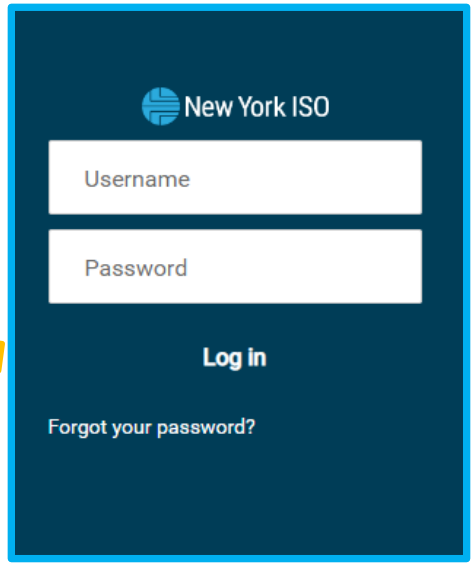
* Refer to the Credit infographic of this Onboarding Educational suite for details

NYISO Customer Registration

- Registration package is submitted through the NYISO's Member Community Online Portal
- Initial Steps:
  1. Applicant's Initial Email inquiry to customer_registration@nyiso.com
  2. Assignment of login credentials for the Member Community Portal for main Administrator and other appropriate users in Organization
  3. Completion of:
     - NYISO Customer Registration Application
     - Service Agreement OATT Attachment A
     - Service Agreement MST Attachment A
     - Satisfy Minimum Participation Criteria
     - Provide Credit Support, as applicable

NYISO Customer Registration

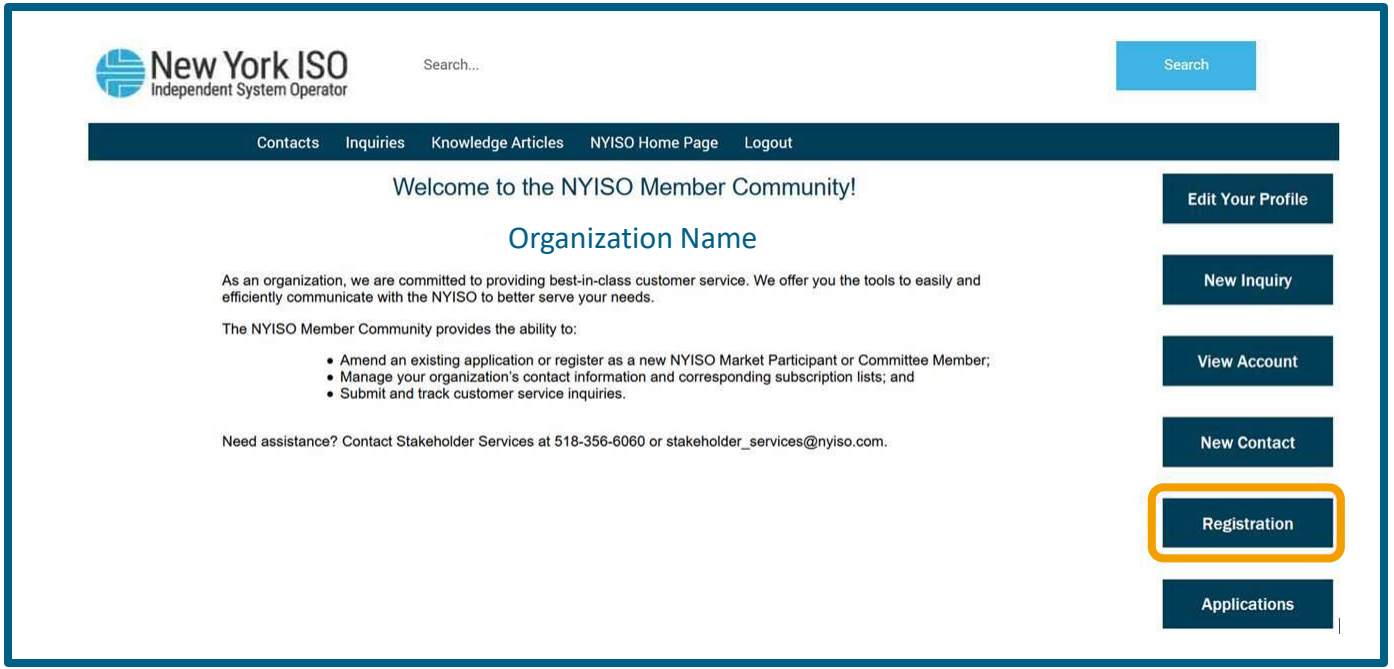




Accessing the NYISO's Member Community Portal

NYISO Customer Registration

NYISO Member Community Portal



NYISO Customer Registration

- Minimum Participation Criteria:
  - Customer specific eligibility requirements set forth in Tariffs
  - List of parent company and any Affiliates
  - Risk management: Approved risk management policies and procedures
  - Training: Appropriate training to bid/schedule and participate in NYISO administered market areas as a Wind or Solar Resource
  - Operational capabilities: Personnel resources and technical abilities to respond to NYISO communications and directions
  - Financial capabilities: Appropriate experience and resources to satisfy obligations to NYISO
  - Capitalization: Minimum capitalization requirement

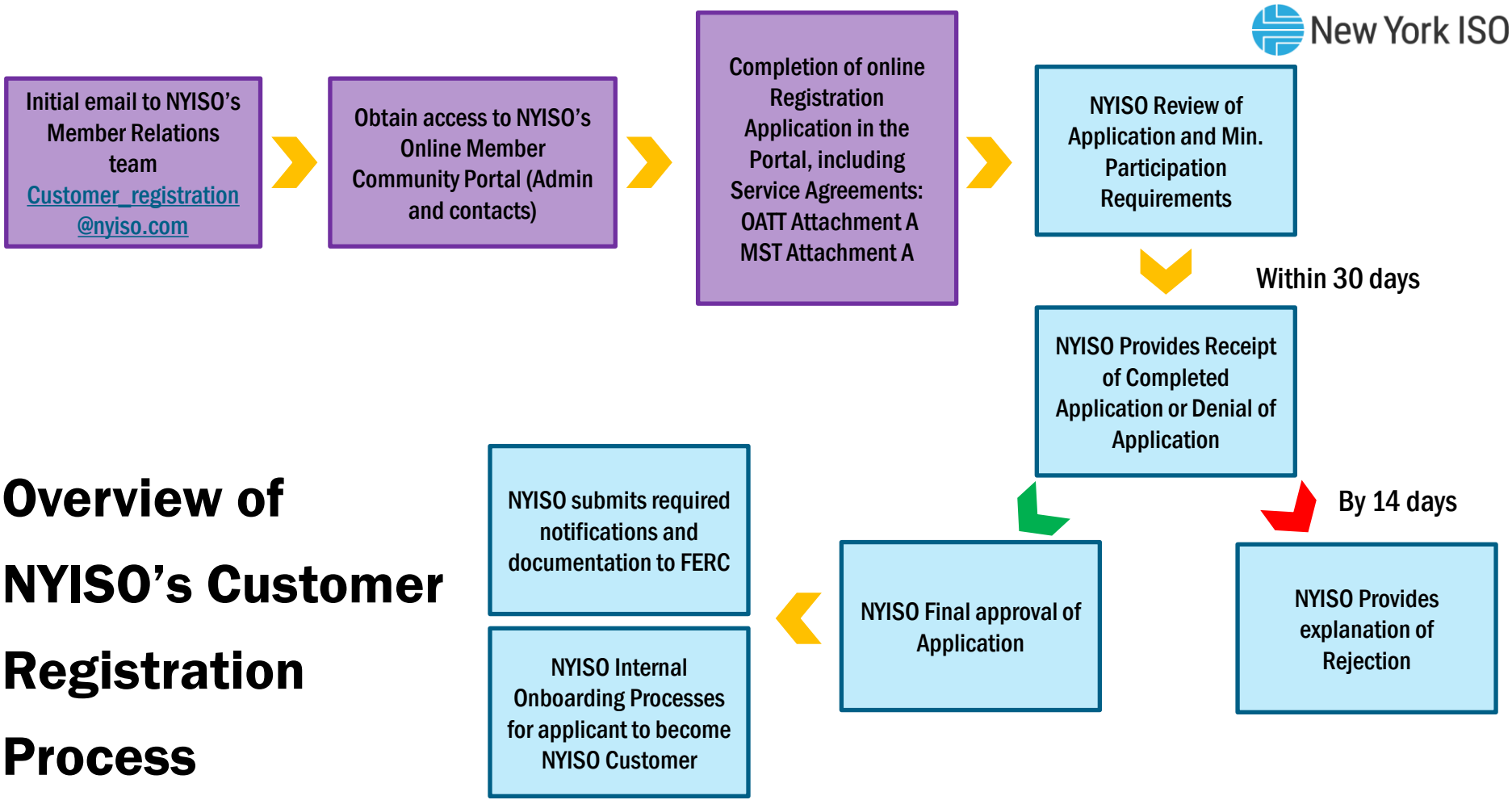
NYISO Customer Registration

- Minimum Participation Criteria:
  - Minimum Capitalization Requirement
    - Maintain at least US $10 million in assets or at least US $1 million in tangible net worth
      - As evidenced by Customer's or its guarantor's most recent audited annual financial statements
  - If unable to meet Minimum Capitalization Criteria, post with NYISO either:
    - $200,000 to participate in any/all of the ISO-Administered Markets other than the TCC market, or
    - $500,000 to participate in any/all of the ISO-Administered Markets including the TCC market
  - The Customer may not use this security to support any NYISO credit requirements

NYISO Customer Registration

- Timeline Facts:
  - The primary Registration process of review, validation and approval of a new applicant as a NYISO customer may take up to, or more than, 60 days
  - Incomplete applications expire 12 months from the date of receipt by the NYISO or 6 months from the date of NYISO legal approval, whichever is earlier
  - The Interconnection Study process does not need to be completed before starting Customer Registration
    - However, by the time Registration is completed, all the steps in the Interconnection process needs to be completed, and the Interconnection Agreement needs to be executed

Overview of NYISO's Customer Registration Process



NYISO Customer Registration

- NYISO Internal Onboarding Processes:
  - Credit Evaluation
  - Establishing MIS privileges
  - Establishing system access privileges for organization/personnel:
    - NAESB Digital Certificate
    - NYISO online systems such as Market Information System (MIS), ICAP Automated Market System, (ICAP AMS), Reference Level System (RLS), Credit Management System (CMS), Outage Management System (OMS), Customer Settlement Interface (CSI) etc.

Resource Registration Process

- Process by which new/existing NYISO customers register a resource for participation in NYISO markets
- Can take place in parallel with the NYISO Customer Registration Process for new applicants who own or operate a Wind or Solar Resource and wish to participate in NYISO markets
- Resource specific sections of the application package (Section BB, Section EE, one-line diagrams, etc.) used to complete:
  - Resource modeling in NYISO operational systems
  - Establishing Day-ahead and Real-time power output forecasting with NYISO's forecast vendor
  - Establishing resource specific privileges in NYISO systems
  - Pre-commercial processes to get resource ready for commercial participation in NYISO markets
- Resource specific sections must be submitted at least 4-6 months before Start-Up testing to account for accurate modeling of the resource in NYISO Operational systems

Resource Registration

- Operational Information from Resource in Registration Application:
  - Section BB of Registration packet, information includes:
    - Generator size
    - Operating restrictions
    - NYS Transmission System injection point and voltage level
    - VAR Capability of Resource
    - Indication of ICAP Market Participation
  - One-line Diagram of the resource
    - Representation of all electrical equipment and connections

Cont.

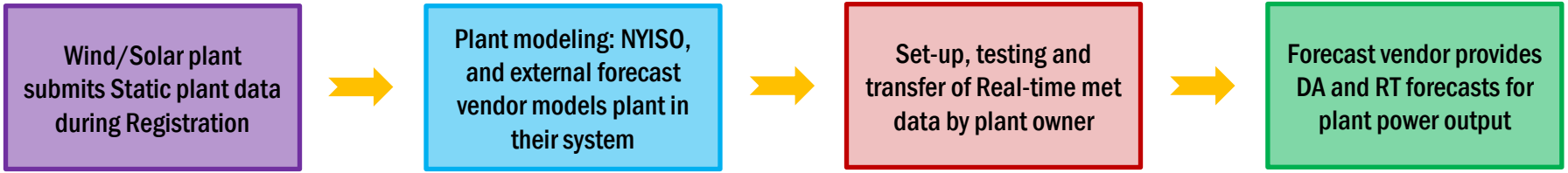
Resource Registration

- Plant specific data required for Wind and Solar Resources – Section EE of Registration packet
  - Static Plant data
    - Description of individual site configurations
    - Information on meteorological towers
    - Details on wind turbines and solar array location
    - Manufacturer's power curves
- Site-specific meteorological data
  - All Wind Resources, and Solar resources greater than 20 MW
  - Two options for providing meteorological data:
    - Via NYISO's web service application, OR
    - Directly via ICCP
- Maximum plant availability
- 2 year look ahead outage schedule

For more details, please refer to the Wind and Solar Plant Operator Data User's Guide

Establishment of Wind/Solar Forecasts

- Key step in Registration of Wind or Solar resources required for Energy Market participation
  - Day-ahead and Real-time forecasts of power output from Wind or Solar IPRs are inputs used for scheduling in the Day-Ahead and Real-Time Markets
- Initial set up for generating plant specific forecasts coordinated between:
  - NYISO
  - Plant owner
  - NYISO external forecast vendor
- Prior to start of commercial participation, the Resource will test the transfer of Real-time meteorological data required for generation of the forecast of power output
  - This will be validated by the external forecast vendor
- Plant owners will be assessed an IPR Forecast Charge by the NYISO throughout NYISO market participation



For more details, please refer to the Establishment of Wind and Solar Forecasts fact sheet that is part of this Onboarding Educational Suite

Resource Registration

- NYISO Internal Processes pertaining to Resource Registration:
  - Resource modeling in NYISO operational systems*
  - Establishing NYISO MIS system privileges for market participation of the resource
    - Establishing Generator Point Identifier (PTID)
    - Establishing Energy flags within the NYISO MIS
    - Establishing resource specific Registration parameters
  - Establishing Reference Levels for Energy for new IPR
  - Establishing ICAP Market related metrics within ICAP AMS (CRIS, derating factors, Unforced Capacity) for new Wind or Solar IPR

* For more details on this process, please refer to the Resource Modeling, End-to-End Communications Testing and Pre-Commercial Testing factsheet that is part of this Onboarding educational suite

End-to-End Communications Testing

- Prior to pre-commercial testing, the Resource must successfully complete end-to-end communications testing
  - NYISO transmitted 5-minute & 6-second MW basepoints to Gen and Transmission Owner
  - NYISO transmitted curtailment status flag
  - NYISO received Generator MW/MVAR (and alternate sourced MW/MVAR if available)
  - NYISO received Generator breaker status
- Done in coordination between:
  - Plant Owner
  - Applicable Transmission owner (TO)
  - NYISO

* For more details on this process, please refer to the Resource Modeling, End-to-End Communications Testing and Pre-Commercial Testing factsheet that is part of this Onboarding educational suite

Pre-Commercial or Start-up Testing

- New Wind or Solar resources connect to the grid and operate in testing mode to prepare for commercial operation
  - Coordinated between
    - NYISO Grid Operations team, NYISO Outage Scheduling team
    - Wind or Solar Resource
    - Applicable Transmission Owner (TO)
  - New resources must notify NYISO and the applicable Transmission Owner (TO) at least 30 days prior to connecting to the grid
  - End-to-end communications testing must be successfully completed before start up testing commences
  - Various plant systems are tested prior to the commercial operation of a new generating facility
  - Curtailment testing:
    - To ensure that Wind or Solar resources can respond to activation of the curtailment flag and reduce their output in response to NYISO basepoints
    - Conducted once the plant reaches the lesser of its nameplate capacity or 20 MW output
    - NYISO activates curtailment flag and dispatches resource to 0 MW output

* For more details on this process, please refer to the Resource Modeling, End-to-End Communications Testing and Pre-Commercial Testing factsheet that is part of this Onboarding educational suite

Resource Registration - Summary

New York ISO

Registration Application through Member Community Resource Specific Sections

Resource modeling in NYISO Operational Systems

Modeling in NYISO MIS:
- Establishing MIS privileges
- Establishing PTID
- Establishing Energy flags

Establishing System Access Privileges

Establishing Wind/Solar Forecasting

NYISO Processes

Establishing Reference Levels

ICAP Market related Processes
- Importing CRIS values into ICAP-AMS
- Coordinating entry of initial DMNC test values into ICAP AMS
- Calculating derating factor for resource
- Establishing Unforced Capacity (UCAP) for resource

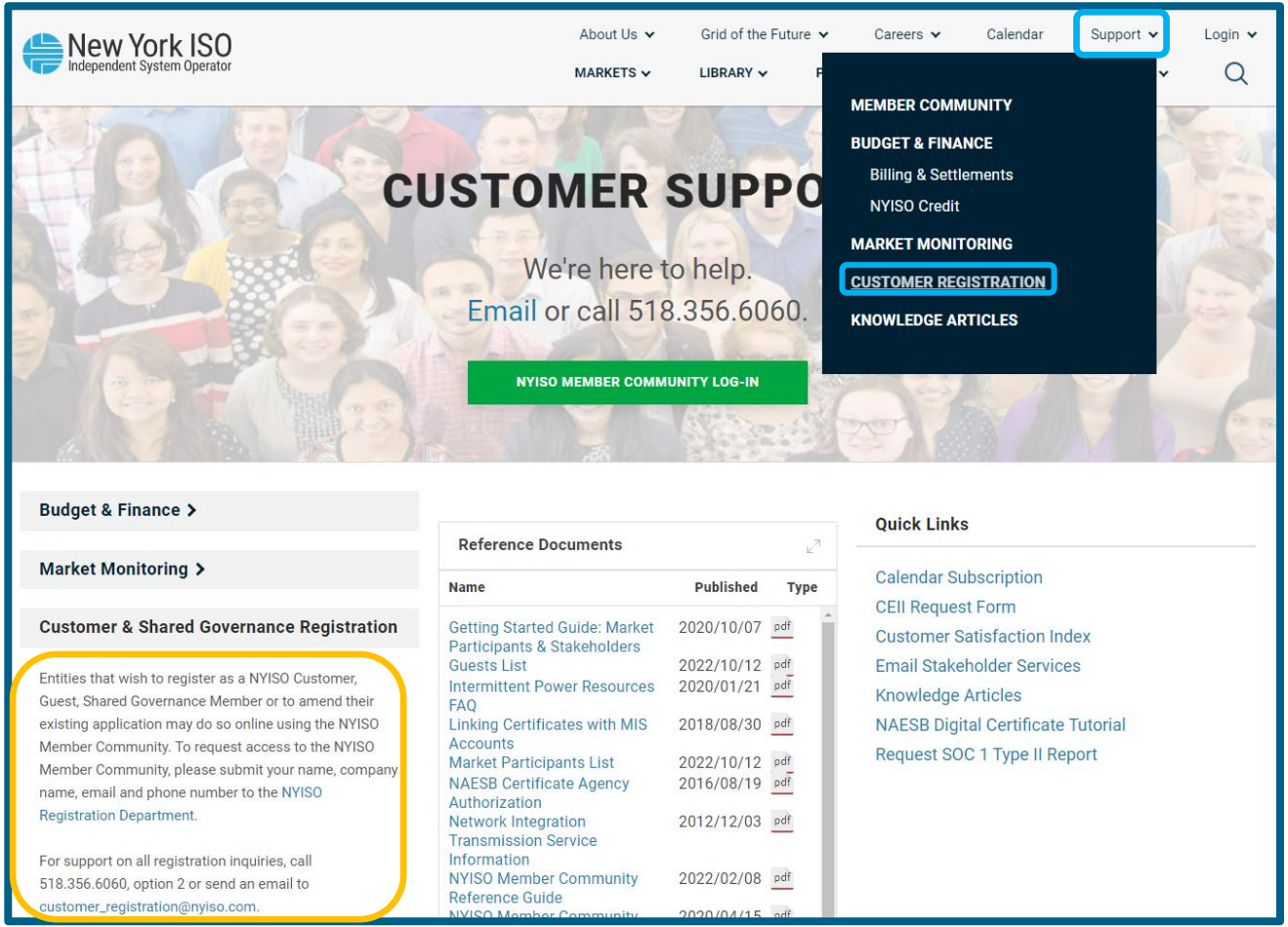
Start NYISO Market Participation

End-to-End Communications Testing

Pre-Commercial or Start-Up Testing

Testing by Resource

Real time met data transfer testing



Contact Information – NYISO Registration

Onboarding Educational Suite Table of Contents

New York ISO

Topic	Resource Mode
Introduction to Onboarding	eLearning Module
1. Interconnection and BSM	Fact Sheet (PDF)
2. Customer & Resource Registration Process	eLearning Module
3. Establishment of Forecasting	Fact Sheet (PDF)
4. Resource Modeling, End-to-end communications testing and Pre-Commercial testing	Fact Sheet (PDF)
5. Credit Requirements	Fact Sheet (PDF)
6. Market Mitigation & Analysis Reference Levels	Info Graphic (PDF)
7. Outage Scheduling Submission	Fact Sheet (PDF)
8. Installed Capacity (ICAP) Participation Enrollment	Fact Sheet (PDF)
9. Metering Requirements	Info Graphic (PDF)
10. Metering for Settlements	Info Graphic (PDF)
11. Financial Settlements	Quick Reference Sheet (PDF)
12. Resource Appendix: Onboarding of New Wind & Solar Resources	PDF

New York ISO

Establishment of Wind/Solar Forecasts

Registration: Wind/Solar Resource submits Static Plant Data

- Static plant data submitted during NYISO Customer and Resource Registration process
- Section EE of registration package
- Includes descriptions of their individual site configuration, turbine and solar array locations, meteorological (met) tower locations, make/model information, and unique identifiers for each meteorological data collection point

Plant Modeling: NYISO, and external forecast vendor model the plant in their systems

- NYISO transfers plant specific data (including Section BB and EE of Registration package) to external forecast vendor for each individual plant to be modeled in their system
- NYISO models the resource in its operational systems
- Vendor performs data integrity check, communicates with NYISO Registration if any information needs to be resubmitted
- Vendor reviews physical location of plant and meteorological data collection points for accuracy
- At minimum, each wind turbine or solar array at the plant site must be within 5 kilometers of a meteorological data collection point. This is the minimum requirement only
- See Section 3.3.2 of Wind and Solar Plant Operator User's Guide for more details

Resource sets up transfer of Real Time met data elements to NYISO

Testing of Real-time met data transfer to the NYISO

- Wind/Solar plant owner sets up technology to enable data transfer of Real-time meteorological data with the NYISO; NYISO will in turn transfer data to the forecast vendor
- Details on formats and protocols, as well as equipment maintenance details in Appendix A of the Wind and Solar Plant Operator's User's Guide
- SendMetData message: Message web service hosted by NYISO for plants to transfer met data
- For data elements and descriptions of the data elements, see section A.11 of Appendix A of the above-mentioned User's Guide

Plant starts transferring Real-time met data for forecasting

- Wind/Solar plants must test Real-time met data transfer during or just after start-up testing, but prior to start of commercial participation
- NYISO Registration team will communicate with the resource if either the NYISO or the forecast vendor has any issues with the data transfer

Forecast vendor provides NYISO scheduling software with Day-ahead and Real-time power output forecasts for each plant

- Plant owners must transfer Real-time met data at least once every 30 seconds 24/7/365
- Forecast vendor will send plant owners hourly met data quality alerts
  - Plant owner must take action to address any data quality issues
- Plant owners can access Day-ahead and Real-time forecasts from the vendor's website using login credentials provided by the vendor
- Plant owners must ensure that the met data feed is maintained throughout their NYISO market participation
- Plant owners will be assessed a IPR Forecasting Charge by NYISO

Wind and Solar Intermittent Power Resource (IPR)

Resource Modeling, End-to-End Communications Testing, and Pre-Commercial Testing

Modeling of a new Wind or Solar Resource within NYISO Operational Systems

To enable accurate system representation, the new Wind or Solar IPR must be modeled in the NYISO Operational systems and the NYISO's Market Information Systems (MIS). The inputs used for modeling the resources include metering configuration setup, and resource-specific parameters submitted in Section BB and Section EE as part of Registration.

Section BB includes:

- Generator size
- Maximum plant availability
- Operating restrictions
- NY State Transmission System injection point and voltage level
- Indication of ICAP Market Participation

Section EE includes:

- Static Plant Data
  - Physical Layout of plant
  - Details on Wind turbines
  - Details on solar arrays
  - Manufacturer's power curves
  - Details on Meteorological towers and location

Resource specific Object IDs are assigned for Wind turbines, Solar arrays, meteorological towers etc., and appropriate MIS flags (Energy participation) are attributed to the resource within the NYISO's operational systems and the MIS. For timely modeling to be completed and for start-up testing and participation in the NYISO markets, the recommended timeframe for modeling a new resource is 4-6 months prior to the intended start date.

Also see the Wind and Solar Plant Operator Data User's Guide for more information.

End-to-end communications testing

Once the resource has been modeled in NYISO's operational systems, the Wind or Solar IPR must coordinate with NYISO (Customer Registration team and Power Systems Applications Engineering team) and its applicable Transmission Owner to set up end-to-end communications testing.

Communications testing includes:

- NYISO transmitted 5-minute & 6-second MW basepoints to Generator and TO
- NYISO transmitted curtailment status flag
- NYISO received Generator MW/MVAR (and alternate sourced MW/MVAR if available)
- NYISO received Generator breaker status

Real-time communication protocols and the communications path must be established with the respective Transmission Owners (TOs) prior to the onset of end-to-end communication testing. The typical path is a three-way communication path from the NYISO Control Computer System to the Transmission Owner Control Computer system, and from there to the Generator. Requirements and procedures are detailed in the Control Center Requirements Manual. Generators requesting additional (and optional) direct communication with the NYISO for transmitting data and basepoint information must follow the procedures outlined in the Direct Communications Manual, as well as reach out to NYISO Stakeholder Services.

End-to-end communications testing must be successfully completed prior to scheduling pre-commercial or start-up testing and must be coordinated with the NYISO using the customer_registration@nyiso.com email address.

Pre-Commercial or Start-Up Testing

Start-up testing covers various aspects of operating, scheduling, and bidding of new Wind or Solar IPR prior to commercial operation and participation in NYISO Energy and Installed Capacity Markets. Start-up testing must be coordinated with NYISO Customer Registration, Outage Scheduling department and NYISO's Operations Generation desk, as well as the applicable Transmission Owner. New resources must notify NYISO and the applicable TO at least 30 days prior to connecting to the grid. End-to-end communications testing must be successfully completed before Start-up testing commences. Various plant systems are tested prior to the commercial operation of a new generating facility, such as:

- Operating details of the new Generator
- Synchronization to the grid
- Meter data coordination for various phases of metering, based on MW output of Generator
- Testing for providing any selected Ancillary Services products (VSS), and
- ICAP specific resource capability testing (DMNC)

Resources also do Curtailment testing, to ensure that Wind or Solar resources can respond to activation of the curtailment flag and reduce their output in response to NYISO basepoints. This is conducted once the plant reaches the lesser of its nameplate capacity or 20 MWh output. NYISO will communicate the activation of the Curtailment flag and the resources is tested on its ability to reduce its power output, and ramp down all the way to 0 MW.

Details about pre-commercial start-up testing can be found in Technical Bulletin 116: New Generation Units Operating During the Start-Up Testing Phase.

During or just after Start-up testing, the Wind or Solar resource must complete Real time meteorological data transfer testing. Real-time data elements are transferred to the NYISO at least once every 30 seconds and is in turn transferred to the external forecast vendor in order to generate power output forecasts for scheduling Wind and Solar generators in NYISO's Energy markets.
To learn more, please refer to the Establishment of Wind and Solar forecasts factsheet that is part of this Onboarding Educational suite.

Once start-up testing is completed without any issues, the operational onboarding process of the new Wind or Solar IPR is complete. The resource can now start participating in the various NYISO markets and services that it qualifies for.

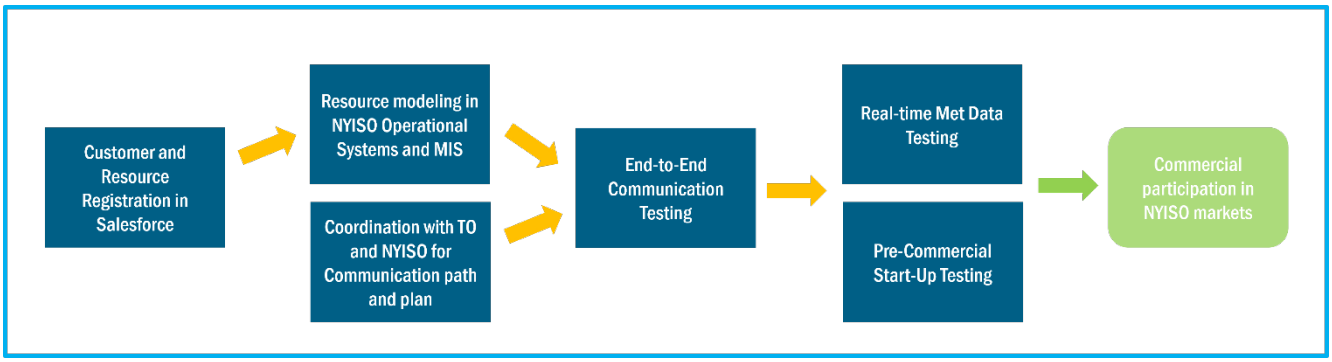


Figure: Process for resource modeling and Start-Up testing for a new Wind or Solar IPR

New York ISO

Credit

Market Participants can see their individual market credit requirements within the Credit Management System

The Credit Management System (CMS) is a New York Independent System Operator (NYISO) software application designed to allow viewing and maintenance of Credit information by qualified users.

What documentation is required on a periodic and annual basis?

Annual/Periodic Submissions: Summary Matrix

A. Market Participant authorized to participate in the TCC market
B. Market Participant NOT authorized to participate in the TCC market
C. Guarantor who has provided a guarantee to be used as collateral
D. Guarantor who has provided an unlimited guarantee solely for capitalization purposes
E. Market Participant who qualifies for and is using Unsecured Credit

Form	Due Date	A	B	C	D	E
NYISO Officer Certification Form and Credit Questionnaire	Annually by 4/30	X	X			X
Annual Financial Statements*	Within 90 days of fiscal year end	X	X	X	X	X
Quarterly Financial Statements	Within 60 days of quarter end			X		X
Risk Policies**	Annually by 4/30	X				
Road Map if requested	Date requested by the NYISO	X				
Affiliate Forms***	Annually by requested due date	X	X			X

* If the Market Participant is using financial statements to meet their capitalization requirement or is using Unsecured Credit, the annual financial statements must be audited.

** If the Market Participant's Risk Policies have not materially changed since the last annual submission, only the Road Map needs to be submitted indicating that there have been no material changes.

*** If the Market Participant is using Unsecured Credit and they do not submit the Affiliate Form by the date requested, the Unsecured Credit will be removed and secured credit will be required until the form is received.

New York ISO

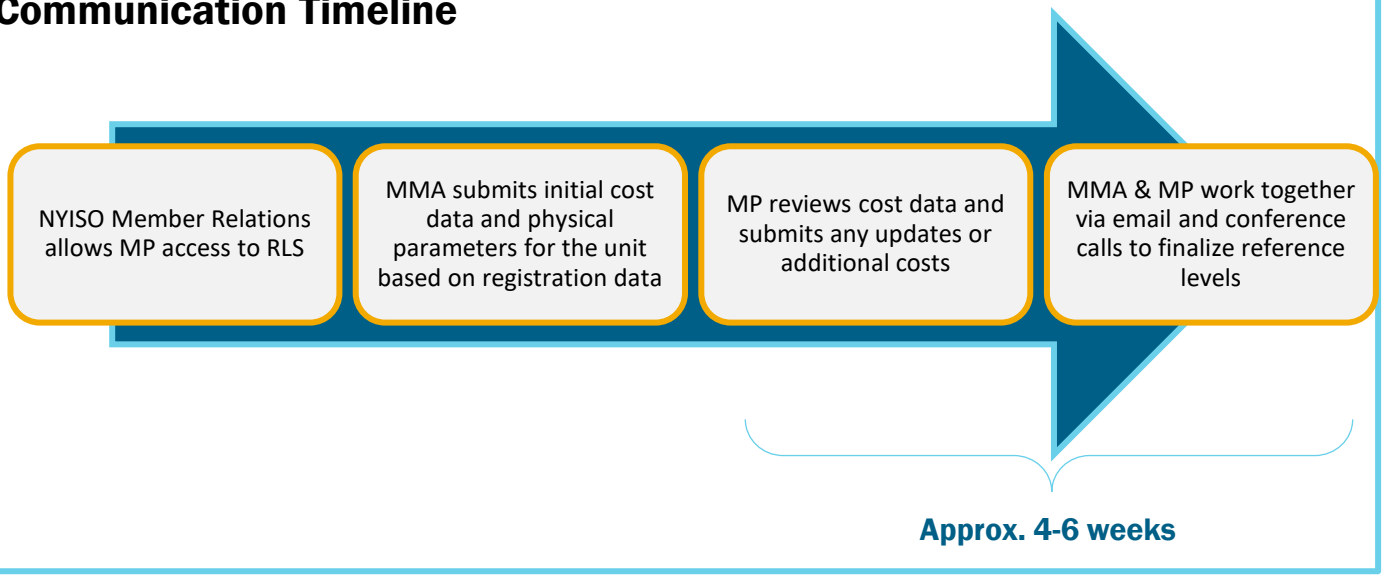
Market Mitigation & Analysis

Energy Reference Levels for Wind & Solar Resource Participation

What are Energy Reference Levels?

- Thresholds that NYISO establishes that provide Market Participants with a framework for conduct as well as provide NYISO a more defined way to monitor Market Participant conduct
- Reference levels generally reflect a resource's marginal cost of providing a service.
- Reference level data is submitted and monitored via Reference Level Software (RLS)
  - RLS
    - Access to current and historical reference levels
    - Submit and check status of data submissions and reference level adjustment requests
    - Generates DAM and RT reference levels by unit on a daily and hourly basis

Communication Timeline



Additional Potential Adjustments

Fuel Cost Adjustments

- Temporary updates to reference fuel price or fuel type that a supplier can submit with its energy bids when a Supplier's fuel cost for a Generator will temporarily exceed its burdened fuel reference cost

Opportunity Cost Adjustments

- Limited to generators with regulatory, environmental, technical, or other restrictions that limit their availability, and reflect the net revenues that are expected to be foregone by producing MWh in lower-priced hours, *e.g. hydroelectric generators with pondage*

New York ISO

Outage Scheduling

Outage Scheduling is the process by which NYISO evaluates and tracks planned and unplanned changes to operational availability of transmission and generating facilities.

Basis for Outage Scheduling Process

- NYCA Reliability
- Reliability Rules Compliance
- Ensuring Sufficient Capacity
- Impact to Neighboring Control Areas

What is required for Wind & Solar Resources onboarding with the NYISO?

Outage Scheduling – Wind and Solar Resources are required to submit a two-year maintenance schedule to the NYISO upon registration.

After the initial two-year maintenance schedule has been submitted, all subsequent updates and submittals should be provided through the Outage Management System (OMS).

Outage Management System (OMS)

- Secure, web-based application used for scheduling and tracking resource outages
  - **NOTE:** Market Participants only see the outages that pertain to their own organization

Hardware/Software/Network Specifications

- Details can be found in OMS Training Modules

Additional Specifications upon Registration with the NYISO

- Users must have the following set up with NYISO Member Relations upon registration with the NYISO before Market Participants are able to access OMS through the NYISO website
  - **NOTE:** Market Participants do not need these specifications to view the OMS Training Modules on the NYISO website

NAESB Digital Certificate

- Users must have a valid NAESB Digital Certificate installed

Market Information System (MIS)

- OMS users must have specific MIS privileges
  - OMS privileges must be set up for MIS account at the Org Level, **this privilege is assigned by the NYISO**
  - OMS users must also have OMS privileges assigned to the MIS account at the User Level, **this privilege is done by the organization's MIS Administrator**

New York ISO

Installed Capacity Market

General Process from Registration up to Auction Participation:

Capacity Market Qualifications → 60 Days before Go-Live → ICAP Market Operations Processes

Capacity Market Qualifications

- Satisfaction of all registration requirements as per tariff rules
- Effective Interconnection Agreement that allows wholesale market participation
- Have a minimum injection capability of 0.1 MW or greater
- Outage schedules two years forward from the anticipated date of first offer into the capacity market

60 Days before Go-Live

- Wind & Solar Resources submits checklist of documents to the NYISO Member Services/ Registration team indicating:
  - NYISO activates MIS
  - NYISO establishes PTID
  - Obtains CRIS data
- ICAP Operations team to set ICAP AMS access; ICAP Market Operations (IMO) to send email to Wind & Solar Resource
- Wind & Solar Resources to enter DMNC equivalent value information once PTID is activated in ICAP AMS

Checklist

Documents needed to participate in the ICAP market

- ❑ Intent to offer letter
- ❑ DMNC Equivalent value
- ❑ Generating Availability Data System (GADS) form

ICAP Market Operations Processes

- ICAP Operations calculates UCAP for resource using CRIS, DMNC Equivalent Value, and class average derating factor

New York ISO

Wind/Solar Intermittent Power Resource (IPR) Metering Requirements

Meter Requirements

- Meters must:
  - Be approved by Metering Authority
  - Provide revenue-quality metering information
  - Provide six-second telemetry
  - Comply with minimum acceptable accuracy standards
- Fulfill Station Power requirements
- Intermittent Power Resources with a capability of 200 MW or more, required to have Phase I (analog) metering, along with Phase II (digital) metering

Meter Authority

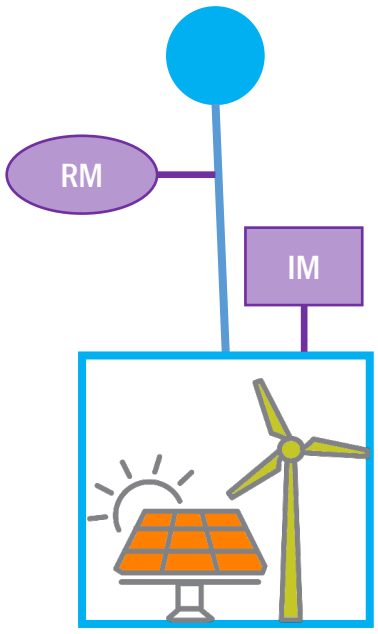
- An entity responsible for the calibration, maintenance, operation, and reporting of metered data from an electric revenue meter used in the wholesale electricity markets administered by the NYISO
- For stand-alone Wind/Solar IPRs, typically a Transmission Owner (TO)
- Decided based on Inter-connecting TO
- Will provide instantaneous and hourly metered data (meeting NYISO and TO requirements), to the NYISO and the TO

Metering Configuration

Meter Designation	Meter Requirements	Data Flows
RM	Revenue grade, dual channel meter; Reported by a Meter Authority	Hourly data
IM	Instantaneous metering	6 second aggregated output telemetry*

* RT telemetry used for Settlements and other operational purposes

Point of Injection (POI)



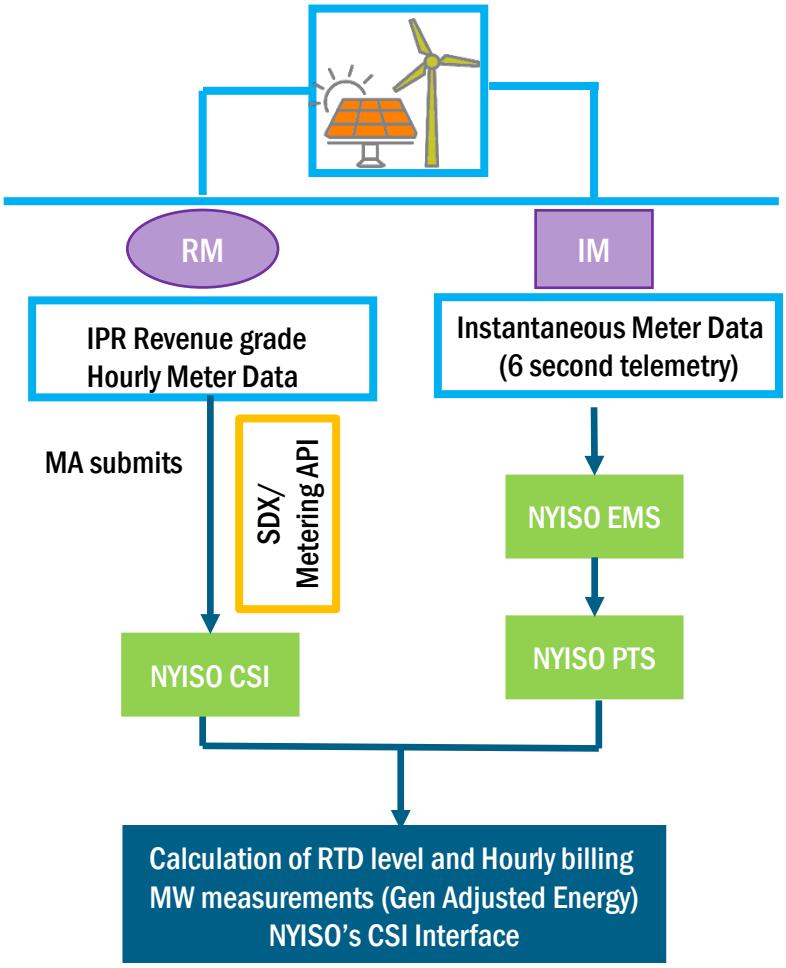
- For Wind/Solar IPRs co-located with an Energy Storage resource (ESR), at one POI, additional metering requirements may apply. Please refer to the Co-Located Storage Resource Participation Model e-learning module on the Market Training webpage of the NYISO website
- For Wind/Solar IPRs facilities that are part of a DER Aggregation, please refer to the Distributed Energy Resources (DER) Metering Configurations infographic of the DER Onboarding Educational suite, that can be found on the Market Training webpage of the NYISO website

FOR TRAINING PURPOSES ONLY

New York ISO

Wind and Solar IPR - Metering Data for Settlement Processing

Meter Data Processing



- Calculation of the Generator Adjusted Energy includes:
  1. Hourly integration of Instantaneous meter data from the Wind or Solar IPR, and
  2. Profiling process to account for measurement variability between Revenue Grade meter data and Instantaneous telemetry data
- MP should check for discrepancies between MA and PTS hourly interval data in the CSI platform, refer to Section 4.1.3.2 of the Accounting and Billing Manual for details
- Gen Adjusted Energy calculations used for settlement calculations

Terms

Metering Authority (MA):
Entity responsible for calibration, maintenance, operation, and reporting of metered data from an electric revenue meter used in the wholesale electricity markets administered by the NYISO

Settlement Data Exchange (SDX):
A web-enabled application for the upload and download query functions related to hourly tie line, generation, Sub-Zone, and load bus data

Metering API (Application Programming Interface):
System-to-system interface for submission and retrieval of hourly meter data for generation, tie line, and sub-zone data; Will replace the SDX application in the future

EMS:
NYISO's Energy Management System

Performance Tracking System (PTS):
Actual energy injections are measured in real time and telemetered to the NYISO typically every six seconds

Customer Settlements Interface (CSI):
NYISO's online settlement interface that houses meter data review information, all the billing invoices, and related information

New York ISO

Wind and Solar IPR - Metering Data for Settlement Processing

Billing Invoice Cycle*

* For specific timelines, refer to the Processing and Invoice Schedule on NYISO Website

Tracking a given Billing period:

MA submits Revenue grade meter data by noon the following business day

Gen metering updates/challenges up to 55 days after Monthly Initial Invoice

Billing Day	Weekly Invoice Version 0.5	Monthly Invoice Version 1.0	4-month True-up Version 2.0	Final Bill Close out 8 months Version 3.0

Note: Each monthly invoice contains a 4-month true up and final bill close out for prior Billing periods

Billing Invoice information

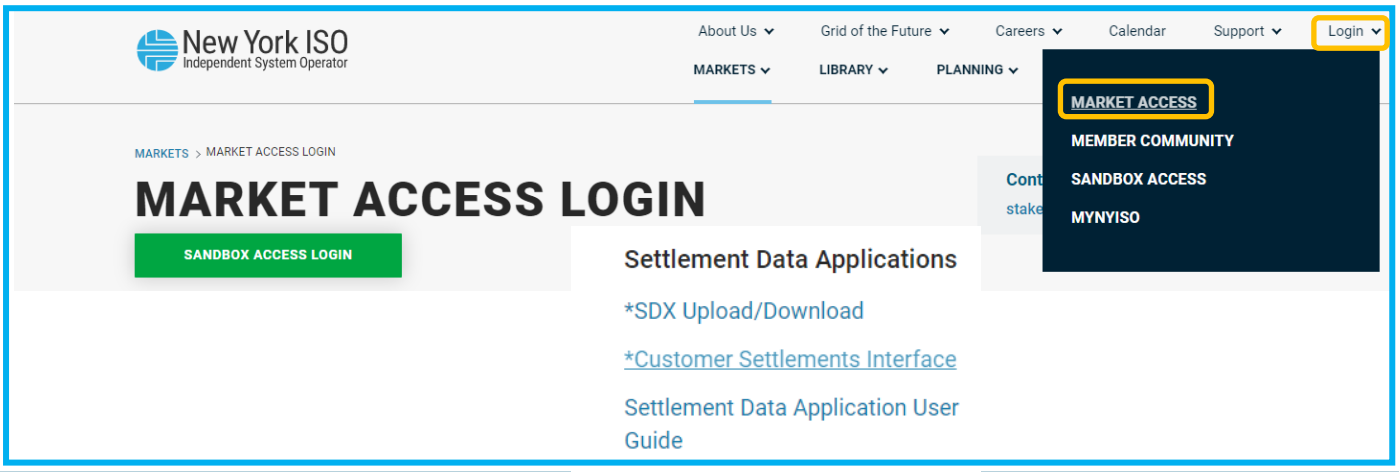
Flexible Invoice Period (FIP):

- Weekly Invoice, version 0.5
- Contains 7 Billing Days or Fewer
- Issued Wednesday of Each Week
- Starts the 1st of every month
- Typically, a Saturday – Friday Billing Period

Monthly Invoice:

- Issued 5th Business Day of Month
- Initial Month Billing Period
- Updates to FIPs as Needed
- Remaining Initial Month Billing Days not Captured in a FIP

Settlement Interfaces Login



FOR TRAINING PURPOSES ONLY

Wind & Solar Settlements - Quick Reference Sheet

Settlements Based on Wind & Solar Participation

	Energy Market	Supplemental Supplier Payments	Cost-Based Ancillary Services	Market Based Ancillary Services	Installed Capacity
DAM Energy	✓				
Balancing Energy	✓				
Forecasting Service	✓				
DAM BPCG					
RT BPCG		✓			
*Over- Generation Reg Penalty				✓	
Rate Schedule 1			✓		
VSS			✓		
VSS LOC			✓		
Auction Settlement					✓

Legend

Acronym	Full Term
DAM	Day Ahead Market
RT	Real Time
BPCG	Bid Production Cost Guarantee
REG	Regulation
VSS	Voltage Support Service
VSS LOC	Voltage Support Service Lost Opportunity Cost

** Over-Generation Reg Penalty applies when 1) IPR plant is ≥ 13 MWs, 2) Output Limit is in effect, and 3) the resource injects power above 3% of its upper operating limit (UOL)*

Formulas describing each settlement type can be found in the Accounting & Billing manual, as well as the Market Training eLearning module on Wind and Solar Intermittent Power Participation Model

New York ISO

New York ISO
Independent System Operator

RESOURCE APPENDIX: ONBOARDING OF NEW NYISO RESOURCES

IPR Participation

Version:
1.0

Revision Date:
05/16/2023

This document was prepared by:
NYISO Market Training

New York Independent System Operator
10 Krey Blvd
Rensselaer, NY 12144
(518) 356-6060
www.nyiso.com

Disclaimer
The information contained within this guide, along with the other NYISO documents, is intended to be used for informational purposes and is subject to change. The NYISO is not responsible for the user's reliance on these publications or for any erroneous or misleading material.

New York ISO

Table of Contents

1. NYISO'S INTERCONNECTION PROCESS

A. TRANSMISSION EXPANSION INTERCONNECTION MANUAL

The purpose of this Transmission Expansion and Interconnection Manual ("TEI Manual") is to provide interested parties with a road map of the NYISO's transmission expansion and interconnection process. The manual also describes the study criteria, guidelines, procedures, and practices used in the processes.

Navigation Path:
NYISO Website → Manuals, Tech Bulletins & Guides → Manuals → Planning → Transmission Expansion and Interconnection Manual

B. TRANSMISSION EXPANSION AND INTERCONNECTION GUIDE

The purpose of this guide is to provide developers with an introduction to and a high-level summary of various NYISO interconnection procedures.

Navigation Path:
NYISO Website → Manuals, Tech Bulletins & Guides → Guides → Transmission Expansion and Interconnection Guide

C. NYISO TARIFF – OPEN ACCESS & TRANSMISSION TARIFF (OATT)

This eLearning module defines "Outage Scheduling," and covers the basis for NYISO Outage Scheduling Process. This training also features:

- Attachment X: Large Facility Interconnection Procedures
- Attachment Z: Small Facility Interconnection Procedures
- Attachment S: Rules to allocate responsibility for the cost of New Interconnection Studies

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → OATT

1.1 BUYER-SIDE MITIGATION

A. NYISO TARIFF – MARKET ADMINISTRATION AND CONTROL AREA SERVICES TARIFF (MST)

This document sets forth the provisions applicable to the services provided by the ISO related to its administration of competitive markets for the sale and purchase of Energy and Capacity and for the payments to Suppliers who provide Ancillary Services to the ISO in the ISO Administered Markets ("Market Services") and the ISO's provision of Control Area Services ("Control Area Services"), including services relating:

- Attachment H, ISO Market Power Mitigation Measures

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → MST

2. NYISO CUSTOMER REGISTRATION

A. NYISO TARIFF – MARKET ADMINISTRATION AND CONTROL AREA SERVICES TARIFF (MST)

This document sets forth the provisions applicable to the services provided by the ISO related to its administration of competitive markets for the sale and purchase of Energy and Capacity and for the payments to Suppliers who provide Ancillary Services to the ISO in the ISO Administered Markets ("Market Services") and the ISO's provision of Control Area Services ("Control Area Services"), including services relating:

- Section 9 Application and Registration Procedure
- Attachment K: Creditworthiness Requirements for Customers

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → MST

B. REFERENCE DOCUMENTATION ON NYISO CUSTOMER SUPPORT WEBPAGE

- NAESB Digital Certificate Tutorial
- MIS Access
- Admin set up
- Linking Certificates with MIS
- Member Community Reference Guide
- Member Community Access

Navigation Path:
NYISO Website → Support

C. TECH BULLETIN #116

This Technical Bulletin describes procedures for new generating units to operate in testing mode prior to commercial operation.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Technical Bulletins → New Generation Units Operating During the Start-Up Testing Phase

D. WIND AND SOLAR PLANT OPERATOR DATA USER'S GUIDE

This guide focuses on the data reporting required of Intermittent Power Resources that depend on wind or solar energy as their fuel to support the integration of renewable energy into the New York Control Area.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Guides → Wind and Solar Plant Operator Data User's Guide

E. TECH BULLETIN #154

This Technical Bulletin identifies market rules for wind and solar resources pertaining to bidding, scheduling, and settlements for energy. This Technical Bulletin assumes prior knowledge of NYISO bidding processes.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Technical Bulletins → Wind and Solar Resource Bidding, Scheduling, Dispatch, and Settlements

3. ESTABLISHMENT OF WIND AND SOLAR FORECASTS

A. WIND AND SOLAR PLANT OPERATOR DATA USER'S GUIDE

This guide focuses on the data reporting required of Intermittent Power Resources that depend on wind or solar energy as their fuel to support the integration of renewable energy into the New York Control Area.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Guides → Wind and Solar Plant Operator Data User's Guide

4. CREDIT REQUIREMENTS

A. NYISO TARIFF – MARKET ADMINISTRATION AND CONTROL AREA SERVICES TARIFF (MST)

This document sets forth the provisions applicable to the services provided by the ISO related to its administration of competitive markets for the sale and purchase of Energy and Capacity and for the payments to Suppliers who provide Ancillary Services to the ISO in the ISO Administered Markets ("Market Services") and the ISO's provision of Control Area Services ("Control Area Services"), including services relating:

- Attachment K Creditworthiness Requirements for Customers

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → MST

B. CREDIT DEPARTMENT FAQ

The NYISO Credit FAQ Document covers the following topics:

- Collateral
- Cash Deposits
- Letter of Credit
- Surety Bonds
- Credit Management System (CMS)
- Annual/Periodic Submissions
- New Applicants – Items needed for Credit Approval

Navigation Path:
NYISO Website → Support → Budget & Finance → NYISO Credit → NYISO Credit FAQ

5. COMMNICATIONS TESTING & OPERATIONS MODELING

A. WIND AND SOLAR PLANT OPERATOR DATA USER'S GUIDE

This guide focuses on the data reporting required of Intermittent Power Resources that depend on wind or solar energy as their fuel to support the integration of renewable energy into the New York Control Area.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Guides → Wind and Solar Plant Operator Data User's Guide

B. CONTROL CENTER REQUIREMENTS MANUAL

This Manual focuses on the computer, communications, and metering systems required for reliable and economic operations of the New York Independent System Operator (NYISO).

- *Computer Systems*
- *Metering Policy and Certification*
- *Voice Communications*

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Control Center Requirements

C. DIRECT COMMUNICATIONS PROCEDURE

The Direct Communications Procedure describes the communication options available to generation owners, demand-side resources, limited energy storage resources, and other suppliers that provide energy and ancillary services to the NYISO markets; outlines the Initial Installation Procedure; and documents Operational Procedures for communications facilities.

- The Direct Communications Procedure is a secured document not available on the NYISO website. To request authorization to receive the Direct Communications Procedure, please contact Stakeholder_services@nyiso.com

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Operations → Direct Communications Manual

D. NEW GENERATION UNITS OPERATING DURING THE START-UP TESTING PHASE

This Technical Bulletin describes procedures for new generating units to operate in testing mode prior to commercial operation.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Technical Bulletins → TB 116 – New Generation Units Operating During the Start-Up Testing Phase

6. MARKET MITIGATION & ANALYSIS: ENERGY REFERENCE LEVELS

A. NAESB DIGITAL CERTIFICATE TUTORIAL

This e-Learning module is geared toward guiding Market Participants (MPs) on how to obtain and implement the use of a digital certificate to access NYISO markets and applications.

Navigation Path:
NYISO Website → Training → Online Learning → NAESB Digital Certificate Tutorial

B. REFERENCE LEVEL MANUAL

This manual describes the NYISO's Reference Level Processes and details various timelines that apply to the submission, review, approval, and update of cost-based data and to mitigation consultations.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Operations → Reference Level Manual

C. REFERENCE LEVEL SOFTWARE USER'S GUIDE

This user guide is intended for Market Participants (MPs) who are users of the NYISO Reference Level Software (RLS) application.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Guides → Reference Level Software User's Guide

D. NYISO TARIFF – MARKET ADMINISTRATION AND CONTROL AREA SERVICES TARIFF (MST)

This document sets forth the provisions applicable to the services provided by the ISO related to its administration of competitive markets for the sale and purchase of Energy and Capacity and for the payments to Suppliers who provide Ancillary Services to the ISO in the ISO Administered Markets ("Market Services") and the ISO's provision of Control Area Services ("Control Area Services"), including services relating:

- Attachment H, ISO Market Power Mitigation Measures

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → MST

7. OUTAGE SCHEDULING

A. NYISO TARIFF – OPEN ACCESS & TRANSMISSION TARIFF (OATT)

This eLearning module defines "Outage Scheduling," and covers the basis for NYISO Outage Scheduling Process. This training also features:

- Section 9.6, Transmission Reliability Margin ("TRM")

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → OATT

B. NYISO TARIFF – MARKET ADMINISTRATION AND CONTROL AREA SERVICES TARIFF (MST)

This document sets forth the provisions applicable to the services provided by the ISO related to its administration of competitive markets for the sale and purchase of Energy and Capacity and for the payments to Suppliers who provide Ancillary Services to the ISO in the ISO Administered Markets ("Market Services") and the ISO's provision of Control Area Services ("Control Area Services"), including services relating:

- *Section 5.18 Generator Outages and Generator Obligations While in These Outages*
- *Section 5.12 Requirements Applicable to Installed Capacity Suppliers*

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → MST

C. OUTAGE SCHEDULING MANUAL

This Outage Scheduling Manual is intended for the New York Independent System Operator (NYISO) staff and those entities who are responsible for

notifying the NYISO of planned and unexpected changes to the operational availability of their transmission and generating facilities.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Outage Scheduling Manual

D. OUTAGE SCHEDULER USER'S GUIDE

This user guide is intended for Market Participants (MPs) and Transmission Owners (TOs) who are users of the NYISO Outage Scheduler (OMS) System.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Guides → Outage Scheduler User's Guide

E. MARKET PARTICIPANTS USER GUIDE

This Guide provides Market Participants with the information needed to participate in New York Independent System Operator (NYISO) Markets.

- *Section 7.4 Generator and Ancillary Services Bids*

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Guides → Market Participant User's Guide

F. INSTALLED CAPACITY MANUAL

The Installed Capacity Manual contains the procedures that will be followed by the NYISO and its Customers with regard to the Installed Capacity markets and auctions administered by the NYISO pursuant to the NYISO Market Administration and Control Area Services Tariff (Services Tariff).

- *Section 4.3 Maintenance Scheduling Requirements*
- *Section 4.8 Bidding, Scheduling, and Notification Requirements*
- *Attachment K: Reportable Operating Data*

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Operations → Installed Capacity Manual

G. OUTAGE SCHEDULER TRAINING: OUTAGE SCHEDULER (OMS) SYSTEM – GENERATOR OWNER (GO) EDITION

This e-Learning module provides a walk-through of the Outage Scheduler (OMS) System for Generator Owners. Topics covered include accessing and logging into the OMS System, environment navigation, creating a new outage request (Generation O.R.E.), tracking a request, as well as modifying a request.

Navigation Path:
NYISO Website → Training → Online Learning → Outage Scheduler (OMS) System → Generator Owner (GO) Edition

H. OUTAGE SCHEDULER TRAINING: OUTAGE SCHEDULER (OMS) SYSTEM – TRANSMISSION OWNER (TO) EDITION

This e-Learning module provides a walk-though of the Outage Scheduler (OMS) System for Transmission Owners. Topics covered include accessing and logging into the OMS System, environment navigation, accessing the conflict calendar, creating a new outage request (Transmission O.R.E.), tracking a request, as well as modifying a request.

Navigation Path:
NYISO Website → Training → Online Learning → Outage Scheduler (OMS) System → Transmission Owner (TO) Edition

8. METERING CONFIGURATION

A. NYISO TARIFF – MARKET ADMINISTRATION AND CONTROL AREA SERVICES TARIFF (MST)

This document sets forth the provisions applicable to the services provided by the ISO related to its administration of competitive markets for the sale and purchase of Energy and Capacity and for the payments to Suppliers who provide Ancillary Services to the ISO in the ISO Administered Markets ("Market Services") and the ISO's provision of Control Area Services ("Control Area Services"), including services relating:

- 13 Metering

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → MST → Metering 13

B. REVENUE METERING REQUIREMENTS MANUAL

The material in this manual defines the standards for the revenue metering systems required for conducting accurate financial settlements of the New York Independent System Operator, Inc. (NYISO) – administered wholesale electric energy markets. Additionally, it defines the responsibilities for Meter Authorities (MA) and describes the processes for data processing, analysis, and dispute resolution.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Revenue Metering Requirements

C. CONTROL CENTER REQUIREMENTS MANUAL

This Manual focuses on the computer, communications, and metering systems required for reliable and economic operations of the New York Independent System Operator (NYISO).

- Computer Systems
- Metering Policy and Certification
- Voice Communications

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Control Center Requirements

9. METERING FOR SETTLEMENTS

A. NYISO TARIFF – MARKET ADMINISTRATION AND CONTROL AREA SERVICES TARIFF (MST)

This document sets forth the provisions applicable to the services provided by the ISO related to its administration of competitive markets for the sale and purchase of Energy and Capacity and for the payments to Suppliers who provide Ancillary Services to the ISO in the ISO Administered Markets ("Market Services") and the ISO's provision of Control Area Services ("Control Area Services"), including services relating:

- 13 Metering

Navigation Path:
NYISO Website → Library → Regulatory Resources → Tariffs, FERC Filings & Orders → Tariffs → MST → Metering 13.2.4

B. REVENUE METERING REQUIREMENTS MANUAL

The material in this manual defines the standards for the revenue metering systems required for conducting accurate financial settlements of the New York Independent System Operator, Inc. (NYISO) – administered wholesale electric energy markets. Additionally, it defines the responsibilities for Meter Authorities (MA) and describes the processes for data processing, analysis, and dispute resolution.

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Revenue Metering Requirements

C. CONTROL CENTER REQUIREMENTS MANUAL

This Manual focuses on the computer, communications, and metering systems required for reliable and economic operations of the New York Independent System Operator (NYISO).

- Computer Systems
- Metering Policy and Certification
- Voice Communications

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Control Center Requirements

D. ACCOUNTING & BILLING MT-304 COURSE MATERIALS

This course provides detailed knowledge of the settlements associated with Power Suppliers, Load Serving Entities, Transactions, Virtual Trading, Demand Response and Transmission Owners.

- Metering Fundamentals
- Settlements Reports Overview

Navigation Path:
NYISO Website → Training → Course Materials & Infographics → Training Course Materials → Accounting & Billing MT-304

E. METER DATA SUBMISSION TIMELINE

The Meter Data Review section of the website hosts the following information in PDF:

- Daily Lock-down Schedule
- Meter System Contacts
- Hourly Tie-line Generator, LSE Bus Meter Data Revision, & Lock-down Schedule
- Meter Data Management Protocols

Navigation Path:
NYISO Website → Support → Budget & Finance → Billing & Settlements → Processing and Invoice Schedule → Meter Data Review

F. PROCESSING AND INVOICE SCHEDULING

This schedule provides dates for the following:

- 4-Month Cycle Settlement Months
- NYISO Flexible Billing Period Invoice

Navigation Path:
NYISO Website → Support → Budget & Finance → Billing & Settlements → Processing and Invoice Schedule → Close-out Schedule

NYISO Website → Support → Budget & Finance → Billing & Settlements → Processing and Invoice Schedule → Flexible Invoicing Schedule

G. ACCOUNTING & BILLING MANUAL

This document focuses on the settlement, invoicing and clearing processes for wholesale market transactions encompassing the NYISO-administered Energy, Transmission Service, and Ancillary Services markets.

- *Section 4.1.3.2: Adjustment of Actual Energy Injections and Actual Energy Withdrawals to Revenue Quality Metered Values*

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Accounting and Billing

10. INSTALLED CAPACITY (ICAP) ENROLLMENT FOR PARTICIPATION

A. INSTALLED CAPACITY MANUAL

The Installed Capacity Manual contains the procedures that will be followed by the NYISO and its Customers with regard to the Installed Capacity markets and auctions administered by the NYISO pursuant to the NYISO Market Administration and Control Area Services Tariff (Services Tariff).

- *Attachment D: Dependable Maximum Net Capability (DMNC)*
- *Attachment F: Intent to Offer Letter*

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Operations → Installed Capacity Manual

11. SETTLEMENTS

A. ACCOUNTING AND BILLING MANUAL

This document focuses on the settlement, invoicing and clearing processes for wholesale market transactions encompassing the NYISO-administered Energy, Transmission Service, and Ancillary Services markets.

- *Section 1 Settlement and Invoicing Process*
- *Section 2 Market Participant Responsibilities and Controls*

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Accounting and Billing

B. REVENUE METERING REQUIREMENTS MANUAL

Services Tariff Section 13 permits Member Systems and third parties – known as Meter Services Entities (MSEs) – to provide metering and meter data services to Demand Reduction Providers, DSASP Providers, Responsible Interface Parties (RIPs) and Curtailment Service Providers (CSPs).

Navigation Path:
NYISO Website → Library → Manuals, Tech Bulletins & Guides → Manuals → Administrative → Revenue Metering Requirements

C. BUSINESS INTELLIGENCE TASK FORCE (BITF) PRESENTATIONS

BITF is a forum for stakeholders to exchange information pertaining to NYISO software enhancements and associated software training courses.

Navigation Path:
NYISO Website → Committees → Business Issues Committee → Business Intelligence Task Force

D. DECISION SUPPORT SYSTEM (DSS) TRAINING

Series of four eLearning modules that encompass:

- **Session 1:** This e-Learning module explains the purpose and benefits behind DSS, identifies reports available, and explains how to access it.
- **Session 2:** This e-Learning module steps through logging into DSS, the DSS homepage options, resources within DSS, and DSS data versioning.
- Session 3: This e-Learning module demonstrates how to access DSS corporate reports, utilize Automated Data Delivery Files, and identified supporting documentation.
- Session 4: This e-Learning module explains the organization of DSS Data, and teaches basic custom query building.

Navigation Path:
NYISO Website → Training → Online Learning → DSS

12. ADDITIONAL RESOURCES FOR IPR

A. STATION POWER TRAINING MODULE

This intermediate level e-Learning module explains the function of Station Power, various types of Station Power, requirements for Station Power, as well as the registration process for participation in the Station Power Program.

Navigation Path:
NYISO Website → Training → Online Learning → Energy Storage Resources Participation Model

B. STATION POWER METERING, DATA AND PROGRAM REQUIREMENTS

This intermediate level e-Learning module explains the function of Station Power, various types of Station Power, requirements for Station Power, as well as the registration process for participation in the Station Power Program.

Navigation Path:
NYISO Website → Training → Online Learning → Energy Storage Resources Participation Model

13. CONTACT INFORMATION

A. STAKEHOLDER SERVICES

Contact: stakeholder_services@nyiso.com

B. CUSTOMER REGISTRATION

Contact: customer_registration@nyiso.com