

# Intraday Offers Education Impacts to Markets Gateway

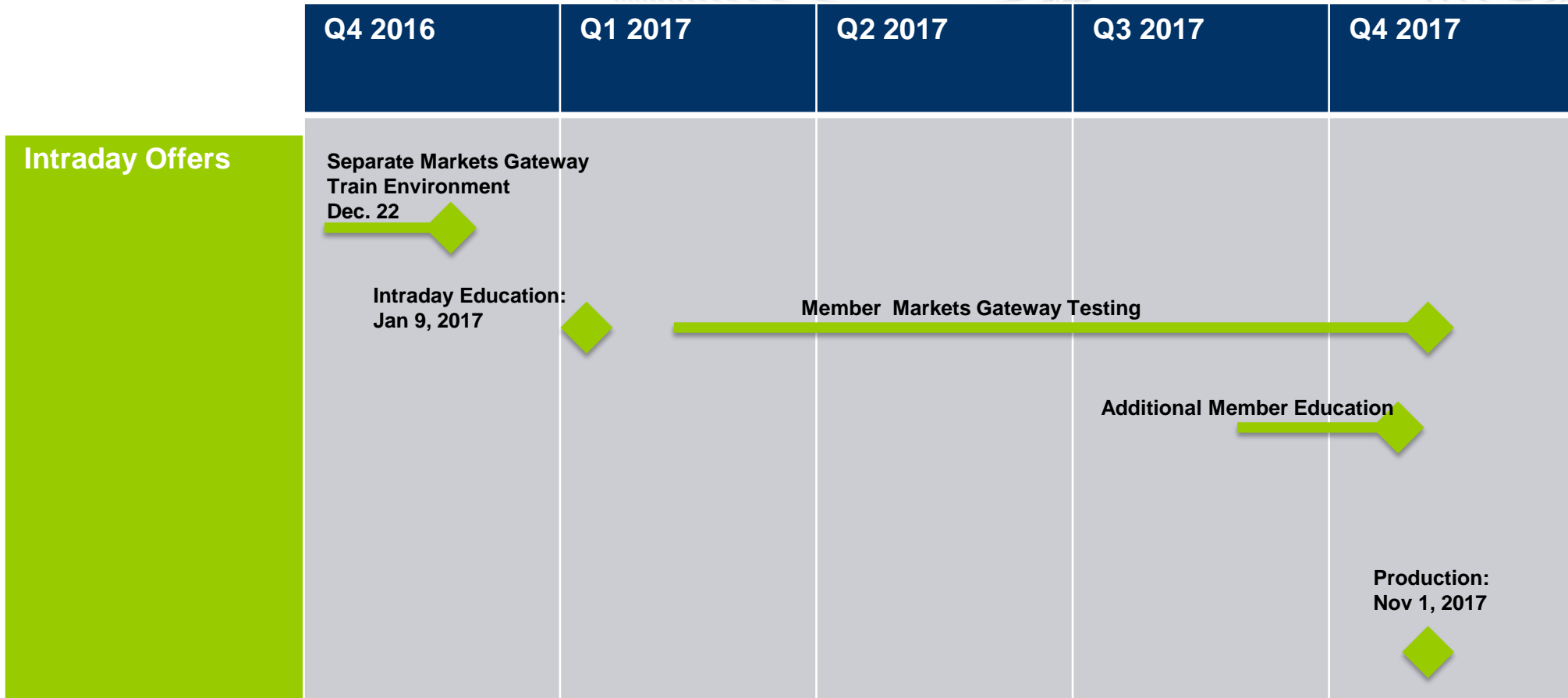
January 9, 2017

- PJM has made all efforts possible to accurately document all information in this presentation. The information seen here does not supersede the PJM Operating Agreement or the PJM Tariff or any pending FERC Filings or Orders.

<http://www.pjm.com/documents/agreements/pjmagreements.aspx>

- The intent of this session is to review a high level overview of Intraday Offers and its impact on Markets Gateway.
  - It is assumed participants have an understanding of the existing offer rules.
  - It is not to debate the business rules of Intraday Offer implementation.
  - It is not meant to cover all aspects of the Intraday Offer implementation.
- Future sessions will be planned closer to the implementation date that cover all affected areas.

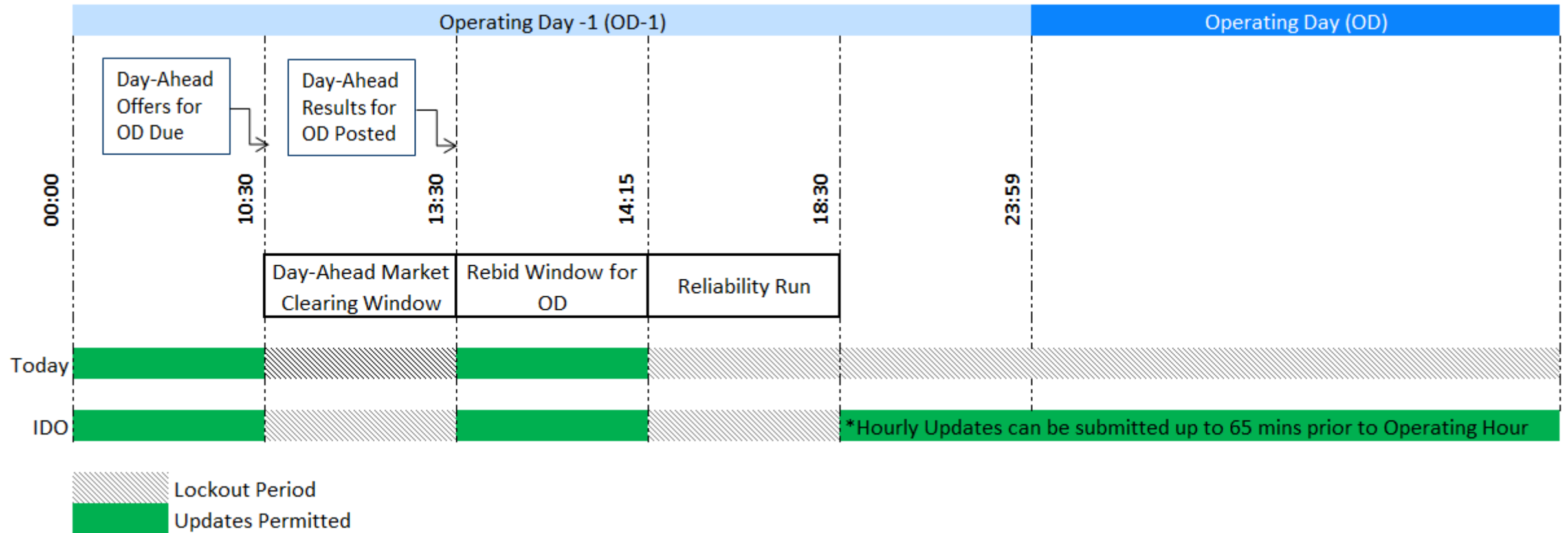
- Introduction of Intraday Offers (IDO) will enable hourly differentiation and modifications for certain parameters of supply offers for
  - Generation Resources
  - Demand Resources
- The current Markets Gateway Screens that allow changing availability of cost schedules intraday will be retired
  - Implemented during the Gas Unit Commitment Coordination (GUCC) effort



Requesting volunteer companies willing to assist with early testing and data creation. Please contact your client manager or email [custsvc@pjm.com](mailto:custsvc@pjm.com).

- A separate environment of the Markets Gateway Training environment is available with the Intraday Offer functionality
- A separate user account is not required if the user already has a Markets Gateway Training account
- Markets Gateway Screen changes
  - 4 new screens
  - 5 updated screens
  - 1 screen deleted
- Associated XML is also impacted
  - External Specification Guide is available

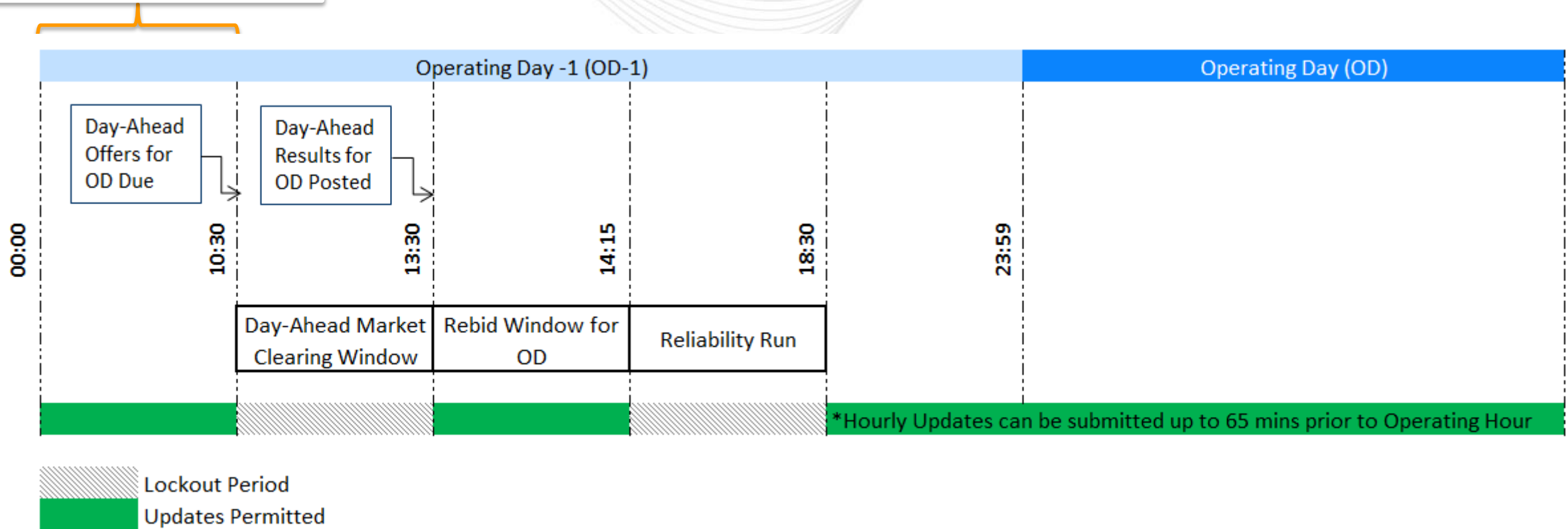
# Submitting and Updating Offer Timelines



# Impacts to Day-Ahead Market Offers



## Day-Ahead Offer Period



- Schedule availability will continue to be designated on a daily basis, however will be able to contain offer curves and certain parameters that differ on an hourly basis. Parameters include:
  - No Load Cost
  - Startup Cost (Cold, Intermediate, Hot)
  - ~~– Min Run Time~~
  - ~~– Notification Time~~
- New screens will be added to Markets Gateway to support the hourly differentiated values
  - Offers Update
  - Detail Update

\*corrected post-education session

## Schedule IDs Currently Allowed

Cost Based Schedules:  
1-69, 80-89

Price Based PLS Schedules:  
70-79

Price Based Schedules:  
91 -99

## Schedule IDs Allowed in Intraday Offers

Cost Based Schedules:  
1-9


Price Based PLS Schedule:  
79

Price Based Schedule:  
99

- The implementation of Intraday Offers will limit the schedule IDs that can be created and used
- Schedules not in the new list will not be able to be made available in Markets Gateway
- Members are urged to begin using the IDO schedule IDs at their earliest convenience to minimize the impact at time of implementation

- Today schedules can be assigned a Market Type
  - Day Ahead
  - Balancing
  - Both
- With the Intraday Offers Implementation, this Market Type field will be removed from the Schedule Detail and Schedule Selection screens and XML Specification Guide
  - Any participant XML submissions will need to remove the parameter

# Offers Update Screen in Markets Gateway


**Markets Gateway**

Bilaterals

Con Edison

Demand

▶ Demand Response

▼ Generator

Unit

Schedules

Dispatch Lambda

Market Results

Regulation Market

Synchronized Reserve Mar

Day-Ahead Scheduling Res

Interface Pricing

Opportunity Cost Calculator

Parameter Limits

Price Responsive Demand

▶ Public

System Utilities

Up-To-Transaction

Virtual

Weather Forecast

Market Day

1/16/2017

Portfolio

Generation

Location

GENERATOR 1

Schedule

Cost

Refresh

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XML

CSV

Offers

Offer Updates

Detail

Detail Updates

Manager

Selection

Restriction Information

PJMTST >> 2017-01-16 >> GENERATOR 1 (98000001) >> Cost (1)

Last Updated Date/Time: 2017-01-11 12:20:01


| <input type="checkbox"/>              | Hour | MW   | Price |
|---------------------------------------|------|------|-------|
| ▼ <input type="checkbox"/>            | 1    |      |       |
| ▼ <input type="checkbox"/>            | 2    |      |       |
|                                       |      | 10.0 | 20.00 |
|                                       |      | 20.0 | 25.00 |
|                                       |      | 30.0 | 30.00 |
| ▼ <input type="checkbox"/>            | 3    |      |       |
| ▼ <input checked="" type="checkbox"/> | 4    |      |       |
| ▼ <input type="checkbox"/>            | 5    |      |       |
| ▼ <input type="checkbox"/>            | 6    |      |       |
| ▼ <input type="checkbox"/>            | 7    |      |       |
| ▼ <input type="checkbox"/>            | 8    |      |       |
| ▼ <input type="checkbox"/>            | 9    |      |       |
| ▼ <input type="checkbox"/>            | 10   |      |       |
| ▼ <input type="checkbox"/>            | 11   |      |       |
| ▼ <input type="checkbox"/>            | 12   |      |       |
| ▼ <input type="checkbox"/>            | 13   |      |       |
| ▼ <input type="checkbox"/>            | 14   |      |       |
| ▼ <input type="checkbox"/>            | 15   |      |       |
| ▼ <input type="checkbox"/>            | 16   |      |       |

Collapse All

Expand All

Add Segment

- Right click on the hour to “Add Segment”
- Can add hourly offer curves for one, some or all hours.
- If an hour is not populated, will default to use the daily curve


**Markets Gateway**

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Restriction Information

PJMTST >> 2017-01-16 >> GENERATOR 1 (98000001) >> Cost (1)

☐ Switch To Cost Schedule
 

Start Hour

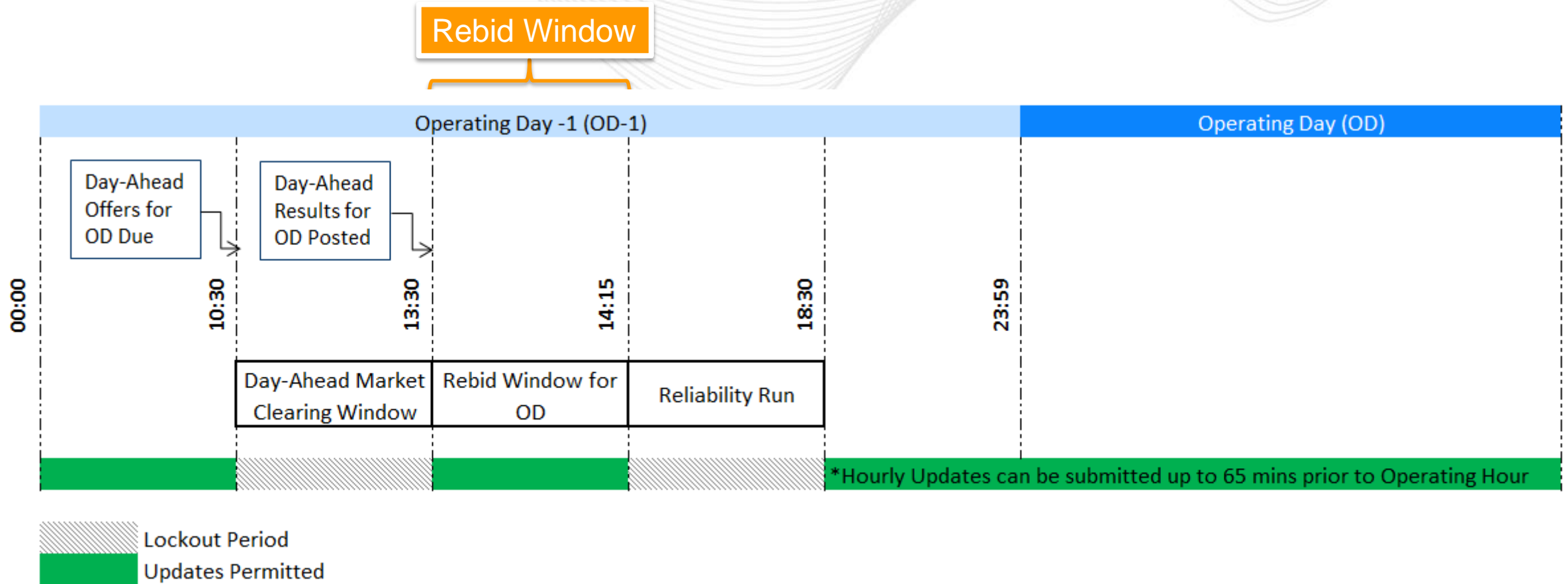
1

Last Updated Date/Time: No Update

|                          | Hour | No Load Cost | Cold Startup Cost | Intermediate Startup Cost | Hot Startup Cost | Minimum Runtime | Notification Time | Status        |
|--------------------------|------|--------------|-------------------|---------------------------|------------------|-----------------|-------------------|---------------|
| <input type="checkbox"/> | 1    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 2    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 3    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 4    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 5    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 6    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 7    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 8    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 9    |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 10   |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 11   |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 12   |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 13   |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 14   |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 15   |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 16   |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 17   |              |                   |                           |                  |                 |                   | Not Committed |

# Updates to Offers during Rebid Period



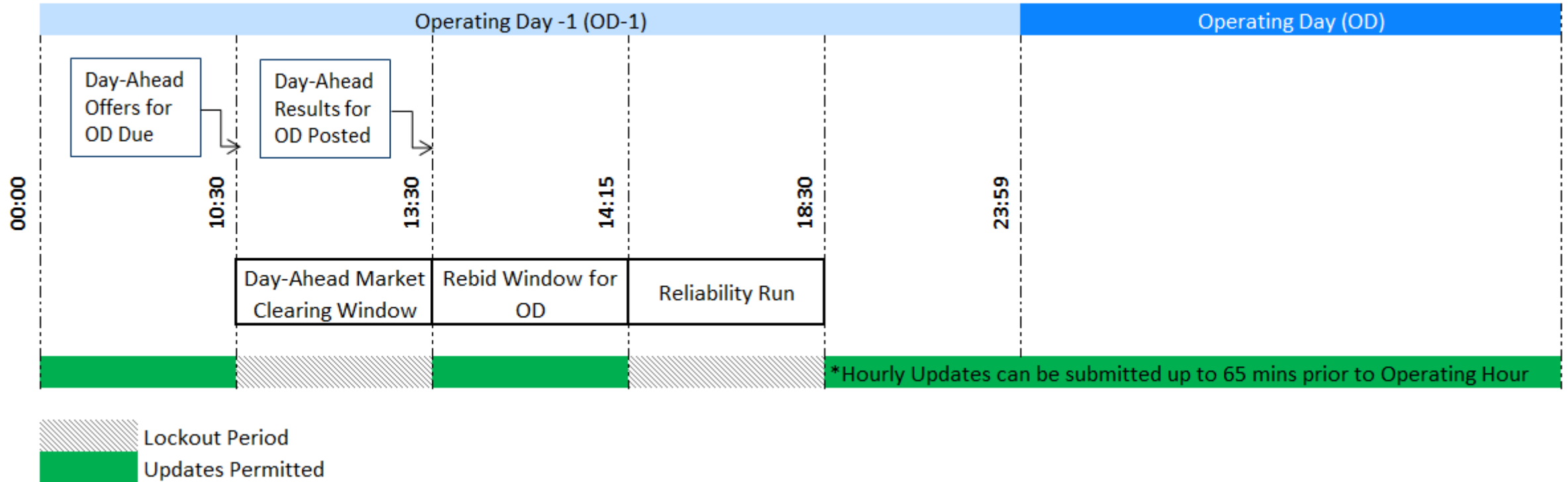




|                         | Today  | IDO Implementation  |
|-------------------------|--|---|
| Committed Day-Ahead     | No updates to Offer MW or Price permitted for entire day                               | <ul style="list-style-type: none"> <li>No updates to Offer MW for committed hours</li> <li>Updates permitted to offer price for all hours (price schedule offer price cannot be increased for an hour that is committed)</li> </ul> |
| Not Committed Day-Ahead | Offer MW and Price may be updated prior 1415 (the start of the Reliability Assessment) | <ul style="list-style-type: none"> <li>Offer MW is editable (through end of Rebid period)</li> <li>Updates permitted to offer price for all hours</li> </ul>  |

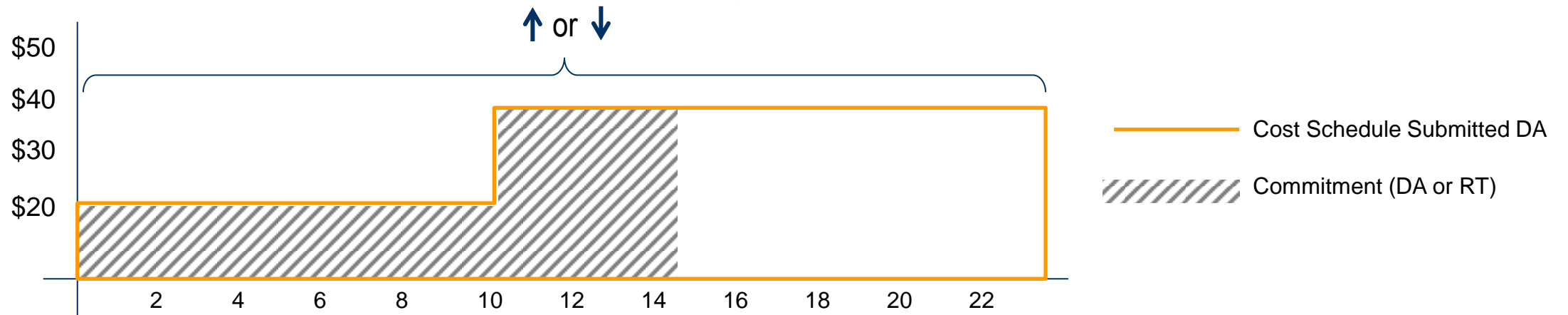
# Updates to Offers in Real Time

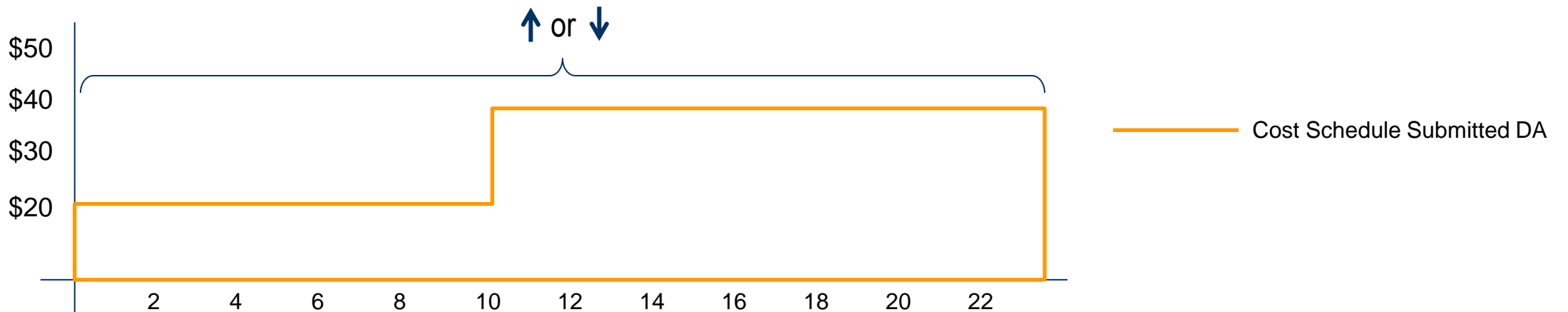
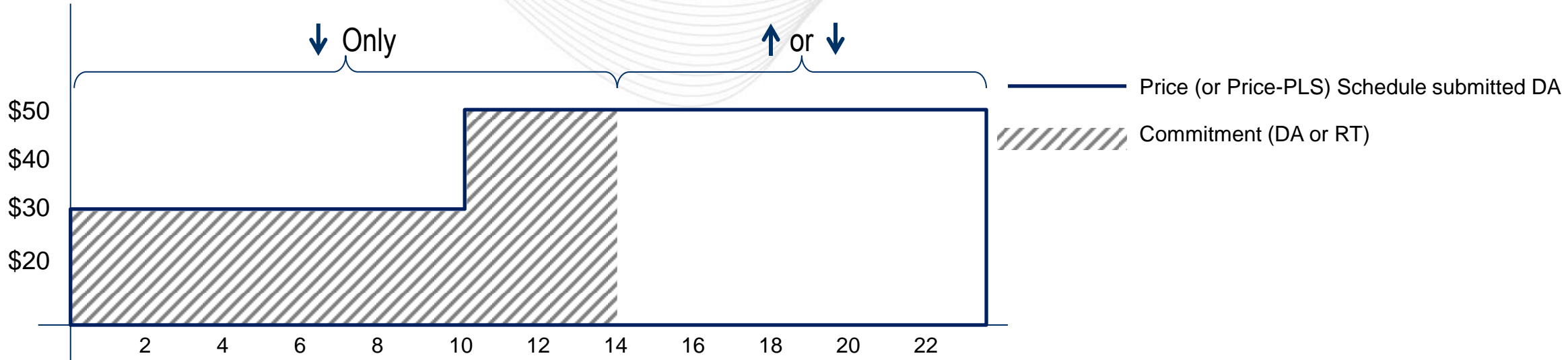
## Intraday Offer Period



- Generation offers can be updated after the Reliability Run is complete, starting at 18:30 up to 65 minutes prior to operating hour
- Potential Updates to Offers include:
  - Price component of the Offer Segment
  - No load and Startup Costs
  - Notification Time
  - Min Run Time
  - Switch to Cost Schedule

| Type of Unit | Type of Schedule | Committed Hours   | Uncommitted Hours |
|--------------|------------------|-------------------|-------------------|
| Cost-Based   | Price            | N/A               | N/A               |
|              | Cost             | Increase/Decrease | Increase/Decrease |
| Price-Based  | Price            | Decrease          | Increase/Decrease |
|              | Cost             | Increase/Decrease | Increase/Decrease |





## Real Time Updates to No Load and Startup Costs

- No load cost and startup costs (cold, intermediate, hot) can be updated hourly via the Detail Updates Screen based on the following rules:

| Startup/No load Election | Type of Schedule | Current Updates Permitted                  | Future Updates Permitted                           |
|--------------------------|------------------|--|--|
| Cost-Based Startup       | Cost or Price    | Updated Daily on Schedule Detail Screen    | Increase/Decrease hourly except for lockout period |
| Price-Based Startup      | Cost             | Updated Daily on Schedule Detail Screen    | Increase/Decrease hourly except for lockout period |
|                          | Price            | Specified biannually on Unit Detail screen | No change to current functionality                 |



- Notification Time and Min Run Time:
  - May be updated hourly starting 7 days in advance, up to 65 minutes before the start of the target hour (excluding lockout periods)
  - Updates are used in Reliability Run and Real Time only
  - Min Run Time cannot be updated for committed hours
  - Updates made via the Detail Updates Screen
    - Notification Time will be removed from the Hourly Updates screen

- If a unit is committed on a price schedule and its cost schedule incremental energy offer subsequently exceeds its price schedule value, it may elect to be switched to its cost schedule
  - Unit will be switched to use the cheapest available cost schedule
  - The unit must then stay on its cost schedule for the rest of the Operating Day
  - The price schedule will become unavailable and will not be permitted to be made available again for the rest of the Operating Day

## Today (GUCC)

- Elected on “Availability Update” screen
- Elect between 18<sup>30</sup> and 2100 the day before
- Election does not propagate to subsequent market days

## Intraday Offer Implementation

- Elected on “Detail Updates” Screen
- Elect between 18<sup>30</sup> the day before and 65 minutes prior to operating hour
- Election does not propagate to subsequent market days

\*corrected post-education session

## Switch to Cost Schedule Option Relocated

**pjm | Markets Gateway**

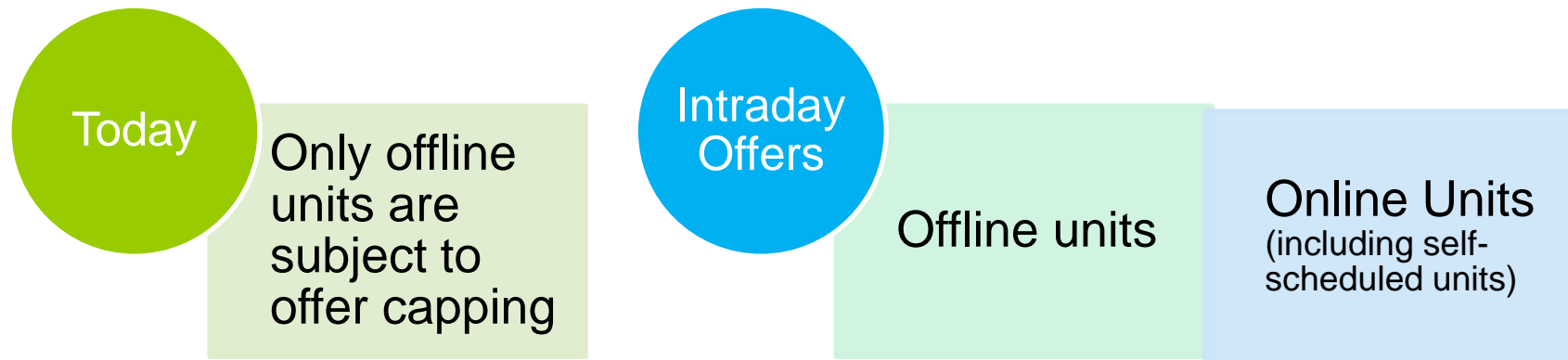
Market Day:  Portfolio:  Location:  Schedule:

PJMTST >> 2017-01-16 >> GENERATOR 1 (98000001) >> Cost (1)

Start Hour:  Last Updated Date/Time: No Update

| <input type="checkbox"/> | Hour ^ | No Load Cost | Cold Startup Cost | Intermediate Startup Cost | Hot Startup Cost | Minimum Runtime | Notification Time | Status        |
|--------------------------|--------|--------------|-------------------|---------------------------|------------------|-----------------|-------------------|---------------|
| <input type="checkbox"/> | 1      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 2      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 3      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 4      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 5      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 6      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 7      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 8      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 9      |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 10     |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 11     |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 12     |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 13     |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 14     |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 15     |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 16     |              |                   |                           |                  |                 |                   | Not Committed |
| <input type="checkbox"/> | 17     |              |                   |                           |                  |                 |                   | Not Committed |

- The Three Pivotal Supplier (TPS) Test for the Energy Market is a structural market power test to measure the market power of a participant
  - TPS does not apply to Demand Response Resources
  - Test is performed hourly



- Participants will be notified of offer capped units via new screen in Markets Gateway

- Online resources owned by suppliers failing the TPS test will only be offer capped if they are outside of their Day-Ahead commitment (if committed Day-Ahead) or min run time (if committed in Real Time)
- Offer capped resources will remain offer capped until the earlier of:
  - End of the day
  - Unit is released
  - Start of its next pre-existing commitment
    - Applies to units cycled in the Day-Ahead commitment or brought online in Real Time prior to Day-Ahead commitment

- Generators can opt out of Hourly updates on a monthly basis if their Fuel Cost Policy supports it

If a Generator opts out, they may:

- Provide hourly differentiation for their DA offer
- Update the incremental energy offer, min run time, and no load and startup costs during the Rebid period for hours where the unit does not have a Day-Ahead commitment.
- Update schedule based notification time (except during lockout periods)
- Utilize “Switch to Cost” functionality


If a Generator opts out, they may NOT:

- Update incremental energy offer, min run time, no load and start-up costs after the Rebid period



- Users must communicate their desire to opt out or opt back in in the month prior to the month they want to begin opting out
- The option may only be selected/deselected prior to midnight of the 16<sup>th</sup> day of the current month (end of the 15<sup>th</sup> day)
- Opt out is generator specific, and continues until the user cancels, by unchecking the box
- There is no XML capability for opt out




Markets Gateway

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GENERATOR 1

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Hourly Updates

Detail

Energy Ramp Rates

Synchronized Reserve Ramp Rates

Wind Forecast

IntraDay Opt Out

| <input type="checkbox"/> | Month         | Opted Out | PJM Override | Notes |
|--------------------------|---------------|-----------|--------------|-------|
| <input type="checkbox"/> | October 2016  | No        | Approved     |       |
| <input type="checkbox"/> | November 2016 | No        | Approved     |       |
| <input type="checkbox"/> | December 2016 | No        | Approved     |       |
| <input type="checkbox"/> | January 2017  | No        | Approved     |       |
| <input type="checkbox"/> | February 2017 | No        | Approved     |       |

The option may only be selected/deselected prior to midnight of the 16<sup>th</sup> day of the current month (end of the 15<sup>th</sup> day)

- Schedule Selection Screen
  - “Use Max Gen” will be removed – no longer used
  - “Daily” will be added to No Load Cost, all Start-up Costs
- Hourly Updates Screen
  - ~~“Status”~~ and “Notification Time” will be removed
  - Requires XML Changes
    - Reported on the new Detail Updates screen

\*corrected post-education session

- In order to avoid needing several XML templates for different times of the day and different commitment statuses, the system will allow XML submittals to contain locked out parameters and not reject them if the new value is the same as currently in the system

# Impacts to Demand Response Resources

- Incremental energy offer price and the shut down cost of a DSR can be updated up to 65 minutes prior to the start of the target hour under the following conditions:

| Committed Hours | Uncommitted Hours |
|-----------------|-------------------|
| Decrease        | Increase/Decrease |

- Price will be added to the Demand Response > Hourly Updates screen
- New Parameter Updates screen in Markets Gateway will allow hourly values for shut down cost

- Hourly Notification Time and Min Down Time Values:
  - Can be submitted starting 7 days in advance, up to 65 minutes before the start of the target hour (excluding lockout periods)
  - Updates only used in Reliability Run and Real Time
  - Updated via Load Response > Hourly Updates screen
  - Min Down Time cannot be updated for committed hours

# Impacts to Ancillary Service Offers

|                                 | Today                                     | IDO Implementation                 | Opt Out of IDO                     |
|---------------------------------|---|------------------------------------|------------------------------------|
| Offer Price Granularity         | Daily                                     | Hourly                             | Hourly                             |
| Offer Price Update Deadline     | 1415 Day Before                           | 65 minutes prior to Operating Hour | 1415 Day Before                    |
| Offer MW/Status Granularity     | Hourly                                    | Hourly                             | Hourly                             |
| Offer MW/Status Update Deadline | <b>61 minutes</b> prior to Operating Hour | 65 minutes prior to Operating Hour | 65 minutes prior to Operating Hour |

\*corrected post-education session



4 new columns

|             |             |
|-------------|-------------|
| Capability  | Offer Price |
| Performance | Offer Price |
| Capability  | Offer Cost  |
| Performance | Offer Cost  |

Updates can be made up to 65 minutes prior to the start of the hour

# Impact to Generation Synchronized Reserve Offers

|                                     | Today                              | IDO Implementation                 | Opt Out of IDO                     |
|-------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Offer Price Granularity             | Daily                              | Hourly                             | Hourly                             |
| Offer Price Update Deadline         | 1415 Day Before                    | 65 minutes prior to Operating Hour | 1415 Day Before                    |
| Offer MW Granularity                | Hourly                             | No Change                          | No Change                          |
| Offer MW Update Deadline            | 2 hours prior to Operating Hour    | 65 minutes prior to Operating Hour | 65 minutes prior to Operating Hour |
| Hourly Availability Update Deadline | 61 minutes prior to Operating Hour | 65 minutes prior to Operating Hour | 65 minutes prior to Operating Hour |

\*corrected post-education session

# Synchronized Reserve Offer Updates to Markets Gateway

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Generation ▼


Location 

GENERATOR 1 ▼

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Updates

| <input type="checkbox"/> | Location ▲  | Offer MW | Offer Price | Condense Energy Use | Condense Startup Cost | Condense To Generate Cost | Full Heat Rate | Reduced Heat Rate | Variable Operating & Maintenance Expense Rate | Spin As Condenser | Condense Available Status |
|--------------------------|-------------|----------|-------------|---------------------|-----------------------|---------------------------|----------------|-------------------|---|-------------------|---------------------------|
| <input type="checkbox"/> | GENERATOR 1 |          |             |                     |                       |                           |                |                   |   | No                | Not Available             |

Offer Price Added



# Impact to Demand Response Synchronized Reserve Offers

|                             | Today                           | IDO Implementation                 |
|-----------------------------|---------------------------------|------------------------------------|
| Offer Price Granularity     | Daily                           | Hourly                             |
| Offer Price Update Deadline | 1415 Day Before                 | 65 minutes prior to Operating Hour |
| Offer MW Granularity        | Hourly                          | No Change                          |
| Offer MW Update Deadline    | 3 hours prior to Operating Hour | 65 minutes prior to Operating Hour |

\*corrected post-education session

- Any updates to the functionality discussed in this session will be communicated at Tech Change Forum
- Additional education sessions will be scheduled closer to the implementation dates and communicated via:
  - MIC
  - Markets Gateway User Distribution List
  - Technotify
  - Demand Response Subcommittee

- Additional Materials are available on the [Markets Gateway Tools Page](#)
  - [Updated External Specification Guide](#)
  - [Intraday Offers Frequently Asked Questions Document](#)
    - Accessing the IDO Training Environment
    - Market Rule Changes
    - XML/Browserless Information & Examples
- Questions?
  - Member Support Hotline at 610-666-8980 or 866-400-8980, or at [custsvc@pjm.com](mailto:custsvc@pjm.com)