Data Miner API Guide

PJM Interconnection

Contents

I. Introduction

Welcome to the PJM API Integration specification for PJM Data Miner. In this Introduction, you will find the following information:

About This User Guide

The Data Miner API User Guide will provide

1. Instructions for New User Registration, User Profile Management and Access to API Integration Specifications for PJM Data Miner.
2. Descriptions on the attributes per feed
3. Code samples of some API calls

Data Miner is PJM's enhanced data management tool, giving members and non-members easier, faster and more reliable access to public data formerly posted on pjm.com. The API Integration specs for Data Miner provides steps to register for a free API key that can be used to authenticate data retrieval via Data Miner APIs as well as access detailed API specification on the API Portal platform.

Data can be accessed from Data Miner two ways –

- First is the user interface, available at https://dataminer.pjm.com, which allows users to view all available data including feed metadata such as the feed definition and publication frequency. Users can query and filter data and export the data in csv format if required.
- Second is the Data Miner API allows users to issue automated queries for data from their own internal systems. This document discusses the specifics of using the Data Miner API.

Note that information and data contained in Data Miner is for internal use only and redistribution of information and or data contained in or derived from Data Miner is strictly prohibited without a PJM membership.

II. Data Miner API Integration Specification

Data Miner is PJM's enhanced data management tool, giving members and non-members easier, faster and more reliable access to public data formerly posted on pjm.com.

In this section the following information is provided:

- A description of how to register for API Portal
- A description of how to log in into the API Portal
- A description of how to manage user account profile
- A description of how to access the API Integration Specs

Access to Data Miner API Portal

The API Portal can be accessed using the URL: **https://apiportal.pjm.com/**. Users will need a PJM Tools username that is provisioned for Data Miner access or sign in to their existing PJM tools account from this page.

Existing User Request

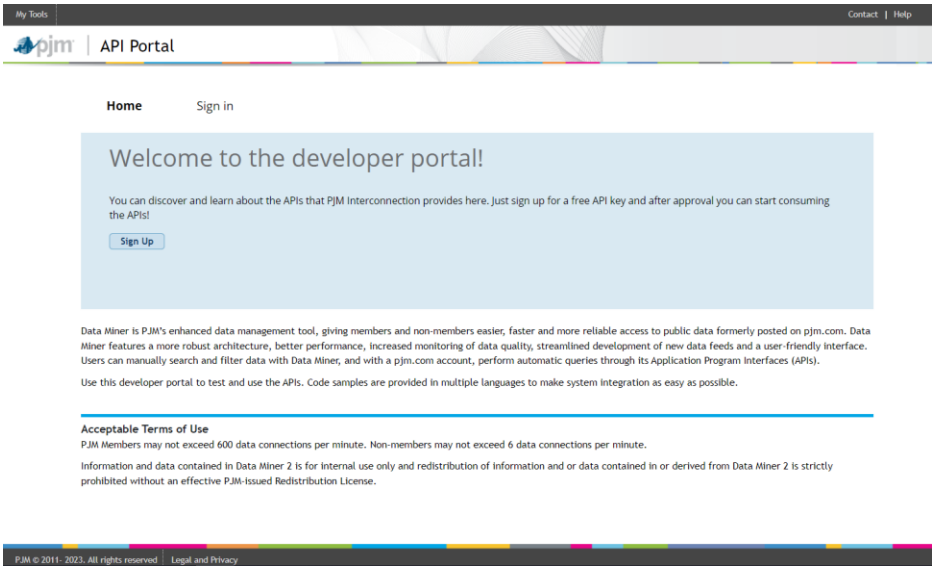
If you have an existing PJM Tools username, you may add Data Miner access. There are different steps for Member company access and for Non-Member company access. See below.

New User Registration

In order to gain access to API portal and access the specifications as well as obtain the required API key, users must register for a PJM tools username. The steps identified below show in detail how a user can register for a new username

Navigate to the URL below: https://accountmanager.pjm.com/accountmanager/pages/public/new-user.jsf

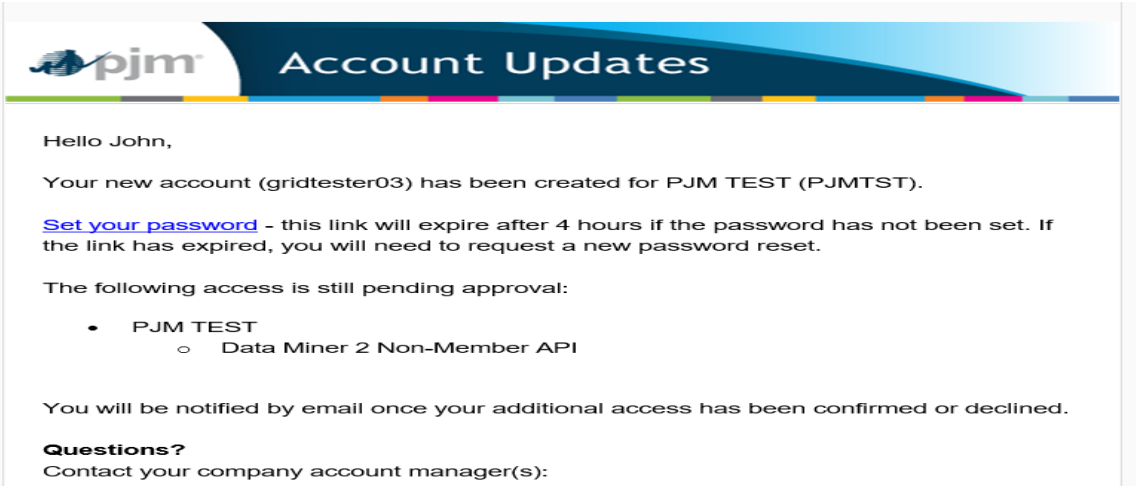
OR https://apiportal.pjm .com



1. Select “Sign up” to create a new account. On the next screen, Select “Register” to create a new account. The screen below will prompt the user to fill out their contact information.

2. Follow the steps for a login request located at URL: https://pjm.com/-/media/etools/account-manager/new-user-registration-workflows-quick-guide-1.ashx

3. Click on the link provided in the email to generate a password. Please note that if the user does not create their password within the 4 hour threshold, the user will need to contact their Customer Account Manager (CAM) to request a password reset. The company CAM will also receive an email that will detail the new user and pending access request. Email sample below:


Account Updates

Hello John,

Your new account (gridtester03) has been created for PJM TEST (PJMTST).

Set your password - this link will expire after 4 hours if the password has not been set. If the link has expired, you will need to request a new password reset.

The following access is still pending approval:

- PJM TEST
  - Data Miner 2 Non-Member API

You will be notified by email once your additional access has been confirmed or declined.

Questions?
Contact your company account manager(s):

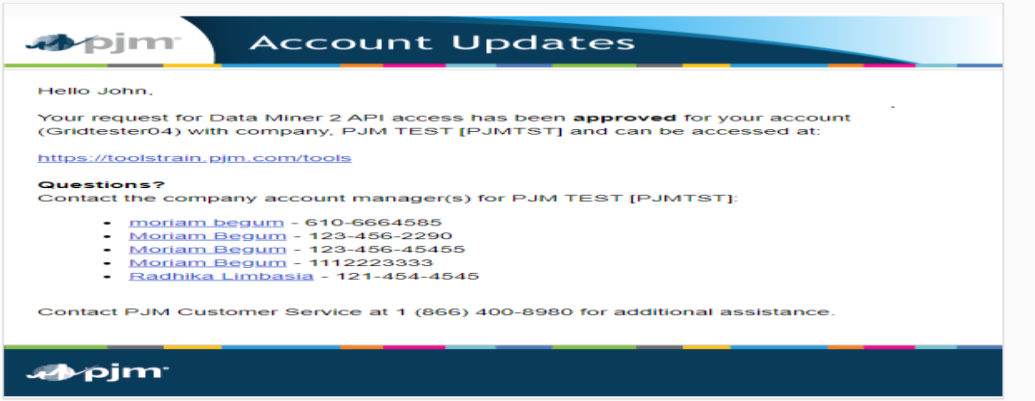
PJM Member Company
Login to PJM Account Manager, go to the Account Access tab in User Profile, and use the "Request Access" button to select Data Miner API. Go to **"Signing in to Data Miner API"** section in this document.

Non-Member Company
For a non-member account, you may use the Data and/or Tools for your internal business only. If that is the case, please send an email to **accountmanager@pjm.com** with the statement "**I confirm that the PJM Data will be used for internal business purposes only**." Include your Account Manager user id and your email address that you used to subscribe. Additional instructions will follow for provisioning non-member API access.

If you wish to use the Data and/or Tools for commercial purposes, including publishing and making derivatives of the Data, you must become a PJM Member. An Associate Membership is required at a minimum. You can enroll here.

PJM Data Miner Acceptable Terms of Use

Access Approval
When the user id is subscribed successfully to Data Miner, users will receive a confirmation email that looks like the email sample below.


Account Updates

Hello John,

Your request for Data Miner 2 API access has been **approved** for your account (Gridtester04) with company, PJM TEST [PJMTST] and can be accessed at:

https://toolstrain.pjm.com/tools

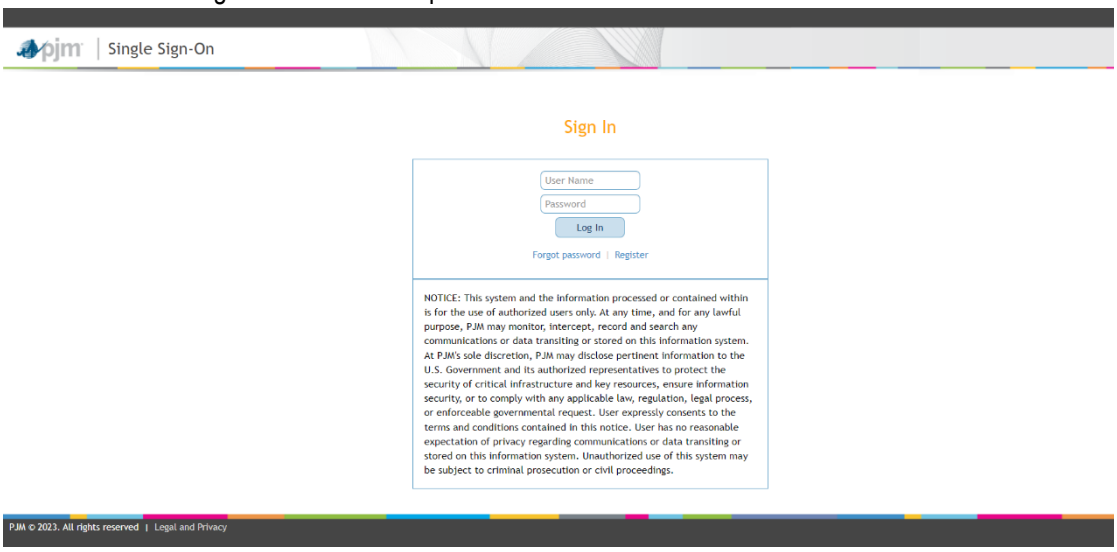
Questions?
Contact the company account manager(s) for PJM TEST [PJMTST]:

- moriam begum - 610-6664585
- Moriam Begum - 123-456-2290
- Moriam Begum - 123-456-45455
- Moriam Begum - 1112223333
- Radhika Limbasia - 121-454-4545

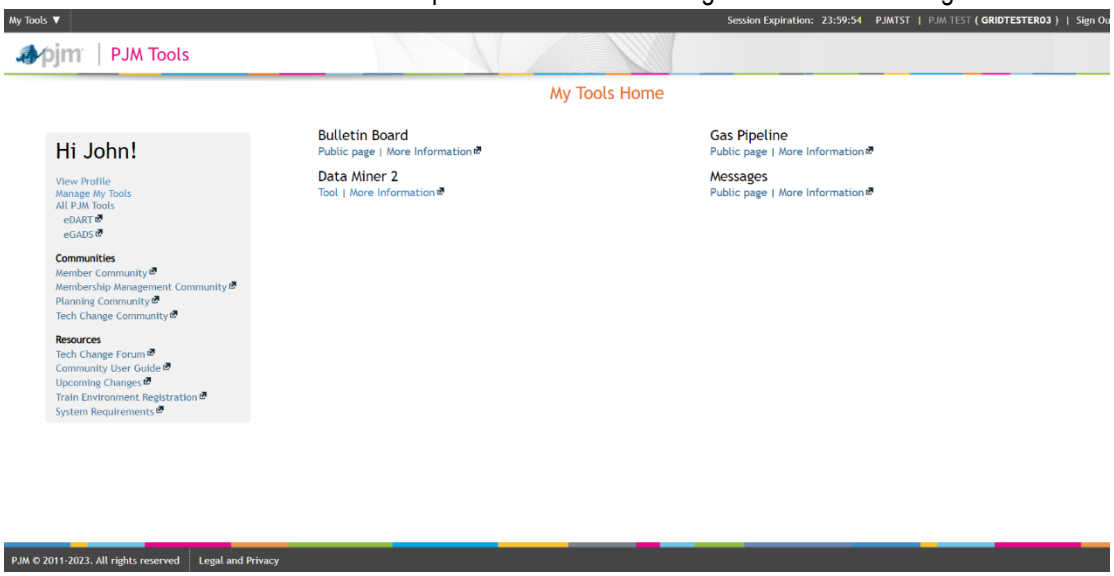
Contact PJM Customer Service at 1 (866) 400-8980 for additional assistance.

Signing in to Data Miner API

1. Once a valid PJM username and password is set up, navigate to https://apiportal.pjm.com/ and click on sign in button. The following screen will show up



2. Enter PJM tools account username and password and click on Log In to see the following screen



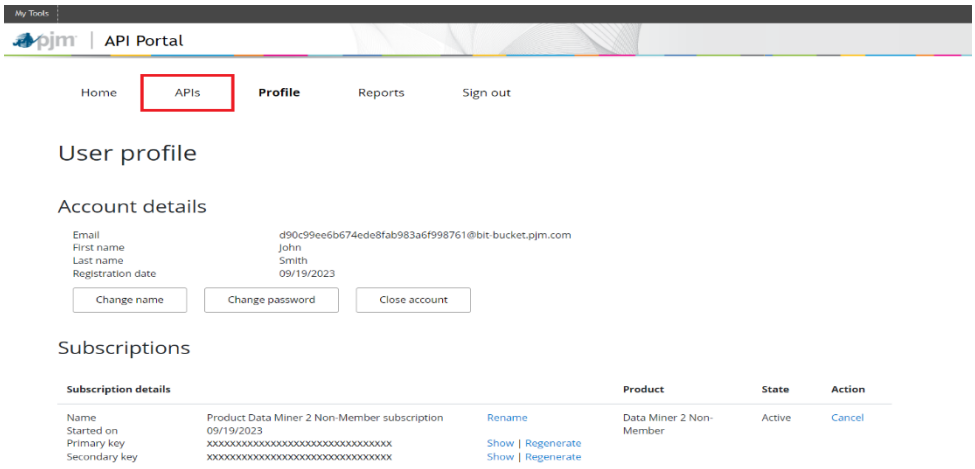
3. Click on “Tool” link under Data Miner to navigate to the API portal

User Profile Management

Once a user has an established PJM account in API Portal, the user can manage their profile information. The steps below show the different functions a user can perform on the My Tools Home page, Account Manager User Profile Account Information page, and the Account Manager Account Access page.

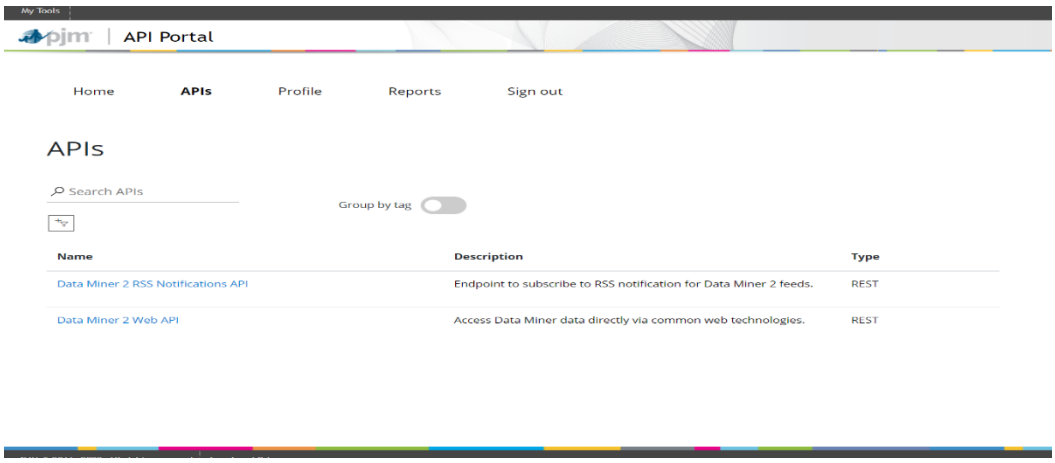
1. Click on the “profile area” link listed on the e-mail above, it should take you to the screen below. Upon signing in, it will navigate to your profile area.

2. From the profile area as provided in the screenshot below, users will be able to change your account information, change passwords and look up API token keys etc.

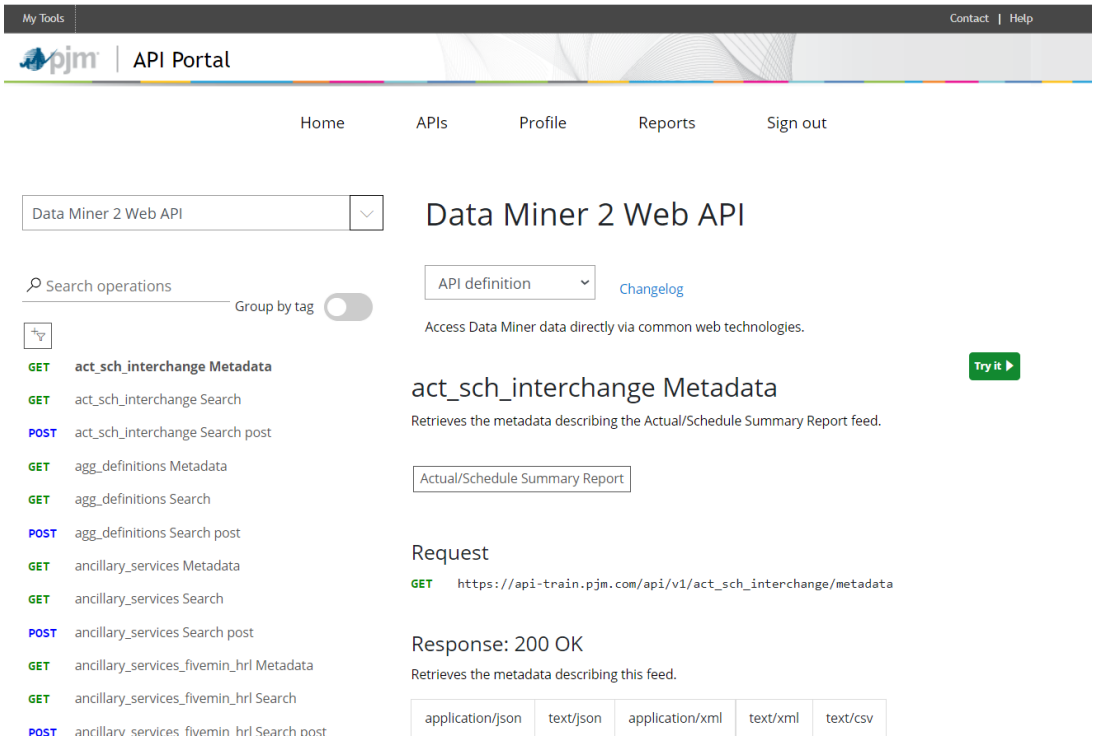


Access to API Integration Specification

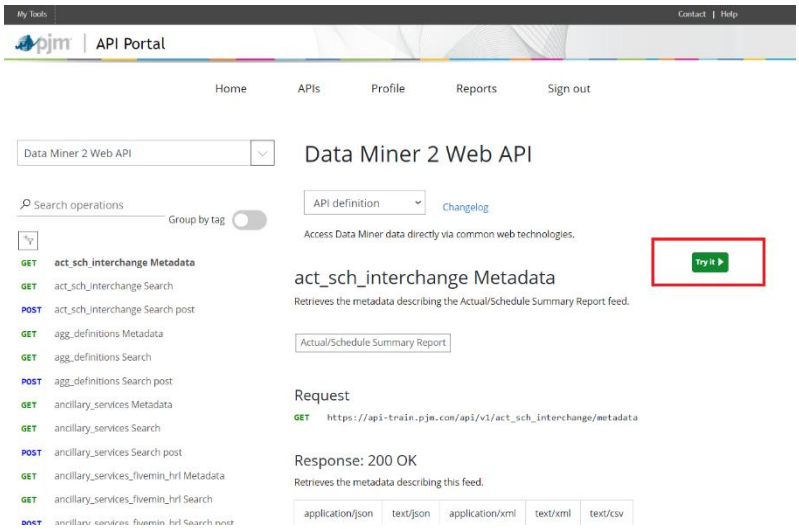
1. When users click on the API link above, it should navigate to list of API available. Please click on the “DataMiner Web API”.



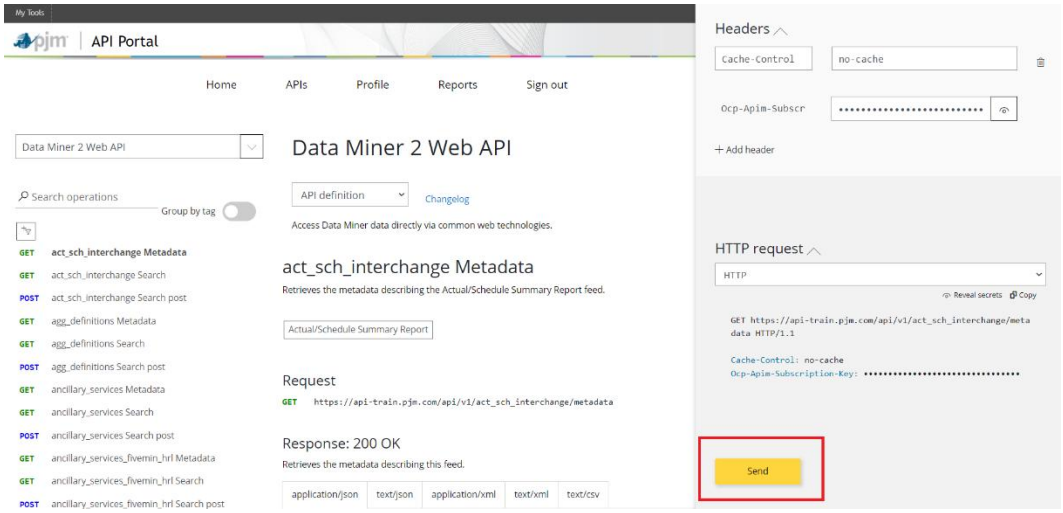
2. Clicking on the “DataMiner Web API” will provide the list of topics available, the request URL / headers for the API and the responses received for each published list of API. The API definition is also available in Swagger and WADL formats located in API definition drop down menu.



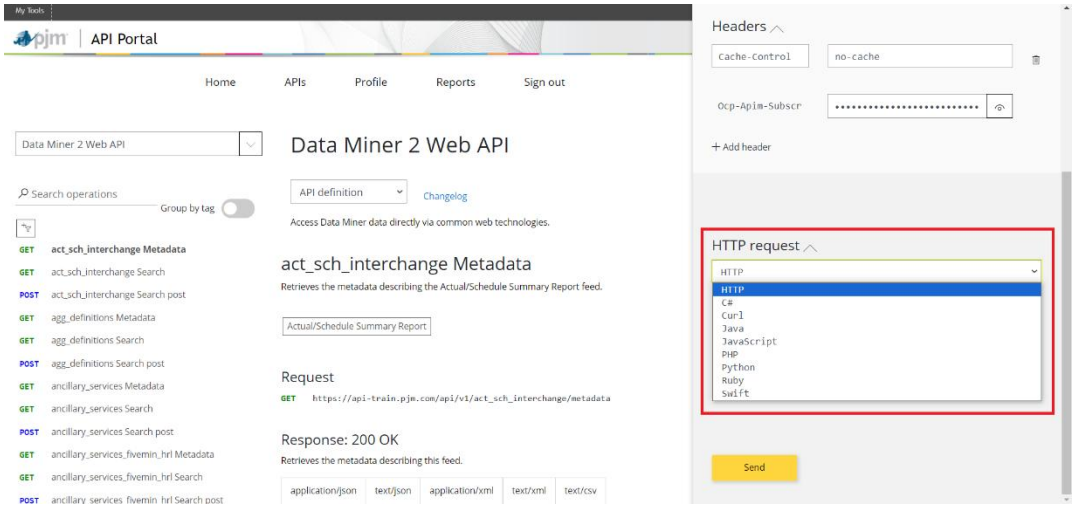
3. The user can also simply try and test the API call directly from this page by clicking the “Try it” button at the top of the page



4. Click on the “Send” button at the bottom of the page as shown below, any parameters (if available) can also be tested right from the page.



5. Selecting the dropdown, provides the sample code to invoke the API in different languages such as CURL, C#, JAVA, JavaScript, ObjC, PHP, Python and Ruby.



III. API Attribute descriptions

There are many different data feeds in Data Miner. Each feed represents a different stream of data. Each feed has an API for the “metadata” and an API to “search” the data itself. The “metadata” API does not contain any attributes that can be passed as inputs but the “search” API calls have specific set of attributes (optional) that users can use to analyze the data. Some of these attributes are filterable and sortable for more streamlined API calls. The following section describes a list of these attributes and the allowed values (where applicable) that can be used while making API calls using them. Note that only the attributes that can be filterable are listed per each feed. Some of the attributes are generic for most feeds. Example: Date Time Stamps, rowcount, start row etc. These are documented under Generic Attributes. The feed specific attributes are documented under Feed Specific Attributes.

All of the following information can also be found on apiportal.pjm.com

A) Generic Attributes

i) Date Time Attributes: Allowed values for the following DateTime Attributes are:

Allowed values are: Today (returns data for today's day), LastWeek (returns data where the date falls within the last calendar week) , LastMonth (returns data where the date falls within the last calendar month),Yesterday (returns data for today's date -1 day), CurrentMonth (returns data where the date value falls within the current month including current day), CurrentWeek (returns data where the date value falls within the current week including current day), CurrentYear (returns data where the date value falls within the current calendar year including current day), LastYear (returns data where the date value falls within the last calendar year) , NextYear (returns data where the date value falls within the next calendar year), NextMonth (returns data where the date value falls within the next calendar month), NextWeek (returns data where the date value falls within the next calendar week), Tomorrow (returns data for current calendar day +1 day), CurrentHour (returns data where the date value is equal to today’s date and the time is equal to the current hour), 1MonthAgo (returns data for the month where the date value falls within the current full calendar month minus one)4MonthsAgo (returns data for the month where the date value falls within the current full calendar month minus four), 6MonthsAgo (returns data for the month where the date value falls within the current full calendar month minus six), LastHour (returns data where the date value is equal to today’s date and the time is equal to the current hour-1 hour),15SecondsAgo (returns data where timestamp value is equal to current timestamp minus 15 seconds), 5MinutesAgo (returns data where timestamp value is equal to current timestamp minus 5 seconds), [date-value] to [date-value].The date-value should include the date and time component or the date component for applicable feeds. The date-value range should be within 366 days. Example: yyyy-mm-dd hh:mi to yyyy-mm-dd hh:mi

15SecondsAgo and 5MinutesAgo are designed specifically for dispatch rates and unverified LMP feeds that update every 15 seconds and 5 minutes respectively, additionally these filters are designed to work only with the ept columns, do not use with the utc columns.

For the date-value range, the following table defines the expected result behavior

ID	Date-Value Filter Input - Sample	Expected Result
1	1/26/2017	If there is no upper bound, this query will return full day result for 1/26/2017
2	1/26/2017 4:00	If there is no upper bound, this query will ignore the time component and return full day result for 1/26/2017
4	01/26/2017 exact	If "exact" is specified, even if there is no upper bound, the query restrict to the specific exact date and time In this example since no time was specified, data for 1/26/2017 00:00:00 will be returned
5	01/26/2017 04:00:00 exact	If "exact" is specified, even if there is no upper bound, the query restrict to the specific exact date and time In this example since no time was specified, data for 1/26/2017 04:00:00 will be used.
6	to 01/26/2017 00:00	If there is no lower bound, this query will return all the data the date is less than or equal to the specified date including the whole day 1/26/2017. The query will ignore the time component in this case.
9	01/26/2017 00:00 to	If there is no upper bound, this query will return all the data the date is greater than or equal to the specified date including the whole day 1/26/2017. The query will ignore the time component in this case.
10	01/26/2017 00:00 to 01/26/2017 00:00 01/26/2017 00:00 to 01/26/2017 00:59 01/26/2017 00:00 to 01/26/2017 00:59:59	This query will return the data for the one hour - 1/26/2017 hour 00:00 If the range exceeds 366 days, this query will return the error – "Error: Date range cannot exceed 366 days. Please refine your search and try again."
12	01/26/2017 06:00 to 01/26/2017 07:00	This query will return the data for the two hours - 1/26/2017 hours 06:00 and 07:00 If the range exceeds 366 days, this query will return the error – "Error: Date range cannot exceed 366 days. Please refine your search and try again."

Note: Data Miner uses consistent date-time field names and definitions. While not all data feeds have the same date-time fields, the usage is consistent anywhere they appear.

- _ept: this is a date-time value using Eastern Prevailing Time (i.e. Eastern Standard Time or Eastern Daylight time as appropriate for the time of year). Example: datetime_beginning_ept.
- datetime_beginning_utc: this is a date-time value using the Coordinated Universal Time time zone (the successor to Grenwich Mean Time or GMT). Example: datetime_beginning_utc.
- _beginning_: The inclusion of the "beginning" notation means that this date-time value represents the start of the appropriate interval. For example, if the data in question was for hourly data, and the time value was for 1000, the data in question would be for the hour from 1000 to 1059. Example: datetime_ending_ept.

- _ending_: Similar to their “beginning” counterparts, this timestamp shows the end time of the relevant interval. Example: datetime_ending_utc.

Various Date Time attributes that are used in Data Miner feeds:

(1) datetime_beginning_utc

(2) datetime_beginning_ept

(3) datetime_ending_utc

(4) datetime_ending_ept

(5) determinant_month

(6) bid_datetime_beginning_utc

(7) bid_datetime_beginning_ept

(8) case_approved_utc

(9) case_approved_ept

(10) day_ahead_market_date

(11) forecast_execution_date_ept

(12) forecast_date

(13) evaluated_at_utc

(14) evaluated_at_ept

(15) forecast_hour_beginning_utc

(16) forecast_hour_beginning_ept

(17) forecast_datetime_beginning_utc

(18) forecast_datetime_beginning_ept

(19) forecast_datetime_ending_utc

(20) forecast_datetime_ending_ept

(21) determinant_date

(22) ffe_datetime_beginning_utc

(23) ffe_datetime_beginning_ept

(24) eford_date_beginning

(25) effective_beginning_date

(26) effective_ending_date

(27) date

(28) start_time_utc

(29) start_time_ept

(30) end_time_utc

(31) end_time_ept

(32) pai_date

(33) pai_datetime_beginning_utc

(34) pai_datetime_beginning_ept

(35) pai_datetime_ending_utc

(36) pai_datetime_ending_ept

(37) prelim_br_posting_datetime_utc

(38) prelim_br_posting_datetime_ept

(39) projected_peak_datetime_utc

(40) projected_peak_datetime_ept

(41) generated_at_ept

(42) posted_day

ii) download :Determines how results should be returned. When true, only the results will be returned, no links or search criteria will be echoed. Additionally, the total count will be returned in the HTTP Header X-TotalRows, a Content-Disposition header will be added triggering browsers to show a Save prompt, and the rowCount argument becomes optional. Note that there are still limits on the maximum rows that may be returned and, if that threshold is crossed, a 400 response will be returned.

iii) rowCount: Specifies the maximum number of results to include in the search result. This is required if any other parameters are specified. The maximum is 50,000.

iv) Sort: Specifies the name of the field to sort on.

v) Order: Specifies the direction to sort the field on. Allowed values are: "asc" for ascending or "desc" for descending order. The default value is "asc".

vi) startRow: Specifies the one-based number of the first record in the search results to be returned. This is one-based, so 1 is the smallest value allowed and will return the very first record. This is required if any other parameters are specified.

B) Feed Specific Attributes

i) act_sch_interchange Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, tie_line, actual_flow, sched_flow, inadv_flow

(2) tie_line: Restricts results to those that contain the specified value in the 'Tie Line' field. This performs a partial, case-insensitive match. Allowed values are: AEP-C, AEP-P, ALEX, ALTE, ALTW, ALWX, AMIL, APS, CIN, CPLE, CPLW, CWLP, DUK, FE, HUDS, IPL, LAGN, LGEE, LIND, MDU, MEC, MECS, NEPT, NIPS, NYIS, OVEC, SIGE, TVA, WEC, WECX.

ii) agg_definitions Search

(1) agg_pnode_id: Restricts results to those that match the specified value in the 'Aggregate Pnode ID' field. This performs an exact, numerical match.

(2) agg_pnode_name: Restricts results to those that contain the specified value in the 'Aggregate Pnode Name' field. This performs a partial, case-insensitive match.

(3) bus_pnode_id: Restricts results to those that match the specified value in the 'BUS Pnode ID' field. This performs an exact, numerical match.

(4) bus_pnode_name: Restricts results to those that contain the specified value in the 'BUS Pnode Name' field. This performs a partial, case-insensitive match.

(5) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:effective_date_ept, terminate_date_ept, agg_pnode_id, agg_pnode_name, bus_pnode_id, bus_pnode_name, bus_pnode_factor

iii) ancillary_services Search

(1) ancillary_service: Restricts results to those that contain the specified value in the 'Ancillary Service' field. This performs a partial, case-insensitive match.

(2) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, ancillary_service, unit, value, row_is_current, version_nbr

(3) Unit: Restricts results to those that contain the specified value in the 'Unit Type' field. This performs a partial, case-insensitive match.

(4) row_is_current: Restricts results to those that contain the specified value in the 'Latest Version' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

(5) version_nbr: Restricts results to those that match the specified value in the 'Version Number' field. This performs an exact, numerical match.

iv) ancillary_services_fivemin_hrl Search

(1) ancillary_service: Restricts results to those that contain the specified value in the 'Ancillary Service' field. This performs a partial, case-insensitive match.

(2) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, ancillary_service, unit, value, row_is_current, version_nbr

(3) Unit: Restricts results to those that contain the specified value in the 'Unit Type' field. This performs a partial, case-insensitive match.

(4) row_is_current: Restricts results to those that contain the specified value in the 'Latest Version' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

(5) version_nbr: Restricts results to those that match the specified value in the 'Version Number' field. This performs an exact, numerical match.

v) ancillary_services_fivemin_mnt Search

(1) ancillary_service: Restricts results to those that contain the specified value in the 'Ancillary Service' field. This performs a partial, case-insensitive match.

(2) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, ancillary_service, unit, value

(3) Unit: Restricts results to those that contain the specified value in the 'Unit Type' field. This performs a partial, case-insensitive match.

vi) ancillary_services_monthly Search

(1) ancillary_service: Restricts results to those that contain the specified value in the 'Ancillary Service' field. This performs a partial, case-insensitive match.

(2) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, ancillary_service, unit, value

(3) Unit: Restricts results to those that contain the specified value in the 'Unit Type' field. This performs a partial, case-insensitive match.

vii) area_control_error Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, area, ace_mw

viii) bal_trns_cong_prelim_billing Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, balancing_trans_cong_cred_rate

ix) bill_deter_mnt_load Search

(1) billing_determinant: Restricts results to those that contain the specified value in the 'Billing Determinant' field. This performs a partial, case-insensitive match.

(2) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:determinant_month, billing_determinant, zone, monthly_rate

(3) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, ATSI, BGE, COMED, DAY, DEOK, DPL, DUQ, EKPC, JCPL, METED, PECO, PENELEC, PEPCO, PJM, PPL, PSEG, RECO.

x) da_ancillary_services Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, ancillary_service, unit, value, row_is_current, version_nbr

(2) ancillary_service: Restricts results to those that contain the specified value in the 'Ancillary Service' field. This performs a partial, case-insensitive match.

(3) Unit: Restricts results to those that contain the specified value in the 'Unit Type' field. This performs a partial, case-insensitive match.

(4) row_is_current: Restricts results to those that contain the specified value in the 'Latest Version' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

(5) version_nbr: Restricts results to those that match the specified value in the 'Version Number' field. This performs an exact, numerical match.

xi) da_hrl_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_id, pnode_name, voltage, equipment, type, zone, system_energy_price_da, total_lmp_da, congestion_price_da, marginal_loss_price_da, row_is_current, version_nbr

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) Voltage: Restricts results to those that contain the specified value in the 'Voltage' field. This performs a partial, case-insensitive match.

(4) Equipment: Restricts results to those that contain the specified value in the 'Equipment' field. This performs a partial, case-insensitive match.

(5) Type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match.

(6) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, CPL, DAY, DEOK, DOM, DPL, DUKE, DUQ, EKPC, EXTERNAL, JCPL, METED, PECO, PENELEC, PEPCO, PPL, PSEG, RECO.

(7) row_is_current: Restricts results to those that contain the specified value in the 'Latest Version' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

(8) version_nbr: Restricts results to those that match the specified value in the 'Version Number' field. This performs an exact, numerical match.

xii) da_interface_flows_and_limits Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, interface_limit_name, flow_mw, limit_mw

(2) interface_limit_name: Restricts results to those that contain the specified value in the 'Interface Limit Name' field. This performs a partial, case-insensitive match. Allowed values are: APSOUTH, BCPEP, BED-BLA, CENTRAL, EAST, WEST.

xiii) da_marginal_value Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, monitored_facility, contingency_facility, shadow_price

(2) monitored_facility: Restricts results to those that contain the specified value in the 'Monitored Facility' field. This performs a partial, case-insensitive match.

(3) contingency_facility: Restricts results to those that contain the specified value in the 'Contingency Facility' field. This performs a partial, case-insensitive match.

xiv) da_ratings Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, equipment_name, normal_rating, contingency_rating

(2) equipment_name: Restricts results to those that contain the specified value in the 'Equipment Name' field. This performs a partial, case-insensitive match.

xv) da_reserve_market_results Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, locale, service, mcp, mcp_capped, as_req_mw, total_mw, as_mw, ss_mw, tier1_mw, ircmwt2, dsr_as_mw, nsr_mw

xvi) da_tempset Search

(1) fields: specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, zone, da_temperature_set

(2) locale: Restricts results to those that contain the specified value in the 'Locale' field. This performs a partial, case-insensitive match.

(3) Service: Restricts results to those that contain the specified value in the 'Service' field. This performs a partial, case-insensitive match.

xvii) da_transconstraints Search

(1) fields: Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, duration, day_ahead_congestion_event, monitored_facility, contingency_facility

(2) day_ahead_congestion_event: Restricts results to those that contain the specified value in the 'Day Ahead Congestion Event' field. This performs a partial, case-insensitive match.

(3) monitored_facility: Restricts results to those that contain the specified value in the 'Monitored Facility' field. This performs a partial, case-insensitive match.

(4) contingency_facility: Restricts results to those that contain the specified value in the 'Contingency Facility' field. This performs a partial, case-insensitive match.

xviii) dasr_results Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, dasrmcp, total_pjm_rt_load_mwh, total_pjm_cleared_dasr_mwh, total_pjm_dasr_credits, total_pjm_adj_dasr_oblig_mwh

xix) day_gen_capacity Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:bid_datetime_beginning_utc, bid_datetime_beginning_ept, eco_max, emerg_max, total_committed

xx) day_inc_dec_utc Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:day_ahead_market_date, dec_mw, inc_mw, utc_mw

xxi) demand_response_uplift_credit Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:uplift_credit_date, id_number, csp_name, zone, pnode_id, credit_category, uplift_credit, run_date_ept

(2) id_number: Restricts results to those that match the specified value in the 'DSR Registration ID' field. This performs an exact, numerical match.

(3) csp_name: Restricts results to those that contain the specified value in the 'CSP Name' field. This performs a partial, case-insensitive match.

(4) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match.

(5) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(6) credit_category: Restricts results to those that contain the specified value in the 'Credit Category' field. This performs a partial, case-insensitive match.

xxii) dispatched_reserves Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, area, reserve_type, reserve_quantity, reserve_requirement, reliability_requirement, market_clearing_price, shortage_indicator

(2) Area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: MAD, PJM_RTO.

(3) reserve_type: Restricts results to those that contain the specified value in the 'Reserve Type' field. This performs a partial, case-insensitive match. Allowed values are: SR, PR.

(4) shortage_indicator: Restricts results to those that contain the specified value in the 'Shortage Indicator' field. This performs a partial, case-insensitive match. Allowed values are: 0, 1.

xxiii) energy_market_offers Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:bid_datetime_beginning_utc, bid_datetime_beginning_ept, unit_code, bid_slope_flag, mw1, mw2, mw3, mw4, mw5, mw6, mw7, mw8, mw9, mw10, bid1, bid2, bid3, bid4, bid5, bid6, bid7, bid8, bid9, bid10, no_load_cost, cold_start_cost, inter_start_cost, hot_start_cost, max_daily_starts, min_runtime, max_ecomax, min_ecomax, avg_ecomax, max_ecomin, min_ecomin, avg_ecomin

(2) bid_slope_flag: Restricts results to those that contain the specified value in the 'Bid Slope Flag' field. This performs a partial, case-insensitive match. Allowed values are: False, True.

xxiv) five_min_itsced_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:case_approval_datetime_utc, case_approval_datetime_ept, datetime_beginning_utc, datetime_beginning_ept, pnode_id, pnode_name, itsced_lmp, marginal_congestion, marginal_loss

(2) case_approval_datetime_utc: Restricts results to those that have a 'Case Approval Date Time UTC' which falls inside the specified date range.

(3) case_approval_datetime_ept: Restricts results to those that have a 'Case Approval Date Time EPT' which falls inside the specified date range.

(4) pnode_id: Restricts results to those that match the specified value in the 'Pnode ID' field. This performs an exact, numerical match.

xxv) five_min_solar_generation Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, solar_generation_mw

xxvi) five_min_solar_power_forecast Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:evaluated_at_utc, evaluated_at_ept, datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, solar_forecast_mwh, solar_forecast_btm_mwh

xxvii) five_min_tie_flows Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, tie_flow_name, actual_mw, scheduled_mw

xxviii) five_min_wind_power_forecast Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:evaluated_at_utc, evaluated_at_ept, datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, wind_forecast_mwh

xxix) fivemin_marginal_emissions Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_name, pnode_id, marginal_co2_rate, marginal_so2_rate, marginal_nox_rate

(2) pnode_id: Restricts results to those that match the specified value in the 'Pnode ID' field. This performs an exact, numerical match.

xxx) frcstd_gen_outages Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:forecast_execution_date_ept, forecast_date, forecast_gen_outage_mw_rto, forecast_gen_outage_mw_west, forecast_gen_outage_mw_other

xxxi) ftr_bids_annual Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:market_name, auction_round, source_pnode_name, sink_pnode_name, class_type, trade_type, quoted_mw, quoted_price, hedge_type

(2) market_name: Restricts results to those that contain the specified value in the 'Market Name' field. This performs a partial, case-insensitive match.

(3) class_type: Restricts results to those that contain the specified value in the 'Class Type' field. This performs a partial, case-insensitive match. Allowed values are: 24H, OffPeak, OnPeak.

(4) trade_type: Restricts results to those that contain the specified value in the 'Trade Type' field. This performs a partial, case-insensitive match. Allowed values are: Buy, Sell.

(5) hedge_type: Restricts results to those that contain the specified value in the 'Hedge Type' field. This performs a partial, case-insensitive match. Allowed values are: Obligation, Option.

xxxii) ftr_bids_long_term Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:market_name, period_type, auction_round, source_pnode_name, sink_pnode_name, class_type, trade_type, quoted_mw, quoted_price, hedge_type

(2) market_name: Restricts results to those that contain the specified value in the 'Market Name' field. This performs a partial, case-insensitive match.

(3) period_type: Restricts results to those that contain the specified value in the 'Period Type' field. This performs a partial, case-insensitive match. Allowed values are: YR1, YR2, YR3, YRALL.

(4) class_type: Restricts results to those that contain the specified value in the 'Class Type' field. This performs a partial, case-insensitive match.

(5) trade_type: Restricts results to those that contain the specified value in the 'Trade Type' field. This performs a partial, case-insensitive match. Allowed values are: Buy, Sell.

(6) hedge_type: Restricts results to those that contain the specified value in the 'Hedge Type' field. This performs a partial, case-insensitive match. Allowed values are: Obligation.

xxxiii) ftr_bids_mnt Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:market_name, period_type, auction_round, source_pnode_name, sink_pnode_name, class_type, trade_type, quoted_mw, quoted_price, hedge_type

(2) market_name: Restricts results to those that contain the specified value in the 'Market Name' field. This performs a partial, case-insensitive match.

(3) period_type: Restricts results to those that contain the specified value in the 'Period Type' field. This performs a partial, case-insensitive match. Allowed values are: YR1, YR2, YR3, YRALL.

(4) class_type: Restricts results to those that contain the specified value in the 'Class Type' field. This performs a partial, case-insensitive match.

(5) trade_type: Restricts results to those that contain the specified value in the 'Trade Type' field. This performs a partial, case-insensitive match. Allowed values are: Buy, Sell.

(6) hedge_type: Restricts results to those that contain the specified value in the 'Hedge Type' field. This performs a partial, case-insensitive match. Allowed values are: Obligation.

xxxiv) ftr_cong_lmp Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:effective_day, terminate_day, pnode_name, offpeak_clmp, onpeak_clmp, 24hour_clmp, lt_sim_offpeak_clmp, lt_sim_onpeak_clmp, lt_sim_clmp

(2) pnode_name: Restricts results to those that contain the specified value in the 'Pnode Name' field. This performs a partial, case-insensitive match.

xxxv) gen_by_fuel Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, fuel_type, mw, fuel_percentage_of_total, is_renewable

(2) fuel_type: Restricts results to those that contain the specified value in the 'Fuel Type' field. This performs a partial, case-insensitive match.

(3) is_renewable: Restricts results to those that contain the specified value in the 'Renewable Fuel Type' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

xxxvi) gen_outages_by_type Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:forecast_execution_date_ept, forecast_date, region, total_outages_mw, planned_outages_mw, maintenance_outages_mw, forced_outages_mw

(2) region: Restricts results to those that contain the specified value in the 'Region' field. This performs a partial, case-insensitive match.

xxxvii) gen_specific_uplift_credit Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:uplift_credit_date, generator, zone, pnode_id, credit_category, uplift_credit, run_date_ept

(2) zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match.

(3) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(4) credit_category: Restricts results to those that contain the specified value in the 'Credit Category' field. This performs a partial, case-insensitive match.

xxxviii) hourly_solar_power_forecast Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:evaluated_at_utc, evaluated_at_ept, datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, solar_forecast_mwh, solar_forecast_btm_mwh

xxxix) hourly_wind_power_forecast Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:evaluated_at_utc, evaluated_at_ept, datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, wind_forecast_mwh

xl) hrl_da_demand_bids Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, price_point, mw

xli) hrl_da_incs_decs Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:bid_datetime_beginning_utc, bid_datetime_beginning_ept, price_point, inc_mw, dec_mw, modified_datetime_utc

xlii) hrl_dmd_bids Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, area, hrly_da_demand_bid

xliii) hrl_load_estimated Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, load_area, estimated_load_hourly

(2) load_area: Restricts results to those that contain the specified value in the 'Load Area' field. This performs a partial, case-insensitive match. Allowed values are: AEP, COMED, DAYTON, DEOK, DOM, DUQ, EKPC, FE, PJME, PJMW.

xliv) hrl_load_metered Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, nerc_region, mkt_region, zone, load_area, mw, is_verified

(2) nerc_region: Restricts results to those that contain the specified value in the 'NERC Region' field. This performs a partial, case-insensitive match. Allowed values are: OTHER, RFC, RTO, SERC.

(3) mkt_region: Restricts results to those that contain the specified value in the 'Market Region' field. This performs a partial, case-insensitive match. Allowed values are: MIDATL, OTHER, RTO, SOUTH, WEST.

(4) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AE, AEP, AP, ATSI, BC, CE, DAY, DEOK, DOM, DPL, DUQ, EKPC, JC, ME, OTHER, PE, PEP, PL, PN, PS, RECO, RTO.

(5) load_area: Restricts results to those that contain the specified value in the 'Load Area' field. This performs a partial, case-insensitive match. Allowed values are: AE, AECO, AEPAPT, AEPIMP, AEPKPT, AEPOPT, AP, BC, CE, DAY, DEOK, DOM, DPLCO, DUQ, EASTON, EKPC, JC, ME, OE, PAPWR, PE, PEPCO, PLCO, PN, PS, RECO, RTO, SMECO, UGI.

(6) is_verified: Restricts results to those that contain the specified value in the 'Company Verified' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

xlv) hrl_load_prelim Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, load_area, prelim_load_avg_hourly

(2) oad_area: Restricts results to those that contain the specified value in the 'Load Area' field. This performs a partial, case-insensitive match. Allowed values are: AEP, AP, ATSI, DAY, DEOK, DOM, DUQ, EKPC, MIDATL, NI.

xlvi) inst_dispatch_rates Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, zone, dispatch_rate

(2) zone: estricts results to those that contain the specified value in the 'Zone' field. This performs a partial, case-insensitive match.

xlvii) inst_load Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, area, instantaneous_load

(2) area: Restricts results to those that contain the specified value in the 'Load Area' field. This performs a partial, case-insensitive match. Allowed values are: PJM MID ATLANTIC REGION, PJM RTO, PJM SOUTHERN REGION, PJM WESTERN REGION.

xlviii) instantaneous_wind_gen Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, wind_generation_mw

xlix) it_sced_bias Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:case_approved_utc, case_approved_ept, uds_delta_mw

l) load_frcstd_7_day Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:evaluated_at_datetime_utc, evaluated_at_datetime_ept, forecast_datetime_beginning_utc, forecast_datetime_beginning_ept, forecast_datetime_ending_utc, forecast_datetime_ending_ept, forecast_area, forecast_load_mw

(2) forecast_area: Restricts results to those that contain the specified value in the 'Forecast Area' field. This performs a partial, case-insensitive match. Allowed values are: AE/MIDATL, AEP, AP, ATSI, BG&E/MIDATL, COMED, DAYTON, DEOK, DOMINION, DP&L/MIDATL, DUQUESNE, EKPC, JCP&L/MIDATL, METED/MIDATL, MID_ATLANTIC_REGION, PECO/MIDATL, PENELEC/MIDATL, PEPCO/MIDATL, PPL/MIDATL, PSE&G/MIDATL, RECO, RTO_COMBINED, SOUTHERN_REGION, UGI/MIDATL, WESTERN_REGION.

li) load_frcstd_hist Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:evaluated_at_utc, evaluated_at_ept, forecast_hour_beginning_utc, forecast_hour_beginning_ept, forecast_area, forecast_load_mw

(2) forecast_area: Restricts results to those that contain the specified value in the 'Forecast Area' field. This performs a partial, case-insensitive match. Allowed values are: AEP, APS, ATSI, COMED, DAY, DOM, DUQ, MIDATL, RTO.

lii) load_recon_bill_deter_daily Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:determinant_date, billing_determinant, zone, rate, bor_id

(2) billing_determinant: Restricts results to those that contain the specified value in the 'Billing Determinant' field. This performs a partial, case-insensitive match.

(3) Zone: Restricts results to those that contain the specified value in the 'Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, DAY, DEOK, DOM, DPL, DUQ, East, EKPC, JCPL, METED, PECO, PENELEC, PEPCO, PJM, PPL, PSEG, RECO, RTO, West.

liii) load_recon_bill_deter_hrly Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, billing_determinant, zone, rate, bor_id

(2) billing_determinant: Restricts results to those that contain the specified value in the 'Billing Determinant' field. This performs a partial, case-insensitive match.

(3) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO_RESID_AGG, AEPAPCO_RESID_AGG, AEPIM_RESID_AGG, AEPKY_RESID_AGG, AEPOHIO_RESID_AGG, APS_RESID_AGG, BGE_RESID_AGG, COMED_RESID_AGG, DAY_RESID_AGG, DEOK_RESID_AGG, DOM_RESID_AGG, DPL_RESID_AGG, DPLEASTON_RESID_AGG, DUQ_RESID_AGG, EKPC_RESID_AGG, FEOHIO_RESID_AGG, JCPL_RESID_AGG, METED_RESID_AGG, Non PJM Mid Atlantic Dominion (MAD), PECO_RESID_AGG, PENELEC_RESID_AGG, PENNPOWER_RESID_AGG, PJM, PJM Mid Atlantic Dominion (MAD), PPL_RESID_AGG, PSEG_RESID_AGG, RECO_RESID_AGG, SMECO_RESID_AGG, UGI_RESID_AGG, VINELAND_RESID_AGG.

liv) lpc_bias Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:case_approved_utc, case_approved_ept, uds_delta_mw

lv) m2m_rt_ffe Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:flowgate_id, flowgate_name, mon_rto, nmo_rto, ffe_datetime_beginning_utc, ffe_datetime_beginning_ept, nmon_rto_hourly_ffe

(2) flowgate_id: Restricts results to those that match the specified value in the 'Flowgate Id' field. This performs an exact, numerical match.

(3) flowgate_name: Restricts results to those that contain the specified value in the 'Flowgate Name' field. This performs a partial, case-insensitive match. Allowed values are: 6101 line-Henepin 138kV l/o Kewanee-Cresent Rid 138kV, 6101 line-Henepin 138kV l/o Mazon-Cresent Rid-Oglesby 38kV, 6101-Hennepin 138 l/o Kickapoo Crk-Lasalle 138, 6101-Hennepin 138 l/o Princetp 138 Sub, Arcadian Zion 345 kV l/o PP Zion 345 kV, Austin-Auburn 138 kV l/o Kincaid-Latham Blmd 345 kV, Austin-Auburn 138kV l/o Kincaid-Lans 345 kV, Babcock-Stillwell 345 kV l/o Wilton Center-Dumont 765 kV, Babcock-Stillwell 345kV l/o Cook-Olive 345kV, Baldwin 345/138 kV l/o Baldwin-Turkey Hill 345 kV, Baldwin 345/138 kV xfmr l/o Baldwin-Cahokia 345 kV, Baldwin XF 345/138 l/o PrairieState-MtVernon 345 kV, Baldwin XF 345/138 l/o TurkeyHill XF 345/138, Batesville-Hubble 138 kV l/o Rockport-Jefferson 765kV, Batesville-Hubble 138 l/o Tanners Crk-Miami Fort 345, Belleau-Enon 345 kV l/o Labadie-Montgomery 345 kV, Bondurant-Montezuma 345kV, BR Tap-

Paradise 161kV l/o Marshall-Cumberland 500kV, BREC Paradise Tap-Paradise FP 161 kV l/o Barkly-Princeton 161 kV, Brokaw-Cornbelt 138 kV l/o Kincaid-Latham-Blue Mound-Latham TR, Brokaw-Cornbelt 138 l/o Blue Mound-Pontiac 345, Brokaw-Cornbelt 138 l/o Kincaid-Latham-BluMound 345+Kincaid-Austin 345, Brokaw-Cornbelt 138 l/o Loretto-Wilton Center 345, Brokaw-Cornbelt 138kV l/o Brokaw-Leroy 138kV + Leroy-Weedman 138kV, Brokaw-Cornbelt 138kV l/o Rising TR81 + Goosecreek-Rising 345kV, Brokaw-Cornbelt 138kV l/o Vermilion-NChampgn 138kV, Brokaw-Gibson (Cornbelt) 138 kV l/o Clinton-Oreana-GooseCrk 345 kV, Brokaw-Leroy 138 kV l/o Clinton-Oreana-Goose Creek 345 kV, Brokaw-Pontiac 345kV, Brokaw-Weedman 138kV l/o Brokaw-Pontiac 345kV, Bunsonvil-Eugene 345 kV l/o Sullivan XF 2 765/345, Bunsonvill 345/138 TR1 l/o Sidney-Bunsonvil 345 KV, Bunsonvill-Eugene 345 l/o WiltonCenter-Dumont 765, Bunsonville 138/345kV XF TR1 l/o Sullivan-Casey 345 kV, Bunsonville-Eugene 345 kV l/o Casey-Sullivan 345 kV, Bunsonville-Eugene 345 kV l/o Rockport-Jefferson 765 kV, Burr Oak-Plymouth 138kV l/o Babcock-Twer Rd, Burr Oak-Plymouth 138kV l/o Wilton-Dumont 765kV, Bush-Lafayette 138 kV l/o Westwood-Tippecan 138 kV, Bushcin-08Lafyte 138 l/o Cayuga2-Cayuga3 345, Bushcin-08Lafyte 138 l/o Cayuga3-Eugene 345, Casey-Sullivan 345 l/o Wilton Center-Dumont 765, CaseyWest-Sullivan 345 l/o Bunsonvil-Eugene 345, Cayuga 345/230 XFMR 9 (flo) Cayuga 345/230 XFMR 10, Cayuga bk10 l/o Cayuga-Nucor + Cayuga bk9, Cayuga Starbus TR 9-P l/o Cayuga-Nucor 345, Cayuga Starbus TR 9S l/o Cayuga-Cayuga CT 345, Cayuga-Cayuga3 345 kV l/o Petersburg-Sullivan 345 kV, Cayuga-Nucor 345 kV l/o Dresser-Sugar Creek (Mirant) 345kV, Cayuga-Nucor 345 kV l/o Petersburg-Thompson 345 kV, Cayuga-Nucor 345kV l/o Petersburg-Thompson 345kV, Cayuga3-Cayuga2 345kV l/o Rockport-Jefferson 765kV, Cayugabk10 l/o Cayugabk09, Chatham-Chatham IND 138kV l/o Kincaid-Lanesvil 345kV, Chatham-Chatham-Ind 138 kV l/o Kincaid-Pana 345 kV, Chicago Ave-Praxair 3 138 kV l/o Dumont-Witon Center 765 kV, Chicago Ave-Praxair3 l/o Lake George-Munster + Munster Xfmr, Chicago-USSstock 138kV l/o Wilton Center-Dumont 765 kV, Coffeen North-Ramsey 345 kV l/o Praire State-W Mt Vernon 345 kV+W Mt Vernon TR4 345/138 kV, Coffeen_N_Rmsy345flo_PraireSt_W_MtV345W_MtV_TR4, CoffeenN MidwayWBus 138 l/o COFN-RAME-HDNW 345 RMSY T1, Cornbelt-Gibson 138kV l/o RantJ-Sid 138kV+Rant-RantJ 138kV+RantJ-PaxE 138kV, Cornbelt-Gibson 138kV l/o Vermilion-NChampagne 138kV, Diamstr-Mclean 138kV l/o Powerton-Havana kV, Dune Acres-Michigan City 138 kV l/o Wilton Center-Dumont 765 kV, Edwards-Kewanee 138 kV l/o Hennepin-Woodhall 138 kV, Edwards-Kewanee 138 kV l/o Nelson-ElectricJct 345 kV, Edwards-Kewanee 138 kV l/o Tazewell XF 2 345/138, Effingham NW-Effinham 138 kV l/o Casey-Newton 345 kV, Effinham-Effingham NW 138kV l/o Casey-Newton 345kV, Enon-Montgomery 345 KV l/o Labadie-Montgomery 345 kV, Eugene-Bunsonville 345 kV l/o Sullivan-Casey 345 kV, Eugene-Cayuga 345 kV l/o Jefferson-Greentown 765 kV, Eugene-Cayuga 345 kV l/o Peteresburg-Sullivan 345 kV, Eugene-Cayuga 345 l/o Rockport-Jefferson 765, Eugene-Cayuga 345 l/o Rockport-Jefferson 765 Rockport1, Frankfrt 138kV-Frankfrt E 138kV l/o Frankfrt 345kV-Mt Vernon 345kV, Gibson-Abbrown 345 l/o Gibson-Merom 345, Gibson-Paxton 138kV, Gibson-Paxton 138kV l/o Clinton-MaroaJ-Oreana 345kV+Goosecrk-MaroaJ 345kV, Gibson-Petersburg 345 kV l/o Gibson-ABBrown 345 kV, Gibson-Petersburg 345 kV l/o Gibson-Francisco 345 kV, Gibson-Petersburg 345 kV l/o GibsonT9 + Gibson-AB Brown 345 kV, Gibson-Petersburg 345kV l/o Gibson-Bedford 345kV, Goodland-Reynolds 138 kV l/o Bunsonville-Eugene 345 kV, Greentown 765/138 XFMR 1 l/o Dumont-Greentown 765 kV, Greentown 765/138 xfmr1 Greentown 765/138 xfmr2, Greentown 765/138

xfmr2 l/o Dumont-Greentown 765, Greentown 765/138 xfmr2 Greentown 765/138 xfmr1, Greentown 765/138 xfmr2 l/o Greentown-Webster 230kV, Greentown 765/138 xfmr2 l/o Hanging Rock-Jefferson 765kV, Greentown 765/138 xfmr2 l/o Highlandpark-Newlondon 230, Greentown 765/138 xfmr2 l/o Rockport-Sullivan 765, Greentown TR1 765/138 kV l/o HangingRock-Jefferson 765, Greentown TRF1 765/138 kV l/o HangingRock-Baker 765kV, Greentown-Delco 138 kV l/o Greentown-Chrysler 138 kV, Greentown-Delco 138 kV l/o Gtown-Chrysler 138 kV + Dumont-Greentown 765 kV, Greentown-KokomoE 230 kV l/o Walton-Peru 230 kV + Peru-Greentown 230 kV, Havana - Elkhart Jct 138 kV l/o Havana S - Havana E 138 kV, Havana E-Havana S 138 kV l/o Duck Creek-Maple Ridge 345 kV, Havana S-Havana E 138 kV l/o DuckCreek-Tazewell 345 kV, Havana-Elkhart Jct 138 kV l/o DuckCreek-Tazewell 345 kV, HavanaS-Mason City West 138 l/o Duck Creek-Maple Rid 345, Hennepin-LTV_1353 138 kV l/o Duck Creek-Tazewell 345 kV, Hennepin-LTVSteel 138 kV l/o Hennepin-Ottawa 138 kV+ Ottawa-Oglesby 138 kV, Hennepin-LTVSteel 138 kV l/o Kendall-Tazewell 345 kV, Hennepin-Ottawa 138 kV l/o Oglesy-Mazon-Cresent 138 kV, Hennepin_LTV_Stl_138_flo_Duck_Crk_Tazewell_345, Henry-New Castle 138 l/o Noblesville-Sanderson 138, Holland-Mason 138 l/o Loretto-Wilton Center 345, Holland-Neoga 345 l/o Kincaid-Pana-Coffeen 345, Holland-Neoga 345 l/o Newton-Casey 345, HollandNW-NeogaS 345 kV l/o Coffeen-Pana 345 kV, Hortonville-Whitestown 345 kV l/o Whitestown Guion 345+Guion TR, IP_1352_Powerton_JCT_FLO_Clinton_Unit_1, Ipava - Frederck 138kV l/o Duck Creek - Maple Ridge 345kV, Ipava-Canton 138 kV l/o DuckCreek-Tazewell 345 kV, Ipava-Havana 138 kV l/o Havanna-Powerton 138 kV+ Powerton-Danvers 138 kV, Ipva-Macomb 138 kV l/o Duck Creek-Maple Ridge 345 kV, Ipva-Macomb 138 l/o Frederck-Meredosa 138+Frederck TR 138/69 kV, Kew-Princetp-Henn 138kV l/o Kew-Henn-Str 138kV, Kewanee-Edwards 138 kV l/o Duck Creek-Tazewell 345 kV, Kewanee-Edwards 138 kV l/o Nelson-Electric Jct 345 kV, Kincaid-Austin 345kv l/o Lanesville-Brokaw 345kv, Kokomo E -Webster 230 kV l/o Dumont-Greentown 765 kV, Kokomo High Park-New London 230 kV l/o Nucor-Cayuga 345 kV, Kokomo-Chrysler 138 kV l/o Webster-Newlondon 230 kV, Kokomo_Newlondon_230_flo_Greentown_Dumont_765, Labadie-GraySummit 2 345 kV l/o Labadie-GraySummit 1 345 kV, Labadie-Montgomery 345 kV l/o Belleau-Sioux 345 kV, Lafsou-southJ l/o Westwood-NrthwestTap1 WestLafayette, Lakegeor-Aetna 138kV l/o Lkgeor-Miller 138kV, Lakeview Zion 138 kV l/o PP Zion 345 kV, Lakeview-Zion 138 l/o Pleasant Prairie-Zion 345+Pleasant Prairie-Zion EC 345, Lanesville 345/138 l/o Kincd-Lathm-Blue Mnd 345+Kincd-Austin 345, Lasalle Jct-Esk Tap 138 kv l/o Ottawa-Hennepin-Oglesby 138 kV, Latham-Fogarty 138 l/o Loretto-Wilton Center 345, Lawrencevil-Vincennes 138 kV l/o Casey-Newton 345 kV, Lawrencevil-Vincennes 138 kV l/o Casey-Sullivan 345 kV, Leesburg - NorthEast 138 kV l/o Leesburg - Hip 345 kV, Leesburg - NorthEast 138 kV l/o Wilton - Center - Dumont 765 kV, Leesburg-Northeast 138 kV l/o Leesburg-Hiple 345 kV, Lilly-Powerton 138 kV l/o DuckCreek-Tazewell 345 kV, Louisvil-Olney 138 kV l/o Casey-Newton 345 kV, Lutevil-StFrancis 345 kV l/o PrairieState-MtVernon 345 kV, Macomb-Ipva 138 kV l/o Duck Creek-Maple Ridge 345 kV, Macomb-Ipva 138 kV l/o Frederck-Meredosa 138+Frederck TR 138/69 kV, Maple Ridge-Tazewell 345kV l/o Fargo-Maple Ridge 345kV, Marblehead 161/138kV XFMR l/o Maywood-Herleman 345kV, Mark Jct-Wimingtn 138kV l/o Miami Fort-Tanners Creek 345kV+MF 2 Xfs 345/138kV, Market Jct-Wilimington l/o Ghent-Lexington-Brown 345kV, Maroa E-Goose Creek 345 kV l/o Wilton Center-Dumont 765 kV, Maroa E-GooseCreek 345 kV l/o Wilton Center-Dumont 765 kV, MasonT-ElanT 138 kV l/o Lan-Bro 345 kV, Mclean-Diamond Star Tap 138kV l/o Kickapoo Creek-Lasal

138kV, Mclean-El Paso 138 kV l/o Pontiac-Brokaw 345 kV, Mercer IP-Sandburg 161kV l/o Byron-Lee County 345, Mercer IP-Sandburg 161kV l/o Cherry Valley-Silver Lake 345kV, Mercer IP-Sandburg 161kV l/o Cordova-Nelson 345 kV, Mercer IP-Sandburg 161kV l/o Nelson-Electric Junction 345kV, Mercer IP-Sandburg 161kV l/o Sterling Steel-Nelson 345 kV, Merom-Dresser 345kV l/o Merom-Worthington 345kV, Michcity-DuneAcrs 13843 l/o WiltonC-Dumnt 765 kV, Michigan City-Trail Creek 138 kV l/o Wilton Center-Dumont 765 kV, Michigan City-Trail Creek 138 l/o Michigan City-Bosserman 138, MIcity-Trlcrk 138 kV l/o Bosserman-MIcity 138 kV+Dumont-Wilton 765 kV, Midway-Pana 138 kV l/o Coffeen-Pana 345 kV, Midway-SchramCity 138 kV l/o Coffeen-Pana 345 kV, Midwayip-Shram_T3 138 l/o Kincaid-Pana-Coffeen 345+Kincaid U1, Montgomery_Enon Tap_345kV_flo_Labadie_Montgomery_345kV, Monticello-East Winamac 138 l/o Reynolds-Olive 1 345 kV, Monticello-EWinamac 138kV l/o Reynolds-Olive 34527 345 kV, Monticello-EWinamac 138kV l/o Reynolds-Olive 34532 345 kV, Mt Vernon TR 345/138 kV l/o Mt Vernon-WFrankfort 345 kV, Mt Vernon TR 345/138 kV l/o Mt Vernon-Xenia 345 kV, Mt Vernon Xfmr 345/138 kV l/o Newton-Xenia 345 kV, MtVernon XF 345/138 l/o Casey-Newton 345 kV, Munster 345/138 kV xfmr l/o Dumont-Wilton Center, NChampgn-Vermilion 138 kV l/o Bunsonville 345/138 kV, NChampgn-Vermilli 138kV l/o Paxton-Hoop 138kV, Neoga 345/138 kV TR2 l/o Casey West Kansas 345 kV, Neoga 345/138 kV Xfmr l/o Casey-Sullivan 345 kV, Neoga TR 345/138 kV l/o Casey-Neoga 345 kV, New London-Kokomo 230kV l/o Cayuga-Nucor 345kV, New London-Kokomo230 kV l/o Webster-New London 230 kV, Newlondon-Kokomo 230 l/o Cayuga-Nucor 345, Newton 345kV/138kV #2 l/o Newt-Casey 345kV, Newton TR 345/138 kV l/o Casey-Newton 345 kV, Newton TR1 345/138 kV l/o Newton TR2 345/138 kV, Newton TR2 345/138 kV l/o Newton TR1 345/138 kV, Newton Xfmr 2 l/o Newton-Xenia 345 kV, Newton Xfmr 345/138 kV l/o Coffen-Ramsey E-Holland-RamseyT1 345 kV, Newton-Louisville 138 kV l/o Casey-Newton 345 kV, Newton-Rob 138 kV l/o Newwton-Xenia 345 kV, Newton-Robsnom 138 kV l/o Casey-Newton 345 kV, Newton_Casey_345_flo_Rockpt_Sullivan_765, Newton_CaseyWest_345_FLO_NeogaSouth_CaseyWest_345, Newton2-Louisville South138 kV l/o MtVernon-Xenia 345 kV, Noblesvil_Lapeljt138kV_flo_GuionWhitestown345kV_GuoinNxfmr, Norris-Crossville 138kV l/o Newton-Xenia 345kV, NorthChampaign-Vermillion 138 kV l/o Sidney-Bunsonvil 345 kV, Northeast_Kline1_38_flo_Dumont_Sorenson_765, Northport - Albion 138kv l/o Dumont-Sorenson 765kv, Nucor-Whitestown 345 kV l/o Petersburg-Thompson 345 kV, Nucor-Whitestown 345 kV l/o Rockport-Jefferson 765 kV, Nucor-Whitestown 345kV l/o Edwardsport-AMO 345kV, Nucor-Whitestown 345kV l/o Meadow Lake 2-Reynolds 2 345kV, Nucor_Whitestown_345_flo_Rockport_Jefferson_765, NWTap-Purdue 138kV l/o Westwood-Nrthwest Tap1-West Lafayette, Oak Grove-Mercer 161 kV l/o Byron-Lee County 345 kV, Oak Grove-Mercer 161 kV l/o Cordova-Nelson 345 kV, Oak Grove-Mercer 161 kV l/o Nelson-Electric Junction 345 kV, Oak Grove-Mercer 161 kV l/o Sterling Steel-Nelson 345 kV, Palisades-Argenta1 345kV l/o Palisades-Argenta2, Pana 345/138 TR3 l/o Kincaid-Lanesville 345+Kincaid-Austin 345, Pana 345/138 xfm3 l/o Kincaid-Lanesvil 345kV, Pana 345/138 xfmr 1 l/o Kincaid-Lanesville 345, Pana Shelby 138 kV lo Newton Casey 345 kV, Pana Xfmr 1 345/138 kV l/o Kincaid-Lansvil-Kincaid-Pawnee 345 kV + Pawnee xf 345/138 kV, Pana-Shelbyvil 138 kV l/o Goose Creek-Rising 345 kV, Pana_Shelbyvil_S_138kV_flo__Holland_NW_Neoga_S_345kV, Pana_Shelbyville_138_flo_HollandNW_NeogaS_345, Paradise-Big River Tap l/o Wilson1, Paradise-BR Tap 161kV l/o Wilson-Roane 500kV, Paradise-New Hardinsburg 161kV l/o Phipps

Bend-Volunteer 500kV, Pawn-Austin 138 l/o Kincd-Lthm-Blmnd + Kincd-Lansvl 345, Pawn-Austin 138kV l/o Kincd-Lthm-Blmnd 345, Paxton E-Rantoul Jct 138 kV l/o Vermillion-N Champaign 138 kV, Paxton East-Hoopest 138 l/o Vermilion-Tilton 138, Paxton-Rantoul Jct l/o Goodland-Morrison + Goodland TR1, Pleasant Prairie-Zion 345, Pleasant Prairie-Zion 345 l/o Pleasant Prairie-Zion EC 345, Pleasant Prairie-Zion 345 l/o Zion-Zion EC 345, Pleasant Prairie-Zion EC 345 kV l/o Pleasant Prairie-Zion 345 kV, Pleasant Prairie-Zion Ec345, Pleasant Prairie-ZionEc345 l/o Pleasant Prairie-Zion+Arcadian-Zion, PleasantPrairie-Zion 345 kV l/o Arcadian-Zion 345 kV, Plymouth-Leesburg 138 kV l/o Cook-Dumnt 765kV, Plymouth-Leesburg 138kV l/o Dumont-Sorensn 765kV, Powerton Jct-Huffip (AMIL) 138kV l/o Kewanee-Toulon (CE) 138kV, Powerton Jct-Huffip 138 kV l/o Clinton unit 1, Powerton Jct-Lilly 138 l/o Havana-Ipava 138, Powerton Jct-Lilly 138 l/o Lanesville-Brokaw 345, PowertonJct-Lilly 138 kV l/o Duck Creek-Tazewell 345 kV, PowertonJct_Lilly138_flo_DuckCreek_Tazewell_345, PowertonJct_Lilly138_FLO_Kewanee_Toulon138, PPG 3 - Route 51 138 kV l/o PPG 3- Mount Zion 121 138 kV, Prair St - MtVernon 345 l/o Lutesvil - StFrancois 345, PTDF Sandburg-SouthSST 138 kV Basecase, Ramsey TR 345/138 kV l/o Neoga-Holland 345 kV, Ramsey-NPana 138 kV l/o Coffeen-Pana-Kincaid 345 + Kincaid U1 + Pana TR1, RAMSEY-PANA + COFFEEN-PANA-KINCAID, Rantoul Jct-Paxt East 138kV, Rantoul Jct-Paxt East 138kV l/o Darwin-Sullivan 345kV, Rantoul Jct-Paxt East 138kV l/o Vermilion-NChampagne 138kV, Rantoul Jct-Paxton East 138 kV l/o Casey 30309-Breed 345 kV, Rantoul Jct-Paxton East 138 kV l/o Goodland-Morrison + Goodland xfmr 1, Rantoul Jct-Paxton East 138 kV l/o Tilton EC-West Tilton 138 kV, Rantoul Jct-Paxton East l/o Paxton-Paxton East+Paxton-Gibson, Rantoul-Paxton 138 l/o Goodland-Reynolds + Goodland xfmr, Rantoul-Rantou lJct 138 kV l/o NChmpgn-Mahmet-Rising 138 kV, Rantoul_RantlJct_138_flo_NChmpgn_Mahmet_Rsng_138, Reynolds 345/138 xfmr l/o Hip-Collingwood 345kV, Reynolds 345/138 xfmr l/o MeadowLk-Olive 345, Reynolds 345/138 xfmr l/o tipplabs-Lafind138, Reynolds-Goodland 138 l/o Eugene-Bunsonville 345, Reynolds-Magnetation 138 kV l/o Reynolds-Olive 1 345 kV, Reynolds-Magnetation 138 kV l/o Rockport-Jefferson 765 kV, Reynolds-Magnetation 138 kV l/o Schahffer-Burr Oak 345 kV, Reynolds-Magnetation 138 l/o Cayuga2-Cayuga3 345, Reynolds-Magnetation 138 l/o Deedsvil-Leesburg-Walton 345, Reynolds-Magnetation 138 l/o Eugene-Cayuga3 345, Reynolds-Magnetation 138kV l/o Dequine-Westwood1 345 kV, Reynolds-Magnetation 138kV l/o Dequine-Westwood2 345kV, Reynolds-Magnetation l/o Reynolds-Olive 34527 345 kV, Reynolds-Magnetation l/o Reynolds-Olive 34532 345 kV, Reynolds-Magnetation l/o Tipplabs-Lafind 138, Reyonlds 345/138 l/o Dequine-Westwood 2 345, Rising 345/138 kV l/o Loretto Wind Farm-Wilton Center 345 kV, Rising 345/138 kV xfmr 1 l/o Wilton Center-Dumont 765 kV, Rising 345/138 l/o Brokaw-Pontiac 345, Rising 345/138 XFMR 1 (flo) Clinton - Brokaw 345kV, Rising TR 345/138 l/o Rising-Sidney 345 kV, Rising_TR1_FLO_WiltonCenter_Dumont765, Robins-Lawrence 138 kV l/o Casey-Sullivan 345 kV, Rock Creek 345-161 TX l/o Quad Cities-Sub 91 345 kV, Rock Creek-Beaver Channel 161kV l/o SUB91 345-161kV TRF1, Rossvill-Hoopest 138kV l/o Vermilion-NChampagne 138 kV, Rossvill-Hoopest 138kV l/o Vermilion-Tilton 138 kV, Rossville-Vermilion 138kV l/o RantJ-Sidney+Rant-RantJ+RantJ-PaxE, Roxana-LTV2 138 kV l/o Sheffield-Marktown 138 kV, Roxana-Praxair 138 kV l/o Gary Ave-Sheffield 345 kV, Roxana-Praxair 138 kV l/o Inland5-Marktown 138 kV, Roxana_Praxair_138_flo_Wilton_Center_Dumont_765, Sandburg 161/138 kV l/o Electric Jct-Nelson 345 kV, Sandburg 161/138 kV l/o Nelson-H471 ESS 345 kV, Sandburg-SouthSST 138kV

l/o CORDOVA-NELSON 345kV, Sch-Pana 138 kVB l/o Cof-Pan 345kV, SchramCity-Midway 138 kV l/o Coffeen-Pana-Kincaid 345 kV, SchramCity-Midway 138 kV l/o Coffeen-Pana-Kincaid 345 kV + Kincaid U1, SE Wisconsin Interface, Segreto-Palisades 1 345 kV l/o Segreto-Palisades 2 345 kV, Segreto-Palisades 1 345 kV l/o Segreto-Palisades 2 345 kV (MOPI), Segreto-Palisades 1 345 kV l/o Twin Branch-Argenta 345 kV, Segreto-Palisades 1 345 kV l/o Twin Branch-Argenta 345 kV (MOPI), Segreto-Palisades 2 345 kV l/o Cook-Benton Harbor 345 kV, Segreto-Palisades 2 345 kV l/o Cook-Benton Harbor 345 kV (MOPI), Segreto-Palisades 2 345 kV l/o Segreto-Palisades 1 345 kV, Segreto-Palisades 2 345 kV l/o Segreto-Palisades 1 345 kV (MOPI), Segreto-Palisades 2 345 kV l/o Twin Branch-Argenta 345 kV, Segreto-Palisades 2 345 kV l/o Twin Branch-Argenta 345 kV (MOPI), Shadeland-LafayetteS l/o Westwod-NWTap1-WestLafayett, Shelbyville-Pana 138 kV l/o Coffeen-Ramsey-Holland 345 kV, Shelbyville-Pana 138 kV l/o Neoga-Holland 345 kV, Sidney-Bunsonville 345 kV 1/o Casey-Sullivan 345 kV, Sidney-Bunsonville 345 kV l/o Casey-Sullivan 345 kV, Sidney-Bunsonville 345 kV l/o Rockport-Jefferson 765 kV, Stallings-Madtap 138 l/o Roxford-Stallings 345, Staunton-Gilespie 138 kV l/o Coffeen-Roxford 345 kV, Sullivan-Casey 345 kV l/o Dumont-Greentown 765 kV, Sullivan-Casey 345 kV l/o Wilton Center-Dumont 765 kV, SW Wisconsin Interface, Tazewell TR1 345/138 kV l/o Tazewell TR2 345/138 kV, Tazewell TR2 345/138 kV l/o Tazewell TR1 345/138 kV, Tilden-Fayet 138 kV l/o Prairie State-Mt Vernon 345 kV, TildenJct-Tilden 138 kV l/o Prairie State-Mt Vernon 345 kV, Tompkins-Majestic 345 kV l/o Oneida-Majestic 345 kV, Turkey Hill TR 345/138 kV l/o Prairie State-Mt Vernon 345 kV, Vermilion-Nchampgn 138 kV l/o Tiltonec-West Tilt 138 kV, Vermilion-Nchampgn 138kV l/o Brokaw-Cornbelt 138kV + Gibson-Cornbelt 138kV, Vermilion-NChampgn 138kV l/o Darwin-Sullivan 345kV, Vermilion-NChampgn 138kV l/o Hoopest-Paxton East 138kV, Vermilion-NChampgn 138kV l/o Hoopest-Rossvill 138kV, Vermilion-Nchampgn 138kV l/o Paxton-Paxton East + Paxton-Gibson, Vermilion-NChampgn 138kV l/o Sullivan-Casey 345 kV, Vermilion-NChampgn 138kV l/o Vermilion-Tilton 138kV, Vermilion-Tilton 138 kV l/o Bunsonville-Sidney 345 kV, Vermilion-Tiltonec 138kV l/o Sidney 138/345kV TR1, Vermilion-Tiltonec 138kV l/o Sullivan-Casey 345 kV, W Casey-Sullivan 345kV l/o Eugene-Bunsonville 345kV, Walton 230/345 XFMR l/o BurrOak-Leesburg 345 kV, Walton 230/345 xfmr l/o Dumont-Greentown 765, Wash St 3-Raab Rd3 138 kv l/o Clinton Unit 1, Westwood 345 138bk1 l/o Rockport-Jefferson 765, Westwood 345/138 1 l/o Cayuga-Eugene 345 kV, Westwood 345/138 bk2 l/o MeadowLK-Reynolds-Olive 345, Westwood 345/138 kV Xfmr1 l/o Meadow Lake-Reynolds-Olive 345 kV, Westwood 345/138 l/o Cayuga-Frankfort 230, Westwood 345/138kV BK2 l/o Westwood 345/138kV BK1, Westwood-SPrairie 138kV l/o Rockport-Jefferson 765kV, Westwood-TippecanoeLabs 138kV l/o Westwood-NrthwestTap1-WestLafa, WestwoodBK1 l/o WestwoodBK2 + MeadowOlive-Meadow_Reynolds, Wheatland-Petersburg 345 l/o Rockport-Jefferson 765, Whitestown-Guion 345 l/o Petersburg xfmr E, Whitestown-Hortonville 345 kV l/o Whitestown-Guion 345 kV+Guion N 345/138 kV, Whitestown-Hortonville 345 l/o Fall Creek-Sunnyside 345, Zion-Pleasant Prairie 345KV.

(4) mon_rto: Restricts results to those that contain the specified value in the 'Monitoring RTO' field. This performs a partial, case-insensitive match. Allowed values are: MISO.

(5) nmo_rto: Restricts results to those that contain the specified value in the 'Non-Monitoring RTO' field. This performs a partial, case-insensitive match. Allowed values are: PJM.

lvi) mnt_efor Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:eford_date_beginning, unit_type, rating, number_of_units, eford, modified_date

(2) unit_type: Restricts results to those that contain the specified value in the 'Unit Type' field. This performs a partial, case-insensitive match. Allowed values are: COAL, COMBINED CYCLE, COMBUSTION TURBINE, DIESEL, GAS, HYDRO, NUCLEAR, OIL, OTHER, PUMPED HYDRO.

(3) Rating: Restricts results to those that contain the specified value in the 'Rating' field. This performs a partial, case-insensitive match. Allowed values are: 0 - 299, 300 - 599, 600 PLUS, ALL

lvii) mnt_ftr_zonal_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, pnode_id, pnode_name, lmp

(2) pnode_id:Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

lviii) nodal_ref_prices Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:pnode_id, pnode_name, pnode_type, effective_date, terminate_date, offpeak_lmp, onpeak_lmp, as_of

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

(4) pnode_type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match. Allowed values are: AGGREGATE, INTERFACE.

lix) nodal_refe_prices_incdec Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:effective_beginning_date, effective_ending_date, pnode_id, pnode_name, pnode_price

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

lx) non_sync_reserve Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, nsr_zone, subzone, nsr_market_clearing_price, total_reserve_zone_load, total_subzone_nsr_loc_cleared, total_subzone_nsr_purchases, total_subzone_nsr_credit, total_subzone_ns_pjm_scheduled, total_subzone_ns_shortfall

(2) nsr_zone: Restricts results to those that contain the specified value in the 'Non-Synch Reserve Zone' field. This performs a partial, case-insensitive match. Allowed values are: RTO.

(3) Subzone: Restricts results to those that contain the specified value in the 'Subzone' field. This performs a partial, case-insensitive match. Allowed values are: Non PJM Mid Atlantic Dominion (MAD), PJM Mid Atlantic Dominion (MAD).

lxi) non_sync_reserve_prelim_billing Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, subzone, dansrmcp, rtnsrmcp, total_da_nsr_sched_mwh, total_rt_nsr_sched_mwh, total_nsr_load_mwh, total_nsr_purchase_mwh, total_da_nsrmcp_credit, total_bal_nsrmcp_credit, total_nsr_loc_credit

(2) subzone: Restricts results to those that contain the specified value in the 'Subzone or RTO' field. This performs a partial, case-insensitive match.

lxii) off_cost_ops Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:date, start_time_utc, start_time_ept, end_time_utc, end_time_ept, off_cost_region, facility, contingency

(2) off_cost_region: Restricts results to those that contain the specified value in the 'Region' field. This performs a partial, case-insensitive match. Allowed values are: EXTERNAL, MIDATL, RTO, WEST.

(3) Facility: Restricts results to those that contain the specified value in the 'Facility' field. This performs a partial, case-insensitive match.

(4) Contingency: Restricts results to those that contain the specified value in the 'Contingency' field. This performs a partial, case-insensitive match.

lxiii) operational_reserves Search:

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, reserve_name, reserve_mw

(2) reserve_name: Restricts results to those that contain the specified value in the 'Reserve Name' field. This performs a partial, case-insensitive match. Allowed values are: Dominion Contingency Reserve Requirement, Dominion Contingency Reserves, Dominion Day Ahead Scheduling Reserves, Dominion Synchronized Reserves, Mid-Atlantic/Dominion Contingency Reserve Requirement, Mid-Atlantic/Dominion Contingency Reserves, Mid-Atlantic/Dominion Day Ahead Scheduling Reserves, Mid-Atlantic/Dominion Synchronized Reserve Requirement, Mid-Atlantic/Dominion Synchronized Reserves, RTO Contingency Reserve Requirement, RTO Contingency Reserves, RTO Day Ahead Scheduling Reserves, RTO Synchronized Reserve Requirement, RTO Synchronized Reserves.

lxiv) ops_init_commit Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, zone, economic_max_mw, reason

(2) zone: Restricts results to those that contain the specified value in the 'Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, DAY, DEOK, DOM, DPL, EKPC, JCPL, METED, PECO, PENELEC, PEPCO, PPL, PSEG.

lxv) off_cost_ops Search

(1) fields:

(2) Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:date, off_cost_region, facility, contingency, start_time_utc, end_time_utc, start_time_ept, end_time_ept

(3) off_cost_region: Restricts results to those that contain the specified value in the 'Region' field. This performs a partial, case-insensitive match. Allowed values are: EXTERNAL, MIDATL, RTO, WEST.

(4) Facility:Restricts results to those that contain the specified value in the 'Facility' field. This performs a partial, case-insensitive match.

(5) Contingency: Restricts results to those that contain the specified value in the 'Contingency' field. This performs a partial, case-insensitive match.

lxvi) ops_sum_frcst_peak_area Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:projected_peak_datetime_utc, projected_peak_datetime_ept, generated_at_ept, area, internal_scheduled_capacity, pjm_load_forecast, unscheduled_steam_capacity

(2) Area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: AEP, AP, ATSI, COMED, DAYTON, DEOK, DOM, DUQ, EKPC, MIDATL.

lxvii) ops_sum_frcst_peak_rto Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:projected_peak_datetime_utc, projected_peak_datetime_ept, generated_at_ept, area, internal_scheduled_capacity, scheduled_tie_flow_total, capacity_adjustments, total_scheduled_capacity, load_forecast, operating_reserve, unscheduled_steam_capacity

(2) area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: PJM RTO.

lxviii) ops_sum_frcstd_tran_lim Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:projected_peak_datetime_utc, projected_peak_datetime_ept, generated_at_ept, transfer_limit_name, transfer_limit_mw

(2) transfer_limit_name: Restricts results to those that contain the specified value in the 'Transfer Limit Name' field. This performs a partial, case-insensitive match. Allowed values are: AP-South, Bedington-BlackOak, Central, Eastern, Western.

lxix) ops_sum_prev_period Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, generated_at_ept, area, area_load_forecast, actual_load, dispatch_rate

(2) area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: AEP, AP, ATSI, ComEd, Dayton, DEOK, Dom, Duq, EKPC, MidAtl, MidAtl - East, MidAtl - West.

lxx) ops_sum_prjctd_tie_flow Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:projected_peak_datetime_utc, projected_peak_datetime_ept, generated_at_ept, interface, scheduled_tie_flow

(2) interface:Restricts results to those that contain the specified value in the 'Interface' field. This performs a partial, case-insensitive match. Allowed values are: ALTE, ALTW, AMIL, CIN, CPLE, CPLW, CWLP, DUK, EKPC, IPL, LGEE, LIND, MEC, MECS, NEPT, NIPS, NYIS, OVEC, TVA, WEC.

lxxi) pai_final_balancing_ratio Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:pai_date, pai_datetime_beginning_utc, pai_datetime_beginning_ept, pai_datetime_ending_utc, pai_datetime_ending_ept, pai_area, final_bal_ratio

(2) pai_area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: AEP, AEP-BGE-DOM-PEPCO, AEP-Edison.

lxxii) pai_prelim_balancing_ratio Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:pai_date, pai_datetime_beginning_utc, pai_datetime_beginning_ept, pai_datetime_ending_utc, pai_datetime_ending_ept, pai_area, prelim_bal_ratio, prelim_br_posting_datetime_utc, prelim_br_posting_datetime_ept

(2) pai_area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: AEP, AEP-BGE-DOM-PEPCO, AEP-Edison.

lxxiii) pjm_miso_da Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, flowgate_id, flowgate_name, monitoring_rto, non_monitoring_rto, requesting_entity, responding_entity, da_miso_shadow_price, da_pjm_shadow_price, da_miso_approved_mw, da_pjm_approved_mw, da_miso_credit, da_pjm_credit

(2) flowgate_id: Restricts results to those that match the specified value in the 'Flowgate Id' field. This performs an exact, numerical match.

(3) flowgate_name: Restricts results to those that contain the specified value in the 'Flowgate Name' field. This performs a partial, case-insensitive match.

(4) monitoring_rto: Restricts results to those that contain the specified value in the 'Monitoring RTO' field. This performs a partial, case-insensitive match. Allowed values are: MISO, PJM.

(5) non_monitoring_rto: Restricts results to those that contain the specified value in the 'Non-Monitoring RTO' field. This performs a partial, case-insensitive match. Allowed values are: MISO, PJM.

(6) requesting_entity: Restricts results to those that contain the specified value in the 'Requesting Entity' field. This performs a partial, case-insensitive match. Allowed values are: MISO, PJM.

(7) responding_entity: Restricts results to those that contain the specified value in the 'Responding Entity' field. This performs a partial, case-insensitive match. Allowed values are: MISO, PJM.

lxxiv) pjm_miso_rt Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, flowgate_id, flowgate_name, monitoring_rto, non_monitoring_rto, miso_shadow_price, pjm_shadow_price, miso_mkt_flow, pjm_mkt_flow, miso_ffe, pjm_ffe, miso_credit, pjm_credit

(2) flowgate_id: Restricts results to those that match the specified value in the 'Flowgate Id' field. This performs an exact, numerical match.

(3) flowgate_name: Restricts results to those that contain the specified value in the 'Flowgate Name' field. This performs a partial, case-insensitive match.

(4) monitoring_rto: Restricts results to those that contain the specified value in the 'Monitoring RTO' field. This performs a partial, case-insensitive match. Allowed values are: MISO, PJM.

(5) non_monitoring_rto: Restricts results to those that contain the specified value in the 'Non-Monitoring RTO' field. This performs a partial, case-insensitive match. Allowed values are: MISO, PJM.

lxxv) pnode Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:pnode_id, pnode_name, pnode_type, pnode_subtype, zone, voltage_level, effective_date, termination_date

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

(4) pnode_type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match. Allowed values are: AGGREGATE, BUS, LOCALE.

(5) pnode_subtype: Restricts results to those that contain the specified value in the 'Pricing Node SubType' field. This performs a partial, case-insensitive match. Allowed values are: AGGREGATE, EHV, EXT, GEN, HUB, INTERFACE, LOAD, RESIDUAL_METERED_EDC, TIE, ZONE.

(6) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, CPL, DAY, DEOK, DOM, DPL, DUKE, DUQ, EKPC, EXTERNAL, JCPL, METED, PECO, PENELEC, PEPCO, PPL, PSEG, RECO.

(7) voltage_level: Restricts results to those that contain the specified value in the 'Voltage Level' field. This performs a partial, case-insensitive match.

lxxvi) prelim_or_rates Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:operating_reserve_date, da_operating_reserve_rate, rto_bal_op_res_reliab_rate, rto_bal_op_res_dev_rate, east_bal_op_res_reliab_rate, east_bal_op_res_dev_rate, west_bal_op_res_reliab_rate, west_bal_op_res_dev_rate

(2) operating_reserve_date: Restricts results to those that have a 'Operating Reserve Date' which falls inside the specified date range.

lxxvii) reg_market_results Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, requirement, regd_ssmw, rega_ssmw, regd_procure, rega_procure, total_mw, deficiency, rto_perfscore, rega_mileage, regd_mileage, rega_hourly, regd_hourly, is_approved, modified_datetime_utc

lxxviii) reg_prices Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, area, reserve_quantity, reserve_requirement, market_clearing_price, market_capped_clearing_price, capability_clearing_price, performance_clearing_price

lxxix) reg_zone_prelim_bill Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, rmccp, rmpcp, total_pjm_rt_load_mwh, total_pjm_loc_credit, total_pjm_reg_purchases, total_pjm_self_sched_reg, total_pjm_assigned_reg, total_pjm_rmccp_cr, total_pjm_rmpcp_cr

lxxx) reserve_market_results Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, locale, service, mcp, mcp_capped, reg_ccp, reg_pcp, as_req_mw, total_mw, as_mw, ss_mw, tier1_mw, ircmwt2, dsr_as_mw, nsr_mw, regd_mw

(2) locale: Restricts results to those that contain the specified value in the 'Locale' field. This performs a partial, case-insensitive match. Allowed values are: MAD, PJM_RTO.

(3) Service: Restricts results to those that contain the specified value in the 'Service' field. This performs a partial, case-insensitive match. Allowed values are: PR, REG, SR.

lxxxi) rt_and_self_ecomax Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, rt_ecomax, conf_disclaimer, self_ecomax

lxxxii) rt_da_monthly_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_id, pnode_name, voltage, equipment, type, zone, system_energy_price_rt, total_lmp_rt, congestion_price_rt, marginal_loss_price_rt, system_energy_price_da, total_lmp_da, congestion_price_da, marginal_loss_price_da

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

(4) Voltage: Restricts results to those that contain the specified value in the 'Voltage' field. This performs a partial, case-insensitive match.

(5) Equipment: Restricts results to those that contain the specified value in the 'Equipment' field. This performs a partial, case-insensitive match.

(6) Type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match.

(7) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, DOM, DPL, EXTERNAL, JCPL, METED, PECO, PENELEC, PEPCO, PPL, PSEG.

lxxxiii) rt_default_mv_override Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:posted_day, constraint_name, contingency_description, default_transmission_constraint_penalty_factor, effective_day, terminate_day

lxxxiv) rt_dispatch_reserves Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:mkt_day, datetime_beginning_utc, datetime_beginning_ept, area, reserve_type, total_reserve_mw, reserve_reqmt_mw, reliability_reqmt_mw, extended_reqmt_mw, additional_extended_reqmt_mw, deficit_mw

(2) area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are:, Mid-Atlantic/Dominion, PJM_RTO, Baltimore/Pepco/Dominion

(3) reserve_type: Restricts results to those that contain the specified value in the 'Reserve Type' field. This performs a partial, case-insensitive match. Allowed values are: 30MIN_RESV, Primary Reserves, Synchronized Reserves.

lxxxv) rt_fivemin_hrl_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_id, pnode_name, voltage, equipment, type, zone, system_energy_price_rt, total_lmp_rt, congestion_price_rt, marginal_loss_price_rt, row_is_current, version_nbr

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) row_is_current: Restricts results to those that contain the specified value in the 'Latest Version' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

(4) version_nbr: Restricts results to those that match the specified value in the 'Version Number' field. This performs an exact, numerical match.

lxxxvi) rt_fivemin_mnt_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_id, pnode_name, voltage, equipment, type, zone, system_energy_price_rt, total_lmp_rt, congestion_price_rt, marginal_loss_price_rt, system_energy_price_da, total_lmp_da, congestion_price_da, marginal_loss_price_da

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

(4) Voltage: Restricts results to those that contain the specified value in the 'Voltage' field. This performs a partial, case-insensitive match.

(5) Equipment: Restricts results to those that contain the specified value in the 'Equipment' field. This performs a partial, case-insensitive match.

(6) Type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match.

(7) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, DOM, DPL, EXTERNAL, JCPL, METED, PECO, PENELEC, PEPCO, PPL, PSEG.

lxxxvii) rt_hrl_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_id, pnode_name, voltage, equipment, type, zone, system_energy_price_rt, total_lmp_rt, congestion_price_rt, marginal_loss_price_rt, row_is_current, version_nbr

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

(4) Voltage: Restricts results to those that contain the specified value in the 'Voltage' field. This performs a partial, case-insensitive match.

(5) Equipment: Restricts results to those that contain the specified value in the 'Equipment' field. This performs a partial, case-insensitive match.

(6) Type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match.

(7) Zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, CPL, DAY, DEOK, DOM, DPL, DUKE, DUQ, EKPC, EXTERNAL, JCPL, METED, PECO, PENELEC, PEPCO, PPL, PSEG, RECO.

(8) row_is_current: Restricts results to those that contain the specified value in the 'Latest Version' field. This performs a partial, case-insensitive match. Allowed values are: FALSE, TRUE.

(9) version_nbr: Restricts results to those that match the specified value in the 'Version Number' field. This performs an exact, numerical match.

lxxxviii) rt_marginal_value Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, monitored_facility, contingency_facility, shadow_price

(2) monitored_facility: Restricts results to those that contain the specified value in the 'Monitored Facility' field. This performs a partial, case-insensitive match.

(3) contingency_facility: Restricts results to those that contain the specified value in the 'Contingency Facility' field. This performs a partial, case-insensitive match.

lxxxix) rt_sced_bias Search

(1) Fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:case_approved_utc, case_approved_ept, uds_delta_mw

xc) rt_tempset Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, zone, rt_temperature_set

(2) zone: Restricts results to those that contain the specified value in the 'Zone' field. This performs a partial, case-insensitive match. Allowed values are: AE, AEP, AP, ATSI, BC, CE, DAY, DEOK, DOM, DPL, DUQ, EKPC, JC, ME, PE, PEP, PL, PN, PS.

xci) rt_scheduled_interchange Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, tie_line, hrly_net_tie_sched

(2) tie_line: Restricts results to those that contain the specified value in the 'Tie Line' field. This performs a partial, case-insensitive match. Allowed values are: AEP-C-PJM-E, AEP-P-PJM-E, AEP-PJM, ALEX-PJM-E, ALTE-PJM, ALTE-PJM-E, ALTW-PJM, ALTW-PJM-E, ALWX-PJM-E, AMIL-PJM, AMIL-PJM-E, AMRN-PJM, AMRN-PJM-E, APS-PJM-E, CILC-PJM, CILC-PJM-E, CIN-PJM, CIN-PJM-E, CPLE-PJM, CPLE-PJM-E, CPLW-PJM, CPLW-PJM-E, CWLP-PJM, CWLP-PJM-E, DUK-PJM, DUK-PJM-E, EKPC-PJM, EKPC-PJM-E, FE-PJM, FE-PJM-E, HUDS-PJM-E, IP-PJM, IP-PJM-E, IPL-PJM, IPL-PJM-E, LAGN-PJM-E, LGEE-PJM, LGEE-PJM-E, LIND-PJM-E, MEC-PJM, MEC-PJM-E, MECS-PJM, MECS-PJM-E, NEPT-PJM, NEPT-PJM-E, NIPS-PJM, NIPS-PJM-E, NYIS-PJM, NYIS-PJM-E, OVEC-PJM, OVEC-PJM-E, SIGE-PJM-E, TVA-PJM, TVA-PJM-E, WEC-PJM, WEC-PJM-E, WECX-PJM-E.

xcii) rt_transn_constraints Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, duration, monitored_facility, contingency_facility

(2) monitored_facility: Restricts results to those that contain the specified value in the 'Monitored Facility' field. This performs a partial, case-insensitive match.

(3) contingency_facility: Restricts results to those that contain the specified value in the 'Contingency Facility' field. This performs a partial, case-insensitive match.

xciii) rt_unverified_fivemin_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_id, pnode_name, type, total_lmp_rt, congestion_price_rt, marginal_loss_price_rt

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

xciv) rt_unverified_hrl_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, pnode_name, type, total_lmp_rt, congestion_price_rt, marginal_loss_price_rt

(2) pnode_name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

(3) Type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match. Allowed values are: AGGREGATE, BUS, EHV, HUB, INTERFACE, ZONE.

xcv) sched_9_10_rates Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:schedule_month, schedule_name, schedule_rate, row_is_current, version_nbr

(2) schedule_month: Restricts results to those that have a 'Schedule Rates Month' which falls inside the specified date range. Allowed values are: Today, CurrentHour, CurrentWeek, CurrentMonth, CurrentYear, Yesterday, LastHour, LastWeek, LastMonth, LastYear, Tomorrow, NextWeek, NextMonth, NextYear, 15SecondsAgo, 5MinutesAgo, 1MonthAgo, 4MonthsAgo, 6MonthsAgo, [date-value] to [date-value]. The date-value range should be within 366 days. The date-value should include the date and time component. Example: yyyy-MM-dd HH:mm to yyyy-MM-dd HH:mm. Please refer to the API Guide on www.pjm.com page for additional detail on the date parameter.

(3) schedule_name: Restricts results to those that contain the specified value in the 'Schedule Name' field. This performs a partial, case-insensitive match.

(4) row_is_current: Restricts results to those that contain the specified value in the 'Latest Version' field. This performs a partial, case-insensitive match. Allowed values are: False, True.

(5) version_nbr: Restricts results to those that match the specified value in the 'Version Number' field. This performs an exact, numerical match.

xcvi) secondary_nonsync_reserve_prelim_billing Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, subzone, dasecrmcp, rtsecrmcp, total_da_secres_pjm_sched_mwh, total_rt_secres_pjm_sched_mwh, total_rt_secres_load, total_rt_secres_purchases, total_dasecrmcp_credits, total_balsecrmcp_credits, total_secres_loc_credits

(2) subzone: Restricts results to those that contain the specified value in the 'SUBZONE' field. This performs a partial, case-insensitive match.

xcvii) solar_gen Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, area, wind_generation_mw

(2) area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: MIDATL, RFC, RTO, SOUTH, WEST.

xcviii) state_net_interchange Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, state, net_interchange

xcix) sync_reserve_events Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:event_start_ept, event_end_ept, duration, synchronized_reserve_zone, synchronized_sub_zone

(2) duration: Restricts results to those that contain the specified value in the 'Duration' field. This performs a partial, case-insensitive match.

(3) synchronized_reserve_zone: Restricts results to those that contain the specified value in the 'Synchronized Reserve Zone' field. This performs a partial, case-insensitive match.

(4) synchronized_sub_zone: Restricts results to those that contain the specified value in the 'Synchronized Sub-Zone' field. This performs a partial, case-insensitive match. Allowed values are: Eastern Sub-zone, MidAtlantic Sub-Zone, MidAtlantic-Dominion (MAD).

c) sync_pri_reserves_buses_list Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:pnode_id, pnode_name, pnode_type, effective_date, terminate_date

(2) pnode_id: Restricts results to those that match the specified value in the 'Pricing Node ID' field. This performs an exact, numerical match.

(3) pnode_type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match.

ci) sync_pri_reserves_resources_list Search

(1) fields: fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:pnode_id, pnode_name, pnode_type, effective_date, terminate_date

(2) resource_id: Restricts results to those that match the specified value in the 'Resource ID' field. This performs an exact, numerical match.

(3) resouce_type: Restricts results to those that contain the specified value in the 'Resource Type' field. This performs a partial, case-insensitive match.

(4) Zone: Restricts results to those that contain the specified value in the 'Zone' field. This performs a partial, case-insensitive match.

cii) sync_reserve_prelim_bill Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, synch_reserve_zone, subzone, srmcp, total_reserve_zone_load, total_subz_abv_oblig_tier1_adj, total_subz_tier1_excess, total_subz_lost_opp_cred_clrd, total_subz_lost_opp_cred_added, total_subz_synch_res_purchases, total_subz_tier1_alloc_oblig, total_subz_tier1_credit, total_subz_tier1_lost, total_subz_tier2_pjm_sched, total_subz_tier2_pjm_added, total_subz_tier2_self_sched, total_subz_tier2_shortfall, total_subz_tier2_retr_pen_chrg, total_subz_tier2_retr_oblig

(2) synch_reserve_zone: Restricts results to those that contain the specified value in the 'Synch Reserve Zone' field. This performs a partial, case-insensitive match. Allowed values are: RTO, DOM, RFC.

(3) Subzone: Restricts results to those that contain the specified value in the 'Subzone' field. This performs a partial, case-insensitive match. Allowed values are: Non PJM Mid Atlantic Dominion (MAD), PJM Mid Atlantic, PJM Mid Atlantic Dominion (MAD), Dominion, Non PJM Mid Atlantic.

ciii) sync_reserve_prelim_billing Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, subzone, dasrmcp, rtsrmcp, total_da_sync_pjm_sched_mwh, total_da_sync_self_mwh, total_rt_sync_pjm_sched_mwh, total_rt_sync_self_mwh, total_rt_sync_load, total_rt_sync_purchases, total_retro_pen_obl, total_retro_pen_ch, total_dasrmcp_credits, total_balsrmcp_credits, total_sync_loc_credits

(2) subzone: Restricts results to those that contain the specified value in the 'SUBZONE' field. This performs a partial, case-insensitive match.

civ) transfer_interface_infor Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, name, actual_flow, warning_level, transfer_limit

(2) name: Restricts results to those that contain the specified value in the 'Interface Name' field. This performs a partial, case-insensitive match. Allowed values are: 50045005, AEP/DOM, APSOUTH, BED-BLA, CE-EAST, CENTRAL, CLVLND, COMED, EAST, WEST.

cv) transfer_limits_and_flows Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, datetime_ending_utc, datetime_ending_ept, transfer_limit_area, transfers, transfer_limit

(2) transfer_limit_area: Restricts results to those that contain the specified value in the 'Transfer Limit Area' field. This performs a partial, case-insensitive match.

cvi) transmission_limits Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, constraint_name, constraint_type, contingency_equipment_station_name, contingency_equipment_voltage_level, contingency_equipment_long_name

(2) constraint_name: Restricts results to those that contain the specified value in the 'Constraint Name' field. This performs a partial, case-insensitive match.

(3) constraint_type: Restricts results to those that contain the specified value in the 'Constraint Type' field. This performs a partial, case-insensitive match. Allowed values are: Thermal.

cvii) unverified_five_min_lmps Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, name, type, five_min_rtlmp, hourly_lmp

(2) name: Restricts results to those that contain the specified value in the 'Pricing Node Name' field. This performs a partial, case-insensitive match.

(3) type: Restricts results to those that contain the specified value in the 'Pricing Node Type' field. This performs a partial, case-insensitive match. Allowed values are: 500 KV, AGGREGATE, HUB, INTERFACE, ZONE.

cviii) uplift_by_zone Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:uplift_credit_date, zone, operating_reserve_credit_da, operating_reserve_credit_bal, reactive_credit, blackstart_credit, lost_opportunity_cost_credit, datetime_rundate_ept

(2) zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: AECO, AEP, APS, ATSI, BGE, COMED, DAY, DEOK, DOM, DPL, DUQ, EKPC, JCPL, METED, PECO, PENELEC, PEPCO, PPL, PSEG.

cix) uplift_charges_by_zone Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, zone, charge_category, charge_reason, region, uplift_charges, rundate_ept

(2) zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match. Allowed values are: East.

(3) charge_category: Restricts results to those that contain the specified value in the 'Charge Category' field. This performs a partial, case-insensitive match.

(4) charge_reason: Restricts results to those that contain the specified value in the 'Charge Reason' field. This performs a partial, case-insensitive match.

cx) uplift_credits_by_zone Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:uplift_credit_date, zone, credit_category, uplift_charges, datetime_rundate_ept

(2) zone: Restricts results to those that contain the specified value in the 'Transmission Zone' field. This performs a partial, case-insensitive match.

(3) credit_category: Restricts results to those that contain the specified value in the 'Credit Category' field. This performs a partial, case-insensitive match.

cxi) utc_bid_screening Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:bid_screening_date, source_pnode_id, sink_pnode_id, percentile_30th_rt_path_value, percentile_20th_rt_path_value, percentile_5th_rt_path_value, avg_da_path_value

(2) source_pnode_id: Restricts results to those that match the specified value in the 'Source Pnode ID' field. This performs an exact, numerical match.

(3) sink_pnode_id: Restricts results to those that match the specified value in the 'Sink Pnode ID' field. This performs an exact, numerical match.

cxii) very_short_load_frcst Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:evaluated_at_utc, evaluated_at_ept, forecast_datetime_beginning_utc, forecast_datetime_beginning_ept, forecast_datetime_ending_utc, forecast_datetime_ending_ept, forecast_area, forecast_load_mw

(2) forecast_area: Restricts results to those that contain the specified value in the 'Forecast Area' field. This performs a partial, case-insensitive match. Allowed values are: AE/MIDATL, AEP, AP, ATSI, BG&E/MIDATL, COMED, DAYTON, DEOK, DOMINION, DP&L/MIDATL, DUQUESNE, EKPC, JCP&L/MIDATL, METED/MIDATL, MID_ATLANTIC_REGION, PECO/MIDATL, PENELEC/MIDATL, PEPCO/MIDATL, PPL/MIDATL, PSE&G/MIDATL, RECO/MIDATL, RTO_COMBINED, SOUTHERN_REGION, UGI/MIDATL, WESTERN_REGION. The '&' in the allowed values must be replaced by '%26' for API requests. Example: BG&E/MIDATL will be BG%26E/MIDATL

cxiii) wind_gen Search

(1) fields: Specifies the list of field names to retrieve in the form of a CSV list. Allowed values for this feed are:datetime_beginning_utc, datetime_beginning_ept, area, wind_generation_mw

(2) area: Restricts results to those that contain the specified value in the 'Area' field. This performs a partial, case-insensitive match. Allowed values are: MIDATL, RFC, RTO, SOUTH, WEST.

IV. Helpful Tips while making API calls

A) Use rowcount and start row while making the API call. The maximum rowcount is 50,000. In the response header you will be able to see the “totalRows” that a returned for the input query parameters. Users should be able to loop through programmatically to obtain the entire data. Startrow value should be 1+rowcount for subsequent fetches.

B) To query data for a range of dates, use the query input format as mm-dd-yyyy to mm-dd-yyyy. This format will work for both datetime_beginning_ept and datetime_beginning_utc. The date-value range must be less than 366 days.

C) To query for active pnodes, use terminate date= 12/31/9999exact

D) To query active pnodes as of a certain date, use effective_date_ept = to 2/26/2019&terminate_date_ept=2/16/2019 to

E) Sort on the same field that filters are applied on for better performance. Ex: if the input parameter has a value in date_time_begining_ept, then sort value should also be on ept, not on utc and vice versa

F) Filter on pnodeid instead of pnode name for better performance results

G) LMP data is versioned. Set parameter 'row_is_current' to 'true' to retrieve latest version data only. Set parameter 'row_is_current' to 'false' to retrieve older versions. Set parameter to 'row_is_current' to 'all' retrieve all versions available. The parameter 'version_nbr' represents the version number of the LMP data row.

H) The export limits for API – 50K per fetch.

I) When download parameter is set to true in the API "get" and "post"

i) The total count is available in the HTTP response header as "X-TotalRows" instead of response body

ii) When a CSV is requested by adding format=csv in the request, nothing has changed in the format of the response

iii) When XML or JSON is requested, only results are returned. The Links, SearchSpecification and TotalRows properties are available in the header.

iv) The remaining data and json structure remain the same.

v) Response is sent in gzip format

J) Security updates for September 9th and November 1st, 2025

i) On September 9th, the download=true was impacted causing the response to no longer be sent in gzip format. To make the code completely resilient regardless of the encoding, consider adding a check to the response headers to inspect the header "Content-Encoding". If the value is gzip, use your libraries to decompress the data. If the header is missing, the contents are not compressed and can be used immediately.

ii) On November 1st, our security appliance will begin enforcing strict rules about the HTTP Protocol. Consult the appropriate RFC for HTTP for details.

(1) One notable problem we have detected is sending an HTTP GET request with a body. This is invalid and will be rejected on November 1st.

iii) In general, Tls1.2 is required for all PJM tools, including Data Miner. Additionally, our security appliance requires encryption protocols that have not been broken. To ensure that you remain connected, you must use an operating system which is up to date and has all current security patches. Notably Windows 2012 is no longer supported by Microsoft or Data Miner.

V. Historic Data

To enhance the performance of current data queries and to better handle the increasing volume of Five-Minute Real-Time LMP data, PJM has implemented an archiving solution for Data Miner. The archiving solution will move

older data for specific feeds to a different area in order to preserve the speed and availability of more recent data. The archived data will still be available, but will have slightly less flexibility on querying parameters than the more recent data does. The details of the restrictions and expected results for several filter combinations are detailed in the following sections.

For example: The archive date for Real-Time Energy Market Hourly LMP data is 731 days. Users querying more recent data (data within the last two years) will be able to query that data as they do today. Users interested in querying older data will have slightly less flexibility in the data sets that can be retrieved. For example, this data could be queried by pnode type (i.e. requesting all aggregates), but not queried for a specific pnode.

A. Historic Data vs Standard Data

Historic Data is defined as data that is dated prior to the archived date. Standard data is defined as data that is more recent than the archived date. Archived date is specific to feed and is a rolling date. These dates are determined based on the UTC date fields.

B. Feeds that have archived solution implemented

Real-Time Hourly LMPs: This feed contains hourly Real-Time Energy Market locational marginal pricing (LMP) data for all bus locations, including aggregates. The archived date for this feed is current date is 731 days (approximately two years).

Day-Ahead Hourly LMPs: This feed contains hourly Day-Ahead Energy Market LMP data for all bus locations, including aggregates. The archived date for this feed is current date is 731 days (approximately two years).

Real-Time Five Minute LMPs: This feed contains five minute Real-Time Energy Market locational marginal pricing (LMP) data for all bus locations, including aggregates. The archived date for this feed is current date – 186 days (approximately six months).

C. API and User Interface Impacts

i. Dates

i) Both Standard data and Historic data API queries will now require a date parameter. If API request is sent without either datetime_beginning_UTC or datetime_beginning_EPT, users will see the following error message as response:

```
{ "errors": [{ "field": "Filters", "message": "A datetime is missing.
Please input values for datetime_beginning_ept or datetime_beginning_utc",
"detail": ["datetime_filter"] }],
```

ii) If the date range in the request is spanning between archived date and standard date, users will see the following error message as response:

```
{ "errors": [{ "field": "Filters", "message": "Date range in the API
request spans over archived and standard data. Please update the request.
Refer to API Guide for more information." }],
```

iii) Current restriction on date range of 365 continuous days of data for standard data remains unchanged.

ii. Filters, Order, Sort

iv) Current filtering, ordering and sorting capabilities for standard data remains unchanged.

v) Historic data API requests will require to have the start and end dates within the same calendar year following the UTC timezone. If these API requests have date range outside same calendar year, uses will see the following error message as response:

```
{ "errors": [{ "field": "Filters", "message": "Archived data date range must be within same calendar year. Please enter valid dates" }],
```

vi) Historic data API requests will have no sorting and order capabilities. Data returned will be sorted by datetime_beginning_utc in ascending order. If these API requests have sort and/or order, users will see the following error message as response:

```
{ "errors": [{ "field": "Order", "message": "Custom Order is not an available option on archived data. Please remove order from the request" }],
{ "errors": [{ "field": "Sort", "message": "Custom Sort is not an available option on archived data. Please remove sort from the request", "detail": ["datetime_beginning_utc"] },
```

vii) Historic data API requests will have limited filtering capabilities. Filters can be applied only on following attributes – dates, type, row_is_current, version_nbr. If these API requests have filters other than the ones specified below, users will see the following error message as response:

```
{ "errors": [{ "field": "Filters", "message": "The API request contains invalid attribute(s) for archived data - Pnode_Id. Please update the request and retry.", "detail": ["pnode_id"] }],
```

Please note that type is not an allowed filter for both standard and archived data for Real-Time Five-Minute LMPs.

iii. Metadata API

Metadata API response for these three feeds will include these new fields – EnableArchiving, ArchiveCutoffDays, EnableArchiveFiltering

Response will look like:

```
"enableArchiving": true, "archiveCutoffDays": 731, "enableArchiveFiltering": "True",
```

VI. Sample GET API queries

This section contains few samples of API GET calls for various feeds. These URLs can also be used to get the data from a browser or application integrations by adding &subscription-key=<yourkey> to the links.

1) DA LMPs with date filters and csv format parameters:
https://api.pjm.com/api/v1/da_hrl_lmps?rowCount=100&startRow=1&datetime_beginning_ept=1-09-2018 00:00 to 1-09-2018 23:59&format=csv

2) RT LMPs with date filters and specific pnodes:
https://api.pjm.com/api/v1/rt_hrl_lmps?rowCount=100&startRow=1&datetime_beginning_ept=1-09-2018 00:00 to 1-09-2018 23:59 &pnode_id=1;3;48579

3) RT LMPs with date filters and latest version:
https://api.pjm.com/api/v1/rt_hrl_lmps?rowCount=100&startRow=1&datetime_beginning_ept=2-4-2018 00:00 to 2-4-2018 23:00&pnode_id=1;3;48592;48593&row_is_current=true

4) DA LMPs with specific columns and sorted by date and date filters:
https://api.pjm.com/api/v1/da_hrl_lmps?rowCount=50000&sort=datetime_beginning_ept&order=Asc&startRow=1&fields=datetime_beginning_utc;pnode_id;congestion_price_da&datetime_beginning_ept=1-1-2015 00:00 to 12-31-2015 23:00&pnode_id=123901541

5) Monthly FTR Zonal LMPs with date filters:
https://api.pjm.com/api/v1/mnt_ftr_zonal_lmps?rowCount=50000&startRow=1&datetime_beginning_ept=2017-11-01 00:00 to 2017-11-30 23:00

6) All effective aggregate nodes:
https://api.pjm.com/api/v1/agg_definitions?rowCount=100&startRow=1&terminate_date_ept=12-31/9999exact

7) All effective pnodes: https://api.pjm.com/api/v1/pnode?rowCount=100&startRow=1&terminate_date_ept=12-31/9999exact

8) To Get the five minute RT LMPs for specific zones: (This will require two API calls as Zone filters are disabled for five minute LMPs due to data volume.

   Get the pnode ids that are mapped to the zone you are interested in and construct the API query using those pnode ids as inputs.

   In the example below, the first API (a) call is used to get all the pnode ids that are mapped to zone = zone=PSEG&subtype=EHV and used the pnode ids that are returned from this call as inputs to the second API call (b) to query LMPs for those specific pnodes

   a. https://api-train.pjm.com/api/v1/pnode?rowCount=50000&startRow=1&fields=pnode_id&pnode_subtype=EHV&zone=PSEG&effective_date=to 3-14-2018&termination_date=03-14-2018 to 12/31/9999exact
   b. https://api-train.pjm.com/api/v1/rt_fivemin_hrl_lmps?rowCount=100&startRow=1&datetime_beginning_ept=3/12/2018&pnode_id=52444;52451;52454;52461;52464;1218933536;135617818 5

VII. Code Samples

Notes:

- https://api.pjm.com refers to our production environment.
- https://api-train.pjm.com refers to our training environment.
- The subscription keys are NOT interchangeable. Each environment has its own key.

Curl:

curl --compressed "https://api.pjm.com/api/v1/da_hrl_lmps?download=true&rowCount=1500&sort=datetime_beginning_ept&order=Asc&startRow=1&datetime_beginning_ept=9/1/2016 00:00to10/31/2016 23:00&pnode_id=48592&subscription-key=<yourkeyhere>" -o C:\<yourpath here>

Python:

```
import http.client, urllib.request, urllib.parse, urllib.error, base64
 headers = {'Ocp-Apim-Subscription-Key': '<key>'}
 params = urllib.parse.urlencode({})
 try:
    conn = http.client.HTTPSConnection('api.pjm.com')
    conn.request("GET", "/api/v1/act_sch_interchange/metadata?%s" % params, None,
headers)
    response = conn.getresponse()
    print(response.status, response.reason)
    data = response.read()
    conn.close()
     file = open('output.txt', 'wb')
    file.write(data)
    file.close()
     print("Go to output.txt")
except Exception as e:
    print("[Errno {0}] {1}".format(e.errno, e.strerror))
```

C# .Net Framework:

Note: A NuGet package reference to Newtonsoft.Json needs to be added as well as a Reference to the System.Web assembly.

```
using System;
using System.Collections.Generic;
using System.Collections.Specialized;
using System.IO;
using System.Net.Http;
using System.Threading.Tasks;
using System.Web;
using Newtonsoft.Json;

namespace DM2_Api_Request
{
    class Program
    {
```

```
        static void Main()
        {
            const string apiKey = " YOUR-API-SUBSCRIPTION-KEY";// see https://apiportal.pjm.com/
            const string endpoint = "https://api-train.pjm.com/api/v1/pnode";
            const int pageSize = 5000;

            // Request parameters
            // Filters must match API definition. See API definitions page for more information
(https://apiportal.pjm.com/).
            var queryString = HttpUtility.ParseQueryString(string.Empty);
            queryString["rowCount"] = pageSize.ToString();
            queryString["startRow"] = "1";

            // Other options can be found on the API portal and depend on the exact endpoint.  For example:
            //queryString["datetime_beginning_ept"] = "2019-03-01 00:00:00 to 2019-03-31 00:00:00";
            //queryString["row_is_current"] = "1";
            //queryString["sort"] = "datetime_beginning_ept";
            //queryString["order"] = "Asc";
            //queryString["isActiveMetadata"] = "{boolean}";
            //queryString["fields"] = "{string}";
            //queryString["datetime_beginning_utc"] = "Today";
            //queryString["pnode_id"] = "{number}";
            //queryString["voltage"] = "{string}";
            //queryString["equipment"] = "{string}";
            //queryString["type"] = "{string}";
            //queryString["zone"] = "{string}";
            //queryString["version_nbr"] = "{number}";

            var resultsAsync = GetApiResultsAsync(apiKey, endpoint, queryString, pageSize);
            Task.WaitAll(resultsAsync);

            Console.WriteLine($"Results saved. Hit ENTER to exit...");
            Console.ReadLine();
        }

        private static async Task GetApiResultsAsync(string apiKey, string endpoint, NameValueCollection
queryString, int pageSize)
        {
            // assume at least one page, calculate it correctly after first response is retrieved
            var totalPages = 1;
            var currentPage = 0;
            do
            {
                // The startRow pointer is moved forward by one-based pageSize
                queryString["startRow"] = (currentPage * pageSize + 1).ToString();
                // build a URL...queryString will correctly escape its arguments
                var uri = string.Concat(endpoint, "?", queryString);
                Console.WriteLine($"Requesting: {uri}");

                var jsonResult = await RequestData(uri, apiKey);

                // calculate the total pages from the HTTP header in the first/any response
                if (currentPage == 0)
                {
                    totalPages = GetTotalPages(pageSize, jsonResult.TotalRows);
                }

                // Write the output of results
                OutputResults(jsonResult);

                Console.WriteLine("Done page {0} of {1}.", totalPages == 0 ? 0 : currentPage + 1, totalPages);
                Console.WriteLine();

            } while (++currentPage < totalPages);
        }

        private static void OutputResults(ResponseResult jsonResult)
        {
            var fileName = Guid.NewGuid() + ".csv";
            Console.WriteLine($"Output File : {Path.Combine(Directory.GetCurrentDirectory(), fileName)}");
            // start reading the response
            using (var streamToWriteTo = File.Open(fileName, FileMode.Create))
            {
                using (var writer = new StreamWriter(streamToWriteTo))
                {
                    var firstPass = true;

                    foreach (var item in jsonResult.Items)
```

```
                {
                    if (firstPass)
                    {
                        // read columns from the row and write it to our console|file|database
                        writer.WriteLine(string.Join(",", item.Keys));

                        firstPass = false;
                    }
                    // read values from the row and write it to our console|file|database
                    writer.WriteLine(string.Join(",", item.Values));
                }
            }
        }
    }

    private static async Task<ResponseResult> RequestData(string uri, string apiKey)
    {
        ResponseResult jsonResult;
        using (var client = new HttpClient())
        {
            // authorize our request by attaching our subscription key in a header
            client.DefaultRequestHeaders.Add("Ocp-Apim-Subscription-Key", apiKey);

            // make the request and wait for a response
            var response = await client.GetAsync(uri);

            Console.WriteLine($"Response: {response.StatusCode}");

            var result = response.Content.ReadAsStringAsync();
            jsonResult = JsonConvert.DeserializeObject<ResponseResult>(result.Result);
        }

        return jsonResult;
    }

    private static int GetTotalPages(int pageSize, string totalRows)
    {
        try
        {

            // We must determine how many pages the rowcount implies exists...round up because we need partial
pages
            var totalPages = (int)Math.Ceiling(short.Parse(totalRows) / (double)pageSize);

            Console.WriteLine("Have {0} rows.  Hence there are {1} pages.", totalPages, totalPages);

            return totalPages;
        }
        catch (Exception)
        {
            throw new InvalidDataException("Could not deserialize response.");
        }
    }

    // ResponseResult class is used for the Json Serializer
    private class ResponseResult
    {
        private ResponseResult()
        {
            Links = new List<LinksType>();
            Items = new List<IDictionary<string, string>>();
            SearchSpecification = SearchSpec.NULL;
            TotalRows = "0";
        }

        public List<LinksType> Links { get; set; }
        public List<IDictionary<string, string>> Items { get; set; }
        public SearchSpec SearchSpecification { get; set; }
        public string TotalRows { get; set; }
    }

    // Links class is used for the Json Serializer
    private class LinksType
    {
        public string Rel { get; set; }
        public string Href { get; set; }
    }
```

```
        // SearchSpec class is used for the Json Serializer
        private class SearchSpec
        {
            public static readonly SearchSpec NULL = new SearchSpec();

            private SearchSpec()
            {
                RowCount = "0";
                Sort = string.Empty;
                StartRow = "1";
                IsActiveMetadata = "1";
                Fields = new List<string>();
                Filters = new List<IDictionary<string, string>>();
            }

            public string RowCount { get; set; }
            public string Sort { get; set; }
            public string StartRow { get; set; }
            public string IsActiveMetadata { get; set; }
            public List<string> Fields { get; set; }
            public List<IDictionary<string, string>> Filters { get; set; }
        }
    }
}
```

C# 10 .Net 9:

```
using System.Collections.Specialized;
using System.Text.Json;
using System.Web;

public class Program
{
    static void Main()
    {
        const string apiKey = "YOUR-API-SUBSCRIPTION-KEY";// see https://apiportal.pjm.com/
        const string endpoint = "https://api-train.pjm.com/api/v1/pnode";
        const int pageSize = 5000;

        // Request parameters
        // Filters must match API definition. See API definitions page for more information
(https://apiportal.pjm.com/).
        var queryString = HttpUtility.ParseQueryString(string.Empty);
        queryString["rowCount"] = pageSize.ToString();
        queryString["startRow"] = "1";

        // Other options can be found on the API portal and depend on the exact endpoint.  For example:
        //queryString["datetime_beginning_ept"] = "2019-03-01 00:00:00 to 2019-03-31 00:00:00";
        //queryString["row_is_current"] = "1";
        //queryString["sort"] = "datetime_beginning_ept";
        //queryString["order"] = "Asc";
        //queryString["isActiveMetadata"] = "{boolean}";
        //queryString["fields"] = "{string}";
        //queryString["datetime_beginning_utc"] = "Today";
        //queryString["pnode_id"] = "{number}";
        //queryString["voltage"] = "{string}";
        //queryString["equipment"] = "{string}";
        //queryString["type"] = "{string}";
        //queryString["zone"] = "{string}";
        //queryString["version_nbr"] = "{number}";

        var resultsAsync = GetApiResultsAsync(apiKey, endpoint, queryString, pageSize);
        Task.WaitAll(resultsAsync);

        Console.WriteLine($"Results saved. Hit ENTER to exit...");
        Console.ReadLine();
    }

    private static async Task GetApiResultsAsync(string apiKey, string endpoint, NameValueCollection queryString,
int pageSize)
    {
        // assume at least one page, calculate it correctly after first response is retrieved
        var totalPages = 1;
        var currentPage = 0;
        do
        {
```

```
            // The startRow pointer is moved forward by one-based pageSize
            queryString["startRow"] = (currentPage * pageSize + 1).ToString();
            // build a URL...queryString will correctly escape its arguments
            var uri = string.Concat(endpoint, "?", queryString);
            Console.WriteLine($"Requesting: {uri}");

            var jsonResult = await RequestData(uri, apiKey);

            if (jsonResult == null)
            {
                Console.WriteLine("Unexpected Null result.  Ensure your key is valid.");
                return;
            }

            // calculate the total pages from the HTTP header in the first/any response
            if (currentPage == 0)
            {
                totalPages = GetTotalPages(pageSize, jsonResult.TotalRows);
            }

            // Write the output of results
            OutputResults(jsonResult);

            Console.WriteLine("Done page {0} of {1}.", totalPages == 0 ? 0 : currentPage + 1, totalPages);
            Console.WriteLine();

        } while (++currentPage < totalPages);
    }

    private static void OutputResults(ResponseResult jsonResult)
    {
        var fileName = Guid.NewGuid() + ".csv";
        Console.WriteLine($"Output File : {Path.Combine(Directory.GetCurrentDirectory(), fileName)}");
        // start reading the response
        using var streamToWriteTo = File.Open(fileName, FileMode.Create);
        using var writer = new StreamWriter(streamToWriteTo);
        var firstPass = true;

        foreach (var item in jsonResult.Items)
        {
            if (firstPass)
            {
                // read columns from the row and write it to our console|file|database
                writer.WriteLine(string.Join(",", item.Keys));

                firstPass = false;
            }
            // read values from the row and write it to our console|file|database
            writer.WriteLine(string.Join(",", item.Values));
        }
    }

    private static async Task<ResponseResult?> RequestData(string uri, string apiKey)
    {
        using var client = new HttpClient();
        // authorize our request by attaching our subscription key in a header
        client.DefaultRequestHeaders.Add("Ocp-Apim-Subscription-Key", apiKey);

        // make the request and wait for a response
        var response = await client.GetAsync(uri);

        Console.WriteLine($"Response: {response.StatusCode}");

        var result = response.Content.ReadAsStringAsync();

        return JsonSerializer.Deserialize<ResponseResult>(result.Result, new
JsonSerializerOptions{PropertyNameCaseInsensitive = true});
    }

    private static int GetTotalPages(int pageSize, long totalRows)
    {
        try
        {

            // We must determine how many pages the rowcount implies exists...round up because we need partial
pages
            var totalPages = (int)Math.Ceiling(totalRows / (double)pageSize);
```

```
            Console.WriteLine("Have {0} rows.  Hence there are {1} pages.", totalPages, totalPages);

            return totalPages;
        }
        catch (Exception)
        {
            throw new InvalidDataException("Could not deserialize response.");
        }
    }

    // ResponseResult class is used for the Json Serializer
    public class ResponseResult
    {
        public static ResponseResult NULL = new();

        public List<LinksType> Links { get; init; } = [];
        public List<IDictionary<string, object>> Items { get; init; } = [];
        public SearchSpec SearchSpecification { get; init; } = SearchSpec.NULL;
        public long TotalRows { get; init; } = 0;
    }


    // Links class is used for the Json Serializer
    public class LinksType
    {
        public string Rel { get; set; } = string.Empty;
        public string Href { get; set; } = string.Empty;
    }

    // SearchSpec class is used for the Json Serializer
    public class SearchSpec
    {
        public static readonly SearchSpec NULL = new();

        public long RowCount { get; set; } = 0;
        public string Sort { get; set; } = string.Empty;
        public long StartRow { get; set; } = 1;
        public bool IsActiveMetadata { get; set; } = true;
        public List<string> Fields { get; set; } = [];
        public List<IDictionary<string, string>> Filters { get; set; } = [];
    }
}
```

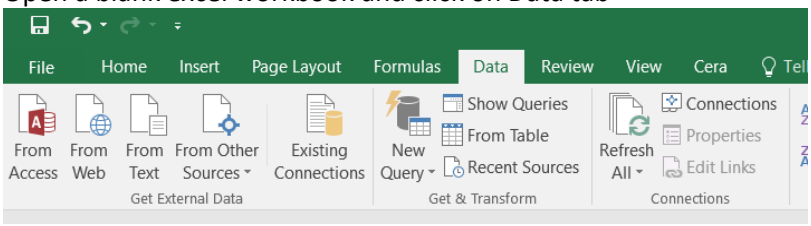
VBA macro to generate in excel to download DA LMP data:

```
Sub DM2API_VBA()
'
' DM2API_VBA Macro
' VBA to get DA LMP data from DM2 API. To make the macro work, please enter your
subscription key where it says <yourkey>
'
' Keyboard Shortcut: Ctrl+e
'
    ActiveWorkbook.XmlImport URL:= _
        "https://api-
train.pjm.com/api/v1/pnode?rowCount=100&startRow=1&subscription-
key=<yourkey>&format=xml" _
        , ImportMap:=Nothing, Overwrite:=True, Destination:=Range("$A$1")
    ActiveWindow.SmallScroll Down:=0
End Sub
```

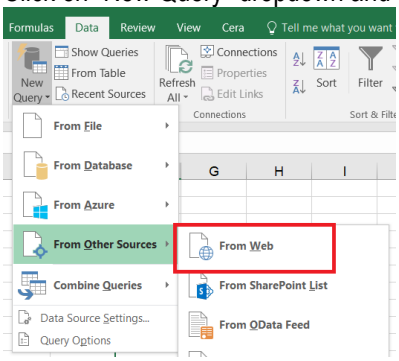
Import data to Excel using Data Connection:

The steps below are for Excel 2016. These steps may work on other versions but these steps may help with other versions

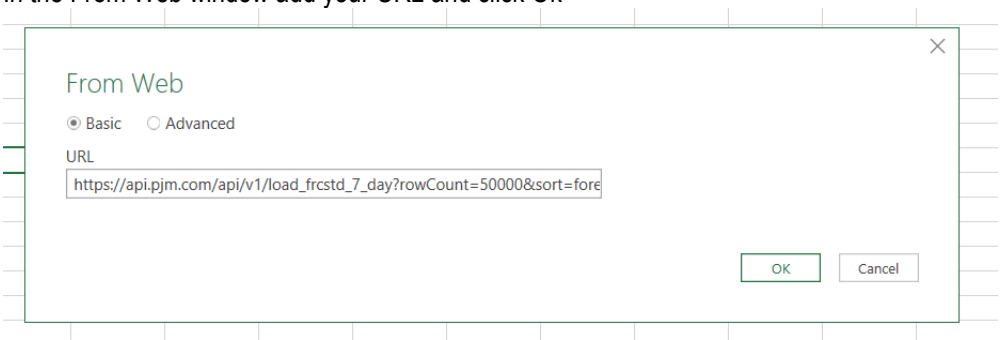
1. Open a blank excel workbook and click on Data tab



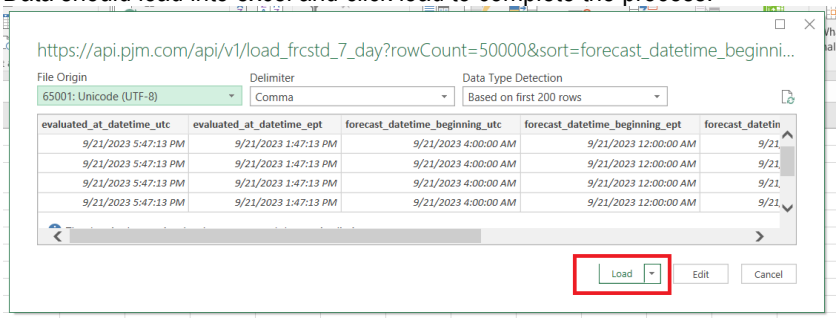
2. Click on "New Query" dropdown and select " From Web from the From other sources menu"



3. In the From Web window add your URL and click Ok



4. Data should load into excel and click load to complete the process.



5. The URL being used here is for 7 day load forecast. Please update the text <your key> with your API subscription key. To obtain the subscription key log onto https://apiportal.pjm.com/. Click on profile and click Show for Primary key.
6. URL – https://api.pjm.com/api/v1/load_frcstd_7_day?rowCount=50000&sort=forecast_datetime_beginning_ept&ord

er=Asc&startRow=1&forecast_datetime_beginning_ept=09/21/2023 00:00:00 to 09/21/2023 23:59:59&format=csv&subscription-key=<your-key>

7. Use the "Try It" feature on API portal to construct the URL for other combinations and/or other feeds. When constructing a URL via the portal, be sure to add format=csv and subscription-key=<your-key> to the URL.

VIII. Appendix –A: Feed Long names to short names mapping

The API call names for the feeds are classified by their short names. The "metadata" APIs are constructed as: https://api.pjm.com/api/v1/<feed short name>/metadata and "search" APIs are constructed as: https://api.pjm.com/api/v1/<feed short name>? The following table provides an easy reference for the short names of Data Miner feeds

Feed Long Name	Feed Short Name/API call name
Actual/Schedule Summary Report	act_sch_interchange
Ancillary Service LMPs	ancillary_services
Ancillary Services Five Minute LMPs	ancillary_services_fivemin_hrl
Ancillary Service Market Results	reserve_market_results
Balancing Transmission Congestion Preliminary Billing Data	bal_trns_cong_prelim_billing
Daily Cleared INCs, DECs and UTCs	day_inc_dec_utc
Daily Generation Capacity	day_gen_capacity
Daily Uplift by Zone	uplift_by_zone
Day Ahead Interface Flows and Limits	da_interface_flows_and_limits
Day-Ahead Hourly LMPs	da_hrl_lmps
Day-Ahead Marginal Value	da_marginal_value
Day-Ahead Scheduling Reserve	dasr_results
Day-Ahead Transmission Constraints	da_transconstraints
Day-Ahead Temperature Sets	da_tempset
Energy Market Generation Offers	energy_market_offers

Equivalent Forced Outage Rates – Monthly	mnt_efor
Five Minute Load Forecast	very_short_load_frcst
Fixed Weighted Average Aggregate Definitions	agg_definitions
Forecasted Generation Outages	frcstd_gen_outages
FTR Auction Bids – Annual	ftr_bids_annual
FTR Auction Bids - Long-Term Auction	ftr_bids_long_term
FTR Auction Bids – Monthly	ftr_bids_mnt
FTR Credit Calculator Congestion LMPs	ftr_cong_lmp
Generation and Extra High Voltage Losses	gen_ehv_losses
Generation by Fuel Type	gen_by_fuel
Generation Outage for Seven Days by Type	gen_outages_by_type
Historical Load Forecasts	load_frcstd_hist
Hourly Day-Ahead Demand Bids	hrl_da_demand_bids
Hourly Day-Ahead Increment Offer and Decrement Bid Data	hrl_da_incs_decs
Hourly Demand Bid Data	hrl_dmd_bids
Hourly Load: Estimated	hrl_load_estimated
Hourly Load: Metered	hrl_load_metered
Hourly Load: Preliminary	hrl_load_prelim
Load Reconciliation Billing Determinants - Daily	load_recon_bill_deter_daily
Load Reconciliation Billing Determinants - Hourly	load_recon_bill_deter_hrly
Market to Market Flowgate FFE	m2m_rt_ffe
Monthly Financial Transmission Rights Zonal LMPs	mnt_ftr_zonal_lmps
Nodal Reference Prices for Export Credit Screening	nodal_ref_prices

Nodal Reference Prices for Increment Offer & Decrement Bid Screening	nodal_refe_prices_incdec
Non-Synchronized Reserve	non_sync_reserve
Off-Cost Operations	off_cost_ops
Operations Summary - Actual Operational Statistics	ops_sum_prev_period
Operations Summary - Forecast Transfer Limits	ops_sum_frcstd_tran_lim
Operations Summary - Projected Area Statistics at Peak	ops_sum_frcst_peak_area
Operations Summary - Projected RTO Statistics at Peak	ops_sum_frcst_peak_rto
Operations Summary - Projected Scheduled Tie Flow	ops_sum_prjctd_tie_flow
PJM Regulation Zone Preliminary Billing Data	reg_zone_prelim_bill
Pricing Nodes	Pnode
Real-Time Default Marginal Value Override	rt_default_mv_override
Real-Time Five Minute LMPs	rt_fivemin_hrl_lmps
Real-Time Hourly LMPs	rt_hrl_lmps
Real-Time Marginal Value	rt_marginal_value
Real-Time Scheduled Interchange	rt_scheduled_interchange
Real-Time Transmission Constraints	rt_transn_constraints
Real-Time Temperature Sets	rt_tempset
Reconciliation Billing Determinants - Monthly	bill_deter_mnt_load
Reconciliation Billing Determinants Preliminary Operating Reserves Rates	prelim_or_rates
Regulation Market Data	reg_market_results
RTO Synchronized Reserve Preliminary Billing Data	sync_reserve_prelim_bill
RTO Transfer Limit and Flows	transfer_limits_and_flows
Scheduled Generation	rt_and_self_ecomax

Settlements Verified Five Minute Ancillary LMPs	ancillary_services_fivemin_mnt
Settlements Verified Five Minute LMPs	rt_fivemin_mnt_lmps
Settlements Verified Hourly Ancillary LMPs	ancillary_services_monthly
Settlements Verified Hourly LMPs	rt_da_monthly_lmps
Seven-Day Load Forecast	load_frcstd_7_day
Solar Generation	solar_gen
Synchronized Reserve Events	sync_reserve_events
Up-to-Congestion Bid Screening	utc_bid_screening
Wind Generation	wind_gen

IX. Revision History

Version 00	*03/22/2017*	Created a new document with user registration and accessing the API Integration Specifications for Data Miner - Beta. The document includes functionality in the API developer portal for New User Registration, User Profile Management, and Access to API Integration Specifications for Data Miner - Beta delivery on 03/31/2017. This is the first release of the PJM Data Miner API Integration Specifications
Version 01	04/07/2017	*Updated the URL for the Beta / Train environment*.
Version 02	06/02/2017	*Updated New User registration and Sign in to reflect PJM Account Sign up*
Version 03	08/15/2017	*Updated user guide to reflect production sign-up process and API Integration Specs* *Added helpful API tips section*

Version 04	09/08/2017	*Modified helpful API tips section*
Version 05	02/15/2018	*Updated with API Specs*
Version 06	03/15/2018	*Updated with VBA, Excel Import and 5 minute lmp GET samples*
Version 07	09/17/2018	*Updated with new feeds API specs.*
Version 08	10/19/2018	*Updated Section 7*
Version 09	3/12/2019	*Updated with new feeds API specs. Updated Section 3A*
Version 10	*7/01/2019*	*Updated with new feeds API specs. Updated Section 3A*
Version 11	*7/23/2019*	*Updated with new feeds API specs. Updated Section 3A*
Version 12	7/15/2020	*Updated to remove "2" from Data Miner 2. Various readability edits. Included information on archived data.*
Version 13	9/22/2023	*Updated screen captures & account creation steps for the API portal redesign. Import data in excel was updated*
Version 14	9/26/2025	*Updated with newer code samples and updates to address new security tools protecting Data Miner 2.*
Version 15	02/10/2026	*Updated instructions for Non-Member access requests. Updated section IV with updated security requirements (J)*