

Methodology and specifications guide

North American electricity

Latest update: February 2020

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INTRODUCTION

S&P Global Platts methodologies are designed to produce price assessments that are representative of market value, and of the particular markets to which they relate. Methodology documents describe the specifications for various products reflected by Platts assessments and indices, the processes and standards Platts adheres to in collecting data, and the methods by which Platts arrives at final assessment values for publication. These guides are freely available on Platts website for public review.

Platts discloses publicly the days of publication for its price assessments and indices, and the times during each trading day in which Platts considers transactions in determining its assessments and index levels. This schedule of publication is available on Platts website, at the following link: <https://www.spglobal.com/platts/en/our-methodology/holiday>.

The dates of publication and the assessment periods are subject to change in the event of outside circumstances that affect Platts ability to adhere to its normal publication schedule. Such circumstances include network outages, power failures, acts of terrorism and other situations that result in an interruption in Platts operations at one or more of its worldwide offices. In the event that any such circumstance occurs, Platts will endeavor, whenever feasible, to communicate publicly any changes to its publication schedule and assessment periods, with as much advance notice as possible.

All Platts methodologies reflect Platts commitment to maintaining best practices in price reporting.

Platts methodologies have evolved to reflect changing market conditions through time, and will continue to evolve as markets change. A revision history, a cumulative summary of changes to this and future updates, is included at the end of the methodology guide.

How this methodology statement is organized

- This description of methodology for assessments and indices is divided into seven major parts (I-VII) that parallel the entire process of producing the end-of-day assessments and indices.
- Part I describes what goes into Platts assessments and indices, including details on what data market participants are expected to submit, the process for submitting data and criteria for timeliness of market data submissions.
- Part II describes any security and confidentiality practices that Platts uses in handling and treating data, including the separation between Platts price reporting and its news reporting.
- Part III is a detailed account of how Platts collects bids, offers, trades and other market data, and what Platts does with the data to formulate its assessments and indices. It includes descriptions of the methods that Platts uses for reviewing data, and the methods used to convert raw data into assessments and indices, including the procedures used to identify anomalous data. This section describes how and when judgment is applied in this process, the basis upon which transaction data may be excluded from a price assessment, and the relative importance assigned to each criterion used in forming the price assessment. This section describes the criteria for determining which values are indices, and which are assessments, based on reported transactions and other market information. Finally, this section describes how Platts addresses assessment periods where one or more reporting entities submit market data that constitute a significant proportion of the total data upon which the assessment is based.
- Part IV explains the process for verifying that published prices comply with Platts standards.

- Part V lays out the verification and correction process for revising published prices and the criteria Platts uses to determine when it publishes a correction.
- Part VI explains how users of Platts assessments and indices can contact Platts for clarification of data that has been published, or to register a complaint. It also describes how to find out more about Platts complaint policies.
- Part VII is a list of detailed specifications for the trading locations and products for which Platts publishes assessments and indices in this commodity. This section describes what specific units of measurement are used, and what conversion factors are used to move between units of measurement, where relevant.

PART I: DATA QUALITY AND DATA SUBMISSION

Platts objective is to ensure that the submission of transactional information and other data inputs that editors use as the basis for their price assessments is of the highest quality. Ensuring that data used in Platts assessments is of high quality is crucial to maintaining the integrity of Platts various price assessment processes.

Platts encourages entities that submit any market data for consideration in its assessment processes to submit all transaction data that they have which may be relevant to the assessment being made. Under price reporting guidelines issued by the US Federal Energy Regulatory Commission in 2003, which apply to US electricity markets, companies should report each bilateral, arm's-length transaction between non-affiliated companies in the physical markets at all trading locations. Platts expects reported data to include all transactions done by the entity at all locations reported by Platts, not a selective subset of those locations.

To that end, Platts requires formalized reporting relationships with market participants in which data is submitted from a central point in the mid- or back-office. If the reporting entity chooses, Platts will sign a standard confidentiality agreement protecting the submitted data. A copy of the standard agreement is available upon request. The data provider must certify that it is making a good-faith effort to report completely and accurately, and will have staff assigned to respond to questions concerning data submittals. In addition, reporting entities, in cases of error or omission, have an obligation to make reasonable efforts to inform Platts and, as necessary, modify their internal processes to eliminate or minimize the likelihood of future errors or omissions in their data submissions.

Data submitted to Platts must be detailed, transaction-level data. Below is a summary of what should be reported.

What to report

- For day-ahead indices, report each business day all fixed-price physical and financial deals for next-day and weekend delivery in North America. Trading schedules may vary in the case of holidays.
- Report the price at which the two parties agreed to transact. Do not add estimated transmission cost to make the transaction fit one of Platts delivery location definitions.
- Label deals for delivery at locations not defined or reported by Platts using the name of the control area, tie point or hub or zone. Although Platts may not currently assess all locations reported, if sufficient trading develops at a location and is sustained, Platts would be able to add that pricing point to its daily indices. (Definitions for the locations for which indices and assessments are currently published are in Part VII of this methodology guide.) In addition, information on deals at those points adds to Platts understanding of the market and aids Platts in assessing thinly traded points in that geographic area.

- List all transactions individually and with the following information: location, trade time and date, start flow date, end flow date, shape (peak or off-peak), deal type (physical or financial), firm or non-firm, price (\$/MWh), volume (MW), side of transaction (buy or sell), counterparty name, and intermediary name (broker or trading platform).
- Platts firmly believes that counterparty information is the best single way to verify transactions and encourages all market participants to report counterparty information.
- Deals should be reported only for transactions done that day. The cutoff for all transactions is 2:30 p.m. Eastern Prevailing Time. The cutoff time applies to the time a trade was transacted, not the time the trade is entered into the company's system. Do not include "early" daily deals done after the cutoff on the previous day. Platts considers these transactions to be non-standard deals done before the opening of the market.
- Platts does include deals done after options expiration in its daily assessments and indices, as long as those deals are priced within the range of the bulk of the day's trading.

How to report

- Reports of each day's deals should be compiled and sent to Platts by a non-commercial department of the company. Generally, the reporting function is the responsibility of the mid or back office. Even in the case of small entities, the FERC policy statement requires that prices should be provided by individuals separate from trading activities, such as accounting or bookkeeping staff.
- Platts should be provided with at least two contacts (with phone numbers and e-mail addresses for both) who are responsible for submissions and can answer questions about transactions reported to Platts.

- Reports should be sent electronically in either Excel or CSV (comma separated values) format. Platts can provide reporting entities with a sample Excel sheet showing the preferred format and the information needed for each transaction.
- Reports should be sent to electricityprice@spglobal.com and electricityprice2@spglobal.com each day by 4:30 p.m. EPT.
- If a reporting entity is unable to compile the needed information by the deadline set by Platts on a given day, it should notify Platts editors of the delay and the length of the delay by either e-mail or phone. This will help Platts editors decide whether to wait for the submission.

PART II: SECURITY AND CONFIDENTIALITY

In the North American electricity market, where market participants are expected to submit all fixed-price physical and financial transactions for next-day delivery, Platts will sign confidentiality agreements providing for non-disclosure of submitted data except in circumstances where it is legally required to disclose the data.

- Price data is e-mailed to specific Platts e-mail addresses and enters a secure network protected by firewalls and is accessible only by market editors. Encryption is available upon request of the reporting company.
- The data is then entered into a proprietary software system designed specifically to store and analyze trade data.
- Data is stored in a secure network, in accordance with Platts' policies and procedures.
- Price data is used only for constructing assessments and indices. Platts has a strict internal policy, reflected in its confidentiality agreements, of never using individual price data for news reporting purposes. Nor do Platts news

reporters have access to individual entities' transaction reports. Data aggregated from all reporting sources – e.g., changes in prices and trading volumes over time – may be used as the basis for news stories.

PART III: CALCULATING INDICES AND MAKING ASSESSMENTS

As a publisher owned by S&P Global, Platts places independence and impartiality at the heart of its price assessments. Platts has no financial interest in the price of the products or commodities on which it reports. Platts' overall objective is to reflect the transactable value of the commodity assessed.

Daily

Platts editors produce indices for next-day markets. For daily trading hubs where there is sufficient liquidity, market editors use volume-weighted averages to calculate an index value.

For each daily index, Platts publishes the index price, the change from the previous day, the low, the high, the volume, the number of transactions the index is based on, and the running average for the index price for the month. Index prices, lows, and highs are expressed in \$/MWh. The daily change is expressed in dollars. The volume is expressed in megawatts (MW) across the on-peak or off-peak period, rather than in megawatt hours. For instance, if ten 50-MW on-peak deals are reported, the volume would be expressed as 500 MW, rather than the equivalent value of 8,000 MWh (ten 50-MW deals multiplied by 16 hours).

In order to identify potential anomalous data, which may be excluded from formulating an index, Platts analyses reported transactions using, but not limited to, standard deviation, volume, and gaps in trade data. Platts editors will contact the reporting party for more specifics on the potential anomalous transaction.

Gaps in the market are not in themselves anomalous. They warrant closer analysis, and might not be reflected in our final published assessments and/or indices, depending on the outcome of that further analysis. Examples of potentially anomalous data could include trades that differ in price from the bulk of reported transactions, transactional data containing nonstandard contractual terms, information that is incomplete (lacking full confirmation, or important details), and/or information that otherwise deviates from our methodology.

Hourly market

In the hourly market, power is priced for each day of the month. Platts editors produce indices for hourly markets. For hourly trading hubs where there is sufficient liquidity, market editors use volume-weighted averages to calculate an index value.

For each hourly index, Platts publishes the index price, the low, the high, the volume, the number of transactions the index is based on, and the running average for the index price for the month. Index prices, lows, and highs are expressed in \$/MWh. The volume is expressed in megawatts (MW) for hourly, on-peak and off-peak packages.

In order to identify potential anomalous data, which may be excluded from formulating an index, Platts analyses reported transactions looking at gaps in trade data within each hour. Platts editors will contact the reporting party for more specifics on the potential anomalous transaction.

Gaps in the market are not in themselves anomalous. They warrant closer analysis, and might not be reflected in our final published assessments and/or indices, depending on the outcome of that further analysis. Examples of potentially anomalous data could include trades that differ in price from the bulk of reported transactions, transactional data containing nonstandard contractual terms, information that is incomplete (lacking full confirmation, or important details), and/or information that otherwise deviates from our methodology.

Low-liquidity daily markets

For trading locations with less liquidity, Platts will examine reported, transactional-level information to gauge whether it is representative of the day's trading activity and decide whether to publish a volume-weighted index. If Platts deems information is not representative of that day's trading activity, Platts will assess a price and not publish any volume. Platts assesses such illiquid points using, but not limited to, reported transactions, locational spreads and other market data, such as bids and offers, and relevant grid operator information. Platts clearly indicates when it assesses a price rather than calculating a volume-weighted average index by not publishing a volume or deal count for the day.

Assessments for weekend-delivery power

Indices and assessments are also formulated for weekends for standard packages.

For bilateral markets in the Southeast, for standard non-holiday weekends, Platts formulates its off-peak assessments and indices for the weekend based on transactions traded Friday for delivery during off-peak hours Saturday through Monday, known as 3x8 packages. On-peak assessments for standard weekends for these trading hubs are based on 2x16 packages.

In the West, Saturday is normally part of a Friday and Saturday package. Single-day deals are not included in the volume-weighted index of either day, and assessments for the two days are the same. Sunday power is traded in the West for delivery around-the-clock as a package with the Monday off-peak deals. The price for Sunday will be equal to that of the Monday off-peak. Again, no single-day deals will be included in these calculations.

In addition, Sunday on-peak and Sunday off-peak will be assessed separately from the standard around-the-clock Sunday and off-peak Monday package.

In all regions, standard weekend packages are changed to reflect the market practice of altering standard weekend packages to accommodate holidays and to avoid splitting a weekend package between two months. When weekend packages are altered because of holidays, indices and assessments are based on the standard holiday packages and single-day packages are not included in the volume-weighted indices.

Firm and non-firm delivery

Power assessed by Platts is firm with liquidated damages, or firm LD. Platts does not assess non-firm power.

California ISO Curtailment Indices

Platts publishes daily peak, off-peak and 24 hour indices for solar, wind, and combined solar and wind generation curtailment in the California Independent System Operator (ISO) service area. Indices are reported in megawatts, covering the previous day.

Daily curtailment data is reported by the California ISO, which Platts weights against California ISO historical generation data to produce daily index values.

PART IV: PLATTS EDITORIAL STANDARDS

All Platts employees must adhere to the S&P Global Code of Business Ethics (COBE), which has to be signed annually. The COBE reflects S&P Global's commitment to integrity, honesty and acting in good faith in all its dealings.

In addition, Platts requires that all employees attest annually that they do not have any personal relationships or personal financial interests that may influence or be perceived to influence or interfere with their ability to perform their jobs in an

objective, impartial and effective manner.

Market reporters and editors are mandated to ensure adherence to published methodologies as well as internal standards that require accurate records are kept in order to document their work.

Platts has a Compliance function that is independent of the editorial group. Compliance is responsible for ensuring the quality and adherence to Platts policies, standards, processes and procedures. The Compliance team conducts regular assessments of editorial operations, including checks for adherence to published methodologies.

S&P Global's internal auditor, an independent group that reports directly to the parent company's board of directors, reviews the Platts risk assessment programs.

PART V: CORRECTIONS

Platts is committed to promptly correcting any material errors. When corrections are made, they are limited to corrections to data that was available when the assessment or index was calculated.

Errors that data providers should report to Platts are limited to inaccuracies in the attributes (price, volume, location, etc.) at the time the transaction was done and reported to Platts, and do not include operationally driven, after-the-fact changes in the nature of the transaction.

If Platts is notified of an error in a submission after a price is calculated and published, it will assess the impact of the error.

PART VI: REQUESTS FOR CLARIFICATIONS OF DATA AND COMPLAINTS

Platts strives to provide critical information of the highest standards, to facilitate greater transparency and efficiency in physical commodity markets.

Platts customers raise questions about its methodologies and the approach taken in price assessments, proposed methodology changes and other editorial decisions in relation to Platts price assessments. Platts strongly values these interactions and encourages dialogue concerning any questions a customer or market stakeholder may have.

However, Platts recognizes that occasionally customers may not be satisfied with responses received or the services provided by Platts and wish to escalate matters. Full information about how to contact Platts to request clarification around an assessment, or make a complaint, is available on the Platts website, at: <http://www.platts.com/ContactUs/Complaints>.

PART VII: DEFINITIONS OF THE TRADING LOCATIONS FOR WHICH PLATTS PUBLISHES DAILY INDICES OR ASSESSMENTS

Points are listed alphabetically for two daily bilateral regions: Eastern and Western markets, and one hourly bilateral region

For the Platts symbols in the table, the bates are: h=high; l=low; u=index; w=volume.

This methodology is current at the time of publication. Platts may issue further updates and enhancements to this methodology and will announce these to subscribers through its usual publications of record. Such updates will be included in the next version of the methodology. Platts editorial staff and managers will be ready to provide guidance when assessment issues require clarification.

A revision history, a cumulative summary of changes since January 2012 is included at the end of this section.

EASTERN MARKETS

Assessment	Trade On-peak Daily l,h,u,w	Trade On-peak Wknd l,h,u,w	Trade Off-peak Daily l,h,u,w	Trade Off-peak Wknd l,h,u,w	Flow On-peak Daily l,h,u,w	Flow On-peak Wknd l,h,u,w	Flow On-peak Wkly Avg l,h,u,w	Flow Off-peak Daily l,h,u,w	Flow Off-peak Wknd l,h,u,w	Flow Off-peak Wkly Avg l,h,u,w
Florida	AAMAV00	AAMAV28	AAMA000	AAMA028	AAMAV20	AAMAV21	AAMAZ00	AAMA020	AAMA021	AAMAS00
GTC, into	WAMCJ00	WAMCJ28	WAMCC00		WAMCJ20	WAMCJ21	AAMUN00	WAMCC20		AAMDA00
Southern, into	AAMBJ00	AAMBJ28	AAMBC00	AAMBC28	AAMBJ20	AAMBJ21	AAMBN00	AAMBC20	AAMBC21	AAMBG00
TVA, into	WEBAB00	WEBAB28	AAJER00	AAJER28	WEBAB20	WEBAB21	WEBAK04	AAJER20	AAJER21	AAJEU00
VACAR	AAMCI00	AAMCI28	AAMCB00	AAMCB28	AAMCI20	AAMCI21	AAMCM00	AAMCB20	AAMCB21	AAMCF00

DAILY BILATERAL

Eastern Markets Florida

AKA: Florida instate

Description: The Florida instate pricing area comprises control areas within the State of Florida or the Florida Reliability Coordination Council (FRPCC), excluding Gulf Power, which is part of the Southern Company control area. Florida control areas include: Progress Energy Florida, Florida Power & Light Company, Tampa Electric Company, Florida Municipal Power Agency, Gainesville Regional Utilities, JEA, City of Lakeland, Orlando Utilities Commission, City of Tallahassee and Seminole Electric Cooperative.

Market type: no formal market design

Grid operator: Individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Product assessed: Physical power, energy only (no capacity)

Start date: Jan 2002

Into GTC

AKA: Georgia Transmission Corporation

Description: GTC comprises power delivered into the GTC transmission system, which includes 38 electric membership corporations that serves nearly all of Georgia.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Product assessed: Physical power, energy only (no capacity)

Start date: Dec 2014

Into Southern**AKA:** Into SoCo

Description: Into Southern comprises power delivered to an interface with or a delivery point within the Southern Company control area, which spans a swath of SERC from Georgia to Mississippi including a portion of the Florida panhandle. (Control area for purposes of this location description is defined to exclude any other entity's transmission system for which the utility acts as the balancing authority.)

Market type: no formal market design

Grid operator: Southern Company

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Product assessed: Physical power, energy only (no capacity)

Start date: Jan 2002

Into TVA**AKA:** none

Description: Into TVA comprises power delivered to an interface with or a delivery point within the control area of the Tennessee Valley Authority, which includes Tennessee and the northern portion of Alabama. (Control area for purposes of this location description is defined to exclude any other entity's system for which TVA acts as the balancing authority.)

Market type: no formal market design

Grid operator: Tennessee Valley Authority

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Product assessed: Physical power, energy only (no capacity)

Start date: May 1997

VACAR**AKA:** none

Description: VACAR comprises the control areas in the Virginia and Carolinas subregion of the Southeastern Electric Reliability Council, including: Progress Energy's Carolina Power and Light east and west, Duke, South Carolina Electric and Gas, Santee Cooper, Southeastern Power Administration and APGI Yadkin Division. Dominion's Virginia Power control area has been excluded since it joined the PJM interconnection on May 1, 2005.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Product assessed: Physical power, energy only (no capacity)

Start date: Jan 2002

WESTERN MARKETS

Assessment	Trade On-peak Daily l,h,u,w	Trade On-peak Wknd l,h,u,w	Trade Off-peak Daily l,h,u,w	Trade Off-peak Wknd l,h,u,w	Flow On-peak Daily l,h,u,w	Flow On-peak Wknd l,h,u,w	Flow On-peak Wkly Avg l,h,u,w	Flow Off-peak Daily l,h,u,w	Flow Off-peak Wknd l,h,u,w	Flow Off-peak Wkly Avg l,h,u,w
COB	WEABE00	WEABE28	WEACJ05	WEACJ28	WEABE20	WEABE21	WEAAB00	WEACJ20	WEACJ21	WEAAQ00
Four Corners	WEABI00	WEABI28	WEACR05	WEACR28	WEABI20	WEABI21	WEAAJ00	WEACR20	WEACR21	WEAAU00
John Day	WEAHF00	WEAHF28	WEAHL05	WEAHL28	WEAHF20	WEAHF21	WEAHA00	WEAHL20	WEAHL21	WEAHR00
Mead	AAMBW00	AAMBW28	AAMBQ00	AAMBQ28	AAMBW20	AAMBW21	AAMBZ00	AAMBQ20	AAMBQ21	AAMBT00
Mid-Columbia	WEABF00	WEABF28	WEACL05	WEACL28	WEABF20	WEABF21	WEAAA00	WEACL20	WEACL21	WEAAR00
Mona	AARLQ00	AARLQ28	AARL000	AARL028	AARLQ20	AARLQ21	AARLR00	AARL020	AARL021	AARLP00
NOB	WEAIF00	WEAIF28	WEAIL05	WEAIL28	WEAIF20	WEAIF21	WEAIA00	WEAIL20	WEAIL21	WEAIR00
Palo Verde	WEACC00	WEACC28	WEACT05	WEACT28	WEACC20	WEACC21	WEAAC00	WEACT20	WEACT21	WEAAV00
Pinnacle Peak	WEAKF00	WEAKF28	WEAKL05	WEAKL28	WEAKF20	WEAKF21	WEAKA00	WEAKL20	WEAKL21	WEAKR00
Westwing	WEAJF00	WEAJF28	WEAJL05	WEAJL28	WEAJF20	WEAJF21	WEAJA00	WEAJL20	WEAJL21	WEAJR00

Western Markets

COB

AKA: California-Oregon Border

Description: COB comprises the Captain Jack and Malin substations on the AC transmission system between Oregon and California.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Oct 1994

Four Corners

AKA: none

Description: Four Corners comprises the switchyard of the coal-fired Four Corners power plant in Fruitland, New Mexico, located in the northwestern corner of the state where Arizona, Colorado, New Mexico and Utah meet.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: May 1995

John Day

AKA: none

Description: John Day comprises the John Day Dam on the Columbia River along with John Day substations in Oregon.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Dec 2014

Mead

AKA: none

Description: Mead comprises the switchyard at the Hoover Dam on the Colorado River, forming Lake Mead near Las Vegas, Nevada.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Feb 2004

Mid-C

AKA: Mid-Columbia

Description: Mid-C is a trading hub for the Northwest U.S. comprising the control areas of three public utility districts in Washington that run hydroelectric projects on the Columbia River. The three PUDs are Grant, Douglas and Chelan. Hydro projects include Wells, Rocky Reach, Rock Island, Wanapum and Priest Rapids dams.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Oct 1994

Mona

AKA: none

Description: Mona comprises the Mona substation in central Utah, directly south of Salt Lake City and linked to major

generating units in the region.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Aug 2005

NOB

AKA: Nevada-Oregon Border

Description: NOB is part of the Pacific DC Intertie that connects the Pacific Northwest directly with Southern California. The DC Intertie connects the Celio DC Converter station near The Dalles, Oregon with the Sylmar substation north of Los Angeles, California.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Dec 2014

Palo Verde

AKA: PV or Palo

Description: Palo Verde comprises the switchyard at the Palo Verde nuclear power station west of Phoenix, Arizona.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour-ending 1 through 6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Oct 1994

Pinnacle Peak

AKA: none

Description: Pinnacle Peak comprises three substations northeast of Phoenix, Arizona and west of Scottsdale Arizona. The three substations are operated individually by Arizona Public Service, US Bureau of Reclamation Lower Colorado Region and Salt River Project.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour ending 1-6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Dec 2014

Westwing

AKA: none

Description: Westwing comprises a substation northwest of Phoenix, Arizona operated by Arizona Public Service.

Market type: no formal market design

Grid operator: individual utilities

On-peak hours: Hour-ending 7 through 22

Off-peak hours: Hour ending 1-6 and 23 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Dec 2014

PLATTS DAY-AHEAD LMP MARGINAL HEAT RATES AND SPARK SPREADS

Power Hub	Power/Gas Hub Pairs		On-Peak			Off-Peak		
	Gas Hub 1	Gas Hub 2	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol
CAISO NP15	PG&E CG		ICNGR00	SCBLP07	SCBLP12	ICNGT00	SCBL007	SCBL012
CAISO SP15	SoCal Gas	PG&E South	ICSGR00	SCCLP07	SCCLP12	ICSGT00	SCDL007	SCDL012
CAISO ZP26	SoCal Gas	PG&E South	ICZGR00	SCELP07	SCELP12	ICZGT00	SCFL007	SCFL012
ERCOT AEN	Waha	Transwestn Perm	IERAR00	SCGLP07	SCGLP12	IERAT00	SCHL007	SCHL012
ERCOT Bus Average	Waha	Transwestn Perm	IERBR00	SCILP07	SCILP12	IERBT00	SCJL007	SCJL012
ERCOT CPS Zone	Tenn Zn0 Fdt	Tx. Eastern, STX	IERDR00	SCKLP07	SCKLP12	IERDT00	SCLL007	SCLL012
ERCOT Houston Hub	Houston ShipChl	Katy	IERHR00	SCMLP07	SCMLP12	IERHT00	SCNL007	SCNL012
ERCOT Houston Zone	Houston ShipChl	Katy	IERZR00	SCOLP07	SCOLP12	IERZT00	SCPL007	SCPL012
ERCOT Hub Average	Waha	Transwestn Perm	IERRR00	SCQLP07	SCQLP12	IERRT00	SCRLO07	SCRLO12
ERCOT LCRA Zone	Tenn Zn0 Fdt	Tx. Eastern, STX	IERLR00	SCSLP07	SCSLP12	IERLT00	SCTL007	SCTL012
ERCOT North Hub	NGPL Texok Zn	Tx. Eastern, ETX	IERNR00	SCULP07	SCULP12	IERNT00	SCVL007	SCVL012
ERCOT North Zone	NGPL Texok Zn	Tx. Eastern, ETX	IERTR00	SCWLP07	SCWLP12	IERTT00	SCXL007	SCXL012
ERCOT Rayburn Zone	Carthage Hub	Tx. Eastern, ETX	IERUR00	SCYLP07	SCYLP12	IERUT00	SCZL007	SCZL012
ERCOT South Hub	Tenn Zn0 Fdt	Agua Dulce Hub	IERSR00	SDALP07	SDALP12	IERST00	SDBL007	SDBL012
ERCOT South Zone	Tenn Zn0 Fdt	Agua Dulce Hub	IERVR00	SDCLP07	SDCLP12	IERVT00	SDDL007	SDDL012
ERCOT West Hub	Waha	Transwestn Perm	IERWR00	SDEL07	SDEL12	IERWT00	SDFL007	SDFL012
ERCOT West Zone	Waha	Transwestn Perm	IERER00	SDGLP07	SDGLP12	IERET00	SDHL007	SDHL012
ISONE Connecticut Zone	Iroquois Zn2	Tenn Zn6 Dlvd	IINCR00	SDILP07	SDILP12	IINCT00	SDJL007	SDJL012
ISONE Internal Hub	Algonquin CG	Tenn Zn6 Dlvd	IINIR00	SDKLP07	SDKLP12	IINIT00	SDLL007	SDLL012
ISONE Maine Zone	Algonquin CG	Iroquois Recpts	IINMR00	SDMLP07	SDMLP12	IINMT00	SDNL007	SDNL012
ISONE NE Mass-Boston Zone	Algonquin CG	Iroquois Recpts	IINNR00	SDOLP07	SDOLP12	IINNT00	SDPL007	SDPL012
ISONE New Hampshire Zone	Algonquin CG	Iroquois Recpts	IINHR00	SDQLP07	SDQLP12	IINH00	SDRL007	SDRL012
ISONE Rhode Island Zone	Algonquin CG	Tenn Zn6 Dlvd	IINRR00	SDSLP07	SDSLP12	IINRT00	SDTL007	SDTL012
ISONE SE Mass Zone	Algonquin CG	Tenn Zn6 Dlvd	IINSR00	SDULP07	SDULP12	IINST00	SDVL007	SDVL012
ISONE Vermont Zone	Algonquin CG	Iroquois Recpts	IINVR00	SDWLP07	SDWLP12	IINVT00	SDXL007	SDXL012
ISONE West-Central Mass Zone	Algonquin CG	Tenn Zn6 Dlvd	IINWR00	SDYLP07	SDYLP12	IINWT00	SDZL007	SDZL012
MISO Arkansas Hub	Enable Gas Transmission	Trunkline Zn 1A	IMARR00	SIDL07	SIDL12	IMART00	SICL007	SICL12
MISO Illinois Hub	Chicago CG	Alliance Interstates	IMILR00	SEBL07	SEBL12	IMILT00	SECL007	SECL12
MISO Indiana Hub	Chicago CG	Lebanon Hub-Ohio	IMIDR00	SEDLP07	SEDLP12	IMIDT00	SEEL007	SEEL12
MISO Louisiana Hub	Col Gulf LA	TX Eastern W LA	IMLAR00	SIBLP07	SIBLP12	IMLAT00	SIALP07	SIAL12
MISO Michigan Hub	Mich Con CG	Cons Energy CG	IMIMR00	SEGLP07	SEGLP12	IMIMT00	SEHL007	SEHL12
MISO Minnesota Hub	Nrthrn Ventura	Emerson Viking	IMINR00	SEILP07	SEILP12	IMINT00	SEJL007	SEJL12
MISO Texas Hub	NGPL Texok Zn		IMTXR00	SHYLP07	SHYLP12	IMTX00	SHYLP07	SHYLP12
NYISO Capital Zone	Transco Zn6 NY	Millennium East receipts	INYCR00	SELLP07	SELLP12	INYCT00	SEML007	SEML012
NYISO Central Zone	Niagara	Dominion S Pt	INYRR00	SENLP07	SENLP12	INYRT00	SEOL007	SEOL012
NYISO Dunwood Zone	Iroquois Zn2	Transco Zn6 NY	INYDR00	SEPLP07	SEPLP12	INYDT00	SEQL007	SEQL012
NYISO Genesee Zone	Niagara	Dominion S Pt	INYGR00	SERLP07	SERLP12	INYGT00	SESL007	SESL012

PLATTS DAY-AHEAD LMP MARGINAL HEAT RATES AND SPARK SPREADS

Power Hub	Power/Gas Hub Pairs		On-Peak			Off-Peak		
	Gas Hub 1	Gas Hub 2	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol
NYISO Hudson Valley Zone	Iroquois Zn2	Transco Zn6 NY	INYHR00	SETLP07	SETLP12	INYHT00	SEUL007	SEUL012
NYISO Long Island Zone	Transco Zn6 NY	Iroquois Zn2	INYLR00	SEVLP07	SEVLP12	INYLT00	SEWL007	SEWL012
NYISO Millwood Zone	Iroquois Zn2	Transco Zn6 NY	INMYR00	SEXLP07	SEXLP12	INMYT00	SEYL007	SEYL012
NYISO Mohawk Valley Zone	Transco Zn6 NY	Millennium East receipts	INYVR00	SEZLP07	SEZLP12	INYVT00	SFAL007	SFAL012
NYISO NYC Zone	Iroquois Recpts		INYNR00	SFBLP07	SFBLP12	INYNT00	SFCL007	SFCL012
NYISO North Zone	Transco Zn6 NY	Iroquois Zn2	INYOR00	SFDLP07	SFDLP12	INYOT00	SFEL007	SFEL012
NYISO West Zone	Niagara	Dominion S Pt	INYWR00	SFFLP07	SFFLP12	INYWT00	SFGL007	SFGL012
PJM AEP Gen Hub	Dominion S Pt	Texas Eastern zone M-2 receipts	IPAGR00	SFILP07	SFILP12	IPAGT00	SFJL007	SFJL012
PJM AEP Zone	Dominion S Pt	Texas Eastern zone M-2 receipts	IPAZR00	SFKLP07	SFKLP12	IPAZT00	SFLL007	SFLL012
PJM AEP-Dayton Hub	Mich Con CG		IPADR00	SFMLP07	SFMLP12	IPADT00	SFNL007	SFNL012
PJM Allegheny Power Zone	Col Gas Appal	Dominion S Pt	IPAPR00	SFOLP07	SFOLP12	IPAPT00	SFPL007	SFPL012
PJM Atlantic Electric Zone	Transco Zn6 non-N.Y	TX Eastern M-3	IPAER00	SFQLP07	SFQLP12	IPAET00	SFRL007	SFRL012
PJM ATSI Gen Hub	Dominion S Pt	Col Gas Appal	IPATR00	SFSLP07	SFSLP12	IPATT00	SFTL007	SFTL012
PJM ATSI Zone	Dominion S Pt	Col Gas Appal	IPASR00	SFULP07	SFULP12	IPAST00	SFVL007	SFVL012
PJM BG&E Zone	TX Eastern M-3	Dominion S Pt	IPBER00	SFWLP07	SFWLP12	IPBET00	SFXL007	SFXL012
PJM Chicago Gen Hub	Chicago CG		IPCGR00	SFYL07	SFYL12	IPCGT00	SFZL007	SFZL012
PJM Chicao Hub	Chicago CG		IPCHR00	SGALP07	SGALP12	IPCHT00	SGBL007	SGBL012
PJM ComEd Zone	Chicago CG		IPCER00	SGCLP07	SGCLP12	IPCET00	SGDL007	SGDL012
PJM Dayton Power and Light Zone	TX Eastern M-3	Lebanon Hub-Ohio	IPDPR00	SGELP07	SGELP12	IPDPT00	SGFL007	SGFL012
PJM Delmarva Power and Light Zone	Transco Zn6 non-N.Y	TX Eastern M-3	IPEPR00	SGGLP07	SGGLP12	IPEPT00	SGHL007	SGHL012
PJM Dominion Hub	Transco Zn5 Dlv	Col Gas Appal	IPDMR00	SGILP07	SGILP12	IPDMT00	SGJL007	SGJL012
PJM Dominion Zone	Transco Zn5 Dlv	Col Gas Appal	IPDZR00	SGKLP07	SGKLP12	IPDZT00	SGLL007	SGLL012
PJM Duke Zone	Dominion S Pt	Texas Eastern zone M-2 receipts	IPDKR00	SGMLP07	SGMLP12	IPDKT00	SGNL007	SGNL012
PJM Duquesne Light Zone	Dominion S Pt	Col Gas Appal	IPDLR00	SGOLP07	SGOLP12	IPDLT00	SGPL007	SGPL012
PJM Eastern Hub	TX Eastern M-3	Transco Zn6 non-N.Y	IPEHR00	SGQLP07	SGQLP12	IPEHT00	SGRL007	SGRL012
PJM EKPC Zone	Texas Eastern zone M-2 receipts	Lebanon Hub-Ohio	IPEKR00	SAZLP07	SAZLP12	IPEKT00	SAZL007	SAZL012
PJM JCPL Zone	Transco Zn6 non-N.Y	Transco Leidy Line receipts	IPJCR00	SGTLP07	SGTLP12	IPJCT00	SGUL007	SGUL012
PJM MetEd Zone	TX Eastern M-3	Transco Zn6 non-N.Y	IPMER00	SGVLP07	SGVLP12	IPMET00	SGWL007	SGWL012
PJM New Jersey Hub	TX Eastern M-3	Transco Zn6 non-N.Y	IPNJR00	SGYLP07	SGYLP12	IPNJT00	SGZL007	SGZL012
PJM Northern Illinois Hub	Chicago CG		IPNIR00	SGZLP07	SGZLP12	IPNIT00	SHAL007	SHAL012
PJM Ohio Hub	Dominion S	Texas Eastern zone M-2 receipts	IPOHR00	SHBLP07	SHBLP12	IPOHT00	SHCL007	SHCL012
PJM PECO Zone	TX Eastern M-3	Transco Zn6 non-N.Y	IPPCR00	SHDLP07	SHDLP12	IPPCT00	SHEL007	SHEL012
PJM Pennsylvania Electric Zone	Transco Leidy Line receipts	Dominion S Pt	IPPAR00	SHFLP07	SHFLP12	IPPAT00	SHGL007	SHGL012
PJM PEPCO Zone	Transco Zn5 Dlv	Dominion S Pt	IPPZR00	SHHLP07	SHHLP12	IPPZT00	SHIL007	SHIL012
PJM PPL Zone	Transco Leidy Line receipts	Transco Zn6 non-N.Y	IPPLR00	SHJLP07	SHJLP12	IPPLT00	SHKL007	SHKL012
PJM PSEG Zone	TX Eastern M-3	Transco Zn6 non-N.Y	IPSGR00	SHLLP07	SHLLP12	IPSGT00	SHML007	SHML012
PJM Rockland Electric Zone	Transco Zn6 non-N.Y	TX Eastern M-3	IPRRR00	SHNLP07	SHNLP12	IPRET00	SHOL007	SHOL012

PLATTS DAY-AHEAD LMP MARGINAL HEAT RATES AND SPARK SPREADS

Power Hub	Power/Gas Hub Pairs		On-Peak			Off-Peak		
	Gas Hub 1	Gas Hub 2	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol
PJM West Interface Hub	Col Gas Appal	Texas Eastern zone M-2 receipts	IPWIR00	SHPLP07	SHPLP12	IPWIT00	SHQL007	SHQL012
PJM Western Hub	TX Eastern M-3	Dominion S Pt	IPWHR00	SHRLP07	SHRLP12	IPWHT00	SHSL007	SHSL012
SPP North Hub	Nrthrn Ventura	Northern Demarc	ISNOR00	SHTLP07	SHTLP12	ISNOT00	SHUL007	SHUL012
SPP South Hub	Panhandle TX-OK	Oneok OK	ISSOR00	SHVLP07	SHVLP12	ISSOT00	SHWL007	SHWL012

PLATTS REAL-TIME LMP MARGINAL HEAT RATES AND SPARK SPREADS

Power Hub	Power/Gas Hub Pairs		On-Peak			Off-Peak		
	Gas Hub 1	Gas Hub 2	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol
Alberta	TC Alb AECC-C		LALBR01	SCALP07	SCALP12	LALBT01	SCAL007	SCAL012
CAISO NP15	PG&E CG		ICNGR01	SHXLP07	SHXLP12	ICNGT01	SCCL007	SCCL012
CAISO SP15	SoCal Gas	PG&E South	ICSGR01	SCDLP07	SCDLP12	ICSGT01	SCEL007	SCEL012
CAISO ZP26	SoCal Gas	PG&E South	ICZGR01	SCFLP07	SCFLP12	ICZGT01	SCGL007	SCGL012
ERCOT AEN	Waha	Transwestn Perm	IERAR01	SCHLP07	SCHLP12	IERAT01	SCIL007	SCIL012
ERCOT Bus Average	Waha	Transwestn Perm	IERBR01	SCJLP07	SCJLP12	IERBT01	SCKL007	SCKL012
ERCOT CPS Zone	Tenn Zn0 Fdt	Tx. Eastern, STX	IERDR01	SCLLP07	SCLLP12	IERDT01	SCML007	SCML012
ERCOT Houston Hub	Houston ShipChl	Katy	IERHR01	SCNLP07	SCNLP12	IERHT01	SCOL007	SCOL012
ERCOT Houston Zone	Houston ShipChl	Katy	IERZR01	SCPLP07	SCPLP12	IERZT01	SCQL007	SCQL012
ERCOT Hub Average	Waha	Transwestn Perm	IERRR01	SCRLP07	SCRLP12	IERRT01	SCSL007	SCSL012
ERCOT LCRA Zone	Tenn Zn0 Fdt	Tx. Eastern, STX	IERLR01	SCTLP07	SCTLP12	IERLT01	SCUL007	SCUL012
ERCOT North Hub	NGPL Texok Zn	Tx. Eastern, ETX	IERNR01	SCVLP07	SCVLP12	IERNT01	SCWL007	SCWL012
ERCOT North Zone	NGPL Texok Zn	Tx. Eastern, ETX	IERTR01	SCXLP07	SCXLP12	IERTT01	SCYL007	SCYL012
ERCOT Rayburn Zone	Carthage Hub	Tx. Eastern, ETX	IERUR01	SCZLP07	SCZLP12	IERUT01	SDAL007	SDAL012
ERCOT South Hub	Tenn Zn0 Fdt	Agua Dulce Hub	IERSR01	SDBLP07	SDBLP12	IERST01	SDCL007	SDCL012
ERCOT South Zone	Tenn Zn0 Fdt	Agua Dulce Hub	IERVR01	SDDL07	SDDL12	IERVT01	SDEL007	SDEL012
ERCOT West Hub	Waha	Transwestn Perm	IERWR01	SDFLP07	SDFLP12	IERWT01	SDGL007	SDGL012
ERCOT West Zone	Waha	Transwestn Perm	IERER01	SDHLP07	SDHLP12	IERET01	SDIL007	SDIL012
ISONE Connecticut Zone	Iroquois Zn2	Tenn Zn6 Dlvd	IINCR01	SDJLP07	SDJLP12	IINCT01	SDKL007	SDKL012
ISONE Internal Hub	Algonquin CG	Tenn Zn6 Dlvd	IINIR01	SDLLP07	SDLLP12	IINIT01	SDML007	SDML012
ISONE Maine Zone	Algonquin CG	Iroquois Recpts	IINMR01	SDNLP07	SDNLP12	IINMT01	SDOL007	SDOL012
ISONE NE Mass-Boston Zone	Algonquin CG	Iroquois Recpts	IINNR01	SDPLP07	SDPLP12	IINNT01	SDQL007	SDQL012
ISONE New Hampshire Zone	Algonquin CG	Iroquois Recpts	IINHR01	SDRLP07	SDRLP12	IINHNT01	SDSL007	SDSL012
ISONE Rhode Island Zone	Algonquin CG	Tenn Zn6 Dlvd	IINRR01	SDTLP07	SDTLP12	IINRT01	SDUL007	SDUL012
ISONE SE Mass Zone	Algonquin CG	Tenn Zn6 Dlvd	IINSR01	SDVLP07	SDVLP12	IINST01	SDWL007	SDWL012
ISONE Vermont Zone	Algonquin CG	Iroquois Recpts	IINVR01	SDXLP07	SDXLP12	IINVT01	SDYL007	SDYL012
ISONE West-Central Mass Zone	Algonquin CG	Tenn Zn6 Dlvd	IINWR01	SDZLP07	SDZLP12	IINWT01	SEAL007	SEAL012
MISO Arkansas Hub	Enable Gas Transmission	Trunkline Zn 1A	IMARR01	SEALP07	SEALP12	IMART01	SEBL007	SEBL012
MISO Illinois Hub	Chicago CG	Alliance Interstates	IMILR01	SECLP07	SECLP12	IMILT01	SEDL007	SEDL012

PLATTS REAL-TIME LMP MARGINAL HEAT RATES AND SPARK SPREADS

Power Hub	Power/Gas Hub Pairs		On-Peak			Off-Peak		
	Gas Hub 1	Gas Hub 2	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol
MISO Indiana Hub	Chicago CG	Lebanon Hub-Ohio	IMIDR01	SEELP07	SEELP12	IMIDT01	SEFL007	SEFL012
MISO Louisiana Hub	Col Gulf LA	TX Eastern W LA	IMLAR01	SEFLP07	SEFLP12	IMLAT01	SEGL007	SEGL012
MISO Michigan Hub	Mich Con CG	Cons Energy CG	IMIMR01	SEHLP07	SEHLP12	IMINT01	SEIL007	SEIL012
MISO Minnesota Hub	Nrthrn Ventura	Emerson Viking	IMINR01	SEJLP07	SEJLP12	IMINT01	SEKL007	SEKL012
MISO Texas Hub	NGPL Texok Zn		IMTXR01	SEKLP07	SEKLP12	IMTXT01	SELL007	SELL012
NYISO Capital Zone	Transco Zn6 NY	Millennium East receipts	INYCR01	SEMLP07	SEMLP12	INYCT01	SENL007	SENL012
NYISO Central Zone	Niagara	Dominion S Pt	INYRR01	SEOLP07	SEOLP12	INYRT01	SEPL007	SEPL012
NYISO Dunwood Zone	Iroquois Zn2	Transco Zn6 NY	INYDR01	SEQLP07	SEQLP12	INYDT01	SERL007	SERL012
NYISO Genesee Zone	Niagara	Dominion S Pt	INYGR01	SESLP07	SESLP12	INYGT01	SETL007	SETL012
NYISO Hudson Valley Zone	Iroquois Zn2	Transco Zn6 NY	INYHR01	SEULP07	SEULP12	INYHT01	SEVL007	SEVL012
NYISO Long Island Zone	Transco Zn6 NY	Iroquois Zn2	INYLR01	SEWLP07	SEWLP12	INYLT01	SEXL007	SEXL012
NYISO Millwood Zone	Iroquois Zn2	Transco Zn6 NY	INYMR01	SEYLP07	SEYLP12	INYMT01	SEZL007	SEZL012
NYISO Mohawk Valley Zone	Transco Zn6 NY	Millennium East receipts	INYVR01	SFALP07	SFALP12	INYVT01	SFBL007	SFBL012
NYISO NYC Zone	Iroquois Recpts		INYNR01	SFCLP07	SFCLP12	INYNT01	SFDL007	SFDL012
NYISO North Zone	Transco Zn6 NY	Iroquois Zn2	INYOR01	SFELP07	SFELP12	INYOT01	SFFL007	SFFL012
NYISO West Zone	Niagara	Dominion S Pt	INYWR01	SFGLP07	SFGLP12	INYWT01	SFHL007	SFHL012
Ontario	Dawn Ontario	Mich Con CG	LOTCR01	SFHL07	SFHL012	LOTCT01	SFIL007	SFIL012
PJM AEP Gen Hub	Dominion S Pt	Texas Eastern zone M-2 receipts	IPAGR01	SFJLP07	SFJLP12	IPAGT01	SFKL007	SFKL012
PJM AEP Zone	Dominion S Pt	Texas Eastern zone M-2 receipts	IPAZR01	SFLLP07	SFLLP12	IPAZT01	SFML007	SFML012
PJM AEP-Dayton Hub	Mich Con CG		IPADR01	SFNL07	SFNL012	IPADT01	SFOL007	SFOL012
PJM Allegheny Power Zone	Col Gas Appal	Dominion S Pt	IPAPR01	SFPLP07	SFPLP12	IPAPT01	SFQL007	SFQL012
PJM Atlantic Electric Zone	Transco Zn6 non-N.Y	TX Eastern M-3	IPAER01	SFRLP07	SFRLP12	IPAET01	SFSL007	SFSL012
PJM ATSI Gen Hub	Dominion S Pt	Col Gas Appal	IPATR01	SFTLP07	SFTLP12	IPATT01	SFUL007	SFUL012
PJM ATSI Zone	Dominion S Pt	Col Gas Appal	IPASR01	SFVLP07	SFVLP12	IPAST01	SFWL007	SFWL012
PJM BG&E Zone	TX Eastern M-3	Dominion S Pt	IPBER01	SFXLP07	SFXLP12	IPBET01	SFYL007	SFYL012
PJM Chicago Gen Hub	Chicago CG		IPCGR01	SFZLP07	SFZLP12	IPCGT01	SGAL007	SGAL012
PJM Chicao Hub	Chicago CG		IPCHR01	SGBLP07	SGBLP12	IPCHT01	SGCL007	SGCL012
PJM ComEd Zone	Chicago CG		IPCER01	SGDLP07	SGDLP12	IPCET01	SGEL007	SGEL012
PJM Dayton Power and Light Zone	TX Eastern M-3	Lebanon Hub-Ohio	IPDPR01	SGFLP07	SGFLP12	IPDPT01	SGGL007	SGGL012
PJM Delmarva Power and Light Zone	Transco Zn6 non-N.Y	TX Eastern M-3	IPEPR01	SGHLP07	SGHLP12	IPEPT01	SGIL007	SGIL012
PJM Dominion Hub	Transco Zn5 Dlv	Col Gas Appal	IPDMR01	SGJLP07	SGJLP12	IPDMT01	SGKL007	SGKL012
PJM Dominion Zone	Transco Zn5 Dlv	Col Gas Appal	IPDZR01	SGLLP07	SGLLP12	IPDZT01	SGML007	SGML012
PJM Duke Zone	Dominion S Pt	Texas Eastern zone M-2 receipts	IPDKR01	SGNLP07	SGNLP12	IPDKT01	SGOL007	SGOL012
PJM Duquesne Light Zone	Dominion S Pt	Col Gas Appal	IPDLR01	SGPLP07	SGPLP12	IPDLT01	SGQL007	SGQL012
PJM Eastern Hub	TX Eastern M-3	Transco Zn6 non-N.Y	IPEHR01	SGRLP07	SGRLP12	IPEHT01	SGSL007	SGSL012
PJM EKPC Zone	Texas Eastern zone M-2 receipts	Lebanon Hub-Ohio	IPEKR01	SGSLP07	SGSLP12	IPEKT01	SGTL007	SGTL012

PLATTS REAL-TIME LMP MARGINAL HEAT RATES AND SPARK SPREADS

Power/Gas Hub Pairs			On-Peak			Off-Peak		
Power Hub	Gas Hub 1	Gas Hub 2	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol	Mrg Heat Rate Symbol	7K Spark Symbol	12K Spark Symbol
PJM JCPL Zone	Transco Zn6 non-N.Y	Transco Leidy Line receipts	IPJCR01	SGULP07	SGULP12	IPJCT01	SGVL007	SGVL012
PJM MetEd Zone	TX Eastern M-3	Transco Zn6 non-N.Y	IPMER01	SGWLP07	SGWLP12	IPMET01	SGXL007	SGXL012
PJM New Jersey Hub	TX Eastern M-3	Transco Zn6 non-N.Y	IPNJR01	SGXLP07	SGXLP12	IPNJT01	SGYL007	SGYL012
PJM Northern Illinois Hub	Chicago CG		IPNIR01	SHALP07	SHALP12	IPNIT01	SHBL007	SHBL012
PJM Ohio Hub	Dominion S	Texas Eastern zone M-2 receipts	IPOHR01	SHCLP07	SHCLP12	IPOHT01	SHDL007	SHDL012
PJM PECO Zone	TX Eastern M-3	Transco Zn6 non-N.Y	IPPCR01	SHELP07	SHELP12	IPPC01	SHFL007	SHFL012
PJM Pennsylvania Electric Zone	Transco Leidy Line receipts	Dominion S Pt	IPPAR01	SHGLP07	SHGLP12	IPPAT01	SHHL007	SHHL012
PJM PEPCO Zone	Transco Zn5 Dlv	Dominion S Pt	IPPZR01	SHILP07	SHILP12	IPPZT01	SHJL007	SHJL012
PJM PPL Zone	Transco Leidy Line receipts	Transco Zn6 non-N.Y	IPPLR01	SHKLP07	SHKLP12	IPPLT01	SHLL007	SHLL012
PJM PSEG Zone	TX Eastern M-3	Transco Zn6 non-N.Y	IPSGR01	SHMLP07	SHMLP12	IPSGT01	SHNL007	SHNL012
PJM Rockland Electric Zone	Transco Zn6 non-N.Y	TX Eastern M-3	IPRER01	SHOLP07	SHOLP12	IPRET01	SHPL007	SHPL012
PJM West Interface Hub	Col Gas Appal	Texas Eastern zone M-2 receipts	IPWIR01	SHQLP07	SHQLP12	IPWIT01	SHRL007	SHRL012
PJM Western Hub	TX Eastern M-3	Dominion S Pt	IPWHR01	SHSLP07	SHSLP12	IPWHT01	SHTL007	SHTL012
SPP North Hub	Nrthrn Ventura	Northern Demarc	ISNOR01	SHULP07	SHULP12	ISNOT01	SHVL007	SHVL012
SPP South Hub	Panhandle TX-OK	Oneok OK	ISSOR01	SHWLP07	SHWLP12	ISSOT01	SHXL007	SHXL012

PLATTS DAY-AHEAD BILATERAL MARGINAL HEAT RATES AND SPARK SPREADS

Power/Gas Hub Pairs			On-Peak					Off-Peak					
Power Hub	Gas Hub	Mrg Heat Rate	7K Spark Symbol	8K Spark Symbol	10K Spark Symbol	12K Spark Symbol	15K Spark Symbol	Mrg Heat Rate	7K Spark Symbol	8K Spark Symbol	10K Spark Symbol	12K Spark Symbol	15K Spark Symbol
COB	PG&E Malin	SAANP00	SAANP07	SAANP08	SAANP10	SAANP12	SAANP15	SAANO00	SAANO07	SAANO08	SAANO10	SAANO12	SAANO15
Florida	FL Gas Zn3	SAINP00	SAINP07	SAINP08	SAINP10	SAINP12	SAINP15	SAINO00	SAINO07	SAINO08	SAINO10	SAINO12	SAINO15
Four Corners	El Paso SanJuan	SAJNP00	SAJNP07	SAJNP08	SAJNP10	SAJNP12	SAJNP15	SAJNO00	SAJNO07	SAJNO08	SAJNO10	SAJNO12	SAJNO15
Into GTC	Transco Zn4	SANNR00	SANNR07	SANNR08	SANNR10	SANNR12	SANNR15	SANNQ00	SANNQ07	SANNQ08	SANNQ10	SANNQ12	SANNQ15
Into Southern	Transco Zn4	SANNP00	SANNP07	SANNP08	SANNP10	SANNP12	SANNP15	SANNO00	SANNO07	SANNO08	SANNO10	SANNO12	SANNO15
Into TVA	Texas Gas Zn 1	SAONP00	SAONP07	SAONP08	SAONP10	SAONP12	SAONP15	SAONO00	SAONO07	SAONO08	SAONO10	SAONO12	SAONO15
John Day	NW Can Bd Sumas	SAPOP00	SAPOP07	SAPOP08	SAPOP10	SAPOP12	SAPOP15	SAPOO00	SAPOO07	SAPOO08	SAPOO10	SAPOO12	SAPOO15
Mead	SoCal Gas CG	SBENP00	SBENP07	SBENP08	SBENP10	SBENP12	SBENP15	SBENO00	SBENO07	SBENO08	SBENO10	SBENO12	SBENO15
Mid-Columbia	NW Can Bd Sumas	SAPNP00	SAPNP07	SAPNP08	SAPNP10	SAPNP12	SAPNP15	SAPNO00	SAPNO07	SAPNO08	SAPNO10	SAPNO12	SAPNO15
Mona	Kern Rvr Opal	SBMNP00	SBMNP07	SBMNP08	SBMNP10	SBMNP12	SBMNP15	SBMNO00	SBMNO07	SBMNO08	SBMNO10	SBMNO12	SBMNO15
NOB	NW Can Bd Sumas	SAPPP00	SAPPP07	SAPPP08	SAPPP10	SAPPP12	SAPPP15	SAPPO00	SAPPO07	SAPPO08	SAPPO10	SAPPO12	SAPPO15
Palo Verde	SoCal Gas CG	SAYNP00	SAYNP07	SAYNP08	SAYNP10	SAYNP12	SAYNP15	SAYNO00	SAYNO07	SAYNO08	SAYNO10	SAYNO12	SAYNO15
Pinnacle	SoCal Gas CG	SAPRP00	SAPRP07	SAPRP08	SAPRP10	SAPRP12	SAPRP15	SAPRO00	SAPRO07	SAPRO08	SAPRO10	SAPRO12	SAPRO15
VACAR	Transco Zn5 Dlv	SBCNP00	SBCNP07	SBCNP08	SBCNP10	SBCNP12	SBCNP15	SBCNO00	SBCNO07	SBCNO08	SBCNO10	SBCNO12	SBCNO15
Westwing	SoCal Gas CG	SAPQP00	SAPQP07	SAPQP08	SAPQP10	SAPQP12	SAPQP15	SAPQO00	SAPQO07	SAPQO08	SAPQO10	SAPQO12	SAPQO15

HOURLY BILATERAL

Mid-C Hourly	Symbol
Hour 1	MCRTH01
Hour 2	MCRTH02
Hour 3	MCRTH03
Hour 4	MCRTH04
Hour 5	MCRTH05
Hour 6	MCRTH06
Hour 7	MCRTH07
Hour 8	MCRTH08
Hour 9	MCRTH09
Hour 10	MCRTH10
Hour 11	MCRTH11
Hour 12	MCRTH12
Hour 13	MCRTH13
Hour 14	MCRTH14
Hour 15	MCRTH15
Hour 16	MCRTH16
Hour 17	MCRTH17
Hour 18	MCRTH18
Hour 19	MCRTH19
Hour 20	MCRTH20
Hour 21	MCRTH21
Hour 22	MCRTH22
Hour 23	MCRTH23
Hour 24	MCRTH24
Daily on-peak	MCRTP00
Daily off-peak	MCRTO00
Weekly on-peak	MCRTP04
Weekly off-peak	MCRTO04

Mid-C

AKA: Mid-Columbia

Description: Mid-C is a trading hub for the Northwest U.S. comprising the control areas of three public utility districts in Washington that run hydroelectric projects on the Columbia River. The three PUDs are Grant, Douglas and Chelan. Hydro projects include Wells, Rocky Reach, Rock Island, Wanapum and Priest Rapids dams.

Market type: no formal market design

Grid operator: individual utilities

Hourly: Hour-ending 1 through 24

Products assessed: Physical power, energy only (no capacity)

Start date: Dec 2019

Marginal Heat Rates

Platts marginal heat rates are derived as a ratio of the electricity price and natural gas price for a particular delivery period.

Each electricity location is paired with one or two corresponding regional natural gas locations. On most days, the gas location in the first position will be used to calculate the marginal heat rate. If on a given day prices are not published for the primary natural gas location – for example because of no reported trades or transparent market activity – Platts will use the natural gas location in the second position to calculate the marginal heat rate.

The electricity prices for each location represent day ahead or real time locational marginal prices from grid operators and independent system operators, as well as Platts bilateral

assessments.

The natural gas prices represent Platts daily price assessments on regional pipelines with physical delivery in close proximity to the electricity location.

For details on the assessment processes for natural gas, including price reporting criteria, see the Methodology and Reference section on Platts.com. The formula for marginal heat rates is power price/gas price.

Spark Spreads

Platts spark spreads represent the difference between the wholesale electricity price and equivalent natural gas price.

The electricity prices for each location represent day ahead or real time locational marginal prices from grid operators and independent system operators, as well as Platts bilateral assessments.

The natural gas prices represent Platts daily price assessments on regional pipelines with physical delivery in close proximity to the electricity location.

For details on the assessment processes for natural gas, including price reporting criteria, see the Methodology and Reference section on Platts.com.

Calculations are expressed in \$/MWh.

The formula for spark spreads is electricity price (USD/Mwh) – [natural gas price (USD/mmBtu)*heat rate (mmBtu/Mwh)].

Specifics on power and gas pairings for each location, as well as marginal heat rate and spark spread symbols, are listed in preceding tables.

CALIFORNIA ISO CURTAILMENT HOURLY WEIGHTINGS

Mid-C Hourly	Symbol
California ISO System-Wide Solar Weighting Curtailment- HE 1	CAISW01
California ISO System-Wide Solar Weighting Curtailment- HE 2	CAISW02
California ISO System-Wide Solar Weighting Curtailment- HE 3	CAISW03
California ISO System-Wide Solar Weighting Curtailment- HE 4	CAISW04
California ISO System-Wide Solar Weighting Curtailment- HE 5	CAISW05
California ISO System-Wide Solar Weighting Curtailment- HE 6	CAISW06
California ISO System-Wide Solar Weighting Curtailment- HE 7	CAISW07
California ISO System-Wide Solar Weighting Curtailment- HE 8	CAISW08
California ISO System-Wide Solar Weighting Curtailment- HE 9	CAISW09
California ISO System-Wide Solar Weighting Curtailment- HE 10	CAISW10
California ISO System-Wide Solar Weighting Curtailment- HE 11	CAISW11
California ISO System-Wide Solar Weighting Curtailment- HE 12	CAISW12
California ISO System-Wide Solar Weighting Curtailment- HE 13	CAISW13
California ISO System-Wide Solar Weighting Curtailment- HE 14	CAISW14
California ISO System-Wide Solar Weighting Curtailment- HE 15	CAISW15
California ISO System-Wide Solar Weighting Curtailment- HE 16	CAISW16
California ISO System-Wide Solar Weighting Curtailment- HE 17	CAISW17
California ISO System-Wide Solar Weighting Curtailment- HE 18	CAISW18
California ISO System-Wide Solar Weighting Curtailment- HE 19	CAISW19
California ISO System-Wide Solar Weighting Curtailment- HE 20	CAISW20
California ISO System-Wide Solar Weighting Curtailment- HE 21	CAISW21
California ISO System-Wide Solar Weighting Curtailment- HE 22	CAISW22
California ISO System-Wide Solar Weighting Curtailment- HE 23	CAISW23
California ISO System-Wide Solar Weighting Curtailment- HE 24	CAISW24
California ISO System-Wide Wind Weighting Curtailment- HE 1	CAIWW01
California ISO System-Wide Wind Weighting Curtailment- HE 2	CAIWW02
California ISO System-Wide Wind Weighting Curtailment- HE 3	CAIWW03
California ISO System-Wide Wind Weighting Curtailment- HE 4	CAIWW04
California ISO System-Wide Wind Weighting Curtailment- HE 5	CAIWW05
California ISO System-Wide Wind Weighting Curtailment- HE 6	CAIWW06

CALIFORNIA ISO CURTAILMENT HOURLY WEIGHTINGS

Mid-C Hourly	Symbol
California ISO System-Wide Wind Weighting Curtailment- HE 7	CAIWW07
California ISO System-Wide Wind Weighting Curtailment- HE 8	CAIWW08
California ISO System-Wide Wind Weighting Curtailment- HE 9	CAIWW09
California ISO System-Wide Wind Weighting Curtailment- HE 10	CAIWW10
California ISO System-Wide Wind Weighting Curtailment- HE 11	CAIWW11
California ISO System-Wide Wind Weighting Curtailment- HE 12	CAIWW12
California ISO System-Wide Wind Weighting Curtailment- HE 13	CAIWW13
California ISO System-Wide Wind Weighting Curtailment- HE 14	CAIWW14
California ISO System-Wide Wind Weighting Curtailment- HE 15	CAIWW15
California ISO System-Wide Wind Weighting Curtailment- HE 16	CAIWW16
California ISO System-Wide Wind Weighting Curtailment- HE 17	CAIWW17
California ISO System-Wide Wind Weighting Curtailment- HE 18	CAIWW18
California ISO System-Wide Wind Weighting Curtailment- HE 19	CAIWW19
California ISO System-Wide Wind Weighting Curtailment- HE 20	CAIWW20
California ISO System-Wide Wind Weighting Curtailment- HE 21	CAIWW21
California ISO System-Wide Wind Weighting Curtailment- HE 22	CAIWW22
California ISO System-Wide Wind Weighting Curtailment- HE 23	CAIWW23
California ISO System-Wide Wind Weighting Curtailment- HE 24	CAIWW24
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 1	CAITW01
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 2	CAITW02
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 3	CAITW03
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 4	CAITW04
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 5	CAITW05
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 6	CAITW06
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 7	CAITW07

CALIFORNIA ISO CURTAILMENT HOURLY WEIGHTINGS

Mid-C Hourly	Symbol
California ISO System-Wide Solar and Wind Total Weighting Curtailment HE 8	CAITW08
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 9	CAITW09
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 10	CAITW10
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 11	CAITW11
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 12	CAITW12
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 13	CAITW13
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 14	CAITW14
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 15	CAITW15
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 16	CAITW16
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 17	CAITW17
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 18	CAITW18
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 19	CAITW19
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 20	CAITW20
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 21	CAITW21
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 22	CAITW22
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 23	CAITW23
California ISO System-Wide Solar and Wind Total Weighting Curtailment- HE 24	CAITW24

CALIFORNIA ISO CURTAILMENT HOURLY CURTAILMENT

Mid-C Hourly	Symbol
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 1	CAISC01
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 2	CAISC02
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 3	CAISC03
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 4	CAISC04
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 5	CAISC05
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 6	CAISC06
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 7	CAISC07
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 8	CAISC08
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 9	CAISC09
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 10	CAISC10
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 11	CAISC11
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 12	CAISC12
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 13	CAISC13
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 14	CAISC14
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 15	CAISC15
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 16	CAISC16
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 17	CAISC17
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 18	CAISC18
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 19	CAISC19
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 20	CAISC20

CALIFORNIA ISO CURTAILMENT HOURLY CURTAILMENT

Mid-C Hourly	Symbol
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 21	CAISC21
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 22	CAISC22
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 23	CAISC23
California ISO System-Wide Solar Calculated Weighting Curtailment- HE 24	CAISC24
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 1	CAIWC01
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 2	CAIWC02
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 3	CAIWC03
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 4	CAIWC04
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 5	CAIWC05
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 6	CAIWC06
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 7	CAIWC07
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 8	CAIWC08
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 9	CAIWC09
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 10	CAIWC10
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 11	CAIWC11
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 12	CAIWC12
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 13	CAIWC13
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 14	CAIWC14
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 15	CAIWC15
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 16	CAIWC16

CALIFORNIA ISO CURTAILMENT HOURLY CURTAILMENT

Mid-C Hourly	Symbol
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 17	CAIWC17
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 18	CAIWC18
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 19	CAIWC19
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 20	CAIWC20
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 21	CAIWC21
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 22	CAIWC22
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 23	CAIWC23
California ISO System-Wide Wind Calculated Weighting Curtailment- HE 24	CAIWC24
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment – HE 1	CAITC01
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 2	CAITC02
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 3	CAITC03
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 4	CAITC04
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 5	CAITC05
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 6	CAITC06
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 7	CAITC07
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 8	CAITC08
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 9	CAITC09
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 10	CAITC10
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 11	CAITC11
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 12	CAITC12

CALIFORNIA ISO CURTAILMENT HOURLY CURTAILMENT

Mid-C Hourly	Symbol
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 13	CAITC13
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 14	CAITC14
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 15	CAITC15
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 16	CAITC16

CALIFORNIA ISO CURTAILMENT HOURLY CURTAILMENT

Mid-C Hourly	Symbol
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 17	CAITC17
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 18	CAITC18
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 19	CAITC19
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 20	CAITC20

CALIFORNIA ISO CURTAILMENT HOURLY CURTAILMENT

Mid-C Hourly	Symbol
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 21	CAITC21
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 22	CAITC22
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 23	CAITC23
California ISO System-Wide Solar and Wind Total Calculated Weighting Curtailment- HE 24	CAITC24

California ISO Curtailment Indices**The methodology for deriving the indices is as follows: Determine historical weightings**

The California ISO reports curtailment data each day for the prior calendar day. Data is in megawatts by hour and generation type – either solar or wind. Platts uses the ISO curtailments that are reported at both the local and system levels.

Curtailment data for a given day is weighted against historical generation data from the same month during the prior year. For example, daily curtailment data during the month of January 2020 would be based on weightings from generation data from January 2019.

Generation data is reported by the California ISO in five-minute increments. Platts calculates an average for solar generation, wind generation and total generation for each hour across the whole of the month. For hour ending 1, for example, Platts will calculate the average solar generation during that hour throughout a given month.

For each hour, the calculated average solar generation across the month is divided by the average total generation for the same hour to determine the hourly solar rating. For wind generation, the calculated average wind generation for the hour is divided by

the average total generation for the same hour to generate the wind weighting. To generate the combined solar and wind hourly weighting, the average hourly solar generation is added to the average hourly wind generation, and the sum is divided by the average total generation for the hour.

The same hourly weightings are used for the whole of the current month and updated when a new month begins. Platts will publish the hourly weightings after a month closes when the ISO makes the monthly generation data available.

Calculate weighted curtailment

The weighted curtailment for each hour is determined on a daily basis by multiplying hourly curtailment reported by the California ISO by the corresponding hourly weighting.

For example, the weighted solar curtailment for hour ending 1 is calculated by multiplying the reported megawatts of solar generation curtailed for that hour by the historical weighting for solar generation for the same hour. Similarly, weighted wind curtailment is calculated by multiplying the reported wind curtailment for a specific hour by the corresponding hourly weighting. For combined wind and solar, the sum of solar curtailment for a given hour is multiplied by the historical wind and solar weighting for the same hour.

CALIFORNIA ISO CURTAILMENT INDICES

Solar on-peak index	CAICA00
Solar off-peak index	CAICB00
Solar 24-hour index	CAICC00
Wind on-peak index	CAICD00
Wind off-peak index	CAICE00
Wind 24-hour index	CAICF00
Combined solar and wind on-peak index	CAICG00
Combined solar and wind off-peak index	CAICH00
Combined solar and wind 24-hour index	CAICI00

During some hours of the day, no wind or solar curtailment occurs. For those hours, hourly curtailment is calculated as a zero.

Calculate curtailment indices

The sum of the hourly weighted curtailment for hours ending 7 through 22 is calculated to generate the on-peak indices for solar, wind and combined solar and wind.

Off-peak indices are derived from the sum of the hourly weighted curtailment for hours ending 1 through 6, and 23 through 24.

The 24-hour curtailment indices are calculated from the sum of the hourly weighted curtailment from all 24 hours in a given day.

REVISION HISTORY

February 2020: Platts added California ISO Curtailment hourly weightings and hourly curtailment symbols.

December 2019: Platts added Mid-C Hourly Bilateral Indices and California ISO Curtailment Indices sections.

April 2019: Platts completed an annual update to the North American Electricity Methodology Guide in April 2019. In this update, Platts reviewed all content and made minor edits throughout.

January 2019: Platts eliminated deal count, volume thresholds, limit on trade size for North American power indexes on January 31.

October 2018: Platts discontinued non-firm daily assessments at all Western locations on July 31.

May 2018: Platts discontinued and removed references to near-term power assessments in North American markets on April 30, 2018.

Mar 2018: Platts completed an annual update to the North American Electricity Methodology Guide in March 2018. In this update, Platts reviewed all content and made minor edits throughout.

June 2017: Platts updated gas and power pairing used to calculate marginal heat rates and spark spread data.

March 2017: Platts completed an annual update to the North American Electricity Methodology Guide in March 2017. In this update, Platts reviewed all content.

March 2016: Platts completed an annual update to the North American Electricity Methodology Guide in February 2016. In this update, Platts reviewed all content. Platts updated guidance around how to report information.

December 2014: Deleted on-peak and off-peak bilateral daily assessments for markets served by independent system operators. Also, added on-peak and off-peak bilateral daily assessments for Into GTC, John Day, NOB, Pinnacle Peak and Westwing.

January 2014: Deleted references to daily forward assessments to reflect that daily market-on-close assessments of North American forward power markets, known as the Platts-ICE Forward Curve –Electricity (PFC Electricity), are no longer produced by Platts editorial. Under the new methodology, PFC Electricity is derived by the Platts quantitative team. See separate methodology and specifications guides for Platts-ICE Forward Curve – Electricity (North American) and M2MS Power.

September 2013: Added non-firm daily assessments at all Western locations; added Sunday peak and off-peak for all Western locations.

January 2012: Replacement of the Cinergy Hub with the Indiana Hub, effective January 1, 2012.