

Methodology and Specifications Guide

Global Hydrogen & Ammonia

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INTRODUCTION

S&P Global Platts methodologies are designed to produce price assessments and indices 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 values for publication.

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 the 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 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.

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 previous updates, is included at the end of methodology and specification documents. Methodology is reviewed regularly to ensure it reflects current market reality.

Such reviews are carried out by Platts reporters and their managers, supplemented and supported by price methodology specialists who operate separately from the reporting teams.

Platts follows a clearly defined process for public consultation on material changes to its methodologies. This process is based on full transparency and communication with industry stakeholders aimed at gaining market acceptance for any proposed introduction or changes to methodology. For more information on the review and approval procedures, please visit <https://www.spglobal.com/platts/en/our-methodology/methodology-review-change>.

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

How this methodology statement is organized

This description of methodology for indices and assessments is divided into seven major parts (I-VII) that parallel the entire process of producing price values for the specified market period (daily or monthly).

- Part I describes what goes into Platts indices and price values, 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.
- Part III is a detailed account of how Platts collects market data, and what Platts does with the data to formulate its indices and assessments. It includes descriptions of the methods that Platts uses for reviewing data, and the methods used to convert raw data into indices or assessments, 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 an index, and the relative importance assigned to each criterion used in forming the index or price assessment. This section describes the minimum amount of transaction data required for a particular price assessment

to be published, and the criteria for determining which values are indices, and which are assessments, based on reported transactions and other market information.

- 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 for which Platts publishes indices or assessments.

PART I: DATA QUALITY AND DATA SUBMISSION

S&P Global 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. This is crucial to maintaining the integrity of Platts valuation processes.

Transparency underpins Platts data publishing processes in commodity markets. Platts hydrogen valuations incorporate fixed capital and water costs and variable feedstock costs for natural gas, electricity, and carbon allowances. For details on the methodology for Platts natural gas and electricity prices used in feedstock calculations, see the methodology guides located at:

North American natural gas: <https://www.spglobal.com/platts/en/our-methodology/methodology-specifications/natural-gas/north-american-natural-gas-methodology>

North American electricity: <https://www.spglobal.com/platts/en/our-methodology/methodology-specifications/electric-power/north-american-electricity-methodology>

European natural gas: <https://www.spglobal.com/platts/en/our-methodology/methodology-specifications/natural-gas/european-gas-methodology>

European electricity: <https://www.spglobal.com/platts/en/our-methodology/methodology-specifications/electric-power/european-electricity-assessments-and-indices>

PART II: SECURITY AND CONFIDENTIALITY

Data is stored in a secure network, in accordance with Platts policies and procedures.

PART III: CALCULATING ASSESSMENTS

As a publisher, Platts places independence and impartiality at the heart of its valuation process. Platts has no financial interest in the price of products or commodities on which it reports. Platts overall objective is to reflect the production costs of the commodity assessed.

Platts publishes hydrogen price valuations on each business day covering several production pathways.

The Platts hydrogen valuations at each hub are based on the calculated cost of production from various production pathways and are not based on observed or reported market transactions. Relevant natural gas and electricity prices, carbon prices and assumptions for water, capital expenses and operating expenses are used to derive valuations.

Platts reviews the variable and fixed inputs including capital and operating assumptions such as energy conversion efficiency and plant capacity factor on an annual basis to ensure they are

representative of current market dynamics.

At any time, should market data, such as bids, offers or transactions be available and meet Platts editorial guidelines, Platts may launch new values to reflect this traded market after sufficient consultation.

In certain hubs, including Alberta (Canada), Japan and most US hubs, some hydrogen valuations via PEM or alkaline electrolysis may continue to publish during respective holiday periods due to the automated collection of electricity inputs from third parties. In Australia, the daily hydrogen valuations for all pathways are following the Singapore holiday schedule, with the assessments published after 1pm Singapore time each business day, using the previous business day's variable data inputs, with the hydrogen assessments databased as the previous day's assessments. Otherwise, the Platts hydrogen valuations follow the respective holiday calendars for each region.

PART IV: PLATTS EDITORIAL STANDARDS

All Platts employees must adhere to the S&P Global Code of Business Ethics (COBE), which is 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 are required to ensure adherence to published methodologies as well as internal standards that require accurate records are kept to document their work.

Platts has a Compliance function that is independent of the editorial group. The Compliance team is responsible for ensuring the quality and adherence to Platts policies, standards,

processes and procedures.

S&P Global Platts appoints an independent, external auditor with appropriate experience and capability to review and report on its adherence to this stated methodology. The annual report is published online at <https://www.spglobal.com/platts/en/about-platts/regulatory-engagement>.

PART V: CORRECTIONS

Platts is committed to promptly correcting any material errors. When corrections are made, they are based on data and information that was available when the valuation or assessment was originally calculated.

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 commodity markets.

Platts users may raise questions about its methodologies and the approach taken in pricing, 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 market participant or stakeholder may have.

However, Platts recognizes that occasionally a market participant 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: <https://www.spglobal.com/platts/en/contact/complaints>.

PART VII: DEFINITIONS OF THE TRADING LOCATIONS

Hydrogen Prices

Platts publishes hydrogen valuations based on the following production pathways:

SMR w/o CCS

Platts publishes valuations for hydrogen produced via Steam Methane Reforming w/o Carbon Capture and Sequestration (SMR w/o CCS). The feedstock inputs consist of a fixed water price as well as natural gas and the on-and off-peak electricity assessments most geographically relevant. In some hubs, Platts averages additional electricity or gas assessments. A table of daily variable inputs is listed above.

The operational parameters across all hubs are identical, and include plant efficiency of 76%, a capacity factor of 95% and a carbon dioxide (CO₂) emission rate of 8.9 kg/kg of hydrogen.

Capital expenses (capex) differ by location and are included in a separate table at the end of the section. The base capex value for SMR w/o CCS is \$910/KW; in the US, this value is then further adjusted to a regional basis by comparing the overnight capital costs of certain electricity generating technologies as published in the US Energy Information Administration (EIA) Annual Outlook 2020 report. The capex value in Alberta and Japan also are adjusted based on industry research. Annual non-fuel operating expenses are assumed at 4.7% of capital cost.

CO₂ prices are considered for the Netherlands, the UK, Northern California and Southern California.

SMR with CCS

Platts publishes valuations for hydrogen produced via Steam

Methane Reforming with Carbon Capture and Sequestration (SMR with CCS). The feedstock inputs consist of a fixed water price, natural gas and the on- and off-peak electricity assessments most geographically relevant. A table of daily variable inputs is listed above.

The operational parameters for SMR with CCS include plant efficiency of 69%, a capacity factor of 95% and a CO₂ capture rate of 90%.

The base capex value for SMR with CCS is \$1,680/KW. Annual non-fuel operating expenses are assumed at 3% of capital cost.

ATR with CCS

Platts publishes hydrogen valuations for hydrogen produced via Autothermal Reforming (ATR) with CCS. The feedstock inputs consist of a fixed water price as well as natural gas and the on-and off-peak electricity assessments most geographically relevant. A table of daily variable inputs is listed above.

The operational parameters for ATR with CCS include plant efficiency of 68%, a capacity factor of 95% and a CO₂ capture rate of 95%.

The base capex value for ATR with CCS is GBP631/KW for the United Kingdom and Eur736/KW for the Netherlands. Annual non-fuel operating expenses are assumed at 3.5% of capital cost.

Coal Gasification with CCS

Platts publishes hydrogen valuations for hydrogen produced using coal gasification with CCS. The feedstock inputs consist of a fixed water price as well as a coal price and the electricity prices most geographically relevant.

The operational parameters for Coal Gasification with CCS include plant efficiency of 60.50%, a capacity factor of 95% and a CO₂ capture rate of 90%.

The base capex value for Coal Gasification with CCS is \$2,780/KW. Annual non-fuel operating expenses are assumed at 5% of capital cost.

Lignite Gasification with CCS

Platts publishes hydrogen valuations for hydrogen produced using lignite gasification with CCS. The feedstock inputs consist of a fixed water price as well as a lignite price and the electricity prices most geographically relevant.

The operational parameters for Lignite Gasification with CCS include plant efficiency of 57.90%, a capacity factor of 95% and a CO₂ capture rate of 90%.

The base capex value for Lignite Gasification with CCS is \$3,508/KW. Annual non-fuel operating expenses are assumed at 5% of capital cost.

PEM Electrolysis

Platts publishes hydrogen valuations for Proton Exchange Membrane (PEM) electrolysis. The feedstock inputs consist of a fixed water price as well as the on- and off-peak electricity assessments most geographically relevant. A table of daily variable inputs is listed above.

The operational parameters for PEM electrolysis across all hubs are identical and include an electrolyzer efficiency of 58% and a capacity factor of 95%.

Capital expenses (Capex) differ by location and are included in a separate table above. The base capex value for PEM electrolysis is \$1,382/KW; in the US, this value is then further adjusted to a regional basis by comparing the overnight capital costs of certain electricity generating technologies as published in the EIA Annual Outlook 2020 report. The capex value in Alberta and Japan also are adjusted based on industry research. The capex value in Australia is based on industry research including

Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO)'s National Hydrogen Roadmap. Annual non-fuel operating expenses are assumed at 1.5% of capital cost, and stack refurbishment every 7 years at 35% of capital cost.

Alkaline Electrolysis

Platts publishes hydrogen valuations for alkaline electrolysis. The feedstock inputs consist of a fixed water price as well as the on- and off-peak electricity assessments most geographically relevant. A table of daily variable inputs is listed above.

The operational parameters for alkaline electrolysis across all hubs are identical and include electrolyzer efficiency of 67% and a capacity factor of 95%.

Capital expenses (Capex) differ by location and are included in a separate table. A table of daily variable inputs is listed above. The base capex value for alkaline electrolysis is \$891/KW; in the US, this value is then further adjusted to a regional basis by comparing the overnight capital costs of certain electricity generating technologies as published in the EIA Annual Outlook 2020 report. The capex value in Alberta and Japan also are adjusted based on industry research. The capex value in Australia is based on industry research including CSIRO's National Hydrogen Roadmap. Annual non-fuel operating expenses are assumed at 1.5% of capital cost, and stack refurbishment every nine years at 45% of capital cost.

Pricing Locations

North America

In North America, Platts publishes daily hydrogen price valuations in Alberta, Canada along with 10 locations in the United States: Appalachia, Gulf Coast, Midcontinent, Northeast, Northern California, Northwest, Rockies, Southern California, Southeast and Upper Midwest at 9:00 am US Central Time.

The US prices are published in US dollars per kilogram (\$/kg) and US dollars per thousand standard cubic feet (\$/Mcf). Alberta prices are published in Canadian dollars per kilogram (C\$/kg) and Canadian dollars per thousand standard cubic feet (C\$/Mcf).

All North American values are published across the following three production pathways: SMR w/o CCS, Alkaline Electrolysis and PEM Electrolysis.

The hydrogen valuations in North America are calculated on a previous day basis due to timing issues related to the collection of day-ahead power prices from the Independent System Operators (ISOs) relevant to the particular hubs.

Europe

In Europe, Platts publishes daily hydrogen valuations in the Netherlands and the UK for the month-ahead price after 5:00 pm London time each business day. The Netherlands prices are published in Euros per kilogram (Eur/kg) and Euros per Kilowatt hour (Eur/KWh). The UK prices are published in GBP per kilogram (GBP/kg) and GBP per Kilowatt hour (Eur/KWh).

The Netherlands values are published across the following five production pathways: ATR with CCS, SMR w/o CCS, SMR with CCS, Alkaline Electrolysis and PEM Electrolysis.

The UK values are published across the following four production pathways: ATR with CCS, SMR with CCS, Alkaline Electrolysis and PEM Electrolysis.

The hydrogen valuations in the Netherlands and the UK are published using same day assessments for the component feedstock inputs, which include month-ahead power and gas prices.

Asia-Pacific

In Asia-Pacific, Platts publishes daily hydrogen valuations in Japan, which are published after 5:00 pm Singapore time each

business day. In Australia, the daily hydrogen valuations for all pathways are following the Singapore holiday schedule, with the assessments published after 1 pm Singapore time each business day, using the previous business day's variable data inputs, with the hydrogen assessments databased as the previous day's assessments.

The Japan prices are published in Yen per kilogram (yen/kg) and US dollars per kilogram (\$/kg). The Australia prices are published in A\$ per kilogram and MMBtu and in \$ per kilogram and MMBtu.

All Japan values are published across the following three production pathways: SMR w/o CCS, Alkaline Electrolysis and PEM Electrolysis. For Australia, Platts publishes assessments for the following locations and pathways: New South Wales (Coal Gasification w CCS, Alkaline Electrolysis and PEM Electrolysis), Queensland (Coal Gasification w CCS, Alkaline Electrolysis and PEM Electrolysis), South Australia (Alkaline Electrolysis and PEM Electrolysis), Tasmania (Alkaline Electrolysis and PEM Electrolysis), Victoria (Lignite Gasification w CCS, Alkaline Electrolysis and PEM Electrolysis), and Western Australia (SMR w CCS, Alkaline Electrolysis and PEM Electrolysis).

The hydrogen valuations in Japan and Australia are published using current assessments for the component feedstock inputs.

Further Assumptions

Across all pathways, Platts hydrogen valuations consist of variable natural gas, coal and electricity assessments, as well as carbon allowances where applicable, most geographically relevant to each hub. A fixed water cost is also included. A second set of hydrogen valuations at each hub adds fixed assumptions for capital and operating expenses. The Platts hydrogen valuations reflect a "snapshot in time" of a theoretical long-term supply contract, rather than a levelized cost. A levelized cost, either in real or nominal terms, would account for long-term escalation of the underlying cost components. Many

of the underlying cost components, such as natural gas, do not escalate at the same rate as general inflation; therefore, the Platts hydrogen valuations do not represent a levelized cost but rather the daily price that might be paid to a hydrogen producer to cover the fixed and variable costs of hydrogen production under a long-term supply contract.

For capital expenses, the Platts hydrogen valuations use a levelized fixed charge rate, which is the product of a capital recovery factor and a project finance factor, to account for inflation, depreciation, return on equity, debt service, insurance as well as income and property taxes. Platts cited the US National Renewable Energy Laboratory's Annual Technology Baseline report for many of the financial assumptions, including inflation, return on equity and debt service.

Accordingly, each production pathway is 40% equity financed, and 60% debt financed, with nominal rates of return of 11.26% and 6.12%, respectively, and real rates of return of 8.55% and 3.53%, respectively, across a 25-year loan and equity recovery period. A seven-year depreciation schedule is assumed, along with an inflation rate of 2.5%, an income tax rate of 26%, a property tax rate of 1% and an insurance rate of 0.5%.

Capex costs are all-in, fixed assumptions and do not represent an aggregation of component costs. Capex assumptions for Alberta, Japan, the Netherlands and the UK are converted from a base value in USD to their respective currencies using Platts foreign exchange assessments. Capex assumptions in Australia for SMR w CCS, coal gasification w CCS and lignite gasification w CCS, are in USD, and converted into AUD as well using Platts foreign exchange assessments. Capex assumptions in Australia for Alkaline electrolysis and PEM electrolysis are in AUD, and converted in USD as well using Platts foreign exchange assessments.

Other assumptions for capital and operating expenses were largely drawn from reports published by the International Energy Agency (IEA) and the EIA and are identical across all hubs.

Labor is considered in the annual operating expenses for each production pathway.

The operational parameters for each production pathway were collected from reports published by a variety of sources, including the IEA, NREL and the International Renewable Energy Agency).

The Platts hydrogen valuations are published to 4 decimal places.

Hydrogen Pump Prices

On a monthly basis, Platts assesses the price of hydrogen at refueling stations in the California market based on source data from hydrogen fuel station operators in the California market, and republishes posted pump prices for Germany and Japan hydrogen fuel stations.

Prices for German markets are sourced from "H2 Mobility Deutschland," a consortium of hydrogen retail station operators, and for Japan are sourced from the gas company, "Iwatani."

Prices for California and Germany are published in USD per kilogram and Euros per kilogram. For Japan, prices are published in Yen per kilogram and USD per kilogram. Prices are published on 1st working day of every month.

Ammonia Prices

Pricing Locations: Platts publishes ammonia assessments for CFR Far East Asia, FOB Middle East, CFR Northwest Europe, FOB Black Sea, and CFR US Gulf Coast.

Assessment window: Daily assessments basis CFR Far East Asia and FOB Middle East are based on latest information sourced from the market up to the close of the assessment

window at 4:30pm Singapore time. Daily assessment basis CFR Northwest Europe and FOB Black Sea are based on latest information sourced from the market up to the close of the assessment window at 4.30 pm London time. Daily assessment basis CFR USGC are based on latest information sourced from the market up to the close of the assessment window at 1:30pm Houston Time.

Timing: Daily assessments for CFR Far East Asia, CFR Northwest Europe and CFR USGC for parcels to be delivered 15-45 days forward from the date of publication. Daily assessments for FOB Middle East and FOB Black Sea for parcels loaded 15-30 days forward from the date of publication.

Basis and locations: CFR Far East Asia (Major ports that can accommodate ammonia cargoes in China, Japan, South Korea, and Taiwan); CFR Northwest Europe (Major ports that can accommodate ammonia cargoes in Belgium, Germany, the Netherlands, and northern France); and CFR USGC (basis port Tampa, Florida with information from other USGC ports considered and normalized). FOB Middle East (Major loading points that can accommodate ammonia cargoes in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates); FOB Black Sea (Major ports that can accommodate ammonia cargoes in Ukraine).

For the European market, Platts assessments represent duty free cargoes. Cargoes incurring any duty may be normalized as part of the European assessment process.

Cargo Size: CFR Far East Asia: 20,000-40,000 mt, CFR Northwest Europe: 20,000-25,000 mt, CFR USGC 20,000-25,000mt, FOB Middle East: 15,000-40,000 mt, FOB Black Sea 15,000-40,000 mt. Platts may use information with different cargo sizes after normalization.

Units: Platts assesses ammonia in US dollars per metric ton and US dollars per million British Thermal Units.

Credit terms: Assessments are cash prices, net of any credit. Platts may use information with longer credit terms after normalization.

Quality specifications: Minimum purity of 99.5% of anhydrous ammonia by weight, a maximum water content of 0.5% by weight, and a maximum oil content of 10 ppm by weight.

Further Assumptions: The Platts ammonia valuations are published to two decimal places.

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
Alberta Hydrogen Alkaline Electrolysis	IGZCU00	c	HY	4	DW	CAD	KG
Alberta Hydrogen Alkaline Electrolysis	IGYDM00	c	HY	4	DW	CAD	MCF
Alberta Hydrogen Alkaline Electrolysis Inc. Capex	IGZCS00	c	HY	4	DW	CAD	KG
Alberta Hydrogen Alkaline Electrolysis Inc. Capex	IGYDK00	c	HY	4	DW	CAD	MCF
Alberta Hydrogen PEM Electrolysis	IGZBC00	c	HY	4	DW	CAD	KG
Alberta Hydrogen PEM Electrolysis	IGYBU00	c	HY	4	DW	CAD	MCF
Alberta Hydrogen PEM Electrolysis Inc. Capex	IGZBA00	c	HY	4	DW	CAD	KG
Alberta Hydrogen PEM Electrolysis Inc. Capex	IGYBS00	c	HY	4	DW	CAD	MCF
Alberta Hydrogen SMR w/o CCS	IGCCC00	c	HY	4	DW	CAD	KG
Alberta Hydrogen SMR w/o CCS	IGYAC00	c	HY	4	DW	CAD	MCF
Alberta Hydrogen SMR w/o CCS Inc. Capex	IGCCA00	c	HY	4	DW	CAD	KG
Alberta Hydrogen SMR w/o CCS Inc. Capex	IGYAA00	c	HY	4	DW	CAD	MCF
Appalachia Hydrogen Alkaline Electrolysis	IGZCY00	c	HY	4	DW	USD	KG
Appalachia Hydrogen Alkaline Electrolysis	IGYDQ00	c	HY	4	DW	USD	MCF
Appalachia Hydrogen Alkaline Electrolysis Inc. Capex	IGZCW00	c	HY	4	DW	USD	KG
Appalachia Hydrogen Alkaline Electrolysis Inc. Capex	IGYD000	c	HY	4	DW	USD	MCF
Appalachia Hydrogen PEM Electrolysis	IGZBG00	c	HY	4	DW	USD	KG
Appalachia Hydrogen PEM Electrolysis	IGYBY00	c	HY	4	DW	USD	MCF
Appalachia Hydrogen PEM Electrolysis Inc. Capex	IGZBE00	c	HY	4	DW	USD	KG
Appalachia Hydrogen PEM Electrolysis Inc. Capex	IGYBW00	c	HY	4	DW	USD	MCF
Appalachia Hydrogen SMR w/o CCS	IGCCG00	c	HY	4	DW	USD	KG
Appalachia Hydrogen SMR w/o CCS	IGYAG00	c	HY	4	DW	USD	MCF
Appalachia Hydrogen SMR w/o CCS Inc. Capex	IGCCE00	c	HY	4	DW	USD	KG
Appalachia Hydrogen SMR w/o CCS Inc. Capex	IGYAE00	c	HY	4	DW	USD	MCF
Gulf Coast Hydrogen Alkaline Electrolysis	IGZDC00	c	HY	4	DW	USD	KG
Gulf Coast Hydrogen Alkaline Electrolysis	IGYDU00	c	HY	4	DW	USD	MCF
Gulf Coast Hydrogen Alkaline Electrolysis Inc. Capex	IGZDA00	c	HY	4	DW	USD	KG
Gulf Coast Hydrogen Alkaline Electrolysis Inc. Capex	IGYDS00	c	HY	4	DW	USD	MCF
Gulf Coast Hydrogen PEM Electrolysis	IGZBK00	c	HY	4	DW	USD	KG
Gulf Coast Hydrogen PEM Electrolysis	IGYCC00	c	HY	4	DW	USD	MCF
Gulf Coast Hydrogen PEM Electrolysis Inc. Capex	IGZBI00	c	HY	4	DW	USD	KG
Gulf Coast Hydrogen PEM Electrolysis Inc. Capex	IGYCA00	c	HY	4	DW	USD	MCF
Gulf Coast Hydrogen SMR w/o CCS	IGCCN00	c	HY	4	DW	USD	KG
Gulf Coast Hydrogen SMR w/o CCS	IGYAK00	c	HY	4	DW	USD	MCF
Gulf Coast Hydrogen SMR w/o CCS Inc. Capex	IGCCL00	c	HY	4	DW	USD	KG
Gulf Coast Hydrogen SMR w/o CCS Inc. Capex	IGYAI00	c	HY	4	DW	USD	MCF
Japan Hydrogen Alkaline Electrolysis	IGYFT00	c	HY	4	DW	JPY	KG
Japan Hydrogen Alkaline Electrolysis	IGYFS00	c	HY	4	DW	USD	KG
Japan Hydrogen Alkaline Electrolysis Inc. Capex	IGYFV00	c	HY	4	DW	JPY	KG
Japan Hydrogen Alkaline Electrolysis Inc. Capex	IGYFU00	c	HY	4	DW	USD	KG
Japan Hydrogen PEM Electrolysis	IGYFX00	c	HY	4	DW	JPY	KG
Japan Hydrogen PEM Electrolysis	IGYFW00	c	HY	4	DW	USD	KG
Japan Hydrogen PEM Electrolysis Inc. Capex	IGYFZ00	c	HY	4	DW	JPY	KG

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
Japan Hydrogen PEM Electrolysis Inc. Capex	IGYFY00	c	HY	4	DW	USD	KG
Japan Hydrogen SMR w/o CCS	IGYGB00	c	HY	4	DW	JPY	KG
Japan Hydrogen SMR w/o CCS	IGYGA00	c	HY	4	DW	USD	KG
Japan Hydrogen SMR w/o CCS Inc. Capex	IGYGD00	c	HY	4	DW	JPY	KG
Japan Hydrogen SMR w/o CCS Inc. Capex	IGYGC00	c	HY	4	DW	USD	KG
Midcontinent Hydrogen Alkaline Electrolysis	IGZDG00	c	HY	4	DW	USD	KG
Midcontinent Hydrogen Alkaline Electrolysis	IGYDY00	c	HY	4	DW	USD	MCF
Midcontinent Hydrogen Alkaline Electrolysis Inc. Capex	IGZDE00	c	HY	4	DW	USD	KG
Midcontinent Hydrogen Alkaline Electrolysis Inc. Capex	IGYDW00	c	HY	4	DW	USD	MCF
Midcontinent Hydrogen PEM Electrolysis	IGZBS00	c	HY	4	DW	USD	KG
Midcontinent Hydrogen PEM Electrolysis	IGYCG00	c	HY	4	DW	USD	MCF
Midcontinent Hydrogen PEM Electrolysis Inc. Capex	IGZBQ00	c	HY	4	DW	USD	KG
Midcontinent Hydrogen PEM Electrolysis Inc. Capex	IGYCE00	c	HY	4	DW	USD	MCF
Midcontinent Hydrogen SMR w/o CCS	IGCCK00	c	HY	4	DW	USD	KG
Midcontinent Hydrogen SMR w/o CCS	IGYA000	c	HY	4	DW	USD	MCF
Midcontinent Hydrogen SMR w/o CCS Inc. Capex	IGCCI00	c	HY	4	DW	USD	KG
Midcontinent Hydrogen SMR w/o CCS Inc. Capex	IGYAM00	c	HY	4	DW	USD	MCF
Netherlands Hydrogen ATR with CCS Eur/kg	HNETA00	c	HY	4	DW	Eur	KG
Netherlands Hydrogen ATR with CCS (inc. CAPEX) Eur/kg	HNETB00	c	HY	4	DW	Eur	KG
Netherlands Hydrogen ATR with CCS Eur/KWh	HNETC00	c	HY	4	DW	Eur	KWh
Netherlands Hydrogen ATR with CCS (inc. CAPEX) Eur/KWh	HNETD00	c	HY	4	DW	Eur	KWh
Netherlands Hydrogen SMR w/o CCS Eur/kg	HWNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR w/o CCS (inc. CAPEX) Eur/kg	HXNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR w/o CCS (inc. Carbon) Eur/kg	HYNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR w/o CCS (inc. CAPEX and Carbon) Eur/kg	HZNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR w/o CCS Eur/KWh	HANMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen SMR w/o CCS (inc. CAPEX) Eur/KWh	HBNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen SMR w/o CCS (inc. Carbon) Eur/KWh	HCNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen SMR w/o CCS (inc. CAPEX and Carbon) Eur/KWh	HDNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen SMR with CCS Eur/kg	HENMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR with CCS (inc. CAPEX) Eur/kg	HFNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR with CCS (inc. Carbon) Eur/kg	HGNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR with CCS (inc. CAPEX and Carbon) Eur/kg	HHNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen SMR with CCS Eur/KWh	HJNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen SMR with CCS (inc. CAPEX) Eur/KWh	HJNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen SMR with CCS (inc. Carbon) Eur/KWh	HKNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen SMR with CCS (inc. CAPEX and Carbon) Eur/KWh	HLNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen PEM Electrolysis Eur/kg	HMNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen PEM Electrolysis Eur/KWh	HNNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen PEM Electrolysis (inc. CAPEX) Eur/kg	HQNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen PEM Electrolysis (inc. CAPEX) Eur/KWh	HRNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen Alkaline Electrolysis Eur/kg	HONMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen Alkaline Electrolysis Eur/KWh	HPNMA00	c	HY	4	DW	EUR	KWh

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
Netherlands Hydrogen Alkaline Electrolysis (inc. CAPEX) Eur/kg	HSNMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen Alkaline Electrolysis (inc. CAPEX) Eur/KWh	HTNMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen Alkaline Electrolysis (inc. CAPEX) Grid Only Eur/KWh	HTDMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen Alkaline Electrolysis (inc. CAPEX) Grid Only Eur/kg	HSDMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen Alkaline Electrolysis Grid Only Eur/KWh	HPDMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen Alkaline Electrolysis Grid Only Eur/kg	HODMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen PEM Electrolysis (inc. CAPEX) Grid Only Eur/KWh	HRDMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen PEM Electrolysis (inc. CAPEX) Grid Only Eur/kg	HQDMA00	c	HY	4	DW	EUR	KG
Netherlands Hydrogen PEM Electrolysis Grid Only Eur/KWh	HNDMA00	c	HY	4	DW	EUR	KWh
Netherlands Hydrogen PEM Electrolysis Grid Only Eur/kg	HMDMA00	c	HY	4	DW	EUR	KG
New South Wales Hydrogen Alkaline Electrolysis A\$/kg	HYADC00	c	HY	4	DW	AUD	KG
New South Wales Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/kg	HYADD00	c	HY	4	DW	AUD	KG
New South Wales Hydrogen Alkaline Electrolysis \$/kg	HYADE00	c	HY	4	DW	USD	KG
New South Wales Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/kg	HYADF00	c	HY	4	DW	USD	KG
New South Wales Hydrogen Alkaline Electrolysis A\$/MMBtu	HYADG00	c	HY	4	DW	AUD	MMB
New South Wales Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/MMBtu	HYADH00	c	HY	4	DW	AUD	MMB
New South Wales Hydrogen Alkaline Electrolysis \$/MMBtu	HYADI00	c	HY	4	DW	USD	MMB
New South Wales Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/MMBtu	HYADJ00	c	HY	4	DW	USD	MMB
New South Wales Hydrogen PEM Electrolysis A\$/kg	HYABG00	c	HY	4	DW	AUD	KG
New South Wales Hydrogen PEM Electrolysis (inc. CAPEX) A\$/kg	HYABH00	c	HY	4	DW	AUD	KG
New South Wales Hydrogen PEM Electrolysis \$/kg	HYABI00	c	HY	4	DW	USD	KG
New South Wales Hydrogen PEM Electrolysis (inc. CAPEX) \$/kg	HYABJ00	c	HY	4	DW	USD	KG
New South Wales Hydrogen PEM Electrolysis A\$/MMBtu	HYABK00	c	HY	4	DW	AUD	MMB
New South Wales Hydrogen PEM Electrolysis (inc. CAPEX) A\$/MMBtu	HYABL00	c	HY	4	DW	AUD	MMB
New South Wales Hydrogen PEM Electrolysis \$/MMBtu	HYABM00	c	HY	4	DW	USD	MMB
New South Wales Hydrogen PEM Electrolysis (inc. CAPEX) \$/MMBtu	HYABN00	c	HY	4	DW	USD	MMB
New South Wales Hydrogen Coal Gasification with CCS A\$/kg	HYAAA00	c	HY	4	DW	AUD	KG
New South Wales Hydrogen Coal Gasification with CCS (inc. CAPEX) A\$/kg	HYAAB00	c	HY	4	DW	AUD	KG
New South Wales Hydrogen Coal Gasification with CCS \$/kg	HYAAC00	c	HY	4	DW	USD	KG
New South Wales Hydrogen Coal Gasification with CCS (inc. CAPEX) \$/kg	HYAAD00	c	HY	4	DW	USD	KG
New South Wales Hydrogen Coal Gasification with CCS A\$/MMBtu	HYAAE00	c	HY	4	DW	AUD	MMB
New South Wales Hydrogen Coal Gasification with CCS (inc. CAPEX) A\$/MMBtu	HYAAF00	c	HY	4	DW	AUD	MMB
New South Wales Hydrogen Coal Gasification with CCS \$/MMBtu	HYAAG00	c	HY	4	DW	USD	MMB
New South Wales Hydrogen Coal Gasification with CCS (inc. CAPEX) \$/MMBtu	HYAAH00	c	HY	4	DW	USD	MMB
Northeast Hydrogen Alkaline Electrolysis	IGZDK00	c	HY	4	DW	USD	KG
Northeast Hydrogen Alkaline Electrolysis	IGYEC00	c	HY	4	DW	USD	MCF
Northeast Hydrogen Alkaline Electrolysis Inc. Capex	IGZDI00	c	HY	4	DW	USD	KG
Northeast Hydrogen Alkaline Electrolysis Inc. Capex	IGYEA00	c	HY	4	DW	USD	MCF
Northeast Hydrogen PEM Electrolysis	IGZBW00	c	HY	4	DW	USD	KG
Northeast Hydrogen PEM Electrolysis	IGYCK00	c	HY	4	DW	USD	MCF
Northeast Hydrogen PEM Electrolysis Inc. Capex	IGZBU00	c	HY	4	DW	USD	KG
Northeast Hydrogen PEM Electrolysis Inc. Capex	IGYCI00	c	HY	4	DW	USD	MCF
Northeast Hydrogen SMR w/o CCS	IGCCS00	c	HY	4	DW	USD	KG

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
Northeast Hydrogen SMR w/o CCS	IGYAS00	c	HY	4	DW	USD	MCF
Northeast Hydrogen SMR w/o CCS Inc. Capex	IGCCQ00	c	HY	4	DW	USD	KG
Northeast Hydrogen SMR w/o CCS Inc. Capex	IGYAQ00	c	HY	4	DW	USD	MCF
Northern California Hydrogen Alkaline Electrolysis	IGZD000	c	HY	4	DW	USD	KG
Northern California Hydrogen Alkaline Electrolysis	IGYEG00	c	HY	4	DW	USD	MCF
Northern California Hydrogen Alkaline Electrolysis Inc. Capex	IGZDM00	c	HY	4	DW	USD	KG
Northern California Hydrogen Alkaline Electrolysis Inc. Capex	IGYEE00	c	HY	4	DW	USD	MCF
Northern California Hydrogen PEM Electrolysis	IGYBN00	c	HY	4	DW	USD	KG
Northern California Hydrogen PEM Electrolysis	IGYC000	c	HY	4	DW	USD	MCF
Northern California Hydrogen PEM Electrolysis Inc. Capex	IGYBL00	c	HY	4	DW	USD	KG
Northern California Hydrogen PEM Electrolysis Inc. Capex	IGYCM00	c	HY	4	DW	USD	MCF
Northern California Hydrogen SMR w/o CCS Inc. Capex	IGZBL00	c	HY	4	DW	USD	KG
Northern California Hydrogen SMR w/o CCS Inc. Capex	IGYAU00	c	HY	4	DW	USD	MCF
Northern California Hydrogen SMR w/o CCS	IGZBN00	c	HY	4	DW	USD	KG
Northern California Hydrogen SMR w/o CCS	IGYAW00	c	HY	4	DW	USD	MCF
Northwest Hydrogen Alkaline Electrolysis	IGZDS00	c	HY	4	DW	USD	KG
Northwest Hydrogen Alkaline Electrolysis	IGYEK00	c	HY	4	DW	USD	MCF
Northwest Hydrogen Alkaline Electrolysis Inc. Capex	IGZDQ00	c	HY	4	DW	USD	KG
Northwest Hydrogen Alkaline Electrolysis Inc. Capex	IGYEI00	c	HY	4	DW	USD	MCF
Northwest Hydrogen PEM Electrolysis	IGZCA00	c	HY	4	DW	USD	KG
Northwest Hydrogen PEM Electrolysis	IGYCS00	c	HY	4	DW	USD	MCF
Northwest Hydrogen PEM Electrolysis Inc. Capex	IGZBY00	c	HY	4	DW	USD	KG
Northwest Hydrogen PEM Electrolysis Inc. Capex	IGYCC00	c	HY	4	DW	USD	MCF
Northwest Hydrogen SMR w/o CCS	IGCCW00	c	HY	4	DW	USD	KG
Northwest Hydrogen SMR w/o CCS	IGYBA00	c	HY	4	DW	USD	MCF
Northwest Hydrogen SMR w/o CCS Inc. Capex	IGCCU00	c	HY	4	DW	USD	KG
Northwest Hydrogen SMR w/o CCS Inc. Capex	IGYAY00	c	HY	4	DW	USD	MCF
Queensland Hydrogen Alkaline Electrolysis A\$/kg	HYADK00	c	HY	4	DW	AUD	KG
Queensland Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/kg	HYADL00	c	HY	4	DW	AUD	KG
Queensland Hydrogen Alkaline Electrolysis \$/kg	HYADM00	c	HY	4	DW	USD	KG
Queensland Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/kg	HYADN00	c	HY	4	DW	USD	KG
Queensland Hydrogen Alkaline Electrolysis A\$/MMBtu	HYADO00	c	HY	4	DW	AUD	MMB
Queensland Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/MMBtu	HYADP00	c	HY	4	DW	AUD	MMB
Queensland Hydrogen Alkaline Electrolysis \$/MMBtu	HYADQ00	c	HY	4	DW	USD	MMB
Queensland Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/MMBtu	HYADR00	c	HY	4	DW	USD	MMB
Queensland Hydrogen PEM Electrolysis A\$/kg	HYABO00	c	HY	4	DW	AUD	KG
Queensland Hydrogen PEM Electrolysis (inc. CAPEX) A\$/kg	HYABP00	c	HY	4	DW	AUD	KG
Queensland Hydrogen PEM Electrolysis \$/kg	HYABQ00	c	HY	4	DW	USD	KG
Queensland Hydrogen PEM Electrolysis (inc. CAPEX) \$/kg	HYABR00	c	HY	4	DW	USD	KG
Queensland Hydrogen PEM Electrolysis A\$/MMBtu	HYABS00	c	HY	4	DW	AUD	MMB
Queensland Hydrogen PEM Electrolysis (inc. CAPEX) A\$/MMBtu	HYABT00	c	HY	4	DW	AUD	MMB
Queensland Hydrogen PEM Electrolysis \$/MMBtu	HYABU00	c	HY	4	DW	USD	MMB
Queensland Hydrogen PEM Electrolysis (inc. CAPEX) \$/MMBtu	HYABV00	c	HY	4	DW	USD	MMB

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
Queensland Hydrogen Coal Gasification with CCS A\$/kg	HYAAI00	c	HY	4	DW	AUD	KG
Queensland Hydrogen Coal Gasification with CCS (inc. CAPEX) A\$/kg	HYAAJ00	c	HY	4	DW	AUD	KG
Queensland Hydrogen Coal Gasification with CCS \$/kg	HYAAK00	c	HY	4	DW	USD	KG
Queensland Hydrogen Coal Gasification with CCS (inc. CAPEX) \$/kg	HYAAL00	c	HY	4	DW	USD	KG
Queensland Hydrogen Coal Gasification with CCS A\$/MMBtu	HYAAM00	c	HY	4	DW	AUD	MMB
Queensland Hydrogen Coal Gasification with CCS (inc. CAPEX) A\$/MMBtu	HYAAN00	c	HY	4	DW	AUD	MMB
Queensland Hydrogen Coal Gasification with CCS \$/MMBtu	HYAAO00	c	HY	4	DW	USD	MMB
Queensland Hydrogen Coal Gasification with CCS (inc. CAPEX) \$/MMBtu	HYAAP00	c	HY	4	DW	USD	MMB
Rockies Hydrogen Alkaline Electrolysis	IGZDW00	c	HY	4	DW	USD	KG
Rockies Hydrogen Alkaline Electrolysis	IGYE000	c	HY	4	DW	USD	MCF
Rockies Hydrogen Alkaline Electrolysis Inc. Capex	IGZDU00	c	HY	4	DW	USD	KG
Rockies Hydrogen Alkaline Electrolysis Inc. Capex	IGYEM00	c	HY	4	DW	USD	MCF
Rockies Hydrogen PEM Electrolysis	IGZCE00	c	HY	4	DW	USD	KG
Rockies Hydrogen PEM Electrolysis	IGYCW00	c	HY	4	DW	USD	MCF
Rockies Hydrogen PEM Electrolysis Inc. Capex	IGZCC00	c	HY	4	DW	USD	KG
Rockies Hydrogen PEM Electrolysis Inc. Capex	IGYCU00	c	HY	4	DW	USD	MCF
Rockies Hydrogen SMR w/o CCS	IGCDA00	c	HY	4	DW	USD	KG
Rockies Hydrogen SMR w/o CCS	IGYBE00	c	HY	4	DW	USD	MCF
Rockies Hydrogen SMR w/o CCS Inc. Capex	IGCCY00	c	HY	4	DW	USD	KG
Rockies Hydrogen SMR w/o CCS Inc. Capex	IGYBC00	c	HY	4	DW	USD	MCF
South Australia Hydrogen Alkaline Electrolysis A\$/kg	HYADS00	c	HY	4	DW	AUD	KG
South Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/kg	HYADT00	c	HY	4	DW	AUD	KG
South Australia Hydrogen Alkaline Electrolysis \$/kg	HYADU00	c	HY	4	DW	USD	KG
South Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/kg	HYADV00	c	HY	4	DW	USD	KG
South Australia Hydrogen Alkaline Electrolysis A\$/MMBtu	HYADW00	c	HY	4	DW	AUD	MMB
South Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/MMBtu	HYADX00	c	HY	4	DW	AUD	MMB
South Australia Hydrogen Alkaline Electrolysis \$/MMBtu	HYADY00	c	HY	4	DW	USD	MMB
South Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/MMBtu	HYADZ00	c	HY	4	DW	USD	MMB
South Australia Hydrogen PEM Electrolysis A\$/kg	HYABW00	c	HY	4	DW	AUD	KG
South Australia Hydrogen PEM Electrolysis (inc. CAPEX) A\$/kg	HYABX00	c	HY	4	DW	AUD	KG
South Australia Hydrogen PEM Electrolysis \$/kg	HYABY00	c	HY	4	DW	USD	KG
South Australia Hydrogen PEM Electrolysis (inc. CAPEX) \$/kg	HYABZ00	c	HY	4	DW	USD	KG
South Australia Hydrogen PEM Electrolysis A\$/MMBtu	HYACA00	c	HY	4	DW	AUD	MMB
South Australia Hydrogen PEM Electrolysis (inc. CAPEX) A\$/MMBtu	HYACB00	c	HY	4	DW	AUD	MMB
South Australia Hydrogen PEM Electrolysis \$/MMBtu	HYACC00	c	HY	4	DW	USD	MMB
South Australia Hydrogen PEM Electrolysis (inc. CAPEX) \$/MMBtu	HYACD00	c	HY	4	DW	USD	MMB
Southeast Hydrogen Alkaline Electrolysis	IGZEA00	c	HY	4	DW	USD	KG
Southeast Hydrogen Alkaline Electrolysis	IGYES00	c	HY	4	DW	USD	MCF
Southeast Hydrogen Alkaline Electrolysis Inc. Capex	IGZDY00	c	HY	4	DW	USD	KG
Southeast Hydrogen Alkaline Electrolysis Inc. Capex	IGYEQ00	c	HY	4	DW	USD	MCF
Southeast Hydrogen PEM Electrolysis	IGZCI00	c	HY	4	DW	USD	KG
Southeast Hydrogen PEM Electrolysis	IGYDA00	c	HY	4	DW	USD	MCF
Southeast Hydrogen PEM Electrolysis Inc. Capex	IGZCG00	c	HY	4	DW	USD	KG

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
Southeast Hydrogen PEM Electrolysis Inc. Capex	IGYCY00	c	HY	4	DW	USD	MCF
Southeast Hydrogen SMR w/o CCS	IGCDE00	c	HY	4	DW	USD	KG
Southeast Hydrogen SMR w/o CCS	IGYBI00	c	HY	4	DW	USD	MCF
Southeast Hydrogen SMR w/o CCS Inc. Capex	IGCDC00	c	HY	4	DW	USD	KG
Southeast Hydrogen SMR w/o CCS Inc. Capex	IGYBG00	c	HY	4	DW	USD	MCF
Southern California Hydrogen Alkaline Electrolysis	IGZEG00	c	HY	4	DW	USD	KG
Southern California Hydrogen Alkaline Electrolysis	IGYEW00	c	HY	4	DW	USD	MCF
Southern California Hydrogen Alkaline Electrolysis Inc. Capex	IGZEC00	c	HY	4	DW	USD	KG
Southern California Hydrogen Alkaline Electrolysis Inc. Capex	IGYEU00	c	HY	4	DW	USD	MCF
Southern California Hydrogen PEM Electrolysis	IGZCM00	c	HY	4	DW	USD	KG
Southern California Hydrogen PEM Electrolysis	IGYDE00	c	HY	4	DW	USD	MCF
Southern California Hydrogen PEM Electrolysis Inc. Capex	IGZCK00	c	HY	4	DW	USD	KG
Southern California Hydrogen PEM Electrolysis Inc. Capex	IGYDC00	c	HY	4	DW	USD	MCF
Southern California Hydrogen SMR w/o CCS	IGCDI00	c	HY	4	DW	USD	KG
Southern California Hydrogen SMR w/o CCS	IGYFD00	c	HY	4	DW	USD	MCF
Southern California Hydrogen SMR w/o CCS Inc. Capex	IGCDG00	c	HY	4	DW	USD	KG
Southern California Hydrogen SMR w/o CCS Inc. Capex	IGYBK00	c	HY	4	DW	USD	MCF
Tasmania Hydrogen Alkaline Electrolysis A\$/kg	HYAEA00	c	HY	4	DW	AUD	KG
Tasmania Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/kg	HYAEB00	c	HY	4	DW	AUD	KG
Tasmania Hydrogen Alkaline Electrolysis \$/kg	HYAEC00	c	HY	4	DW	USD	KG
Tasmania Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/kg	HYAED00	c	HY	4	DW	USD	KG
Tasmania Hydrogen Alkaline Electrolysis A\$/MMBtu	HYAEE00	c	HY	4	DW	AUD	MMB
Tasmania Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/MMBtu	HYAEF00	c	HY	4	DW	AUD	MMB
Tasmania Hydrogen Alkaline Electrolysis \$/MMBtu	HYAEG00	c	HY	4	DW	USD	MMB
Tasmania Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/MMBtu	HYAEH00	c	HY	4	DW	USD	MMB
Tasmania Hydrogen PEM Electrolysis A\$/kg	HYACE00	c	HY	4	DW	AUD	KG
Tasmania Hydrogen PEM Electrolysis (inc. CAPEX) A\$/kg	HYACF00	c	HY	4	DW	AUD	KG
Tasmania Hydrogen PEM Electrolysis \$/kg	HYACG00	c	HY	4	DW	USD	KG
Tasmania Hydrogen PEM Electrolysis (inc. CAPEX) \$/kg	HYACH00	c	HY	4	DW	USD	KG
Tasmania Hydrogen PEM Electrolysis A\$/MMBtu	HYACI00	c	HY	4	DW	AUD	MMB
Tasmania Hydrogen PEM Electrolysis (inc. CAPEX) A\$/MMBtu	HYACJ00	c	HY	4	DW	AUD	MMB
Tasmania Hydrogen PEM Electrolysis \$/MMBtu	HYACK00	c	HY	4	DW	USD	MMB
Tasmania Hydrogen PEM Electrolysis (inc. CAPEX) \$/MMBtu	HYACL00	c	HY	4	DW	USD	MMB
UK Hydrogen ATR with CCS (GBP/KWh)	HYUKC00	c	HY	4	DW	GBP	KW
UK Hydrogen ATR with CCS (GBP/kg)	HYUKA00	c	HY	4	DW	GBP	KG
UK Hydrogen ATR with CCS inc. CAPEX (GBP/KWh)	HYUKD00	c	HY	4	DW	GBP	KW
UK Hydrogen ATR with CCS inc. CAPEX (GBP/Kg)	HYUKB00	c	HY	4	DW	GBP	KG
UK Hydrogen Alkaline Electrolysis (GBP/KWh)	HYUKK00	c	HY	4	DW	GBP	KW
UK Hydrogen Alkaline Electrolysis (GBP/Kg)	HYUKI00	c	HY	4	DW	GBP	KG
UK Hydrogen Alkaline Electrolysis inc. CAPEX (GBP/KWh)	HYUKL00	c	HY	4	DW	GBP	KW
UK Hydrogen Alkaline Electrolysis inc. CAPEX (GBP/Kg)	HYUKJ00	c	HY	4	DW	GBP	KG
UK Hydrogen PEM Electrolysis (GBP/KWh)	HYUKG00	c	HY	4	DW	GBP	KW
UK Hydrogen PEM Electrolysis (GBP/Kg)	HYUKE00	c	HY	4	DW	GBP	KG

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
UK Hydrogen PEM Electrolysis inc. CAPEX (GBP/KWh)	HYUKH00	c	HY	4	DW	GBP	KW
UK Hydrogen PEM Electrolysis inc. CAPEX (GBP/Kg)	HYUKF00	c	HY	4	DW	GBP	KG
UK Hydrogen SMR with CCS (GBP/kg)	HUKHA00	c	HY	4	DW	GBP	KG
UK Hydrogen SMR with CCS inc. Carbon (GBP/kg)	HUKHB00	c	HY	4	DW	GBP	KG
UK Hydrogen SMR with CCS inc. CAPEX (GBP/kg)	HUKHC00	c	HY	4	DW	GBP	KG
UK Hydrogen SMR with CCS inc. CAPEX and Carbon (GBP/kg)	HUKHD00	c	HY	4	DW	GBP	KG
UK Hydrogen SMR with CCS (GBP/KWh)	HUKHE00	c	HY	4	DW	GBP	KWh
UK Hydrogen SMR with CCS inc. Carbon (GBP/KWh)	HUKHF00	c	HY	4	DW	GBP	KWh
UK Hydrogen SMR with CCS inc. CAPEX (GBP/KWh)	HUKHG00	c	HY	4	DW	GBP	KWh
UK Hydrogen SMR with CCS inc. CAPEX and Carbon (GBP/KWh)	HUKHH00	c	HY	4	DW	GBP	KWh
Upper Midwest Hydrogen Alkaline Electrolysis	IGZEK00	c	HY	4	DW	USD	KG
Upper Midwest Hydrogen Alkaline Electrolysis	IGYFA00	c	HY	4	DW	USD	MCF
Upper Midwest Hydrogen Alkaline Electrolysis Inc. Capex	IGZEI00	c	HY	4	DW	USD	KG
Upper Midwest Hydrogen Alkaline Electrolysis Inc. Capex	IGYEV00	c	HY	4	DW	USD	MCF
Upper Midwest Hydrogen PEM Electrolysis	IGZCQ00	c	HY	4	DW	USD	KG
Upper Midwest Hydrogen PEM Electrolysis	IGYDI00	c	HY	4	DW	USD	MCF
Upper Midwest Hydrogen PEM Electrolysis Inc. Capex	IGZCO00	c	HY	4	DW	USD	KG
Upper Midwest Hydrogen PEM Electrolysis Inc. Capex	IGYDG00	c	HY	4	DW	USD	MCF
Upper Midwest Hydrogen SMR w/o CCS	IGCDM00	c	HY	4	DW	USD	KG
Upper Midwest Hydrogen SMR w/o CCS	IGYBQ00	c	HY	4	DW	USD	MCF
Upper Midwest Hydrogen SMR w/o CCS Inc. Capex	IGCDK00	c	HY	4	DW	USD	KG
Upper Midwest Hydrogen SMR w/o CCS Inc. Capex	IGYFF00	c	HY	4	DW	USD	MCF
Victoria Hydrogen Alkaline Electrolysis A\$/kg	HYAEI00	c	HY	4	DW	AUD	KG
Victoria Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/kg	HYAEJ00	c	HY	4	DW	AUD	KG
Victoria Hydrogen Alkaline Electrolysis \$/kg	HYAEK00	c	HY	4	DW	USD	KG
Victoria Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/kg	HYAEL00	c	HY	4	DW	USD	KG
Victoria Hydrogen Alkaline Electrolysis A\$/MMBtu	HYAEM00	c	HY	4	DW	AUD	MMB
Victoria Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/MMBtu	HYAEN00	c	HY	4	DW	AUD	MMB
Victoria Hydrogen Alkaline Electrolysis \$/MMBtu	HYAE000	c	HY	4	DW	USD	MMB
Victoria Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/MMBtu	HYAEP00	c	HY	4	DW	USD	MMB
Victoria Hydrogen PEM Electrolysis A\$/kg	HYACM00	c	HY	4	DW	AUD	KG
Victoria Hydrogen PEM Electrolysis (inc. CAPEX) A\$/kg	HYACN00	c	HY	4	DW	AUD	KG
Victoria Hydrogen PEM Electrolysis \$/kg	HYAC000	c	HY	4	DW	USD	KG
Victoria Hydrogen PEM Electrolysis (inc. CAPEX) \$/kg	HYACP00	c	HY	4	DW	USD	KG
Victoria Hydrogen PEM Electrolysis A\$/MMBtu	HYACQ00	c	HY	4	DW	AUD	MMB
Victoria Hydrogen PEM Electrolysis (inc. CAPEX) A\$/MMBtu	HYACR00	c	HY	4	DW	AUD	MMB
Victoria Hydrogen PEM Electrolysis \$/MMBtu	HYACS00	c	HY	4	DW	USD	MMB
Victoria Hydrogen PEM Electrolysis (inc. CAPEX) \$/MMBtu	HYACT00	c	HY	4	DW	USD	MMB
Victoria Hydrogen Lignite Gasification with CCS A\$/kg	HYAAQ00	c	HY	4	DW	AUD	KG
Victoria Hydrogen Lignite Gasification with CCS (inc. CAPEX) A\$/kg	HYAAR00	c	HY	4	DW	AUD	KG
Victoria Hydrogen Lignite Gasification with CCS \$/kg	HYAAS00	c	HY	4	DW	USD	KG
Victoria Hydrogen Lignite Gasification with CCS (inc. CAPEX) \$/kg	HYAAT00	c	HY	4	DW	USD	KG
Victoria Hydrogen Lignite Gasification with CCS A\$/MMBtu	HYAAU00	c	HY	4	DW	AUD	MMB

DAILY HYDROGEN SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
Victoria Hydrogen Lignite Gasification with CCS (inc. CAPEX) A\$/MMBtu	HYAAV00	c	HY	4	DW	AUD	MMB
Victoria Hydrogen Lignite Gasification with CCS \$/MMBtu	HYAAW00	c	HY	4	DW	USD	MMB
Victoria Hydrogen Lignite Gasification with CCS (inc. CAPEX) \$/MMBtu	HYAAX00	c	HY	4	DW	USD	MMB
Western Australia Hydrogen Alkaline Electrolysis A\$/kg	HYAEQ00	c	HY	4	DW	AUD	KG
Western Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/kg	HYAER00	c	HY	4	DW	AUD	KG
Western Australia Hydrogen Alkaline Electrolysis \$/kg	HYAES00	c	HY	4	DW	USD	KG
Western Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/kg	HYAET00	c	HY	4	DW	USD	KG
Western Australia Hydrogen Alkaline Electrolysis A\$/MMBtu	HYAEU00	c	HY	4	DW	AUD	MMB
Western Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) A\$/MMBtu	HYAEV00	c	HY	4	DW	AUD	MMB
Western Australia Hydrogen Alkaline Electrolysis \$/MMBtu	HYAEW00	c	HY	4	DW	USD	MMB
Western Australia Hydrogen Alkaline Electrolysis (inc. CAPEX) \$/MMBtu	HYAEX00	c	HY	4	DW	USD	MMB
Western Australia Hydrogen PEM Electrolysis A\$/kg	HYACU00	c	HY	4	DW	AUD	KG
Western Australia Hydrogen PEM Electrolysis (inc. CAPEX) A\$/kg	HYACV00	c	HY	4	DW	AUD	KG
Western Australia Hydrogen PEM Electrolysis \$/kg	HYACW00	c	HY	4	DW	USD	KG
Western Australia Hydrogen PEM Electrolysis (inc. CAPEX) \$/kg	HYACX00	c	HY	4	DW	USD	KG
Western Australia Hydrogen PEM Electrolysis A\$/MMBtu	HYACY00	c	HY	4	DW	AUD	MMB
Western Australia Hydrogen PEM Electrolysis (inc. CAPEX) A\$/MMBtu	HYACZ00	c	HY	4	DW	AUD	MMB
Western Australia Hydrogen PEM Electrolysis \$/MMBtu	HYADA00	c	HY	4	DW	USD	MMB
Western Australia Hydrogen PEM Electrolysis (inc. CAPEX) \$/MMBtu	HYADB00	c	HY	4	DW	USD	MMB
Western Australia Hydrogen SMR with CCS A\$/kg	HYAAZ00	c	HY	4	DW	AUD	KG
Western Australia Hydrogen SMR with CCS (inc. CAPEX) A\$/kg	HYAAZ00	c	HY	4	DW	AUD	KG
Western Australia Hydrogen SMR with CCS \$/kg	HYABA00	c	HY	4	DW	USD	KG
Western Australia Hydrogen SMR with CCS (inc. CAPEX) \$/kg	HYABB00	c	HY	4	DW	USD	KG
Western Australia Hydrogen SMR with CCS A\$/MMBtu	HYABC00	c	HY	4	DW	AUD	MMB
Western Australia Hydrogen SMR with CCS (inc. CAPEX) A\$/MMBtu	HYABD00	c	HY	4	DW	AUD	MMB
Western Australia Hydrogen SMR with CCS \$/MMBtu	HYABE00	c	HY	4	DW	USD	MMB
Western Australia Hydrogen SMR with CCS (inc. CAPEX) \$/MMBtu	HYABF00	c	HY	4	DW	USD	MMB

AMMONIA SYMBOLS

Description	Symbol	Bates	MDC	MI MDC	Dec	Freq	Curr	UOM
Ammonia CFR Far East Asia \$/MMBtu	AMMOB00	c	AMO	ETR	2	DW	USD	MMB
Ammonia CFR Far East Asia \$/MMBtu MAvg	AMMOB03	c	AMO	ETR	2	MA	USD	MMB
Ammonia CFR Far East Asia \$/mt	AMMOA00	c	AMO	ETR	2	DW	USD	MT
Ammonia CFR Far East Asia \$/mt MAvg	AMMOA03	c	AMO	ETR	2	MA	USD	MT
Ammonia CFR Northwest Europe \$/MMBtu	AMMOD00	c	AMO	ETR	2	DW	USD	MMB
Ammonia CFR Northwest Europe \$/MMBtu MAvg	AMMOD03	c	AMO	ETR	2	MA	USD	MMB
Ammonia CFR Northwest Europe \$/mt	AMMOC00	c	AMO	ETR	2	DW	USD	MT
Ammonia CFR Northwest Europe \$/mt MAvg	AMMOC03	c	AMO	ETR	2	MA	USD	MT
Ammonia CFR USGC \$/MMBtu	AMMOF00	c	AMO	ETR	2	DW	USD	MMB
Ammonia CFR USGC \$/MMBtu MAvg	AMMOF03	c	AMO	ETR	2	MA	USD	MMB
Ammonia CFR USGC \$/mt	AMMOE00	c	AMO	ETR	2	DW	USD	MT
Ammonia CFR USGC \$/mt MAvg	AMMOE03	c	AMO	ETR	2	MA	USD	MT
Ammonia FOB Black Sea \$/MMBtu	AMMOH00	c	AMO	ETR	2	DW	USD	MMB
Ammonia FOB Black Sea \$/MMBtu MAvg	AMMOH03	c	AMO	ETR	2	MA	USD	MMB
Ammonia FOB Black Sea \$/mt	AMMOG00	c	AMO	ETR	2	DW	USD	MT
Ammonia FOB Black Sea \$/mt MAvg	AMMOG03	c	AMO	ETR	2	MA	USD	MT
Ammonia FOB Middle East \$/MMBtu	AMMOJ00	c	AMO	ETR	2	DW	USD	MMB
Ammonia FOB Middle East \$/MMBtu MAvg	AMMOJ03	c	AMO	ETR	2	MA	USD	MMB
Ammonia FOB Middle East \$/mt	AMMOI00	c	AMO	ETR	2	DW	USD	MT
Ammonia FOB Middle East \$/mt MAvg	AMMOI03	c	AMO	ETR	2	MA	USD	MT

DAILY HYDROGEN VARIABLE INPUT SYMBOLS

Description	Symbol	Hydrogen Location
ICE NGX AB NIT	ANGXA00	Alberta
AESO Peak Price	LALBM01	Alberta
AESO Off Peak Price	LALBP01	Alberta
Texas Eastern, M-3	IGBEK00	Appalachia
Dominion, North Point	IGBDB00	Appalachia
PJM West Hub Peak Price	IPWHM00	Appalachia
PJM West Hub Off Peak Price	IPWHP00	Appalachia
Henry Hub	IGBBL00	Gulf Coast
Houston Ship Channel	IGBAP00	Gulf Coast
ERCOT North Hub Day Ahead On Peak	IERNM00	Gulf Coast
ERCOT North Hub Day Ahead Off Peak	IERNP00	Gulf Coast
MISO Louisiana Hub Day Ahead On Peak	IMLAM00	Gulf Coast
MISO Louisiana Hub Day Ahead Off Peak	IMLAP00	Gulf Coast
LNG JKM DES Spot Price	AAOVR00	Japan
NGPL, Midcontinent	IGBBZ00	Midcontinent
Panhandle, Tx.-Okla.	IGBCE00	Midcontinent
SPP South Hub Peak Price	ISSOM00	Midcontinent
SPP South Hub Off Peak Price	ISSOP00	Midcontinent
EUA CO2e nearest December	EADLP00	Netherlands
EU Wind Guarantees of Origin (GO) Current Yr	EWGY004	Netherlands
NL Sys Base 1 -Mo Euro	AADMN00	Netherlands
NL Sys Pk 1 -Mo Euro	AADMP00	Netherlands
Platts TTF month-ahead (\$/MMBtu)	GTFWM10	Netherlands
Coal FOB Newcastle	AAVVB00	New South Wales
Transco, zone 6 non-N.Y.	IGBEL00	Northeast
Tenn, zone 6 delivered	IGBEI00	Northeast
NEISO Internal Hub Peak Price	IINIM00	Northeast
NEISO Internal Hub Off Peak Price	IINIP00	Northeast
NYISO Zone G Peak Price	INYHM00	Northeast

DAILY HYDROGEN VARIABLE INPUT SYMBOLS

Description	Symbol	Hydrogen Location
NYISO Zone G Off Peak Price	INYHP00	Northeast
PG&E, city-gate	IGBEB00	Northern California
CAISO NP15 Peak Price	ICNGM00	Northern California
CAISO NP15 Off Peak Price	ICNGP00	Northern California
California Carbon Allowance	ARECB04	Northern California
NW, Can border (Sumas)	IGBCT00	Northwest
PG&E, Malin	IGBD000	Northwest
Mid-Col Peak Price	WEABF00	Northwest
Mid-Col Off Peak Price	WEACL05	Northwest
Coal FOB Newcastle	AAVVB00	Queensland
Cheyenne Hub	IGBC000	Rockies
Kern River/Opal plant	IGBCL00	Rockies
Mona Peak Price	AARLQ00	Rockies
Mona Off Peak Price	AARL000	Rockies
Transco, zone 5 delivered	IGBEN00	Southeast
Into Soco Peak Price	AAMBJ00	Southeast
Into Soco Off Peak Price	AAMBC00	Southeast
SoCal Gas, city-gate	IGBGG00	Southern California
CAISO SP15 Day Ahead On Peak	ICSGM00	Southern California
CAISO SP15 Day Ahead Off Peak	ICSGP00	Southern California
California Carbon Allowance	ARECB04	Southern California
Platts UK GTMA 1 mo Base	AADGP00	UK
Platts UK GTMA 1 mo Peak	AADGV00	UK
UK NBP MA	GNCWM10	UK
UK Allowance Nearest December	ATIEUK00	UK
Chicago city-gates	IGBDX00	Upper Midwest
MISO Indiana Hub Peak Price	IMIDM00	Upper Midwest
MISO Indiana Hub Off Peak Price	IMIDP00	Upper Midwest
Coal FOB Newcastle	AAVVB00	Victoria
LNG FOB Australia Netback	AARXR00	Western Australia

PLATTS HYDROGEN CAPITAL COST ASSUMPTIONS

	Units	Value
Alkaline Electrolysis		
Alberta	\$/KW	\$1,025
Appalachia	\$/KW	\$941
Gulf Coast	\$/KW	\$891
Japan	\$/KW	\$1,336
Midcontinent	\$/KW	\$914
Netherlands	\$/KW	\$891
New South Wales	A\$/KW	AUD 1,203
Northeast	\$/KW	\$968
Northern California	\$/KW	\$1,056
Northwest	\$/KW	\$959
Queensland	A\$/KW	AUD 1,203
Rockies	\$/KW	\$928
South Australia	A\$/KW	AUD 1,203
Southeast	\$/KW	\$915
Southern California	\$/KW	\$1,034
Tasmania	A\$/KW	AUD 1,203
United Kingdom	\$/KW	\$891
Upper Midwest	\$/KW	\$970
Victoria	A\$/KW	AUD 1,203
Western Australia	A\$/KW	AUD 1,203
ATR w CCS		
Netherlands	Eur/KW	€ 736
United Kingdom	GBP/KW	£631
PEM Electrolysis		
Alberta	\$/KW	\$1,589
Appalachia	\$/KW	\$1,460
Gulf Coast	\$/KW	\$1,382
Japan	\$/KW	\$2,073
Midcontinent	\$/KW	\$1,417
Netherlands	\$/KW	\$1,382
New South Wales	A\$/KW	AUD 2,413
Northeast	\$/KW	\$1,502
Northern California	\$/KW	\$1,637

PLATTS HYDROGEN CAPITAL COST ASSUMPTIONS

	Units	Value
Northwest	\$/KW	\$1,488
Queensland	A\$/KW	AUD 2,413
Rockies	\$/KW	\$1,439
South Australia	A\$/KW	AUD 2,413
Southeast	\$/KW	\$1,419
Southern California	\$/KW	\$1,603
Tasmania	A\$/KW	AUD 2,413
United Kingdom	\$/KW	\$1,382
Upper Midwest	\$/KW	\$1,505
Victoria	A\$/KW	AUD 2,413
Western Australia	A\$/KW	AUD 2,413
SMR W/O CCS		
Alberta	\$/KW	\$1,047
Appalachia	\$/KW	\$1,075
Gulf Coast	\$/KW	\$910
Japan	\$/KW	\$1,365
Midcontinent	\$/KW	\$959
Netherlands	\$/KW	\$910
Northeast	\$/KW	\$1,146
Northern California	\$/KW	\$1,319
Northwest	\$/KW	\$1,052
Rockies	\$/KW	\$1,008
Southeast	\$/KW	\$938
Southern California	\$/KW	\$1,265
Upper Midwest	\$/KW	\$1,026
SMR w CCS		
Netherlands	\$/KW	\$1,680
UK	\$/KW	\$1,680
Western Australia	\$/KW	\$1,680
Coal Gasification w CCS		
New South Wales	\$/KW	\$2,780
Queensland	\$/KW	\$2,780
Lignite Gasification w CCS		
Victoria	\$/KW	\$3,508

MONTHLY HYDROGEN PUMP PRICE SYMBOLS

Description	Symbol	Bates	MDC	Dec	Freq	Curr	UOM
California H2 Pump Price	HYPUC00	c	HY	2	MA	USD	KG
California H2 Pump Price	HYPUD00	c	HY	2	MA	Eur	KG
Germany H2 Pump Price	HYPUE00	c	HY	2	MA	USD	KG
Germany H2 Pump Price	HYPUF00	c	HY	2	MA	Eur	KG
Japan Chubu H2 Pump Price	HYPUG00	c	HY	2	MA	USD	KG
Japan Chubu H2 Pump Price	HYPUH00	c	HY	2	MA	Yen	KG
Japan Chugoku and Kyushu H2 Pump Price	HYPUI00	c	HY	2	MA	USD	KG
Japan Chugoku and Kyushu H2 Pump Price	HYPUJ00	c	HY	2	MA	Yen	KG
Japan Kinki H2 Pump Price	HYPUK00	c	HY	2	MA	USD	KG
Japan Kinki H2 Pump Price	HYPUL00	c	HY	2	MA	Yen	KG
Japan Metropolitan H2 Pump Price	HYPUM00	c	HY	2	MA	USD	KG
Japan Metropolitan H2 Pump Price	HYPUN00	c	HY	2	MA	Yen	KG
Japan Tohoku H2 Pump Price	HYPUO00	c	HY	2	MA	USD	KG
Japan Tohoku H2 Pump Price	HYPUP00	c	HY	2	MA	Yen	KG

REVISION HISTORY

October 2021: Added new ammonia assessments for CFR Far East Asia, CFR Northwest Europe, CFR US Gulf Coast, FOB Middle East, and FOB Black Sea.

September 2021: Added new Steam Methane Reforming and Autothermal Reforming price valuations for the UK and the Netherlands, respectively, both including CCS.

September 2021: Platts launched monthly Hydrogen Pump Prices for the California market based on source data from hydrogen fuel station operators, and began to republish posted pump prices for Germany and Japan hydrogen fuel stations, based on publicly available source data from each of those respective markets.

August 2021: Platts launched Australia hydrogen assessments for the following locations and pathways: New South Wales (Coal Gasification w CCS, Alkaline Electrolysis and PEM Electrolysis), Queensland (Coal Gasification w CCS, Alkaline Electrolysis and PEM Electrolysis), South Australia (Alkaline Electrolysis and PEM Electrolysis), Tasmania (Alkaline Electrolysis and PEM Electrolysis), Victoria (Lignite Gasification w CCS, Alkaline Electrolysis and PEM Electrolysis), and Western Australia (SMR w CCS, Alkaline Electrolysis and PEM Electrolysis).

August 2021: Replaced existing European Commission's carbon spot auction prices as a daily input for Dutch and UK hydrogen assessments with Platts assessed EU Emission Trading System (EUAs) and UK Emission Trading Scheme (UKAs) daily prices.

April 2021: Platts completed an annual review of this guide, reviewing all content, correcting typos, and making edits to language throughout. In this update, Platts also made several methodology changes, including the adoption of a fixed charge rate, defined as the product of a capital recovery factor and a project finance factor, to more accurately incorporate inflation, depreciation, return on equity, debt service, insurance as well

as income and property taxes. Increased the capital costs for (\$/KW) for proton exchange membrane (PEM) electrolysis from \$900/KW to \$1,382/KW and alkaline electrolysis from \$702/KW to \$891/KW. Increased steam methane reforming (SMR) plant efficiency from 70% to 76%, SMR with carbon capture and sequestration (CCS) plant efficiency from 63% to 69%; and alkaline electrolysis efficiency from 65% to 67%. Increased the cost of stack refurbishment as a percent of capital cost for PEM electrolysis from 15% to 35% for PEM electrolysis, and from 15% to 45% for alkaline electrolysis. Adjusted the percentage of Dutch peak and base electricity prices from 80% base and 20% peak to 50% base and 50% peak. Changed the method for calculating carbon dioxide emissions by adopting the emission factor of 8.9 kg CO₂/kg H₂. Launched new UK hydrogen assessments for autothermal reforming with carbon capture and sequestration (ATR w CCS), alkaline electrolysis and PEM electrolysis. Adjusted the cadence of its methodology review from quarterly to annual.

January 2021: Replaced Dutch EEX month-ahead settlements with Platts Dutch first-month (peak) power assessments and replaced EEX EU Emission Trading System input data with data from the European Commission's Carbon Auction Platform. Reactivated Platts Dutch month-ahead Base and Peak power price assessments for use as the power component in the full suite of Dutch hydrogen prices.

December 2020: Discontinued the duplicative hydrogen assessments for North America and Japan in the ES market data category and moved the surviving North America and Japan hydrogen assessments in the GD market data category to a new HY market data category. The Netherlands hydrogen assessments were also moved to the new HY market data category from their original EG market data category.

October 2020: Platts launched Netherlands PEM and Alkaline Grid-Only price assessments and backfilled to January 2018.

April 2020: Added Capex costs to methodology guide.

April 2020: Changed California location names to Northern California. Added daily SMR w/o CCS prices for Alberta, Appalachia, Midcontinent, Northeast, Northwest, Rockies, Southeast, Southern California, Upper Midwest, and Japan. Added daily PEM Electrolysis prices for Alberta, Appalachia, Midcontinent, Northeast, Northwest, Rockies, Southeast, Southern California, Upper Midwest, and Japan. Added daily Alkaline Electrolysis prices for Alberta, Appalachia, Midcontinent, Northeast, Northern California, Northwest, Rockies, Southeast, Southern California, Upper Midwest, and Japan. Added Netherlands month ahead SMR with CCS, SMR with CCS (includes Capex), SMR with CCS (includes Carbon), SMR with CCS (includes Capex and carbon), PEM Electrolysis, PEM Electrolysis (includes Capex), Alkaline Electrolysis, and Alkaline Electrolysis (includes Capex) prices. Added refurbish cost to PEM Electrolysis prices. Noted European hydrogen fixed capital costs are converted to Euros from USD using Platts daily forex assessments.

February 2020: Platts has added a table of constant input symbols used for calculations for its Dutch hydrogen SMR assessments

January 2020: Platts has corrected typos for Capex cost for USGC SMR w/o CCS, California SMR w/o CCS, and California PEM Electrolysis.

December 2019: Platts launched Hydrogen Inc. Capex USGC SMR w/o CCS, Hydrogen USGC SMR w/o CCS, Hydrogen Inc. Capex California SMR w/o CCS, Hydrogen California SMR w/o CCS, Hydrogen Inc. Capex California PEM Electrolysis, Hydrogen California PEM Electrolysis, and Hydrogen Netherlands SMR w/o CCS valuations. Platts also launched Hydrogen Inc. Netherlands SMR (H₂ 99.9%) w/o CCS MA, Netherlands SMR (H₂ 99.9%) w/o CCS (inc. Capex) MA, Netherlands SMR (H₂ 99.9%) w/o CCS (inc. Carbon) MA, Netherlands SMR (H₂ 99.9%) w/o CCS (inc. Capex & Carbon) MA valuations.