

Gas, Power, and Energy Futures (GPE)

Connect™ User Guide

October 2020

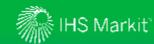


Table of Contents

Connect Login Instructions

Gas, Power, and Energy Futures (GPE) - Overview

Power and Renewables:

- > Global Power & Renewables
- > European Power Analytics
- > North American Power Analytics
- > FastLMP

Regional Integrated:

- > Connect Navigation
- > Deliverables

Global Fuels:

- > Global Coal
- > Global Gas
- > LNG
- > LNG Analytics

Clean Energy Technology:

- > Global Clean Energy Technology
- > Batteries and Energy Storage
- > Hydrogen and Renewable Gas Forum
- > Solar PV

Cross Energy:

- > Energy and Climate Scenarios
- > Strategic Horizons
- > Energy View Service Sector

Trial HUB:

All Insights and Analytics

My Connect (Email alerts and all saved research)

Contact Us



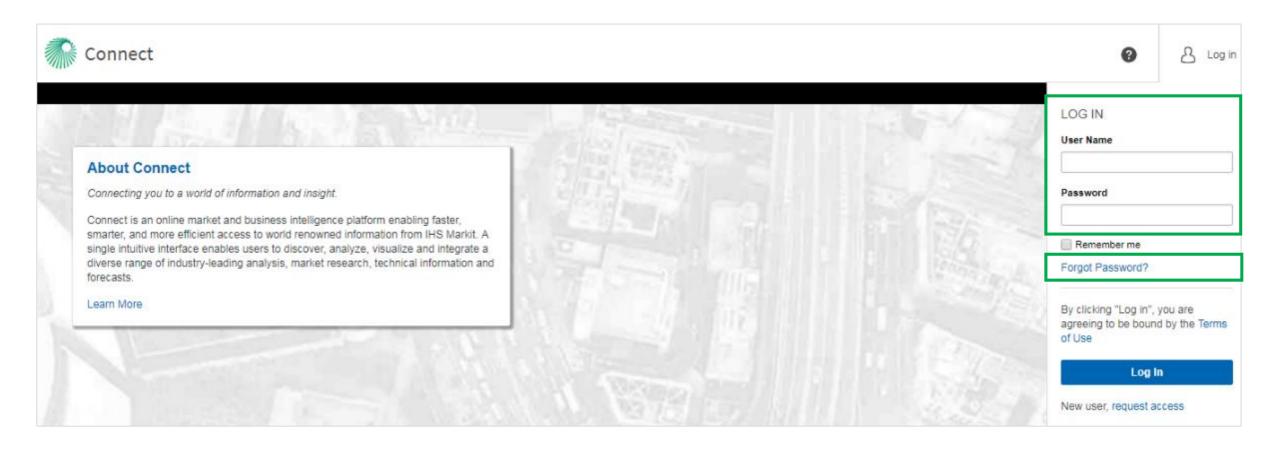
Connect Login Instructions



Connect Login Instructions

Go to connect.ihsmarkit.com and log in with your Username and Password.

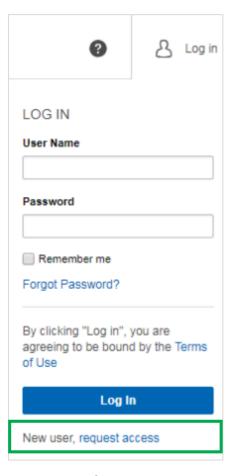
Click on 'Forgot Password?' to reset your password.





Connect New User Registration

Go to connect.ihsmarkit.com and request access.





Follow 4 steps for Connect registration



- Complete your profile. (Enter Connect in the Product Used field)
- 3. Accept the terms of service.
- 4. Complete Your Registration

Once you are provided with access, you will receive an email confirmation from customercare@ihsmarkit.com with your login instructions.

Self Registration Step 1: Enter your email address		
Create a personal account Please enter a valid corporate e-mail address to begin. Email address:		
Self Registration Step 2: Complete your profile		
Please complete your profile. Required fields are indicated by *. We will keep your information confidential. We never share with third parties.		

Go to connect.ihsmarkit.com and login

•	& Login	
LOG IN		
User Name Password		
Remember me Forgot Password?		
By clicking "Log in", you are agreeing to be bound by the Terms of Use		
Log In		
New user, request access		



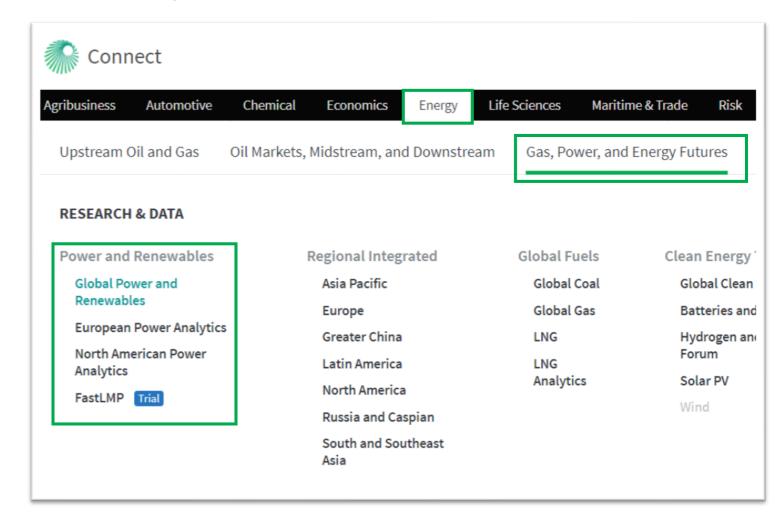
Gas, Power, and Energy Futures (GPE) - Overview



Power and Renewables

Hover over **Energy > Gas**, **Power**, **and Energy Futures** to navigate to **Power and Renewables** research:

- Global Power and Renewables: Features analysis and data on market fundamentals, the policy landscape and changing consumer demands globally and regionally.
- European Power Analytics: Provides a detailed forecast of wholesale power prices and fuel input prices to 2040 for 16 European markets to help you evaluate the long-term market value of power assets.
- North American Power Analytics: Provides extensive sensitivity analysis data relating to natural gas price and long-term renewables penetration on a visually dynamic and interactive platform, supplementing the IHS Markit comprehensive power outlook out to 2050.
- FastLMP (Locational Marginal Price): Consistent and high-quality view of LMP forecasts by combining hourly LMP basis forecasts for two critical wholesale power markets, PJM and ERCOT, with IHS Markit zonal power price forecasts out to 2050.

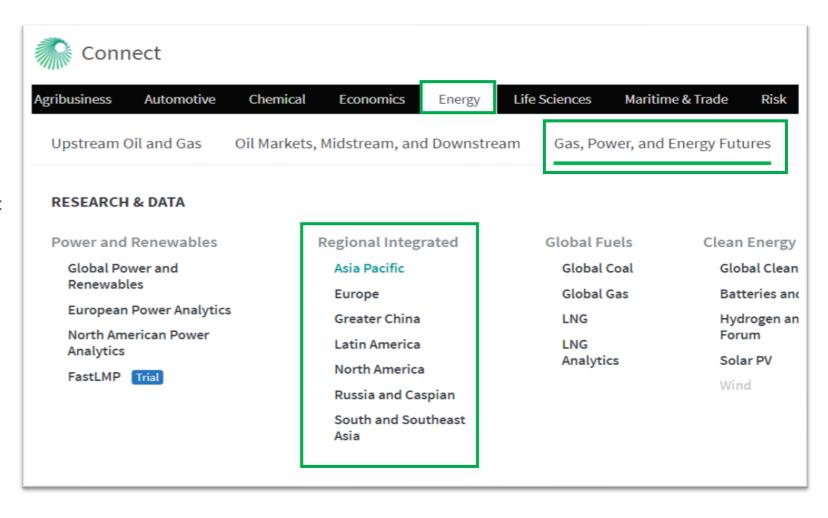




Regional Integrated

Hover over Energy > Gas, Power, and Energy Futures to navigate to research and analysis by Regional Integrated subscriptions:

- Critical insight, strategic analysis, data, and integrated energy outlooks out to 2050 for conventional and renewable power, gas, LNG and coal markets.
- Complete perspective of regional gas, power, and energy futures markets for:
 - Asia Pacific
 - Europe
 - Greater China
 - Latin America
 - North America
 - Russia and Caspian
 - South and Southeast Asia

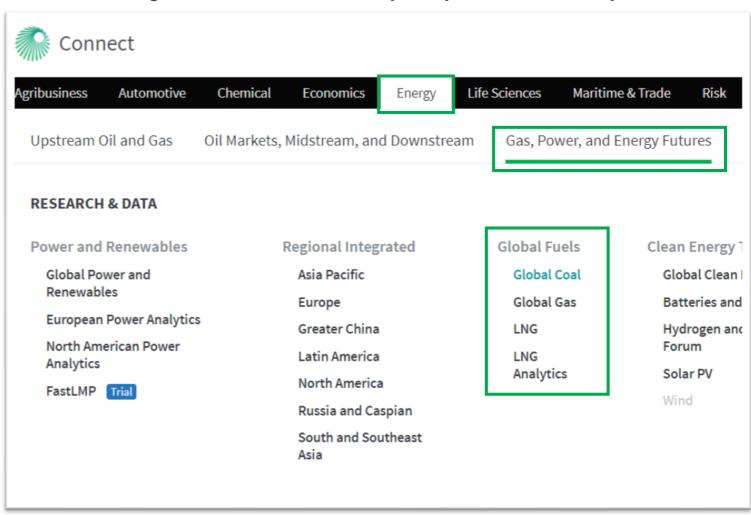




Global Fuels

Hover over Energy > Gas, Power, and Energy Futures to navigate to research and analysis by Global subscriptions:

- Global Coal: Provides coal news, analysis and strategic insight (including research reports and outlooks for price, trade, supply/demand, freight, costs). Real-time news alerts, daily/weekly regional coal publications, fundamental research reports, International coal benchmarks.
- Global Gas: Provides a unique perspective on changing gas markets for both short-term market monitoring and long-term strategy decisions.
- LNG: Provides timely data and analysis on assets, competitive behavior, and regional and global markets across the entire liquefied natural gas (LNG) value chain.
- LNG Analytics:
 - Assets (liquefaction, regasification, shipping)
 - Contracts
 - Prices
 - Supply/Demand forecasts

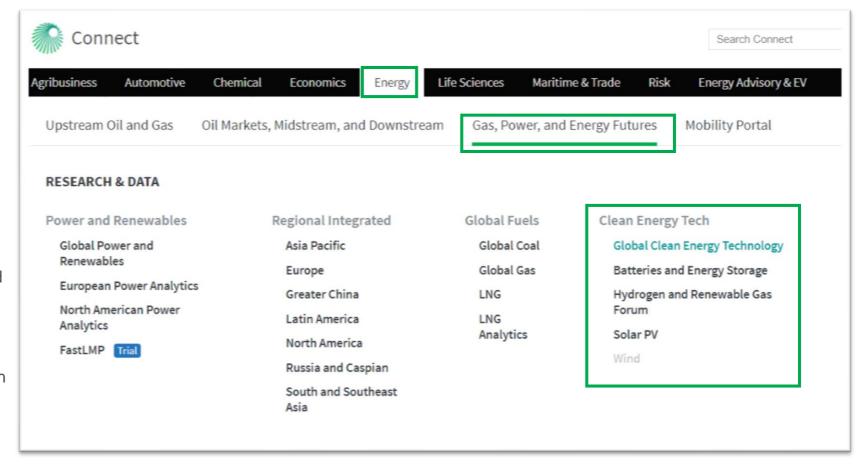




Clean Energy Technology

Hover over Energy > Gas, Power, and Energy Futures to navigate to Clean Energy Technology research:

- Global Clean Energy Technology:
 Market intelligence of the important technologies shaping the energy transition. Includes a continuous flow of data, forecasts, insight and analytics tools to track and understand how technologies develop and their impact on the industry.
- Batteries and Energy Storage: Comprehensive data and analysis on the expanding market for lithium-ion battery cell manufacturing and the rapidly emerging energy storage market.
- Hydrogen and Renewable Gas Forum: Detailed analysis for the main potential producers and consumers of hydrogen and renewable gas.
- Solar PV: Comprehensive data and analysis on the downstream dynamics of the solar industry, on the global PV inverter market and for the global PV module supply chain.
- Coming Soon Wind

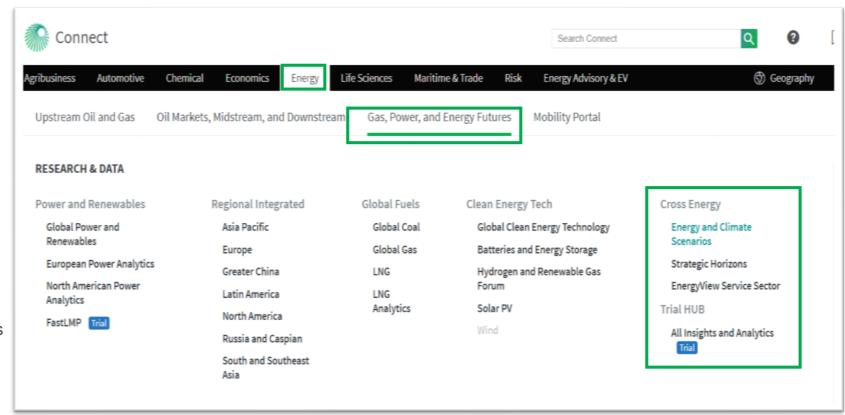




Cross Energy

Hover over Energy > Gas, Power, and Energy Futures to navigate to Cross Energy research:

- Energy and Climate Scenarios: Provides combined ongoing analysis, insights and forecasts on climate policies, Energy Scenarios, low emission pathways that will shape future investments.
- Strategic Horizons: Executive briefings on changing market and geopolitical conditions in the oil and gas industry to anticipate trends and position for competitive advantage.
- EnergyView Service Sector: Suite of IHS
 Markit Energy Advisory Services to provide
 an extensive package of energy data,
 analysis and insight covering oil, natural gas
 and power sectors.
- Trial Hub: Browse selected Gas, Power and Energy Future research outside of your subscription.





Power & Renewables

Features analysis and data on market fundamentals, the policy landscape, and changing consumer demands.



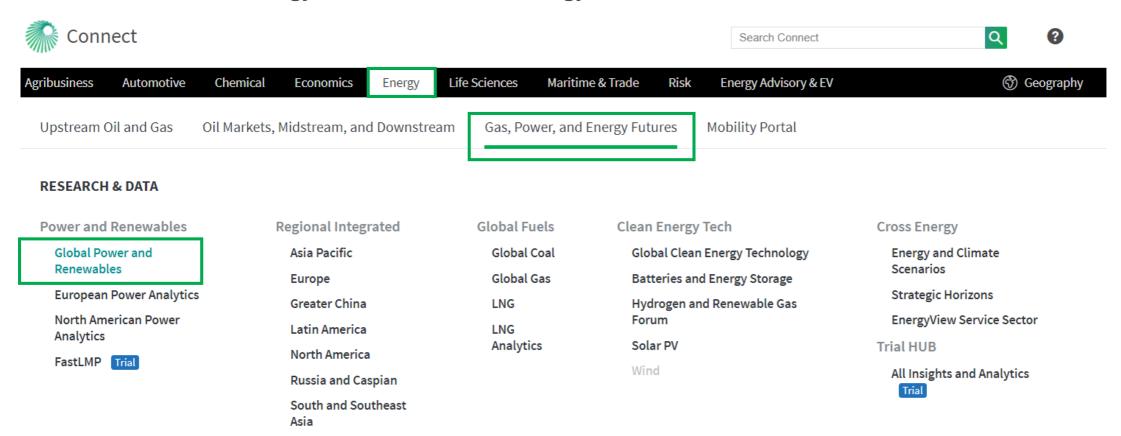
Global Power & Renewables

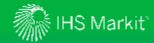
Features analysis and data on market fundamentals, the policy landscape, and changing consumer demands.



Global Power & Renewables in Connect

In Connect, hover over Energy > Gas, Power, and Energy Futures > Click on Global Power and Renewables.





Global Power and Renewables Home Page Navigation

×

X 8

×

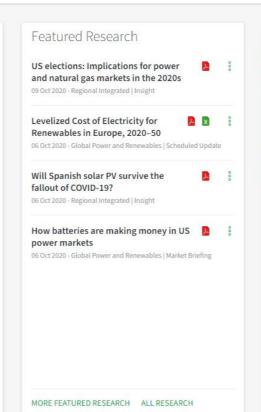
05 Oct 2020 - Global Power and Renewables | Data

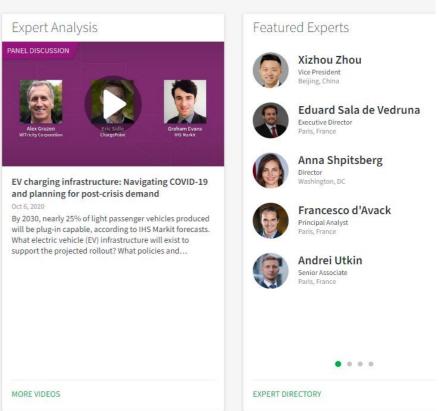
MORE KEY OUTLOOKS

Use the left-hand rail to browse research and analysis under **Home** and **Research** and data visualization under **Analytics**.

Global Power and Renewables Home Home දී Research Key Outlooks South Korea Electric Power Data Tables: September 2020 **Key Outlooks** Latin American Power Outlook: Andean region 28 Sep 2020 - Regional Integrated | Data Japan Electric Power Data Tables: September 2020 09 Sep 2020 - Global Power and Renewables | Data ∠ Analytics European Power Planning Case-Longterm projections to 2050, August 2020 01 Sep 2020 - Global Power and Renewables | Data Brazil Tech Tracker India Power and Renewables Video Library

The **Home** page displays various widgets for **Key Outlooks**, **Featured Research**, **Expert** Analysis, Featured Experts, key data visualization, and more.





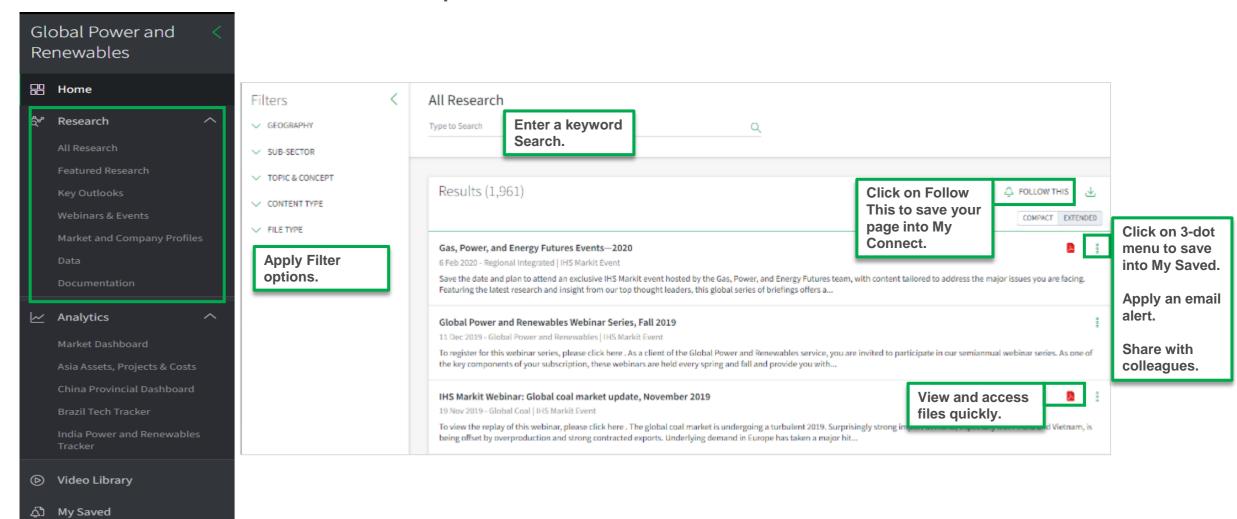
Confidential. © 2020 IHS Markit®. All Rights Reserved.

A My Saved



Global Power and Renewables Research Page Navigation

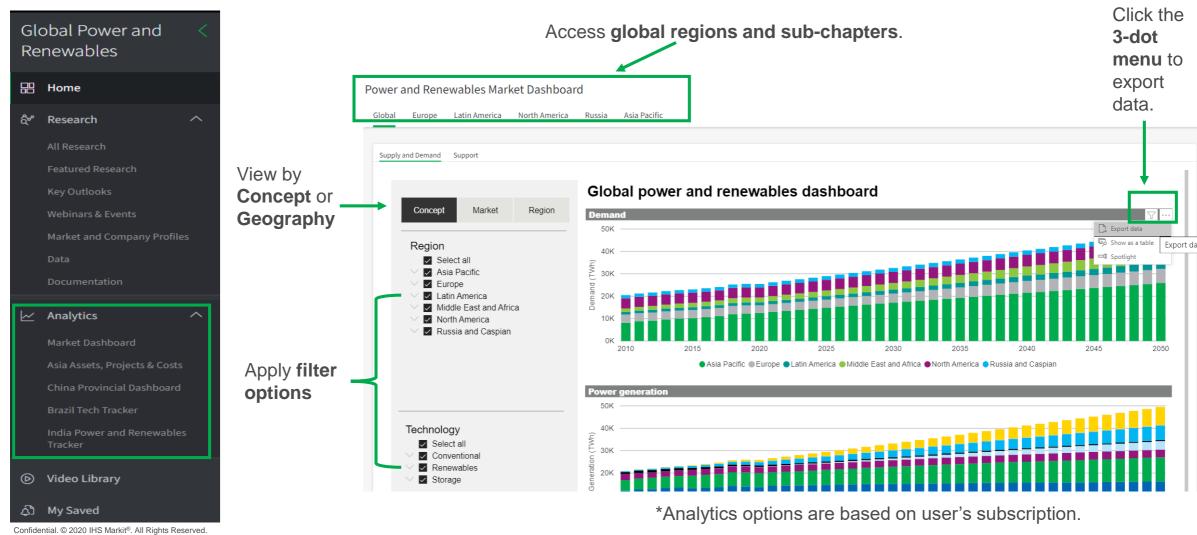
Use the left-hand rail to click on **Research topics** to browse and narrow down **Power and Renewables** research.





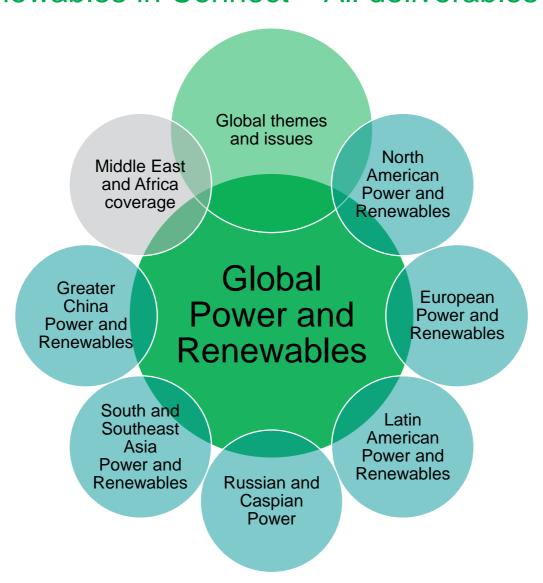
Global Power and Renewables Analytics

Use the left-hand rail to click on **Analytics** topics to customize and visualize related data.





Global Power & Renewables in Connect – All deliverables



Regional service coverage

Only available through Global Power and Renewables





Subscription:

Global Power & Renewables

North America

Reports and datasets that provide a comprehensive view of outlook to 2050 for all major US and Canadian power markets, including

- Outlook for all key wholesale energy market metrics and underlying drivers through 2050 including: economic indicators, power demand, new power supply costs and characteristics, generating capacity retirements and additions, average capacity factor of generation supply across fuels/technologies, fossil fuel prices at relevant delivery points, emission allowance prices, monthly wholesale energy prices, spark spreads, dark spreads, implied heat rates, and capacity values.
- Regional (Northeast, PJM, Southeast, Mid-Continent, ERCOT and West) outlook reports summarizing developments, insights, fundamental market trends, and assumptions that underpin the North American power market outlook
- Profile reports on over 15 major power markets summarizing the market structure and key trends to date, including: demand, fuel supply mix, generation asset ownership, and wholesale energy prices
- Data sets detailing announced coal plant retirements, pollution control retrofit projects, and conventional power plant transactions
- Reports highlighting renewable policy developments, latest project pipeline status and PPA activity
- Reports on regional renewable energy certificates (REC) supply-demand balances
- Forecast of state- and provincial-level renewable and energy storage capacity additions through 2050
- Technology cost and evolution outlooks for wind, solar PV (utility and distributed), and battery storage through 2050
- Top wind and solar asset owners and latest changes to their portfolio





Subscription:

Global Power & Renewables

Europe

- Strategic Reports covering topics relevant for strategic decision-making processes
- Review of key policy developments at EU and national level, affecting supply/demand fundamentals
- Renewable power market update covering major policy announcements and reviews of the renewable pipeline (by company, country, and technology), storage pipeline, and wind and solar M&A activity
- Support levels for wind, solar, biomass, and other technologies, broken down by country and different scales of technology
- Review of EU Emissions Trading System (EU ETS) price drivers—power market dynamics, emissions by sector, offset use, and carbon price outlook
- Country profiles covering policy and market fundamentals
- Wholesale power price outlooks: Baseload and peak prices for 14 European markets, annual to 2050, and quarterly through 2025, real
 and nominal, dirty and clean spark and dark spreads, benchmark prices for coal, gas, and carbon, deflators and exchange rate
 outlooks
- Assumptions and analysis supporting short-term outlook for fuel and carbon, power prices, and spreads
- Power demand to 2050 by sector and country
- Outlook to 2050 for installed capacity, capacity additions, and retirements, for several technologies including coal, gas CCGTs, gas
 CTs, nuclear, and several renewable technologies (biomass, large and small hydro, pump storage, onshore and offshore wind, solar PV and CSP, geothermal, and ocean) by country
- Levelized cost of renewable power by technology and country for 21 European markets, including Capex evolution
- Historical electricity demand figures split by sector on a yearly, quarterly, and monthly basis
- Country-specific retail price evolution and breakdown





Subscription:

Global Power & Renewables

Greater China

- Electric power: Data tables; quarterly Market Briefings; wholesale and retail price data; outlooks for provincial demand by sector, supply by technology, and system reserve margins; regional cost of generation; transmission infrastructure outlook; retail tariff outlooks (wholesale and retail for select provinces); and Strategic Reports
- Specific reports include:
 - China Energy Watch. a summary of key energy market developments in 2018, including changes in market fundamentals, new policy directions, and emerging players, as well as key implications for Chinese and global energy markets.
 - China Power Market Briefing. These quarterly Market Briefings analyze recent changes in power market fundamentals and policy development during the previous quarter and assumptions behind five-year supply and demand outlooks.
 - Taiwan and Hong Kong Power Market Profiles and Data Tables.
 - China Power Generation Cost Tracker. The report visits the status of cost for power generation by different technologies and provides an outlook for future capex, operation costs, and on-grid power tariff policies.
 - China Energy Storage Profile. status of market development, related policies, and the different energy storage applications.
 - Energy Company Profiles. The next company profiles will cover ENN Energy Holdings Ltd., China Huaneng Group, Zhejiang Provincial Energy Group, and Three Gorges Corporation.
 - Provincial Profiles. We plan to launch a brand-new format for China Provincial Profiles, using an interactive analytics tool to enhance our coverage of macroeconomic status and power market development and outlooks at the provincial level.





Subscription:

Global Power & Renewables

Latin America

- Snapshot of the competitiveness of each generation technology in the Brazilian and Mexico powers market
- Specific deliverables include:
 - Latin American Market Dashboard (dynamic format): This dashboard, available from the Latin American Power, Gas, Coal, and Renewables home page, provides a snapshot of the region's power and natural gas fundamentals country by country in a user-friendly format that allows readers to interact with various data sets and understand market trends. All regions in Latin America are covered.
 - Latin American Power Outlooks: The data sets provide power sector (supply, demand, imports/exports) outlooks to 2050. All regions in Latin America will be posted. For the first time, we are now including outlooks for Central America.
 - Latin American Power Price Report (Southern Cone and Andean): These reports outline relevant drivers with key insights and implications for power price trends across the two regions.
 - Mexico Tech Tracker (dynamic format): This report provides a snapshot of the competitiveness of each power generation technology of a selected power market, with additional sensitivities and data in a user-friendly format. The layout allows users to interact with various data sets and understand market trends and shifts in capital costs, variable costs, and levelized costs of energy for key generation technologies in the power market.
- Report that analyzes capacity additions and changes in reserve margins while providing key power trends and drivers, technology shifts market updates, and a 10-year outlook for supply/demand balances
- Power demand, installed capacity, annual capacity additions, annual generation by technology and country
- Historical price report outlining relevant inputs with key highlights and implications; Mexico and Brazil power prices including long-term outlooks for selected industrial and average residential/commercial tariffs





Subscription:

Global Power & Renewables

Russia and Caspian

Key focus areas

- Russian power sector quarterly reports: The report is a quarterly Russian power sector review and analysis on sector fundamentals, infrastructure, and regulations. Each report also reviews an important strategic issue. The report is published in English and Russian languages.
- Strategic analytical reports
 - Reports of different lengths and depth of coverage: Strategic Reports, Watches, Market Briefings, Insights, Market Alerts, and more
- Short analytical pieces (memos/alerts)
- Workshop/forum events and discussions
- Electric power (thermal generation, hydro, nuclear, and renewables)
- Immediate, regular analysis of important topics that reflect broader concerns and issues:
 - Economic development and prospects
 - Politics/political power
 - Regulatory issues/legislation
 - Upstream and downstream developments and prospects/taxation and fiscal terms
 - Company activities, strategies, and performance
 - Analysis of regional political issues and energy transit
- Continued coverage of power developments (fundamentals, infrastructure, and regulation)





Subscription:

Global Power & Renewables

South & Southeast Asia

- In-depth analysis of energy market fundamentals and outlooks to 2050: India Power Market Profile, Bangladesh Power Market Profile, Pakistan Power Market Profile, Sri Lanka Energy Market Profile, Myanmar, Philippines, Vietnam, Indonesia, Singapore, Thailand and Malaysia
- Reviews recent market trends and data, policy changes, and the ways these trends alter the energy landscape: India Power Quarterly
- Monthly updates of data on power supply, demand, pricing, and infrastructure
- Timely analysis of market trends and policy announcements, with implications for investors
- In-depth analysis of power gas sector: Market structure and regulation, fuel supply and demand by sector, energy demand drivers and fuel competition, key market players, and private sector role
- Historical data and forecasts for energy supply, demand, and infrastructure: Energy supply by fuel and key drivers, power generation, demand, capacity, proposed infrastructure projects, and IHS Markit outlook for development timeline
- Key investment opportunities and risks by sector and power capacity requirements by fuel
- Government policy—targets and implementation challenges: Review of key energy policy documents, government power plans, comparison of IHS Markit outlook with government targets, highlighting differences
- Energy price formation, policy, and fuel price outlooks: Electricity tariffs and power supply costs, drivers and constraints to pricing reforms, and outlook on fuel prices

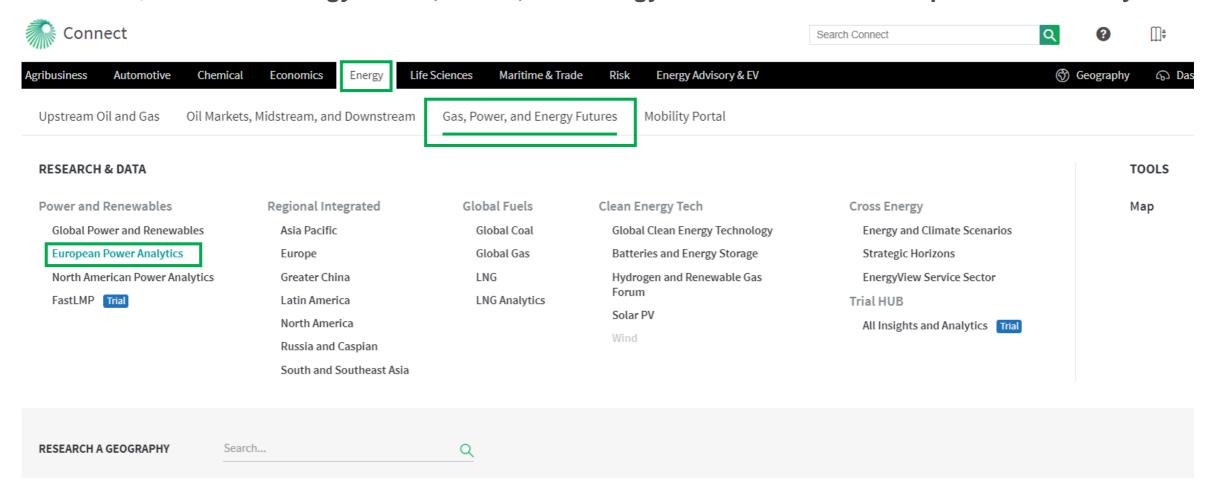


European Power Analytics (EPA)



European Power Analytics in Connect

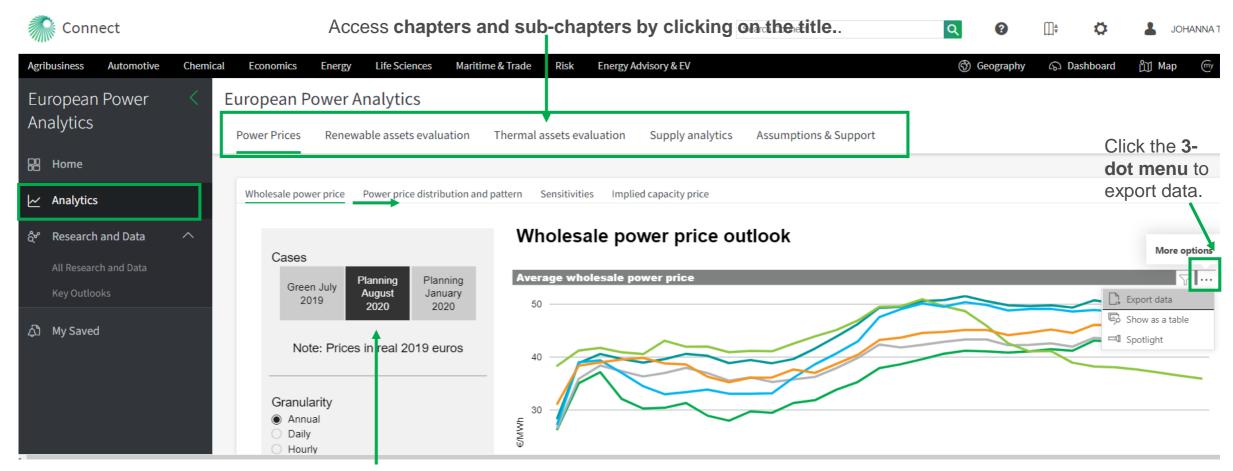
In Connect, hover over Energy > Gas, Power, and Energy Futures > Click on European Power Analytics.





European Power Analytics Page Navigation

Use the left-hand rail to click on **Home**, **Analytics** topics to visualize and customize related data and **Research**.



Apply filter options like Cases, Granularity etc.

^{*}Analytics options are based on user's subscription.



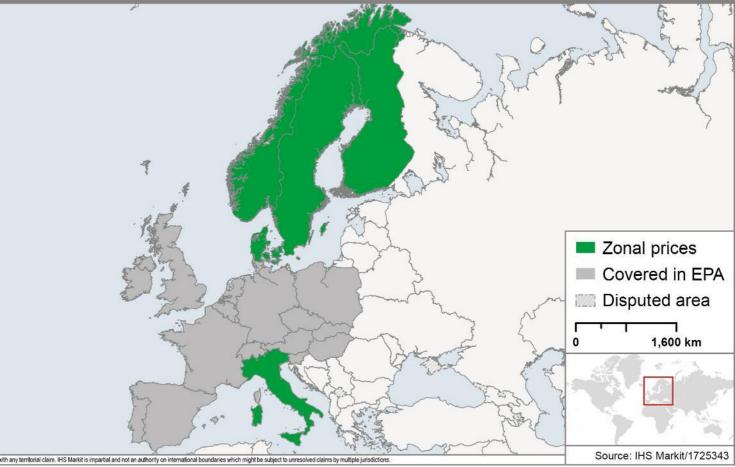
European Power Analytics – Country/Market Coverage

Coverage

Country/market coverage

- Austria
- Belgium
- Czech Republic
- France
- Germany
- Great Britain
- Hungary
- Ireland
- Italy

- Nord Pool
- Netherlands
- Poland
- Portugal
- Slovak Republic
- Slovenia
- Spain
- Switzerland





European Power Analytics – Deliverables

Deliverables

Planning case

- "Business as usual": the European planning case is aligned with IHS Markit economic, industry, and commodity analysis for the long-term evolution of the European economic and energy landscape in our reference case
- Deliverables:
- Hourly prices to 2050 (or 2025)
- Annual asset valuation indicators to 2050 (or 2025)
- Quarterly generation mix
- Annual imports / exports by border

Green case

- "Accelerated transition away from fossil fuels": the European green case assesses the impact of a stronger push for decarbonization across all energy uses and fuels
- Deliverables:
- Hourly prices to 2050
- Annual asset valuation indicators to 2050
- Quarterly generation mix
- Annual imports / exports by border

Sensitivities around the planning case

- Gas price sensitivity: +/- €5/MWh (absolute value may change as they are set at ~ +/-20% of the average price to 2050)
- Renewable penetration sensitivity: renewable net additions are +/-20% of the planning case.
- Deliverables:
- Annual base-load price
- Asset valuation indicators. For thermal assets: value indicators in the sensitivities are provided for the 49% CCGT and 36% coal plants only.
- For 2020, 2025, 2030*, 2040*, and 2050* (*: Half annual updates only)

© 2020 IHS Markit

Source: IHS Markit

In addition to the standard deliverables, IHS Markit can undertake bespoke valuations based on specific plant parameters or market assumptions.



European Power Analytics – Deliverables

European Power Analytics			
Deliverable	Content	Frequency	
Valuation metrics	 Annual realized net revenues: sum of hourly spreads for standardized plants Six (coal) and eight (gas) predefined efficiency and variable operation and maintenance Thermal units: dispatch considers some unit commitment constraints (ramp, min up/down time, etc.) Wind and solar: representative profile; results provided for four predefined bidding strategy reflecting different support mechanisms; onshore/offshore split. Captured prices, adjusted for actual dispatch Implied capacity prices Utilization: full-load-equivalent operating hours per year for thermal plants Technologies covered: CCGT, gas peakers, steam coal, solar PV, wind onshore and offshore 	Quarterly to 2025 (planning case) Twice per year to 2050 (planning case) Once per year to 2050 (green case) Excel	
Power prices	 Hourly power prices Relevant fuel prices: quarterly for the short term, annual for the long term Associated annual macro indicators 	Quarterly to 2025 (planning case) Twice per year to 2050 (planning case) Once per year to 2050 (green case) Excel	
Generation mix	 Generation mix on a quarterly basis Thermal: natural gas, coal, oil, nuclear Renewables: wind, solar, hydro, combustible renewables Imports and exports on a annual basis, by border 	Quarterly to 2025 (planning case) Twice per year to 2050 (planning case) Once per year to 2050 (green case) Excel	
Sensitivities around the planning case	 Impact of changing commodity, carbon, and renewable outlook on wholesale prices, captured prices, and net revenues for thermal plants +/- 5 €/MWh natural gas* +/- 20% wind and solar net additions 	Quarterly to 2025 Twice per year to 2050 Excel	

 $^{^*}$: the absolute values may change as they are set at \sim +/-20% of the average price to 2050 Source: IHS Markit

© 2020 IHS Markit

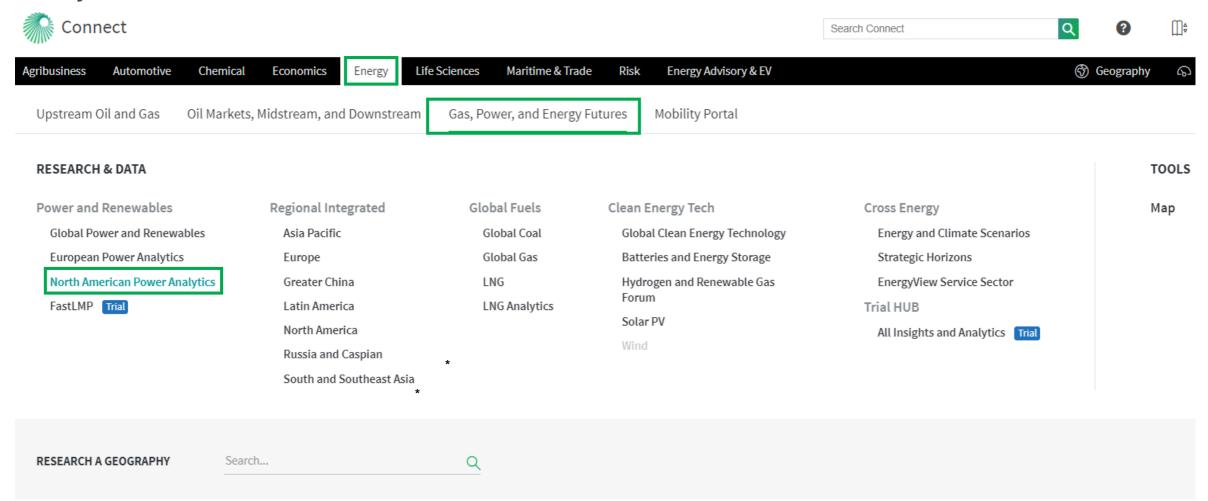


North American Power Analytics (NAPA)



North American Power Analytics in Connect

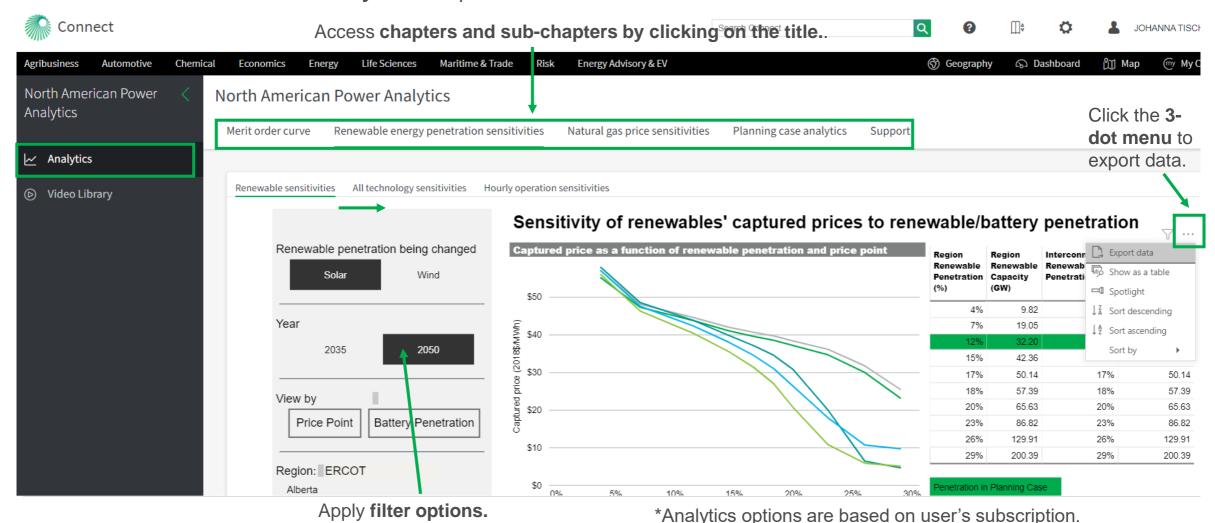
In Connect, hover over Energy > Gas, Power, and Energy Futures > Click on North American Power Analytics.



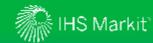


North American Power Analytics Page Navigation

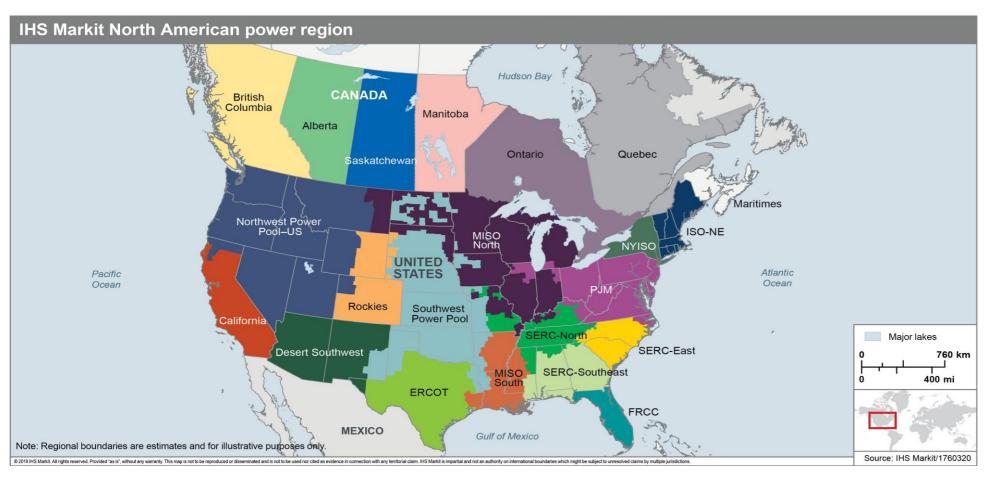
Use the left-hand rail to click on **Analytics** to topics to visualize and customize related data.



Confidential. © 2020 IHS Markit®. All Rights Reserved.



North American Power Analytics – Country/Market Coverage



(Renewable energy penetration sensitivity example)

19 Regions:

- Alberta
- California
- Desert Southwest
- ERCOT
- FRCC
- MISO-North
- MISO-South
- ISONE
- Northwest
- NYISO
- Ontario
- PJM-South
- PJM-MAAC
- PJM-West
- Rockies
- SERC-East
- SERC-North
- SERC-Southeast
- SPP



Key Features Overview – Four Specialized Modules

Renewable Energy Penetration Sensitivity Module

Visualizations of key price and operational data, in response to increasing levels of renewable energy penetration

- All North American markets/regions; multiple price points
- Captured prices for renewables and thermal generators, all-hours market prices, renewables curtailments (zonal)
- Diurnal operating patterns of batteries and other technologies

Natural Gas Price Sensitivity Module

Visualizations of the sensitivity of each generation technology's capacity factor, captured price, and energy margin to the natural gas price; presented for each year and market/region.

Merit Order Curve Module

Visualization of generation supply curve by month-year or year for each market/region, depicting each technology type along with 10th, 50th, and 90th percentile market demand levels.

Planning Case Analytics Module

Capacity factor, captured price and energy margin by technology, year, and region for the IHS Markit Planning Case.

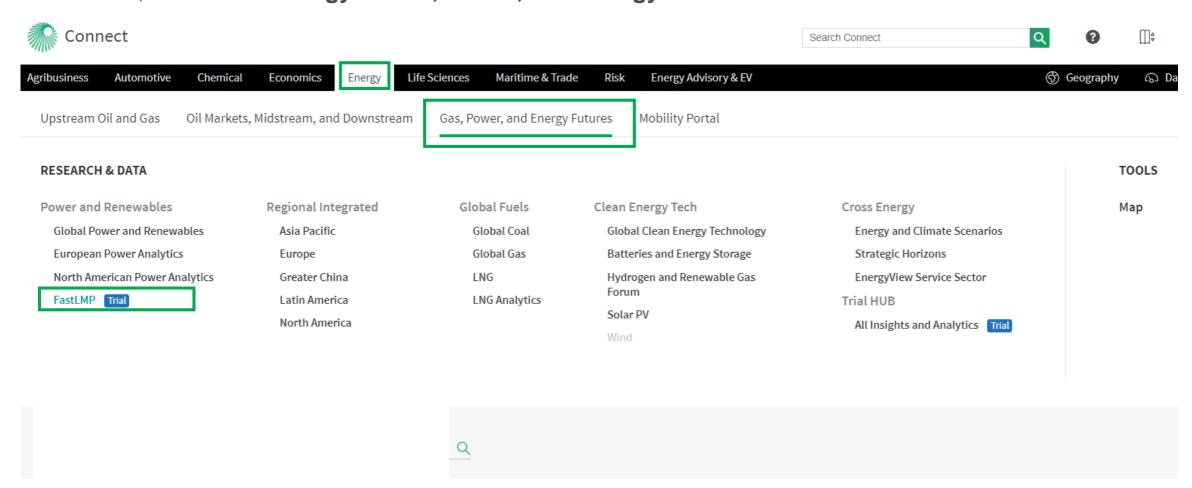


FastLMP (Locational Marginal Price)



FastLMP (Locational Marginal Price) in Connect

In Connect, hover over **Energy** > **Gas, Power, and Energy Futures** > Click on **FastLMP.**

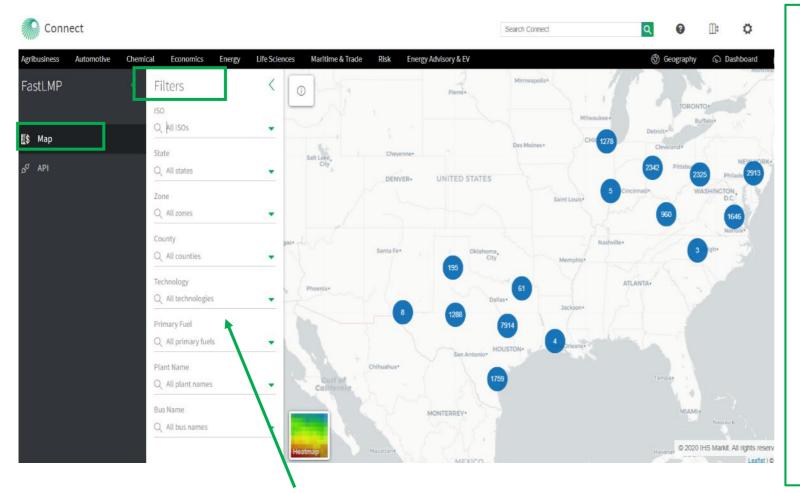


Confidential. © 2020 IHS Markit®. All Rights Reserved.



North American Power Analytics Page Navigation

Use the left-hand rail to click on Map and Filters to visualize and customize related data.



The user can drill down to a 100 mile square grid, to identify a set of nodes for consideration

Nodes are identified as generator or non-generator nodes

Other map features include cities, roads, rail, waterways

A series of filters can be used to narrow down the set of nodes (e.g., state, county, power zone, or characteristics of associated generators)

Heatmap layer allows rapid identification of nodes or regions with higher average basis



Key FastLMP Features

Map interface – Easily navigable map with powerful filtering tools to select nodes for analysis. The user selects from over 22,000 nodes, including generator nodes and other potential nodes for project interconnection.

Historical and forecasted LMP basis visualization – Historical and forecasted LMP basis can be visualized over daily, monthly, annual, and decadal time periods.

Stochastic Outlier Generation – Deep characterization of outage and volatility events in the node history and statistically generated forecasts that align with real values.

Decomposition of LMP basis drivers – LMP basis in any hour derives from the interactions between power supply and demand (including renewables output) and the physics of the transmission system. FastLMP decomposes key drivers associated with each node.

API interface – Data available via API for customers interested in constructing big data applications fed by FastLMP.





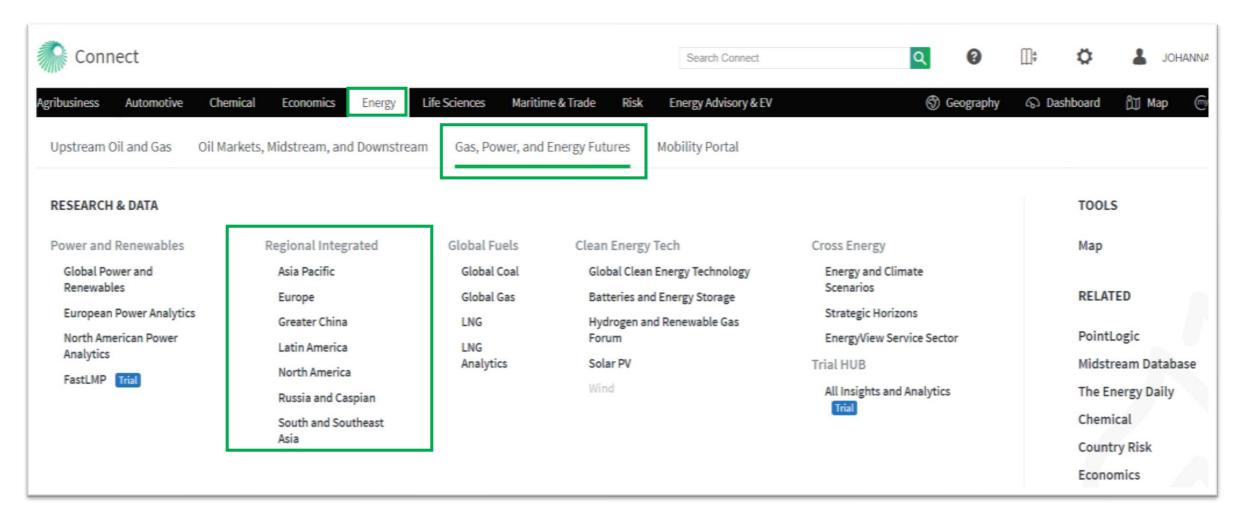
Regional Integrated

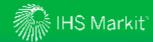
Features analysis and data on regional market fundamentals, the policy landscape and changing consumer demands.



Regional Integrated in Connect

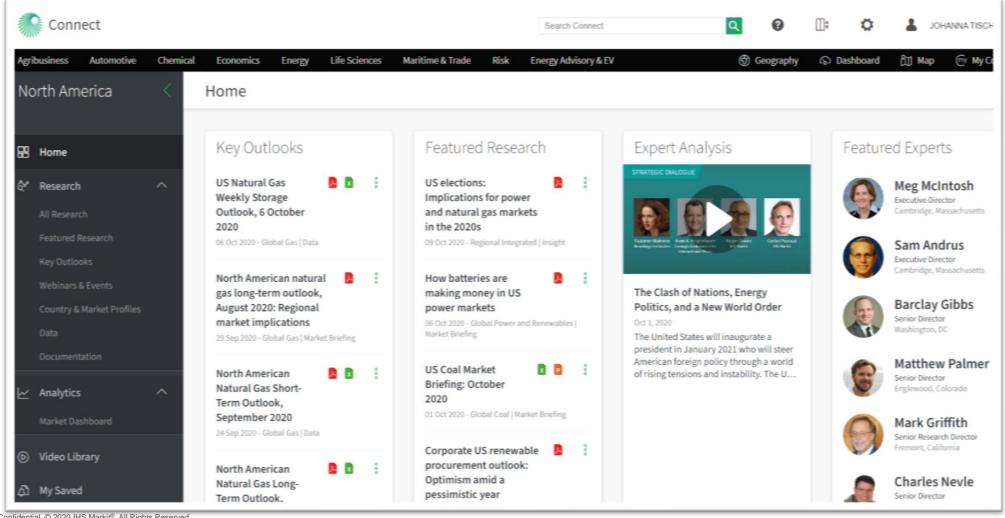
In Connect, hover over Energy > Gas, Power, and Energy Futures > Click within Regional Integrated.





Regional Integrated Home Page

Use the left-hand rail to browse research and analysis under **Home, Research** and data visualization under **Analytics**.



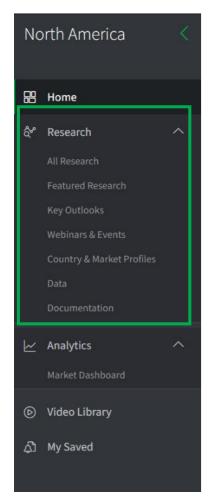
The **Home** page displays various widgets for **Key** Outlooks, **Featured** Research, Expert **Analysis**, Featured **Experts**, key data visualization, and more.

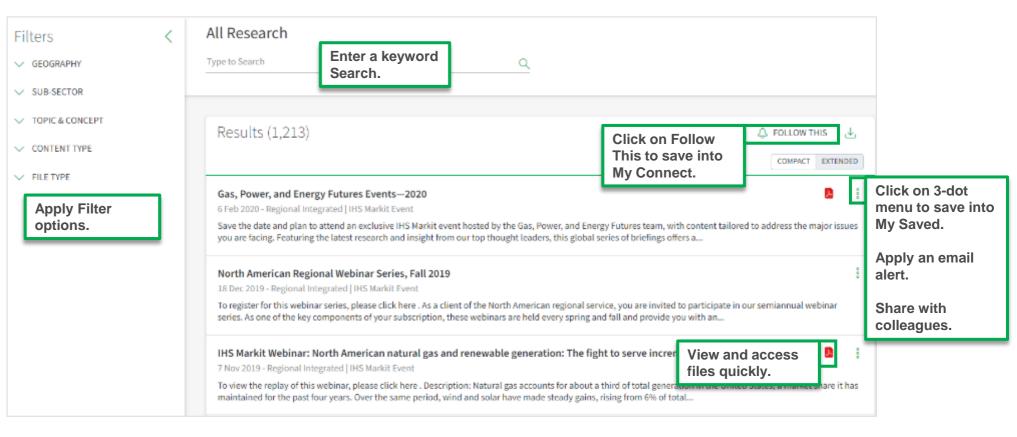
Confidential. © 2020 IHS Markit®. All Rights Reserved.



Regional Integrated Research Page Navigation

Use the left-hand rail to click on **Research topics** to browse and narrow down research.





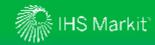
Hover and

3-dot menu

click the

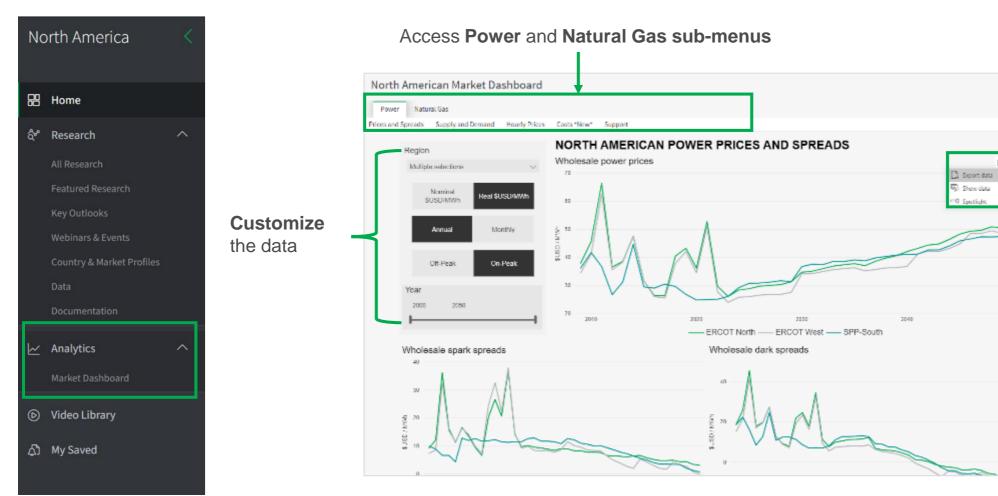
to export

data.



Regional Integrated Analytics

Use the left-hand rail to click within Analytics on Market Dashboard to visualize and customize related data.



*Analytics options are based on user's subscription.





Regional Integrated Deliverables: Asia Pacific - Overview

List of deliverables			
Deliverable	Content	Update frequency	
Market Briefings	Reviews of recent market activity, policy changes, and investments in the previous quarter and its implication on the market outlook	Quarterly	
Market Profiles	Comprehensive market profiles covering fundamentals, policies, and outlooks through 2050 at the national level, and at the provincial/state level as applicable	Annually	
Trackers	Detailed tracking of assets, prices, demand and supply, and other major market activities as applicable	Frequently, ad hoc	
Data Tables	Historical and outlook for energy supply, demand, price and tariffs as applicable	Monthly/Quarterly	
Company Profiles	Analysis and insights on company business segments and strategies of key energy players as applicable	Annually	





Regional Integrated Deliverables: Asia Pacific – Market Briefings

Sector	Southeast Asia	South Asia	Greater China	OECD Asia
Power & Renewables	Southeast Asia Power and Renewables Market Briefing	Bangladesh Energy Briefing (half-yearly) India Power Market Briefing India Renewables Market Briefing (half-yearly) Pakistan Energy Driefing (half-yearly)	Mainland China Electric Power Quarterly Market Briefing	To be updated
Gas	Southeast Asia Gas and LNG Market Briefing	India Gas Market Briefing	Mainland China Natural Gas Market Briefing	To be updated
Coal	V	India Steam Coal Market Briefing India Coking Coal Market Briefing	China Coal Market Briefing	





Regional Integrated Deliverables: Asia Pacific – Country Profiles

Sector	Southeast Asia	South Asia	Greater China	OECD Asia
Power & Renewables	Power/Renewables Market Profile: Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam	Power/Renewables Market Profile: Bangladesh, India (including Power Profile, State Profile, Retail Tariffs), Pakistan Sri Lanka Energy Profile South Asia Renewable Profile Sri Lanka Energy profile	Mainland China Gas, Power, and Coal Market Profiles Mainland China renewable profiles Mainland China Provincial Profiles Taiwan Gas and Power Market Profiles	Power/Renewables Market Profile: Australia, Japan, South Korea
Gas	Natural Gas Market Profile: Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam	Natural Gas Market Profile: Bangladesh, India, Pakistan	Hong Kong Gas and Power Market Profiles Mainland China Carbon Policy & Carbon Price Outlooks Mainland China Energy Watch	To be updated
Coal	Coal Market Profile: Indonesia, Malaysia, Vietnam	Coal Market Profile: Bangladesh, India, Pakistan	Coal Market Profile: Taiwan China Coal Market Fundamentals	Coal Market Profile: Japan





Regional Integrated Deliverables: Asia Pacific – Data Tables

Sector	Southeast Asia	South Asia	Greater China	OECD Asia
Power	& Demand & Availability,	India Rower and Renewables	Electric Power Data Tables:	Japan Electric Power Data
Renewable	es Generation by fuel, Commodity	tracker, Bangladesh Power	Mainland China, Hong Kong,	Tables
	demand, Power plant	Data Tables	Taiwan	South Korea Electric Power
	utilization		Mainland China Electric Power	Data Tables
			Wholesale & Retail Price Data	Australia Power Data Tables
Gas	Trade Data Tables:	Natural Gas Data Tables:	Natural Gas Data Tables:	Australia Natural Gas Data
	Indonesia, Malaysia, Myanmar,	Bangladesh, India, Pakistan	Mainland China, Hong Kong,	Tables
	Singapore, Thailand		Taiwan	
	Southeast Asia Natural Gas		Mainland China Natural Gas	
	Price Outlook		Price Data Tables	
Coal		Thermal coal: India market	China Coal Price Data Tables	Australian Ports weekly data
		fundamentals	China Coal Data Tables	Australian weekly coal
		Metallurgical coal: India market	China Provincial Steam Coal	shipments
		fundamentals	Demand Outlook	Australian vessel queues and
			China's Thermal Coal Price	delays weekly
			Outlook	
			China Coal Production and	
			Cost Outlook	





	Monthly data	Quarterly reports	Annually updated outlooks	Annually updated profiles	Ad-hoc papers (recent topics)	Webinars/Videos/ Events (recent topics)
Gas	Gas data tables	Gas market briefing	Demand outlook by sector	Gas company profiles	Cross-subsidy removed at the citygate level	LNG import outlook
	Gas price data tables		Supply outlook by basin	Small LNG tracker	Gas supply shortage	
			Citygate price outlook	Regas terminal trackers (by region)	US-China trade war impact on LNG	
			Industrial retail gas price outlook		Hong Kong gas supply options	
Power	Power data tables	Power market briefing	Wholesale and retail price data	Gas-fired power tracker	Impact of renewable policies on wind capex trend	Wind capex trend
			Provincial power demand outlook by sector	LCOE tracker	Peak power supply tightness	
			Provincial power supply outlook by technology	Mainland China renewable profiles	Nuclear power approval	
			Regional power generation cost outlook	Power company profiles	Policies to reduce retail power tariffs	
Coal	Coal data tables	Coal market briefing	Provincial coal demand outlook by sector		Import restriction policies	Coal import policies
	Coal price data tables		Coal production and cost outlook by production unit			
			Qinhuangdao delivered coal price outlook			
Integrated	Mainland China carbon tracker			China Energy Watch		Energy and air pollution in China: Implications on coal and gas
				10 Big Questions for China Energy		Fuel in the heating sector
				Provincial Profiles		Bi-annual energy briefings
				-		·





Deliverable	Content	Update frequency
Mainland China Natural Gas Data Tables	Monthly domestic gas production volumes, gas import/export volumes and values by country, annual provincial gas demand, pipeline length, and population connected to the gas grid, and five-year supply and demand outlooks	Monthly
Mainland China Natural Gas Price Data Tables	Regulated citygate prices by province and retail prices by sector in key cities, monthly gas import price by port, and monthly wholesale LNG prices	Monthly
Taiwan Natural Gas Data Tables	Monthly import volumes and prices, quarterly domestic gas prices, annual gas consumption by sector, and five-year supply and demand outlooks	Monthly
Hong Kong Natural Gas Data Tables	Monthly import volumes and prices, annual gas consumption by sector, and five-year supply and demand outlooks	Monthly
Mainland China Natural Gas Quarterly Market Briefing	Analysis of recent changes in the natural gas market fundamentals and policy development during the previous quarter, and assumptions behind five-year supply and demand outlooks	Quarterly
Mainland China Provincial Gas Demand Outlook by Sector	Provincial level gas demand outlook by sector (industrial, feedstock, power generation, district heating, commercial, residential, transport, and others) through 2050	Annually
Mainland China Citygate Gas Price Outlooks	Citygate gas price outlooks in key provinces through 2050	Annually
Mainland China Industrial Retail Gas Price Outlooks	Regulated industrial retail gas price outlook in key provinces through 2050	Annually
Mainland China Small Land-based Liquefaction Watch	Annual updates of capacity addition at the provincial level, trends in utilization rates and prices, and analysis on recent market developments and policies impacting small liquefaction business	Annually
Mainland China LNG Procurement Strategy Watch	Annual updates on key mainland Chinese LNG importers' strategies to procure LNG from the global market and to build up midstream infrastructure to support LNG demand growth	Annually
Mainland China Regional Regasification Outlooks: North, Central, South	Regional regasification outlook by terminal and LNG procurement strategies analysis by key players	Annually





Deliverable	Content	Update frequency
Mainland China Electric Power Data Tables	Provincial power consumption, national power consumption by sector and generation by type, regional peak load, and five-year consumption by sector and capacity addition by resource outlooks	Monthly
Taiwan Electric Power Data Tables	Power consumption by sector, capacity and generation by fuel, key power plants, and five-year supply and demand outlooks	Monthly
Hong Kong Electric Power Data Tables	Power consumption by sector, generation by fuel and power imports, key power plants, and five-year supply and demand outlooks	Monthly
Mainland China Electric Power Quarterly Market Briefing	Analysis of recent changes in the power market fundamentals and policy development during the previous quarter, and assumptions behind five-year supply and demand outlooks	Quarterly
Mainland China Electric Power Wholesale & Retail Price Data	Provincial on-grid tariffs for coal, renewables, and nuclear power, and retail power rates for key consuming sectors	As updated by the governments
Mainland China Gas-Fired Power Trackers	Key development trends, policies, and players in gas-fired power and nuclear power development, and the implications on the power market	Annually
Mainland China Provincial Electric Power Demand Outlook by Sector	Provincial level power demand outlook by sector (agriculture, industrial, commercial and services, residential, transport, grid loss, and power station internal use) through 2050	Annually
Mainland China Provincial Electric Power Supply Outlook by Technology	Provincial installed capacity and generation outlook coal-fired, gas-fired, hydro, nuclear, wind, and other major generation technologies through 2050	Annually
Mainland China Regional Electric Power Cost of Power Generation Outlook	Analysis on the key components that make up generation costs and outlook to 2050 for the key power supply options	Annually





Deliverable	Content	Update frequency
Mainland China Provincial Profiles	Over twenty provincial profiles on economic development, supply, demand, and policies across the energy market including gas, power, and coal	Annually
Mainland China Gas and Power Company Profiles	Analysis and insights on company structure, assets, subsidiaries, fuel procurement, international expansions, and future business strategies of key gas, power, and coal companies in mainland China	Annually
Mainland China Gas, Power, and Coal Market Profiles	A comprehensive introduction to market structures, supply and demand drivers, key market players, regulations, and policies in different energy markets in mainland China	Annually
Taiwan Gas and Power Market Profiles	A comprehensive introduction to market structures, supply and demand drivers, key market players, regulations, and policies in different energy markets in Hong Kong	Annually
Hong Kong Gas and Power Market Profiles	A comprehensive introduction to market structures, supply and demand drivers, key market players, regulations, and policies in different energy markets in Taiwan	Annually
Mainland China Carbon Policy & Carbon Price Outlooks	Fuel- and policy-related research on recent developments in China's rapidly evolving carbon policy, including an overview of mainland China's regional pilot markets, historical price and volume data in the regional markets, and assumptions and outlooks to 2050 for national carbon policy, emissions, and prices	Monthly
Mainland China Energy Watch	A summary of key energy market developments in the past year, including changes in market fundamentals, new policy directions, and emerging players, and key uncertainties that will impact mainland China and global energy markets during the next several years	Annually
Politics, Policy, and Regulatory Strategic Reports	Ad-hoc analysis and reports with long-term implications on recent developments in gas, power, and coal markets	Ad-hoc
Greater China Integrated Energy Research Briefings	Workshops held twice-yearly in Beijing underpinned by shared cross-fuel fundamentals analysis	Twice annually





Deliverable	Content	Update frequency
Mainland China Coal Market Supply & Demand Data Tables	Coal domestic production, imports/exports volumes, coal stocks in ports and coal stocks and daily consumption at key mainland Chinese power plants	Monthly
Mainland China Coal Price Data Tables	Weekly coal prices of six different pricing points, including Datong 5,500 NAR and 5,800 NAR Qinhuangdao FOB prices	Monthly
Mainland China Coal Quarterly Market Briefing	Analysis of recent changes in the coal market fundamentals and policy development during the previous quarter, and assumptions behind five-year supply and demand outlooks	Quarterly
Mainland China Provincial Coal Demand Outlook by Sector	Provincial level steam coal demand outlook by sector (industrial, feedstock, power generation, heating, residential, and others) through 2050	Annually
Mainland China Coal Supply Production and Cost Outlook by Production Unit	Chinese national coal production and thermal coal mining costs for 102 production units to 2050	Annually
Qinhuangdao Delivered Coal Price Outlook	Datong 5,500 NAR Qinhuangdao FOB coal price outlook to 2050	Annually





Regional Integrated Deliverables: European Power

European power		
Deliverable	Content	Frequency
Wholesale power price outlook (short-term)	 Baseload and peak prices for 14 European markets—quarterly through 2025, real and nominal Dirty and clean spark and dark spreads Benchmark prices for coal, gas, and carbon Deflators and exchange rate outlooks 	Quarterly Excel
Wholesale power price outlook (long-term)	 Baseload prices for 14 European markets—annually to 2050, real and nominal Dirty and clean spark and dark spreads Benchmark prices for coal, gas, and carbon Deflators and exchange rate outlooks 	Twice per year Excel
Quarterly price review	• Quarterly review of the new price forecast including a list of the assumptions that have been updated, and their impacts on the wholesale power price (compared with our previous projection)	Quarterly Report
Country-level balances and generation	 Historical generation by fuel by country and imports/exports Consumption by sector 	Monthly Excel
Long-term planning case	 IHS Markit outlook for 36 European countries—annually through 2050 Reserve margins and derating assumptions Economic growth, power demand by sector including losses, peak demand Installed capacity, retirements and additions, generation by technology: Renewables: biomass, large/small/pumped hydro, onshore/offshore wind, concentrating solar power (CSP), solar photovoltaic (PV) (large scale/commercial/residential), other Storage: large-scale split arbitrage, frequency regulation, T/D avoidance, renewable integration, behind the meter Thermal: gas (split combustion turbine and other)/coal (split hard and soft), nuclear, and oil Cross-border interconnection capacity Renewable penetration (as the European Renewable Directive) 	Twice per year Excel
Alternative cases	 Full power balances to 2050, including power demand and power generation, capacity, additions, and retirements by fuel Also power price and carbon price outlooks 	Annual Excel

Source: IHS Markit © 2020 IHS Markit





Regional Integrated Deliverables: European Renewable Power

Deliverable	Content	Frequency
Renewable power market update	 Major policy announcements in the proceeding six months Evolution of green certificate prices Review of the renewable pipeline, by company, country, and technology Review of the storage pipeline Review of wind and solar M&A activity 	Twice per year Report and Excel
Renewable support update	 Emerging trends in renewable support policy across Europe Comparison of remuneration by technology by country Support levels and key scheme characteristics for range of renewable technologies: Onshore and offshore wind Solar (CSP, ground based, large rooftop, residential rooftop) Geothermal, small hydro, ocean, biomass, biogas 	Annual Report and Excel
Levelized cost of renewable power	 Analysis of the levelized cost of renewable power by technology by country—historical and forecast Data provided for 21 European markets Analysis includes Expected evolution of capital cost by technology Sensitivity to key drivers of cost: opex, capex, weighted average cost of capital, capacity factor 	Annual Report and Excel
Renewable power M&A review	 Review of transactions for renewable assets in 36 European countries Studied metrics include: deal count, announced transaction value, generating capacity by technology, and asset maturity 	Annual Report and Excel

Source: IHS Markit © 2020 IHS Markit

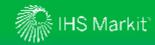




Regional Integrated Deliverables: European Coal and Natural Gas

European coal and natural gas			
Deliverable	Content	Frequency	
Natural gas watch	 Report describing medium-term demand, supply, and price outlooks for the European gas market Focus on demand evolution by sector and main policy driver Impact of international gas market on Europe 	Annual Report	
Supply demand tracker	 Monthly review of recent evolution of gas demand and supply in the seven largest European gas markets Gas storage inventory Commentary on key drivers affecting the five-year market outlook 	Monthly Report	
Competitive fuel price report	 Description of the IHS Markit short-term outlook for coal, gas, and oil Comparison to the forward market 	Quarterly Report	
Commodity price outlook	 Coal prices through 2050 provided for six European delivery points, updated monthly Gas prices through 2050 for 11 hubs and 10 border prices, updated monthly Oil prices through 2050 for five benchmark series, updated monthly 	Monthly Excel	
Gas supply and demand outlook - Reference case	 Gas demand by sector to 2050 for 36 European countries in our Reference case Gas supply by source to 2050 for 36 European countries in our Reference case 	Twice a year Excel	
Gas supply and demand outlook - alternative cases	 Gas demand by sector to 2050 for 36 European countries in our alternative case Gas supply by source to 2050 for 36 European countries in our alternative case 	Once a year Excel	
Storage inventory	Current level of storage fill in the main European markets	Monthly Excel	
Heating and cooling degree days	Yearly, monthly, quarterly, heating and cooling degree days per country	Monthly Excel	

Source: IHS Markit



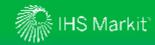


Regional Integrated Deliverables: North American Power and Renewables (1)

Deliverable Name	Content	Frequency, Format
North American Power Market Outlook	A comprehensive, quantitative outlook to 2050 for all major power markets, including underlying economic indicators, power demand, new power supply costs and characteristics, generating capacity retirements and additions, average capacity factor of generation supply across fuels/technologies, fossil fuel prices at relevant delivery points, emission allowance prices, monthly wholesale energy prices, spark spreads, dark spreads, implied heat rates, and capacity values.	Semiannual, Excel (Q2 and Q4)
	,, ,	Semiannual, Report
	An accompanying report highlighting insights and trends across all power markets.	(Q2 and Q4)
North American Power Market Hourly Prices Outlook data tables	A North American Power Market Outlook supplement providing more granular wholesale energy price data of value to market participants for a variety of analyses, most notably forecasting revenue of intermittent renewable resources.	Semiannual, Excel (Q2 and Q4)
North American Power and Natural Gas Market sensitivity cases	A series of sensitivity cases that explore key uncertainties in the latest outlook, and the impact of changes to specific outlook elements.	Trailing outlooks, Excel & Report
North American Regional Power Market Outlooks	Six reports detailing region-specific developments, insights and fundamental market trends. Regions include Northeast, PJM, Southeast, Mid-Continent, ERCOT, and West.*	Annual, Reports
North American Regional Power Market Profiles	Individual reports on over 15 major power markets, which summarize the market structure and key trends to date, including supply/demand, fuel mix, generation asset ownership, and wholesale energy prices.	Annual, Reports
US Coal-Fired Power Plant Retirement Announcements	A quantitative summary of US coal-fired power plant owners' plans to retire specific units, including identification of those that have been ordered or approved to retire by the federal or state regulators.	Semiannual, Excel (Q2 and Q3)
US wind and solar PV captured price outlook	A detailed quantitative outlook and summary report on captured prices to onshore wind and utility-scale solar PV (or the average wholesale electricity price that the variable renewable generators can capture given their estimated hourly generation profile), as well as a comparison of the projected levelized captured price to projected levelized cost of electricity (LCOE) by region and online year.	Semiannual, Excel & Report

Note: North American coverage includes Canada and the US Lower 48, unless otherwise indicated.

^{*}Northeast, Mid-Continent, and West include coverage of Canadian power markets.





Regional Integrated Deliverables: North American Power and Renewables (2)

Deliverable Name	Content	Frequency, Format
North American Renewable Power Market Outlook	A report and accompanying data set with state and provincial capacity addition projections for wind, solar, biomass, geothermal, small hydro, and ocean energy. Solar projections are provided by segment: utility-scale, C&I, and residential. The outlook in this deliverable provides a more granular view of renewable additions than is included in the North American Power Market Outlook.	Semiannual, Excel & Report (Q2 and Q4)
North American Battery Energy Storage System Outlook	Regional and provincial capacity addition forecast for battery energy storage systems (BESS) capacity additions by market, duration and application. The outlook in this deliverable provides a more granular view of BESS additions than is included in the North American Power Market Outlook.	Semiannual, Excel & Report (Q1 and Q2)
US Onshore Wind Capital Cost and LCOE Outlook US Solar PV Capital Cost and LCOE Outlook	Reports and accompanying data sets with technology specific capital cost and performance outlooks, including levelized required price projections for new, utility-scale project development.	Annual, Excel & Report
US Battery Storage Capital and Levelized Cost Outlook	A report and accompanying data set detailing current and projected capital costs for BESS used in grid applications.	Annual, Excel & Report (Q3-Q4)
North American Renewable Power Policy and Market Developments	A summary report highlighting the latest renewable policy developments.	Periodic, Report
North American Wind and Solar Power Project and PPA Activity	A data set summarizing the latest project pipeline status and PPA activity.	Periodic, Excel
North American wind and solar power ownership rankings	A report and accompanying data set with a project-by-project breakdown of the top wind and solar asset owners and their recent asset and portfolio transactions.	Annual, Excel & Report
Regional Renewable Energy Certificate (REC) Market Outlooks	Reports and accompanying data sets that provide an overview of selected regional REC markets, including demand from state-level policy targets, supply from existing and forecast renewable generation, levelized required prices to utility-scale renewable resources, and associated premium to wholesale energy prices.	Periodic, Excel & Report

Note: North American coverage includes Canada and the US Lower 48, unless otherwise indicated.





Regional Integrated Deliverables: North American Natural Gas and Coal

North American Natural Gas and Coal				
Deliverable Name	Content	Frequency, Format		
North American Natural Gas Short- Term Outlook	A report summarizing the short-term market drivers and trends, and accompanying data set with three-year forecasts for natural gas monthly pricing (Henry Hub and approximately 30 key pricing points; storage; supply/demand balances; pipeline flows; and play-level unit cost, production, and drilling activity.	Monthly, Excel & Report		
North American Natural Gas Quarterly Regional Profiles	Individual reports summarizing regional markets and accompanying data set with corresponding supply/demand balances.	Quarterly, Excel & Report		
US Natural Gas Weekly Storage Outlook	Provides a short-term (two-week) outlook for US lower-48 storage injections and withdrawals and discusses the impact on natural gas prices.	Weekly, Report (Tuesdays)		
North American Natural Gas Pipeline Expansion Database	A list of pipeline expansion projects that have been announced for North America. Includes key project details such as estimated capital costs, project scope, and transportation capacity costs.	Quarterly, Excel		
US lower-48 natural gas weather sensitivities	A report summarizing the current seasonal outlook, with high-demand and low-demand sensitivities.	Semiannual, Report		
North American Natural Gas Long- Term Outlook	A report summarizing the long-term North American market drivers and trends, and accompanying data set with forecasts to 2050 for natural gas monthly pricing (Henry Hub and approximately 30 key pricing points); storage; supply/demand balances; pipeline flows; and play-level unit cost, production, and drilling activity.	Semiannual, Excel & Report (February and August)		
North American natural gas long-term outlook: Regional market implications	An accompanying report to the North American Natural Gas Long-Term Outlook, summarizing the long-term regional market drivers and trends.	Semiannual, Excel & Report		
US Steam Coal Market Outlook	A report capturing the long-term US coal market outlook, including recent event impact analysis, analysis of the competiveness of coal and natural gas in US power generation, basin stockpile projections (and underpinning production, demand, imports and export), and monthly price outlooks.	Monthly, Excel & Report		
North American Power and Natural Gas Market sensitivity cases	A series of sensitivity cases that explore key uncertainties in the latest outlook, and the impact of changes to specific outlook elements.	Trailing outlooks, Excel & Report		

Note: North American coverage includes Canada and the US Lower 48, unless otherwise indicated.





Regional Integrated Deliverables: Latin American Power

Deliverable	Content	Update frequency
Power market fundamentals report	Report that analyzes capacity additions, changes in reserve margins while providing key power trends and drivers, technology shifts market updates, and a 10-year outlook for supply/demand balance	Annual
Long term outlooks	Power demand, installed capacity, annual capacity additions, annual generation by technology and country to 2050.	Bi-annually
Power price report	Historical price report outlining relevant inputs with key highlights and implications. Mexico and Brazil power prices include long term outlooks for selected industrial and average residential/commercial tariffs.	Quarterly
Tech tracker	Dynamic snapshot of the competitiveness of each generation technology in the Brazilian and Mexico power markets.	Annually
Market Dashboards	Interactive dashboards to visualize key data points including supply, demand, and prices for both gas & power.	Seasonally
Strategic and insight reports	Strategic research reports covering topics relevant for strategic decision-making processes	Regularly
Country profiles	Individual country profiles covering policy, economic trends, market fundamentals, market structure, regulatory framework in the power sector	Annually





Regional Integrated Deliverables: Latin American Gas

Deliverable	Content	Update frequency
Natural gas market fundamentals report	Report that analyzes project pipelines, market updates while breaking down trends underlying each market's midterm outlook, as well as regional trade and LNG imports.	Annual
Midterm outlooks	Natural gas outlooks for production, import/export levels, and end user demand.	Half-yearly
Natural gas price report	Report with natural prices (historical and outlooks) outlining relevant inputs with key highlights and implications.	Quarterly
Strategic and insight reports	Strategic research reports covering topics relevant for strategic decision-making processes	Regularly
Natural gas country profiles	Individual country profiles covering policy, economic trends, market fundamentals, market structure, regulatory framework in the natural gas sector	Annually





Regional Integrated Deliverables: Russian and Caspian Energy

KEY DELIVERABLES

- Strategic analytical reports:
- Reports have different lengths and depth of coverage: Private Reports, Decision Briefs, Watches, Market Briefings, Insights, and Alerts
- Short analytical pieces (memos/alerts)
- · Workshop/Forum events and discussions
- Selected analytical data sets: Eurasia gas export outlook, national oil and gas balances, energy production tables, etc.

TOPICS

· All energy sectors and aspects:

- Upstream oil and gas: production, reserve and resource base, taxation and fiscal terms, regulation and investment environment
- Midstream and downstream issues for oil and gas: pipelines and transportation, refining, exports
- · Electric power (thermal generation, hydro, nuclear, renewables) and coal (production, exports)
- Energy consumption and domestic energy markets

• Immediate, regular analysis of important topics that reflect broader concerns and issues:

- · Economic development and prospects
- · Politics/political power
- Regulatory issues/legislation
- · Upstream and downstream developments and prospects / taxation and fiscal terms
- · Company activities, strategies, and performance
- Analysis of regional political issues and energy transit

· All countries within region:

· Russia, Kazakhstan, Turkmenistan, Ukraine, Belarus, Azerbaijan, Uzbekistan, Georgia, Tajikistan, Kyrgyzstan, Moldova, Armenia

KEY FOCUS AREAS

- Russian oil and gas developments, regional upstream developments in Kazakhstan, Turkmenistan, Azerbaijan, and National oil companies (NOCs)
- Domestic energy markets (i.e. consumption trends and pricing) and export issues across region (i.e. transportation, markets, prices)
- Politics, economics and geopolitical risks
- State policy and regulation





Regional Integrated Deliverables: South and Southeast Asia

Greater Breadth of Coverage

Frequent Market Updates

Detailed Insights

Annual

Quarterly & Half-yearly

Monthly

Periodic

Profiles

In-depth analysis of energy market fundamentals and outlooks, covering power, gas, and coal.

Reports:

- India:
 - Natural Gas Profile
 - · Coal Profile
 - Power Profile
 - · State Profile
 - Retail Tariffs
- Bangladesh & Pakistan
 - · Power Profile
 - · Gas Profile
- Sri Lanka Energy Profile
- South Asia Renewable Profile
- Market dashboard on connect with longterm power and gas outlooks 2010-2050

Energy Briefings

Reviews recent market trends and data, policy changes, and the ways these trends alter the energy landscape.

Reports:

- Quarterly for India
 - Power
 - Power price tracker
 - Coal
 - Natural gas
- Half-yearly:
 - Renewables Briefing India
 - Energy Briefing Bangladesh
 - Energy Briefing Pakistan

Data Tables

Monthly updates of data on power, gas, and coal supply, demand, pricing, and infrastructure.

Tables:

- Power
 - Demand & Availability
 - Installed Capacity
 - Generation
 - Power Prices
 - · Gas power plants
 - Power outages
- · Coal & Gas
 - Demand-Supply
 - Imports
 - Prices

Market Insights

Timely analysis of market trends and policy announcements, with implications for investors.

Examples:

- India's roadmap for power market reforms: quest for organized and efficient market operations
- The final verdict: Bangladesh increases gas subsidy and consumer tariffs, on account of LNG imports
- India's captive coal industry: Will passive development continue to fuel import growth?
- Low renewable auction prices in India: aggressive bids or unrealistic expectations?

IHS Connect Videos - An exclusive platform for delivery of content through short analysis.





Regional Integrated Deliverables: South and Southeast Asia

Greater breadth of coverage

Frequent Market Updates

Detailed insights

Annual Quarterly Periodic

1. Annual Profiles

In-depth analysis of energy market fundamentals and outlooks to 2050, covering power, gas, coal and renewables.

Country profiles covering Myanmar, Philippines, Vietnam, Singapore, Thailand, Malaysia, Indonesia, Laos and Cambodia.

Sample reports:

- Vietnam Natural Gas Market Profile
- Philippines Power Market Profile
- Indonesia Coal Market Profile
- · Indonesia Power Market Profile
- Indonesia Natural Gas Market Profile
- Malaysia Renewable Market Profile
- Singapore Power and Renewables Profile

2. Market Briefing

Reviews recent market activity, policy changes, trades and investments. Trends are highlighted to determine the impact on our Southeast Asia outlook.

Sample reports:

- Southeast Asia gas/LNG and coal quarterly (7 country coverage)
- Southeast Asia power and renewables quarterly (7 country coverage)

3. Data Tables

Updates of annual forecast for power, gas, coal and renewables.

Data is delivered on Power BI analytics platform.

Tables:

- Demand & Availability
- · Generation by fuel
- Commodity demand
- Power plant utilization

4. Market Insights

Timely analysis of market trends and policy announcements, with implications for investors.

Delivery in the form of videos, written insight and power point.

Examples:

- Indonesia coal-fired capacity to triple by 2050 but financing will be challenging.
- EGAT's request for LNG supply marks the deliberate start of liberalization.
- A potential rewrite of Malaysia's power sector

IHS Connect Videos – An exclusive platform for delivery of content through short analysis.



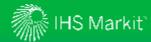
Global Fuels

Features analysis and data on global market fundamentals, the policy landscape and changing consumer demands.



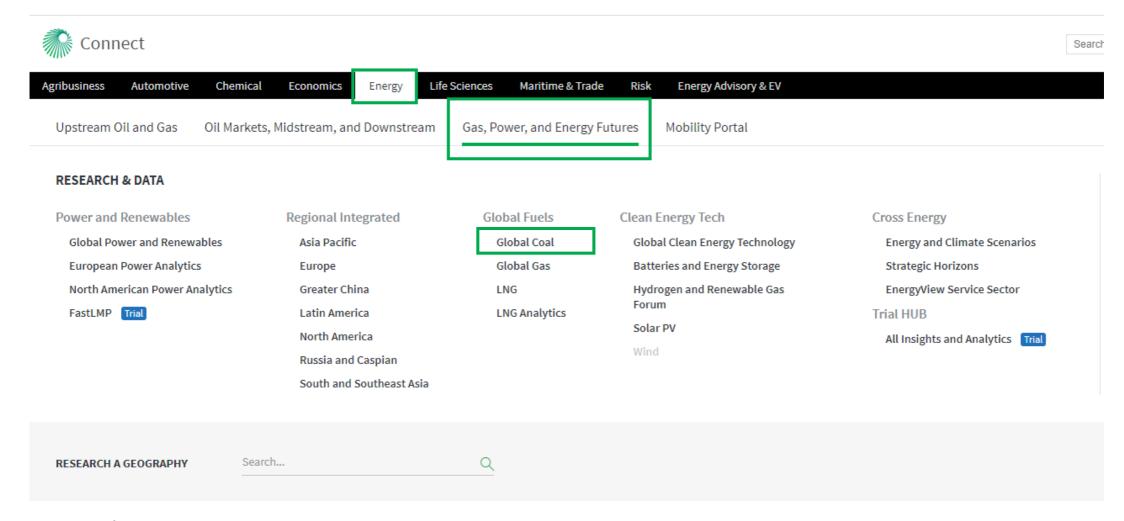
Global Coal

Provides international coal benchmark pricing and market data – from biweekly in-depth reports to real-time email alerts.



Global Coal in Connect

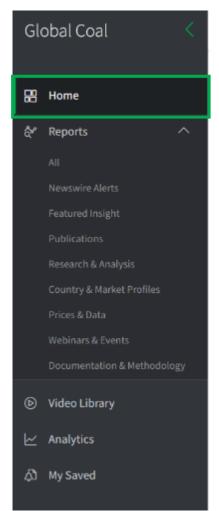
In Connect, hover over the **Energy** menu > **Gas, Power, and Energy Futures** > click on **Global Coal**.



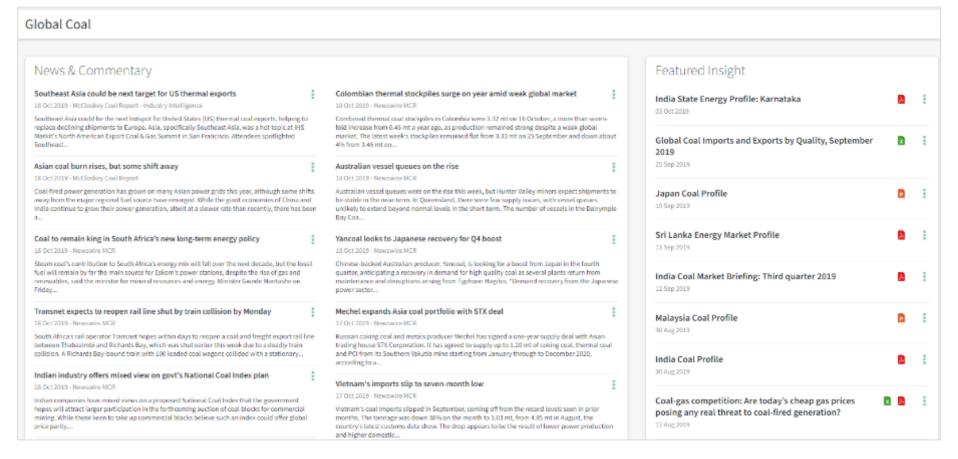


Global Coal Home Page

Use the left-hand rail to browse research and analysis under **Home** and **Research** and data visualization under **Analytics**.



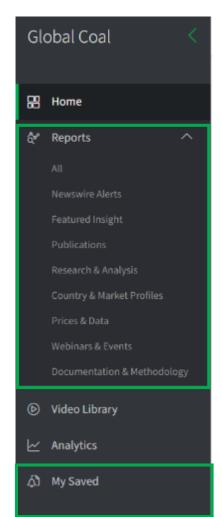
The **Home** page displays various widgets for **News & Commentary, Featured Insight, Expert Analysis, key data visualization**, and more.



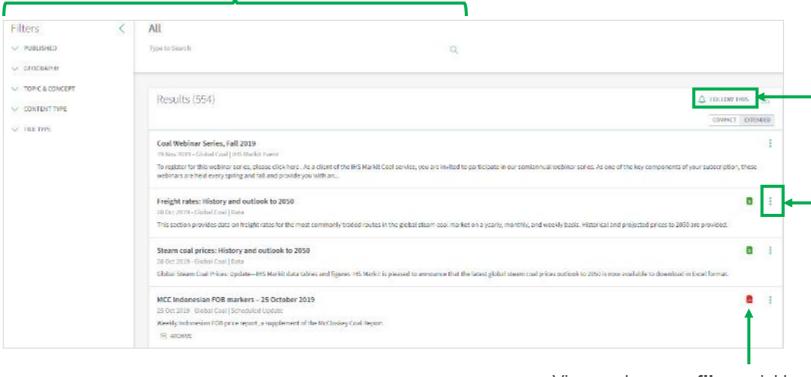


Global Coal Research Pages

Use the left-hand rail to click on Research topics to browse and narrow down Global Coal research.



Use green arrows to apply filter options and/or type a keyword search.



page and apply an email alert. **Save** an individual document, and

Apply filters or a

This to save the

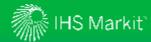
search, then

select Follow

Saved content appears in **My Saved** (in the left hand rail).

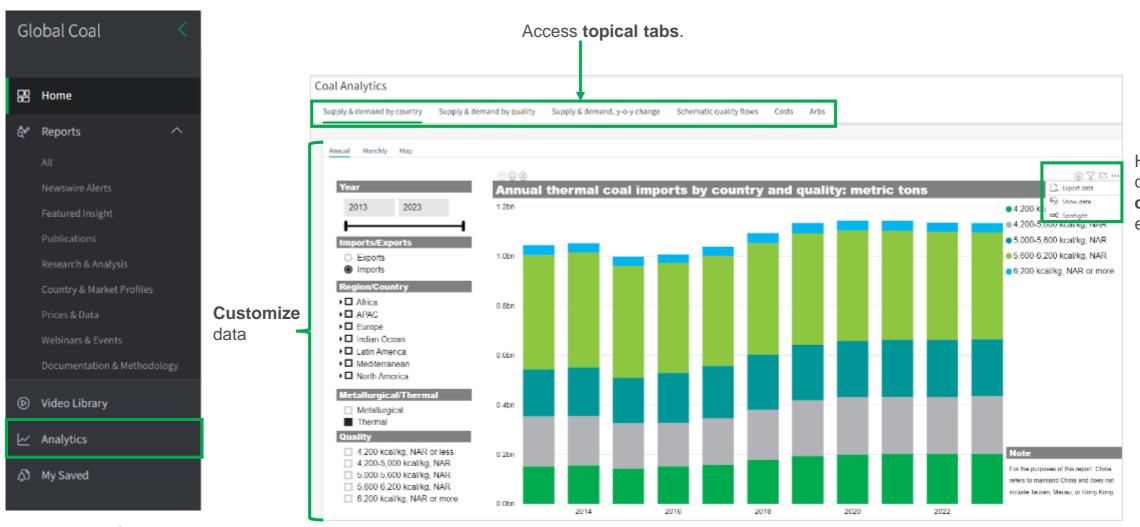
share with colleagues.

View and access files quickly.



Global Coal Analytics

Use the left-hand rail to click on **Analytics** topics to customize and visualize related data.



Hover and click the **3- dot menu** to export data.



Global Steam Coal

- Global Steam Coal Advisory Service Long-term (25yr) outlooks and strategic insight on the global steam coal market.
- Fundamental analysis that includes Supply, demand, cost, price dynamics, as well as freight, carbon, spreads, and arbitrage opportunities.
- Provides an in-depth understanding of competing fuels and price inflection points, and independent analysis of the coal and subsidiary industries set within IHS Global Scenarios and Macroeconomic framework.
- Monthly, quarterly, and annual reports with a 25-year outlook for supply, demand, price, costs curves, freight.
- Steam Coal Forecaster Quarterly review of Global Steam Coal trade.
- 18-24 month outlook for global steam coal trade and data.
- Country-by-country demand and supply analysis.

- Stockpiles (producers & consumers)
- Hydro and generation activity, Rail and port developments
- Detailed forecast of supply, demand and freights.
- Conclusions about steam coal price outlooks.
- Analysis of Atlantic & Pacific steam coal markets.
- Alerts of impending market shortages or surpluses, indicating price direction.
- Full access to our online data center.
- Full access to our coal research team.
- Invitations to executive member forums, webinars, and conference calls/events to engage with our analysts and with peers / colleagues within our coal community.



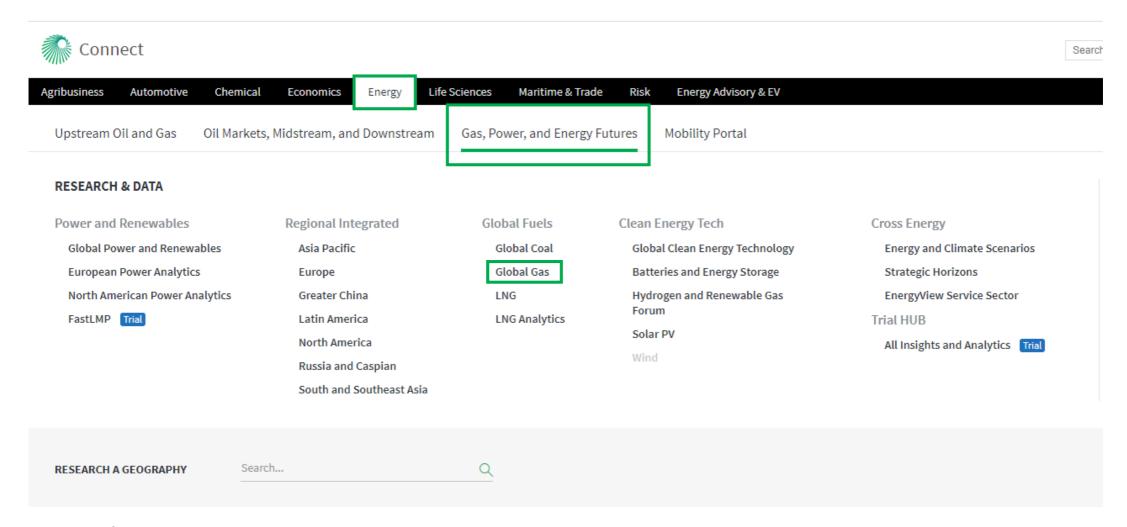
Global Gas

Provides a unique perspective on changing gas markets for both short-term market monitoring and long-term strategy decisions.



Global Gas in Connect

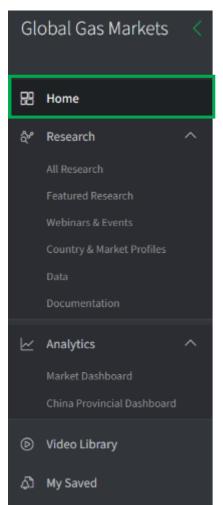
In Connect, hover over the **Energy** menu > **Gas, Power, and Energy Futures** > click on **Global Gas**.



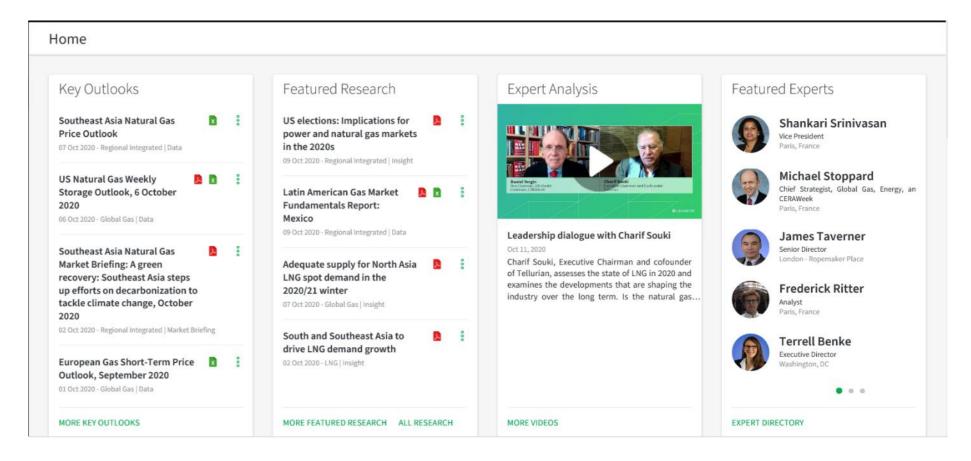


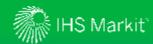
Gas Markets Home Page

Use the left-hand rail to browse research and analysis under **Home** and **Research** and data visualization under **Analytics**.



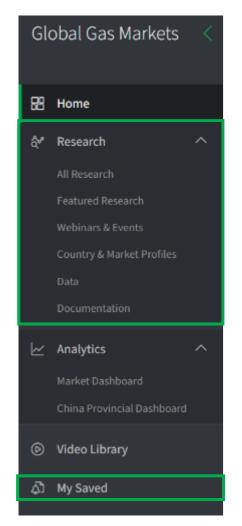
The **Home** page displays various widgets for **Featured Research**, **Expert Analysis**, **Featured Experts**, **key data visualization**, and more.

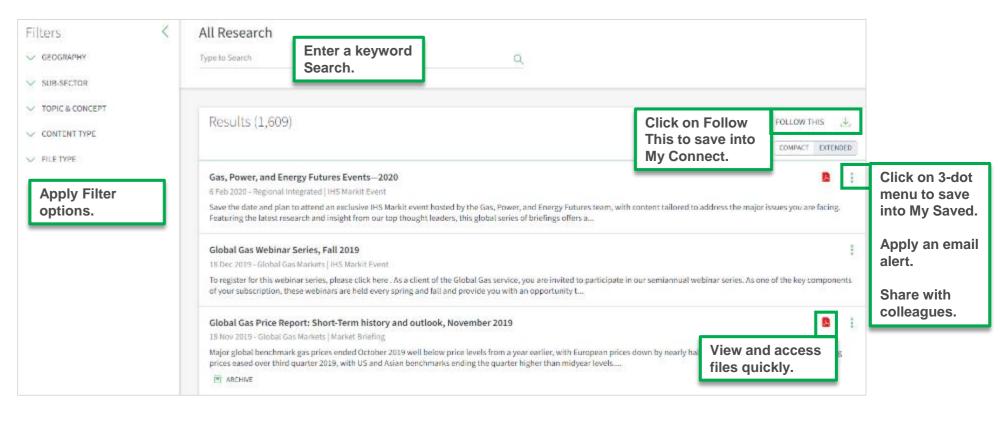




Global Gas Research Page Navigation

Use the left-hand rail to click on **Research topics** to browse and narrow down research.

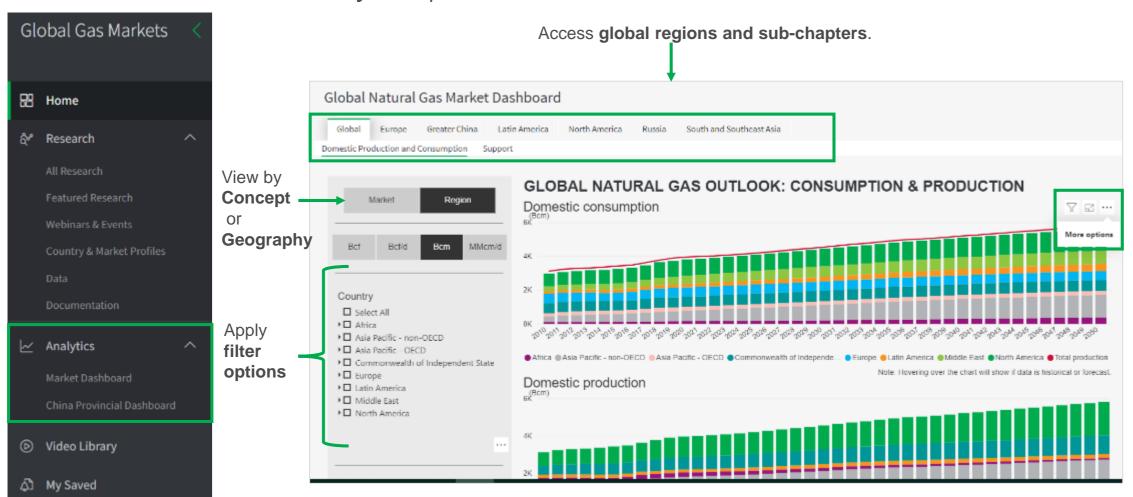






Global Gas Markets Analytics

Use the left-hand rail to click on **Analytics** topics to customize and visualize related data.



Click the **3-dot menu** to export data.





Global Gas: Europe

Europe

Greater China

Latin America

North America

Russian and Caspian

- Watch A report summarizing the short-term market drivers and trends, and accompanying data set with forecasts to 2040 for natural gas monthly pricing, storage, supply / demand balances, pipeline flows, and play-level unit cost, production, and drilling activity.
- Gas demand and supply outlook Individual reports summarizing regional markets and accompanying data set with corresponding supply / demand balances.
- **Gas price outlook** Provides a short-term (two-week) outlook for US lower-48 storage injections and withdrawals outlook and discusses the impact on natural gas prices.
- Competitive fuel price analysis compares competitiveness of gas versus coal, oil, and oil products, including price outlooks for coal, oil, oil products and gas, as well as macroeconomic data.
- European gas flexibility outlook A report summarizing the market outlook to 2025.
- European gas hub tracker A report summarizing the market outlook to 2040.
- Supply and demand tracker Market fundamentals and commentary on key drivers affecting the five year market outlook.
- Heating & cooling degree days Yearly, monthly, quarterly heating and cooling degree days per country.
- Storage tracker Gas storage utilization data and recent market views.
- Strategic reports Strategic research reports covering topics relevant for strategic decision-making processes.
- **Country profiles -** Developments in fundamentals, industry structure, policy and regulation, infrastructure, historical prices by end-user sector.





Global Gas: Greater China

Europe

Greater China

Latin America

North America

Russian and Caspian

- **Natural Gas Data Tables** Monthly domestic gas production volumes, China's gas import/export volumes and values by country, annual provincial gas demand, pipeline length, and population connected to the gas grid, and five-year supply and demand outlooks.
- Natural Gas Price Data Table Regulated citygate prices by province and retail prices by sector in key cities, monthly gas import price by port, and monthly wholesale LNG prices.
- **Natural Gas Quarterly Market Briefing -** Analysis of recent changes in the natural gas market fundamentals and policy development during the previous quarter, and assumptions behind five-year supply and demand outlooks.
- National Gas Supply Outlook by Basin Supply volume and cost for conventional, coalbed methane, and shale gas by basin, coal-based synthetic natural gas by province, and pipeline and LNG imports through 2040.
- **Provincial Gas Demand Outlook by Sector -** Provincial level gas demand outlook by sector (industrial, feedstock, power generation, district heating, commercial, residential, transport, and others) through 2040.
- Long-term Citygate Gas Price Outlooks Citygate gas price outlooks in key provinces through 2040.
- Long-term Industrial Retail Gas Price Outlooks Regulated industrial retail gas price outlook in key provinces through 2040.
- **Small Land-based Liquefaction Watch** Annual updates of capacity addition at the provincial level, trends in utilization rates and prices, and analysis on recent market developments and policies impacting small liquefaction business.
- Regional Regasification Outlooks: North, Central, South Regional regasification outlook by terminal and LNG
 procurement strategies analysis by key players.





Global Gas: Latin America

Europe

Greater China

Latin America

North America

Russian and Caspian

- **Natural gas market fundamentals report -** Report that analyzes project pipelines, market updates while breaking down trends underlying each market's midterm outlook, as well as regional trade and LNG imports.
- Midterm outlooks Natural gas outlooks for production, import/export levels, and end user demand.
- **Natural gas price report** Report with natural prices (historical and outlooks) outlining relevant inputs with key highlights and implications.
- Strategic and insight reports Strategic research reports covering topics relevant for strategic decision-making processes
- **Natural gas country profiles -** Individual country profiles covering policy, economic trends, market fundamentals, market structure, regulatory framework in the natural gas sector
- **Webinars** Interactive sessions with IHS Markit researchers on breaking events of importance to the market. It provides our vision and analysis regarding the implications to our stakeholders while providing a forum for questions.





Global Gas: North America

Europe

Greater China

Latin America

North America

Russian and Caspian

- **Natural Gas Monthly Briefing -** A report summarizing the short-term market drivers and trends, and accompanying data set with forecasts to 2040 for natural gas monthly pricing (Henry Hub and 29 key pricing points), storage, supply / demand balances, pipeline flows, and play-level unit cost, production, and drilling activity.
- **Regional Natural Gas Profiles -** Individual reports summarizing regional markets and accompanying data set with corresponding supply / demand balances.
- **US Natural Gas Weekly Storage Briefing -** Provides a short-term (two-week) outlook for US lower-48 storage injections and withdrawals outlook and discusses the impact on natural gas prices.
- Eastern US and Canada Pipeline Expansion Database A listing of pipeline expansion projects that have been announced in the US Northeast, Midwest, and Southeast/US Gulf Coast regions and in eastern Canada. For each project, the database includes key details, such as estimated capital costs, project scope (e.g., additional pipeline and/or compression), and transportation capacity costs.
- Natural Gas Watch A report summarizing the market outlook to 2025.
- Natural Gas Long-term Outlook A report summarizing the market outlook to 2040.





Global Gas: Russian and Caspian

Europe

Greater China

Latin America

North America

Russian and Caspian

- Market fundamental reports Russia Watch and Caspian Watch. Review and medium-term outlook. Market briefings / Regular short-term updates. Long-term oil and gas outlooks, covering national and regional production trends, consumption and exports by direction and route. Eurasian Oil Export Outlook. Eurasian Gas Export Outlook.
- Strategic and insight reports Strategic research reports covering topics relevant for strategic decision-making processes. Private and special reports Strategic analysis with long-term vision. Decision briefs. Topical analysis on key developments. Insights issued periodically. Short-term analysis.
- **Expert Analysis** Contact: Connect with key researchers. 600+ analyst's across IHS Markit Energy. Local expertise across a global network. Bespoke presentations. On-site briefings on specific topics possible.
- **Webinars / Events -** Client briefings: Regular energy research briefings (held in different global locations) Webcasts: Latest research and key messages. IHS Markit Energy CERAWeek: Preferential rates.





Global Gas: South & Southeast Asia

Europe

Greater China

Latin America

North America

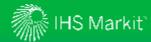
Russian and Caspian

- India Natural Gas Monthly Data Tables Data on historical monthly gas supply by source, production by player, LNG imports, demand by sector, gas-fired power capacity and generation by region, and gas pricing. Annual outlooks for LNG regasification capacity to 2020, and gas supply and demand to 2030.
- India Natural Gas Quarterly Market Briefing The India Natural Gas Market Briefing Third Quarter 2016 provides a quarterly update of recent trends in gas supply, demand, and pricing as well as a review of recent policy and regulatory changes for the gas market.
- India Regasification Outlook This report provides analysis on developments in LNG regasification by terminal and developer, including expected timelines for project start and key drivers/ risks of each project.
- India Natural Gas Market Report and Data Tables This report provides detailed analysis of developments in India's natural gas sector and an outlook to 2030. Sections of the report include: Market overview and structure, Supply by source, Demand by sector, Infrastructure, Pricing, and Market outlook.
- Pakistan Natural Gas Market Report and Data Tables The report covers the country's natural gas sector, including
 market structure, supply, demand, infrastructure, pricing, and outlooks.
- Bangladesh Natural Gas Market Report and Data Tables The report covers the country's natural gas sector, including market structure, supply, demand, infrastructure, pricing, and outlooks.
- **Webinars** Interactive presentation with IHS Markit experts providing analysis on recent market events, policy changes, and implications



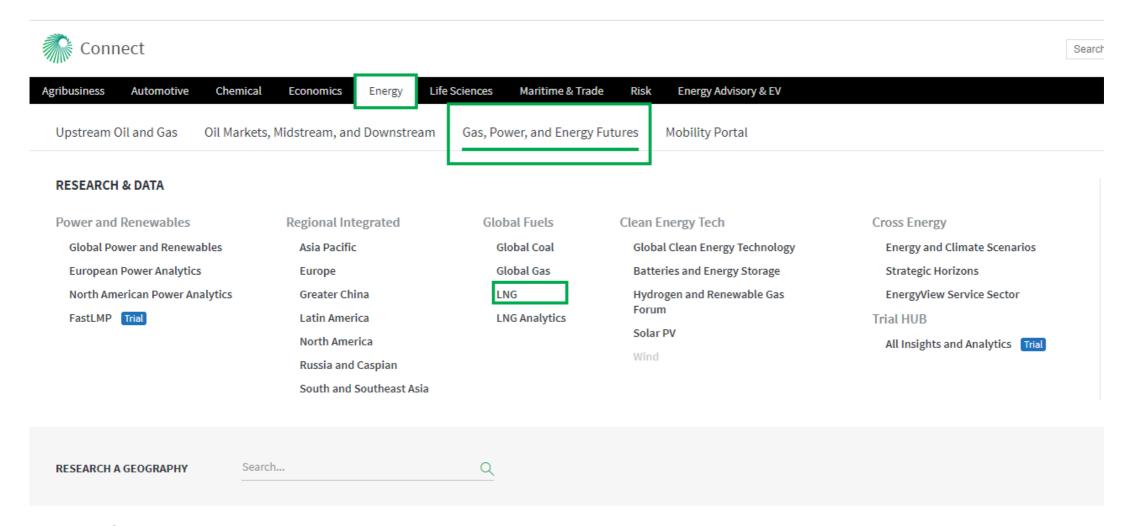
LNG

Provides timely data and analysis on assets, competitive behavior, and regional and global markets across the entire liquefied natural gas (LNG) value chain.



LNG in Connect

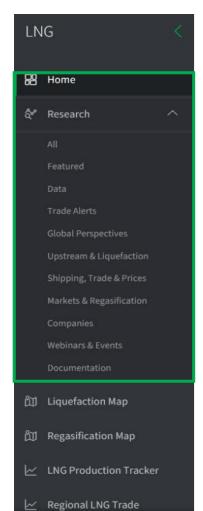
In Connect, hover over the Energy menu > Gas, Power, and Energy Futures > click on LNG.



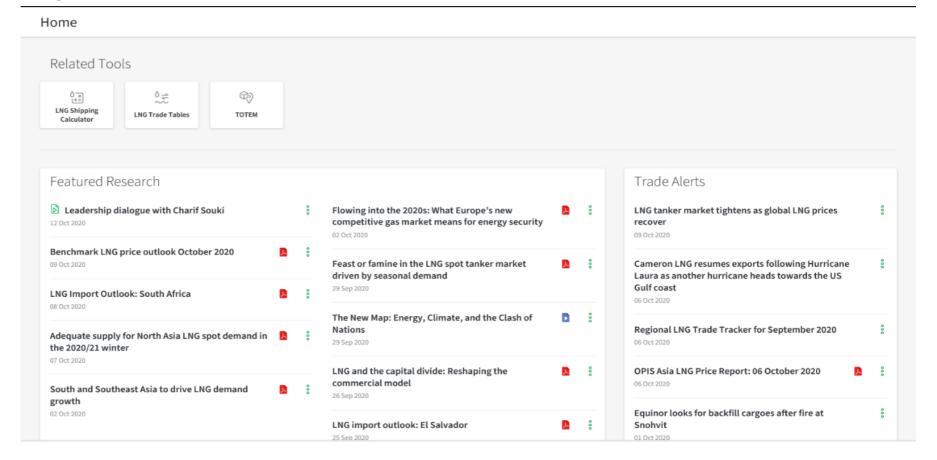


LNG Home Page

Use the left-hand rail to browse research and analysis under **Home** and **Research** and data visualization under **Related Tools**.



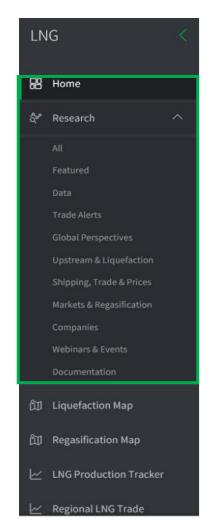
The **Home** page displays **Related Tools** and various widgets for **Featured Research**, **Trade Alerts**, **Data & Maps**, and **more**.

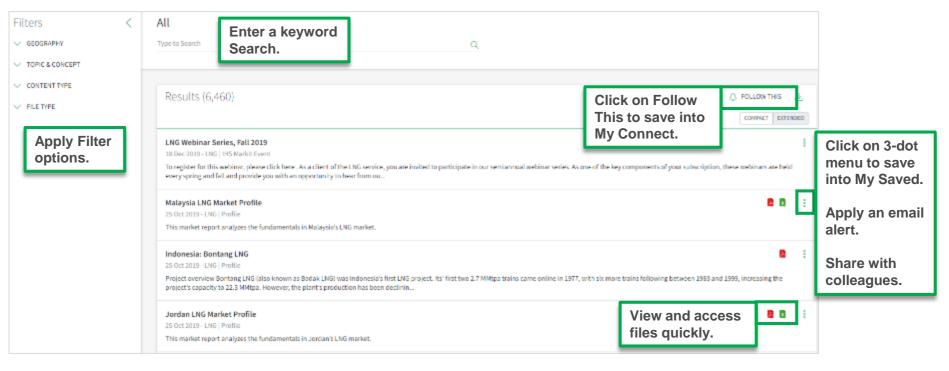


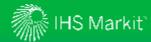


LNG Research Pages

Use the left-hand rail to click on Research topics to browse and narrow down LNG research by topic.



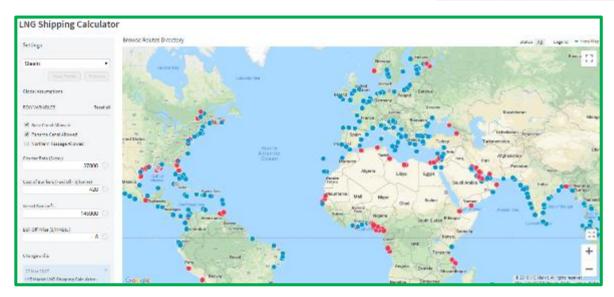


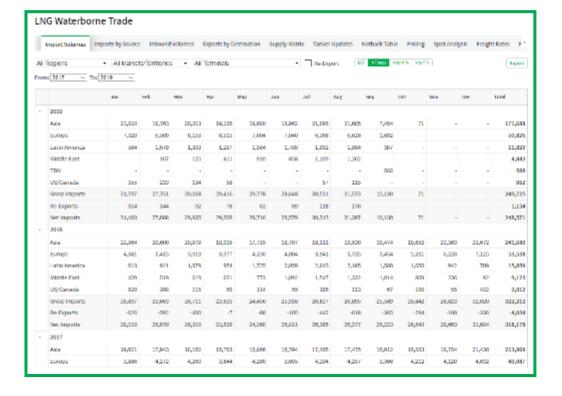


LNG Data Tools

On the **Home** page, access **Related Tools** to visualize, customize, and export data related to LNG shipping, trade, and production.









Global LNG Capability Overview

Global and regional analysis, macro view of LNG industry

Market briefings with short-term trade forecasts highlight impact of recent market events on industry dynamics

Long-term trends derived from global energy scenarios model with stress test drivers behind forecasted S/D balances

Most detailed & accurate LNG cargo data available, 10-year historical database

Continually updated monitoring, spot market tracking, pricing, freight rates, charter information

Unparalleled commercial intelligence sourced from traders, producers, buyers, port authorities, brokers on a daily basis



One-stop source for highly detailed LNG analysis is like adding analysts to your team

Frequently updated profiles and data on: liquefaction projects, markets, regasification

Event and data-driven insights on asset and country level trends

Strategy profiles of 50 LNG actors including suppliers, aggregators and buyers

Deep coverage of niche buyers provides insight into evolving market demand

Analysis on drivers and challenges of your partners, suppliers, customers, and competitors

- Integrated analytic approach yields superior insights by bringing together experts across the LNG value chain
- Data is accurate and the most current available
- Community access through members-only events
- Ease of access to global LNG and regional gas experts





LNG

Global Perspectives

- > Market Briefing: comprehensive and integrated analysis of key drivers for supply, demand, trade and pricing; near-term (through 2020) forecast of global balances
- > **Short-Term Tracker**: data and graphs detailing recent LNG import/export dynamics, and key contracts and milestones
- > Global and Regional Trends: strategic research papers outlining the overarching storylines of macro drivers in LNG
- > **Long-Term Analysis Scenarios:** detailed demand and liquefaction capacity forecasts to 2050 for the three IHS global energy scenarios, updated annually
- > **Strategic Reports:** in depth research papers on special interest topics which will set the stage for future LNG strategy

Assets & Markets

- > **Liquefaction:** granular liquefaction project profiles (120+) updated 2-3x year; regional outlooks; and a quarterly global outlook focusing on key contracting and engineering milestones
- > **Markets:** detailed country profiles (30+) of LNG demand drivers updated 3-4x year with supporting data updated monthly; annual LNG supply/demand gap by country
- > **Regasification:** annual country regasification outlooks (20+) analyzing drivers of regasification investment; biannual floating regasification outlook
- > Shipping Outlook: quarterly analysis of market conditions

Company Strategy

- Analysis of the LNG strategies of 50 companies. Critical insights for users who require a more detailed and sophisticated approach to industry participants, including buyers, sellers, partners and competitors.
- > **Strategy Assessment.** Reviews corporate, regional, and operational strategies and examines investment activity along the value chain and in different regions.
- > **Data Sheet.** Provides company data on operations throughout the value chain, structured and formatted for easy use.
- > Strategic Memos. Address key gas trends and how they influence companies.

Trading

- > **Voyage-Specific Commercial Data:** continually-updated voyage records feature spot shipment identification, buyer/seller, charter information, and pricing
- > **LNG Import and Export Volumes:** monthly import and re-export volumes by importing country/terminal, exporting country
- Activity Alerts: Port-specific notifications as new shipments are identified, alerts of marketplace activity
- > **Expert Analysis:** Time-sensitive identification of emerging trends in the data and commercial intelligence
- > **Regional Trends:** biweekly, and quarterly regional analysis (Americas, Europe, Asia Pacific/Middle East) plus an annual report on global trade
- > **LNG Production Tracker:** Monthly LNG production by country vs. nameplate capacity, monitor liquefaction plant status



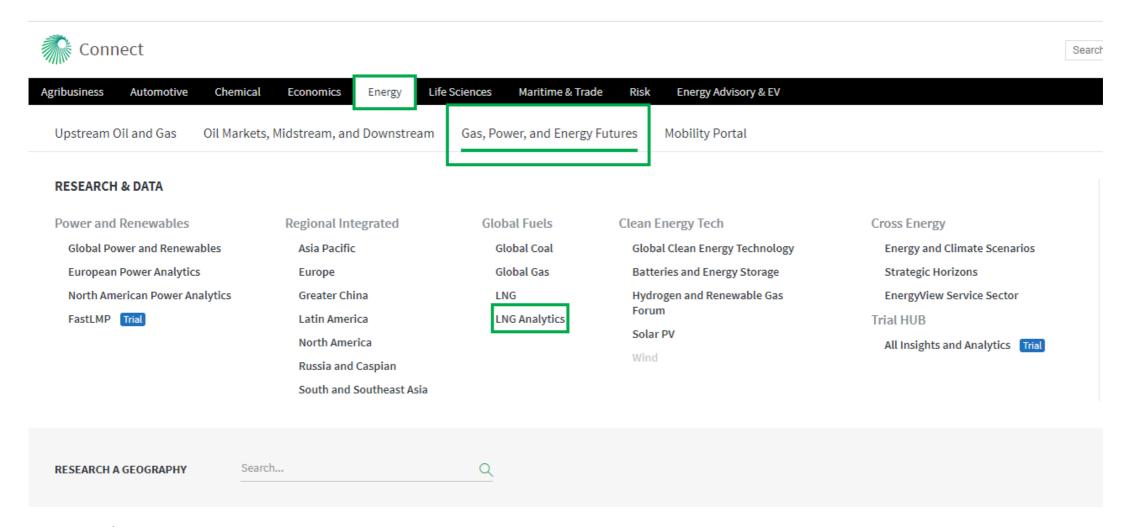
LNG Analytics

Perform quick comparatives and benchmarking analysis on key factors moving the LNG market using historical and forward-looking data.



LNG Analytics in Connect

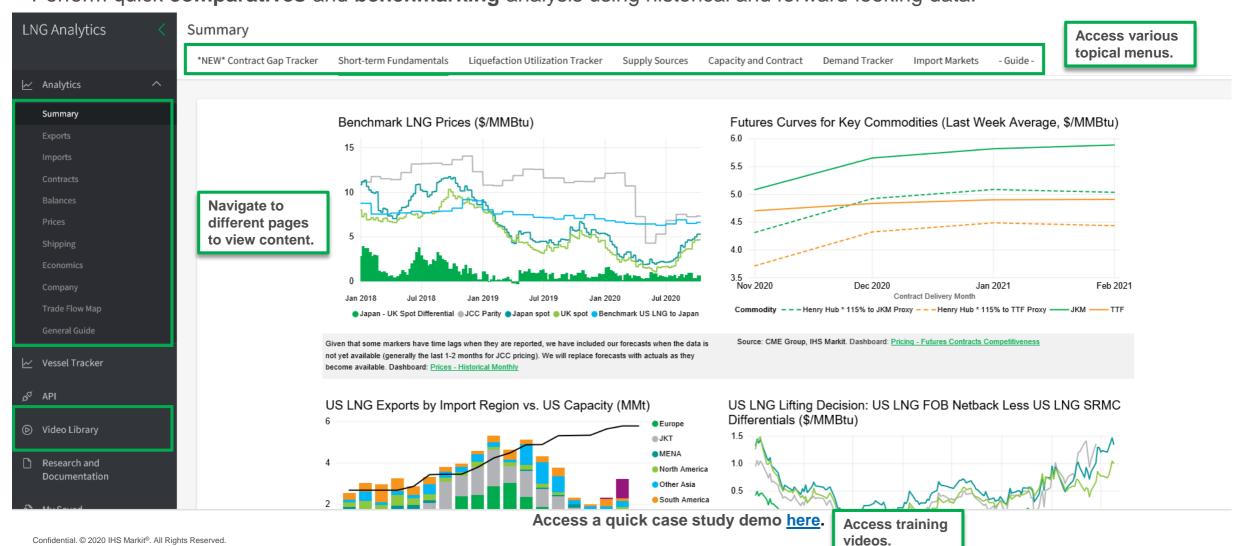
In Connect, hover over the **Energy** menu > **Gas, Power, and Energy Futures** > click on **LNG Analytics**.





LNG Analytics

Perform quick **comparatives** and **benchmarking** analysis using historical and forward-looking data.





LNG Analytics Framework

A deep dive into the key factors moving the LNG market.

IHS Markit	LNG Analytics

II IS Walkit	LING Allalytics						
Exports	Imports	Contracts	Prices	Shipping	Company	Maps	Vessel Tracke
Frade: Loaded Volumes	Trade: Delivered Volumes	Contract Overview	Historical Prices - Monthly	Trade by Vessel	Trade by Company	Trade Flow Map: Loaded or Delivered Volumes	Market Intelligence Networl
Cross Basin Trade: Loaded Volumes	Cross Basin Trade: Delivered Volumes	Contract Expirations	Historical Prices - Annual	Cross Basin Trade by Vessel	Cross Basin Trade by Company	Trade Flow Map: By Vessel	
iquefaction Project & Contract Details Tables	Reexports	Contract Exposure	Short-term Monthly Forecast Prices	Ton-mileage	Liquefaction Portfolios	Trade Flow Map: By Company	
Historical Liquefaction Capacity & Exports	Import Exposure	Contract Signing Trends	Long-term Annual Forecast Prices	Vessel Details Tables	Contract Portfolios		
Short-term Quarterly Forecast: Supply vs. Liquefaction Capacity	Regasification Project Details Tables	Contract Performance	Trade vs. Historical Prices	Fleet evolution	Contract Expirations		
Short-term Quarterly Liquefaction Utilization Forecast	Historical Regasification Capacity & Imports	Contract Pricing: Table	Cross Basin Trade vs. Historical Prices	Charter rates	Regasification Portfolios		
Long-term Annual Forecast: Supply vs. Liquefaction Capacity	Short-term Quarterly Forecast: Imports vs. Capacity	Short-term Supply/Demand Gap	Reexports vs. Historical Prices	Charter rates vs. Trade	Shipping Portfolios		
Long-term Annual Liquefaction Utilization Forecast	Long-term Annual Forecast: Imports vs. Capacity	Long-term Supply/Demand Gap	Long-term Annual Forecast: Supply/Demand & Prices		Trade & Contracts		
	Vintage vs. Current Demand Forecasts				Ton-mileage by Company		
		-			Benchmarking		



Clean Energy Technology

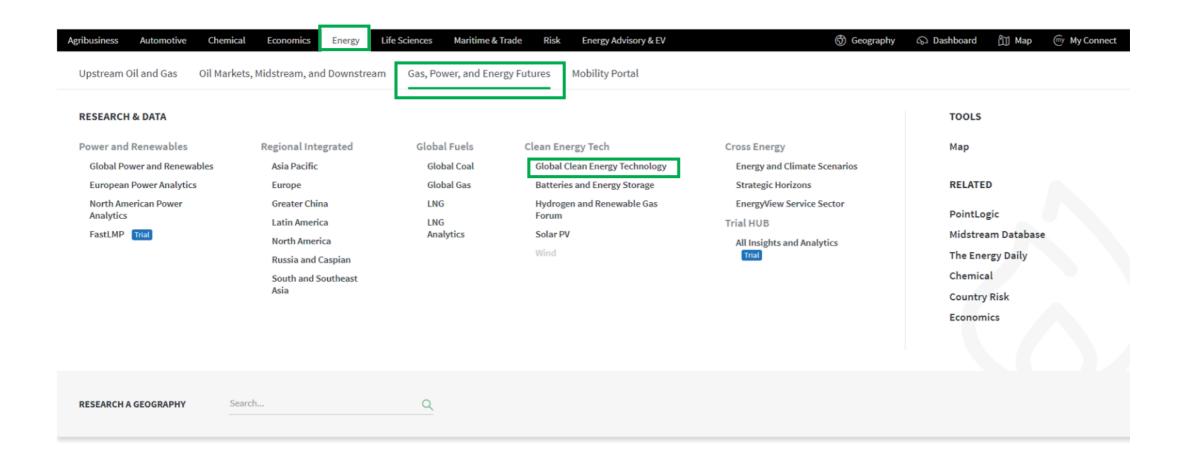


Global Clean Energy Technology



Global Clean Energy Technology in Connect

In Connect, hover over the Energy menu > Gas, Power, and Energy Futures > click on Global Clean Energy Technology.





Global Clean Energy Technology - Home Page

Home

Comprehensive data, analytics and insight on the most important technologies shaping the transformation of the energy industry



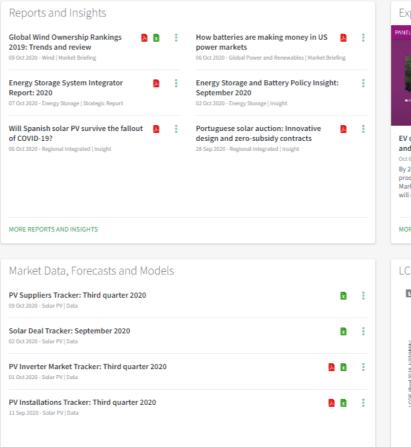
Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Expert Analysis, and more.

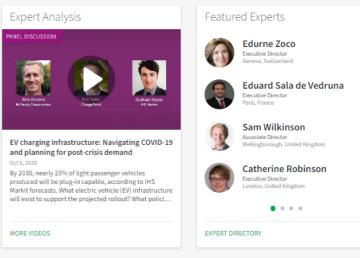
Research: Browse all research by topic, apply filters, or run a search.

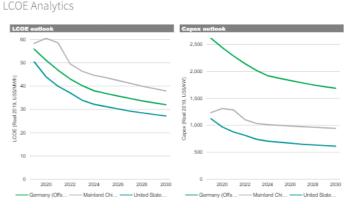
Analytics: Customize, visualize, and export data in the **related technology Dashboard.**

Video Library: Receive **key messages** from IHS Markit research analysts.

My Saved: Access and share your saved items.



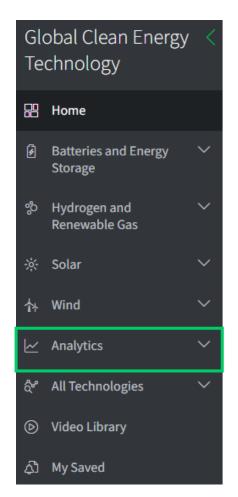






Global Clean Energy Technology - Analytics

Global Levelized Cost of Electricity (LCOE) Dashboards to benchmark countries for LCOE, Capex, Opex



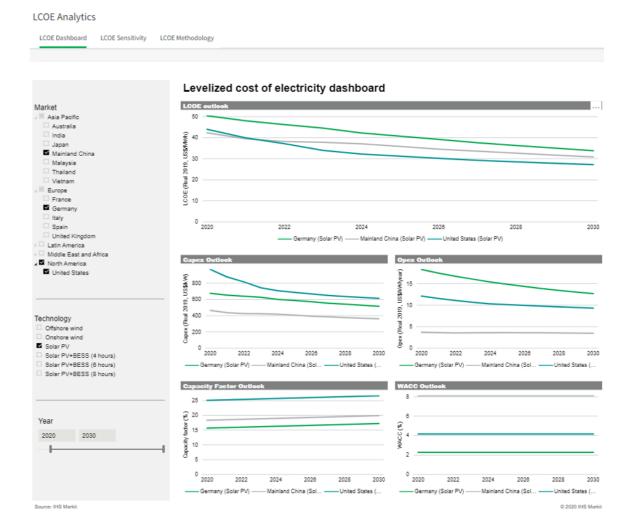
Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Expert Analysis, and more.

Research: Browse all research by topic, apply filters, or run a search.

Analytics: Customize, visualize, and export data in the **related technology Dashboard.**

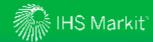
Video Library: Receive **key messages** from IHS Markit research analysts.

My Saved: Access and share your saved items.



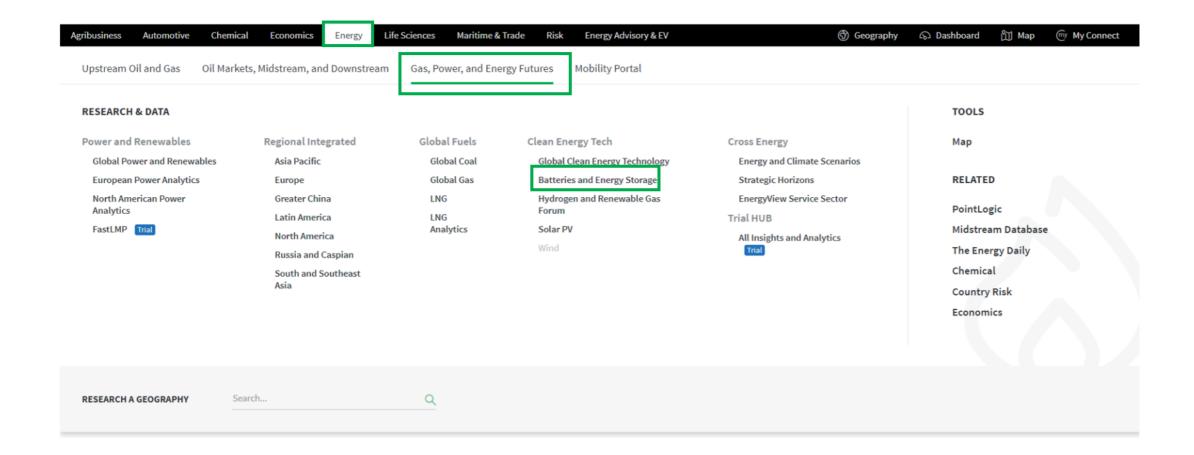


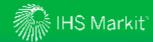
Batteries and Energy Storage



Batteries and Energy Storage in Connect

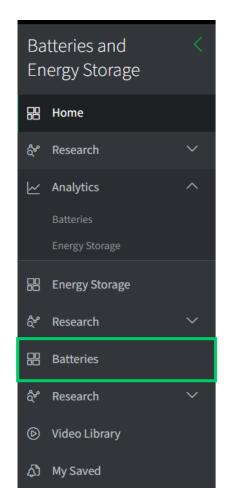
In Connect, hover over the **Energy** menu > **Gas**, **Power**, **and Energy Futures** > click on **Batteries and Energy storage**.





Batteries

Comprehensive data and analysis on the expanding market for Batteries



Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Expert Analysis, and more.

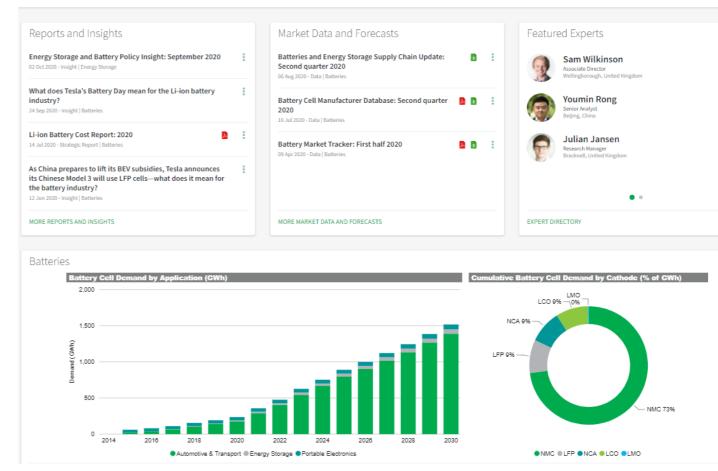
Research: Browse all research by topic, apply filters, or run a search.

Analytics: Customize, visualize, and export data in the Batteries Market Dashboard.

Video Library: Receive **key messages** from IHS Markit research analysts.

My Saved: Access and share your saved items.

Batteries





Batteries Deliverables

Regularly Updated Datasets

- Battery Market Tracker (bi-annually) Historical data and forecasts for battery demand by sector and technology, capacity and production for battery cells, price and cost analysis
- Battery Cell Manufacturer Database (quarterly) Detailed analysis and forecasts for the buildout of battery cell manufacturing capacity, including a global database of battery cell factories.
- Batteries and Energy Storage Supply Chain Update (quarterly) Detailed insights on key news items regarding the battery and energy storage supply industries

Strategic Reports, Insights and Presentations

Topical reports are published regularly, providing a deep-dive into hot topics and key market segments. Recently published reports include:

Li-ion Battery Cost Report (*July 2020*) Comprehensive overview of the outlook for battery costs, including key areas where costs can be reduced, and scenarios for the long-term development of cost and technology.

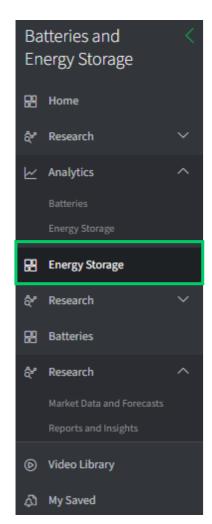
Fears unbound: Geopolitics after the pandemic (*May 2020*) The coronavirus disease 2019 (COVID-19) pandemic will leave us with a world more unstable. Nations and businesses, in fear of their vulnerabilities, will react against globalization, tending toward nationalism and protectionism.

Next-generation Battery Technology Report (Jan 2020) Comprehensive overview of the new battery technologies that are on the horizon, which will likely be adopted by the emerging battery markets in the automotive and energy sectors.



Energy Storage

Comprehensive data and analysis on the expanding market for Energy Storage.



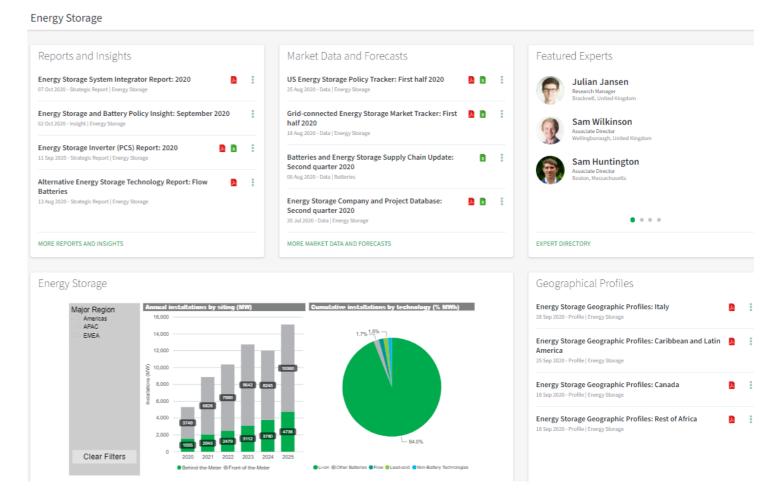
Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Expert Analysis, and more.

Research: Browse all **research by topic,** apply **filters,** or run a **search**.

Analytics: Customize, visualize, and export data in the Energy Storage
Market Dashboard.

Video Library: Receive key messages from IHS Markit research analysts.

My Saved: Access and share your saved items.





Energy Storage Deliverables

Data

- **Grid-Connected Energy Storage Forecast Database:** Twice yearly updates to global grid-connected energy storage forecasts, presented as an Excel database with PDF summary, and an interactive data visualization tool. Each edition examines and explains the latest changes to the market outlook and summarizes the current situation in each major market.
- Energy Storage Company and Project Database: Detailed database of planned and completed energy storage projects, along with details of the timings and key companies involved.
- Batteries and Energy Storage Supply Chain Update (Second quarter 2020) This report summarizes and provides insights on key news items regarding the battery and energy storage supply industries from first half 2020.

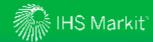
Strategic Reports, Insights and Geography profile

Topical reports are published regularly, providing a deep-dive into hot topics and key market segments. Recently published reports include:

- Energy Storage System Integrator Report: As project pipelines grow, a fragmented battery energy storage system integrator landscape is poised for further consolidation.
- Energy Storage and Battery Policy Insight (Monthly) Overview of the latest policy updates as well as dedicated insights on major updates that offer more details and background on the policy development
- Energy Storage Inverter (PCS) Report: Analysis and forecasts for the market for energy storage inverters, including forecasts by power rating and detailed supplier market share estimates.
- Alternative Energy Storage Technology Report: Flow Batteries: Flow batteries remain a technologically attractive solution, but Li-ion batteries continue to win on costs for most durations.
- Energy Storage Geographic Profiles: Italy New market for frequency reserve is driving significant growth in FTM despite slowdown from the COVID-19 pandemic

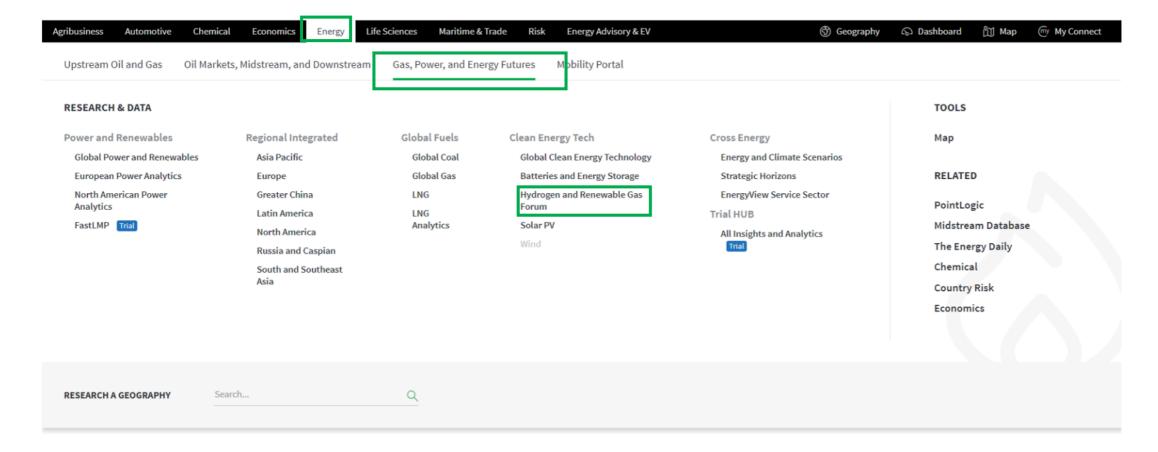


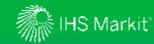
Hydrogen and Renewable Gas Forum



Hydrogen and Renewable Gas Forum in Connect

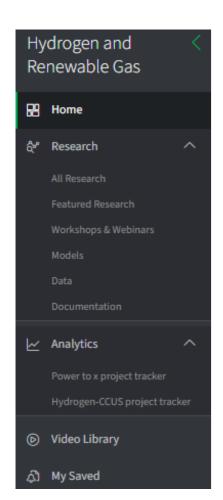
In Connect, hover over the **Energy** menu > **Gas, Power, and Energy Futures** > click on **Hydrogen and Renewable Gas Forum.**





Hydrogen and Renewable Gas Forum – Home Page

Hydrogen and renewable gas are emerging as leading options to support the decarbonisation of all sectors of the economy.



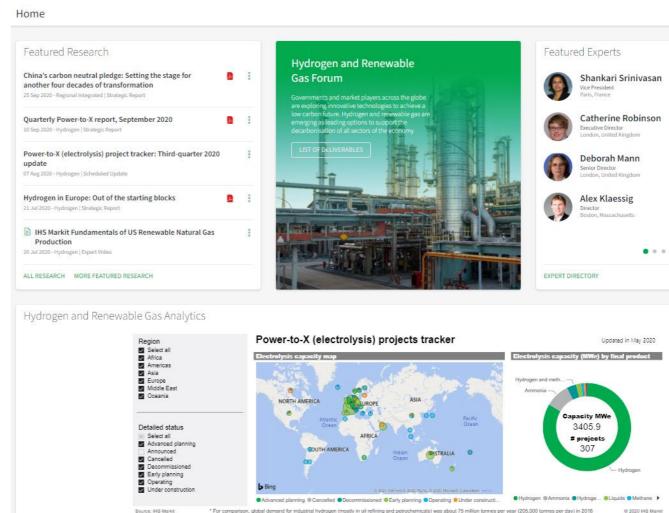
Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Expert Analysis, and more.

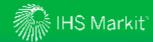
Research: Browse all research by topic, apply filters, or run a search.

Analytics: Customize, visualize, and export data in the Hydrogen and Renewable Gas Market Dashboards.

Video Library: Receive key messages from IHS Markit research analysts.

My Saved: Access and share your saved items.





Hydrogen and Renewable Gas Forum Deliverables

Data

- Levelized cost of hydrogen production (LCOH2) Model
- Outlook for electrolysis capex: outlook for the installed capital cost of AEC and PEM electrolysis from a 1–500 MW scale.
- Power-to-X tracker: Global database of Power-to-X projects. The database provides project-level details
- Low-carbon fossil-based hydrogen tracker: Global database of hydrogen produced from fossil fuels with carbon capture and storage.

Strategic Reports, Insights

Topical reports are published regularly, providing a deep-dive into hot topics and key market segments. Recently published reports include:

China's carbon neutral pledge: Setting the stage for another four decades of transformation (Sep 2020)

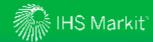
Quarterly Power-to-X report (Sep 2020) Overview of the status of Power-to-X globally. It draws from the IHS Markit global Power-to-X tracker, which has project level detail for all Power-to-X projects.

Hydrogen in Europe: Out of the starting blocks (Jul 2020) A new European Commission communication proposes an EU hydrogen strategy. Together with five recently announced national strategies and a strong statement from the Penta lateral Forum, there is a strong signal that hydrogen and decarbonization of gas are integral to medium-term "green recovery" ...

Hydrogen production and import economics: Australia, Japan, and South Korea (*Jul 2020*) This report presents the economics of hydrogen production and import/export in Australia, Japan, and South Korea, following multiple pathways. The hydrogen production pathways analyzed include Water electrolysis using the grid, onshore wind, or solar photovoltaic (PV) electricity Large-scale...

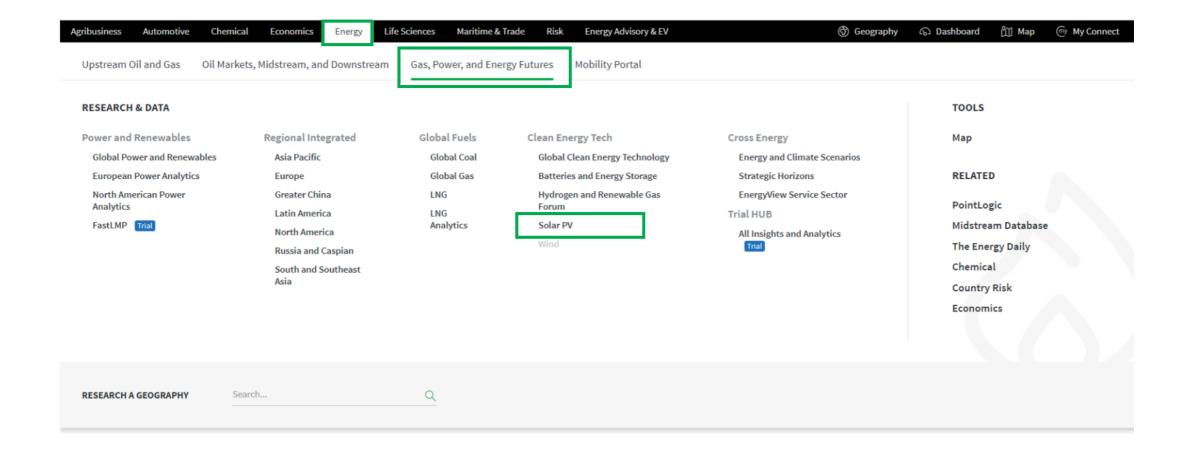


Solar PV



Solar PV in Connect

In Connect, hover over the **Energy** menu > **Gas**, **Power**, **and Energy Futures** > click on **Solar PV**.





Solar PV Downstream

Comprehensive data and analysis on the downstream dynamics of the solar industry.



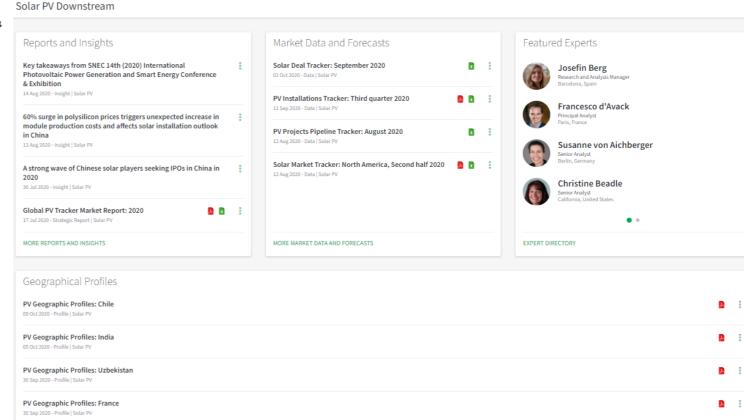
Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Geographical Profiles, and more.

Research: Browse all research by topic and apply filters or run a search.

Analytics: Customize, visualize, and export data in the **Solar PV Tracker**.

Video Library: Receive **key messages** from IHS Markit research analysts.

My Saved: Access and share your saved items.





Solar PV Downstream Deliverables

Data

- **PV Installations Tracker Premium:** Quarterly updates providing detailed tracking and forecasting of installations in 100 PV markets, including annual and quarterly data, with segmentation by installation and system type.
- PV Country Profiles Country specific profiles, for more than 60 markets, with details on the current market situation, drivers, barriers and outlook for PV.
- Solar EPC and O&M Provider Tracker: A detailed report revealing who the leading system integrators (EPCs) are worldwide and by region, showing market shares, rankings, over 500 company profiles and analysis. A comprehensive analysis of the O&M provider landscape by region is also provided.
- Solar Deal Tracker: Comprehensive database coverage of planned and completed solar projects by installer, project developer, market segment, country, and other important criteria via an online dashboard.
- PV Projects Pipeline Tracker: The PV project pipeline size and status by country for more than 1,000 individual PV developers.

Analysis

Topical reports are published regularly, providing a deep-dive into hot topics and key market segments. Recently published reports include:

PV Market Trend Survey – China: This monthly check on the Chinese PV market relies upon real shipment and installation data collected from suppliers and installers in the world's largest PV market. The survey provides customers with an accurate check on its short- and medium-term development.

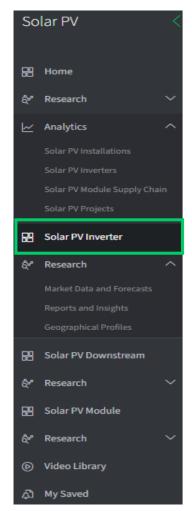
PV Asset Ownership & O&M Report: This report contains market share rankings for 2017 based on IHS Markit's comprehensive coverage of PV projects and the supply chain. The market share estimates are based on the total PV capacity in the portfolio (in MWdc).

Utility-scale PV Cost Report: The annual review and analysis of the cost trends and outlook for utility-scale PV projects across the world.



Solar PV Inverter

Comprehensive data and analysis on the global PV inverter market.

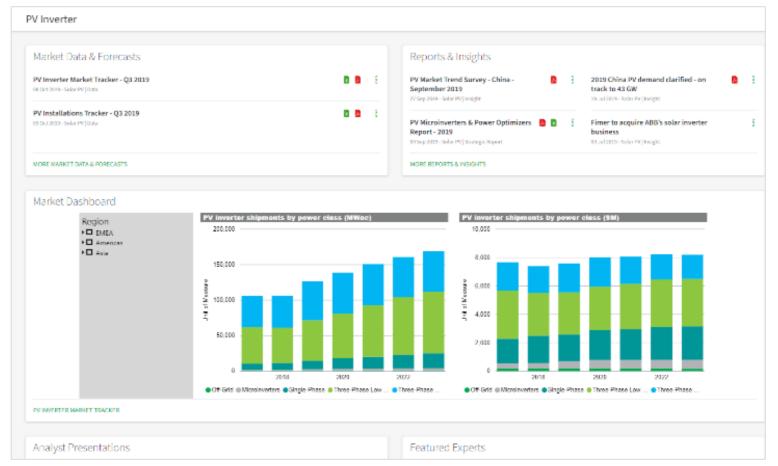


Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Expert Analysis, and more.

Research: Browse all research by topic, apply filters, or run a search.

Analytics: Customize, visualize, and export data in the PV Inverter Market Tracker & PV Installations Tracker Dashboards.

My Saved: Access and share your **saved items**.





Solar PV Inverter Deliverables

Data

- PV Inverter Market Tracker: Quarterly updates providing detailed tracking and forecasting of PV inverter shipments, revenues and pricing, including annual and quarterly data, with segmentation by power rating, voltage, type, isolation and sales channels. Trackers also includes over 50 detailed supplier market share tables by world, region and country.
- PV Installations Tracker: Quarterly updates providing detailed tracking and forecasting of installations in all key PV markets, including annual and quarterly data, with segmentation by installation and system type.
- PV Systems Price Tracker: Update, first half 2020 This data set contains PV System prices and revenues and is published twice a year based on the updated forecasts of module and inverter prices, alongside the latest PV installation forecast.

Analysis

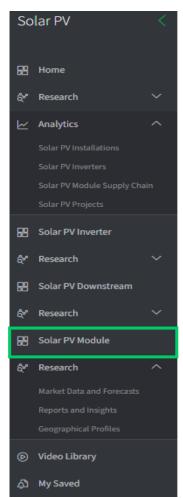
Topical reports are published regularly, providing a deep-dive into hot topics and key market segments. Recently published reports include:

- PV Market Trend Survey China: Monthly check on the Chinese PV market relies upon real shipment and installation data collected from suppliers and installers in the world's largest PV market. The survey provides customers with a regularly updated and accurate check on its short- and medium-term development.
- PV Microinverters and Power Optimizers Report 2020: Annual report identifying opportunities in the high-growth market of module level power electronics (MLPE) and giving insight into key suppliers, market drivers, regulatory environment and detailed forecasts in over 20 markets for both microinverters and power optimizers. Global module level power electronics (MLPE) shipments are forecast to reach 15.7 GW in 2024
- PV Inverter report India 2020: This is the second edition of the PV Inverter Report on the Indian PV inverter market, providing detailed forecasts and analysis of demand for PV inverters in India, and a comprehensive review of the challenges that face PV inverter suppliers in India.



Solar PV Module

Detailed data and analysis for the global PV module supply chain.

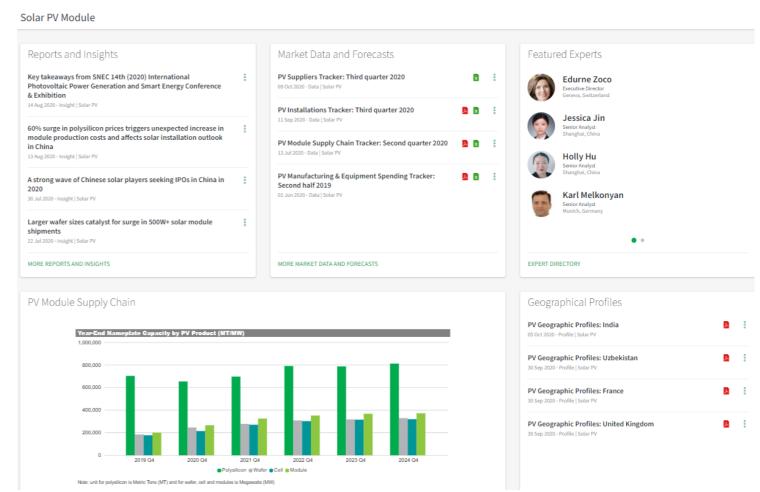


Home: Displays various widgets for Market Data & Forecasts, Reports & Insights, Expert Analysis, and more.

Research: Browse all research by topic, apply filters, or run a search.

Analytics: Customize, visualize, and export data in the PV Module Supply Chain Dashboards.

My Saved: Access and share your saved items.





Solar PV Module Deliverables

Data

- **PV Module Supply Chain Tracker:** Combines analysis of the markets for polysilicon, solar wafers, PV cells and modules, with forecasts for PV installations, assessing the balance between supply and demand, and the impact on pricing and margins throughout the supply chain.
- PV Installations Tracker: Quarterly updates providing detailed tracking and forecasting of installations in all key PV markets, including annual and quarterly data, with segmentation by installation and system type.
- PV Suppliers Tracker: Contains detailed data on the performance of leading companies in the PV module supply chain, and provides a detailed database of capacity, production, utilization and shipments for polysilicon, wafer, cell and module suppliers.
- PV Manufacturing & Equipment Spending Tracker: This bi-annual report tracks production, capacity and equipment spending on wafers, cells and
 modules, supply chain tool demand, technology roadmap adoption rates and more. Also provides quarterly data on market shares for cell types and
 production tools.

Analysis

Topical reports are published regularly, providing a deep-dive into hot topics and key market segments. Recently published reports include:

- PV Market Trend Survey China: Monthly check on the Chinese PV market relies upon real shipment and installation data collected from suppliers and installers in the world's largest PV market. The survey provides customers with an accurate check on its short- and medium-term development.
- Bifacial PV Module Market Report: 2020 (Mar 2020) The report analyses the current situation and future roadmap of bifacial PV cell and module technologies, with details on the current market situation, drivers, barriers, and outlook for PV industry worldwide. It provides historical data from 2017 and forecast data per technology for 2019–23.
- PV Module Advanced Technologies Report 2019: Analyses the current situation and future outlook of advanced PV module technologies such as Half-Cell, Shingle and Bifacial, which have been successfully ramped up to mass production levels.



Cross Energy

Features analysis and data on regional market fundamentals, the policy landscape and changing consumer demands.



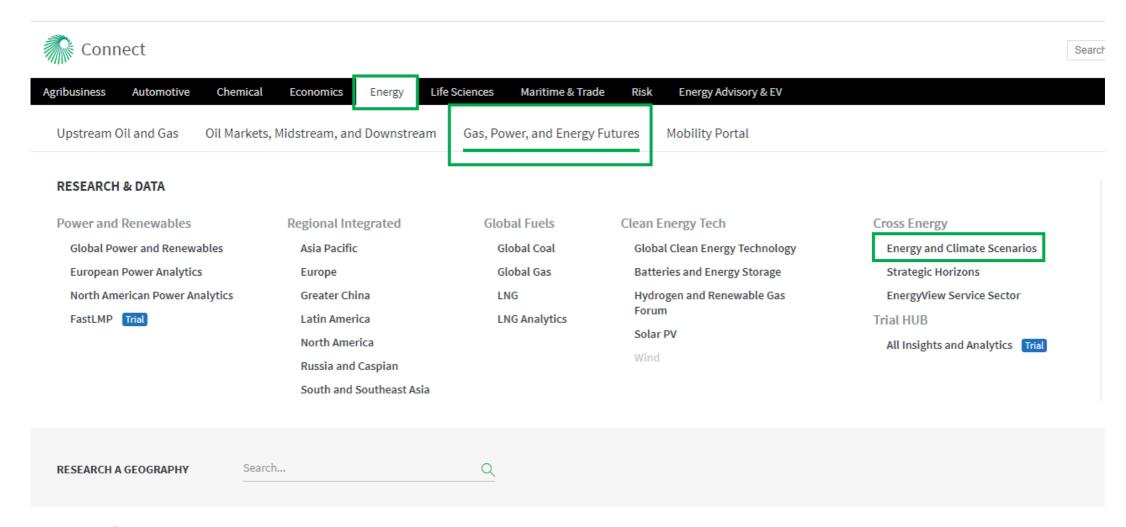
Energy and Climate Scenarios

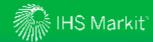
Climate policies, Energy Scenarios, Low emission pathways



Energy and Climate Scenarios in Connect

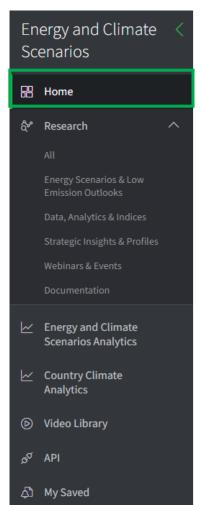
In Connect, hover over the Energy menu > Gas, Power, and Energy Futures > click on Energy and Climate Scenarios.



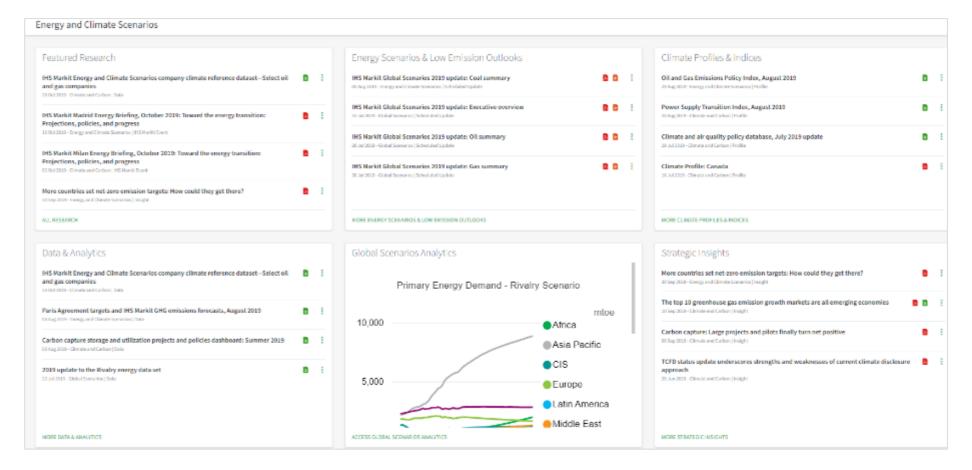


Energy and Climate Scenarios Home Page

Use the left-hand rail to browse research and analysis under **Home** and **Research** and data visualization under **Analytics**.



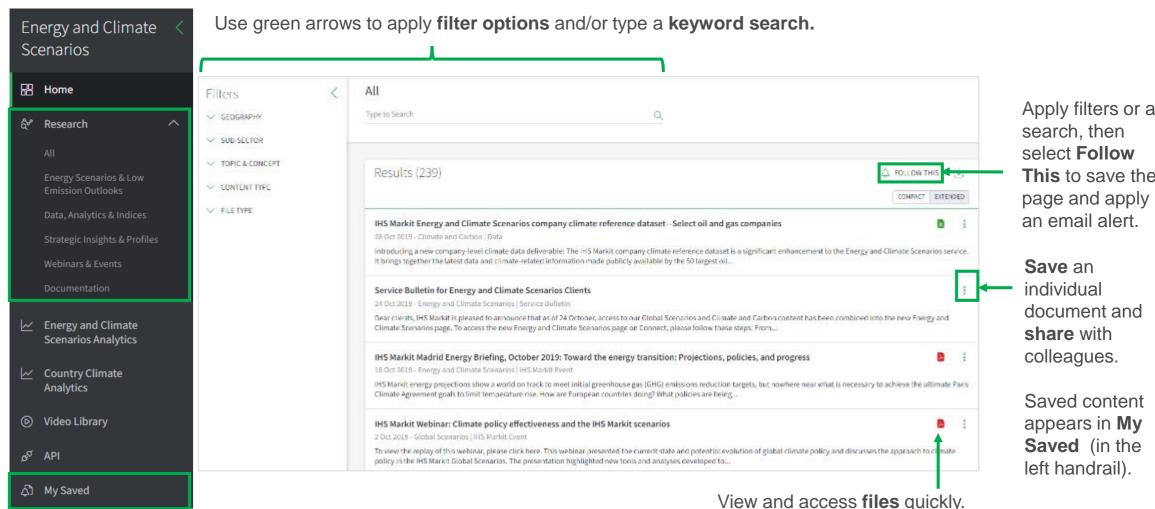
The **Home** page displays various widgets for **Featured Research**, **Outlooks**, **Data & Analytics**, and more.





Energy and Climate Scenarios Research Pages

Use the left-hand rail to click on Research topics to browse and narrow down Energy and Climate Scenarios research.

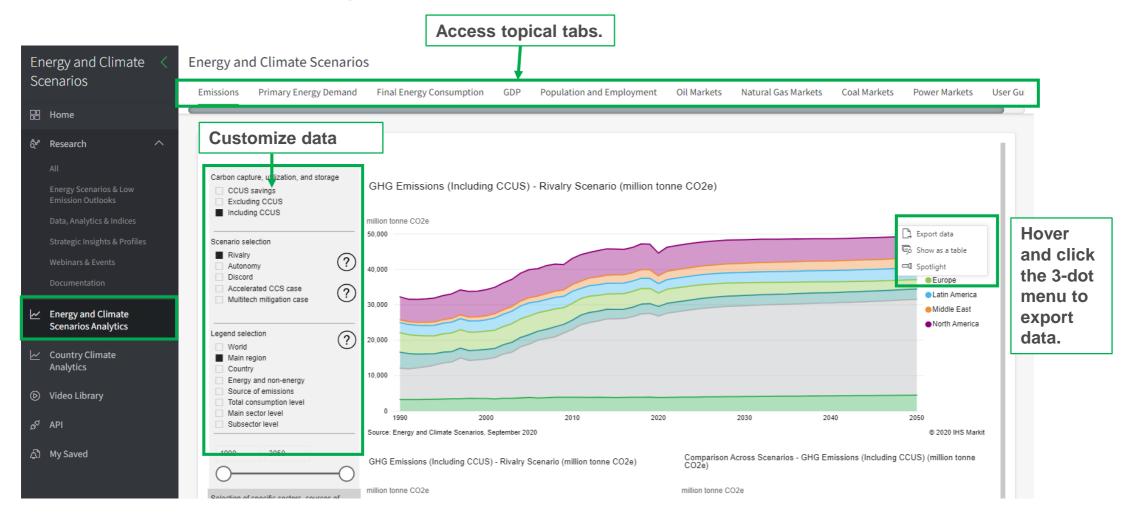


Apply filters or a This to save the



Energy and Climate Scenarios Analytics

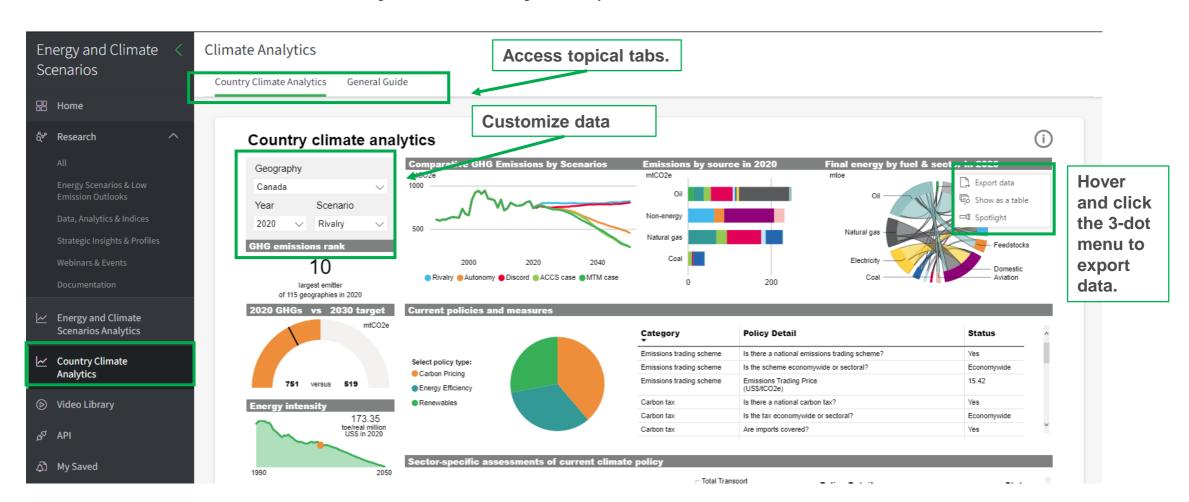
Use the left-hand rail to click on **Energy and Climate Scenarios Analytics** topics to customize and visualize related data.





Climate Analytics

Use the left-hand rail to click on Country Climate Analytics topics to customize and visualize related data.





Climate and Energy Scenarios combined provide ongoing analysis, insights and forecasts that will shape future investments

Climate policies, actions and metrics

- Country climate policies and targets, profiles and insights
- Company climate actions
- Technologies and costs
- Interaction of policies and energy scenarios
- Ongoing analysis, insights and briefings

Global energy scenarios to 2050

- Three integrated, plausible future pathways for primary energy use
- Growth of oil, gas, coal, renewables and other fuels
- Sector and key country demand outlooks
- Quarterly Signposts report and discussion

Low emissions pathways

- Two pathways to meet the Paris Climate targets
- Implications for primary energy fuels and markets
- Constructed with client input to future technologies, efficiencies, carbon capture and other mitigating factors



Climate Policy, Analysis, Databases:

- Climate country profiles: Includes the G20, Alberta, and California. The profiles provide detailed information on each country's approach to climate change and air quality, including emissions data, economy-wide and sector-specific climate change mitigation, adaptation policies and measures, and air quality standards.
- Country benchmarks: Climate and Air Quality Policy Dataset and Indexes for G20. Power Supply Transition Index released in Q1 2019, upstream oil and gas and transport policy assessments slated for 2019.
- Emissions data and long-term projections: Climate-focused dataset covering key emissions drivers and displacement factors in IHS Markit scenarios
- Carbon pricing: Global carbon market, carbon tax and company carbon prices and price forecasts for key cap-and-trade markets in Europe, North America, and Asia.
- Company intelligence: Inventory of energy company peer group-level indicators and targets, including emissions and emissions reduction measures, alignment with Task Force on Climate-related Financial Disclosure recommendations, use of scenarios and engagements with renewables for oil & gas and power companies.
- NDC emissions outlooks: Bottom-up analysis of the nationally determined contribution (NDC) to the Paris Climate Agreement that allows comparisons and assessment of the impact of the NDCs on global emissions in 2030 and measurement of the "ambition gap" in 2030.



Climate Policy, Analysis, Databases Continued:

- Carbon capture project and policy tracking: Carbon Capture Use and Storage (CCUS) Projects and Policy dashboard, which provides data analytics for all existing and planned CCUS projects and policies worldwide.
- Energy Transition Indicator monitoring: IHS Markit tracks a set of energy transition indicators (ETIs) to represent the scale and pace at which the energy transition is advancing in the wake of the Paris Agreement. Data component complemented by regular insights.
- Analysis: Exclusive special reports on climate and carbon-related topics from Climate and Carbon analysts and subject matter experts from across IHS Markit.



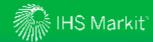
Global Energy Scenarios and Low Emission Scenarios Deliverables

- Energy scenario narrative reports that describe three distinct energy futures to 2050 (refreshed once a year)
- Annually updated datasets with outlooks to 2050; includes detailed global, regional and major country-level outlooks that cover key metrics for economic growth; oil, gas, coal, nuclear, hydro, wind, solar, electric power; and CO₂ emissions.
- Annually updated energy scenario summary PowerPoint reports provide summaries of the updates made to the 2050 outlooks and of the key assumptions and storylines for oil, gas, coal and power under each scenario.
- Annually updated outlooks for two IHS Markit low emissions cases; includes detailed datasets showing the outlooks for two modeled "cases" designed to portray long-term energy demand outlooks of futures where current climate targets are reached by 2100. Also includes a short report highlighting the key assumptions behind each case.
- Annually-updated PPT slide deck that compares our three global energy scenarios and our two low emissions case outlooks with other long-term energy outlooks from across industry, governments and agencies such as the IEA.
- Periodic energy scenarios Signposts reports assess key near-term trends and events to provide an "early warning system" for potential changes in scenario path (updated three times per year).
- Periodic Signpost-related research reports briefly highlight specific indicators or trends affecting potential shifts in long-term energy paths.
- Global Energy Scenarios Analytics Tool is a visualization tool on IHS Markit Connect that provides online access to the data posted in the IHS Markit Global Scenarios datasets.



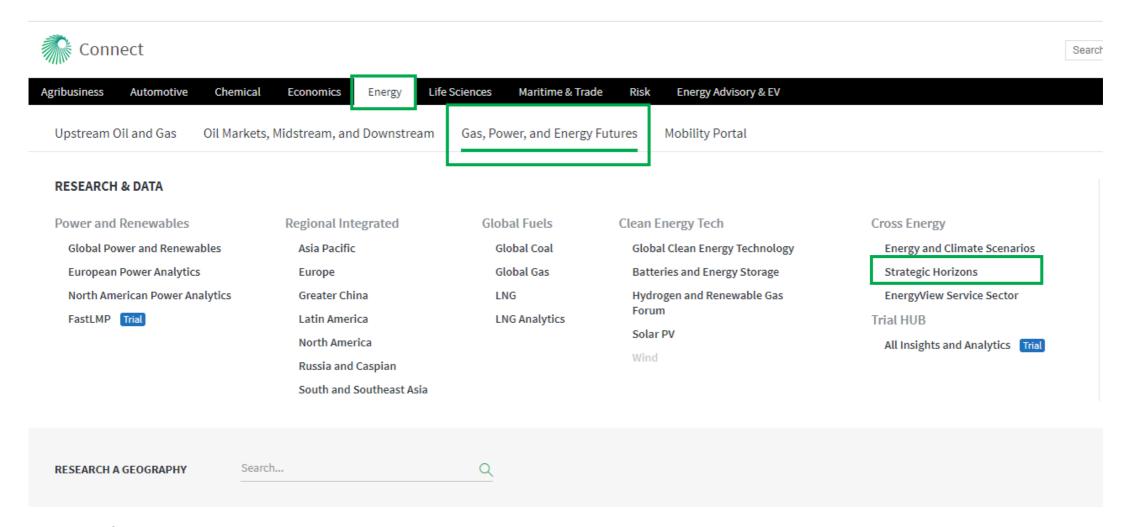
Strategic Horizons

Executive briefings on changing market and geopolitical conditions in the oil and gas industry to anticipate trends and position for competitive advantage.



Strategic Horizons in Connect

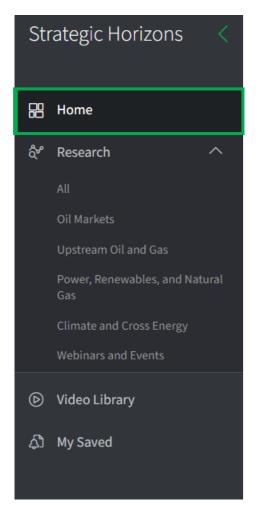
In Connect, hover over the Energy menu > Gas, Power, and Energy Futures > Click on Strategic Horizons topics.



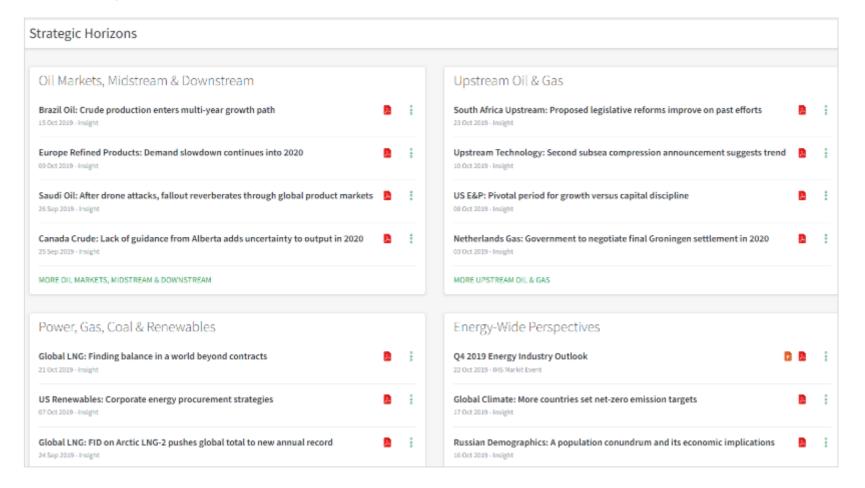


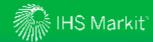
Strategic Horizons Home Page

Use the left-hand rail to browse research and analysis under **Home** and **Research** and data visualization under **Analytics**.



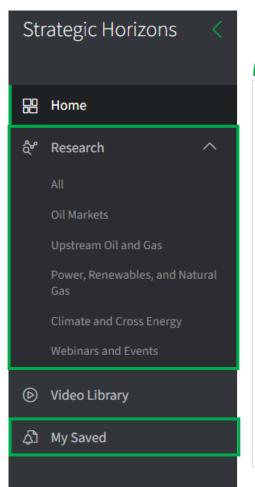
The **Home** page displays **Featured Research**, **Featured Experts**, and **Webinars & Events**.



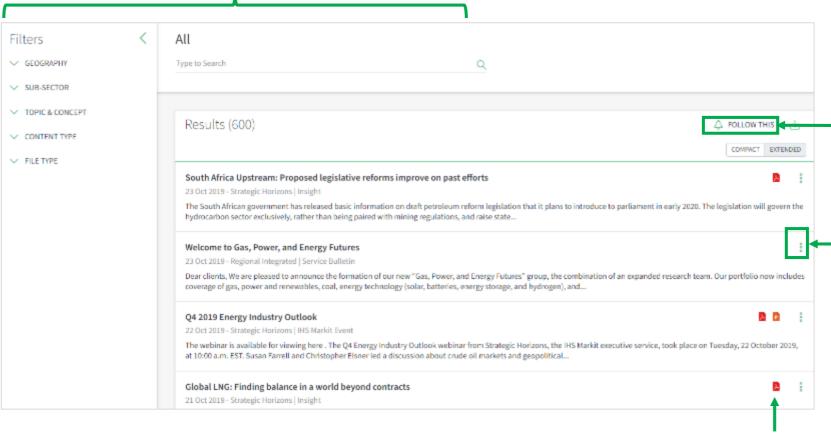


Strategic Horizons Research Pages

Use the left-hand rail to click on **Research topics** to browse and narrow down **Energy and Climate Scenarios** research.



Use green arrows to apply filter options and/or type a keyword search.



Apply filters or a search, then select **Follow This** to save the page and apply an email alert.

Save an individual document, and share with colleagues.

Saved content appears in My Saved (in the left hand rail).

View and access **files** quickly.



Strategic Horizons

Written Executive Analysis & Briefings

Designed for senior energy executives and strategic thinkers, the service delivers 140-150 annual briefings covering key trends and forward-looking views of IHS Markit experts across the energy value chain.

The service synthesizes the detailed research from across IHS Markit Energy services into short, 2-4 page summaries including forecasts, analysis, charts and graphs. (underlying data remains with the original IHS subscription).

It covers oil markets, upstream oil and gas, LNG, downstream, renewables, global economics and geopolitics.

Briefings are delivered via email attachment in pdf format.

Quarterly webinars present industry trends in a presentation and discussion format.

In-person quarterly briefings are offered as an additional option.



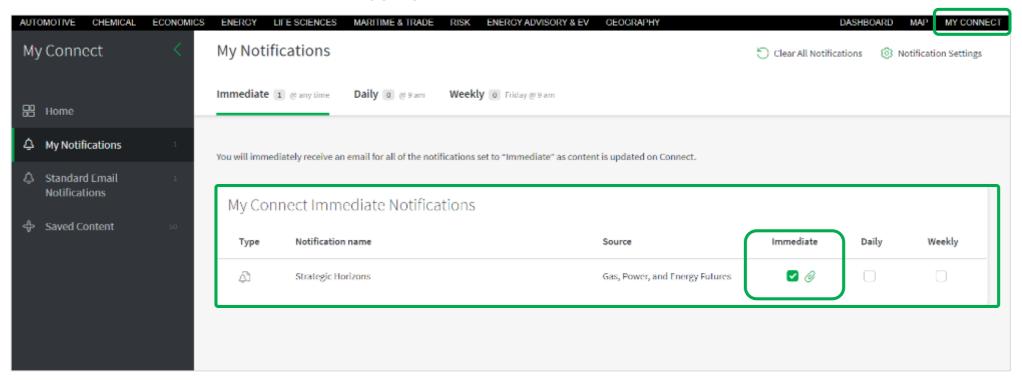
Strategic Horizons Email Alert with PDF Attachment

Click on My Connect in the black menu bar to set your email alert.

Locate Strategic Horizons in the Standard Email Notifications section.

Select the **Immediate** box and then the **paperclip icon** to send the memos as a PDF attachment directly to your inbox.

The **Daily** and **Weekly** options will send an aggregated alert each day/week. The pdf attachment option is not available.





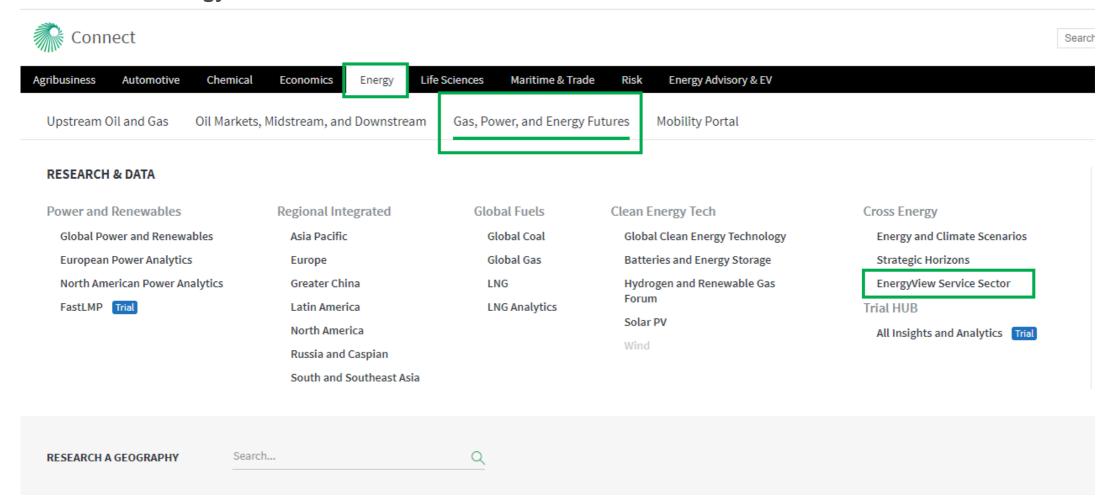
EnergyView Service Sector

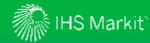
Compiles all available research (Upstream, Oil Markets, Gas, Power, etc.) in one area.



EnergyView Service Sector in Connect

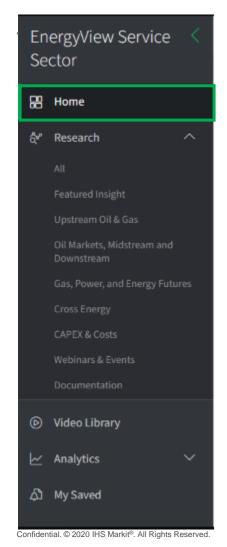
In Connect, hover over the **Energy** menu > **Gas, Power, and Energy Futures** > click on **EnergyView Service Sector** under the **Cross Energy** section.



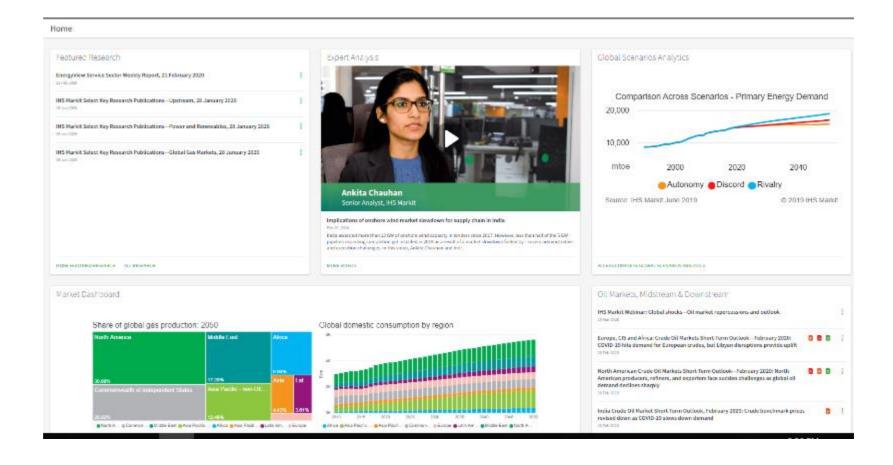


EnergyView Service Sector Research Page

Compiles all available research (Upstream, Oil Markets, Gas, Power, etc.) in one area.



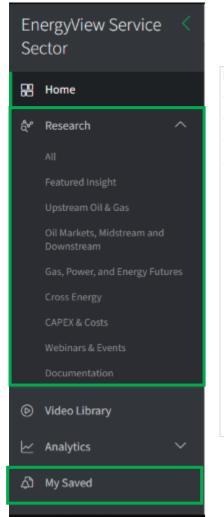
The **Home** page displays **Featured Research**, **Featured Experts**, and **Data Analytics** and more.





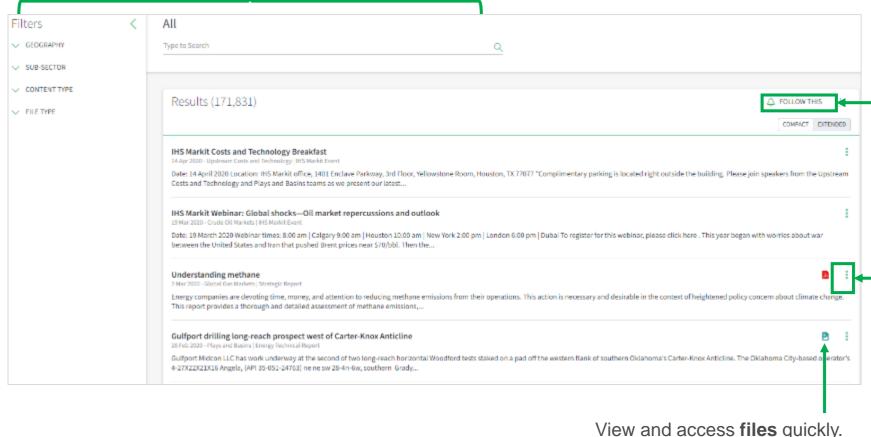
EnergyView Service Sector Research Page

Use the left-hand rail to select **Research topics** to browse and narrow down research.



Confidential. © 2020 IHS Markit®. All Rights Reserved.

Use green arrows to apply filter options and/or type a keyword search.



Apply filters or a search, then select **Follow This** to save the page and apply an email alert.

Save an individual document, and share with colleagues.

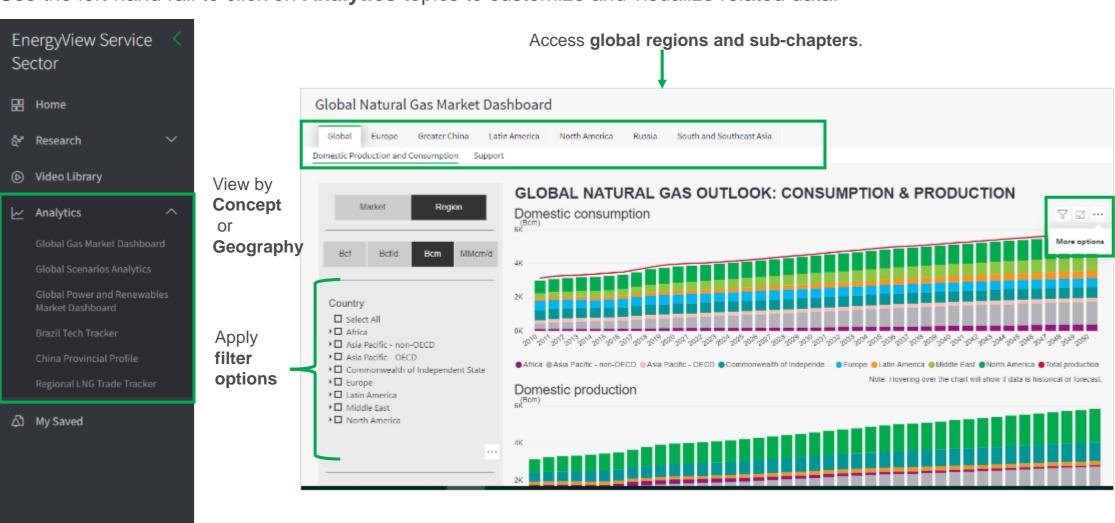
Saved content appears in My Saved (in the left hand rail).



Confidential. © 2020 IHS Markit®. All Rights Reserved.

EnergyView Service Sector Research Page

Use the left-hand rail to click on **Analytics** topics to customize and visualize related data.



Click the 3-dot menu to export data.



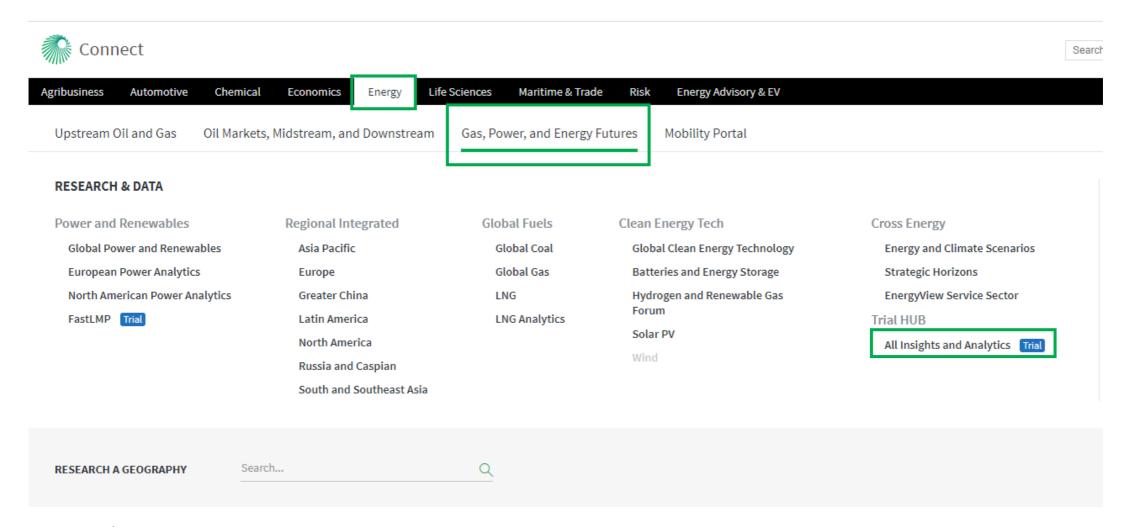
GPE Trial Hub

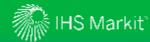
Browse selected GPE research outside of your subscription.



GPE Trial HUB in Connect

In Connect, hover over the Energy menu > Gas, Power, and Energy Futures > click on All Insights and Analytics.

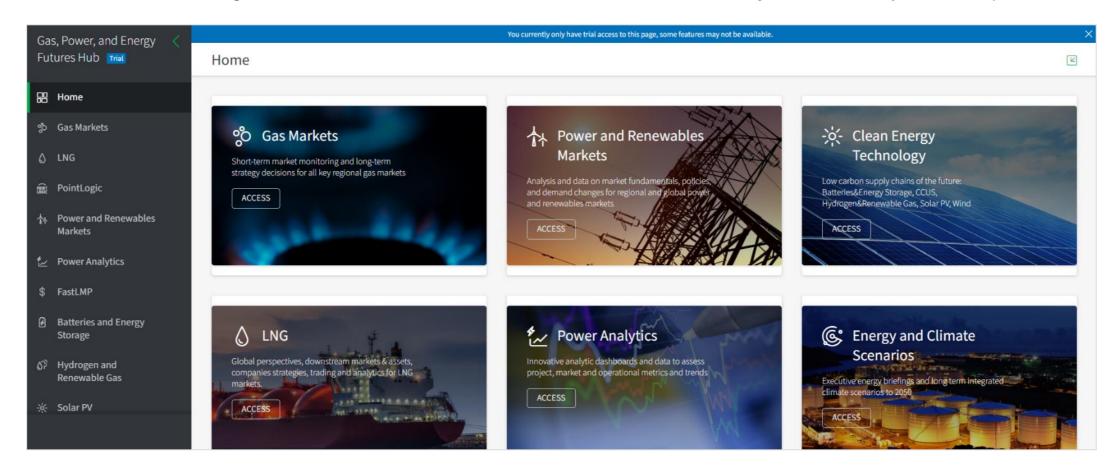




GPE Trial Hub

Browse selected GPE research outside of your subscription.

Use the left-hand navigator or Research modules to browse Research and Data Analytics outside of your subscription.





My Connect

Email alert options and your saved research.



My Connect

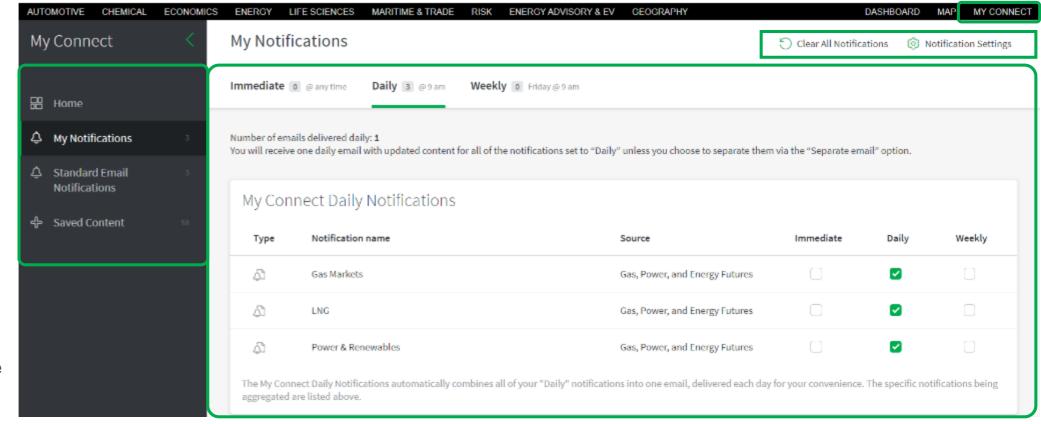
Click on My Connect in the black menu bar to manage Email Notifications and retrieve Saved Content.

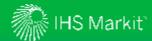
Home: View your selected notifications and latest saved content.

My Notifications: View your selected email notifications by type (Immediate, Daily, Weekly)

Standard Email Notifications: A listing of all available email notifications within your subscription.

Saved Content: Retrieve and edit your saved content by type and folder.





Contact Us

For questions or assistance, contact our Customer Care team.

Schedule a complimentary Connect training:

IHSConnectTraining@ihsmarkit.com

Access IHS Markit Connect anywhere, anytime for the information, insight and analytics necessary to make critical decisions. Download the free Connect <u>iPad</u> and <u>Smartphone</u> apps to your mobile device.



Americas:

+1 800 IHS-CARE (+1 800 447-2273) Mon. to Fri. 0800 to 1800 MDT (GMT -6hrs)

Email: <u>customercare@ihsmarkit.com</u>

Europe, Middle East & Africa:

+44 (0) 1344 328 300

Mon. to Fri. 0800 to 1800 BST (GMT +1h)

Email: customercare@ihsmarkit.com

Asia Pacific:

+604 291 3600

Mon. to Fri. 0800 to 1800 MYT (GMT +8hrs)

Email: <u>customercare@ihsmarkit.com</u>