

Upstream Energy Sector Increasingly Turns to Artificial Intelligence and Advanced Analytics to Navigate Energy Transition and Accelerate Carbon Reduction Efforts

S&P Global Commodity Insights providing new and enhanced capabilities to support industry's decarbonization and energy transition strategies

NEW YORK, Dec. 18, 2023 [/PRNewswire/](#) -- The upstream energy sector is turning to artificial intelligence and advanced analytics to speed up analysis and decision-making to realize their carbon reduction commitments. With an increased focus on strategies and investment surrounding carbon reduction, S&P Global Commodity Insights is leveraging its leading industry content set, deep domain expertise and advanced data capabilities to provide solutions that accelerate informed and confident decisions supporting the industry's decarbonization targets.

"Navigating the Energy Transition requires our industry to develop new capabilities, expand and enhance existing skillsets, and leverage emerging technologies to remain competitive," said Dan Pratt, Vice President Upstream Research & Consulting, S&P Global Commodity Insights. "Meeting the challenge means looking at subsurface, above-ground and market information in new and different ways. Applying advanced data analytics and artificial intelligence can accelerate these efforts."

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The challenges that come with properly assessing and de-risking energy transition initiatives necessitates new data tools. As part of a strategic program aligned with the growing focus on decarbonization and energy transition challenges, S&P Global Commodity Insights is combining data derivation, modeling and machine learning with its domain expertise to deliver innovative capabilities that complement its traditional Upstream Solutions in key areas such as:

Carbon Capture Utilization and Storage (CCUS) : Developing carbon storage at scale to help offset greenhouse gas emissions is an energy transition opportunity that many oil and gas companies find themselves well positioned to take a lead on, as it utilizes their exploration and production capabilities in reverse. However, finding the optimal carbon storage sites requires different analysis to that carried out for hydrocarbon exploration. This could be a barrier to developing CCUS at the speed required.

Focusing on the Gulf of Mexico, S&P Global Commodity Insights conducted a proof of concept study this year that aimed to screen 200+ saline aquifers around greatest potential and lease activity, extending from south of Corpus Christi, Texas, to the Texas/Louisiana border. The basin's sheer size, geologic risks and data inconsistencies limit rapid assessment using conventional technologies. By using multi-variant machine-learning techniques, the study was not only able to predict the distribution of net sands, but also to assess volumetric and injectivity risk. For basin-scale fault analysis, it utilized 3D convolutional neural networks (CNNs), offering a more nuanced understanding of the Gulf of Mexico within just three days.

"The pace of innovation in carbon sequestration is advancing rapidly, bolstered by the convergence of the most advanced tools, data and artificial intelligence/machine learning expertise available today," said Murray Christie, Executive Director of Software and Data Science, S&P Global Commodity Insights. "Our expertise in harnessing these sophisticated assets empowers geoscientists to perform comprehensive basin-scale screenings, achieving unprecedented accuracy and efficiency while significantly diminishing associated risks."

Land for renewable energy or carbon storage projects : With the COP 28 pledge to triple renewable energy by 2030 and the Inflation Reduction Act (2022) in the United States offering incentives for investment in renewable energy and decarbonization initiatives, both hydrocarbon and renewable energy companies are actively seeking land to site wind, solar, biofuel or carbon storage projects. However, there are significant risks and delays associated with getting land siting wrong.

Land purchase takes time, and the process is prolonged by administrative procedures which have been slow to digitize. This is compounded by the need to ensure a site possesses all the right characteristics for a particular energy project, which means obtaining intelligence from disparate sources. To help mitigate project risks and speed up site evaluation, S&P Global Commodity Insights spatially integrates datasets on surface ownership, local and federal siting regulations and zoning ordinances, wildlife restrictions, existing projects and infrastructure, as well as demographics. Companies can quickly carry out the site analysis required with current data aggregated into a single accessible space.

"Leveraging these advanced tools makes it possible for users to identify target locations for renewable energy projects before the competition," said Tony Manzur, Executive Director, Upstream North America Content, S&P Global Commodity Insights. "Aggregating all necessary land for renewables and surface ownership data sets can accelerate land siting from months to days or even hours."

Greenhouse gas emissions from oil & gas production : When planning decarbonization of upstream operations, energy companies and their stakeholders are analyzing relative performance on absolute emissions, emissions intensity and the impact of different abatement strategies. Existing regulatory and voluntary reporting demonstrates variances in coverage and applies inconsistent system boundaries and granularity requirements. Making decisions about lower carbon oil and gas production over the next decades isn't possible without consistent, comprehensive and detailed emissions intensity of different wells and assets.

S&P Global Commodity Insights has drawn on more than 10 years of detailed emissions modeling expertise to create purpose-built models for estimating carbon dioxide, methane and nitrous oxide emissions from onshore, offshore, oil sands and other forms of hydrocarbon extraction. Covering more than 6 million onshore wells in North America and almost 19,000 operating and planned upstream projects in the rest of the world, S&P Global Commodity Insights' model incorporates reported disposition volumes and standard engineering derivations from production data. Fine-tuned with a detailed understanding of the equipment and management practices in place, it is complemented with sensor data from satellite or aerial observations.

"The world is asking upstream companies to compete on carbon, and the key to any competition is standardized metrics," said Kevin Birn, Vice President, Center of Emissions Excellence, S&P Global Commodity Insights. "The capabilities that S&P Global Commodity Insights has developed provide the most comprehensive, granular and independent assessment of upstream oil and gas production emissions globally. Information at this level of detail makes it possible to identify solutions that support emissions reduction plans by better understanding the drivers of emissions and the differences between various operations."

Water and Injection Management : Greenhouse gas emissions are not the only waste stream hydrocarbon producers have to manage responsibly. Produced water from hydrocarbon extraction is increasingly becoming one of the largest waste by-products affecting E&P companies to date. Rapid data acquisition and reconciliation facilitates informed and confident decisions by operators to manage produced water and injection responsibly. The robust S&P Global Commodity Insights collection of data allows operators to know where they can dispose of their produced water, while at the same time, mitigating risk and enhancing extraction. The database includes well level injection volumes and pressures for every injection well in the United States, as well as CO₂ and H₂O pipelines. Overall, S&P Global Commodity Insights provides a single point of contact encompassing all things relating to water and injection management including spare capacity, seismic response areas and disposal locations.

"Meeting the challenges of the energy transition is front-of-mind for the industry, and that requires new types of data that are of the same breadth and depth that the industry has always relied on," said Amy Singer, Commercial Lead, North America Upstream, S&P Global Commodity Insights. "Applying machine learning and advanced analytics allows us to quickly provide solutions to meet these emerging needs."

For more details about S&P Global Commodity Insights' innovative energy transition solutions in the upstream energy space, visit: <https://www.spglobal.com/commodityinsights/en/ci/industry/oil-gas.html>

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