# Hotshots to Hydrogen: As the Utica and Marcellus Shale Opportunities Evolve So Does the Vocabulary

*NAI Spring's Bryce Custer, CCIM, SIOR, On the Colors of Hydrogen, Carbon Dioxide (CO2) Capture and Sequestration (CCS)*

CANTON, OHIO, UNITED STATES, February 17, 2022 /EINPresswire.com/ -- It has been a little over a decade since Aubrey McClendon declared that the Utica Shale would be “the biggest thing to economically hit Ohio since maybe the plow” at the Governor’s 21st Century Energy and Economic Summit (September 2011). “It seems like a lifetime ago since NAI Spring began to field calls for the Oil & Gas rush.” Said Bryce Custer, CCIM, SIOR, Petrochemical & Plastics Broker for NAI Spring.

> “Every industry must grow and adapt to survive, with the energy industry in general, and oil and gas in particular, both long-time survivors.”
>
> *Rick Stouffer*

Along with the new opportunities came a whole new vocabulary. "From my Organic Chemistry days at KSU I understood Carbon Chains (methene, ethane, propane etc.) Who knew that working with upstream, mid-stream and downstream companies would require a whole new education?" said Custer.

- “Dry” vs “Wet” gas
- Formation fracturing (fracing) vs Fractionation
- Fishing?
- Hot Shots?

The abundance of Natural Gas (and decommissioning of coal burning facilities) led to "combined cycle" power plants throughout Ohio.

Welcome to the new era of energy…
Coal and natural gas bad! Solar and wind good!
Gas vehicles bad! Electric vehicles good!
Plastic straws bad! Paper straws good!

Our new “energy economy” has arrived with a whole new vocabulary.

Every industry must grow and adapt to survive, with the energy industry in general, and oil and gas in particular, both long-time survivors.

Today, adapting to ever-tightening emissions regulations, and an investment community which puts its money into companies greatly concerned with climate change and sustainability, there's a new crop of "buzz words" and their accompanying acronyms.

Here are a few terms and acronyms growing daily in importance to energy providers and users.

Colors of Hydrogen (Fuel Cells)

Hydrogen, the most plentiful element in the galaxy, is, in its natural form an odorless, colorless gas.

Not today, sorta. There's a plethora of hydrogen colors, plus various technologies used to produce each tint.

The assorted colors are basically color codes used by the energy industry to differentiate between hydrogen types.

Green hydrogen is the one produced with no greenhouse gas (GHG) emissions. Green hydrogen is made by using clean electricity from renewable energy sources, such as solar and wind power, to electrolyze water.

Electrolyzers use an electrochemical reaction to split water into its components of hydrogen and oxygen, emitting zero-carbon dioxide in the process.

Blue hydrogen is produced primarily from natural gas, using a process called steam reforming, which brings together natural gas and steam. The output is hydrogen, but also CO2 as a byproduct, which means carbon capture and storage (sequestration), or CCS, is used to capture and store the CO2.

Grey hydrogen, the most generic form of hydrogen production, is created from natural gas, or methane, using steam methane reformation, but without capturing GHS made in the process.

Black or brown hydrogen is produced from coal. The black and brown colors refer to the type of coal used: bituminous (black) or lignite (brown). Coal gasification is used to produce hydrogen. However, it's very pollution intensive.

Turquoise hydrogen can be extracted by the thermal splitting of methane via methane pyrolysis. The process, currently experimental, removes carbon in a solid form instead of CO2 gas.

Purple hydrogen is made using nuclear power and heat through combined chemo-thermal electrolysis splitting of water.

Pink hydrogen is generated through electrolysis of water by using electricity from a nuclear power plant.

Red hydrogen is produced through the high-temperature catalytic splitting of water using nuclear power thermal as an energy source.

White hydrogen refers to naturally occurring hydrogen.

Yellow hydrogen is made through electrolysis using solar power.

CCS: Carbon capture and sequestration

Carbon dioxide ($CO_2$) capture and sequestration (CCS), aka, carbon storage, are technologies that can reduce $CO_2$ emissions from new and existing coal- and gas-fired power plants and large industrial sources.

CCS is a three-step process that includes:
- Capture of $CO_2$ from power plants or industrial processes
- Transport of the captured and compressed $CO_2$ (usually in pipelines).
- Underground injection and geologic sequestration (also referred to as storage) of the $CO_2$ into deep underground rock formations.

These formations are often a mile or more beneath the surface and consist of porous rock that holds the $CO_2$. Overlying these formations are impermeable, non-porous layers of rock that trap the $CO_2$ and prevent it from migrating upward.

Many within the industry believe CCS could play a key role in reducing greenhouse gas emissions, while enabling low-carbon electricity generation from power plants, according to the U.S. Environmental Protection Agency (EPA).

More than 40% of $CO_2$ emissions in the U.S. are from electric power generation. CCS technologies are currently available and can dramatically reduce (by 80-90%) $CO_2$ emissions from power plants that burn fossil fuels.

Applied to a 500 MW coal-fired power plant, which emits roughly three million tons of $CO_2$ annually, the amount of GHG emissions avoided (with a 90% reduction efficiency) would be equivalent to:
- Planting more than 62 million trees, and waiting at least a decade for them to grow.
- Avoiding annual electricity-related emissions from more than 300,000 homes.

Geologic formations suitable for sequestration include depleted oil and gas fields, deep coal seams, and saline formations. The U.S. Department of Energy estimates that anywhere from 1,800 to 20,000 billion metric tons of CO2 could be stored underground in the U.S. That's equivalent to 6,000 to 6,700 years of current level emissions from large stationary sources in the country.

For additional information and updates on petrochemical, energy, plastics and polymers throughout the Ohio and West Virginia area, contact Bryce Custer at (330) 418-9287 or bryce@OhioRiverCorridor.com.

Bryce Custer, SIOR, CCIM has been working with clients throughout the Ohio River Corridor with sales/leasing of properties and terminal operations. Custer has been actively involved with site selection for natural gas power plants and manufacturing facilities throughout Ohio and West Virginia. Custer is a licensed commercial real estate broker with NAI Spring in Ohio and West Virginia and our affiliation with NAI Global provides us the opportunities to service clients worldwide.

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