DIVIDEND ASSETS CAPITAL, LLC

INVESTMENT ADVISORS

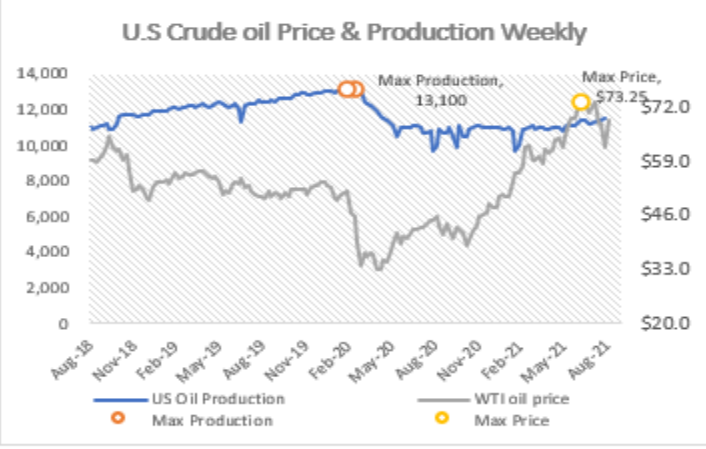
# Energy Investor Monthly: August 2021

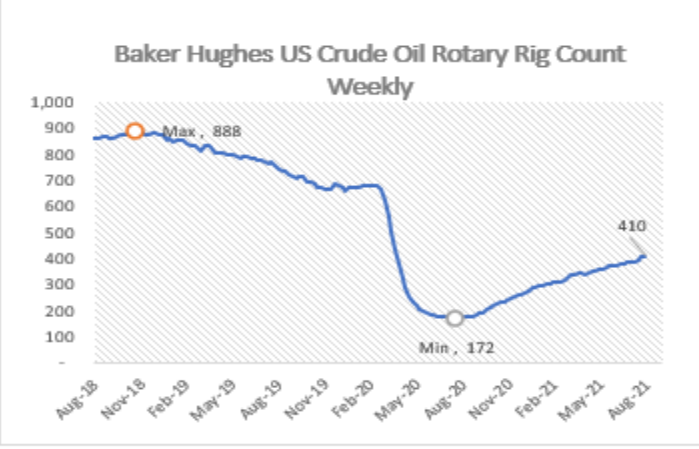
DIVIDEND ASSETS CAPITAL – INVESTMENT STRATEGIES FOR RISING INCOME & GROWTH

**DAC produces the *Energy Investor Monthly* to be a one-stop information resource on domestic supply/demand factors and global trends in the energy market for your reference.**

**U.S. Total Crude Oil Production and U.S. Crude Rotary Rig Count:**

1. As of 8/31/2021, the West Texas Intermediary (WTI) oil price was $66.42 per barrel, the first monthly decline since March, still about 50% higher when compared to the same time a year ago. The market is assessing the impact of Hurricane Ida on oil assets, demand-supply disruptions after the historical storm swept across the Gulf of Mexico and Louisiana. Russia restores output in line with the OPEC+ quota and implies more production if allowed.
2. Oil production increased by 100k bbl/d averaging 11.5 million bbl/d. The highest it's been since May 2020. Still, the number is expected to fall sharply in next week's report, with about 95% of Gulf of Mexico production curtailed by Hurricane Ida.
3. The U.S. oil rig count increased to 410, according to Baker Hughes. An increase of 25 rigs from the previous month-end and 230 more from the same time a year ago.

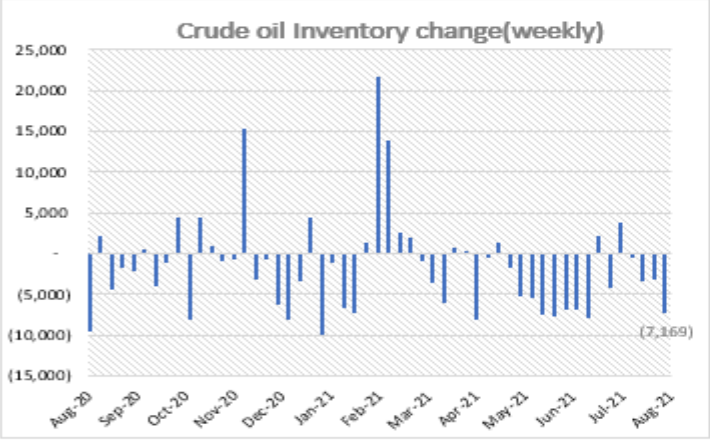


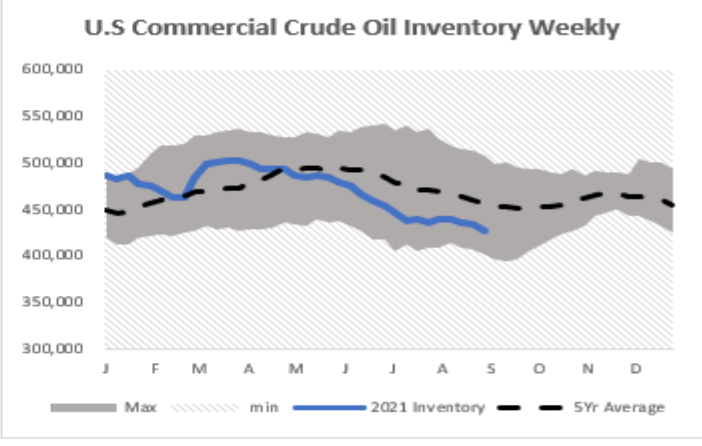




Source: Bloomberg, Dividend Assets Capital

**The U.S. Commercial Crude Oil Inventories (excluding those in the Strategic Petroleum Reserve) and Inventory Changes:**

1. U.S. commercial crude oil inventories were 425.4 million barrels at month-end, the lowest volume since September 2019. This inventory level is also about 6% below the five-year average for this time of year.
2. U.S. commercial crude oil inventories had a noticeable draw of 7.2 mil bbl/d; the bulk of that draw was from the Gulf Coast. The region is now sitting on the lowest supply since February 2020.

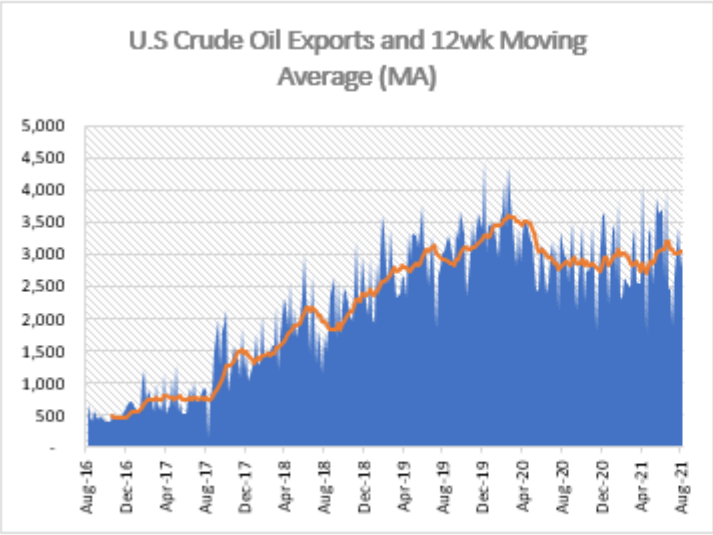


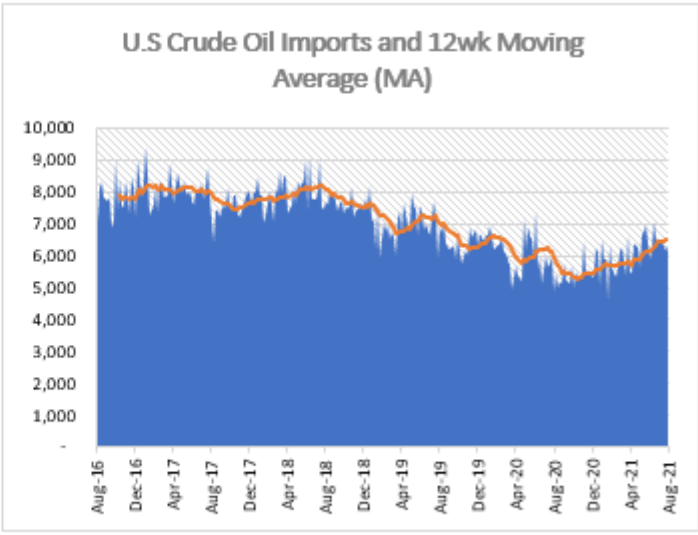




Source: Bloomberg, Dividend Assets Capital

**U.S. Imports and Exports:**

1. U.S. crude exports and imports rose despite Hurricane Ida. Outflows rose by 8.1%, averaging 3.04 million bbl/d, while imports inched up nearly 3%, averaging 6.34 million bbl/d. Over the past four weeks, crude oil imports averaged about 6.3 mil bbl/d, 13.9% more than the same four-week period a year ago.

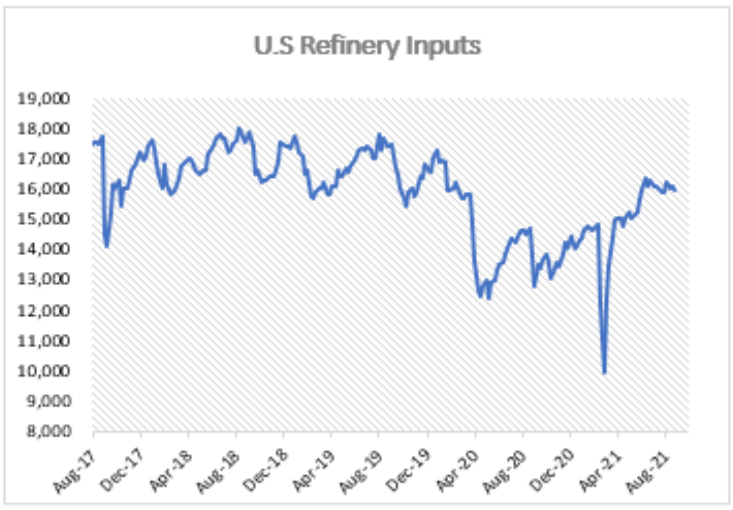


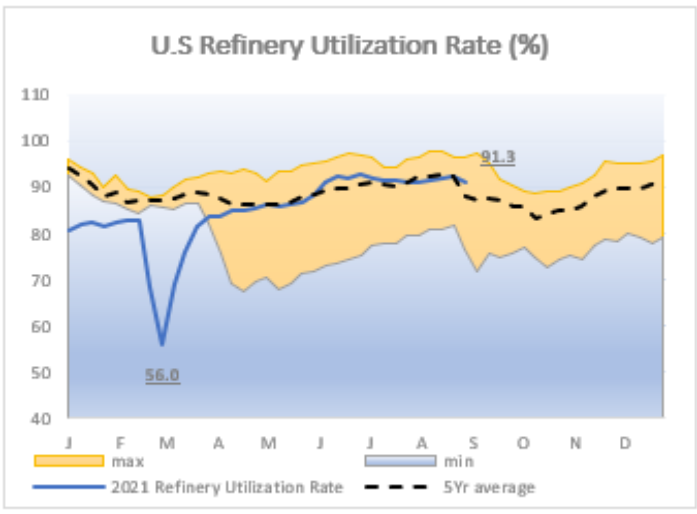




Source: Bloomberg, Dividend Assets Capital

**U.S. Refinery Inputs and Utilization Rates:**

1. U.S. crude oil refinery inputs averaged 15.9 million bbl/d for the week ending 8/27/2021. Four-Week inputs averaged 16.05 million bbl/d and were 11.2% higher than the same time a year ago.
2. Despite the 1.1% drop in U.S. refinery utilization to 91.3%, the reading has remained above the 91% mark since June.
3. Total refined products supplied over the last four-week period averaged 21.4 million bbl/d, up by 17.1% from the same period the previous year.
4. Refined-products demand was strong. Jet fuel implied demand was up about 400k bbl/d to 1.8 million bbl/d, the highest since Christmas travel in late December. Weekly diesel demand was also up 286k bpd to nearly 4.4 million bbl/d. The news from Walmart hiring to boost the supply chain means strong support for trucking and diesel.



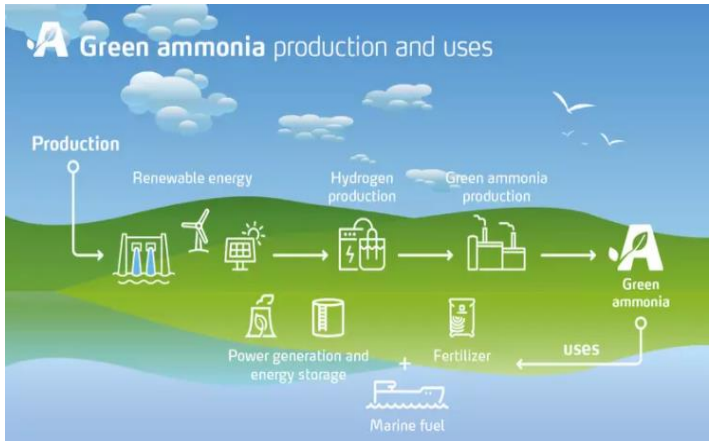

Source: Bloomberg, Dividend Assets Capital

***Insights of the Month*… Green alternatives to transition towards low-carbon economy (Part 2)**

## Why ammonia?

Hydrogen is a very good energy carrier with high energy per unit mass properties but a very low-density gas at room temperature. To store and transport it, we either cool it to below minus 250 degrees Celsius to make it into a liquid or pressurize it somewhere between 100- 103 times atmospheric pressure. Pressurized Hydrogen contains about 14,000 Watt-hours of energy per kilogram. The best lithium-ion batteries can only produce about 280 Watt-hours per kilogram, making Hydrogen an attractive fuel option. But cooling and pressurizing Hydrogen takes a lot of energy, removing approximately 30% of efficiency from the overall hydrogen production and supply chain process. In addition, Hydrogen is a very active gas making it not ideal for shipping in pressurized steel cylinders or transporting it through pipelines. So, converting Hydrogen into ammonia to take advantage of the established infrastructure becomes an ideal solution.

| Fuel Property | Unit | HFO | Compressed Hydrogen (350 bar) | Liquid Hydrogen | Liquid Ammonia | Reference |
|---|---|---|---|---|---|---|
| Low heating value | MJ/kg (kWh/kg) | 40.2 (11.17) | 120.00 (33.33) | 120.00 (33.33) | 18.6 (5.17) | [7–10] |
| Volumetric energy density | MJ/m³ (kWh/m³) | 39,564–42,036 (10,990–11,677) | 5040 (1400) | 8500 (2361) | 14,100 (3917) | [5,9,11] |
| Min. auto-ignition temperature | °C | 250 | 500–577 | 500–577 | 650–657 | [7,8,12] |
| Boiling temperature at 1atm | °C | N/A | N/A | −253 | −33.4 | [8,9] |
| Condensation pressure at 25 °C | atm | N/A | N/A | N/A | 9.90 | [8] |
| Hydrogen content | % by mass | N/A | 100.0 | 100.0 | 17.8 | [7,8] |




Source: weforum.org

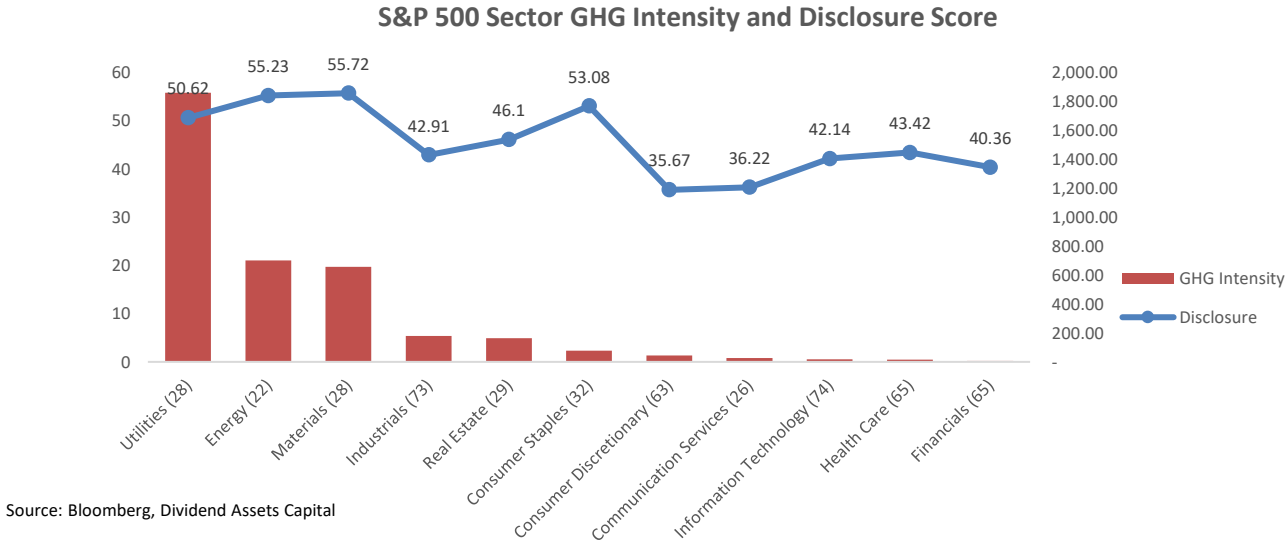
## Use of Ammonia

The latest report for the global market estimates the ammonia industry is worth nearly $73B with an annual production volume of 175 million tons. The bulk of ammonia is used for nitrogen fertilizer. So the potential benefits of transporting and storing ammonia as a long-term energy carrier seem attractive. Ammonia liquefies at only minus 33 degrees Celsius vs. minus 253 degrees Celsius for Hydrogen; it only needs to be compressed to 10 times atmospheric pressure. Unlike Hydrogen, It doesn't react with steel. (see table above). It's a better hydrogen carrier than Hydrogen itself, for the same volume ammonia contains 50% more Hydrogen. A molecule of ammonia contains one nitrogen atom with three hydrogen atoms. The air we breathe is about 78% nitrogen, so there is no shortage of that, and there is no shortage of Hydrogen either. In reality, it's the most abundant element in the universe. **So, why not ammonia? Because** the industrial processes for liberating nitrogen and Hydrogen and combining them into ammonia are currently among the dirtiest in the world, using about 2% of the world's fossil fuels and accounting for 1.2% of total global CO2 emissions. The existing method to produce ammonia is Harbor-Bosh, named after Fritz Harbor, who discovered the reaction in 1909. The process uses a tremendous amount of energy, usually provided by fossil fuels, and releases more CO2 into the atmosphere (neither clean energy nor GHG reduction).

**Green ammonia** refers to ammonia produced through emitting zero or a minimal amount of carbon dioxide and other greenhouse gases. The technologies for green ammonia production are in the emerging stage. These green technologies use things like recycled water, no-cost carbon electricity, or carbon capture. In our view, currently, the economics of such a green ammonia process is not compatible with those of the conventional ammonia process. The bottom line, the potential scope of ammonia energy applications has been widening. It's now being proposed as a direct fuel for shipping and heavy transport vehicles like buses and in power generators, direct ammonia fuel cells, power turbines, and even jet engines. As we have learned so far, every energy source has externalities, pollution, emissions throughout its life cycle. That highlights the importance of carbon capture and storage (CCS) technologies. The goal to achieve a sustainable future requires continuous innovation and government support.

**What is the implication for Energy Investors?**

EV manufacturers, solar and wind assets operators might be the obvious beneficiary in the Energy transition, but hardly the only ones. Sectors with the highest GHG Intensity tend to have the highest disclosure score. As a result, they are actively making strategic investments to better align with long-term investors and regulators. Companies in the Material sector like CF Industries and Air Products and Chemicals could benefit from expanded applications for ammonia as clean energy. At the same time, Utility company PPL Corp is actively working to commercialize newer technologies related to carbon capture, Hydrogen, and ammonia. Energy sector companies like Baker Hughes are evaluating different decarbonization technologies to capture and store carbon. For example, Baker Hughes introduced the chilled ammonia process, which is commercially available and ideal for large-scale projects. At the same time, it offers the Compact Carbon Capture, a rotating bed technology, is more suitable for smaller and mid-scale projects, offshore industries, cement factories, and other industries. Oilfield services & equipment company NOV Inc. provides technologies for ammonia storage that may be essential for transporting Hydrogen globally as the ecosystem builds itself out.




Source: Bloomberg, Dividend Assets Capital

Produced By Susie Wang, Chief Investment Officer and Director of Investment Strategies (September 9, 2021)



DAC-21-069

Dividend Assts Capital, LLC is an independent, employee owned wealth advisor specializing in high quality companies with a history of consistently increasing dividends. Built on a pioneering legacy, our goal is straightforward; achieve our clients desired outcomes through investments that provide sustainable and rising income with long-term capital appreciation. We partner with successful families, advisors and institutions delivering tailored services that adhere to fiduciary principles to provide…

| | | |
|---|---|---|
| **Clarity**: A transparent and understandable approach to portfolio management. | **Simplicity**: We believe dividends are the best indicator of the future price performance of a stock. | **Devotion**: We build confidence through a disciplined process and strong devotion to our investment philosophy and clients. |