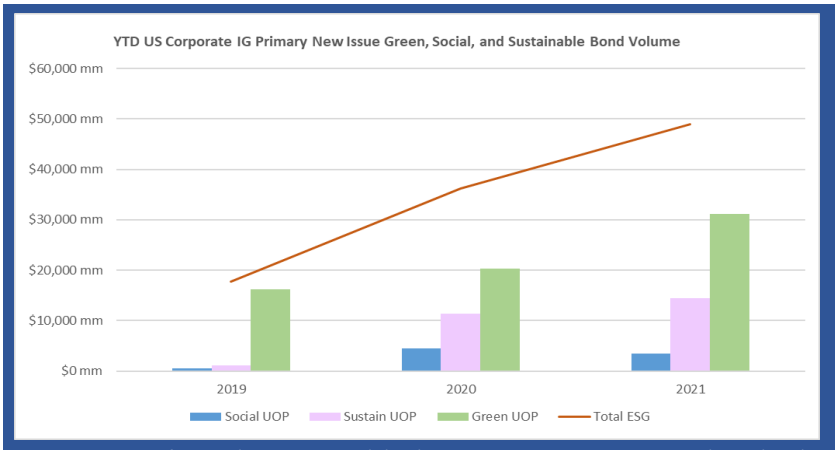
October 2021

Energy Security. You've probably heard the phrase pop up a little more frequently over the past two weeks and the media has been quick to comment on it, but as Inigo Montoya once said, *"You keep using that word. I do not think it means what you think it means."*

In this report we review…

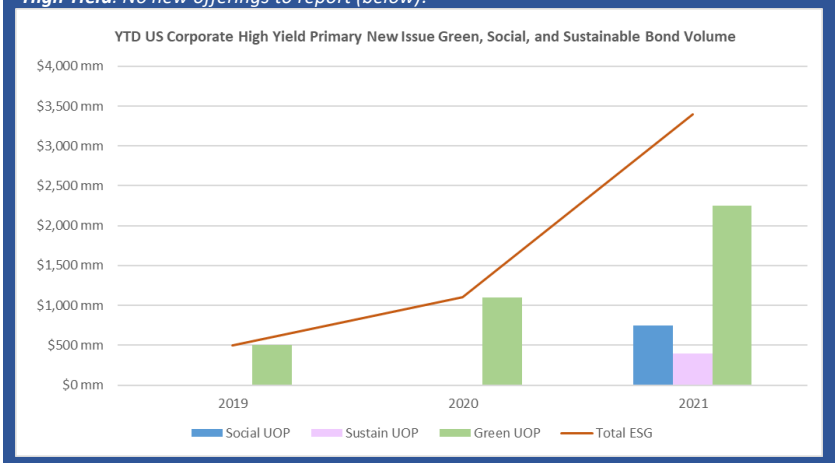
- What energy security entails and a framework for understanding.
- The importance of energy security and historical responses.
- What companies can do, and role sustainable finance and capital markets plays.

As more economies begin opening after almost two years of Covid induced lockdowns, demand for goods and services is rising and spurring the increased use of fuel and electricity. Simultaneously our pre-existing energy infrastructure, specifically generation capacity that is predicated on the combustion of hydrocarbons, is subject to the transitionary risks associated with climate change—in this case, decommissioning. The one-two punch of increased demand coupled with the reduction of coal fired plants related to the drawdown in GHGs has indeed led to increased costs that impact affordability. However, is this really the existential threat to *energy security* that we've been hearing about and why is it important?



Investment Grade: *October remains subdued in comparison to previous months with only WP Carey and Micron came to market with ESG themed UOP bonds. Still YTD ESG issuance exceeds both 2019 and 2020 with over $45bn priced across sustainable, social, and green labeled instruments.*

High Yield: *No new offerings to report (below).*



Energy Security: A Framework

While these increases surely impact one component of energy security (affordability), there are many other components: availability of energy supplies, energy technology & efficiency, social-environmental impact, and government involvement/support.

What is being missed in the headlines is the caveated nature of energy-security. Energy security is caveated because it exists at varying levels from micro to macro. For example, depending on the technology being used, proximity to sources, and regulations or subsidies in place in one region of a nation (or even a state) might be significantly more energy secure than another region. So how do we begin to assess this?

- **Availability**: Traditionally the availability of energy is measured in reserves and resources. Reserves are what we know we have in storage or are quickly and economically feasible to extract. Resources on the other hand are what we know to be available but are not currently feasible to extract. For renewables, this is a little trickier given that wind and solar can vary depending on changes in weather and climate. In 2019 (best available data

for the globe) the global total energy supply was 600,000 petajoules (PJs), while total final consumption was only 417,000 PJs, or ~180,000 PJs less than production.

- **Affordability**: This of course is the focus of market participants and the media, but when you look beyond the 2014-2015 horizon they provide, you will find energy costs are still much more affordable than what they were in 2008. Both the active December contracts for Brent and WTI are floating around $83-$86 respectively, the highest prices since 2014, but still not near the peak we experienced in 2008 when prices reached $140. Similarly, natural gas has experienced a recent spike (now at around $5,300 per MMBtu) but still not near the high of $9,000+ that it reached 13 years ago. As for electricity here in the US, when you examine this across all sectors from 2015 to 2021, you'll find there has been just a 5% increase in the cost per kwh—that's a much lower rate of appreciation compared to the cost of a Big Mac (+18%) over the same time!

- **Energy Technology & Efficiency**: Technology (and its efficiency) are also crucial components to energy security. Having access to more types of engines, dynamos, reactors, and technology capable of translating diverse energy sources into power is critical to energy security. Here in the United States, over the course of 120+ years we have slowly diversified from biomass (wood) to coal and hydrocarbons and now to renewables. Globally the production of energy from renewables and waste (biomass) has increased 36% from ~62,000 PJs in 2008 to ~85,000 PJs in 2020.

- **Environmental Impact**: The fourth component is the environmental/social impact associated with energy and power production. We will not belabor this point, but it relates to climate change and physical risks posed by energy and power production. What we would like to highlight is the energy and water nexus—this is because climate change immediately impacts how water is allocated. For the energy industry, this is important because almost half of all water withdrawn in the US helps to keep power plants functioning and cool and this water is also essential for hydropower and enhanced oil recovery. Drought and higher temperature extremes mean less water for hydropower and plant cooling, but also increases the demand for electricity needed for cooling, thereby compounding the issue. Forests, oceans, and the soil are also negatively impacted by energy and power production.

- **Government Support**: Last and certainly not least is how involved or not involved governments are in energy markets and infrastructure. This includes regulators, subsidies, and transparency of data. Government involvement is also helpful in laying/incentivizing those standards. Here in the United States, the government offers a variety of tax incentives including a production tax credit, an investment tax credit, a residential energy credit, and grant/loan programs through the USDA, DOE, and DOI.

Why is Energy Security Important?

Companies, especially ones which operate outside the United States in regions or nations which score less in some of the categories above compared to others, will want to remain vigilant as the globe shifts from hydrocarbons to more renewables. Governments like China, Britain, and Venezuela are looking to solve energy security challenges by simply curtailing usage. This is a mistake and only fuels economic crises and inflation. Instead, key players should look to enhance availability and technology, while keeping it affordable and mitigating environmental impacts. Here in the US energy prices will continue to rise as we approach winter, but we are still energy rich and the biggest risk posed is to the supply chain, thereby driving inflation. From a near-term geopolitical perspective, this gives an advantage to energy rich nations like Russia, the United States, Iran, Saudi Arabia, and Brazil which can leverage the demand.

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What Can Companies do?

- For instance, when it comes to having accessible & available energy, here in the US, the mid-west is host to the most pipelines in the nation (as well as wind energy production infrastructure). It also has plenty of opportunity zones in which to capture tax benefits and provide jobs to low/median-income communities.
- Another example would be to invest in more diversified energy generation technology (renewables and/or battery storage) or more efficient technology upgrades that use less fuel or power like hybrid vehicles. These would be considered acceptable under a green use of proceeds bond where an issuer could look to capture ESG investor interest/pricing leverage and reduce its cost of capital.

Further Resources

IEA Global Data: *https://www.iea.org/data-and-statistics/data-product/world-energy-balances*

US EIA Monthly Electricity Cost: *https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=table_5_03*

US EIA Fuel Types: *https://www.eia.gov/energyexplained/us-energy-facts/*

Water Energy Nexus: *https://www.energy.gov/articles/ensuring-resiliency-our-future-water-and-energy-systems*

US Govt Incentives: *https://www.eia.gov/energyexplained/renewable-sources/incentives.php*

Energy Security: *https://search.library.dartmouth.edu/permalink/01DCL_INST/b81o46/alma991015611079705706*