

Energy Markets: The Future of Oil and Gas

An Inflection Point
Tom McNulty



A New Golden Age Begins.....Led by the USA

- We are at an inflection point in the history of Energy.
- Not since the Industrial Revolution has there been such potential for capital flows into the Energy Complex.
- This is driven by the need to extend traditional or old energy while at the same time funding the Energy Transition, in whatever form it takes.

Critical Themes

- Supply and Demand Realities
- Climate Risk and Volatility
- The Energy Transition and ESG
- Technology: Clean vs. Renewable
- Developed Economies v. Developing Economies
- Energy Security and Politics
- Houston's Role

Supply and Demand Realities

- The impact of COVID is probably waning but caused a great deal of underinvestment into oil and gas that still resonates today.
- The war in Ukraine has caused supply disruptions from Russia, but India and China have been buying large volumes of Russian crude oil.
- Russian natural gas is essential to Europe right now and has been cut.
- This will drive US gas and LNG development for years to come.

Supply and Demand Realities

- Crude Oil production is increasing globally but is out of balance with global demand.
- Asia in particular continues to have growing demand for crude oil and refined products.
- Production in the US is rising but had been slowed by investor pressure and regulatory obstacles.

Supply and Demand Realities

- High energy costs for consumers and businesses in all industries are driving inflation and financial distress.
- There are wide variations in impact by location and industry.
- Europe and developing countries are now especially threatened.
- Remember, oil makes fuels and lubricants; but natural gas makes many many things, including fertilizer for food.

Supply and Demand Realities

- Natural Gas production is also increasing but not at a pace that matches demand.
- Unlike oil, gas has to be liquefied into LNG to be shipped to markets that cannot be accessed via pipeline, or that have maxed out their pipeline capacity.
- LNG might be the fastest growth segment in traditional energy and there is a substantial amount of capital flowing into delivering more capacity.

Supply and Demand Realities

- We continue to see some capital constraints for fossil fuel company development.
- But there has been an uptick in private capital activity and in RBL activity this year.
- Demand recovery, weighed against worries about demand destruction, are hard to quantify right now.

Supply and Demand Realities

- Oil and gas prices should moderate downward outside of Europe, but still remain relatively high.
- Conflicting influences ranging from the Ukraine war, inflation, interest rates, and recession risk are making the picture muddy.
- Forecasting and modeling is proving to be hard right now.

Supply and Demand Realities*

- Per the EIA, production of U.S. crude oil continues to rise.
- EIA models it to be largely flat over the long run, I disagree and see the US going to 15 mmbpd.
- 90% of our production is from independents and they are less concerned about pressures from Wall Street and Washington.

**EIA Data.*

Supply and Demand Realities*

- U.S. natural gas production also grows in their models.
- EIA price and technology assumptions play a big role in the models.
- Natural gas and the liquefied natural gas (LNG) market reaches 8 trillion cubic feet in their base case.

**EIA Data.*

Supply and Demand Realities

- Also per the EIA, petroleum and natural gas remain the most-consumed sources of energy in the United States through 2050.
- It indicates that wind and solar incentives, along with falling technology costs, will support competition with natural gas for electricity generation, while the shares of coal and nuclear power will decrease in the U.S. electricity mix.
- I disagree on nuclear and think SMRs will be a game changer.

Supply and Demand Realities

- U.S. crude oil production will reach record highs.
- Natural gas production will be increasingly driven by natural gas exports.
- Renewables consumption grows fast but remains far below petroleum and other liquids consumption through 2050.
- Natural gas consumption rises mostly because of industrial use and exports.

Climate Risk and Volatility

- This is a very complex issue, especially because climate modelling is very difficult.
- The “Settled” vs. “Unsettled” debate rages on.
- Adaptation has become a theme given that many of the models suggest that elements of climate risk and volatility might not be reversible.

Climate Risk and Volatility

- Oftentimes the models are assumed to be correct, which is a challenging thesis due the complexity of the Earth's ecosystem as a whole.
- The velocity of climate change is very hard to predict.
- Weather can be mistaken for climate.

The Energy Transition and ESG

- The Energy Transition most often refers to a complete conversion of the global energy complex from fossil-based resources to zero-carbon resources by the second half of this century.
- In the US, it started to be part of public discourse during the 1970's oil shocks.
- The impetus to reduce energy-related CO2 emissions is directly tied to climate change, specifically warming.
- Decarbonization of the energy complex, expansion of renewable energy, and vast acceleration of energy efficiency programs worldwide are generally expected to hit 90% of the “required” carbon reductions.

The Energy Transition and ESG

- Fossil fuels vs. green energy: do we do one or the other or both?
- There are HUGE challenges in transition, and challenges resulting from how it is done.
- This is a short list of issues: evolving technology, high early-stage costs, materials shortages, infrastructure bottlenecks, and supply chain problems.
- Progress is underway, but stated goals will likely take a long time.

The Energy Transition and ESG

- Corporate performance typically has been evaluated using financial metrics like EPS and TSR, alongside other metrics like IRR, NPV, and ROI.
- Non-financial elements have been used in certain specific situations, such as with South Africa (apartheid), Tobacco, and Russia (right now).
- Environmental, Social, and Governance (ESG) refers to a much broader application of non-financial aspects.
- The term was most likely first used in a Forbes article back in 2005.
- ESG is linked to Sustainability and to DEI-Diversity, Equity, and Inclusion as well.

The Energy Transition and ESG

Bifurcated

- The developed world accelerates the transition while the developing world uses the most available and cost-effective energy sources.

Most likely

All-In

- A framework such as Paris is widely implemented without exemptions for developing countries. **Unlikely**

Fragmented

- A hodge-podge approach driven by geopolitics. **Possible**

Technology: Clean vs. Renewable

- EVs
- Carbon Capture and Storage
- SMRs
- Battery Storage
- Hydrogen
- Geothermal
- Renewable Natural Gas
- Biofuels

Technology: Clean vs. Renewable

- Renewables are growing, and now are up to almost 25% here in US.
- But 300 coal plants are under construction globally.
- Clean energy can include nuclear and natural gas.
- Renewable is generally wind, solar, geothermal, gas and hydro. But most of this is weather based energy.
- The distinction is often lost in the media.

Developed v. Developing Economies

- Coal fueled the Industrial Revolution which drove growth in Europe and in the US.
- Energy is directly tied to prosperity.
- Developing nations are not willing to accept dictates from Europe and the US to curtail their use of fossil fuels to grow and raise their standard of living.

Developed v. Developing Economies

- India and China are very large examples of this.
- Many of the coal power plants that are being built around the globe today are being built by China.
- It is likely that nuclear and natural gas could be the only offset to coal at this time for developing nations.

Energy Security and Politics

- Energy is not just an industry or business, it has profound national security implications.
- Just look at Europe; Putin knew that he could attack Ukraine and fund the war by shipping oil and gas to Europe and Asia.
- There are many “difficult” regimes that produce oil and gas, and cash flows to them support their activities.
- Energy Security can feed all other types of security because energy plays a role in just about all facets of life.

Energy Security and Politics

- The politics of energy have become dangerous.
- Energy is very technical and complex, and follows rules that we see in physics and thermodynamics, not politics.
- First Rule: You cannot create energy or destroy it.
- Oftentimes political debate omits actual physical realities.
- Europe is a good example.
- Energy issues can be “weaponized” to drive an agenda, such as use of the term “climate denier.”

Energy Security and Politics

- We are seeing increasingly aggressive government involvement in Europe and the U.S.
 - Substantial incentives as well as some proposed penalties
 - Investment tax credits, sunset on gasoline vehicles, Carbon Border Adjustment Mechanisms, etc.
 - The Inflation Reduction Act
- Increasing international tension from differing priorities within Europe, and East v. West, are accelerating.

Energy Security and Politics

- There is a trade-off in political risk between:
 - Maximizing clean energy and suffering crushing economic effects, or
 - Pursuing “all of the above” including fossil fuels and alienating the green faction.
- How are objectives prioritized: climate, food shortages and cost, high general inflation, destroyed industries, affordable heating and cooling, and minimizing recession/job losses?

Houston's Role

- Houston, we do NOT have a problem.
- It's "right place, right time" in terms of old and new energy.
- Houston has been known as the Energy Capital of the World, it is and will be the Energy Transition Capital of the World as well.

Houston's Role

- Why? The technical skill is concentrated here. Energy is very complex and is peopled with vast numbers of engineers, scientists, and high technical and experienced professionals.
- The vast physical hub is here already and might be used for a hydrogen build out.
- The Ion and Greentown Labs are examples of the innovation and venture capital nexus here.

Where Are We Heading?

- Natural Gas is here to stay for a very long time.
- Crude Oil is probably here to stay for a very long time.
- It is the Energy Complex that must take the lead in all Energy Transition efforts to avoid disastrous outcomes.
- Public policy needs to balance the natural tension between energy security and transition.
- Houston will take the lead.
- Q&A
- tmcnulty@chironfinance.com