FINANCIAL POLICY COUNCIL

Energy

Policy Recommendations Projections and Opportunities

White Paper

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Tim is also CEO of Impact Analytics LLC a media and marketing company specializing in high volume, high profit, aggressive email marketing programs in the health, finance and conservative political space. The company generates several billion customer touches per year on behalf of its clients.

Tim began his career with the Central Intelligence Agency (CIA), running operations and developing technology and analytics, working targets in more than 30 countries in 12 years. He worked against communist insurgencies in El Salvador, Honduras, the Philippines and Nicaragua, Narcotics traffickers in Colombia, Peru and Bolivia, terrorist targets in Beirut, Iran, Somalia and India, and counterintelligence in Russia, Liberia, and much more.

Mr. Kaelin is conducting original research in his primary field of expertise, mass influence and psychology. He has written books about socialized healthcare and climate change and has presented research papers at conferences on a conservative capitalist solution to climate change. He trains in mixed martial arts and plays a mean jazz piano. Tim holds a M.S. in Electrical Engineering from the University of Louisville and a Master of Arts in International Transactions from George Mason University.

Will Reese, Senior Petroleum Production Engineer with Shell Corporation, Oil and Gas Expert, Serial Entrepreneur. Will Reese is a petroleum engineer with 14 years of industry experience after graduating from Texas Tech University with a degree in Petroleum Engineering. Assignments from 2009-2015 include onshore assignments as a production operations engineer in onshore oil in the Niobrara Shale in

Colorado and natural gas in Marcellus & Utica Shale in Pennsylvania. Since 2016, Will has worked as a design production engineer during the re-design of a $4 billion greenfield project where his responsibilities included building production system modeling & well functional specifications for oil producers and water injectors documenting pressures, temperatures, oil, gas & water flowrates, equipment requirements to meet project economics, company & Bureau of Safety & Environmental Enforcement safety standards. Currently, he is a production engineer supporting the 110,000 bbl/day Appomattox platform. Responsibilities include maximizing production while minimizing risk to well and surface facility risk, coordination of well startups, workovers & well enhancement.

Will has a passion for investing starting with stocks & index funds later leading to private equity and fintech. Experience in private equity includes being a founding seed investor for Lost Soldier Oil and Gas, LLC startup prior to the 10 trillion cubic feet of natural gas discovery in an undrilled area of Wyoming in 2022. Oil and gas have always been a passion for Will both on the job and investor with it being the live blood of modern economies and a constant challenge to meet global demand. In addition to personal investing, Will is passionate about preserving a free capitalist market that is a foundation for freedom and has lifted millions of people out of poverty.

George W. McMillan III, CEO, McMillan Associates, Expert in Geopolitical Analysis and Frameworks, elite international security consultant. Over 25 years of research into analytical frameworks, social systems, and the general fabric of the economic/political system. His work on unification theory has been recognized at the highest levels, presented at multiple conferences and included in peer-reviewed journals. He is currently working with commercial and academic entities to actualize his theories into useful predictive frameworks for use in the financial markets, political campaigns and social research

As a security specialist and weapons expert, McMillan has advised and operated in high risk areas, including Iran and Afghanistan. He has over 30 different weapons and security certifications and is highly sought after in the security field. He currently consults with Aegis Defense Services in Afghanistan.

George is currently in collaborations with various organizations including Impact Analytics and the International Institute of Social and Economic Sciences. Some of his works include *Geopolitics, Energy and the Geopolitical Realignment - The Importance of Understanding the Global Grand Strategies*, 2023; *An Overarching Model for the Micro and Macro Psychological and Social Sciences*, 2019; *The Unification of the Philosophical and Behavioral Social Sciences*, 2017

Blaine D. Holt, General, U.S. Air Force (retired), Military Representative to NATO, Council of Foreign Relations, Newsmax Media contributor.

General Blaine D. Holt's professional journey is a testament to his multifaceted expertise and leadership. As a retired General from the U.S. Air Force, he has not only served his country in the military but has also excelled as a geopolitical expert, serial entrepreneur, C-suite Executive, and Newsmax Media contributor.

As Founder and CEO of Irascible Strategic Advisors LLC, General Holt has carved a niche in fostering creative thinking, innovation, and entrepreneurship. His involvement in thought leadership and startup coaching has made him an indispensable partner for emerging disruptors, guiding them toward achieving their initial operational capability.

Additionally, General Holt serves as a Senior Advisor for Xeriant, Inc., dedicated to acquiring, developing, and commercializing aerospace technologies. His strategic insights play a crucial role in shaping the company's direction.

Previously, as the CEO of Alchemai, General Holt led the development of a software tool designed to empower supply chain managers. This innovative tool enhanced decision-making capabilities by providing a comprehensive view of supply chain networks and their dynamics. General Holt's executive prowess extends to his tenure as President of Million Air, a premier fixed-base operation chain offering private aviation services worldwide. His adept management of profit and loss statements ensured the company's resilience in the face of industry challenges.

In the realm of international diplomacy, General Holt served as the United States Deputy Military Representative at NATO, stationed in Brussels, Belgium. His role on the advisory board allowed him to provide military expertise to high-ranking officials, including the Secretary of Defense, the President, and the National Security Council. As the second-highest ranking military official at NATO, he played a pivotal role in maintaining unity within the organization. His achievements included brokering essential agreements between Eastern and Western NATO member states on geostrategy and shaping effective public relations strategies. His profound geopolitical expertise and strategic advice proved invaluable in addressing both internal and external challenges and contributing to the successful handling of delicate international relations.

General Holt served as a Military Fellow at the Council on Foreign Relations. Recognized for his exceptional service in the Kyrgyz Republic, he was honored with a military fellowship. In this capacity, he made significant contributions to international relations research, which directly influenced foreign policy. General Holt authored three influential articles on American foreign policy interests, leveraging his extensive visits to South Korea, Taiwan, and the Philippines. His thought leadership also led to an invitation to co-teach Council President Emeritus Les Gelb's class on strategy. Additionally, he actively participated in high-level diplomacy talks, providing his expertise and supporting U.S. interests in negotiations with representatives from China, Taiwan, South Korea, Japan, and Russia.

Acknowledgments

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Additionally, we would like to express our appreciation to the other esteemed members of the FPC and to McMillan's Geostrategic Associates Group. Their valuable insights and unique perspectives have contributed to shaping our work in ways that may not have been explored otherwise. Their collective input is highly valued and greatly appreciated.

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1 Introduction

Welcome to this exploration of the modern energy industry. Brought to you by the Energy Group of the Financial Policy Council, this document highlights pivotal aspects of today's evolving energy industry. As global energy dynamics shift, understanding the primary trends, challenges, and opportunities is essential.

The global energy landscape is undergoing a profound transformation. As nations grapple with climate change, geopolitical shifts, and technological disruption, understanding the key forces reshaping the industry is crucial. This paper offers a timely perspective, exploring pivotal trends in energy to equip stakeholders with actionable insights.

Our team has distilled both empirical data and qualitative analysis to spotlight crucial elements of the energy sector. The aim is to provide stakeholders, policymakers, investors, and industry experts with concise yet impactful insights, guiding them in making informed strategies and fostering innovations in this critical arena. We warmly invite you to explore these key insights into the multifaceted world of energy.

Within the dynamic landscape of the global energy sector, we encounter a confluence of *conflicting goals* that shape the intricate fabric of nations' strategies and policies.

Primary Goal - Energy Security and Economic Growth

A paramount objective shared by every country on Earth is to ensure the provision of an ample energy supply that not only safeguards its population but also fuels sustained economic growth. This foundational goal underscores the essence of energy as a linchpin for national security and prosperity.

Secondary Goal - Environmental Stewardship

Running in tandem with the imperative of energy security is the ecological imperative. The imperative to safeguard our planet from excessive pollution and mitigate the consumption of carbon dioxide has emerged as a prominent global movement. Under the aegis of models embraced by the United Nations, nations are compelled to embrace this secondary goal. Regardless of one's alignment with this perspective, it has evolved into a defining brand that exerts a pervasive influence over political decisions on a global scale.

Tertiary Goal - Geopolitical Leverage

In addition to these overarching goals, countries also aspire to leverage their unique positions within the energy landscape to enhance their global power and influence. This tertiary goal reflects the intricate dance of nations as they navigate the geopolitical arena, harnessing their energy resources as instruments of diplomacy and statecraft.

These divergent goals underscore the complexity and multifaceted nature of the contemporary energy sector. The interplay between energy security, environmental consciousness, and geopolitical maneuvering shapes the strategies and decisions of nations worldwide, ushering in an era where balance and adaptability are essential for success.

Below are brief statements of key findings in terms of insights, policy recommendations and investment opportunities.

Geopolitical Influences:

- The Belt and Road Initiatives and emerging BRIC alliances, led by Russia and China, are poised to forge a disruptive trade zone that will almost certainly bifurcate global energy markets, offering both chaos and opportunity.

- While the petro-dollar faces short-term challenges, its long-term viability hinges on faith in the U.S. Constitution, although alternative trade currencies may persist.

- Total world energy consumption will grow more rapidly than some recent reports indicate, especially as the developing world begins its accelerated development.

Oil and Gas, Shale, Coal

- Navigating the complex terrain of Environmental, Social, and Governance (ESG) principles, especially those emanating from international forums like Davos and the UN, requires a discerning and pragmatic approach to safeguard the shale industry's growth and stability. A strategic distancing from overbearing ESG mandates to foster a regulatory framework that encapsulates a balanced approach towards environmental stewardship and economic growth is paramount.

- Contrary to expectations, the consumption of oil and gas will rise over time, with most industry executives anticipating growth.

- Projections suggest that coal consumption is more likely to increase than decrease, contrary to 2021 estimates indicating a significant decline.

Renewable Energy

- Despite optimistic projections, renewable energy is unlikely to grow rapidly enough to bridge the energy consumption gap created by demand growth and any decline in conventional sources. Remedying market inefficiencies is imperative.

- We recommend substantial deregulation of the U.S. energy grid, akin to that of the Telecom, Banking and Airline sectors, to foster innovation and foster a competitive market conducive to smaller-scale energy production.

- Without significant strides toward providing "acceptable returns" in renewable energy, the developing world will resist (and indeed, rebel against) efforts to curtail coal and hydrocarbon use, potentially aligning with emerging China-Russia markets.

- The prospects for NetZero standards appear bleak, especially given disparities in projections between 2013 and 2021. Without improved returns in renewable energy, coal and hydrocarbon consumption may surge, imperiling the viability of NetZero and Agenda 21.

Investment Opportunities

- An arbitrage opportunity may arise from the anticipated market upheaval resulting from the potential bifurcation caused by the China-Russia axis.

- Forward-looking exploration companies are poised to be sound investments as expectations of reduced gas and oil consumption are debunked.

- The extension of Russian pipelines south and east may yield real estate investment opportunities for those strategically positioned.

This forward-looking analysis equips stakeholders in multiple ways

1. Policymakers gain insights to craft balanced, adaptive policies that consider second-order effects. By understanding real-world constraints and decision drivers, more pragmatic approaches emerge.

2. Business leaders understand emerging risks and opportunities to guide strategy. With clarity on market forces, investments become sharper. Scenario planning provides lead time to pivot business models.

3. Investors see where capital can catalyze solutions and growth. Money flows to the most promising and undervalued assets. As the paper highlights, areas like grid modernization and advanced exploration are ripe for investment.

4. Innovators identify real-world needs, not hype, revealing where new technologies or business models are most impactful. Breakthroughs that enhance productivity and lower costs will be rewarded.

5. Citizens and activists get a more rounded view of trade-offs, enhancing discourse. Quick fixes may do more harm than good. The gulf between soundbites and reality becomes clearer.

6. Developing nations gain insights on energy pathways that balance economic and climate objectives. The risks of both energy poverty and unchecked emissions are conveyed.

With so much change underway, uncertainty prevails. Yet certain guideposts emerge across scenarios. This paper cuts through the noise, highlighting signposts to navigate towards a more secure, sustainable energy future. The insights presented aim to inform strategies, policies, innovations, and investment decisions as the energy transition unfolds.

2 Geopolitical Factors Shaping Energy Markets

2.1 Challenges for Global Energy Markets

The global energy landscape has always been closely entwined with geopolitical considerations. Energy resources are not only essential for economic development and prosperity but also wield immense power and influence in international relations. The 21st century has witnessed a changing geopolitical environment, marked by shifting alliances, economic rivalries, and concerns related to energy security.

The interplay between geopolitics and global energy markets is undeniable. Resource distribution, transit routes, energy diplomacy, and the push for renewable energy all shape the current geopolitical landscape. The top three challenges facing the global energy

markets are energy security, the transition to renewable energy sources, and resource scarcity and competition.

Energy Security: Ensuring a stable and uninterrupted energy supply is a paramount challenge. Geopolitical conflicts, disruptions in transit routes, and the vulnerability of critical energy infrastructure to cyberattacks all pose significant threats to global energy security.

Climate Change and Energy Transition: As the world moves towards cleaner and renewable energy sources, it faces the challenge of transitioning away from fossil fuels. The uneven distribution of renewable resources, such as wind, solar, and lithium reserves, could lead to new geopolitical tensions and inequities. Unresolved questions of carbon's impact juxtaposed with the hazards to fragile electrical grids will keep tensions high. Western countries mired in recession will continue to ask why they suffer when China and India think nothing of their true CO2 emissions.

Resource Scarcity and Competition: The finite nature of fossil fuel resources, coupled with increasing demand, heightens the competition among nations. This competition can lead to geopolitical rivalries and potential conflicts, especially in regions with significant energy reserves.

The complex interplay between energy and geopolitics creates risks of supply disruptions, market bifurcation, and instability. However, it also reveals possibilities for cooperation and shared solutions. With pragmatism, energy could provide incentive for diplomatic progress, not just competition.

Geopolitical tensions stemming from energy dependences are not new, but today's context is unique. Climate imperatives add urgency around decarbonization and renewables. Meanwhile, global economic and demographic shifts create new energy demand pressures, especially in the developing world. Traditional alliances are in flux, with Russia strengthening ties with China through energy pipelines. Supply chain restructuring due to COVID, the Ukraine war, and energy nationalism exacerbates uncertainties.

These intersecting forces raise several risks. Supply disruptions could leave major economies exposed this coming winter. Severe energy shortages would compound economic headwinds and inflation. The dividing lines around sanctions and energy trade mean energy market bifurcation is possible. If reinforced over years, profoundly different regional energy systems could emerge, creating new geopolitical rifts. Such fragmentation would undermine collective action on shared risks like climate change.

However, a more optimistic scenario is also plausible. Purposeful diplomacy and leadership could craft solutions that allow major powers to achieve some objectives without provoking others. A principled balancing of economic, environmental and security priorities could produce a more stable equilibrium.

Energy diplomacy should be high on the global agenda. With astute statecraft and leadership, a virtuous cycle becomes possible. Pragmatism, not posturing, can tip the scales towards solutions. But the window of opportunity may be narrow.

2.2 Resource Distribution and Scarcity

Geopolitics often revolves around the distribution and scarcity of energy resources. Oil and natural gas-rich regions like the Middle East, Russia, and North America hold immense global influence. The competition for control over these resources can lead to conflicts, as demonstrated by tensions in the South China Sea, Ukraine, and the Middle East.

The climate change movement, now aggressively embraced in North America and Europe, as well as international bodies like the U.N., World Economic Forum, World Bank and International Monetary Fund, has accelerated their agenda in pursuing a world free of fossil fuels. To achieve what the U.N. has called Agenda 21, these nations and bodies have pursued policies to drive up fossil energy costs, making these resources less obtainable, which in turn pushes developed economies into recession.

We explore a particular scenario of renewable energy in section 5.3 *Counter-Brands* where pushback is occurring in developing nations that could turn into outright rebellion against the climate change agenda.

2.2 Wars and Conflicts

Energy infrastructure has been front and center in the recent wars spawned in Europe and the Middle East. In addition to a costly oil and gas sanctions regime on Russia for its invasion of Ukraine, the destruction of the Nordstream 1 and 2 lines from Russia to Europe has tightened supplies even further. The dangers to Europe's infrastructure jumped again as Finland reports its major gas line from Estonia has been attacked.

The E.U. has struggled mightily to compel unity in the sanctions against Russia and is looking at a potential humanitarian crisis as winter sets in. The potential for the cocktail of scarce energy, inflation and unemployment provides fertile ground for deindustrialization. Replacement of liquid natural gas from the United States at 2-5x previous market rates is unsustainable for Europe.

Wars and coups in the Middle East (Israel) and the Sahel (Niger) will add pressure to supplies and upward prices in fuels and uranium. France was reluctant to leave Niger when the military-led junta expelled their ambassador, nearly risking an escalated crisis. There is little doubt French access to previously low-cost uranium was at the core of their interests.

Israel's new war against Hamas, Hezbollah and potentially Iran raises the possibility that the world is on an unavoidable path to World War III. Chinese and North Korean aggression in the pacific round out a global commons where there is either a regional war or the potential for one. Connections between these aggressive entities are hard to ignore. In 2020, China agreed to inject $300-400 Billion into Iranian oil, gas and petrochemical industries over the next 25 years. A similar deal was signed with Russia in 2014.

But the current conflicts are not the beginning, they are the milestones of more long term strategies. Russia's seemingly easy avoidance of sanctions from the West was the result of

10 or more years of preparation. Their ability to connect into China's financial system quickly was neither accident nor luck. Their work on pipelines to the south and west (see section 2.4.1 *Russia's Influence*) was planned and begun long ago.

In all cases, the energy markets will be elemental to each theater and pricing will follow the risk.

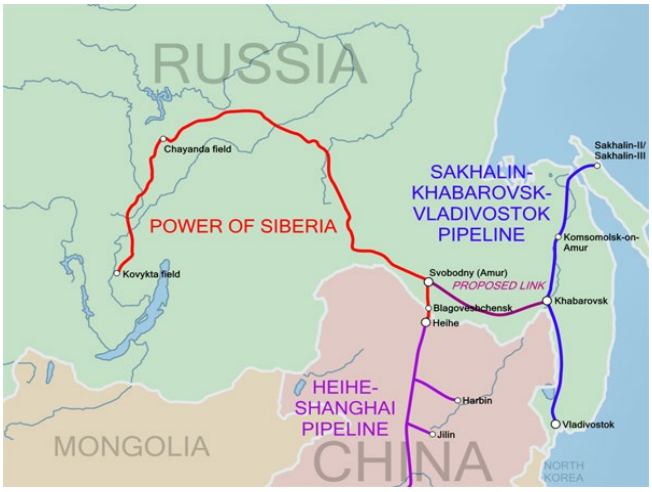
2.3 Energy Diplomacy

2.3.1 Russia's Influence

Russia continues to be a significant player in the global energy market. Its control over natural gas supplies to Europe and its war in Ukraine has kept Europe's energy security in a catastrophic position as winter comes with the E.U. having a fraction of the reserves it did last year.

Russia is taking its "friendship" with China seriously and has been planning and building pipelines from Siberia into China over the last 15 years. Note that these are routes that cannot be easily disrupted by the West and will be impervious to Western sanctions. As noted below, we expect a bifurcation of the energy market, even to the extent of two independent energy markets. (1)

Speculations persist that pipelines may also begin from Iran to India, and from Russia to India. If so, India will be in a position to hedge its bet with the West and participate in both sides of such a bifurcated market. Tensions with China might keep this a tenuous participation.



The routes of the Power of Siberia pipeline, the Sakhalin–Khabarovsk–Vladivostok pipeline and the proposed link between them

2.3.2 US-China Rivalry

The ongoing rivalry between the United States and China extends to the energy sector. As both countries strive for energy security, they engage in resource diplomacy and alternative energy development. This will continue to impact global energy markets and alliances.

The competition with China will shape the energy sector for years to come, as their influence is evident in many geopolitical events discussed in this report. China is known for its strategic long-term planning. While their direct involvement might not be visible in events like the Israel-Hamas conflict, their indirect influence is undeniable. Notably, the Ukraine-Russia conflict and the Israel-Hamas war likely could not have occurred without China's backing.

2.4.3 Energy Transition in the Middle East

The Middle East, traditionally known for its vast oil reserves, is increasingly diversifying its energy portfolio, incorporating renewable energy sources. This shift is driven in part by the need to reduce reliance on oil exports and prepare for a post-fossil fuel future.

International bodies will continue to exert pressure on oil producing states to transition their economies. Many of these oil producing states, traditionally staunch allies of the West, are flirting with China, with likely intent of negating this pressure, in addition to opening additional markets to get the most from their petroleum resources.

At the same time, energy rich western countries like the United States and Canada continue to enact policies to squeeze producers to force a transition to renewables.

The effects on economies and security from these trends are easily plotted…higher costs and more wars.

Oil price fluctuations place significant pressure on Middle Eastern producers. Sustained drops in prices can threaten stability, as oil revenues most often support vast welfare systems, ensuring a higher living standard for many. When prices dip below a critical point, financial reserves decrease, setting a financial crisis in motion. Several oil producing countries are in a position where if they are unable to maintain their welfare commitments, they will face unrest, and if persistent, leading to government upheavals and, indeed, revolutions.

The lower prices of the Trump era were a wakeup call for many. Now, oil producers, appear to be resolved in preventing such price drops from happening again. Consequently, it's unlikely that oil prices will dip below $80 per barrel in the foreseeable future.

2.4 Threats to Trade and Petrodollar

2.4.1 Energy Transit Routes

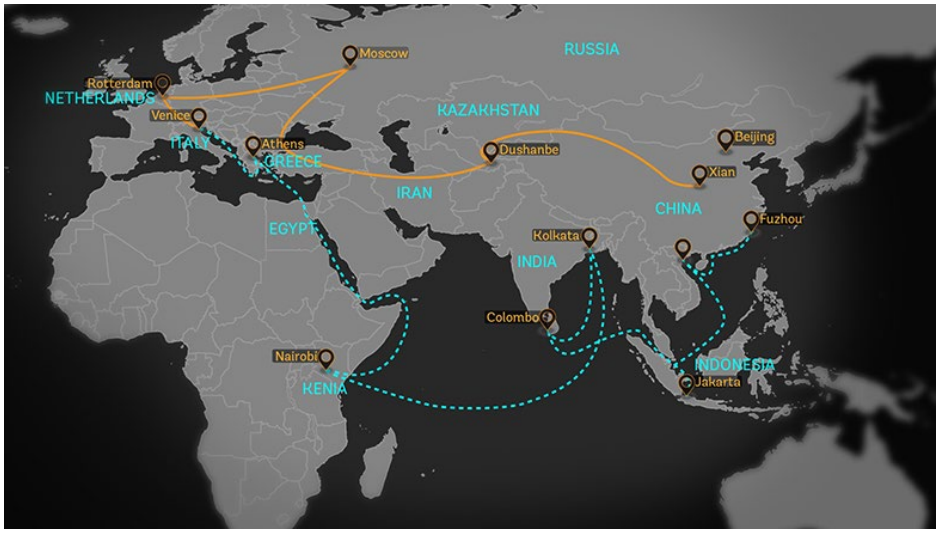
Access to energy resources is as vital as their availability. The control of energy transit routes, such as pipelines and shipping lanes, is a strategic tool for powerful nations. Disputes over transit routes can disrupt the flow of energy and contribute to global

instability, as seen in the ongoing tensions between the United States and China in the South China Sea. (1)

As mentioned in 2.3.1 *Russia's Influence*, we see a dramatic shift in their trade routes to accommodate new alliances. This is a particular threat since it may very well allow Russia to abandon or severely curtail its European markets – a huge power lever that Russia will not hesitate to use.

2.4.2 Alliances Forming

The Belt and Road Initiative and new alliances between Russia, and China will likely form a trade zone that will disrupt global energy markets.



The global political center of gravity (GPCOG) is dramatically shifting as Russia, one of the world's largest energy and raw materials producers has steadily been infrastructurally integrating with China along the Silk Road and the Far East with China, which has been rapidly becoming the World's largest industrial and manufacturing center. Things are quickly but somewhat predictably changing in SE Asia and Eastern Asia. China has been pursuing a Silk Road Strategy to link energy pipelines, railways, highways and port facility infrastructure to maximize overland logistical supply routes. They do this to a) increase the immense energy and raw material wealth in Central and Northern Asia to feed its immense manufacturing facilities, while b) minimizing US and UK Naval Spykman and Mahan based maritime choke point interdiction strategies that have been well known for decades if not longer. (1)

A bifurcation of the energy markets will certainly cause economic turmoil. But while these changes may precipitate challenges, they also unveil a spectrum of investment opportunities. While the petrodollar may experience some volatility in the short term, it is essential to recognize the enduring stability provided by the U.S. Constitution. This stability, combined with America's unwavering commitment to safeguarding the dollar's value, offers a more reliable financial haven than currencies such as the ruble and the yuan, which can be subject to unpredictable governmental maneuvers and influences.

2.4.3 The Petrodollar

In light of the precarious short-term outlook but potentially stable long-term stance of the petrodollar, fortifying its position will require multi-faceted strategic maneuvers. A new era of trade diversification beyond oil may emerge leveraging the inherent strength and global trust in the U.S. Constitution to bolster the petrodollar's standing.

A global digital trade ecosystem could redefine international trade dynamics, with a special emphasis on establishing a digital petrodollar. This modernized version of the petrodollar could encapsulate the digital evolution of global commerce while retaining the constitutional backing of the traditional petrodollar.

Further, a potential rise of renewables (given that the conditions contained herein are satisfied) could allow the diversification needed for a degree of energy self-sufficiency that could shield the petrodollar from oil market volatility, establishing a precedent for economic sustainability.

Additionally, fostering trade alliances and engaging in meaningful economic dialogues could ensure the petrodollar remains pivotal. The competition with non-petrodollar trade networks will be fierce and slow.

3 Consumption Trends

3.1 Trends and Projections

The developing world will greedily absorb fossil fuels at a faster rate than any intended decrease (i.e. shift to renewable) in the industrialized world. The population growth of the less developed third and fourth world countries is growing logarithmically while the population of the more developed first and second world countries is actually declining. This leads to the idea that the two primary trends of technology and population growth are leading to the two secondary trends of mass relocation of manufacturing facilities from the global north to the global south, and the mass migration of people from the global south to the north.

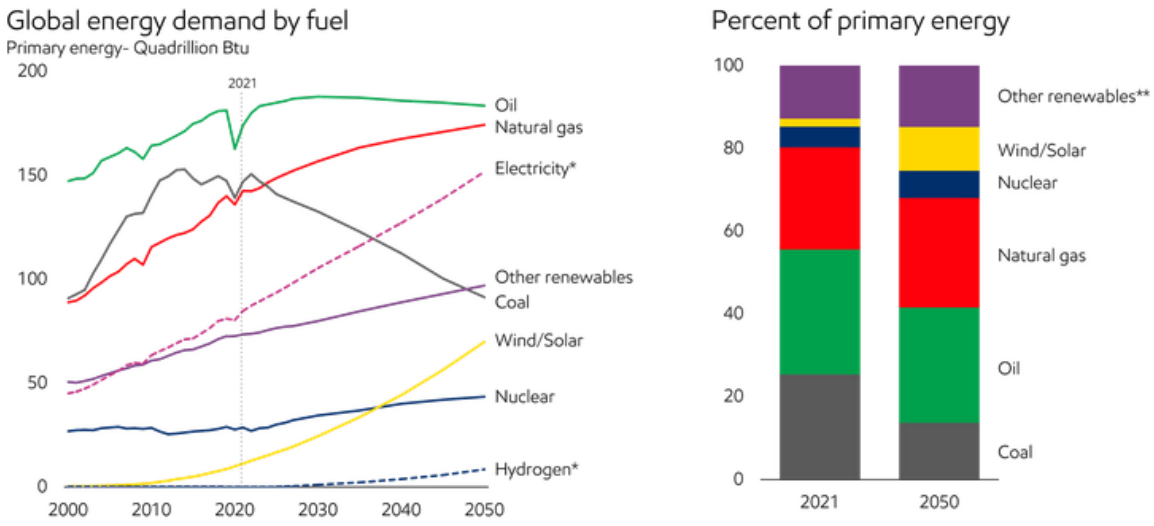
The conclusion is twofold: a) the world is moving towards a global wage labor equilibrium process and b) since global population growth is outpacing global economic growth the global wage labor rate is necessarily declining. Income disparity in first world countries will continue to increase to that of the less developed countries. The less developed countries realize that much of first world economic growth came with the benefit of cheap energy - energy generates economic activity, the more they consume, they richer they become.

Thus we have a schism between the developed world and the less developed world in attempting to allow or deny them to use the cheapest forms of energy. As the West decreases its use of coal, the price will go down, becoming even more attractive in developing nations.

Many of the major reports on energy are following the Net Zero expectations that the use of coal will decline. It is, in fact, quite incredible to see charts from multiple sources showing an increasing global coal consumption rate up to the present shifting to a consistent and notorious straight-line drop to 2050 as in the chart below from the Exxon report below.

Note that the Exxon (2) study says “Coal use remains significant in parts of the developing world. It drops below 15% global share as China and developed nations shift toward lower-emission sources like renewables, nuclear and natural gas.”

However, China is building more coal-fired plants not fewer. (3)



* Electricity and Hydrogen are secondary energies derived from the primary energies shown

**includes biomass, biofuels, hydropower, geothermal

The IEA announced an all time high in coal use in 2022 and, again, they project a rapid decline in coal use through 2050. The world's three biggest coal producers, China, India and Indonesia, are not slaves to U.S. and world climate change pressures. The IEA projections depend on the Announced Pledges Scenario (APZ) where a massive investment is required.

“Over the period to 2030, emerging market and developing economies outside China require about USD 500 billion in investment to put them on a path to transition securely away from unabated coal in the APS and well over a trillion dollars in the NZE Scenario.”(4)(5)(6)

Further, total world energy consumption has doubled from 2000 to the near term projection of 2025. Yet, the report projects that energy consumption to 2050 will not

double again but will fall short of doubling by 20%. This makes no sense. As the "developing" world continues its accelerating development, they will consume increasingly – picking up on the slack in coal consumption and creating new markets for renewable energy(7) – provided it is affordable.

Or does the West plan to keep developing nations from advancing? This paradox is explored further in Section 5.3 *"The Counter" Brand* and Section 5.4 *The Prospect of Achieving NetZero by 2050* below.

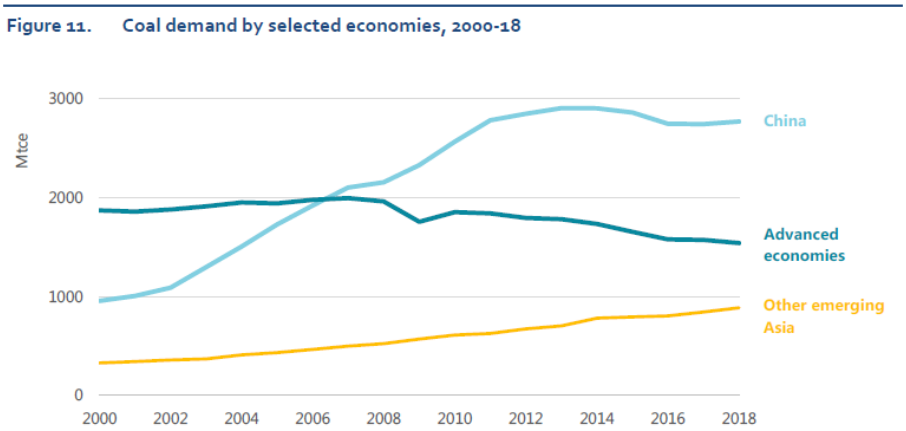
"The year 2022 saw China on a coal spree, greenlighting a record-breaking 106 gigawatts (GW) of new coal power – equivalent to 106 large coal power plants. Recent data from the Global Energy Monitor (GEM) and the Centre for Research on Energy and Clean Air suggests that this trend isn't slowing down. In fact, 2023 may see even more coal plants approved than 2022." (3)

The skeptical capitalist always looks with suspicion at programs that are politically driven and counter to market inertia. From the data available it is clear that NetZero/ACS and Agenda 21 are not on track. In fact, the 2022 Coal in Net Zero Transitions(6) from the IEA is a set of strategies that appear to be merely wishful thinking.

The quote below illustrates the naiveté of this organization's publications:

"Over 95% of the world's coal consumption is taking place in countries that have committed to reducing their emissions to net zero," said IEA Executive Director Fatih Birol. "But while there is encouraging momentum towards expanding clean energy in many governments' policy responses to the current energy crisis, a major unresolved problem is how to deal with the massive amount of existing coal assets worldwide."

This statement overlooks the growing energy demands of developing nations and disregards the resolute commitment of coal industry stakeholders to preserve jobs, enhance income, and sustain the profound economic contributions of the sector. It is essential to acknowledge that the global utilization of such a crucial resource cannot be abruptly halted by political decree.



Global Energy and CO2 Status Report 2018 – International Energy Agency – This report shows the current trends in coal consumption as of 2018.

Investment in coal supply is expected to rise by 10% in 2023 and is already well above pre-pandemic levels. Investment in new coal-fired power plants remains on a declining trend, but a warning sign came in 2022 with 40 GW of new coal plants being approved – the highest figure since 2016. Almost all of these were in China, reflecting the high political priority attached to energy security after severe electricity market strains in 2021 and 2022, even as China deploys a range of low-emission technologies at scale.

Given these facts, we project a substantial growth in market share in renewable energy ONLY if it becomes more profitable than coal to implement.

3.2 Electric Vehicles

The transition (or not) to electric vehicles (EVs) is a substantial variable in energy use. The EV market will largely determine the balance of electricity vs direct fossil fuel consumption in our society. And of course, since most of the developing world will not have the capability to manufacture automobiles in the foreseeable future, they will be forced, to a large degree into the automotive mold of countries who do have that capability – i.e. if those manufacturers were only to produce EVs, the automobile-less countries would only buy EVs. The highest quality cars will be produced in the West, however both India and China have huge and rapidly growing industries.

Many say the current crop of EVs does not meet the convenience standards we have come to expect. After correcting for stylishness, reliability, and speed, EVs are still ultimately

short on range and the ability to rapidly recharge. Technology to address this shortcoming is outside the scope of this paper, but be aware the remedy battery technology is known to exist in laboratories and engineering facilities and will likely emerge.

Ford Motor has pushed back production targets for its electric vehicles, citing slower-than-expected adoption. (9)

Ford now expects to be building EVs at a rate of 600,000 per year sometime during 2024, a delay from earlier estimates that it would reach that level by the end of 2023. The automaker had previously targeted a rate of more than 2 million per year by the end of 2026, but now says it doesn't know when it'll achieve that volume. (9)

"The near-term pace of EV adoption will be a little slower than expected, which is going to benefit early movers like Ford," said CEO of Ford, Jim Farley, noting the success of Ford's first-generation F-150 Lightning and Mustang Mach-E EVs. "While others are trying to catch up, we have clean-sheet, next-generation products in advanced development that will blow people away."

While Ford overall was solidly profitable during the second quarter, the Model E unit posted an operating loss of $1.8 billion.

Energy diversification should be encouraged through competition rather than relying on anti-competitive and arbitrary mandates. (10) High oil prices could be a great opportunity to introduce new competitors into the market, such as natural gas-powered vehicles - with diesel gas currently at $3.66 per gallon, compressed natural gas (CNG) has been an energy-equivalent alternative for most of the past decade at around $2 per gallon[2]. Walmart's rollout of CNG-powered trucks for merchandise transportation, which refuel at Chevron CNG stations, is an excellent example that businesses can adopt.

It is crucial to add EVs to the market at a pace that does not overburden the power grid, as there have already been calls to limit residential power usage. Boston Consulting Group estimates that the United States will require $200 billion in grid upgrades by 2030, assuming 40 million EVs are in use.

3.3 The Need for Grid Deregulation

Renewable energy should and likely will prompt a national "deregulation" similar to the deregulation of telecom, airlines, and banking industries that led to widespread entrepreneurial activity.

> ***Warren Buffett: "Energy deregulation will be the largest transfer of wealth in history."*** (11)

This 2019 statement alluded to the shifts during the 1990s and early 2000s, when several states introduced reforms to allow new participants in their energy sectors. This allowed consumers greater freedom in selecting their energy suppliers.

But what did this lead to? Better value for consumers? A more robust competitive market?

In reality, deregulation at the state level was fraught with challenges.

An illustrative case can be found in New Hampshire, where the concept of "net-metering" was initially enacted. This policy permitted consumers to have their electricity meters operate in reverse when generating their own renewable energy. However, a shift in political leadership occurred two years later, leading to the repeal of the law, with power companies ultimately prevailing over this regulatory change.

While 19 states adopted some form of deregulation, this fragmented approach did not produce the robust economic activity that might have resulted from nationwide deregulation. Factors like smaller market sizes, obstacles from legacy monopolies, and inconsistencies in state policies brought the entrepreneurial spirit to a grinding halt.

In contrast, the successful nationwide deregulation of telecom gave birth to the internet, created hundreds of thousands of new businesses and triggered an economic surge that became an integral part of the current US economy - with increased reliability to

communications. Every part of the internet could augmented, invested in, and monetized by anyone with the knowledge and resources to do it. (12)

Much like the telecom sector did in the 70s and 80s, the power industry today places a heavy emphasis on reliability — the grid simply cannot fail. Presently, our power grid is structured in a top-down, monolithic manner, dominated by major power producers (much like the telecom industry in the 80s).

New electricity production facilities in gas, oil, coal or nuclear are major capital investments. The sheer scale of their construction makes for limited entrepreneurial participation. However, renewable energy can scale down to a single rooftop and up to a multi-square-mile multi-Gigawatt solar farm. Windmills dot the landscapes of Texas, Oklahoma, Illinois and more.

With a focus on "value to producers" and the ability to connect easily (i.e. with the proper protocols, a la the internet's TCP/IP), renewable energy could allow thousands or millions to benefit by connecting smaller energy sources to the power grid. Entrepreneurial efforts could bring added advantages. A distributed network, improved survivability in case of war or disaster, decreased transmission line loads, and increased reliability are examples that certainly would come to fruition. The resulting economic impact would be substantial – assuming certain market problems can be solved.

According to a recent NY Times article (13), over 8,000 renewable energy projects are waiting to be connected to the grid. At this point, they are an engineering nightmare, each project requires substantial work to integrate, calculations of the energy contributed are messy and unreliable, and a PPA contract must be written for each. The cost, the time and the bureaucracy are considerable. These projects need storage, but storage affordability is elusive. This is a product of the legacy monolithic electrical grid and a stilted renewable energy industry. Both must change.

The "brand" of renewable energy and climate change (14) demands a shift in market dynamics. For renewable energy to flourish and for the energy grid to align with the demands of climate advocates and supportive policymakers, a complete deregulation with

connection protocols and storage solutions is paramount. Given the weight of the demand, the move in this direction is foreseeable and perhaps inevitable.

Effects on Infrastructure

"We're still discussing how are we going to decarbonize the economy, but electrification is going to play a huge role in that. And to electrify, you gotta have the grid," Michael Skelly, CEO of Houston-based Grid United, who is regarded as a pioneer in the transmission industry. (15) Across the country, about $700 billion is needed to build the roughly 300,000 more miles of transmission needed by 2035 to meet climate goals. (16)

One of the keys to a more complete deregulation will be the ability for private parties to build, own, lease and connect power lines, where they are needed and where such lines can be profitably operated. This strategy in telecom has been wildly successful, pushing technology, speed, capacity, availability and reliability to unforeseen levels.

4 Oil and Gas

4.1 Oil Production and Reserves

Current Problems & Challenges

Currently, the US oil and gas sector faces multiple challenges. The pandemic-related production disruptions led to temporary low oil prices. Over the last two years, the United States has dealt with high energy costs that occasionally became overwhelming. This was primarily due to the 2020 oil industry crisis when the average oil price was $42 per barrel, and even plummeted to $16 per barrel in April of that year. Widespread layoffs, supply chain disturbances, and bankruptcies happened during international lockdowns, causing the global oil demand in 2020 to fall from 100 million barrels per day to an annual average of 91 million barrels per day[1]. After the lockdowns ended, oil demand rebounded, but the

industry found it challenging to bring production back to pre-pandemic levels, leading to a surge in oil prices. (10)

Future demand projections make it challenging to maintain sufficient investment when the projections of peak oil demand vary so drastically from the IEA and OPEC. The IEA, which expects a swifter energy transition predicts world oil demand peaks in 2028 at 105.7 million barrels per day, which is a stark difference from OPEC's forecast of peak world oil demand of 116 million barrels per day in 2045. According to Rystad energy data the average global annual investment rate was $521 billion from 2015-2022 and showed a modest increased projection of $579 billion in 2023. This is a very sharp decrease from $887 billion in 2014. Exxon Mobil CEO Darren Woods stated at the 2023 World Petroleum Congress in Canada "if we don't maintain some level of investment in the industry, you end up running short of supply, which leads to high prices". (17). This underinvestment is will likely be root cause of the problem where ExxonMobil expects a future deficit oil deficit of 10-15 million barrels per day by 2027. Upstream cost cutting leads to reduced reserve replacements from exploration, lower production levels from sanctioned oil projects with lower well counts, increased well and facility downtime from design decision spending cuts.

ESG lending constraints are challenges the US oil industry is currently facing. Oil producers are now dealing with two distinct types of capital lending restrictions that did not exist before the pandemic. The most concerning one involves strict ESG lending constraints, which are being imposed on the industry by institutional investors like BlackRock. This has led to two climate-focused activists being appointed to ExxonMobil's board of directors against the company's recommendation, and Chevron being forced to adopt scope 3 emission reduction targets. Scope 3 targets mean that Chevron takes responsibility for emissions without imposing any emission restrictions on customers.

The other lending constraint comes from natural industry factors, as investors seek higher returns on investment. This is unfortunate for consumers but makes it difficult for investors to promote growth without favorable returns. The most effective way to counteract rising oil prices due to market forces is to maintain a high level of competition within the industry. (10)

Recommended Solutions

The radical ideas crippling the industry through ESG must be rejected to protect the sector's continued growth and stability. This is because the oil and gas industry is a significant contributor to the global economy and energy security, and sudden disruptions could lead to economic downturns, job losses, and geopolitical tensions.

Energy diversification by expanding multiple sources is necessary which can include clean & lower carbon sources provided consistent baseload power is not neglected. This will allow for innovation and the integration of new technologies while maintaining a stable energy supply. By adopting a more balanced approach, stakeholders can address environmental concerns without jeopardizing the industry's critical role in the global economy and in international relations.

Existing production should be increased in the United States through the following methods:

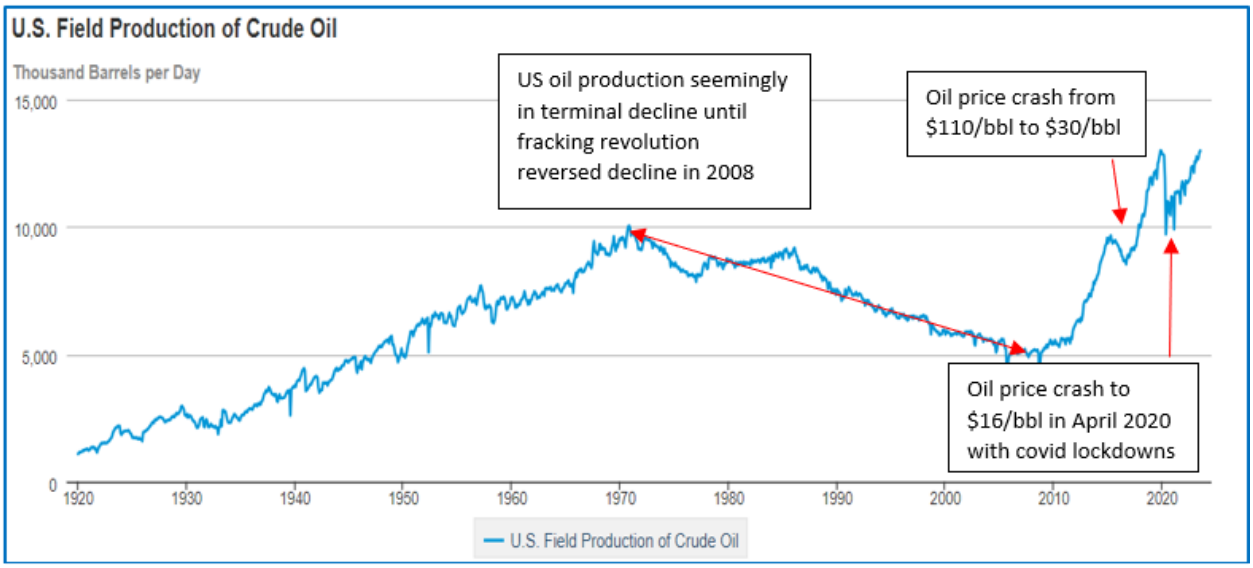
- Invest in the Gulf of Mexico (GOM) for consistent growth. The GOM currently produces 1.9 million barrels per day, with a conservative estimated growth potential of 2.1 million barrels per day that could be exceeded with regular leasing of acreage and investment. In 2023, the federal government reopened the GOM for leasing after a two-year hiatus. 70% of the 313 new leases were awarded to Chevron (75 leases), ExxonMobil (69 leases), BP (37 leases) Shell (21 leases) and Equinor (16 leases) who are actively exploring to replace and add reserves in their GOM portfolios. These two-year gaps without lease offerings can't be repeated without severely impacting future production in the second half of this decade, as it typically takes 4 to 10 years from a company purchasing a lease to first oil extraction.
- Invest in onshore and offshore Alaska to revitalize their oil industry, which has declined by over 75% since its peak production of 2 million barrels per day in 1988. Alaska has unexplored areas like ANWR with potential for conventional oil and gas extraction. Reestablishing Alaska's production will necessitate assurance for companies that an unsupportive government will not halt development after investments have been made in the state. ConocoPhillips is a company that operates with the highest standards of

safety and environmental stewardship, committed to developing the Willow Project and poised to deliver an expected recovery of 600 million barrels, a peak rate of 180,000 BOPD, and generate between $8 and $17 billion to the local and federal government.

- Encourage technological advancements such as enhanced oil recovery in existing oilfields to maximize oil extraction, along with digitization and artificial intelligence implementation to reduce costs.

4.2 Shale Oil

From the 1970's the concerns about fossil fuel-based economies were based on peak oil which is the hypothetical point in time when the maximum rate of global oil production is reached. During the 1970s, the peak oil theory seemed plausible in the United States, and many believed that global peak oil was inevitable. However, in 2007, the introduction of horizontal drilling and multi-stage fracking revived US natural gas production, and these techniques were soon replicated in shale oil basins. As a result, in 2008, onshore shale oil production flattened the decline, and by 2012, it had significantly reversed, as seen in the graph below.



It took high oil prices to spur the shale oil revolution with oil prices ranging from $80-$110/bbl. This was universally viewed as necessary to fuel the shale expansion with most

Exploration and Production (E&P) companies like ExxonMobil, Chevron and British Petroleum requiring an average breakeven price of ~$75-$85/bbl.

It was predicted that shale production would die off due to the high-cost nature of the business until shale producers took a more disciplined approach to identifying the sweet spots, improving drilling rates, and fracturing technologies which reduced their breakeven price to $35-$45/bbl. This frustrated OPEC and Russia which attempted to crush shale oil by flooding the world with cheap crude oil and eventually reversed course in 2017 by cutting oil production to support oil prices.

During half of the last decade, it seemed like the United States was in an unthinkable era of energy independence and concerns of peak oil were times of the past. Oil gluts often lead to complacency in pursuit of new exploration discoveries. it is critical that the United States be relentless in the exploration of new discoveries to avoid a future energy crisis. Complacency could lead to a recurrence of the energy crisis experienced by the U.S. and the world in 2008. There are already signs that major shale basins that boomed in the previous decade are starting to show signs of exhaustion such as the Eagle Ford in South Texas and Bakken shale in North Dakota, Montana, and the Canadian province of Saskatchewan.

During 2021 and 2022, the Bakken and Eagle Ford production remained stagnant, even though oil prices were higher ($71 and $101 per barrel, respectively) compared to the average oil prices of $54 and $71 per barrel in 2018 and 2019 when the Bakken and Eagle Ford production increased significantly.

This leaves the Permian basin located in the southwestern United States, primarily in West Texas and southeastern New Mexico as the only major US basin with growth ahead in future years, but even the Permian basin cannot maintain this level of growth indefinitely. In August, the Energy Information Administration (EIA) forecast that oil production in the United States would grow by 950,000 barrels per day (bpd) to an annual average production of 12.8 million bpd. In 2024, the EIA forecasts slower production growth at a rate of 290,000 (bpd) increasing the United States annual average to 13.09 million bpd. “The aggressive growth era of US shale is over,” said Scott Sheffield, the chief executive of Pioneer Natural Resources, the top shale independent in the country, to the Financial

Times in January. “The shale model definitely is no longer a swing producer” having lost its ability to quickly adjust its oil production in response to changes in global oil prices or market conditions, thus no longer playing the same influential role as it once did. (18)

It should be noted that the stated reasons for stagnant growth are a cause for concern but strong future shale growth cannot be counted out. During second-quarter results, ExxonMobil, Chevron, Pioneer Natural Resources, EOG Resources, and Diamondback Energy were all surprised with bullish data on their shale productivity due to technological advancements or proprietary techniques to improve productivity from well completions. (19)

Another example of the US shale resiliency is that EOG has successfully extended older wells in the Eagle Ford Shale located in South Texas, by injecting produced gas into the reservoir to build pressure and dislodge oil in the reservoir in producing wells. Water plus gas injection has been successfully implemented in the Bakken Shale. It should be noted these techniques are riskier & more challenging in shale oilfields than in conventional oilfields. (18)

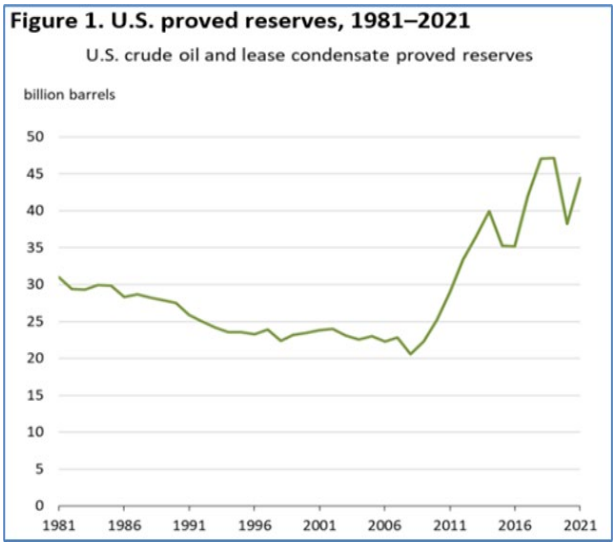
4.3 United States Oil Reserves

The United States oil reserves has a decline curve that followed a similar downward trajectory from the 1970s as the US oil production indicating that the US production and reserves were in permanent decline. The reserves curve follows a similar slope as the US oil production until commercial production from shale oil began in the late 2000s. (16)

In 2021 United States oil reserves recovered the majority of the proved reserves after oil prices recovered from the pandemic lows of 2020. Below are the key oil reserve statistics from the US Energy Information Administration (EIA) at the end of year 2021.

- Proved reserves of U.S. crude oil and lease condensate increased by 6.2 billion barrels (16%), from 38.2 billion barrels to 44.4 billion barrels at year-end 2021 (Table 1). This amounts to ~6.1 years of reserves at the 2021 United States annual consumption rate of 7.2 billion barrels per year. Latest technically recoverable unproved reserves as of January 1, 2020 are 326 billion barrels of oil.

- U.S. domestic production of crude oil and lease condensate decreased 1% in 2021.



- Texas, where more proved reserves of crude oil and lease condensate are located than any other, saw the largest net increase in proved reserves in 2021 (1.9 billion barrels, 12%).

- New Mexico saw the second-largest net increase of proved reserves of crude oil and lease condensate (1.4 billion barrels, 39%), and Alaska the third-largest (0.7 billion barrels, 31%).

- The largest net decrease in proved reserves of crude oil and lease condensate in 2021 was reported by operators in Oklahoma (-19 million barrels, 1%).

- The 12-month, first-day-of-the-month average spot price for West Texas. Intermediate (WTI) crude oil at Cushing, Oklahoma, increased by 67% from $39.66 per barrel in 2020 to $66.26/barrel in 2021.

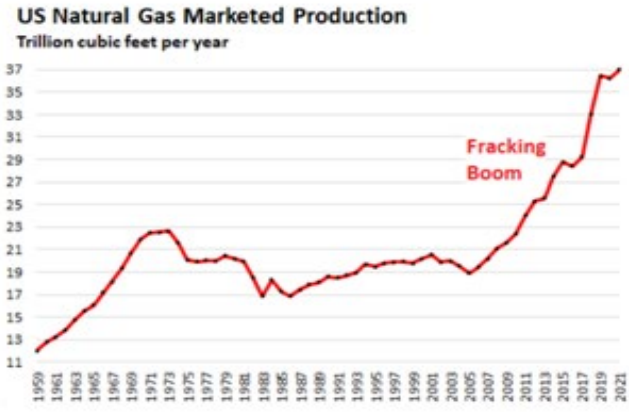
Table 1. U.S. proved reserves, and reserves changes, 2020–21

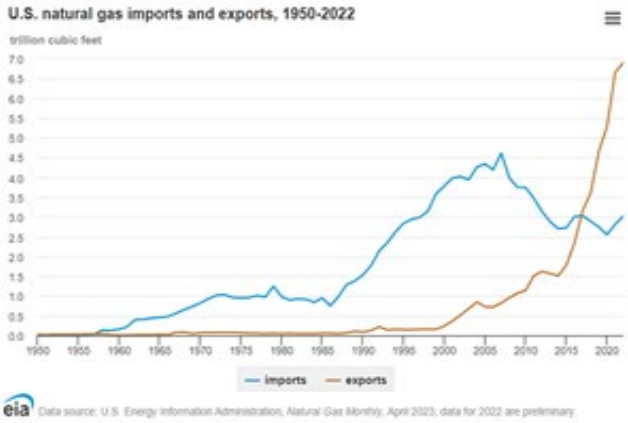
	Crude oil billion barrels	Crude oil and lease condensate billion barrels	Total natural gas trillion cubic feet
U.S. proved reserves as of December 31, 2021	**35.8**	**38.2**	**473.3**
Extensions and discoveries	5.7	6.3	67.6
Net revisions	1.6	2.3	100.0
Net adjustments, sales, and acquisitions	1.8	1.8	22.6
Estimated production	-3.8	-4.1	-38.1
Net additions to U.S. proved reserves	**5.3**	**6.2**	**152.1**
U.S. proved reserves as of December 31, 2021	**41.2**	**44.4**	**625.4**
Percentage change in U.S. proved reserves	**14.8%**	**16.2%**	**32.1%**

Source: U.S. Energy Information Administration, Form EIA-23L, *Annual Report of Domestic Oil and Gas Reserves*
Notes: *Total natural gas* includes natural gas plant liquids. Columns may not add to total because of independent rounding.

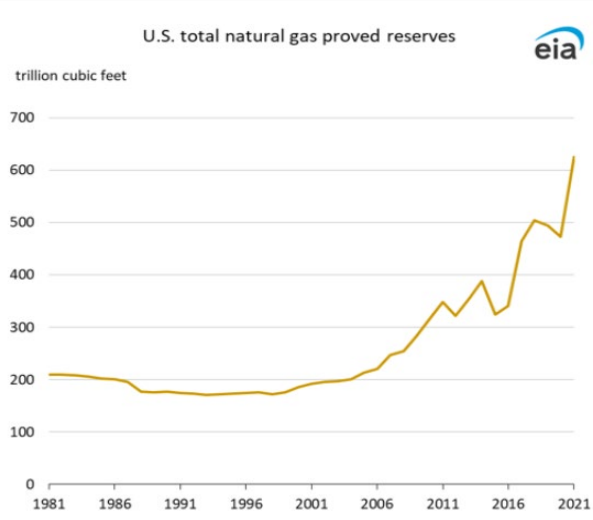
4.4 United States Natural Gas & Shale Gas Production

The United States encountered a similar situation in domestic natural gas production as their domestic oil production by peaking in 1973, increasingly relying on foreign imports. By 2007, the United States had a net import of 3.79 trillion cubic feet per year which equates to 16% of domestic consumption. The growing import of natural gas appeared to be permanent until the shale natural gas boom began, reversed and made the United States a net exporter in 2017. By the year 2022, the United States had net exports of 3.88 trillion cubic feet per year. In the foreseeable future, gross natural gas exports by pipeline to Mexico and the addition of 3 LNG plants will continue to increase with an increase in annualized exports from 6.90 to 8.07 trillion cubic feet per year from 2022 to 2024.





Natural gas looks to have a vibrant future domestically for power consumption as well as internationally as an export with the addition of 1 billion cubic feet per day (Bcf/d) by pipeline to Mexico and 3 future LNG plants with the capacity of 5.7 billion Bcf/d in construction scheduled for startup by 2025. Since 2010 natural gas plants have been replacing shuttered coal powered plants. Power generation emissions have reduced by 18% from 2010 to 2022 largely due to the gradual shift from coal to natural gas.



Current proved reserves of U.S. natural gas increased by 152.1 trillion cubic feet (TCF) (32%), from 473.3 TCF at year-end 2020 to 625.4 TCF at year-end 2021, establishing a new record for natural gas proved reserves in the United States. This amounts to a 17.5 year United States supply at the current annualized production rate of 35.81 TCF per year. Alaska (for the second consecutive year) saw a substantial volume of proved natural gas reserves added in 2021. The annual total of natural gas proved reserves in Alaska increased in 2021 by 63.3 TCF, almost tripling the state's total from 36.5 Tcf to 99.8 Tcf—the largest increase of all states in 2021. Texas saw the second-largest increase in proved reserves of natural gas in 2021 (34.3 TCF, 30%), and New Mexico had the third-largest increase (10 Tcf, 38%). Latest estimates of unproven reserves of natural gas are 2528 TCF as of January 1, 2021. (20)

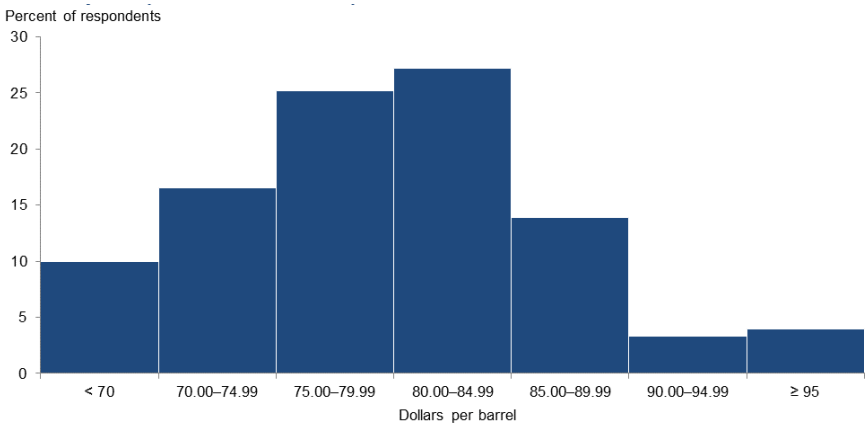
4.5 Coal

Coal demand is up, and will likely continue to go up. It will be the fallback if renewable energy does not fulfill its promises.

In the United States, coal powered generation has been on the decline since 2011. Capacity is expected to be halved by 2026 from the 2011 peak capacity according to a new report from the Cleveland-based nonprofit Institute for Energy Economics and Financial Analysis. The ambition for lower emissions, aging units with higher operating & maintenance costs, abundance of cleaner burning natural gas and renewables have led to the decline in coal consumption. The research based in utilities' plans to retire coal plants finds capacity is expected to drop from 318,000 megawatts to 159,000 megawatts by 2026. (21)

4.6 Price Forecasting

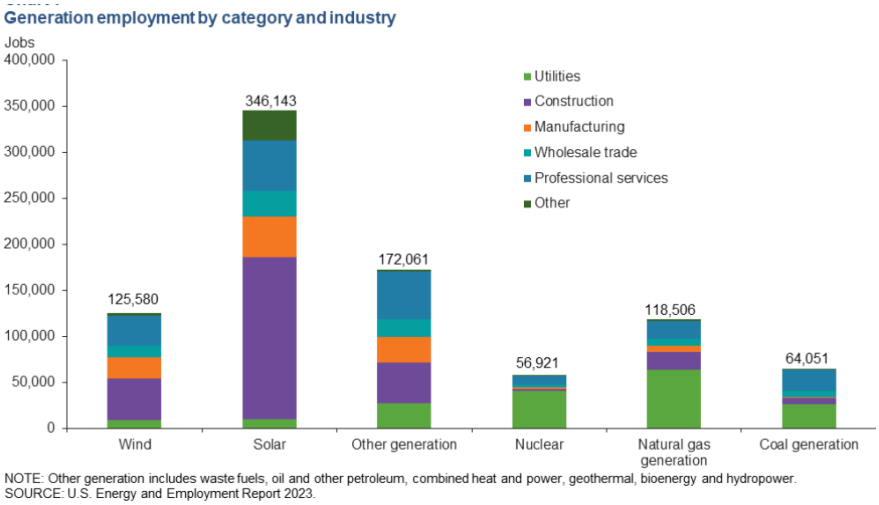
Industry professionals forecasted a WTI oil price of $77 per barrel by year-end 2023. The same group anticipated a $2.97 Henry Hub natural gas price. Responses ranged from $60 to $100 per barrel.



Henry Hub natural gas price (dollars per MMBtu), year-end 2022				
Indicator	Survey Average	Low Forecast	High Forecast	Price During Survey
Current quarter	$7.97	$3.80	$12.50	$8.16
Prior quarter	$7.55	$2.90	$12.00	$8.38

4.7 Energy Sector Employment

The June USEER (U.S. Energy & Employment Jobs Report) highlights the impact of solar energy growth. The largest employment category for electric power generation in the US. Is solar. The solar sector also led with the largest employment category for electric power generation in the USA with 12,256 new positions. This represents a growth rate of 3.7%. With 60% of construction jobs in solar which is up from 46% in 2022. Site-prep and installation are labor intensive and make up 1/3 of all electric power generation payrolls.



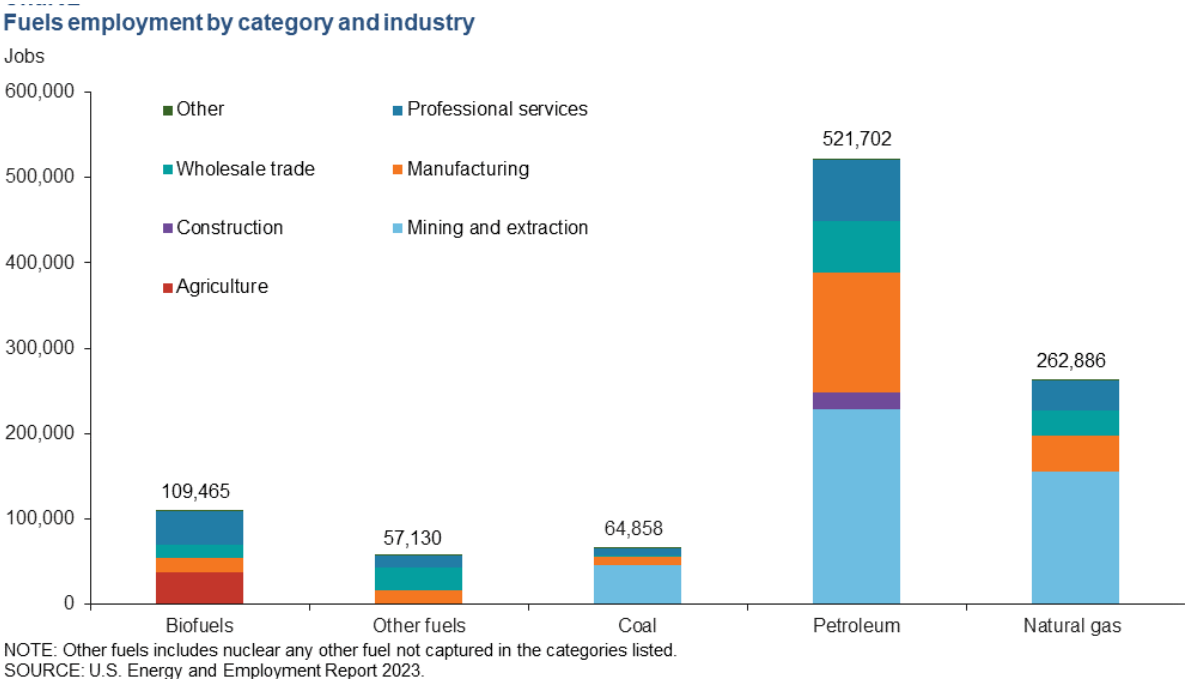
NOTE: Other generation includes waste fuels, oil and other petroleum, combined heat and power, geothermal, bioenergy and hydropower.
SOURCE: U.S. Energy and Employment Report 2023.

Natural gas accounted for 13.4 percent of electric power generation jobs and coal for 7.3 percent. Other generation amounted to

19.5 percent and includes hydropower, geothermal, bio, waste oils, and combined heat and power such as generating units that use natural gas.

All low-carbon generation jobs grew from 2021 to 2022, including wind, solar, hydro, geothermal and nuclear, adding 21,664 jobs (up 44.2 percent), while natural gas generation added 7,311 jobs (up 12.4 percent) and coal lost 6,780 jobs (down 9.6 percent).

However, petroleum and natural gas account for by far the largest share of fuels employment, at a combined 77.2 percent. Within these two categories, mining and extraction jobs are 48.9 of total employment.



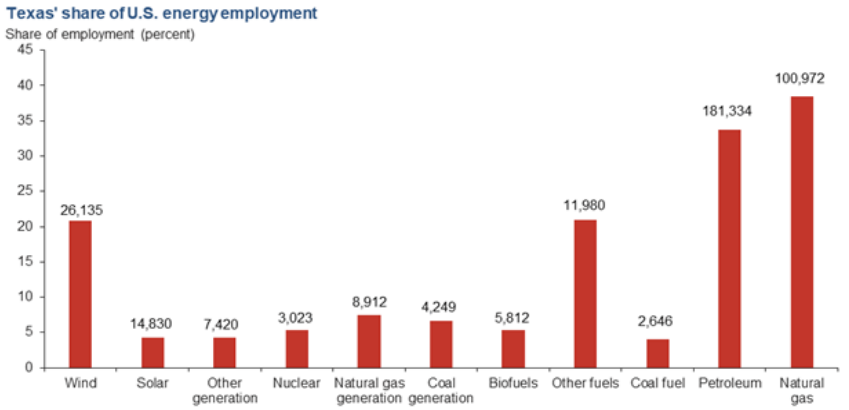
Petroleum fuels employment rebounded from a contraction during the pandemic and, amid high prices, notched the largest employment gain among all fuel categories from 2021 to 2022, followed by natural gas. Petroleum and natural gas growth also outstripped all other major components of domestic energy employment as categorized by the USEER—electricity generation, transmission, distribution and storage, energy efficiency and motor vehicles and component parts.

Total employment for all fuel categories—petroleum, natural gas, biofuels, coal, and other fuels—grew 123,377 jobs, or 13.6%. The petroleum fuels category added 58,100 jobs (up 34.6%), and natural gas jobs increased by 51,100 (up 33.6 %).

To demonstrate how critical domestic energy is to the United States, the American Petroleum Institute (22) determined in 2019 that the oil and gas industry had the following economic impact on the economy.

- The industry's total impact on U.S. GDP was nearly **$1.7 trillion**, accounting for nearly 8 percent of the national total in 2019.
- Supported **more than 11.3 million total jobs** or 5.6 percent of total U.S. employment.
- Generated **an additional 3.5 jobs elsewhere in the U.S. economy** for each direct job in the U.S. natural gas and oil industry.
- Produced **$892.7 billion in labor income**, or 6.8 percent of the U.S. national labor income.
- Supported **nearly $1.7 trillion to U.S. gross domestic product**, accounting for 7.9 percent of the national total. (22)

Texas dominates petroleum and natural gas employment sectors, as well as renewable energy categories. Wind generation jobs total 26,135 in Texas, 21% of the national total, according to the USEER. Texas also has the largest installed wind capacity in the nation, with 27% of the country's total.

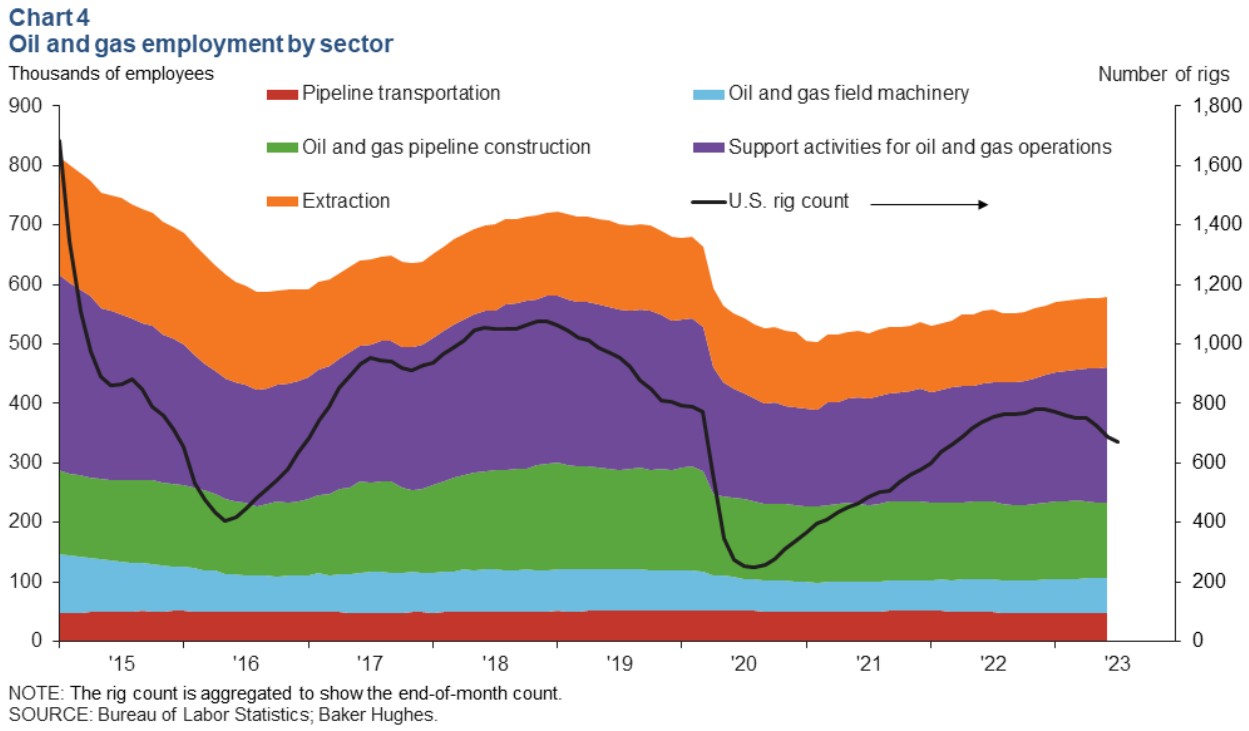


NOTE: Other generation includes waste fuels, oil and other petroleum, combined heat and power, geothermal, bioenergy and hydropower. Other fuels includes other fuels and nuclear. The figures above the columns are the number of employees for each category in Texas.
SOURCE: U.S. Energy and Employment Report 2023.

4.8 Oil and Gas Jobs and Drilling Activity

In the October 2023 monthly data from the BLS (bureau of Labor Statistics), U.S. oil and gas jobs increased slightly in June to 578,900. Of those jobs, 227,300, or 39%, are in the maintenance of oil and gas activities and operations. Another 127,100 jobs or 22% are in pipeline construction. June marks the highest total since April 2020. The industry has added 13,800 jobs this year. Unfortunately, these payroll trends are not supported by rig counts.

The aggregate employee hours index was relatively unchanged at 10.5. Meanwhile, the aggregate wages and benefits index declined to 34.5 from 43.6.



NOTE: The rig count is aggregated to show the end-of-month count.
SOURCE: Bureau of Labor Statistics; Baker Hughes.

Drilling activity dropped by 125 rigs in the first week of August 2023, from the high point of 784 the first week of December 2022. Rigs targeting natural gas production dropped by 27, and oil-directed rigs fell by 102. The miscellaneous rig count added four rigs during the same period.

Texas drilling shrank by 57 rigs, and among the major basins, the Permian shed the most, dropping 21 rigs in the first week of August 2023, from December 2022, with the net losses coming from the Texas side of the basin.

It is believed that E&P firms are anticipating an upturn in drilling activity. This is supported by survey information obtained by the Dallas Fed Energy Survey. Otherwise, falling rig counts would have precipitated a drop in employment.

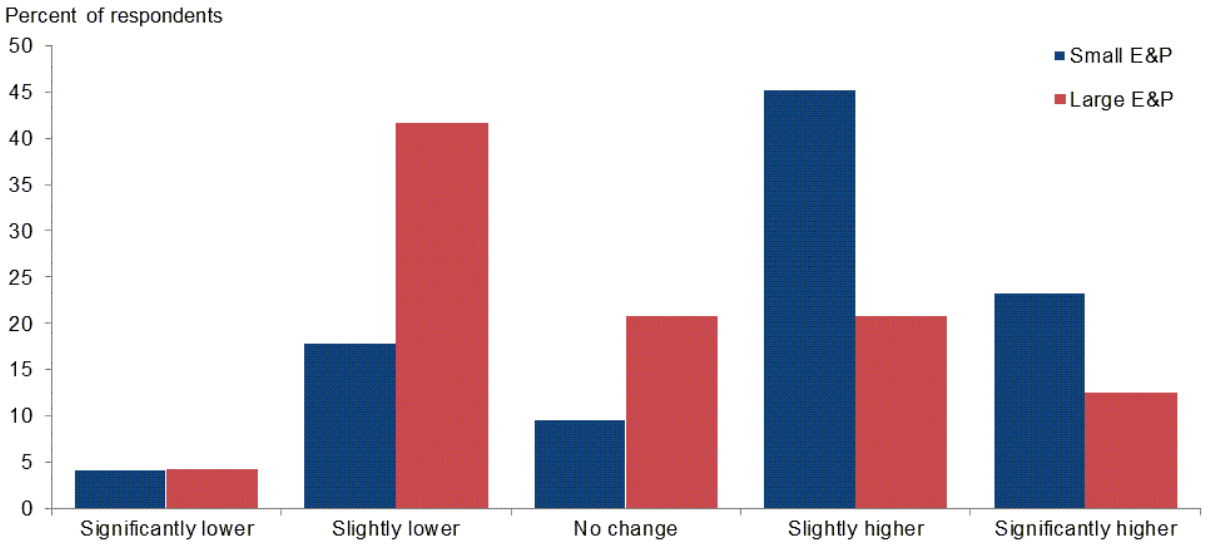
The healthy payroll data aligned with low industry unemployment claims for the mining and logging super sector in June. The BLS job openings and labor turnover survey also show the mining and logging labor market remains tight, with job openings in excess of hiring, and job losses holding at unremarkable levels.

4.9 Exploration and Production (E&P) Firms

When Texas oil and gas operators were asked their view of drilling and completion costs their responses were broken down into two groups; those of larger operators; those producing 10,000 barrels of oil per day (BOPD) or smaller operators that are producing less than 10,000 BOPD. Across all firms, 60% of executives expect drilling and completion costs per well to end the year higher than where they were at year-ends 2022, while 28% expect them to be lower. Twelve percent expect no change.

Larger firms typically expect their drilling and completion costs to be lower at year-end 2023 than year-end 2022. Forty-two percent of executives at larger firms said they expect their firm's drilling and completion costs per well to be slightly lower, with another 4 percent expecting costs will be significantly lower. Twenty-one percent expect no change, while 21% anticipate slightly higher costs and 13% significantly higher costs.

On the other hand, smaller firms on net anticipate their drilling and completion costs at year-end 2023 to be above where those costs were at year-end 2022. Among these firms, 45% expect costs to end the year slightly higher and 23% expect them to significantly increase. Only 18% anticipate slightly lower costs, and 4 percent significantly lower costs.

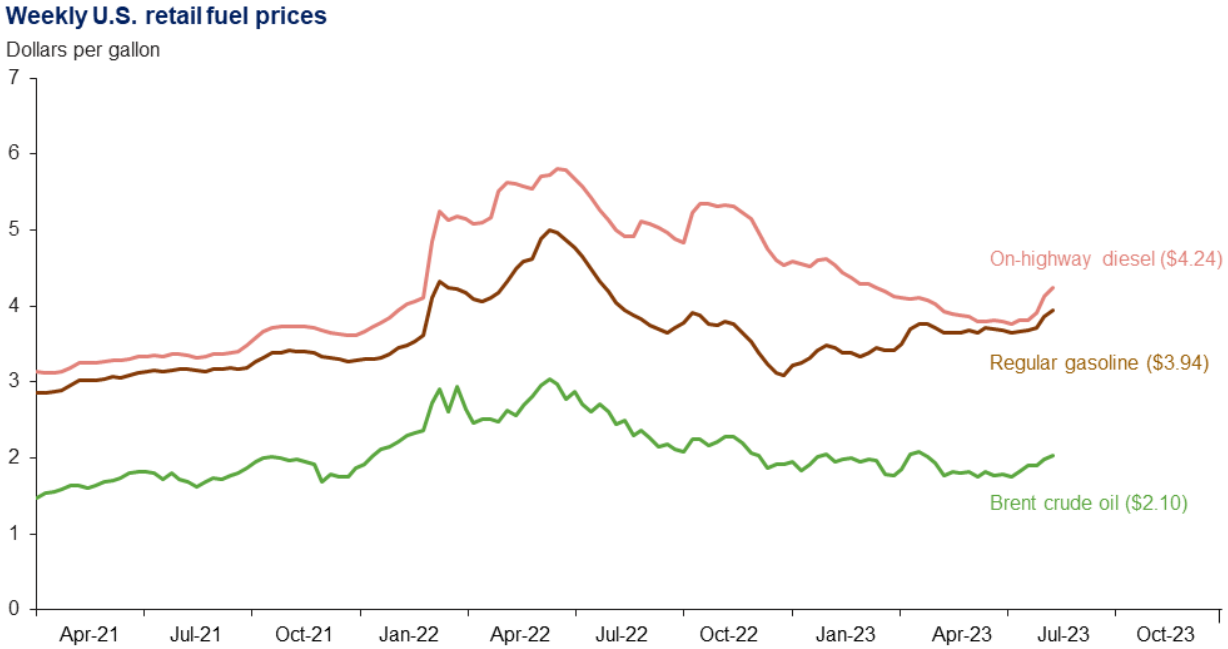


NOTES: Executives from 97 exploration and production firms answered this question during the survey collection period, June 7–15, 2023. Small firms produced fewer than 10,000 barrels per day (b/d) in fourth quarter 2022, while large firms produced 10,000 b/d or more. Responses came from 73 small firms and 24 large firms.
SOURCE: Federal Reserve Bank of Dallas.

4.10 Refinery Production

The price of retail diesel and gasoline have both risen recently. On-highway diesel rose to $4.24 per gallon the week of Aug. 7, up 12.6% since the start of July 2023. Regular gasoline rose to $3.94 for the same week, up 8.2% during the same time frame. For comparison, the price of Brent crude rose 16.4%.

Higher oil prices have driven this rise in fuel prices. Unplanned outages at U.S. refineries have also contributed to this increase. Tight inventories of distillate fuels (diesel and jet fuel) have been more severely impacted than gasoline, and several refineries reported outages of distillate units in July.

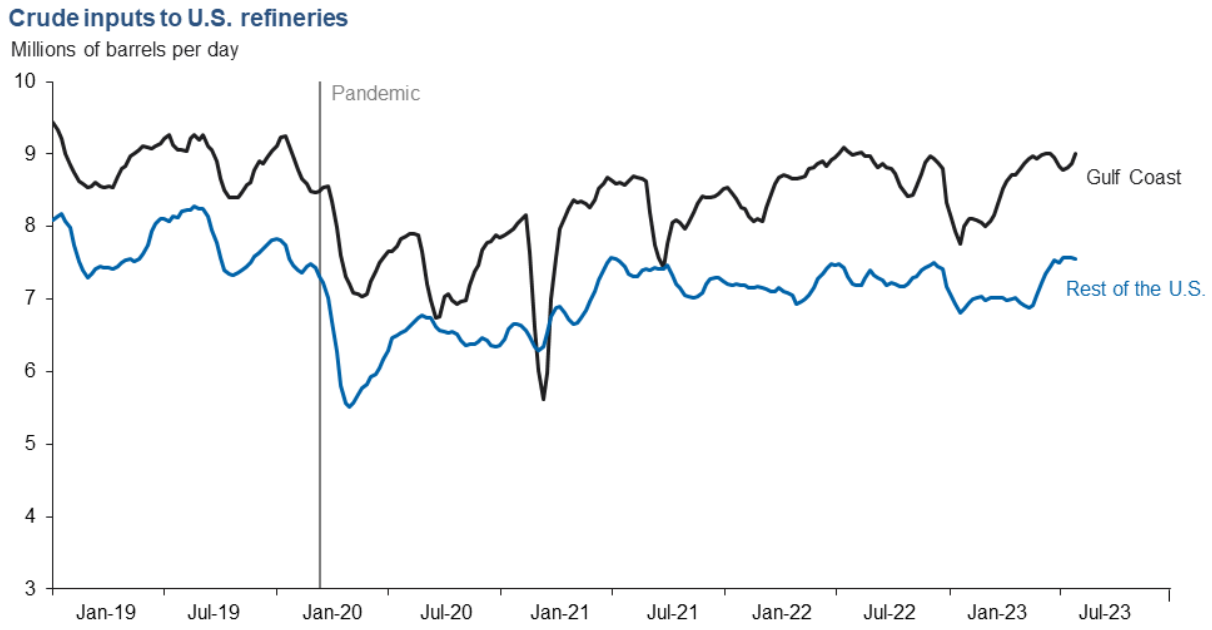


NOTE: The Brent crude oil price is depicted as the average weekly price per gallon. Numbers in parentheses are for the week of Aug. 7, 2023.
SOURCE: Energy Information Administration.

4.11 Gulf Coast and US Refineries

Gulf Coast refineries processed 9.0 million barrels of crude oil per day (mb/d) over the four weeks ending July 28 after dipping earlier in the month due to outages. That's the highest volume processed since August 2022. The volume of crude processed in the rest of the U.S. was 7.6 mb/d and has been trending down slightly since the start of July.

Unplanned outages this summer, including a fire at one facility and maintenance at others, have limited fuel output. Record sustained high temperatures are also partly to blame for lower run rates as some facilities were forced to limit utilization to keep equipment from overheating.



NOTE: Weekly data are depicted as a four-week moving average.
SOURCE: Energy Information Administration.

5 Renewable Energy

5.1 The "Brand" of Climate Change and Renewable Energy

The renewable energy "brand" is bigger than that of Coca Cola, and will continue to push the market and investment worldwide. When we consider renewable energy through the lens of climate change, the scale and impact of its brand are profound and undeniable. Comparable to globally recognized brands like Coca Cola, renewable energy has become a household name, its presence ubiquitous, and its influence palpable.

The enormity of its 'brand power' is evident in the considerable financial resources allocated towards climate change and sustainability initiatives - to the tune of $3.7 billion in outreach expenditures in 2019 alone. When compared to Coca Cola's advertising budget of $4.2 billion, the enormity of this investment becomes clear. Renewable energy, associated as a positive response to climate change, attracted an astounding $128 billion in subsidies in 2017. Over the past decade, this figure has skyrocketed to over a trillion dollars total

worldwide. Brand influence has been instrumental in channeling a multitude of investment dollars towards renewable energy and growing fresh crops of “green” investment funds and green additions to family office portfolios. Even if there were an abrupt change in the narrative on climate change, the inertia of this brand would still carry significant weight for the foreseeable future.

The drive towards renewable energy sources has brought about significant shifts in the geopolitical landscape. With nations committed to minimizing their carbon emissions, a competition has emerged to secure essential elements like rare earth minerals, vital for renewable technologies. Consequently, this competition has given rise to fresh geopolitical tensions, exemplified by the ongoing disputes between China and the United States.

5.2 The Goal and the Shortcomings

5.2.1 Acceptable Returns

However what people are not seeing is "acceptable returns," laments the financial world. Bain (23) has identified this as the key issue with renewable energy. It is not access to capital - the money on the sideline for new renewable investments is abundant (actually staggering!) - but ensuring a return on investment is a problem. Most power utility customers are not willing to pay much more to support these new businesses at scale, so companies have relied on government policy support to incentivize the investment. And subsidies have a hard limit that forces linear growth rather than the exponential growth that other high-demand industries have experienced.

The International Energy Agency estimates that for the world to reach net zero by 2050, annual investments in clean energy would need to increase to $4.6 trillion by 2030 from the 2022 level of about $1.6 trillion. All the while, the companies implementing these investments must also ensure that these projects are economically viable and can be executed given physical constraints (e.g., availability of materials, labor, and supply chain).

If renewable energy could yield substantial profits, it might see explosive growth akin to the internet's rise (20). However, with the market thriving on subsidies, there's little incentive to lower prices, the opposite in fact, limiting its expansion and affordability in the foreseeable future.

5.2.2 Nobody is Sure

"There is a basic lack of understanding of how a fully decarbonized system may work and at which cost. Policymakers yearly increase decarbonization targets, without any reality check. Top-down processes are predicted to fail unless they find support from people, especially when these targets erode spending power by increasing the cost of energy and fuels." — Utilities executive, Europe (Bain) (23).

According to a Bain poll, 78% of executives believe that a major barrier will be that customers will not be willing to pay more for energy. 56% say they are worried about fluctuating government policies.

Additionally, about two-thirds of oil and gas executives believe that their businesses will grow or grow rapidly, as do about half of the mining and minerals executives. And at the same time, it seems that these same executives see renewable and climate change technologies having an increasing impact. It is tough to say if they expect a harmonization of their segments of the industry, or if this is a "doublethink" situation forced upon them.

5.2.3 Subsidies are doing more harm than good

To attempt to propel the industry forward, the West has provided generous subsidies that keep renewable energy growing. But only linearly – in step with government allocations. The US and EU, aiming to lead in clean energy, are funneling significant government funds to foster transitions to greener solutions. Developing nations cannot afford subsidies.

Subsidies are designed to encourage markets to produce more of something by inserting funds or incentives into the supply-demand cycle. At its best, subsidies can encourage

more efficient manufacture of a product or provision of that service to create a larger self-sustaining market, a new balance at a higher level.

But the unintended result, at least in part, is that the success of a renewable project in this subsidized environment is not related to price. Success has come to depend on a company's or a customer's abilities to lobby Congress and secure grants to build renewable projects. "Acceptable returns" can be achieved but only when government support is factored in.

Anything they do differently will be less profitable. Risk in the subsidized renewable industry is related to quality (and often "perceived" quality does not match actual quality), but not price. Any errors relating to quality might jeopardize their ability to get subsidies in the future. Efforts to make a technology more cheaply could literally cause an existential risk to the company. One can be banned from government subsidies with even the slightest problem, the slightest whim of a bureaucrat (funny that bureaucrats are not incentivized to be tolerant of risk…). Why take a chance?

And they haven't. Thus, much of the equipment produced in the U.S. and Europe cannot be exported to the developing world, because it is too expensive to achieve "acceptable returns."

5.3 The "Counter" Brand

If the West continues to subsidize its renewable energy in the current manner, it may achieve a respectable, albeit expensive, renewable energy base. But the developing world will not. As the West starts to pressure the developing world by introducing economic incentives and sanctions, the developing world will rebel. These countries will push back and may even migrate toward markets generated by our foes. China's "Silk Road" comes to mind, with the added expansion of BRICS. Unless renewable energy develops into a cost-effective technology that achieves "acceptable returns," pressure from the West will be ineffective and will, in fact, backfire.

Astonishingly, around 675 million individuals are still living without access to electricity, and an alarming 30% of the global population, equivalent to 2.3 billion people, are without access to clean cooking fuels and technologies. This lack of access isn't just an inconvenience; it's a life-threatening scenario as it leads to premature deaths. And with the anticipated population surge in these regions, especially in sub-Saharan Africa, the situation is bound to become more critical.

The quintessential role of energy becomes even more highlighted when we understand that the future of human well-being and the economy is tethered to the augmentation of the energy supply. Observations from history show a consistent pattern where global energy consumption, population growth, and economic output have moved in sync. In burgeoning economies, even incremental enhancements in per-capita energy consumption have been linked to notable improvements in the Human Development Index, a metric designed by the United Nations that encompasses indicators for health, education, and income. This connection reinforces the idea that energy is indispensable for human flourishing. (1)

Yet, despite the monumental strides in global energy supply over the past 150 years, billions continue to live in the shadows, deprived of adequate, affordable, and reliable energy. The population surges over the next thirty years are predicted to be predominantly concentrated in these underprivileged regions. The people and the governments of these areas will inevitably persist in their endeavor to extend their energy supplies. It is crucial, therefore, to ponder over the injustice and the imbalance in energy access.

Restricting energy in these developing regions would not only be a colossal injustice but it would also curtail the progress of the nations struggling to step out of the shadows of underdevelopment and poverty. It would hinder the upward trajectory of their economies and, more importantly, it would obstruct the enhancement of the quality of life of billions of individuals who are yet to experience the benefits of energy that many of us take for granted. The availability of energy is synonymous with the advancement of human civilization, and it is a collective responsibility to ensure that the radiance of progress illuminates every corner of our planet.

If the West pressures developing countries to avoid hydrocarbon fuels without an affordable alternative, these nations will accuse the West of enforcing "energy poverty" and obstructing their growth.

And they will be right.

Who is going to tell the developing world “You are not allowed to consume as much energy as we do, and you are not allowed to use cheap coal to build your country, like we did?” This will be seen as oppression, and a great hardship for the developing world – a much greater hardship than the West can understand.

We already see some indications of resistance in the developing world, with terms emerging like “green colonialism” and “energy apartheid.” These evoke powerful images that could damage the renewable/climate change brand and cause enthusiasm to quickly wane in these regions.

This will be a limitation and could become a “counter” brand to climate change and renewable energy. It would not be the first time an enthusiastic slogan from the West has become a battle cry for resistance in the developing world.

And it will resonate. This counter brand could easily dominate in countries that are disadvantaged in this way.

Unless renewable energy can be provided with acceptable returns, returns sufficient to attract substantial internal and external investment suitable to their economic environment, its growth will come to a screeching halt, in favor of coal, oil, gas, or any other form of energy that can fuel the economic growth of these developing nations.

5.4 The Prospect of Achieving NetZero by 2050

The major reports that predict zero CO2 by 2050 are not correct. Several major reports illustrate a historic increase in hydrocarbon fuel consumption until the present, then project a sudden and consistent decrease from now until 2050. The basis for such an

optimistic downturn appears unfounded, almost wishful thinking rather than backed by real trends or seismic shifts. As mentioned previously, the growth of renewable energy is heavily tethered to government subsidies, resulting in linear growth constrained by the availability of such subsidies.

As developing nations continue to expand and consume available energy, the linear growth pattern of renewable energy, shackled by subsidies, does not seem promising in outpacing the rise in energy consumption. It's crucial to question the reliability of these projections as they seem to be colored by confirmation bias, projecting hopeful outcomes without solid ground.

In its recent polls, Bain (23) found executives expecting a slowdown in the rate of decarbonization in the short term (by 2030), though their long-term expectations remain largely positive. This seems reasonable since the low hanging fruit in the currently subsidized world is likely to be covered, and political changes are likely to cause a pendulum swing over the next few years.

Executives in utilities and new energy are most optimistic, with nearly two-thirds expecting their business to grow rapidly, owing to continued tailwinds from electrification and low-carbon energy increasingly a part of their core business. The percentage of oil and gas executives anticipating a rapid decline of their core business over the next 10 years fell to 4% from 8% the previous year. (Bain) (23)

Even the IEA (4) says "The outlook for coal **is heavily dependent on the strength of the world's resolve to address climate change.** In the Stated Policies Scenario (STEPS), coal demand declines gradually. In the Announced Pledges Scenario (APS), it declines about 20% below current levels by 2030, and 70% by 2050; coal demand peaks in China in the early 2020s and in India in the late 2020s. In the Net Zero Emissions by 2050 (NZE) Scenario, demand falls 45% by 2030 and 90% by 2050."

This quote directly from their report makes the point that even the agencies leading the charge for Net Zero admit that psychology and politics are important factors. And AS was

pointed out earlier, neither are on their side without “acceptable returns” in renewable energy.

Developing Countries need energy to grow, energy is wealth. Most governments agree in principle, but will not make the tradeoffs vs the economic well being of their people.
The explosion of the primary energy supply since the 19th century has been a catalyst for unprecedented enhancements in human lifespan and wealth. This boom in energy and its associated benefits, however, has not reached everyone; it has predominantly sidestepped the Global South, leaving a significant part of the population in energy poverty.

A cursory analysis of the conflicting data indicates that renewable energy at its current rate of growth and the current state of the market will not fill the gap between energy demands and current fossil fuel production, much less reach Net Zero goals. We illustrate below.

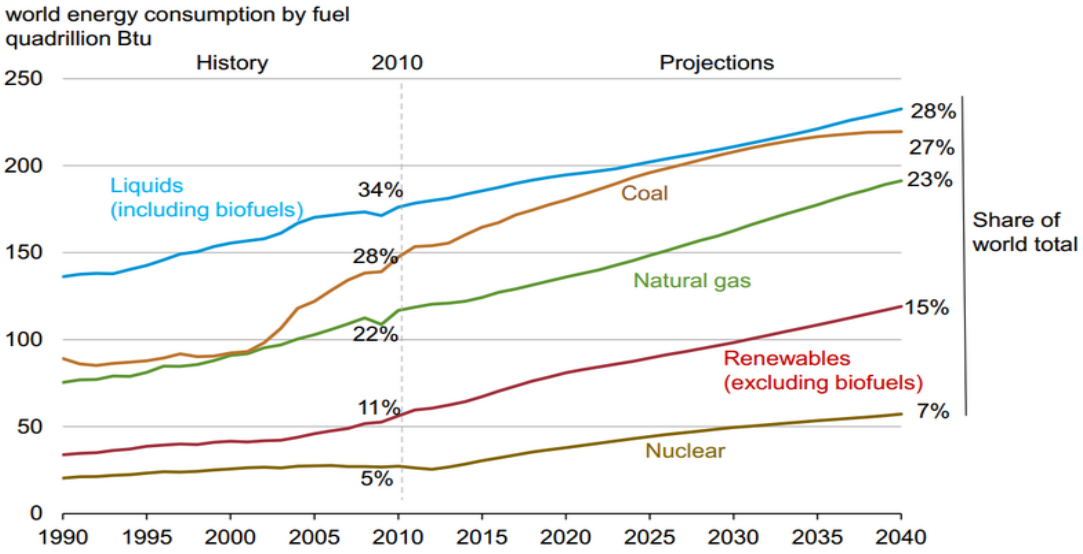
Presented below are graphs from 2013 projecting to 2040 and from 2021 projecting to 2050.

- The total world consumption projected in 2013 is about 30% higher than what is predicted in the 2021 chart - an incredible re-estimation.

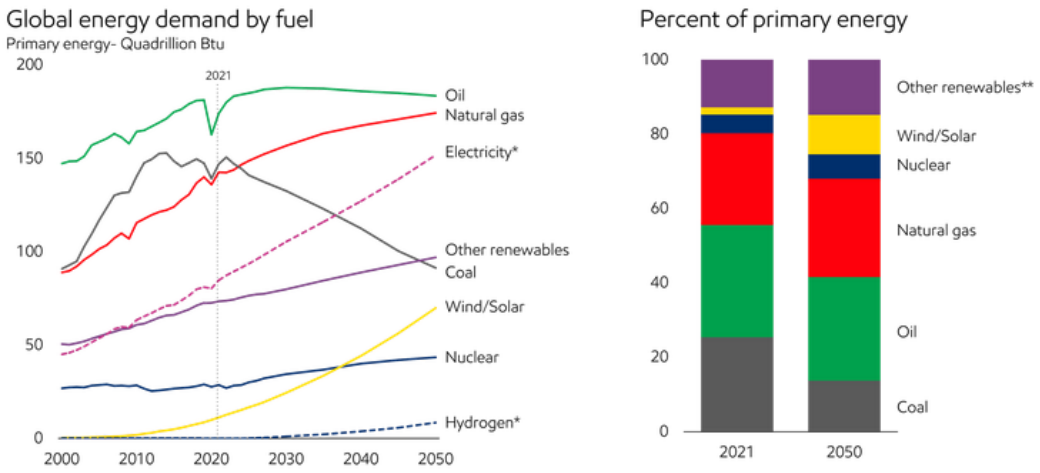
- The projection for coal consumption drops massively from 2021 out to 2050, but there is no trend or documented real world shift supporting that projection. The 2013 chart projects consumption of coal increasing to record levels.

- The projection for total renewables is 20% higher in the 2021 project than in the 2013 projection.

- Oil and gas projections are higher by 15% in the 2013 project than in the 2021 projection.



Source: EIA, International Energy Outlook 2013



* Electricity and Hydrogen are secondary energies derived from the primary energies shown

**includes biomass, biofuels, hydropower, geothermal

We suspect that confirmation bias has slipped into the 2021 figures and that global power demand will grow at the faster pace expressed by the 2013 data. As mentioned above, few oil and gas executives are expecting cutbacks in production and most are planning for increased production.

To put the need for increasing the world's energy supply in even starker terms, consider the following thought experiment. Say that India, Indonesia, Pakistan, Nigeria, and other countries with low or very low energy consumption per capita today were to increase per capita consumption by 2050 to the level of, for example, Mexico in pursuit of economic growth, a desirable goal. Global primary energy consumption would then grow by about 70 petawatt-hours, or approximately 45% of the total global energy supply as of 2019.

And while we project that coal use will not decrease in the manner projected, if it did, renewable energy would have to increase at double the rate to close the gap and maintain current emission standards, much less bring us to Net Zero goals.

Countries, corporations, and cities worldwide are rushing to declare net-zero emissions pledges in an attempt to address climate change, with such targets now encompassing nearly two-thirds of global emissions. However, the actualization of these commitments seems more of a façade than a functional solution to the escalating climate crisis.

The inadequacies of these pledges are increasingly apparent, marked by a lack of tangible plans, inconsistencies in emissions calculations, and potential for 'greenwashing,' creating an illusion of environmental responsibility while lacking substantial impact.

As mentioned before, we predict that developing countries will push back once they realize what they have signed up for – again, given that the West has not achieved acceptable returns for renewable energy.

The conclusion is that the promises to achieve NetZero/Agenda 21 emissions levels are failing, the current projections are wishing thinking - we will not reach the 2050 goals nor even close. The governments of the world, even with the massive brand support of renewable energy and climate change, do not have not been sufficient psychological and political abilities to make these new estimates come true.

The possible remedy

If renewable energy doesn't become cheaper and more worthwhile than hydrocarbon fuels, developing countries won't be able to grow using clean energy. As the developing world plans to absorb cheaper energy, the only factor that would provide for the sustained and rapid growth of renewable energy to approach Net Zero goals is to achieve “acceptable returns.”

In short, if renewable energy is cheaper than coal and other hydrocarbon fuels it will be used, if not, then it will not.

To truly progress, the industry needs to shake off its dependency on subsidies and strive for economic efficiency and innovation, allowing renewable energy to progress exponentially and meet the rising energy demands. It especially needs to find a way to make energy storage and installation more cost effective and to remove the barriers to connecting to the grid by establishing the protocols to allow rapid and profitable connectivity, i.e. deregulation.

The cost of failure in either direction is high: a rapidly warming planet and the consequential environmental risks, or stifled economic progress and lingering quality-of-life concerns for the billions of people who lack access to sufficient energy (18).

5.5 Cost Trends in Solar Energy

The prices of raw solar cells have fallen dramatically over the past 20 years. They are by far cheaper than any other form of energy (excluding installation costs), which, in a rational market should push it to the forefront exponentially.

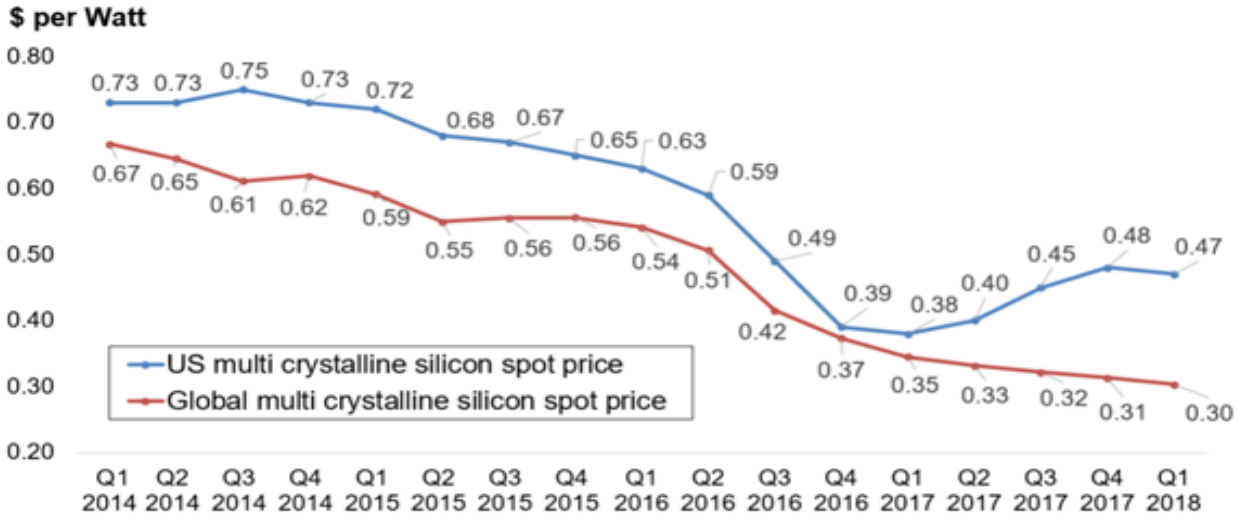
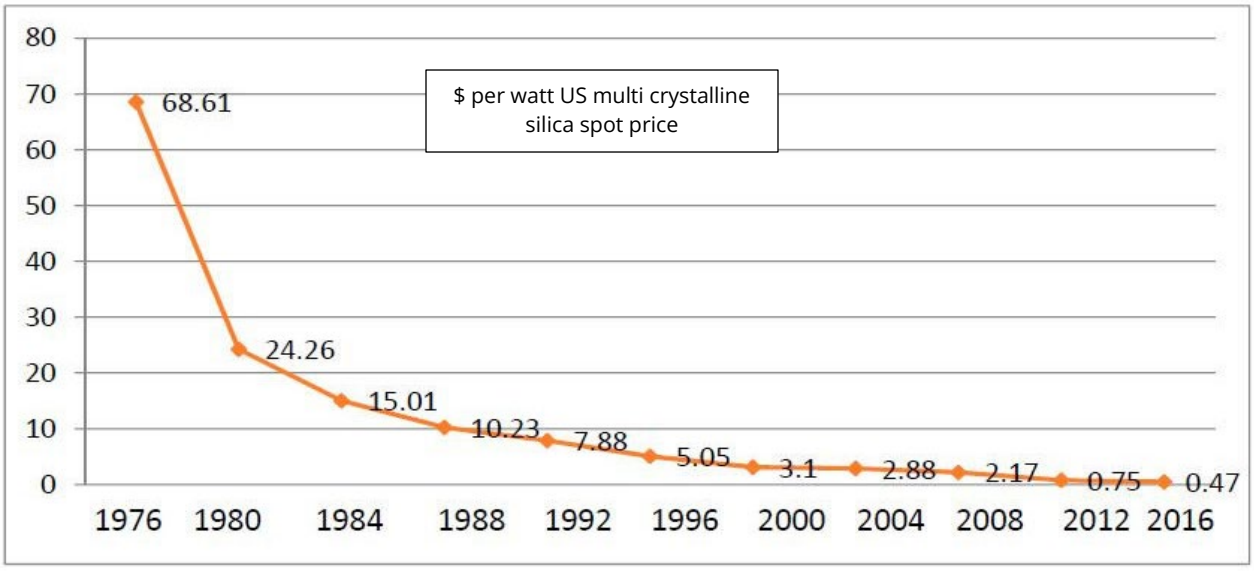


Figure 9. Ex-factory gate prices (spot prices) for U.S. and global multicrystalline-silicon modules from GTM/SEIA (2018) data

Despite the extreme low costs of the cells, installation costs are still high, $1.30 or more per watt even at the largest scale. To attain "acceptable returns" this is an issue to be worked.

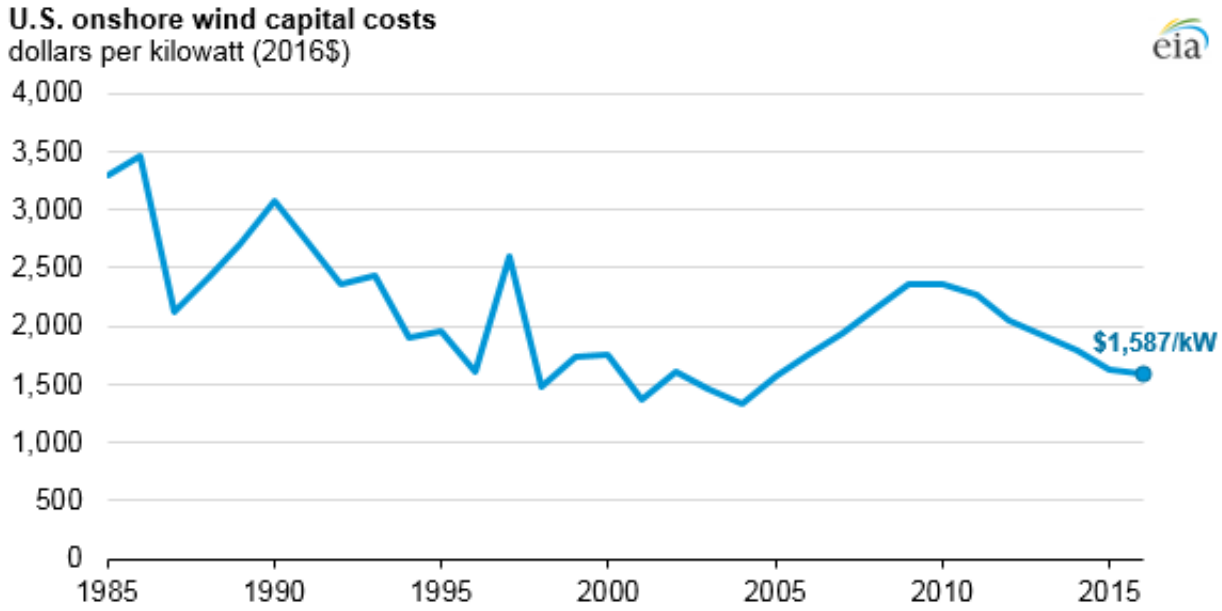
Another issue is that solar requires storage since traditional energy backups are an engineering nightmare for a source that can change its output rapidly and which does not produce during peak energy demand.



5.6 Cost Trends in Wind Energy

Wind Energy has seen a lowering of prices, but not nearly to the extent that solar cells have fallen. Where the cost of solar cells has fallen by more than 99.5% of its 1985 price, wind energy appears to have fallen by just more than 50%. It will be difficult to scale up the manufacture of larger windmills (some with blades longer than a football field) to get lower prices. However, it seems that it is a fair technology for windy climates and has made some inroads into the industry.

Like solar energy, wind energy requires a storage system, as its capacity factor is about 42% (24). Cost effective storage systems are hard to come by, and traditional energy backups are difficult to engineer for a source that can change rapidly. This brings up the "acceptable returns" argument prevalent in renewable energy.



Source: U.S. Energy Information Administration, based on U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE), *Wind Technology Market Report*

5.7 Biomass, Bioenergy, Tidal, Geothermal, Hydro, Nuclear

While there may be ample opportunities to invest in these technologies, especially in the current subsidy environment, the effects and impacts of these forms of renewable energy are not estimated to be as important as the impact of the other forms in this report. No movement in any of these sectors will substantially affect renewable projections for growth. These observations are offered.

Biomass/Bioenergy - This industry is too small to have a substantial impact, and we believe it is included in most reports only to show cooperation. Some countries seem to aim to meet their NetZero promises by counting firewood as biomass.

GeoThermal - There are two types of geothermal energy, neither of which has become widely popular yet. The first one is designed for individual homeowners to help with heating and cooling. It works well but can be expensive to set up. The second type uses volcanic heat to make steam for electricity, like in El Salvador. However, this method isn't widely available nor especially popular since it involves living in proximity to an active volcano.

Tidal power is likely to succumb to their perceived threats to beaches. So far it has not substantial contribution to the world's energy output and will not likely be in the future, except as special purpose generators.

Hydroelectric is considered renewable but really fits more in the conventional category. It appears that many countries are reporting this as renewable since it helps them meet international standards and relieves pressure from climate change advocates. But the special circumstances that allow for hydroelectric dams are becoming more scarce and more expensive as land becomes more valuable. Growth will be limited by these two factors.

Nuclear Energy will not resume growth in the U.S. anytime soon. Where renewable energy has benefitted from a massively positive "branding" effect, the nuclear energy industry in the U.S. was destroyed by it. In fact, the U.S. has only completed a single nuclear energy

plant in the U.S. in the last 30 years (Unit 3 at Plant Vogtle, southeast of Augusta). Deregulation and the advent of Small Modular Nuclear Reactors (SMNRs) may change that, but not quickly, since nuclear power plants take so long to plan and build and require exception scrutiny in the permitting process. A continued nuclear market growth can have no significant impact on the U.S. energy market until at least 2040.

Europe has the same issue and has indeed closed nuclear plants even in the face of oil and gas shortages due to the Ukraine-Russia war. The developing world cannot afford nuclear power, the initial capital investments are too high to be a viable option. SMNRs could conceivably change that, but much would need to change.

6 Investment Opportunities

6.1 Investment Target Opportunities

6.1.1 Market Bifurcation Arbitrage

The Belt and Road Initiatives and new BRIC alliances between Russia, and China will form a **trade zone that will disrupt global energy markets and will likely bifurcate the market**. Amidst the chaos caused by the market bifurcation, there lies a potential for arbitrage opportunities. Investing in commodities or assets that have different prices in these diverging markets could be lucrative. But most of the arbitrage will likely be underground, to avoid the ruinous regulatory and sanction-related restrictions that will arise. The time to prepare for this is now. Russia's successful moves to circumvent potential sanctions on its oil and gas exports began planning over 10 years ago.

The market bifurcation could also lead to emerging markets becoming more significant players on the global stage. Investing in Exchange Traded Funds (ETFs) like iShares MSCI Emerging Markets ETF (EEM on NYSE) or Vanguard FTSE Emerging Markets ETF (VWO on NYSE) might provide broad exposure to these markets, capitalizing on the potential growth spurred by China-Russia axis developments.

Consider investing in specialized energy funds that have a focus on navigating the market bifurcation and capitalizing on the dynamics between traditional energy sources and renewables. Funds like the Energy Select Sector SPDR Fund (XLE on NYSE) or the VanEck Vectors Oil Services ETF (OIH on NYSE) could provide diversified exposure to these sectors. New ETFs will likely emerge.

6.1.2 Advance Exploration Companies

The prognosis for the reduced consumption of gas and oil seems to be debunked by the ongoing global energy demands. Companies specializing in advanced exploration and extraction technologies are poised for growth. Examples include Schlumberger Limited (SLB on NYSE) and Halliburton (HAL on NYSE). They are at the forefront of providing cutting-edge technologies and services for drilling, evaluation, completion, production, and intervention of oil and natural gas. Additionally, **Baker Hughes, Weatherford International and National Oilwell Varco (NOV)** are leading oilfield service companies that provide a wide range of essential services, equipment, and technologies to the oil and gas industry.

They are positioned to benefit from the ongoing demand for energy and the need for efficient and sustainable extraction methods. Investing in these companies offers potential opportunities for investors seeking exposure to the oil and gas sector, particularly as the industry adapts to new challenges, embraces advanced technologies, and navigates evolving regulations.

However, investors must conduct thorough research and due diligence before making any investment decisions, as individual company performance can vary over time and be influenced by various factors, including market conditions and changes in management strategy.

Evaluate potential returns on investment based on industry growth projections and company performance. Companies with **relaxed ESG commitments that can push back against hostile governments and activists will be rewarded in their stock valuation**. Recent evidence of this is demonstrated in February 2023, when US oil and gas majors

ExxonMobil and Chevron traded at approximately 6 times their expected EBITDA for 2023, twice the average of their European competitors with stricter ESG commitments[7]. Future ESG commitments as well as the binding strength of future ESG commitments need to be considered by investors. Companies and investors will be rewarded by ignoring ESG and focusing on return on investment. In February 2023 BP shares soared nearly 20% after announcing they are relaxing their carbon reduction targets from 40 to 25% by 2030[8].

For higher risk and potentially higher returns, consider investing in startups involved in exploration such as **Tachyus, Quantico Energy Solutions, Raptor Rig and Seismos**.

In Renewable Energy look for companies that can profitably export to and operate in developing nations. Not only will they be able to work in relatively wide open markets, but they will be more agile in Western nations where their competition has to wait for subsidies to support growth. "Acceptable returns" will become the concept to follow.

6.1.3 Cross-border Real Estate Investment

As Russia extends its pipelines south and east, there will likely be a surge in real estate opportunities in those regions. Companies or REITs (Real Estate Investment Trusts) with holdings along these pipeline routes or in nearby growing industrial areas could benefit. Investing in local real estate firms or international REITs with exposure to these regions could be a strategic move.

Engage with real estate investment firms that have a cross-border focus, especially in regions where new pipelines and infrastructure projects are underway. These firms could provide insights and access to prime real estate opportunities that could arise due to geopolitical developments.

6.1.4 Infrastructure Development Companies

The extension of pipelines and other infrastructure projects in the south and east regions will require massive construction and development efforts. Companies like Caterpillar Inc. (CAT on NYSE), which specialize in construction machinery and equipment, could see a surge in demand for their products and services.

6.1.5 Advanced Material Companies

Companies specializing in advanced materials crucial for modern energy infrastructure, especially in the clean energy sector, may present unique investment opportunities. For instance, firms like Applied Materials Inc. (AMAT on NASDAQ) and 3M Company (MMM on NYSE) are known for their innovations in materials science and engineering which are critical for solar panels, wind turbines, and battery technology.

6.1.6 Automation and Robotics

As energy projects grow in complexity and scale, automation and robotics will play a pivotal role in ensuring efficiency and safety. Companies like ABB Ltd. (ABB on NYSE) and Rockwell Automation Inc. (ROK on NYSE) are at the forefront of automation technology which could see increased demand as new energy projects unfold, especially in harsh or remote

6.1.7 Global Logistics and Supply Chain Management Companies

The expansion of energy projects across borders will necessitate robust logistic and supply chain solutions. Investing in companies like FedEx Corporation (FDX on NYSE) or United Parcel Service, Inc. (UPS on NYSE) could be strategic as they have the global network and expertise to handle complex logistic challenges associated with large-scale energy projects.

6.1.8 Emerging FinTech Solutions for the Energy Sector

The energy sector is ripe for disruption through financial technology (FinTech) solutions that can streamline transactions, enhance transparency, and facilitate better compliance with evolving regulatory frameworks. Companies like Square, Inc. (SQ on NYSE) or PayPal Holdings, Inc. (PYPL on NASDAQ) that are pioneering in FinTech solutions may find novel applications for their technologies in the energy sector.

These recommendations delve deeper into the intertwining sectors that interact with energy markets, presenting a multifaceted approach towards identifying investment opportunities amidst the ongoing geopolitical and market dynamics. Each recommendation not only serves as a potential avenue for financial growth but also as a means to engage with the broader economic themes impacting the global energy landscape.

7 Policy Recommendations

ESG lending constraints are challenges the US oil industry is currently facing. Oil producers are now dealing with two distinct types of capital lending restrictions that did not exist before the pandemic. The most concerning one involves strict ESG lending constraints, which are being imposed on the industry by institutional investors like BlackRock. The radical ideas crippling the industry through ESG must be rejected to protect the sector's continued growth and stability. This is because the oil and gas industry is a significant contributor to the global economy and energy security, and sudden disruptions could lead to economic downturns, job losses, and geopolitical tensions.

Energy diversification should be encouraged through competition rather than relying on anti-competitive and arbitrary mandates.

It is recommended that the **policies regarding permit restrictions** be carefully examined, since a lack of permits during an extended will mean a definitive shortage 5 to 8 years (the lead time for construction of facilities) down the road. When this occurs **it makes the U.S. vulnerable**. Consistent growth is key, it is recommended to encourage new investments in the Gulf of Mexico and open new regions in Alaska. In addition to permits for exploration and production in the United States, pipeline infrastructure construction should be encouraged by known geopolitical ally Canada to transport crude oil to the United States.

Encourage technological advancements such as enhanced oil recovery in existing oilfields to **maximize oil extraction**, along with digitization and artificial intelligence implementation to reduce costs.

For the **renewable energy** industry, the **focus must be on "acceptable returns."** If this can be achieved, independent of subsidies, then renewable energy has a chance to supplant coal, preventing the anticipated rebellion in the developing world, and reducing the vulnerabilities of the West to the demands of developing countries. To achieve this, the **following three problems** must be solved.

1) The **utility-scale storage** problem must be solved. At this point, the products on the market are too expensive to profitably store energy and produce it later. This is the result of inappropriately applied subsidies.

2) **Installation** of solar and other renewables **must be made cheaper**. This is a relatively straightforward task, but few have attempted it because U.S. government subsidies pay out more for more expensive systems.

3) A national "**deregulation" of the energy grid must happen** similar to the deregulation of telecom, airlines, and banking industries that led to widespread entrepreneurial activity. With a focus on "value to producers" and the ability to connect easily (i.e. with the proper protocols, a la the internet's TCP/IP), renewable energy could allow thousands or millions to benefit by connecting smaller energy sources to the power grid. One of the keys to a more complete deregulation will be the ability for private parties to build, own, lease, provide maintenance and connect to power lines, where they are needed and where such lines can be profitably operated. This strategy in telecom has been wildly successful, pushing technology, speed, capacity, availability and reliability to unforeseen levels. If properly implemented this will become a model for the rest of the world, including the developing world. Together with items 1) and 2), "acceptable returns" are within reach.

The subsidies for renewable energy must be **managed correctly**, not just supporting continued expensive construction, but retargeted to encourage cheaper and better products. The resulting market MUST be independent of government support – else it can never be exported.

These are the key policy changes that must be made, not only to build better and faster within the U.S. but also to export to the developing world where, if these policy recommendations are followed**, renewable energy will be the cheapest and fastest source of energy**. Otherwise, coal will be the default – and our predictions of record coal use will come true.

Prepare for a bifurcated energy market. Attempt to pull countries from the BRICs agreements into Western market participation, **especially India**, as it will have a foot in each marketing and may become a conduit into this market. It is in the interests of the U.S. to have the world utilize the petrodollar, but don't be surprised or overly worried when it is banned in the market – the ruble and the yuan will eventually prove unsatisfactory. **Prepare strategies to extract**, rescue, cajole or persuade members of the Russia-China markets as this will quickly become authoritarian and exploitive. And above all, as we mentioned above, keep the U.S. in a state of energy abundance. If the U.S. is dependent on the energy production of our foes or false allies, then we have zero leverage, and indeed are vulnerable. **Where the U.S fails to lead, our competitors, Russia and China will quickly fill the vacuum** and our stature in the world will decrease accordingly.

Clean up the analysis market that is making rosy predictions for decreasing coal consumption and unrealistic renewable energy build-outs. While this may be palatable politically, as renewable energy transitions to a profitable (without subsidies) market status, distortions in predictive data will **hamper the industry professionals and market makers**, and affect the sorely needed condition of "acceptable returns." The money on the sidelines for renewable energy is staggering, and **only uncertainty** can keep it there in a profitable industry.

8 Conclusion

As this paper reveals, the complex energy challenges ahead rarely have simple solutions. Trade-offs are unavoidable as we balance priorities like development, sustainability, affordability, and security. (28)

Near-term realism is vital - embracing constraints and opportunities as they exist presently, not as we wish them to be. (29) Policy visions must align with technical and commercial viability with an extreme awareness of the geopolitical realm that cares more for power and profit than it does for energy security for the people of the world.

Citizens gain a well-rounded perspective on energy trade-offs to elevate public discourse6. Investors see where capital is most urgently needed to catalyze solutions. (30) Leaders understand critical leverage points to enshrine in policy and diplomacy. (31) Innovators grasp real-world needs to guide creativity. (32)

The Financial Policy Council, led by Chairman Ziad Abdelnour, is committed to nonpartisan solutions. (33) This paper aims to contribute balanced insights to the energy transition dialogue. We hope these perspectives inform strategies and policies that embrace constraint, incentivize innovation, acknowledge interconnectedness, and summon our highest civic values. (34)

The stakes could not be higher as energy risks impact every human life. But the prospects for progress through principled pragmatism are greater than we often assume12. With clarity of thought, empathy, and bold vision, a brighter energy future awaits.

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