SAILINGSTONE

YEAR END 2023 COMMENTARY

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COMMENTARY

"The things best to know are first principles and causes, but these are perhaps the most difficult…to grasp, for they are the farthest removed from the senses." - Aristotle

Swapping Eeyore (3Q23 letter) with Aristotle isn't easy, especially since we have far more in common with the former than the latter. However, the Energy Transition is extraordinarily complex and capital-intensive, and the implications of recent regulatory and capital allocations decisions are manifesting themselves in real-time. We need a simple, testable framework to understand the path forward.

One of the benefits of being sector agnostic is that we aren't beholden to a predefined set of expected or acceptable results. Instead, we rely on basic economic, engineering, and mathematical analysis to determine a range of possible future outcomes.

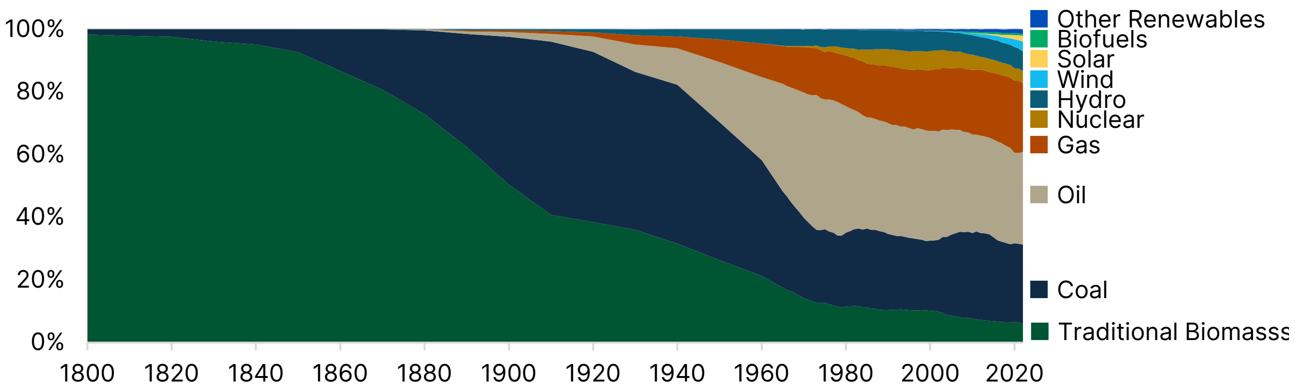
This approach is useful when attempting to disaggregate the Energy Transition into analytically manageable components. Few topics are as intertwined, nuanced, and prone to circular references as the push to decarbonize global energy systems. Adding to the complexity is the fact that discussions about climate change have become so fraught with emotion - they are so close to "the senses" - that attempts to balance benefit with cost or to differentiate between what can be done today with what may or may not be scalable and economic in the future often are met with a mixture of curiosity and animosity.

Investors don't have the luxury of emotion, however. Allocating capital both to generate a reasonable return and to facilitate efforts to expand and decarbonize global energy supplies is far from straightforward. Out of necessity, we revert to first principles to understand what the future may hold and to identify investment opportunities and risks within.

"Those who assume hypotheses as first principles of their speculations…may indeed form an ingenious romance, but a romance it will be." – Roger Cotes

It is important to recognize that the world's energy systems have always been in transition.

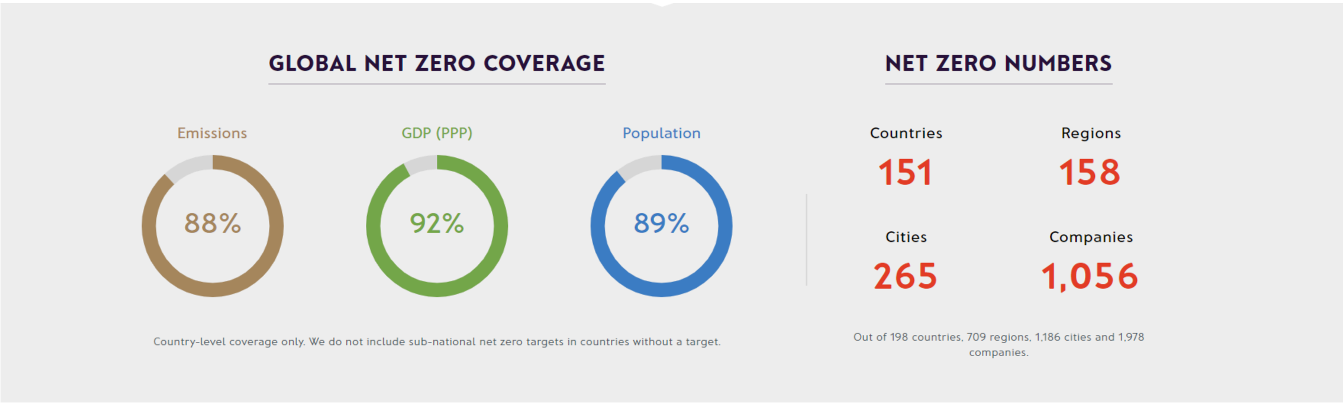
Figure 1: Global Primary Energy Consumption by Source (1800 - 2023)



Source: SailingStone Capital Partners; Our World in Data; Energy Institute – Statistical Review of World Energy (2023); Smil (2017)

What is unique about the current environment is that incremental capacity additions at least in part are a function of regulatory mandates as opposed to being driven by economics and physics. However, there appears to be broad-based support for achieving net zero in the decades ahead.

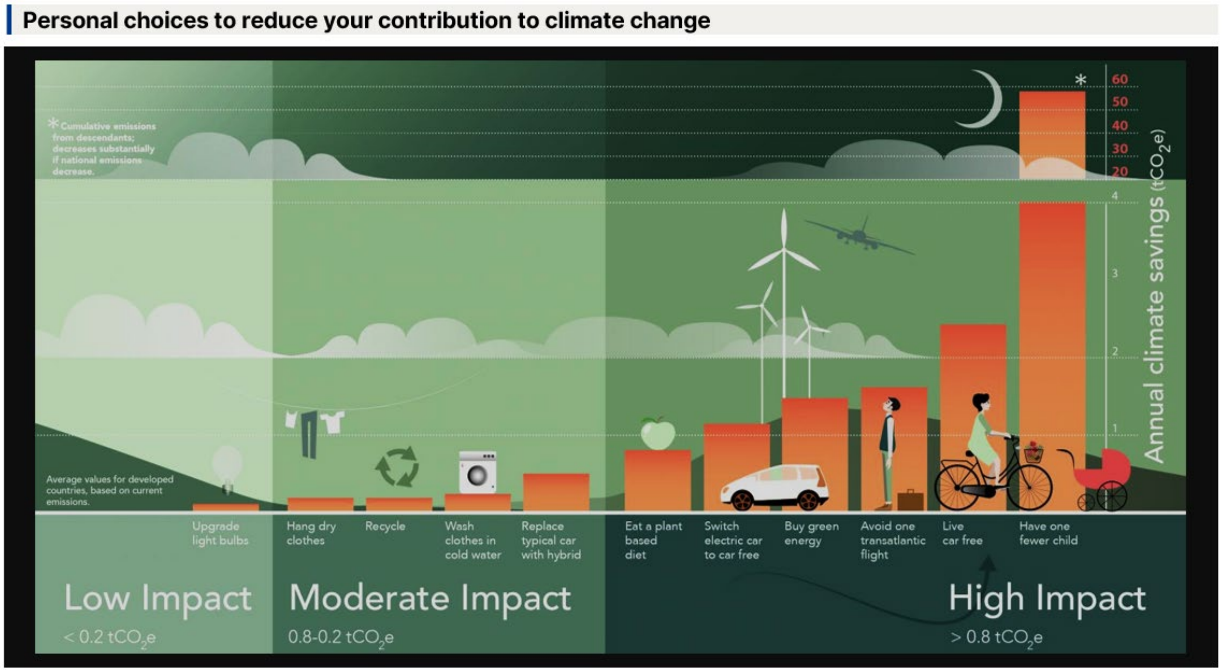
Figure 2: Global Commitment to Net Zero



Source: New Climate Institute: Net Zero Tracker, February 2024

Of course, to some extent government intervention is necessary since at the individual level, reducing one's carbon footprint requires choices that most find unpalatable.

Figure 3: If You Were Trying to Get to Net Zero…



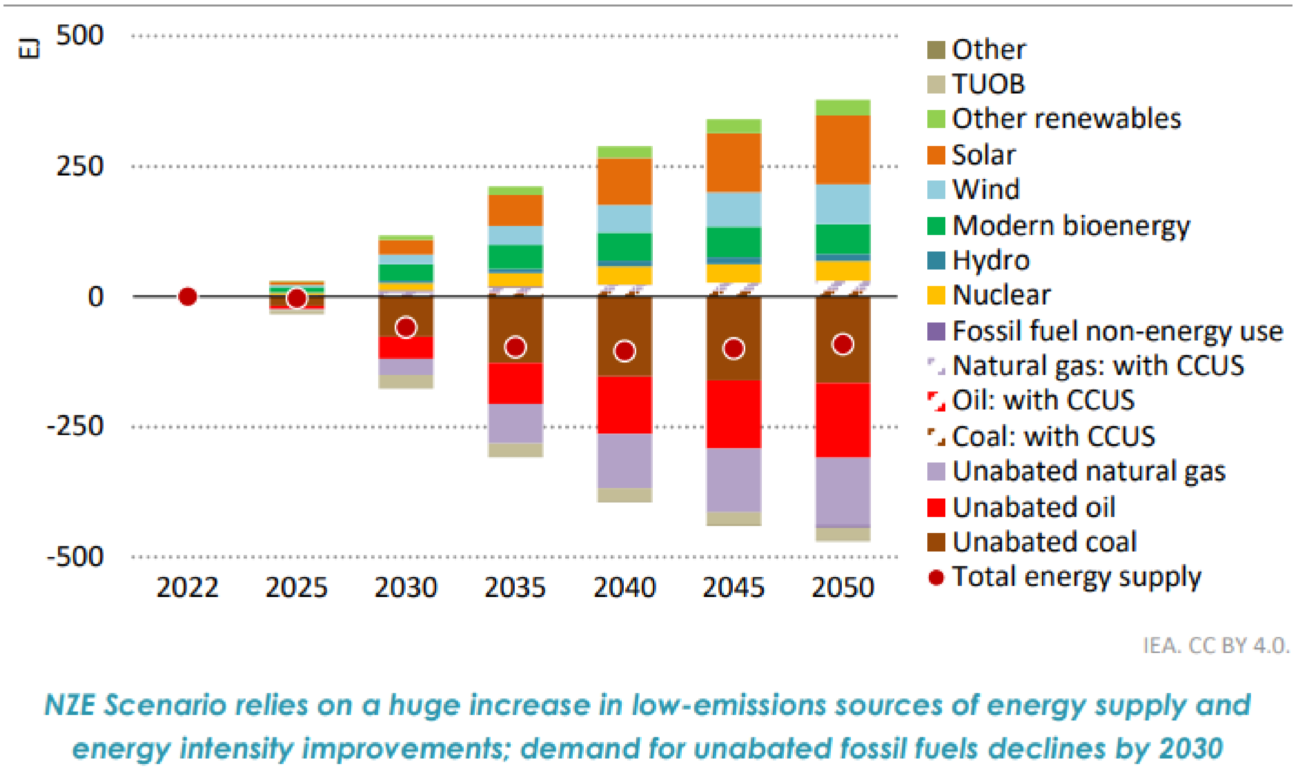
Source: https://phys.org/news/2017-07-effective-individual-tackle-climate-discussed.html

At the conceptual level, attaining net zero should be easy – simply replace hydrocarbons with renewables. However, initial claims about the ease with which a developed country like the U.S. could create a "low-cost" zero carbon future have been dismantled by the scientific community. A peer review of Stanford Professor Mark Jacobson's 2015 report arguing for the U.S. to rely exclusively on wind, water and solar determined:

> ...the work used invalid modeling tools, contained modeling errors, and made implausible and inadequately supported conclusions. Policymakers should treat with caution any visions of a rapid, reliable, and low-cost transition to entire energy systems that relies almost exclusively on wind, solar, and hydroelectric power.[1]

However, current forecasts clearly ignore that conclusion, as evidenced by the IEA 2023 Net Zero Roadmap.

Figure 4: IEA 2023 Net Zero Roadmap

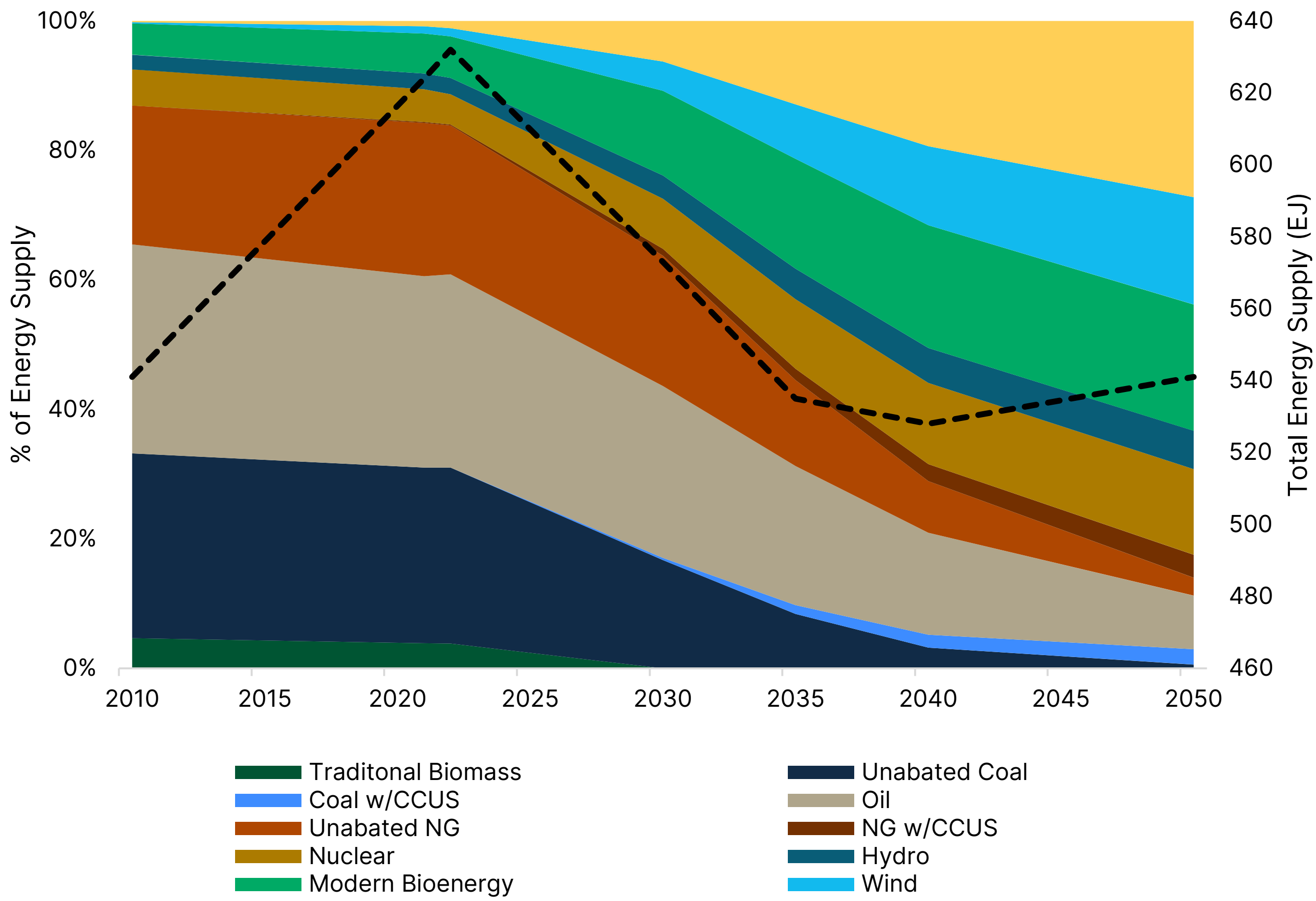


Source: IEA, Net Zero Roadmap, 2023 Update

The resulting supply stack is not too dissimilar from the Jacobson forecast, with the addition of nuclear to the energy mix.

[1] Jacobson et al, https://s3.documentcloud.org/documents/4247250/JACOBSON-Original-Article.pdf
Clark et al, https://s3.documentcloud.org/documents/4247257/Clack-Critique-Clean.pdf

Figure 5: IEA 2023 Net Zero Roadmap & Total Primary Energy



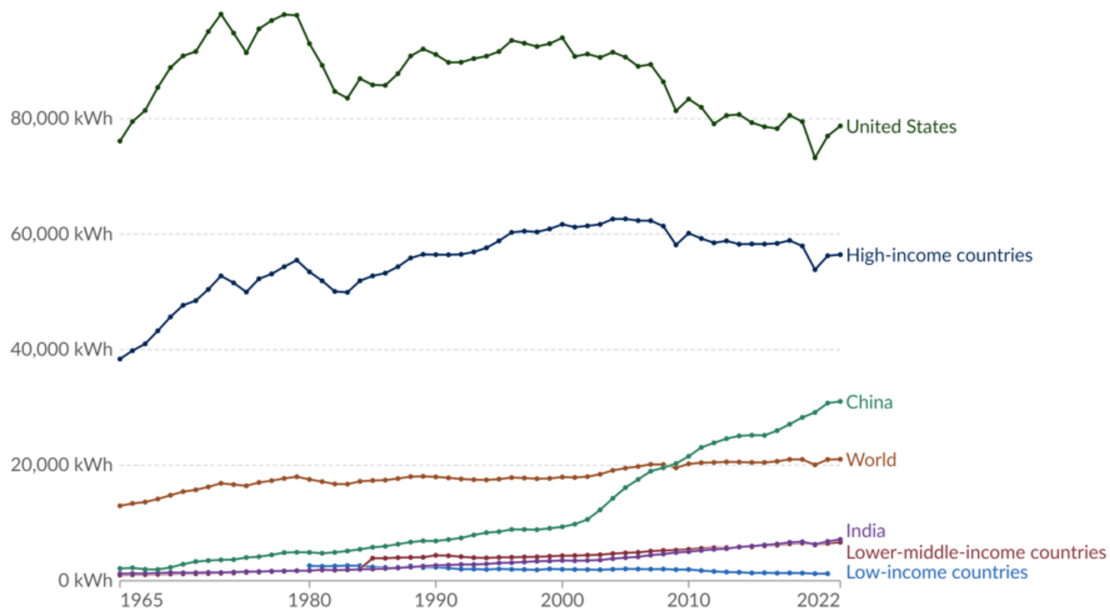
Source: SailingStone Capital Partners; IEA, Net Zero Roadmap, 2023 Update

Of note, the IEA tells us that to achieve net zero by 2050 not only must the world's primary energy supply be 80+% renewable, but global energy consumption will need to fall by almost 15% as well. The first step to understanding if the conventional view of the path to net zero is achievable is to determine if those assumptions are realistic.

"The first principle is that you must not fool yourself and you are the easiest person to fool." – Richard Feynman

There has been a lot of discussion about "decoupling" in the West, reflecting the observation that certain developed economies have continued to experience economic and to a lesser extent population growth while at the same time lowering energy intensity on a per $ GDP and per capita basis. This conclusion is consistent with the data, where high-income countries have exhibited a slow decline in per capita energy consumption since the mid-2000s.

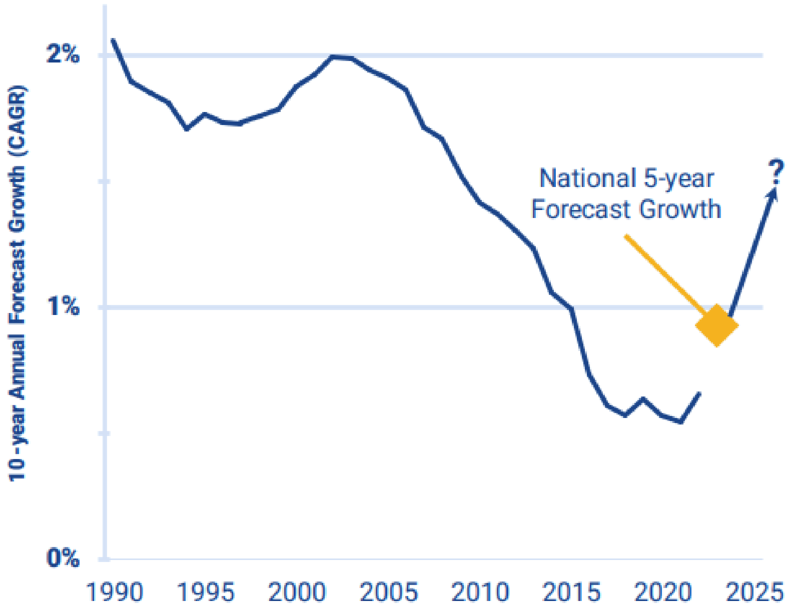
Figure 6: Per Capita Energy Consumption (kWh/Person)



Source: Hannah Ritchie, Pablo Rosado and Max Roser (2020) - "Energy Production and Consumption" (Published online at OurWorldInData.org)

There are two issues with the decoupling thesis. Domestically, the explosion of AI and crypto mining coupled with the reindustrialization of the U.S. economy is forcing utilities and regulators to address the prospect of a sudden, sharp ***increase*** in electricity demand.

Figure 7: NERC 10-Year Load Growth Forecast



Source: Grid Strategies, The Era of Flat Power Demand is Over, December 2023

Notably, most of the load growth is not coming from electrification or other direct drivers of decarbonization, but rather from new technologies and industrial demand.

Figure 8: 2023 Drivers of Load Growth

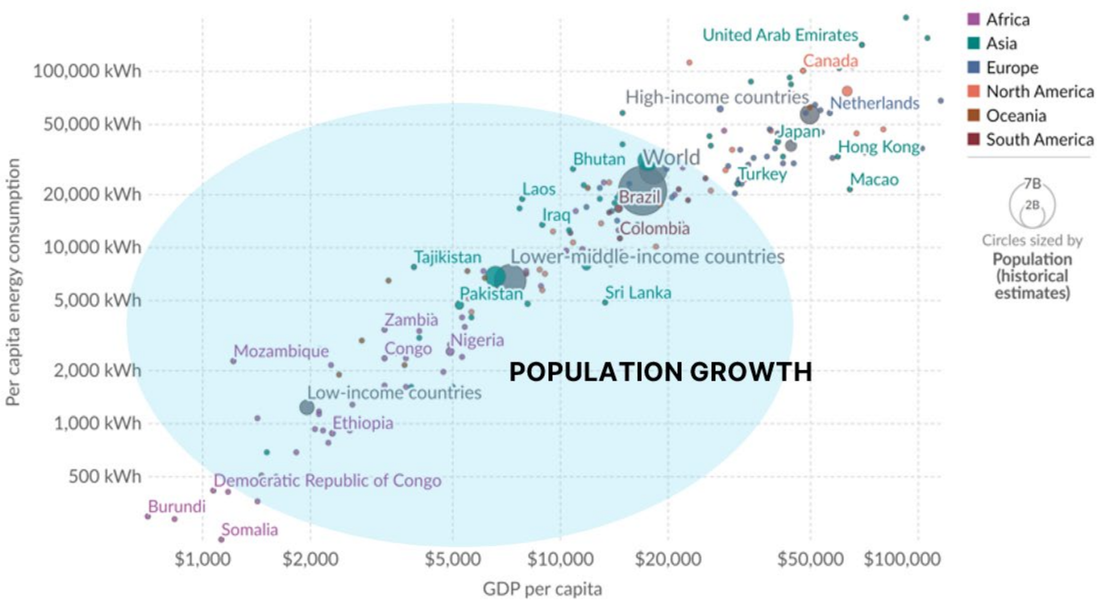
	Data Centers	Industrial Facilities	Hydrogen Plants	Electrification
ERCOT	●	●		
PJM	●			
Duke Energy	●	●		
Georgia Power	●	●		
NYISO	●	●	●	●
Arizona Public Service	●	●		
CAISO				●
Portland General Electric	●	●		

Source: Ibid

In 2023, forecasts for cumulative U.S. electricity growth over the next five years almost doubled from 2.6% to 4.7%, and subsequently several major utilities have further increased their demand expectations. The 2023 figure, which will be revised higher, represents about 40GW of new electricity demand by 2028, equivalent to 40 new utility-scale nuclear power plants or an area about half the size of Rhode Island if addressed with utility scale solar. In the short-term, at least, recoupling seems more likely than decoupling.

The second and more pervasive issue is that economic prosperity is highly correlated with energy consumption.

Figure 9: Energy Use per Person vs. GDP per capita, 2021



Source: U.S. Energy Information Administration (2023), published on OurWorldInData.org.

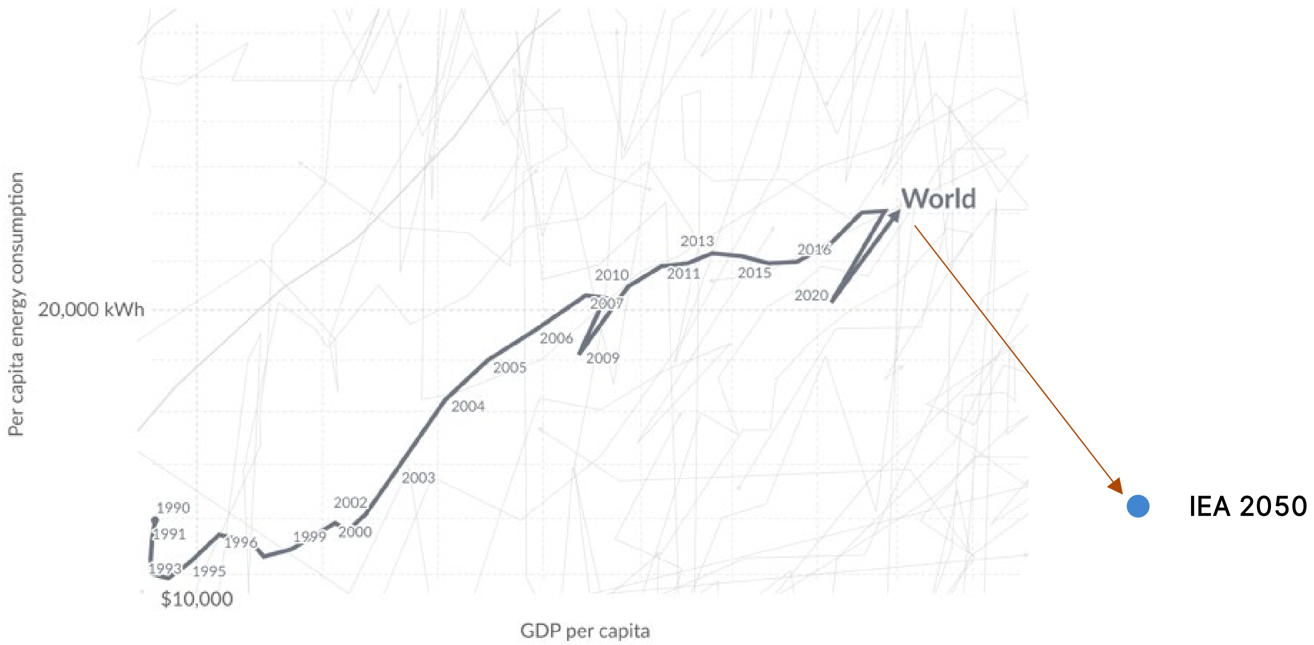
According to the IMF, the less developed countries of Africa, Asia, and Latin America comprise about 80% of the world's population but represent "virtually all" of global growth over the next three decades.[1] It seems implausible that four out of every five global citizens will accept lower standards of living to accommodate the desires of the fifth, yet that is what is embedded in the IEA forecasts.

While the IEA appears to acknowledge that a 30-year recession or a sudden drop in population (good luck regulating that!) can't be necessary conditions to achieve net zero, a substantial reduction in energy consumption explicitly is part of the plan. In their 2023 *Net Zero Roadmap*, the IEA assumes the following:

	2022	2050	% Change
Population (mm people)	7,950	9,681	22%
World GDP (USD trillion, 2022 PPP)	164	339	107%
Primary Energy Supply (EJ)	632	541	-14%

In other words, the IEA suggests that per capita GDP will grow by about 70% while per capita energy consumption will fall by more than 30%. Here's how that forecast looks relative to the last 30 years of history.

Figure 10: Energy Use per Person vs. GDP per Capita, 1990 to 2021



Source: U.S. Energy Information Administration (2023), published on OurWorldInData.org.

[1] https://www.imf.org/en/Publications/fandd/issues/2020/03/changing-demographics-and-economic-growth-bloom

While a decline in per capita energy consumption might be required for the model to balance, it presupposes a reality that simply doesn't exist. In fact, it runs in direct opposition to Maslow's hierarchy of needs, a conclusion that is manifesting itself in real time all around us.

Figure 11: Maslow's Hierarchy of Needs

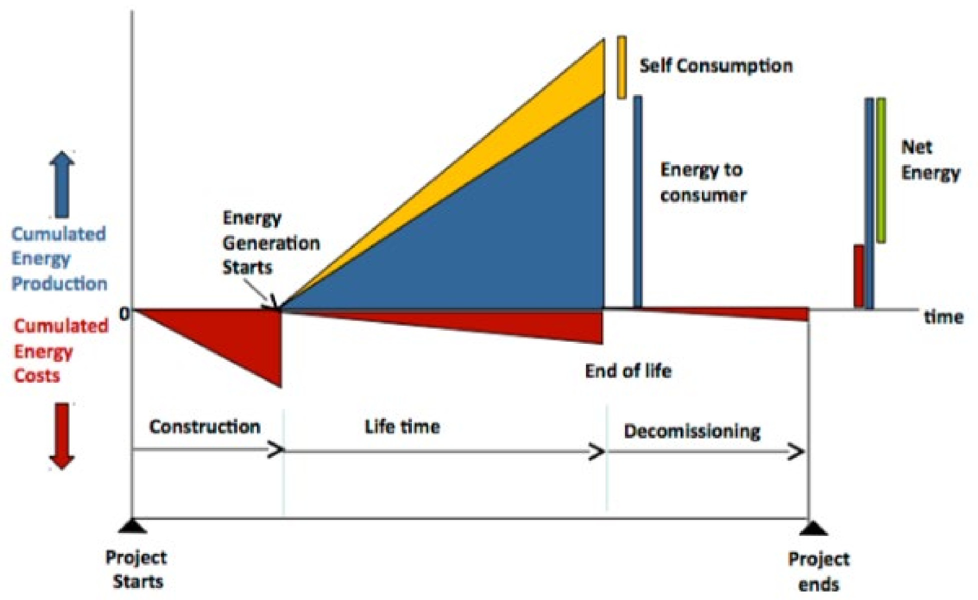
Source: Saul Mcleod, Ph.D., Maslow's Hierarchy of Needs, published on Simply Psychology, updated 2024

While a credible argument can be made that ***not*** addressing climate change will result in the erosion of the pyramid's base, that is a concern that can and is being put aside to address the immediacy of energy security in the developed and the developing world alike. Witness the build-out of Chinese coal-fired capacity, German natural gas and coal consumption, African LNG imports…the list goes on and on.

Absent a prolonged global recession and a cataclysmic population decline, it seems highly improbable that global energy consumption suddenly will begin to fall. ***Critically, that doesn't mean that net zero is not achievable or worth pursuing. It does mean that energy demand will continue to increase. Forecasts that suggest otherwise should be viewed with a significant degree of skepticism.***

The second concept to consider in the context of decarbonization and future energy demand is Energy Return on Energy Invested or "EROEI." Essentially, EROEI measures how much net or consumable energy a specific energy source produces – an indication of efficiency.

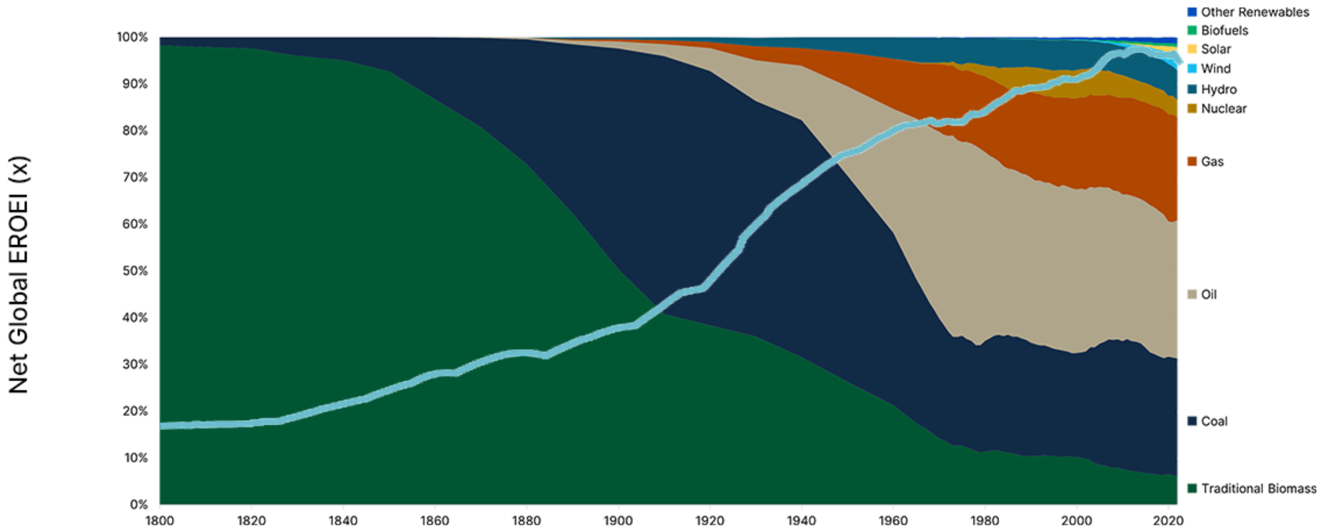
Figure 12: EROEI – Energy Return on Energy Invested



Source: Prieto and Hall; Euan Mearns, [EROEI for Beginners](), 2016

Net global EROEI has been increasing consistently for most of the last 200+ years, with the proliferation of more dense and efficient energy sources helping to drive improvements in living standards, life expectancy, labor productivity, etc.

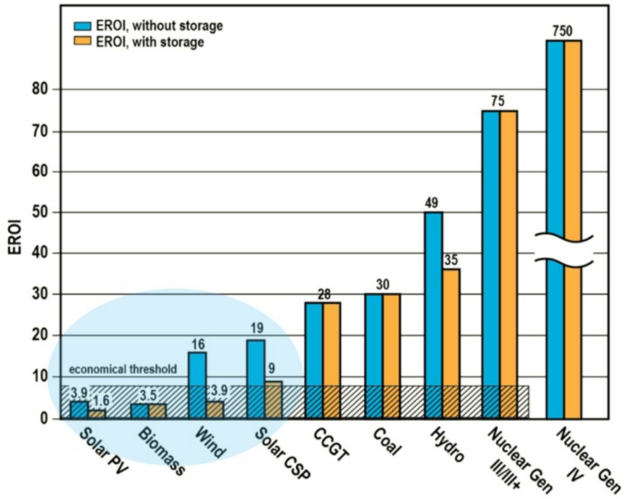
Figure 13: Net Global EROEI Rising for Most of the Last 222 Years



Sources: SailingStone Capital Partners; EROEI: energy return on energy invested?, Thunder Said Energy, March 27, 2023; Our World in Data; Energy Institute – Statistical Review of World Energy (2023); Smil (2017)

Note, however, that over the last 10-15 years, EROEI has started to decline, coinciding with the rapid proliferation of renewables. This makes sense, given the amount of energy required to produce the raw materials for and then construct intermittent, low-capacity factor renewable energy sources.

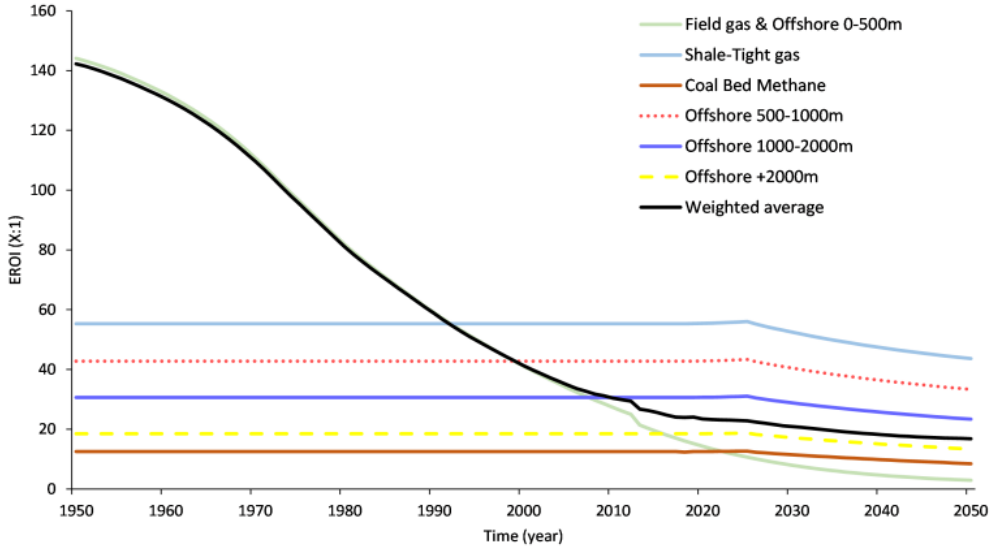
Figure 14: Renewables Have and Will Lower Global EROEI in the Future



Sources: Peter Rudling, Energy Education, "Wind and solar energy are neither renewable nor sustainable" (2021)

And that is before taking into account currently available storage technologies. Of course, renewables aren't the only energy source exhibiting degrading efficiencies. EROEI has been falling for hydrocarbons as well, reflecting the fact that the best, most economic resources typically are consumed first.

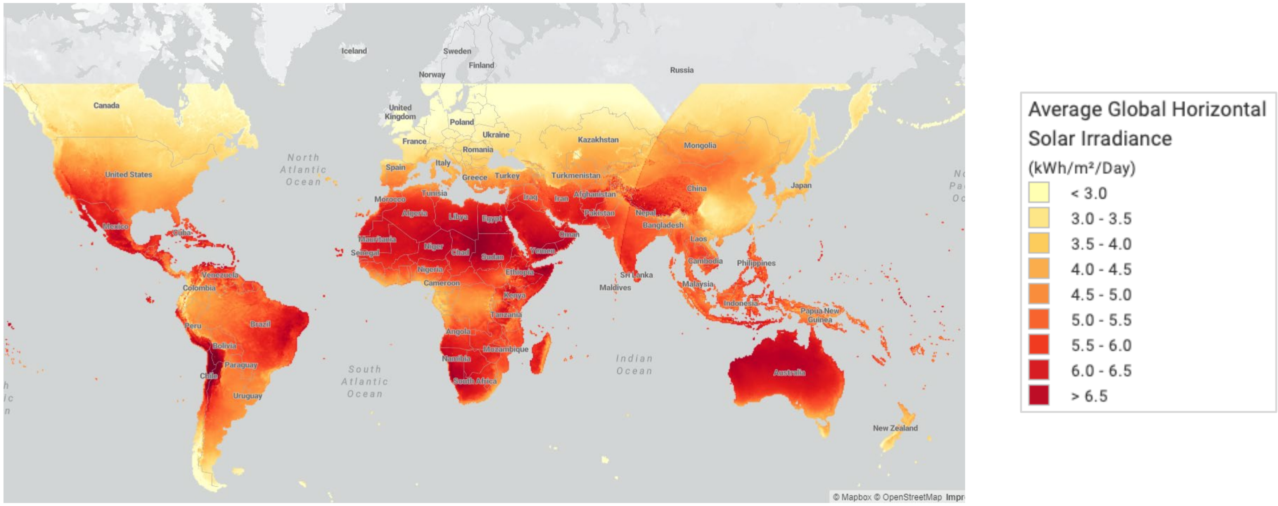
Figure 15: Natural Gas EROEI



Source: Louis Delannoy, Pierre-Yves Longaretti, David Murphy, Emmanuel Prados. Assessing Global Long Term EROI of Gas: A Net-Energy Perspective on the Energy Transition. Energies, 2021, 14 (16), pp.5112. ff10.3390/en14165112ff. ffhal-03322866

In addition to structurally lower EROEI, renewables face the same resource constraints as conventional commodities, although variances in resource quality often are overlooked when modeling a renewable-centric future. For instance, it's clear that solar irradiance is not evenly distributed across the world. High quality solar locations are finite.

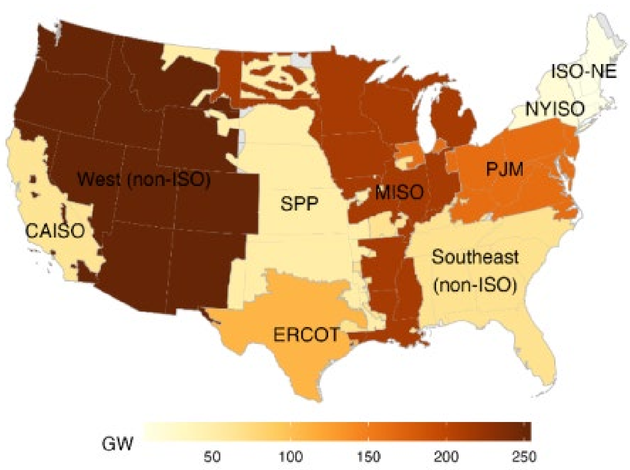
Figure 16: Average Global Horizontal Solar Irradiance



Source: National Renewable Energy Laboratory (NREL), NSRDB: National Solar Radiation Database

As solar additions accelerate, invariably incremental capacity will be installed in areas with inferior resources. Based on the interconnection queues, the trend of building capacity in regions with less robust resources will continue.

Figure 17: Total Solar Capacity in Interconnection Queues YE2022

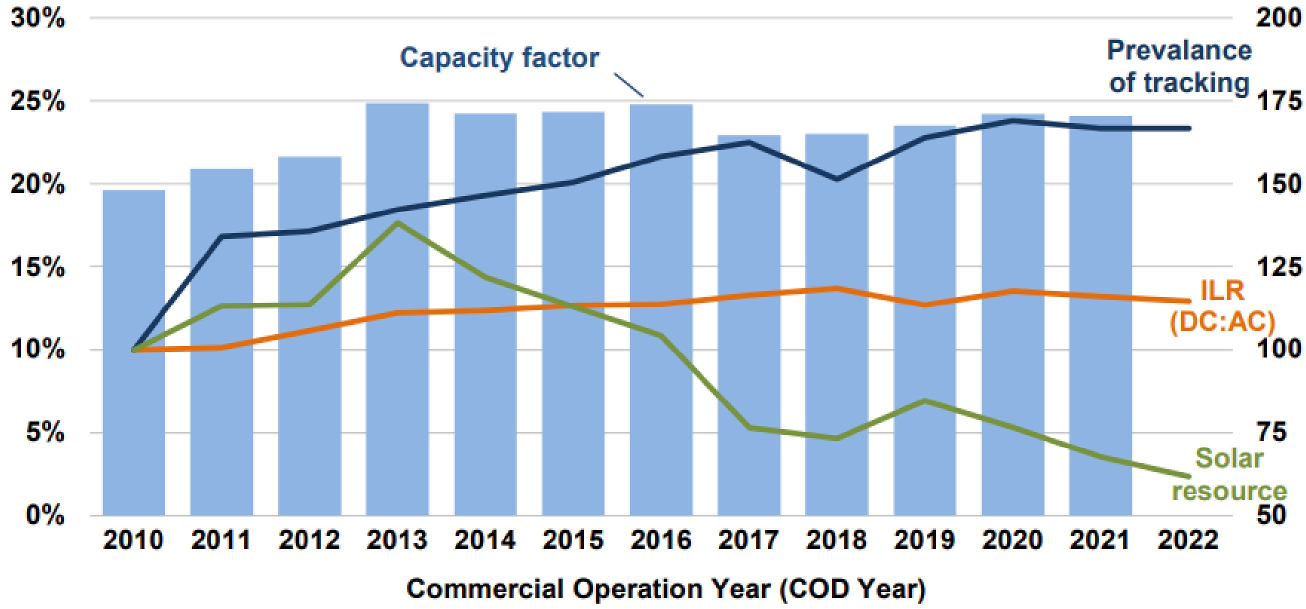


Source: Laurence Berkeley National Laboratory, Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2022

Since the amount of energy that goes into the raw materials and construction of a new site doesn't change, the result of adding capacity in lower quality regions is lower EROEI.

While technology is often viewed as a panacea to these challenges, advances in tracking (the ability of the panels to rotate with the sun) and improvements in inverter loading ratios ("ILR") have been more than offset by degradation in resource quality.

Figure 18: Average Capacity Factor Stagnation



Source: Lawrence Berkeley National Laboratory, Empirical Trends in Deployment, Technology, Cost, Performance, PPA Pricing, and Value in the United States, Utility-Scale Solar, 2023 Edition

The result is a flat to declining capacity factor for most of the past decade. Lower capacity factors mean lower EROEI which in turn translates into more primary energy demand.

In addition, renewable facilities don't always run the way the spreadsheet says they should. Recent analysis from kwH Analytics shows that across more than 200 utility-scale sites around the world, actual performance is skewed well to the left of expected performance as the result of equipment issues, weather-related events, and other incidents that impact availability.

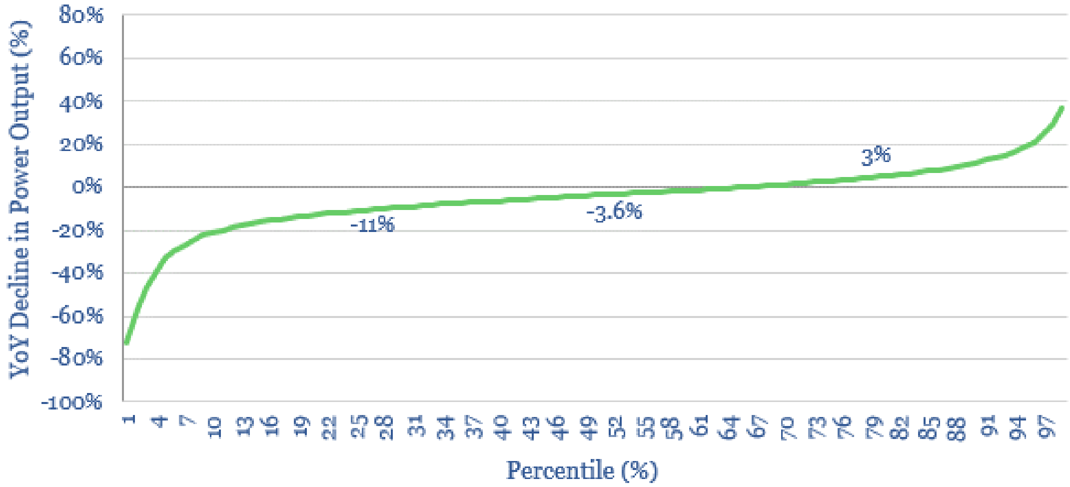
Figure 19: Comparison of Uncertainty Distributions Relative to P50 Estimate

Source: Solar Risk Assessment 2023, kWh Analytics. Upper charts based on data from 200+ utility-scale sites around the world with over 600 years of weather- and curtailment-adjusted production

As a result, hundred-year events are 5-8x more frequent than expected. These interruptions put further downward pressure on capacity factors, which in turn results in lower EROEI, higher overall costs, and higher energy demand relative to plan.

Finally, renewable energy sources exhibit performance degradation, not dissimilar to the decline rates that we see in extractive industries such as mining or oil and gas. While most models assume 0.5-0.7% annual decreases, the actual data is much more challenging. The following chart, produced by Thunder Said Energy, looks at the performance of more than 1,400 wind farms in the U.S. over the last 20 years.

Figure 20: Wind Farm YoY Decline in Power Output



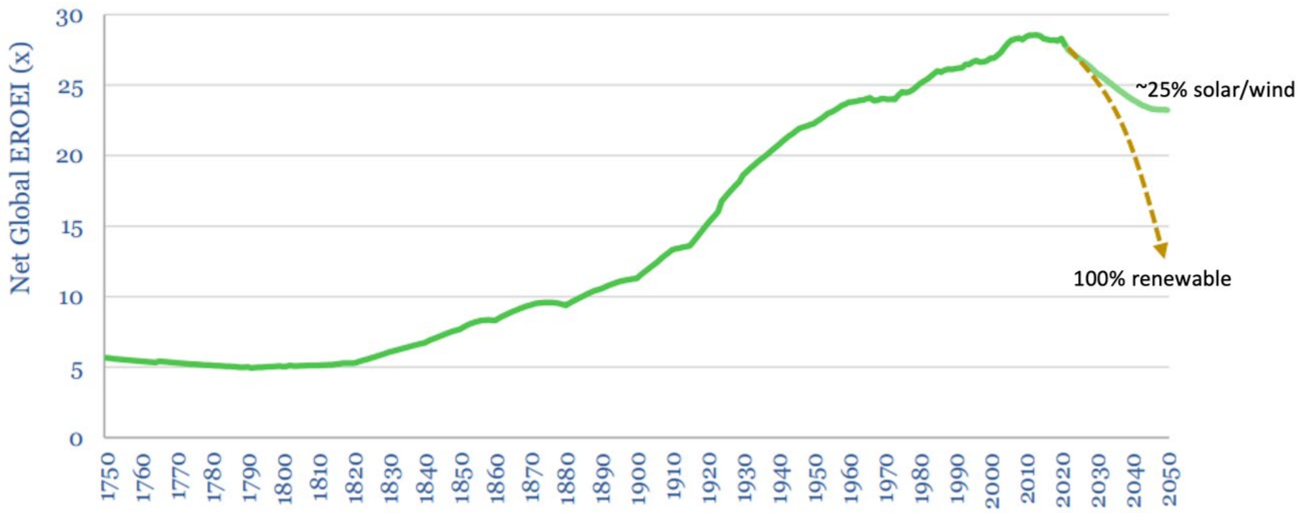
Source: Thunder Said Energy, Wind power: decline rates?

This data suggests that the average annual decline rate is closer to -3.5%, which if true has significant implications for both economics, the EROEI of incremental wind (or solar) installations, and the probability that we can achieve net zero relying solely on renewables.

According to the IEA, onshore wind capacity additions hit 107 GW in 2023, an all-time record. In 2022, wind produced about 2,200 TWH of useful energy, meaning with -3.5% annual performance degradation, 30% of 2023 record capacity additions were consumed to offset declines. Absent a willingness to add other energy sources to the mix, higher performance degradation means more renewables, lower EROEI, more investment, and more primary energy demand.

EROEI will fall going forward. The question is how much energy can the world afford to invest in new sources of energy?

Figure 21: How Much Energy Can We Invest in New Energy?



Sources: EROEI: energy return on energy invested?, Thunder Said Energy, March 27, 2023

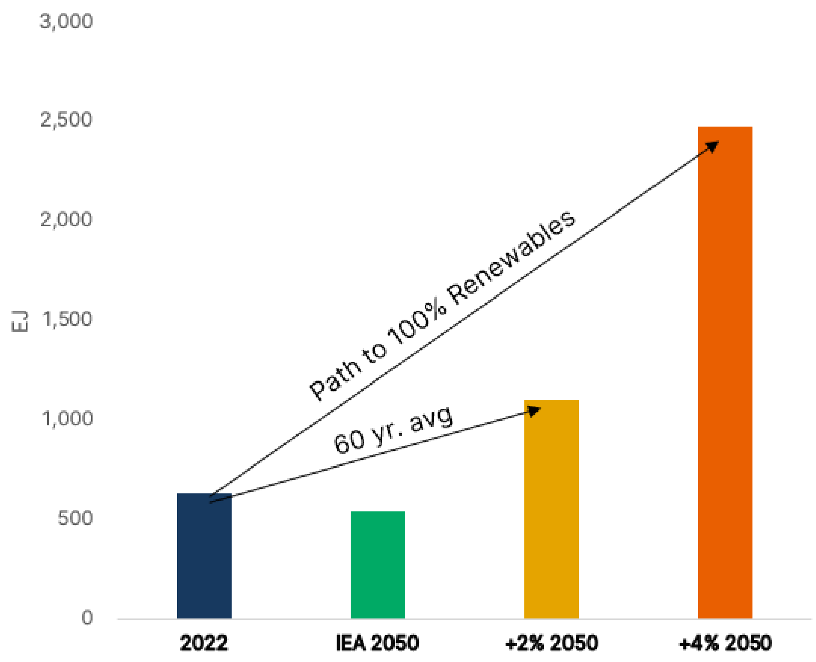
Meeting the energy needs of a growing global economy and population with less efficient energy sources that don't perform the way we want them to only exacerbates the economic/demographic dynamic that we discussed above – ***we are going to need more, not less, primary energy***, especially if a growing portion of that primary energy has a low and/or declining EROEI.

It is worth trying to quantify the discussion thus far. A major premise of the consensus path to net zero is that primary energy demand is going to fall by about 15% from 2022 to 2050, a sharp reversal from the last 60 years during which primary energy demand increased by about 2% per annum. For the sake of this simple math, the impact of falling capacity factors and higher than modeled production degradation is being ignored.

- Absent a dramatic improvement in energy efficiency and setting aside the recent acceleration of electricity demand in parts of the developed world, a conservative estimate of the IEA's assumptions related to economic and population growth suggests a **1+% increase in annual energy demand.**

- Increased renewable penetration rates = a reduction in global net EROEI
  - from 28x to 23x (25% renewable penetration) = **1% increase in annual energy demand**
  - from 28x to 13x (100% renewable penetration) = **4% increase in annual energy demand**
- Declining net EROEI of fossil fuels
  - Natural gas declining from 30x to 20x = **0.5% increase in annual energy demand**

Figure 22: Primary Energy Supply Outlook

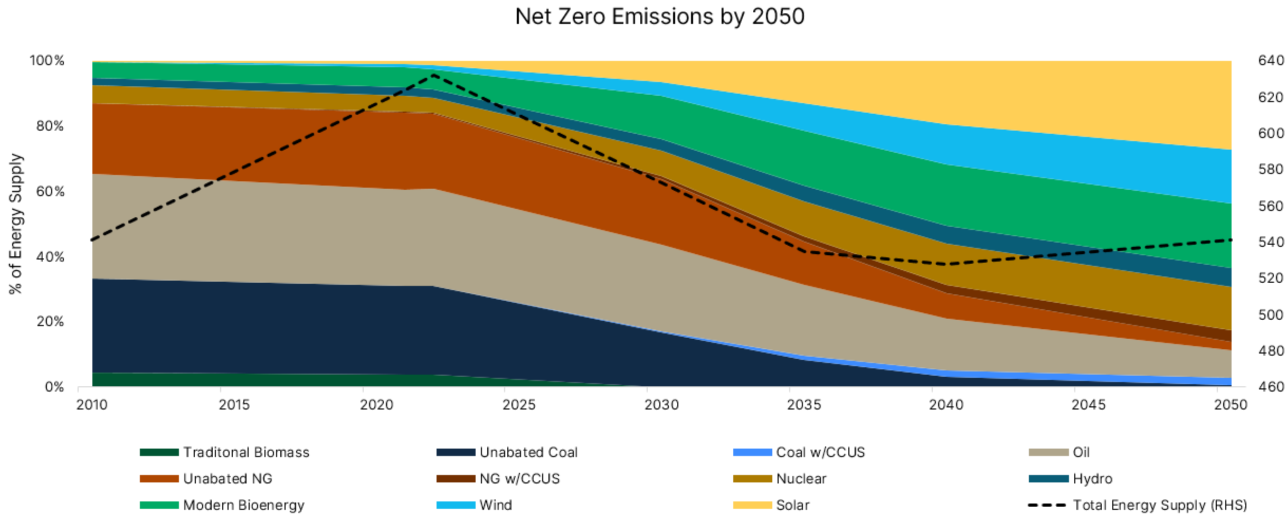


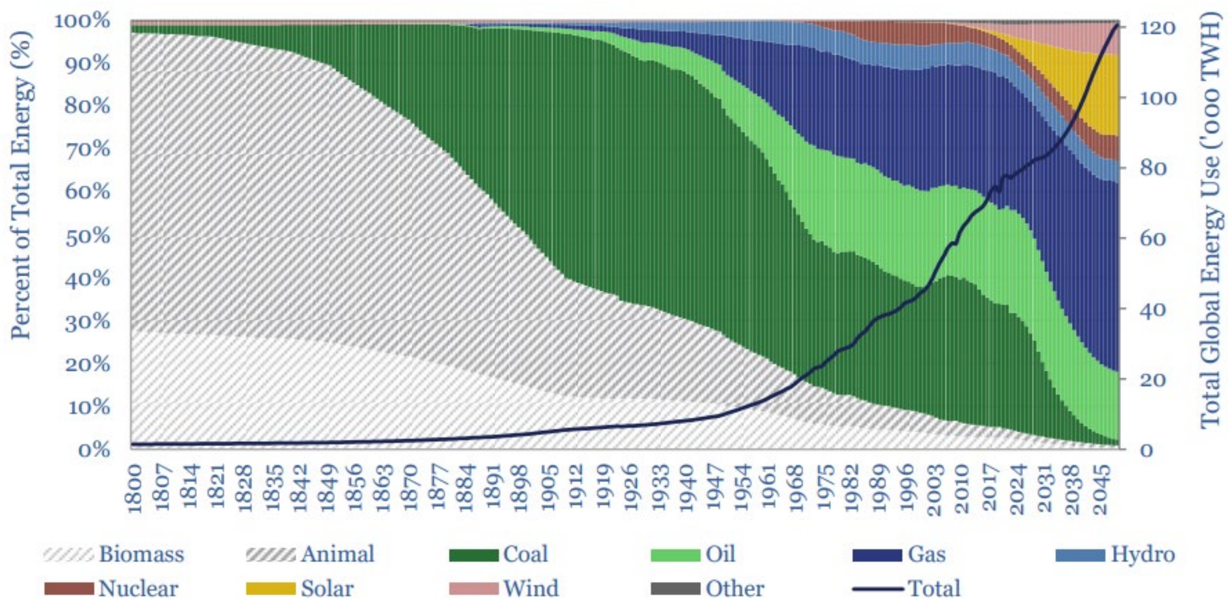
Source: SailingStone Capital Partners

Let's not fool ourselves. The future requires more primary energy, ***especially*** if a fundamental objective is to reduce the global emission profile. And while it would be great if it could all be renewables the arithmetic doesn't add up. ***It is difficult to foresee a credible energy supply stack capable of supporting the economic aspirations of a growing world population that isn't comprised of a mix of sources***, including (increasingly low emission) hydrocarbons. As in nature, diversity is a necessary precondition of a healthy ecosystem.

Below are two forecasts of the future which we contend bookend the range of possible outcomes. One might be more or less desirable, but again, capital allocators aren't afforded the luxury of their "senses." The only question is which is more plausible given the need to balance time, impact, affordability, durability, and demand growth.

Figure 23: **Primary Energy Supply Outlooks: IEA Net Zero 2023 Roadmap vs Thunder Said Energy**



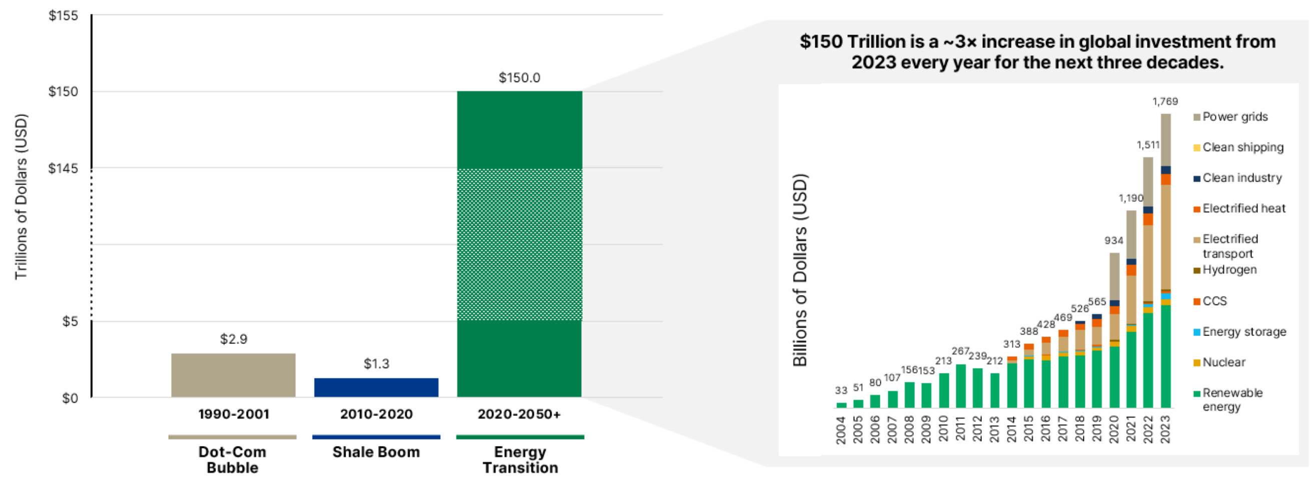


Sources: (Top) SailingStone Capital Partners; https://iea.blob.core.windows.net/assets/9a698da4-4002-4e53-8ef3-631d8971bf84/NetZeroRoadmap_AGlobalPathwaytoKeepthe1.5CGoalinReach-2023Update.pdf (Bottom) Thunder Said Energy, Decarbonizing global energy: the route to net zero?, December 11, 2023

“The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble.” – Ralph Waldo Emerson

More energy requires more capital. While the Energy Transition has attracted a lot of dollars, it is not nearly sufficient to meet a 2050 net zero target.

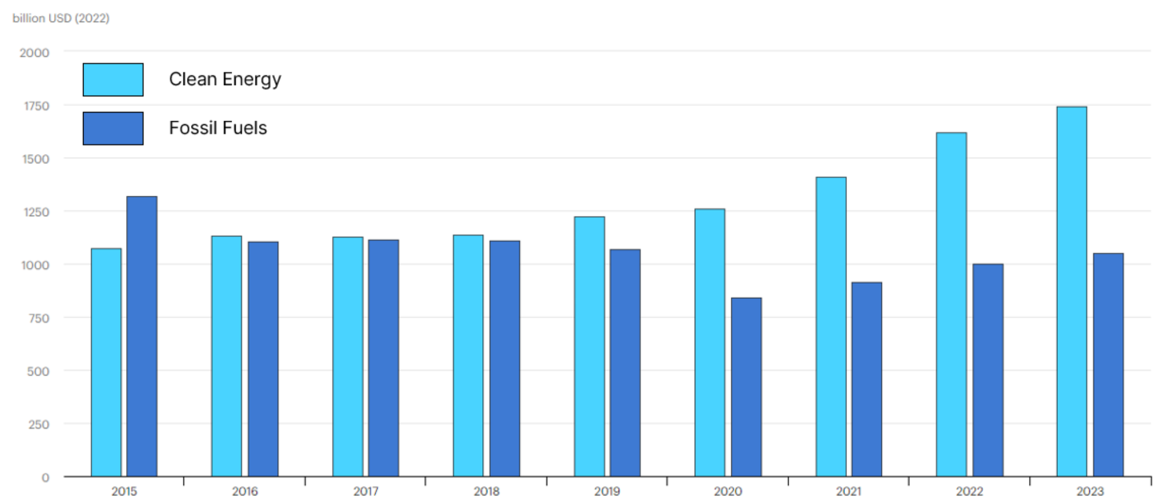
Figure 24: Net Zero Spending In Context



Source: CNNfn and Birinyi Associates, Rystad Energy, and the International Renewable Energy Agency (IRENA), and Bloomberg NEF

Critically, while investment in renewables continues to accelerate, the upstream oil and gas sector remains undercapitalized.

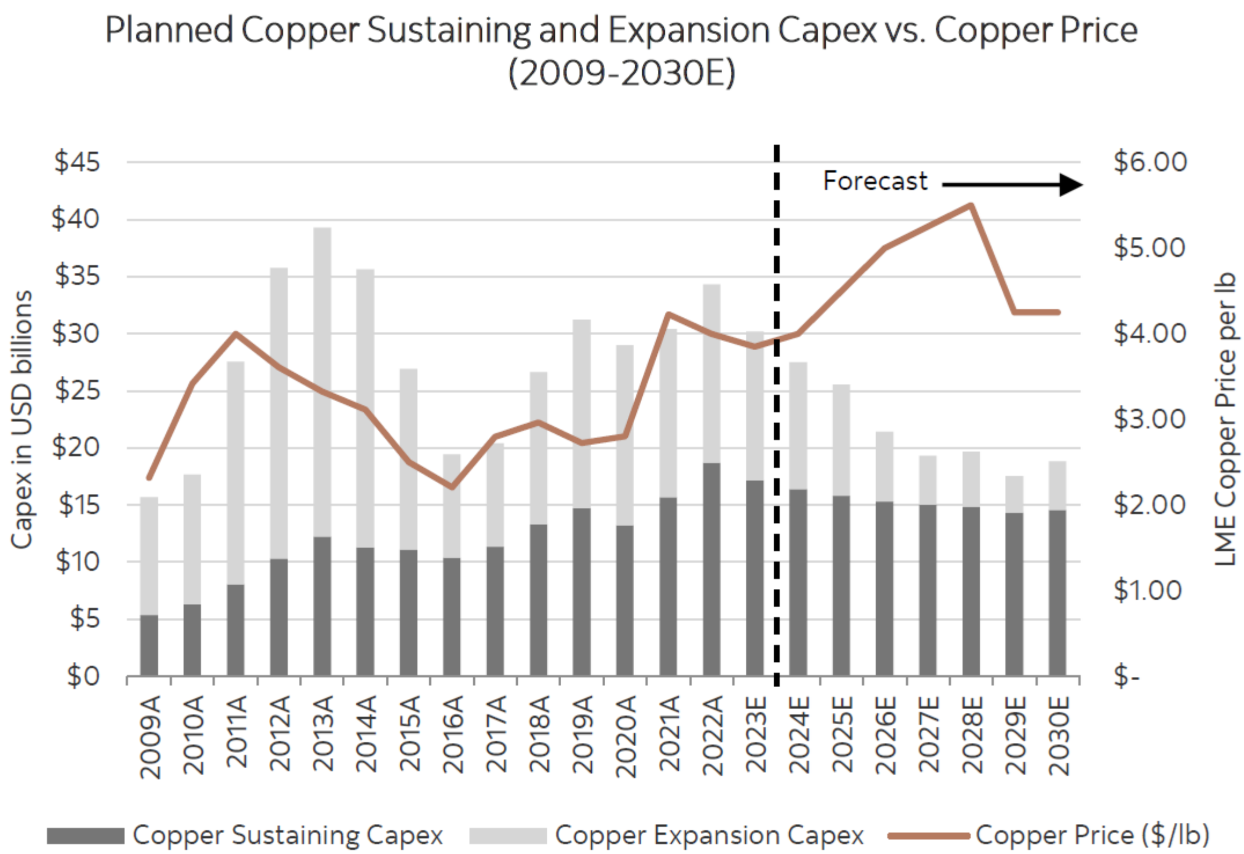
Figure 25: Global Investment in Clean Energy and Fossil Fuels



Source: https://www.iea.org/reports/world-energy-investment-2023/overview-and-key-findings

The same is true in the mining sector. "You reap what you sow" is most apt in capital-intensive, long-cycle undertakings like copper and uranium mining, where a lack of risk capital and development dollars have created the conditions for higher prices and the prospects of supply shortages going forward.

Figure 26: Mining – You Reap What You Sow

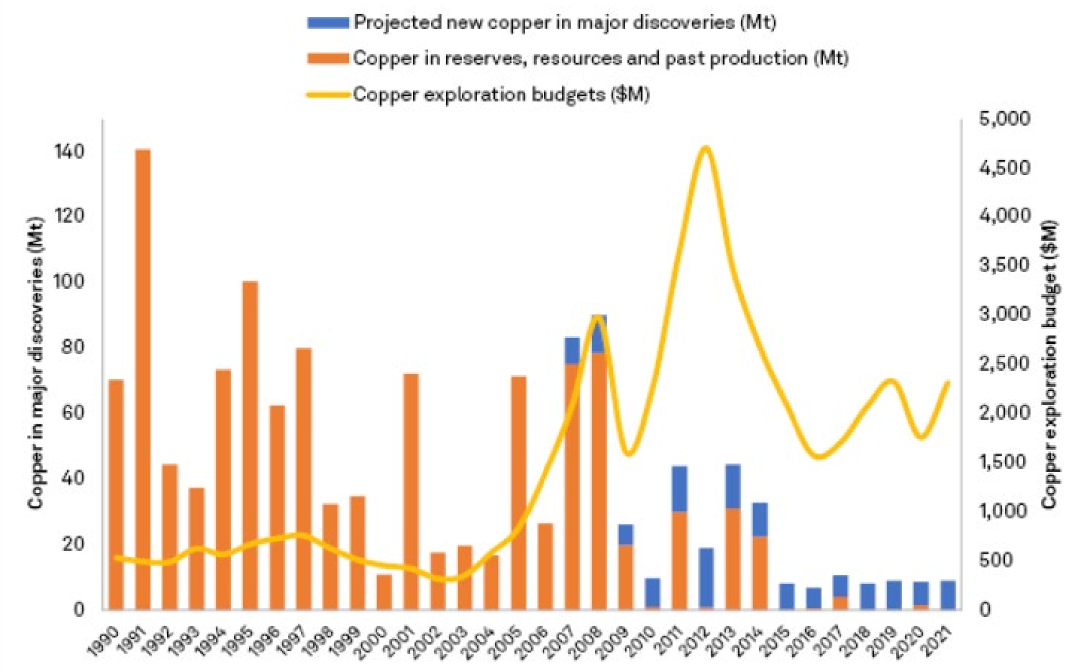


Source: Scotiabank Metals & Mining Research, February 2024

In a similar vein to the discussion above regarding the outlook for energy demand, it's helpful to understand the basic math behind an industry like copper. The global reserve life is about 35 years (total reserves divided by current production), which implies an annual decline rate of about -3% ex-reinvestment. While historically copper demand has grown at about 2.5% per annum, the Energy Transition will require more copper, with current consensus implying something closer to a 4% annual growth rate to meet 2035 demand forecasts. Remember, there is no credible alternative to copper if the goal is to "electrify the world."

Unfortunately, exploration success has been few and far between, particularly of late.

Figure 27: Copper Discoveries – More Money, Less Metal

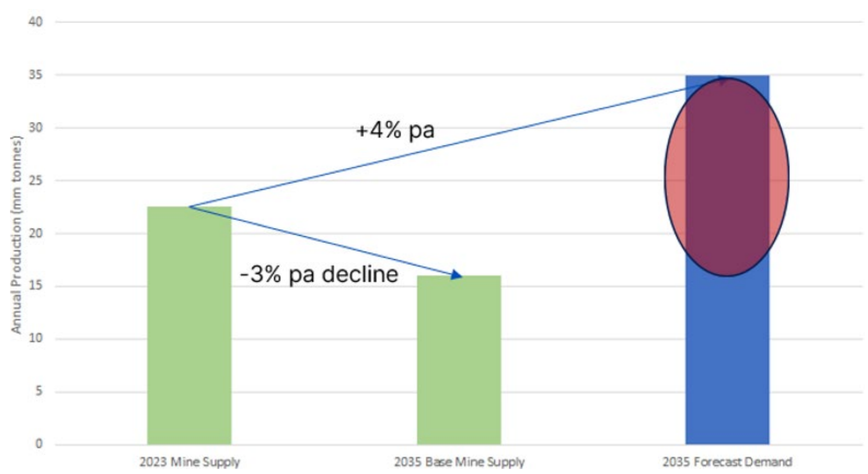


Source: https://www.spglobal.com/marketintelligence/en/news-insights/research/copper-discoveries-declining-trend-continues

Even post discovery, it takes a long time to permit and build a new mine – current industry estimates are in the range of 15 years, although it is possible that changes to the regulatory environment could shorten that window to closer to ten. And finally, capital intensity is high and increasing, with the most recent new major mine, Teck's QB2 coming online at approximately $9bn for 300,000 tons of annual capacity, well above the $20-$25,000/ton range incurred over the last decade or so.

Putting it all together, here is a massively oversimplified snapshot of the industry.

Figure 28: Mining Math - Copper



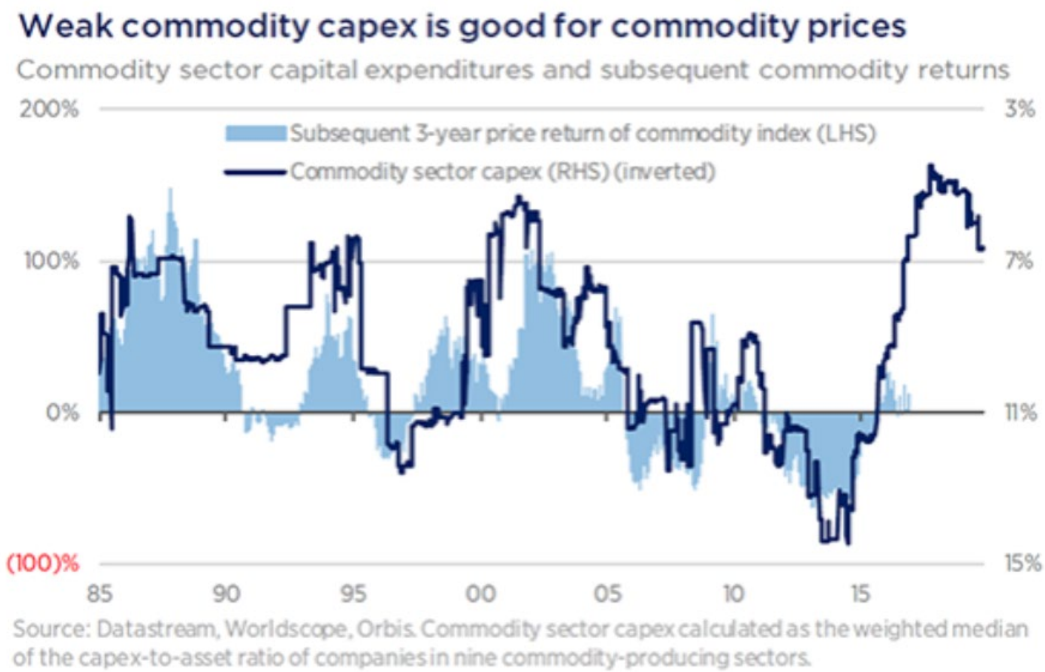
Source: SailingStone Capital Partners

Even without offsetting depletion, the industry requires about 13mmtpa of new supply to be built over the next 11 years to meet estimated 2035 demand. That is 4 QB2s per year every year for a decade. For context, QB2 is a brownfield expansion of QB1, greenlighted in 2018 with an expected in-production date of 2021. Actual commercialization occurred in late 2023. In terms of capital, an additional 13mmtpa of capacity requires at least $350-$450 billion, 2-3x what the industry spent on development in 2023 and closer to 10-15x what is budgeted through the end of the decade, according to Scotiabank.

Including depletion, those numbers rise to an incremental 19mmtpa required by 2035, or about 6 QB2s per year with a similar 50% scaling of capital requirements. Putting aside concerns about whether there will be sufficient copper to meet the demands of the Energy Transition, what does this mean for price?

Intuitively, a lack of investment in capital-intensive industries tends to result in higher prices. This conclusion is borne out by the data.

Figure 29: Underspending Creates Consequences…and Opportunities

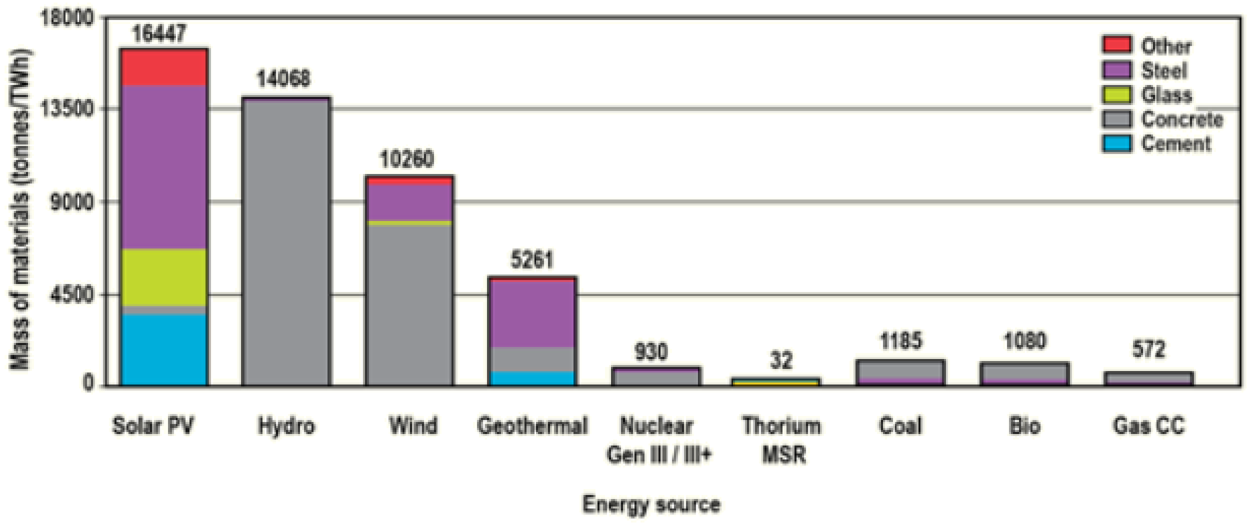


Source: https://twitter.com/wcavinaw/status/1213272297349558272/photo/1

Of course, the inverse is also true, whether from price-driven substitution (cobalt) or from new supply flooding the market during a period of lackluster demand. If forecasts of declining energy consumption are viewed askance, we should be equally leery of perpetual commodity bulls, a lesson nickel and lithium investors have learned the hard way in 2023.

But if energy demand is growing, and renewable installations are growing exponentially, it's worth understanding the resource intensity of those new supply sources. There are a variety of different ways to slice the data, but the chart below is a good representation of the step function change in the material content of renewables relative to more conventional technologies.

Figure 30: Material Intensity of Renewables



Source: https://energyeducation.se/wind-and-solar-energy-are-neither-renewable-nor-sustainable/

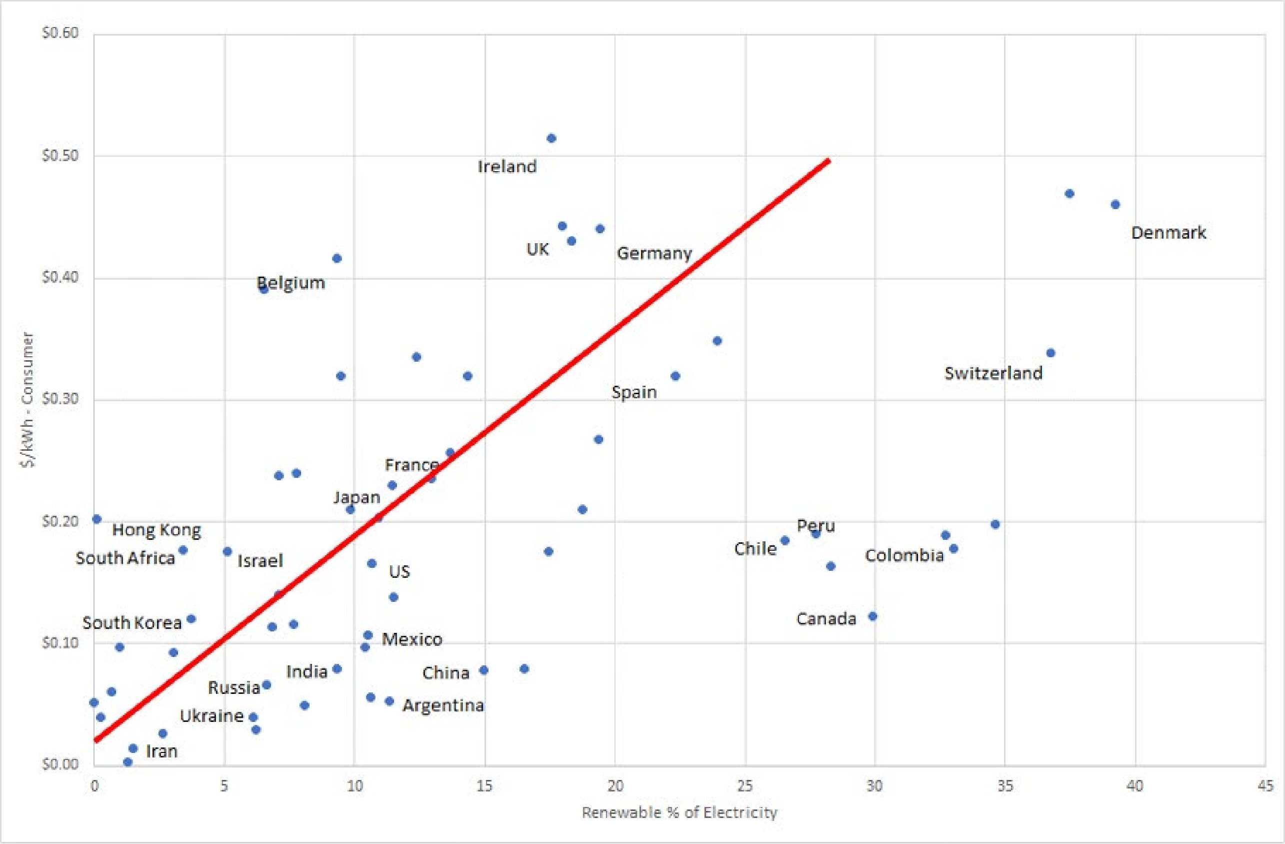
Of course, these estimates can be improved through technology and scaling, but they help explain the lower EROEI of renewables compared to other energy sources. It also raises questions about another core tenet of the Energy Transition – that it will be deflationary.

In theory, installing massive amounts of zero variable cost supply should result in lower prices. Eventually, that promise may be realized, but in the interim (i.e. right now and in the foreseeable future), the opposite is true. Demand for more raw materials likely will require higher prices to incent a supply response or ration consumption. Intermittent capacity requires auxiliary services to meet non-intermittent demand. Declining energy efficiency results in more money being spent on new supply. And the list goes on.

Inflationary pressures related to the Energy Transition already are evident. In fact, contrary to claims that "the faster the world deploys renewables, the more money we will save on energy costs," there is a direct and linear correlation between renewable penetration rates and retail power prices for those regions that are not blessed with the immense hydro-electric resources found in parts of Africa, South America, and Canada.[1]

[1] Rocky Mountain Institution, February 16, 2022

Figure 31: Renewable Penetration Rates and Electricity Prices



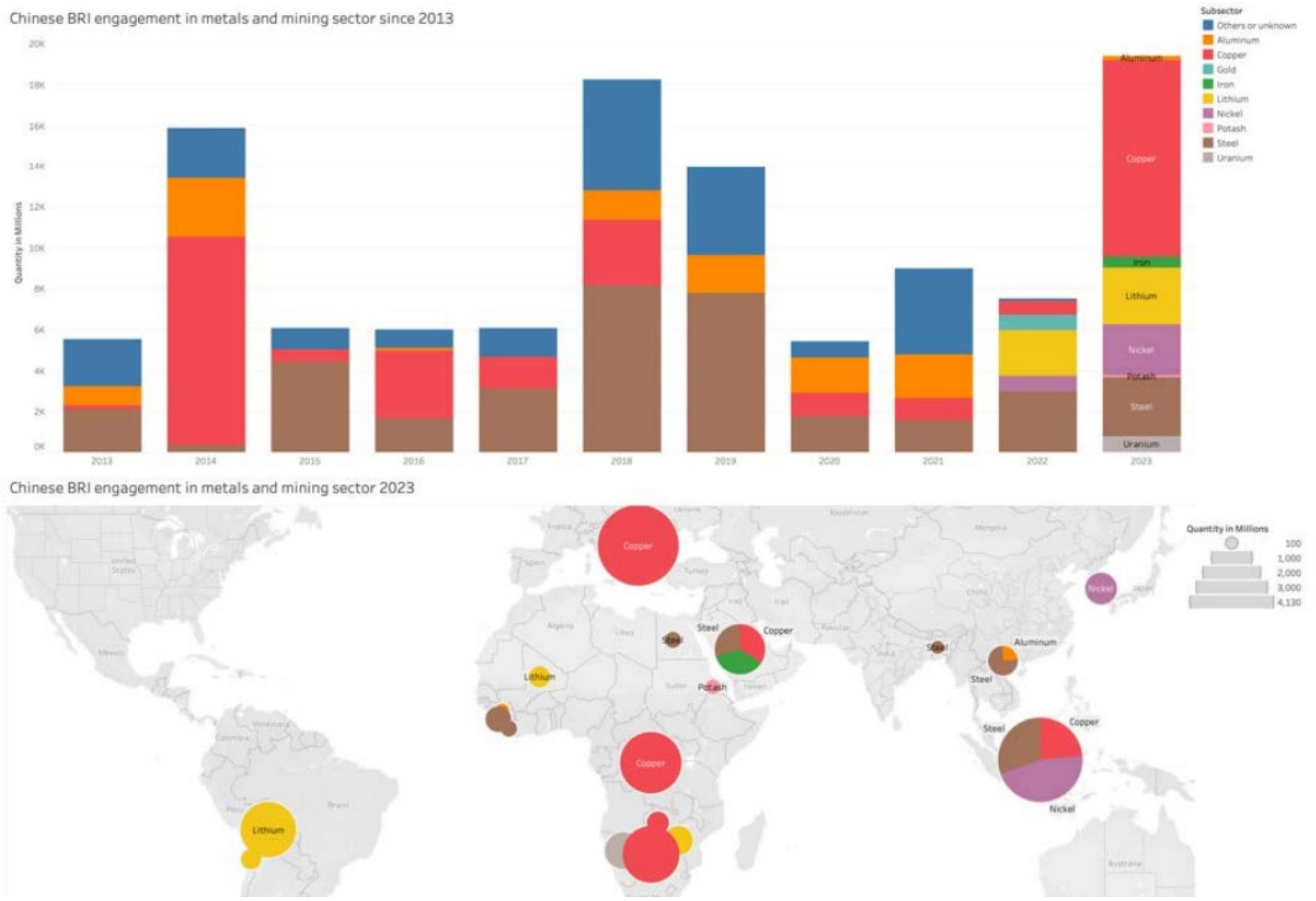
Sources: SailingStone Capital partners, https://ourworldindata.org/grapher/share-elec-by-source?time=latest
https://www.statista.com/statistics/263492/electricity-prices-in-selected-countries/

It is difficult to imagine how over the next decade, the commitment to drive a massive acceleration in capital- and energy-intensive renewables installations that require ancillary services to function on an antiquated, subscale grid, all supported by a structurally undercapitalized resource industry won't lead to persistently high prices. Blackrock's Larry Fink sounded very First Principled in the company's recent earnings call when he noted, "If we are going to decarbonize the world…capital and infrastructure is going to be very necessary…That supply/demand imbalance creates compelling investment opportunities."[1]

One country that appears to be focused on managing if not avoiding supply/demand imbalances is China. The Griffith Asia Institute just published a review of that country's Belt and Road Initiative. Relative to the paltry amount of capital invested by Western industry, the Chinese government pumped more than $100 bn into the metals and mining sector over the past decade.

[1] Blackrock 4Q23 earning call, January 12, 2024

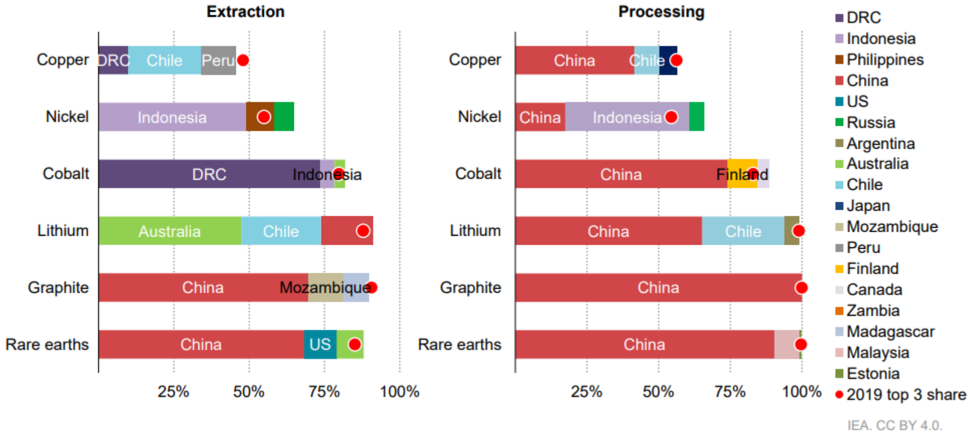
Figure 32: Geopolitics – China BRI Investment in Mining Top $100bn in 2023



Source: https://www.griffith.edu.au/__data/assets/pdf_file/0033/1910697/Nedopil-2024-China-Belt-Road-Initiative-Investment-report.pdf

Of note, the majority of that capital is focused on the core building blocks of the Energy Transition and is located in some of the most resource-rich regions of the world. After years of strategic lending and investment, China now controls the supply chain for many of the foundational raw materials that will unlock the path to net zero.

Figure 33: Geopolitics – Who Controls the Resource?



Source: Critical Mineral Market Review 2023, IEA

Institutions, policymakers, and all who are committed to decarbonization might look east for guidance. As William Shakespeare reminds us, "Talking isn't doing…words are not deeds."[1] Control of critical raw materials has long been a strategic priority for nation states, and more than once was the basis for armed conflict. Forecasting geopolitics probably is more challenging than speculating about commodity prices, but no one should be surprised if rising tensions related to critical mineral supply chains amplify the underlying inflationary pressures discussed above.

"Those are my principles, and if you don't like them…well, I have others." – Groucho Marx

The goal of this discussion was not to be extremist or to overstate the challenges in attaining a goal which in isolation is a universal good and to which individuals, institutions, and governments are committing more and more resources every day. But it is hard to solve what you don't understand, and we are surprised at the level of misinformation surrounding the Energy Transition. Consider this our attempt to provide some simple insights into a staggeringly complex undertaking.

Based on what we know today, we contend that the path to net zero will:

1. Have to accommodate increases in primary energy demand
2. Rely on a breadth of energy sources, including (increasingly decarbonized) fossil fuels
3. Be slower and much more capital-intensive than generally understood
4. Be constrained periodically by the availability of raw materials

[1] William Shakespeare, *King Henry VIII*

5. Be inflationary

6. Potentially exacerbate or accelerate geopolitical tensions

For asset allocators, this means:

1. Be very skeptical of the timing and magnitude of Energy Transition demand forecasts

2. Be prepared for periods of raw material inflation

3. Identify critical path constraints and invest around them

4. Buy tail risk insurance, particularly when it is cheap

SUMMARY

It's not easy to sort through the narratives swirling around the Energy Transition. Hopefully this letter serves as a point of reference for individuals and institutions alike. We aren't bound by the conclusions, and will revisit them to the extent that technology, policy, or any other dynamics emerge that alter the fundamentals.

One of the benefits of investing in the natural resource and infrastructure assets that will enable the path to net zero, in whatever form it takes, is that the market currently ascribes limited to no value for that future. This is in stark contrast to most other sectors and creates the basis to generate attractive absolute and relative returns.

In part, this is because the risks associated with a secular increase in commodity prices remain underappreciated by most investors. Capital constraints and resource exhaustion should drive prices higher, not lower, over the coming years. This runs counter to the experience of the past decade, and as a result, investors still are reluctant to embrace this potential outcome.

This skepticism is reflected in the public equity markets, as valuations in many resource-related areas still are extraordinarily attractive. Over time, we expect commodity prices to reflect economic realities, and we expect stock prices to converge with intrinsic value, including a premium for the scarcity value that should be ascribed to low-cost, long-lived, mission-critical resources residing in safe jurisdictions. Until then, we remain excited to deploy capital into what we believe to be one of the most fundamentally attractive setups in recent memory.

We thank you, as always, for your continued partnership.

Best Regards,

MacKenzie Davis, CFA

Ken Settles, CFA

Brian Lively

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Target Returns and/or Projected Returns May Not Materialize. Investors should keep in mind that the securities markets are volatile and unpredictable. There are no guarantees that the historical performance of an investment, portfolio, or asset class will have a direct correlation with its future performance. Investing in small- and mid-size companies can involve risks such as less publicly available information than larger companies, volatility, and less liquidity. Investing in a more limited number of issuers and sectors can be subject to increased sensitivity to market fluctuation. Portfolios that concentrate investments in a certain sector may be subject to greater risk than portfolios that invest more broadly, as companies in that sector may share common characteristics and may react similarly to market developments or other factors affecting their values. Investments in companies in natural resources industries may involve risks including changes in commodities prices, changes in demand for various natural resources, changes in energy prices, and international political and economic developments. Foreign securities are subject to political, regulatory, economic, and exchange-rate risks, some of which may not be present in domestic investments.

You cannot invest directly in an index. Those indices that are not benchmarks for the strategy are not representative of the strategy and are shown solely as a comparison among asset classes. Certain indices have been selected as benchmarks because they represent the general asset class in which SSCP's strategy invests; however, even such benchmarks will be materially different from portfolios in the strategy since SSCP is not constrained by the any particular index in managing the strategy.

The S&P North American Natural Resources Sector Index™ (S&P NANRSI) is an unmanaged modified-capitalization weighted index of companies in the Global Industry Classification Standard (GICS©) Energy and Materials sectors, excluding the Chemicals industry and Steel sub-industry. Index weights are float-adjusted and capped at 7.5%. Ordinary cash dividends are applied on the ex-date. As of December 31, 2007, the strategy changed its benchmark from the Lipper Natural Resources Fund Index to the S&P North American Natural Resources Sector Index because the S&P North American Natural Resources Sector Index is composed of securities of companies in the natural resources sector while the Lipper Natural Resources Fund Index is composed of mutual funds that invest in the natural resources sector. The S&P Global Natural Resources Index (S&P GNR) includes 90 of companies in natural resources and commodities businesses that meet specific investability requirements whose market capitalization is greater than US$100 million with a float-adjusted market cap of US$100 million. Equity exposure is across 3 primary commodity-related sectors: agribusiness, energy, and metals & mining. Liquidity thresholds are the 3-month average daily value traded of US$5 million. Stocks must be trading on a developed market exchange. Emerging market stocks are considered only if they have a developed market listing. The MSCI World Commodity Producers Index (MSCI-WCP) is an equity-based index designed to reflect the performance related to commodity producers' stocks. The MSCI World Commodity Producers Index is a free float-adjusted market capitalization-weighted index comprised of commodity producer companies based on the GICS. The Bloomberg Commodity Index (formerly the Dow Jones-UBS Commodity Index) is calculated on an excess return basis and composed of futures contracts on 22 physical commodities. It reflects the return of underlying commodity futures price movements. The S&P 500 Index is a free-float adjusted market-capitalization-weighted index designed to measure the performance of 500 leading companies in leading industries of the U.S. economy. The stocks included have a market capitalization in excess of $4 billion and cover over 75% of U.S. equities. The S&P GSCI® Crude Oil Index provides investors with a reliable and publicly available benchmark for investment performance in the crude oil market. The S&P GSCI® Natural Gas Index provides investors with a reliable and publicly available benchmark for investment performance in the natural gas market. The S&P GSCI® Copper Index, a sub-index of the S&P GSCI, provides investors with a reliable and publicly available benchmark for investment performance in the copper commodity market. The S&P GSCI® Gold Index, a sub-index of the S&P GSCI, provides investors with a reliable and publicly available benchmark tracking the COMEX gold future. The index is designed to be tradable, readily accessible to market participants, and cost efficient to implement. The S&P GSCI® Corn Index, a sub-index of the S&P GSCI, provides investors with a reliable and publicly available benchmark for investment performance in the corn commodity market.

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