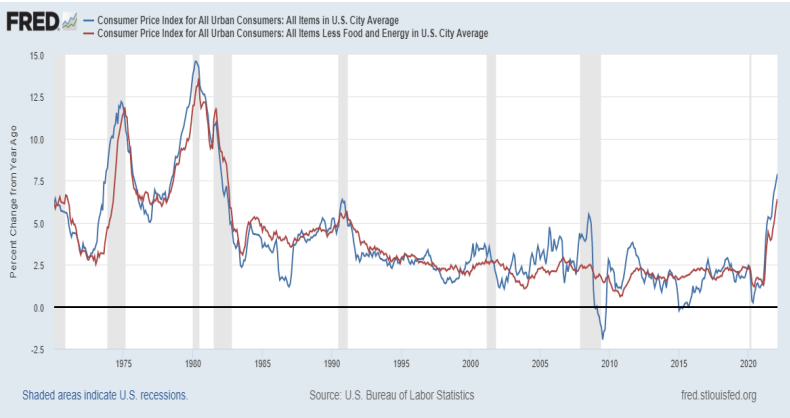
Inflation, Invasion, Innovation!

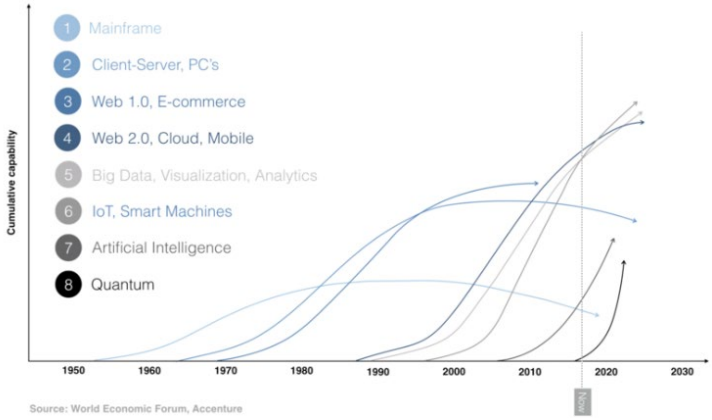
April 2022 – Q1 Explorations

In *Smokey and the Bandit*, Burt Reynolds wins a challenge by illegally taking alcohol over state lines in a big rig.[1] It is a fun movie where truckers do as they please – trucking as a low-on-stress, big-on- adventure ride that leads to a solidly middle-class life. That was in the '70s.

Fast forward to today and truck drivers are constantly monitored within their cabs. Every single one of the truck drivers from *Smokey and the Bandit* would have been fired: no seat belts, speeding, doing what they want when they want, and the list goes on. Nowadays, truckers are primarily paid by the mile,[2] which creates obvious material unpaid periods where they are essentially leashed to their rig and monitored for literally everything via cameras and sensors all over their truck. The compensation reward for the truck driver has also declined materially, over the last few decades,[3] with some calculating the reduction up to 50%. It is no longer a middle-class job, when adjusting for inflation.

Inflation vs Innovation





In 2019, prior to Covid, there was a staggering 90% turnover rate in trucking.[4] Supply chain disruptions, Covid related government assistance, and a seemingly general shift in the way many are viewing their life-work relationship has amplified a shortage already in the making in long haul truckers. These influences have resulted in wage inflation not unlike that highlighted in chicken processing plants in our December 2021 Explorations. Recent headlines have Walmart offering $110,000 to lure truckers, though that presumably may be a teaser rate given some of the wage dynamics we have seen.[5]

Will truckers' pay revert to one necessary for a solidly middle-class lifestyle? NO!

"What if we can create a virtual driver who never drinks, never texts, and never gets tired?" is the second line of TuSimple's Autonomous Trucking opening video.[6] TuSimple began operating heavy-duty trucks autonomously over an 80 mile "hub-to-hub" stretch between Tucson and Phoenix this past December in a series of test runs. It is reasonable to draw the conclusion that if

[1] Burt Reynolds actually runs interference in a Trans Am – a bit more aligned with his brand - but the movie is full of big rigs.
[2] Truck Driving Per-Mile Salary Explained - All Trucking; Higher Pay for the Long Haul | NACS (convenience.org)
[3] Why Truck Driver Pay Has Decreased by As Much As 50% Since the 1970s (businessinsider.com).
[4] "Why Truckers Are Rebelling" by Robin Kaiser-Schatzlein, NY Times, March 20, 2022
[5] Walmart Dangles $110,000 Starting Pay to Lure Truck Drivers - WSJ
[6] TuSimple: Autonomous Trucking - A Better Path Forward

wages continue to increase, then funding of autonomous trucking will increase as well – it is a supply / demand equation. Autonomous driving would result in roughly 500,000 jobs lost in the US alone.[7]

It is worth noting that not only does this technological innovation (autonomous driving and all the tech that comes with it), lead to significant job loss, but also increased energy efficiency, as well as consistency and speed of delivery. Additionally, there is the hopeful safety benefits of robot vs. driver – large trucks were responsible for 10% of fatal crashes in the US in 2019.[8]

Recent wage inflation is but a component of recent heightened inflation. Following, we will broaden out our analysis to attempt to answer the following questions:

- **Why was inflation not present over the last 35+ years?**
- **Why do we have it now?**
- **How does today's environment compare and contrast to the late '70s?**
- **How does Russia's invasion of Ukraine play into inflation?**
- **What role does innovation play in the conversation about inflation?**

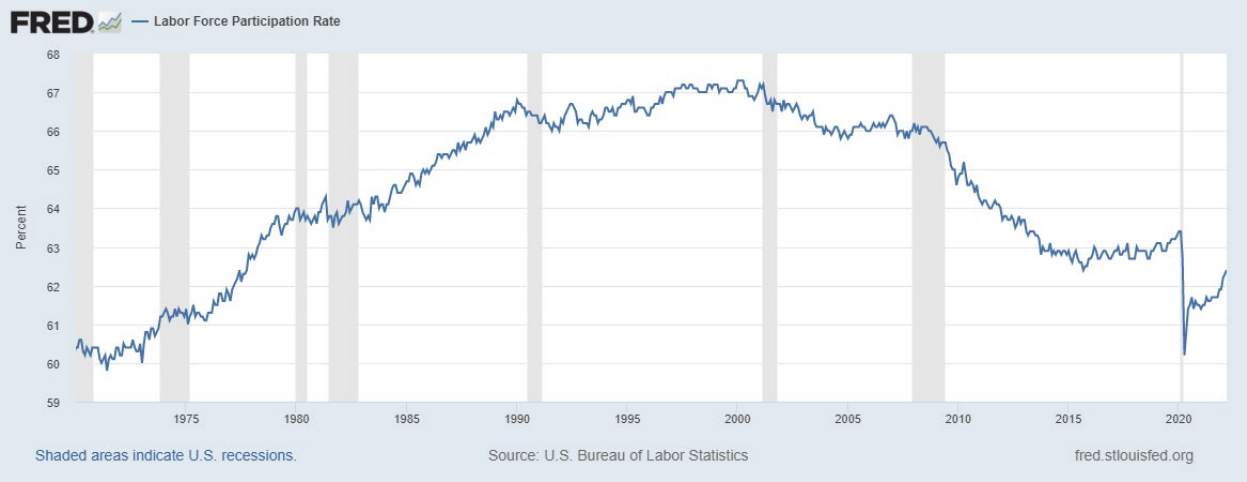
How Come We Did Not Have Inflation Over the last 35+ Years?

There has been a multi-decade decline in real interest rates within the developed world that has primarily been due to the combination of aging demographics, increasing debt loads and massive innovation encompassing technology and global supply chains maintaining a lid on inflation. Globalization has also been a contributor to lower inflation simply by increasing the level of competition and areas of which to source product.

As a population ages, there are a number of population characteristics that shift, leading to lower growth and inflation:

- **Less workers**: the proportion of workers to population declines as a larger percentage of the population is in or approaching retirement age. One can see this somewhat reflected in the US Labor Force Participation Rate which has been in decline since the early 1990's. It is only somewhat reflective in that other trends are in play such as more woman inclusion in the labor force and increasingly older people remaining in the work force. Nevertheless, the current trend means less people earning income and spending that income.
- **More savings**: older populations tend to save more as they approach retirement. It has been estimated that there will be a 25% increase in net worth per person in the US by the middle of the century simply due to population aging according to The Pew Charitable Trust[9]. This is capital that is not getting back into the economy.
- **Less spend**: older populations also spend less. The Bureau of Labor Statistics calculates that the average retired household spends 25% less than the average working household.[10]

[7] Automated trucks could cost 500,000 US jobs, researchers say | ZDNet; Self-Driving Trucks Could Replace 90% of Long-Haul Jobs - Bloomberg
[8] "Why Truckers Are Rebelling" by Robin Kaiser-Schatzlein, NY Times, March 20, 2022
[9] https://www.pewtrusts.org/en/trend/archive/winter-2018/as-the-world-ages-when-older-populations-become-the-majority
[10] A closer look at spending patterns of older Americans : Beyond the Numbers: U.S. Bureau of Labor Statistics (bls.gov)



High government debt levels exacerbate the above characteristics as more dollars go towards debt vs investment. This feels counterintuitive. Increasing debt, especially at lower interest rates, should create a supply / demand mismatch – meaning less market participants interested in buying from a counterpart that is (1) increasing debt and (2) lowering interest payments. However, aging populations save more, institutions are forced via regulations to hold government debt and ultimately, the Fed can use their balance sheet to vacuum up any slack – and have been doing so aggressively over the last decade+ due to a lack of growth as well as to generally support capital markets. For the US, we have the added benefit of being a reserve currency which attracts even more capital to our debt. With low growth and low inflation, the yields necessary to meet investor demands also remained low. The flip is that this same high debt is deflationary as less capital goes towards public and private investments.

One simply needs to look at Japan and Europe, both ahead of us in terms of aging demographics and debt to GDP levels to note the above affects. Japan's debt to equity ratio is 2.5: 1, while Europe is 1.5:1 as compared to current US levels of around 1:1 – they both had negative real yields prior to Covid.

Innovation is the ultimate deflator though. Innovation comes through creation of new products and services as well as methods to increase efficiencies. The Shale revolution is an example of a new innovation that catapulted the US to a lead global energy position while general increases in miles-per-gallon (MPG) is due to many little innovations (and some big ones!: e.g., Tesla) over time to eke out the number of miles we can drive per gallon as an example of increased efficiencies.

Then, Why Is Inflation Now Seemingly Out of Control?

We have written about this prior so we will keep it short (Insights | Fountainhead Asset Management (fountainheadam.com) – May 2021 Explorations). Ultimately though, Covid shut down the economy temporarily. This was a massive deflationary event. The government quickly provided massive fiscal stimulus to its citizens. This was a massive inflationary event. Typically, supply and demand move together through recessions and recoveries. This time around though it was harder for supply to get back online for a variety of reasons with a big one being supply chain issues due to Covid. It was also harder for supply to figure out new consumer trends (e.g., good vs services) due to Covid. Note the theme? Huge disruption due to a once in a century event creates a million ripples through the world.

Every time it seems like there is the potential for inflation to start declining another event exacerbates it:

- China's Zero-Covid policy
- Russian aggressions in Ukraine

It has proven to be quite sticky – or at least less transitory then was initially believed (though transitory was never given a time frame). Are we in a new paradigm or is it simply an extended temporary bout we are dealing with here? Read on!

So, Are We Now in the Stagflation '70s?

No! America looked very different back then as compared to now in many ways. Even when it comes to energy, where one can make a case for similarities in geopolitical events creating an energy crisis (e.g., equating the OPEC Oil Embargo to Russia aggressions in Ukraine), our reliance and production of energy is materially different now then back then. Following the roadmap when speaking about why inflation has been low over the last 35+ years:

	1970's	2022
Demographic	Young	Older
Gov. Debt	Low	High
Employment	Low	High

Furthermore, when looking at both energy production and energy intensity (note Energy Sidebar), the two periods of time do not even compare. In fact, renewables and conservation efforts got a real start due to the two-oil crisis' of the '70s. It is a classic example of disruption leading to innovation.

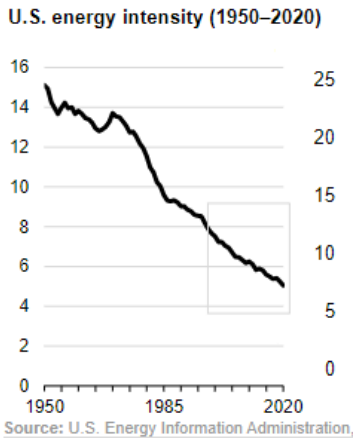
ENERGY SIDEBAR

Petroleum products, which is created from Crude and other energy sources (e.g., coal, natural gas, and biomass) goes into everything. Beyond fuel, heating oil and electricity, petroleum is used in asphalt, plastics and synthetic materials that are in nearly everything we use.

Energy Intensity measures the units of energy used per unit of Gross Domestic Product (GDP). It measures how much energy a society (or group) uses relative to their economic output. Energy efficiency is a major contributing factor but there are others such as more of a population moving to areas with relatively more moderate temperature, reducing heating/cooling costs (e.g., the US migration south generally).

Energy intensity has dropped by half over the last 35 years and by roughly 70% over the last 70 years. It is a good trend!

Furthermore, individual spend has also declined materially[11]. The point is that while energy is a significant component of inflation and an important contributor to the economy, it has declined materially in its contribution to GDP growth as well as consumer cost.

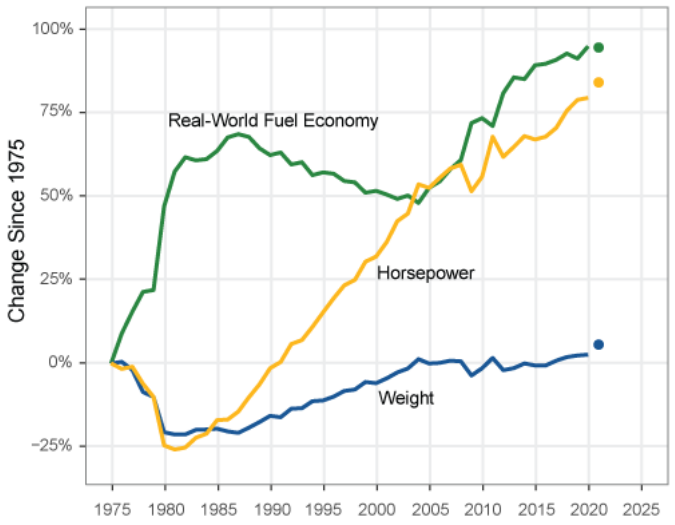


Energy Transition -> Energy Innovation

Innovation has led to efficiencies in energy use all while increasing the overall functionality of product – the car being a perfect example.

[11] Natixis March Macro Webinar Slides show a drop from a 6% - 8% consumer spend on energy through the '70s to a more recent 2% - 4% spend through the end of Feb 2022. We are not at liberty to reshare the slides

And while the world has been transitioning towards renewables, we expect current events in Europe (e.g., Russia) to turbo charge growth of renewables over the next two decades. Based on a recent interview with Daniel Yergin, an expert on energy, it takes roughly 10 years to get a wind turbine functional with eight of those ten years spent on permitting – we imagine government will figure out a way to speed up the permit stage[12].

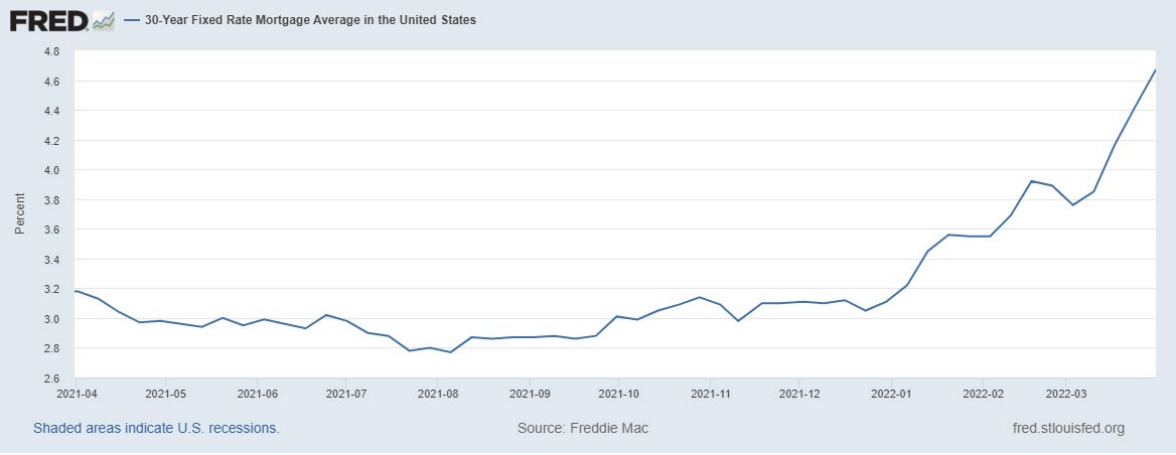


[13]Where Does Inflation Go from Here?

According to Fed chair Jerome Powell in his Q&A post raising rates to 0.25%, based on the data the Fed was watching, they had expectations for inflation to peak in Q1 2022. It is important to note that the Fed may have the most data out there and many tools at their disposal but one of those tools is not a crystal ball. It is an impossible job. So even without further disruptions arising due to Russian aggressions and China's presumably misplaced Zero Covid policy, they may have been wrong. The point here though is that the Fed did believe, based on the information they were receiving, that inflation was topping out.

Year	Traditional Biomass	Renewables	Fossil Fuels	Nuclear Power
2000	10.2%	6.6%	77.3%	5.9%
2005	8.7%	6.5%	79.4%	5.4%
2010	7.7%	7.7%	79.9%	4.7%
2015	6.9%	9.2%	79.9%	4.0%
2020	6.7%	11.2%	78.0%	4.0%

Since the beginning of the year, the Fed in general has become increasingly hawkish. Simply by communicating expected hikes over the remainder of the year they have succeeded in very quickly increasing interest rates that most businesses and consumers are already being charged. For example, the average 30-year mortgage



[12] Via podcast interview with Ezra Klein
[13] https://www.visualcapitalist.com/visualizing-the-history-of-energy-transitions/

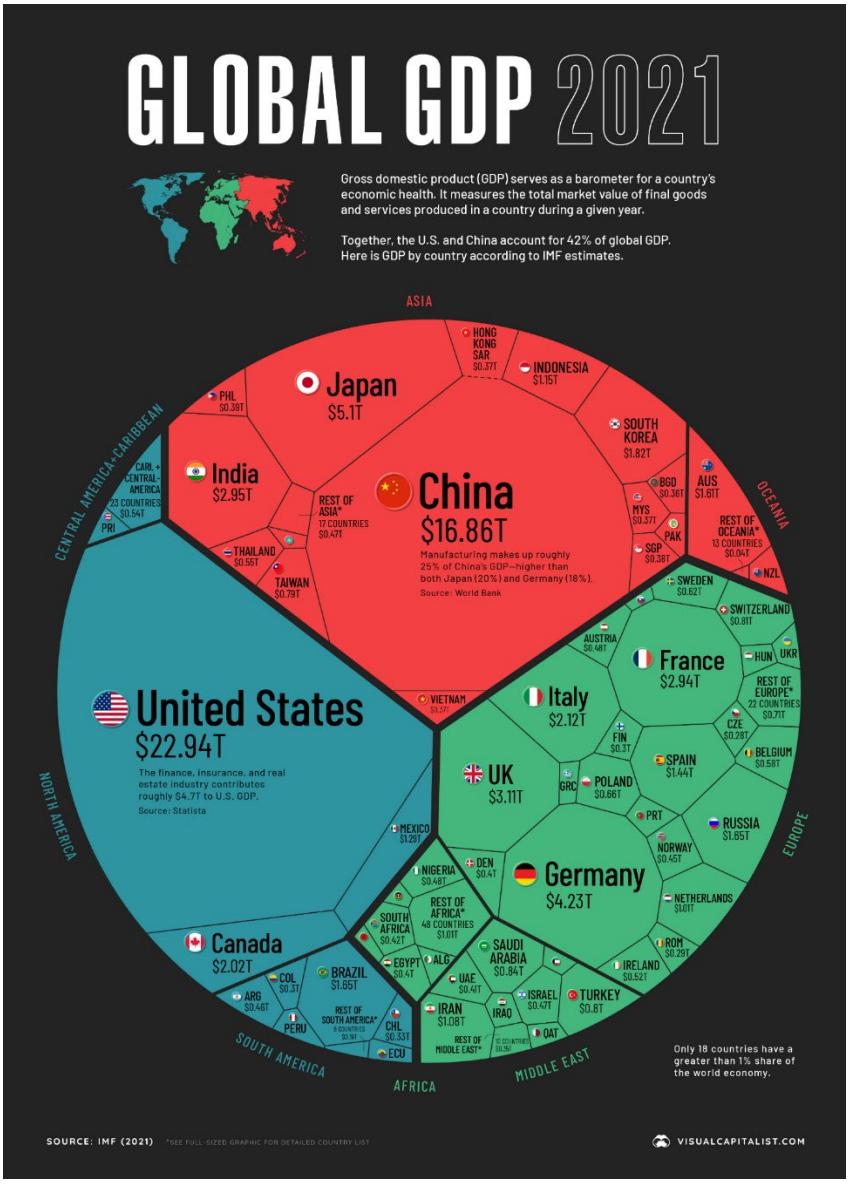
rate has increased to 4.67% as of the end of March, a 50% increase from a quarter prior and ~70% increase from the bottom, experienced this past summer.

Furthermore, the Fed has communicated that they will reduce their balance sheet by roughly $100 Billion a month. According to a conversation with a Prudential portfolio manager, every $500 billion in balance sheet reduction is similar to a 0.5% fed fund increase. That means when combining balance sheet reductions with expected rate hikes, there is over 3% of yield increases expected!

It is worth noting that while the market is expecting these hikes in 2022, the bond market is already pricing in almost 4 rate cuts in 2023, expecting this tightening cycle to be aggressive but short.[14]

Does Russia Aggressions Spell Doom to Globalization?

We had written in the past of a move to regionalization from globalization. However, our views, strongly based on a well-presented McKinsey report, was due to innovation rather than war. In the following GDP map, one can see the size of Russia relative to the world – Russia GDP is slightly bigger than Spain (in 2021 but probably not in 2023) and way smaller than Italy. It is why it is hard to see China fully siding with Russia even if they really want to. US based businesses will continue to source product from China if that is efficient. Globalization has definitely been a tailwind for lower cost products and therefore a dampener of inflation. We can see this dampener slow down as geopolitical tensions increase but it is hard to see China follow too quickly in the path of Russia given the quick reaction the West had to Russian aggressions as well as the material and long-lasting consequences of those actions. China simply has too much to lose in its partnership with the West. It is also worth noting that China has not been involved in any sort of real war since 1979 while Putin (or Russia if you may) has been pretty busy fighting its neighbors and with its allies (notably Syria) since coming to power in 2000[15] with minimal consequence until now.



[14] Cliffwater Weekly Macro news

[15] Technically, December 31, 1999 – Perhaps that was the true Y2K threat!

It All Leads to Innovation!

Disruption leads to innovation. A vaccine was created in a weekend[16]. Then a year was spent testing efficacy and safety. The last major energy crisis led directly to increased research into renewable energy and other conservation and efficiency efforts.

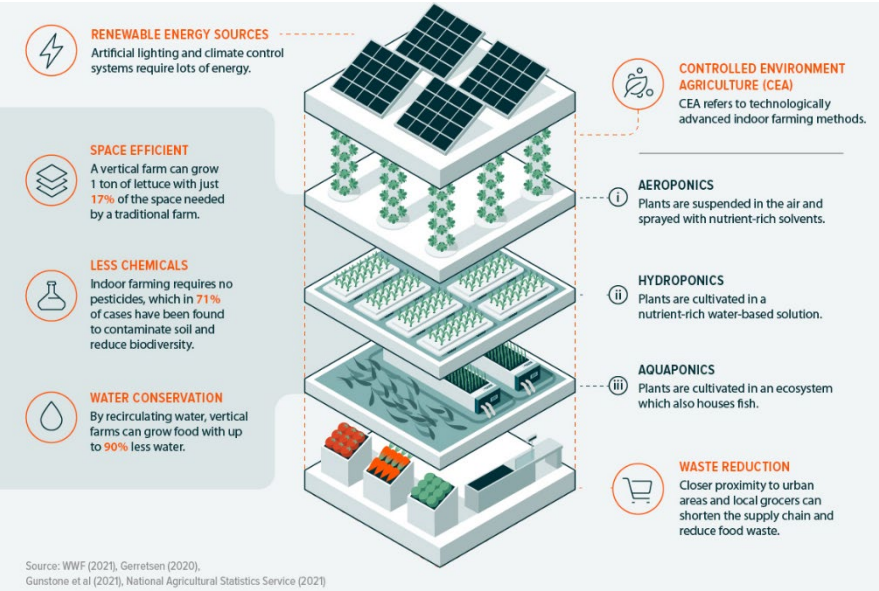
Disruption results in disproportionate reward to the solver which creates, at least in a capitalist world filled with curious humans, a disproportionate focus on solving the problem. This results in innovation!

There will now be more capital and more political will throw at the problem at hand: at speeding up approvals of renewables while solving existing technical hurdles, such as storage (e.g., batteries) and distribution challenges within the energy complex.

Russia and Ukraine are also large exporters of food and food related materials. Unfortunately, third world countries will suffer real food scarcity and inflation. In NYC, where I live, I currently source many herbs in a garden sitting on my counter, with my honey and many vegetables coming from local rooftops[17]. Yes, these are first world luxuries, but they point to the massive innovations that are already rippling across the world.

Vertical Farming – Partly Hypothetical, Partly Real!

[18]As mentioned, Russia and Ukraine are key sources of global energy and food. Global warming has already put pressure on both energy and food supply[19]. So, while we do not believe Putin via Russia did the world any favors, it will speed up (hopefully) the innovation in both areas for the long-term benefit of humankind.



[16] Pfizer and BioNTech's Vaccine Was Designed in Hours Over a Single Day (businessinsider.com)
[17] Brooklyn Grange (brooklyngrangefarm.com)
[18] Is Vertical Farming the Future? (visualcapitalist.com)
[19] Between this fact, the point made above in regards lack of real consequences to any of Putin's aggressions over the last twenty years whether in his region or elsewhere, like Syria, and the more recent squabbling among the West, it did not seem so crazy for Putin to take the gambit he did – 20/20 hindsight of course seems to show he was wrong but based on the last 20 years and even short term capitalist reasons for Europe as opposed to America it may not have been as crazy a plan at least from this angle (and it seems the world was as surprised as Putin (if he knows) at the terrible shape his conventional army is in – rotten throughout! Hopefully this applies to their nuclear complex as well – and hopefully we never get to find out). Where he was totally off base was in believing the Ukrainians would greet Russia with open arms. Regardless of his army, the war was unwinnable because the population would have never ever folded – it is human nature.