Episode 3 - "The Coming Global Energy Crisis"

Previously, on Energy Transition Crisis: The first episode explained the problems we face and the need for Energy Transition, then the 2nd episode laid out a Master Plan to phase out fossil fuels by electrifying the vehicle fleet, replacing fossil fuel-burning electric power stations with clean energy alternatives, and upgrading electric grids to support electric vehicle charging. Environmental impact of mining copper and battery metals needed to electrify society were also discussed. Now, to show you why a Global Energy Crisis cannot be avoided in the mid-2020s, here's Erik Townsend.

This will be one of the most important episodes of this entire docuseries, and will surely be the most controversial, since I'm going to challenge some viewers' most strongly held beliefs.

I predict that a Global energy crisis will occur in the mid-2020s, sending energy prices much higher, and crippling the global economy. Well-intended but poorly conceived climate policy will have been the cause.

This crisis will make energy policy even more politicized and controversial than it already is now, because skyrocketing energy prices will provide strong ammunition to climate skeptics, who will blame climate policy for the economic damage caused by the energy crisis.

There will be calls from the skeptics to abandon energy transition and just go back to polluting the environment. And unfortunately, many people are likely to be swayed by these arguments because they'll be suffering financially from the energy crisis. That means the coming crisis carries the risk of derailing the entire energy transition away from fossil fuels. And we can't allow that to happen!

The roots of the coming crisis were sewn from good intentions. People are sick and tired of no real progress being made on energy transition. They're outraged that we still rely on fossil fuels for nearly all our energy needs, despite the risks posed by climate change having been well-known for two full decades now. They're mad as hell and they're not going to take it anymore! They're fed up with broken promises and they're demanding action. And I say, Amen to that! This situation is ridiculous, and people are right to be outraged!

We absolutely MUST break our addiction to fossil fuels. It's the single most important challenge humanity faces in the 21st century. And progress to date has been pitiful! After two full decades of broken promises, all renewables combined still only supply <5% of our energy needs.

And despite all the wind and solar farms we've built, fossil fuel demand continues to reach new highs every single year! We haven't even made enough progress to stop increasing fossil fuel demand every year, never mind making any progress at all toward reducing it.

People are fighting mad, and they want to put an end to burning fossil fuels without wasting another day! If you feel that way, I salute you for your conviction and desire for justice.

But please, hear me out, because this movement to "Just Stop Oil" is exactly what's going to cause a global energy crisis that will threaten rather than support Energy Transition. What we need to focus on is not stopping oil, but rather, building all the clean energy needed to replace oil. Those are two very different things.

Imagine living in a place where dangerous air pollution is poisoning you and your family. Would you respond by denouncing the polluters and then stop breathing completely in protest, just to make your point? Or would it make more sense to continue breathing while simultaneously demanding that the pollution be stopped and taking aggressive action to bring about that outcome? And how could a person who isn't breathing succeed at bringing about the needed change?

The sad, unfortunate truth is that the whole world still runs on oil. We already agree that must change, and that time is of the essence to cure our addiction to fossil fuels. But let's consider what the implications would be if we try and phase out fossil fuels before phasing in viable replacements.

Planet Earth simply cannot support 8 billion human inhabitants without the energy we derive from fossil fuels. Many of those people now live in poverty. More affordable and abundant energy is precisely what's needed to lift them out of poverty and give them better lives. Just stopping oil completely, before phasing in viable alternatives, would literally mean committing genocide and culling the lives of at least three billion human beings. We simply don't have the ability to feed all those people without modern farming equipment, which unfortunately, still relies on diesel fuel. If we just stopped using oil completely, before replacing it with a clean alternative, the result would be the deaths of billions of people.

Thankfully, nobody is seriously proposing to cut oil consumption to zero overnight. But even just slowing down investment in oil & gas projects needed to maintain current supply levels will be enough to cause a global energy and financial crisis of epic proportions. And because there's already been a lack of adequate investment in maintaining current oil production capacity, it's already too late to avoid a global energy crisis in the mid-2020s.

The crux of the problem is that people are focusing on the wrong thing. What's urgently needed is to aggressively build enough clean energy supply to meet our needs without fossil fuels. That's how you get rid of fossil fuels without derailing the global economy in the process. And progress to date has been pitiful! That's the real problem. We cannot tolerate any further delay building the clean energy we need!

What we should be outraged by, and protesting to change, is not oil, but rather, the lack of progress on building the clean energy we need to replace oil. It doesn't make any sense to try and get rid of fossil fuels before we replace them with something better. That's like stopping breathing just to make a point. It's death by suffocation, and it's the last thing we should be trying to do.

Periods of reduced energy consumption equate to economic hardship. This tiny little blip is the 1973 Arab Oil Embargo. This is the 1979-82 double-dip recession when Federal Reserve Chairman Paul Volcker sacrificed the economy to squash inflation, this is the 2008 Great Financial Crisis, and this is the COVID pandemic. Look how small these periods of massive economic and human suffering appear on the energy consumption chart. If we decided to cut our energy consumption by the full 32% we presently get from oil, the whole world would grind to a halt and mass starvation would result. Just cutting our energy consumption by 10% would cause a crisis worse than the Great Depression of the 1930s!

So the solution is not to just stop oil. The solution is to just stop wasting time, and get serious about building the 160k TWh of clean thermal energy needed to replace fossil fuels. Again, the problem is not oil. The problem is our failure to make any meaningful progress toward building the clean energy supply needed to replace oil.

Our elected leaders don't have any good excuses to explain pitiful progress to date on building the clean energy we need to replace fossil fuels. In theatre, everyone loves to hate the villain, and political theatre is no different. So to deflect the blame for their own failures, our politicians rely on the oldest trick in the book: Political scapegoating.

We're told to hate Big Oil for polluting our environment for all these decades, when in reality, Big Oil is just the drug dealer in this story. It's the rest of us that buy and consume their fossil fuels who are doing the polluting. And we do that because we have no alternative!

The solution is to build the clean energy needed to replace fossil fuels. And there's been almost no meaningful progress toward that goal. Oil will go away all by itself just as soon as viable alternatives exist, and building those clean energy alternatives is where we need to focus our attention.

But the Just Stop Oil sentiment is really taking hold in political circles, and despite well-meaning intentions, it's doing a lot of damage. And it's not just 20-something activists throwing tomato soup on paintings in museums and supergluing themselves to the furniture to get attention.

Now we have organized lobbying groups like ShareAction petitioning bankers around the world to stop financing oil and gas projects that are still desperately needed so that society can CONTINUE BREATHING while we build out the clean energy required to eventually phase fossil fuels out completely. In the UK, a group of celebrities recently began lobbying the bankers with

a similar message. These people clearly mean well and have the best of intentions. But their misguided activism is going to cause a global energy crisis that will threaten, rather than advance, the energy transition agenda.

As a former professional energy trader, I still monitor energy markets very closely, even in my retirement. Mounting signs in the market convinced me in late 2021 that a global energy crisis is coming. In my analysis, the global economy cannot return to pre-pandemic growth trajectory due to insufficient oil & gas supply resulting from lack of investment in exploration and production. Damage done to the industry during the whipsaw of demand during the COVID pandemic played a role in setting the stage, but the primary problem is a lack of sufficient investment to maintain current oil production capacity. That lack of investment was caused by ESG and the lobbying efforts of groups like ShareAction.

The primary factors that led me to conclude the coming energy crisis cannot be avoided are: Collapse of investment in Oil & Gas Exploration & Production due to ESG and other activism; Near-complete exhaustion of OPEC Spare Production Capacity; Generational lows in strategic and commercial inventory; U.S. Production reaching a plateau; and Russian War escalation risks.

I'll explain all these things momentarily, but first, it's essential to understand how oilfields age and why more investment is needed just to maintain current production levels.

Back in the 1950s a Shell Oil geologist named Marion King Hubbert observed that the production profile of any oilfield or collection of oilfields looks approximately like a bell curve. In the beginning, production increases as more oil wells are drilled in the same oilfield. But eventually, reservoir pressure is reduced and the oilfield moves into a period of decline. Almost all of the major oilfields in the middle-east are well into the decline phase, and shale oil wells, which represent most of the recent growth in U.S. oil production, have even steeper decline profiles than aging conventional oil plays.

What all this means is that all the producing oilfields of the world are in a constant state of declining output. New oil wells must be drilled frequently, not to increase oil production, but just to hold oil production steady and prevent it from collapsing.

ESG is a big trend in the money management business. ESG stands for Environmental, Social, and corporate Governance. The idea is to invest in things that are good for the Environment, things that are Socially responsible, and in companies whose senior management, or Governance, behave ethically and responsibly with respect to environmental issues. In principle, it's a great idea. ESG funds favor investing in renewable green energy projects, for example, and that helps the energy transition cause by creating alternatives to fossil fuels for our energy supply.

But ESG has gone badly astray. Rather than helping the energy transition cause by building out more clean energy, which helps solve the problem, ESG has morphed into a crusade to stop investment in extractive industries including oil production and mining. That exacerbates the problem rather than solving it. We can't possibly have a green energy transition without diesel fuel to run the heavy construction equipment that will build all the clean energy electric power plants we need to build by 2050. And we won't have any energy transition at all if ESG policies cause a global energy crisis that empowers climate skeptics, angers the public, and turns them against the energy transition cause. And we can't build electric vehicles or a new electric grid without a big increase in global mining operations, not a decrease.

Because of ESG and activism by groups like ShareAction and Just Stop Oil, investment in oil & gas exploration and production has collapsed in recent years, meaning the oil industry no longer has the ability to increase production as needed to meet economic demand. By my analysis, it's literally impossible for the global economy to recover to full pre-pandemic growth trajectory, because there simply isn't enough oil supply to meet demand under those conditions.

The oil & gas industry needs more investment to both maintain current production capacity and repair the damage done during the pandemic. But instead, investment in oil & gas has practically been criminalized. There's a long lag time between investment and production, so the effects aren't felt instantly.

Quite a few major banks including Goldman Sachs share my view that energy prices will skyrocket as soon as economic conditions stabilize and the world fully recovers from the COVID pandemic. The reason is that because of lack of investment, there just isn't enough oil production capacity to meet demand in a scenario where the global economy resumes its pre-pandemic growth trajectory.

You might be wondering, "Ok, if the world is suddenly running out of oil production capacity, then why hasn't this energy crisis already occurred, and why did oil prices come back down after the initial shock of the Ukraine invasion?". To answer these questions requires introducing the concept of spare production capacity.

For more than 60 years, the Organization of Petroleum Exporting Countries, or OPEC, has played a critical role in energy markets. OPEC manages energy prices by limiting how much oil its member countries are allowed to produce and export. The idea, which dates back more than half a century, is that if all the oil-rich countries were to compete with one another and produce as much oil as they possibly could, that would flood the market with too much oil, causing prices to fall to bargain levels. So they agree to impose quotas on themselves, which limit how many barrels each country is allowed to export. These quotas are adjusted from time to time to

keep prices high enough to make the oil-exporting countries rich, but not so high as to cripple the global economy.

For virtually all of OPEC's 63-year history, the name of the game has been to always produce and export less oil than the maximum amount possible. The difference between the amount of oil actually produced, and the maximum amount of oil which could theoretically be produced if OPEC members pulled out all the stops and produced as much oil as they possibly could, is known as spare capacity. Exactly how much spare capacity each OPEC member country had at any given moment in time has been a closely guarded secret for decades.

In the last few years, OPEC has almost completely run out of spare capacity. In the old days, the OPEC member countries would agree to production quotas limiting the amount of oil each member country was allowed to produce and sell on the international market. But cheating was rampant, and the quotas were seldom fully complied with. It was normal for most member countries to try and get away with producing above their quotas so they could make more money.

But for the last few years, most OPEC members have consistently failed to meet their production quotas. In other words, they've been producing less oil than they're allowed to produce under the OPEC quota system! That's incredibly significant, because it means they've run out of spare capacity completely, and are already producing as much oil as they possibly can. Put another way, there is no decision that can be made in any OPEC meeting to cause those countries to start producing more oil than they already do today. They're already pedaling as fast as they can!

Saudi Arabia and United Arab Emirates are the only exceptions to this trend of spare capacity exhaustion. Saudi Arabia currently produces about 11m bbl/day. In 2022 they announced that their maximum production capacity is 12mm bbl/day and that it would never be possible to increase their production beyond 13mm bbl/day, even with additional investment. Keep in mind that they derive negotiating power by overstating their spare capacity, so it's very unlikely these figures are low, and entirely possible they could be high. From these data we can conclude that Saudi Arabia has at most 1mm bbl/day of spare capacity beyond current production levels, and even that might be a stretch. United Arab Emirates also has some spare capacity, but it's less certain how much. All indications are that the remaining OPEC members have run out of spare capacity are already producing as much oil as they possibly can.

The point I want to impress upon you is that spare capacity is the "safety margin" that the oil market has depended on for decades to prevent energy prices from running away when there's an increase in demand or when supply is taken offline by a war. For the last 60 years, if there was a shortage of oil supply and prices started to rise too quickly, OPEC could be counted on to simply hold a meeting and vote to increase production. Then the member countries would

increase their exports and prices would come back down. Despite all the criticism OPEC gets for being a price cartel, the margin of safety provided by OPEC always having spare capacity that can be put to work whenever it's needed, has served the world extremely well, by limiting how high energy prices go in reaction to a disruption in supply or an increase in demand.

Returning now to the topic of loss of production capacity due to collapsing capital investment, if you were wondering how it could be possible that this loss of investment has been occurring for years and yet there's been no energy crisis yet, the answer is that OPEC Spare Capacity has been almost completely exhausted in the past few years. Lack of investment is the reason it's been exhausted. The safety margin afforded by OPEC is now limited to the very small amount of spare capacity Saudi Arabia and United Arab Emirates still have left. And by my calculations, a return to pre-pandemic economic growth trajectory would completely consume what little spare capacity they still have. At that point, the global oil market will be unable to meet demand at any price, and that's how the global energy crisis I predict will begin.

OPEC isn't the only safety valve in the global oil market. Several of the biggest countries in the world maintain Strategic Petroleum Reserves, which are essentially gigantic piggy banks full of crude oil, set aside for a rainy day. The idea is that if a war or some other event interrupted supply of imported oil, it would be prudent to have an emergency supply stashed away. The United States' Strategic Petroleum Reserve has a capacity of about 750 Million barrels of oil. And the SPRs of major governments are not the only piggy banks. The oil industry always has plenty of oil in commercial storage, both to manage inventories and to cover the scenario where imports are delayed by broken down tanker ships, weather, or other similar factors.

Strategic reserves combined with commercial inventory of crude oil gives major countries the capacity to store a whole lot of oil. The United States has the capacity to store up to 1.28bn Barrels of crude oil, with 750 million in the SPR and the balance in commercial inventory. China can store up to 1.4bn barrels in commercial inventory and strategic reserves combined.

But both Strategic and Commercial inventory have been drawn down in the wake of the Ukraine invasion to generational low-levels. President Biden directed that more than 200mm bbl of oil be removed from the U.S. SPR to stabilize prices in the wake of the Ukraine invasion. This reduced the amount of oil remaining in the SPR to a 40-year low. And commercial inventories also reached generational low levels during the same period.

This means that both the OPEC safety valve and the strategic & commercial inventory safety valve have already been tapped out. OPEC is almost out of spare capacity, and U.S. strategic and commercial inventories both reached generational-low levels by late 2022. When economic activity fully recovers from the pandemic, we won't be able to rely on our commercial or strategic inventory to absorb the increase in demand until new production can be brought online, and we won't be able to bring that new production online because OPEC is already

running out of spare capacity and there hasn't been sufficient investment to increase production outside of OPEC countries.

Conventional oil production in the United States peaked at 9.6 million barrels per day in 1970, as predicted by Hubbert. U.S. production then entered a period of sustained decline, dipping below 5mm b/d by 2008. Many analysts began to predict that oilfields in the U.S. and around the globe moving past Hubbert's Peak would cause a global energy crisis.

But then the commercialization of horizontal drilling and hydraulic fracturing changed everything. Starting in 2009, the U.S. Shale Oil Boom allowed U.S. crude oil production to break its 1970 record of 9.6mm b/d by 2017. And it didn't stop there. U.S. production continued to grow all the way to a record of 13.3mm b/d by 2019!

The point I want to impress upon you is that U.S. production growth since 2009 is literally what saved the world from a Peak Oil energy crisis that would otherwise have crippled the global economy. U.S. production growth made up for production declines across the rest of the world, and saved society from a global energy crisis.

But even before the pandemic, growth in U.S. production had started to level off, suggesting a plateau was forming around 13 mm b/d. Industry experts began predicting that U.S. production had reached its final peak. Then the pandemic hit, and collapsed demand. That did a lot of damage to the Oil & Gas industry. U.S. production dipped below 10mm b/d during the pandemic. But after the pandemic, oil production rebounded robustly, moving back above 11.5 mm b/d by the end of 2021. By the second half of 2022, U.S. production began to plateau again, at just over 12 mm b/d. It first reached 12.3 mm b/d in October 2022, and has held close to that level ever since. As of July 2023 when this video was produced, there's been no further growth beyond 12.4 mm b/d.

So all indications are that U.S. production has reached or is nearing its final peak. The U.S. shale boom may have already passed its peak, and even if it hasn't, that peak will come in the next few years.

If U.S. shale oil growth can no longer be counted on to make up for production declines around the globe due to lack of investment and other factors, what will?

Considering the factors I've just described, the inevitable conclusion is that the global oil market cannot tolerate a supply deficit because all the safety valves have already been used up. If energy prices start to run away, OPEC can't just vote to increase production because they're already producing as much as they can. We can't use our strategic petroleum reserves to cushion the blow because we've already drawn them down to the lowest levels in four decades.

So the one thing the global economy absolutely cannot tolerate is if oil supply started to fall short of meeting demand in the next few years. And that's exactly what JP Morgan is predicting: a 4.2 mm b/d global crude oil supply shortfall by 2030.

If that happens, energy prices could easily double in short order. And ironically, it will have been well-meaning climate activism aimed at "just stopping oil" that will have caused the global energy crisis that derails energy transition.

Russia exports approximately 8mm barrels of crude oil per day. If just half of Russian exports, or 4mm barrels were taken offline, the rest of the world combined simply doesn't have enough spare capacity to make up the difference. This means that the entire world is now dependent on Russian oil. Bombing Russia's oilfields would literally throw the entire world into an acute energy crisis, because there simply isn't enough production capacity elsewhere to make up for losing even half of Russian production.

This also means that Vladimir Putin could weaponize oil prices by intentionally taking half of Russia's oil exports off the market as a tactic of economic warfare. Doing that might cause oil prices to at least double globally, implying that Russia wouldn't even lose any revenue because they'd be selling half as much oil for twice the price. Of course, Western governments would do everything possible to prevent Russia from selling any of its oil at anything close to market prices. But the damage of higher market prices would still cripple the rest of the global economy, making oil prices an effective weapon of economic warfare, even if Russia never gets paid for all of their oil exports.

We're already facing an impending global energy crisis that it's too late to avoid, even before considering the war with Russia. My point is that if Putin wanted to, he could change the timing of the onset of that crisis from still a few years out--to tomorrow morning! That's a sobering thought that Western governments shouldn't take lightly.

A perfect storm is forming on the near horizon. With almost no spare capacity left and generational lows in both strategic and commercial inventory, the market's safety buffers have already been used up.

An economic recession could easily delay the energy crisis I predict by a few years. But soon as we try and resume pre-pandemic growth trajectory, a crisis will ensue. That crisis will threaten the energy transition away from fossil fuels, because people outraged by high energy prices will call for abandoning climate and energy transition policy.

Our goal should not be to Just Stop Oil, but rather, to stop wasting time and get serious about building all the clean energy needed to replace oil. Meanwhile, we need to encourage rather

than discourage Oil Exploration & Production investment, so that we have the energy we need to keep society breathing while we build all the clean energy needed to ultimately phase fossil fuels out completely.

I know it's not what many of you want to hear, but the unfortunate and immutable truth is that we're going to need oil for at least another decade, and trying to phase it out before phasing in viable replacements will only serve to sabotage rather than advance the goal of energy transition.

Scapegoating Big Oil as the cause of all our problems is the politicians' favorite tactic to deflect blame for their own failure to make any meaningful progress on building the clean energy we need after two full decades of empty promises. Don't fall for it! The problem is not getting rid of oil. The problem is replacing oil with something better, and that's what we need to stay focused on.

It's already too late to avert the coming global energy crisis. But we can lessen the impact through immediate reversal of anti-oil/gas investment policies and activism. To be sure, we still need activism, but the activism we need is to demand progress on building the clean energy needed to replace oil.

The remaining episodes of Energy Transition Crisis will focus on exactly that: How we can build out 80k TWh of clean electric generation capacity to replace the 160k TWh of thermal energy we'd otherwise need to get from burning fossil fuels to produce that electricity? Wind and solar alone won't be enough, so the rest of this docuseries will lay out exactly how we can solve this challenge and usher in a new era of human prosperity, defined by abundant and affordable clean energy.