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[00:00:00] **Nate Hagens:** Good morning. I am back from Climate Week in New York City. Gotham, had some amazing podcasts there, on terror management theory and geoengineering and climate. And, CO2 is a story of life. please tune in the next month. There's some really great ones. It's always strange when I go back to New York City.

[00:00:28] I used to work there, on Wall Street, the beating heart of the global economic Superorganism. And so today I just want to share some things I've learned in the last week and the duck juxtaposition of the global economic financial situation with the global planetary ecological, situation. It's almost like a Twilight Zone episode that we are living, but also amazing, fascinating, and motivating to play a role in.

[00:01:20] So, one of the people I met with, It complimented me on this graph that, we've shown a few times, showing the hierarchy of human decision making. This isn't the hierarchy of what the median, human cares about. On the contrary, the median human cares about the things that are lowest on this hierarchy, which is the environment and the wellbeing of our citizens.

[00:01:52] But the way that power, in our system manifests this, hierarchy, this pyramid, has AI and access that supports it at the top and military and the currency markets, and economic growth and energy and politics, et cetera. In giving, I was in New York City. It made me think of the extra pyramid, which is, a financial concept named after a Fed economist.

[00:02:25] Named Exter that shows a pyramid of various financial markers of wealth. And during financial crises, there's a flight to quality where wealth tries to float down this pyramid towards safer, more tangible assets. But the pyramid is

inverted because there's vastly more wealth in derivatives and claims on claims, on financial things at the top than there are physical things at the bottom, like gold.

[00:02:57] So when the panic sets in, everything can't fit through the narrow base. it's a powerful framework which we see manifesting today with gold and silver, making new daily highs. Silver's up 50% this year. Gold is approaching $4,000 an ounce. It's a useful framework for thinking about systemic financial risk and why gold bugs, view precious metals as the ultimate safe haven when trust in the financial system erodes.

[00:03:29] However, this entire thing views the financial system as the whole system, and so, Kel Supr. Long-term viewers of this platform, will recognize that using a wider boundary lens, the biophysical extra pyramid looks even wilder. Money and credit are just claims. When you spend a dollar, it's ultimately spent on something containing energy and materials, which means all higher financial layers sit on top of the throughput of fuels, ORs.

[00:04:09] Soils water and oxygen cycling. A single barrel of oil may do the 10 years of human work. So if you remove affordable power and the whole stack shrinks regardless of interest rates or the value of gold. So in a wide boundary sense, below gold then are the unpriced foundations of our financial accounts.

[00:04:33] Which ignore ecosystems that make oxygen, buffer water, build soil, and host biodiversity services, which our economy treats as free until they're damaged or impaired, at which point the pyramid doesn't just wobble, it implodes. So our culture is energy blind and ecology blind. We mistake the rising financial claims in our world for rising real wealth, even as the Superorganism burns through its four hidden subsidies, energy, credit, complexity, and human trust.

[00:05:11] And when those physical supports tighten, paper promises will cascade down towards the real floor energy. Materials, basic needs and functioning natural ecosystems. so I think, we, need to popularize a, wide boundary extra, pyramid. And part of that, is as most of you know, oil, and let me give you an update of oil courtesy of the International Energy Agency, which last week had, a refreshing for them report.

[00:05:50] Out on, world oil data and situation, which if you didn't know the author, you might think, that it was me or one of my colleagues like Art Berman or such. because. The IEA for a long time has kind of been the cheerleader for a, lower carbon, more renewable energy, future along with continued economic growth.

[00:06:19] And I'm just going to scroll through a few of the charts, from this report here. We're looking at the, oil production by type for the last 25 years. the low, part, the, dark blue is. Conventional crude oil onshore. the light blue is shallow water, conventional crude, and the turquoise sliver.

[00:06:48] His deep water conventional crude. On top of that is natural gats liquids and. As far as I can tell, the IEA lumps least condensate into this, which makes no sense because they shouldn't be lumped together. The condensate should be part of crude oil, which, are Berman and other graphs that I show here usually shows that above that is, is tight oil, extra heavy oil, and other, biofuels and, other things like that.

[00:07:16] We can see here that. Conventional oil has been on a flat to declining plateau for a long time. And what is real oil? remember the stuff in green, often has 50% of the BTU content of a barrel of oil, and a lot of it is ethane and isn't even used for diesel and asphalt and gasoline. It's used to make plastic bags.

[00:07:44] So increasingly what's growing is things that in the past we didn't consider oil. In fact, if you look at, the accompanying chart on the right, it shows

what has grown during the five year periods of the last 25 years, and what's real oil, shown in the light blue. And the dark blue is actually declining, and we're adding.

[00:08:09] Less good things, on top. How does this shake up globally? the graph on the left shows OPEC and Russia basically flat, the last 20 years. And the graph on the right shows the countries that are growing. But it's a misleading graph because the bottom part, the dark red, is the United States, which includes light tight oil or shale oil.

[00:08:36] If they had put the United States, little section on top of this graph, all the other, ones would've been flat to declining in this. So it's, misleading. and again, a lot of this isn't really oil. here's another graph that 20 years ago when I was overseeing the oil drum, we talked a lot about in order to burn oil.

[00:09:02] you need to extract it. In order to extract it, you need to find it. and this shows how much discovery there is of oil and gas from the decade of the sixties, the seventies, the eighties, the nineties, and all the way to now. We are finding, much less oil. Cal Supr, we found the best first, and now there's a lot left, but it's smaller, more costly, more difficult to find, and many of it, of the places it's located are in places that don't like, the United States or the global North Much.

[00:09:39] so, so this graph, I've shown variations of it since 2012, where my friend run lick, and the oil drum, coined the term the red queen, which is we have to run faster and faster just to stay in place. but what this shows the alternating, shades of blue. Show all the wells in the United States that were drilled in that year, how rapidly they decline.

[00:10:09] And then you stack that on top of the decline of previous, wells that were drilled. And as you see. obviously we haven't surpassed 2025 yet, but as we are at 2025, if we drilled no more in the future, that is how quickly all these wells would decline and a similar, dynamic exists for gas. so what this means then,

globally and Exxon, had a similar chart in their recent, annual report is the natural decline lay rate of global conventional, in dark blue and unconventional shown in the light blue.

[00:10:57] If we did nothing. This is what would happen to all the existing oil production in the world. We would go from roughly a hundred million barrels a day to around 16 million barrels a day in the next 25 years. Obviously this would have unbelievably massive implications for the global economy and beyond.

[00:11:20] However, there are things that we add into that. We add, projects that are approved but not yet drilled. so they've got financial approval and out to 2050, this is, those projects, around the world and in various continents. They add up to 8 million barrels a day, declining down to 2 million barrels a day with that additional production.

[00:11:49] So, in this graph. that is the, stacked areas in, the red and the blue on top of the light blue. and then we have other potential approved and unconventional projects in that are, on the, horizon. But there's a massive gap even between this scenario and. What is expected to be needed and demanded in the world?

[00:12:20] And briefly, the concept of peak oil was originally just focused on the supply of oil in the world based on geology. It's a finite substance. It took millions to tens of millions of years to form. We're drawing it down. In 150 years, what took 10 million years to sequester? It's finite. so there's a supply issue.

[00:12:45] There's also peak demand, which I never really subscribed to, which is, the stone age, didn't end for lack of stones, and the oil age will end because. We drive electric cars or we need something else other than oil. I find that very fanciful because one barrel of oil does 10 years of my work, when combined with a machine that's indistinguishable for magic, we don't likely walk away from such.

[00:13:14] Fossil pixie dust. I actually think peak affordability is a much more important concept, which is if we're in a recession and all the prices go down and oil is $40 a barrel, A lot. Demand and affordability will go down below that because people won't be able to afford the GI Joe with the kung fu grip or, the Chevy Chase, vacation to Disneyland.

[00:13:45] affordability will go down more than oil production and then that will create a, positive feedback loop in a negative sense because at $40 oil, the United States won't be drilling. for more oil, we need higher and higher prices to access the dregs or, the things near the source rock.

[00:14:08] So this is all to say. The IEA without any fanfare, and frankly, without even using their own graphs, they're using ryad energy graphs, is painting a picture of supply constraints, and we're going to need massive investment in the world into oil and gas infrastructure to avoid, steep declines. so the other thing I want to comment, about peaks generally is we show, at least back in the day in the peak oil community, these symmetrical curves that show the up slope and the down slope as if it's a normal curve.

[00:14:51] But we have to remember that these curves are geological forecasts, but the down slope of anything is a socioeconomic political event. So once we're past peak in a central resource, we are in unsorted territory where human systems will matter. Way more than geology. Peak oil graft are really just suggesting to us.

[00:15:16] The date when we lose control of the narrative. The up slope was written by geology and economics, and the down slope will be written by crisis management or mismanagement. And we can see, we don't, you know, here's the other thing. 20 years ago when we were writing on the oil drum, we got some things wrong.

[00:15:37] There were a lot of shrill voices that were calling for calamity as soon as the date of peak oil was reached, but. A lot of people in our culture, were talking

about oil and oil depletion and the centrality of oil to our, our lifestyles. Now it's like crickets, and everyone I know in the oil industry takes it for granted that oil is peaking now or in the new future.

[00:16:02] The United States is likely already peaked. Permanently, we had 13.6 or 7 million barrels, and now we're down to 13.2 and we need 50 or 60 barrel, dollar a barrel oil, just at a bare minimum to keep drilling. Yeah. And all of a sudden it's snuck up on us that we are in the midst of the, I mean, technically the date of peak oil, so far is still November, 2018.

[00:16:30] We're almost seven years beyond that kind of bumping around adding ethane and plastic bags and, other things to the total. but we're generally there. And the larger point is Russia, China. Saudi Arabia, the CIA, you know, these entities are well aware of the game theory of the master resource, and so look at what's happening in the world in the Middle East, in Ukraine and Russia, choosing sides with bricks and alternative currency systems.

[00:17:08] These are all in response to a growing. But not publicly acknowledged, recognition of limits and how are we going to, who's going to control, what's left on the down slope. I've joked but not really joked, about the concept of draining America. First, that a wise country would print money, keep their oil in the ground, and use the money to buy other people's oil.

[00:17:39] How long is it before some nations start to do that? start to recognize how important this resource is, to the way the world works today. and the scale and magnitude of our system and, throttling down their internal production, to save for a rainy day. Because oil in today's world is very much, is.

[00:18:04] Power. so, last but not least, I was in New York, and I didn't do another podcast with Johan Strom because he was too busy. But he announced, in the Planetary Health Check that we have exceeded a seventh of the nine planetary boundaries. we've already, exceeded novel entities, which is, plastics, endocrine

disrupting chemicals that are as deep as the Marianas trench and found on the North Pole.

[00:18:39] we have a teaspoon of plastic in our brains, et cetera. There's climate change. There's a CO2 concentration, and also the radiative forcing of making things warmer. There's biosphere integrity, there's land system change, there's freshwater change, there's the, biogeochemical flows of phosphorus and nitrogen.

[00:19:00] But now we've breached, the ocean acidification, limit, and I'm sure this stuff is, there's, not like a. Actual physical. Yeah. In April 3rd, we breached, the planetary boundary on ocean acidification, but the oceans have absorbed, around 30% of the carbon dioxide that we've emitted, and they've become 30% more acidic.

[00:19:23] They've also absorbed about 90% of the warming. So, As we hit all time highs in the financial markets, all time highs in silver and gold, we are hitting all time lows in the functioning and the stability of our global ecosystems. And I found it fascinating to be in New York where my people, the people that are studying and concerned about ecology, future generations, other species, deep time and earth were just laser focused on.

[00:19:57] what do we do and the crisis that we're in, from the ecological perspective, including, one gentleman who's an expert on, geoengineering thinks it's 90% likely that in some form we will send up 24 7 airplanes, into this sky spring sulfur perpetually, just to buy us time functioning as, Mount Pinatubo volcano with the sulfur dimming effect.

[00:20:25] I don't subscribe to that, but I, think it's plausibly, correct that we will be forced to do that when we see things, unravel so much on the warming front. So, this is a little bit of a grab bag of things that I've been in my, working ram. this past week. They're all connected.

[00:20:50] We are all connected, and it is my hope that normalizing these conversations, result in some unknown responses. in the future. Peak oils here, planetary boundaries are being exceeded. after basic needs. The best things in life are free. More to say very soon. I hope you're all well.