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[00:00:00] **Art Berman:** This is a world-changing event, whether it's oil, whether it's LNG, whether it's fertilizer, food, geopolitics, currency, finance. We don't have an infinite pot of resources, and the winners are the ones that have the most access to it. And by the way, World Wars I and II were won and lost on the basis of availability of oil.

[00:00:23] We are not going back to January 2026, and at some point we're gonna see a version of what happened after the first oil shocks. This is not gonna play like that movie did

[00:00:41] **Nate Hagens:** Today I'm joined by longtime TGS guest Art Berman for a wide boundary update on the geopolitical and energy situation surrounding the Middle East and the Strait of Hormuz, looking beyond the chaos of the day-to-day events towards the longer term impacts for the supply and circulation of oil, gas, and other critical materials.

[00:01:05] Art Berman is a petroleum geologist with over 40 years of oil and gas industry experience. He is an expert on US shale plays and is currently consulting for many E&P companies and capital groups in the energy sector. In this conversation, Art and I dig into the buffers that have kept some parts of the system afloat, even while others have already begun to feel the pain of expensive oil and natural gas prices.

[00:01:32] More importantly, Art explains that while these buffers prevented some of the most immediate consequences that many analysts warned about, the resilience in the system is now quickly wearing thin, leaving us on the precipice of

The Great Simplification

the, largest energy shock we've ever seen, mmm, with almost no slack left, unless things change.

[00:01:58] All the while, the power lines of geopolitics are rearranging as countries realign themselves with the materials and resources and protection they'll need amidst an uncertain and rapidly changing world

[00:02:16] These are interesting but serious times that we live in, and no one human can carry it all. I appreciate each of you continuing to tune in, and learn what's happening in our world alongside me and my guests. With that, please welcome Art Berman. Arthur Berman, welcome back to The Great Simplification.

[00:02:40] How are you?

[00:02:41] **Art Berman:** I'm well, Nate. Good to see you again.

[00:02:44] **Nate Hagens:** Good to see you. It's been a minute. So, last you were on in May, I believe, and now we are timestamped, this is Saturday, September 19th. Lots to discuss, lots going on in the world, lots of things you speculated about that are coming true, in, in our last conversation.

[00:03:07] Let's start super broad. What is the US-Israel-Iran war revealing about the condition of our larger global economic system?

[00:03:19] **Art Berman:** What this is revealing is that we cannot run and we cannot hide from a system which is completely dependent on increasing flows and increasing rate of growth in energy supply, and yet has had a decreasing rate of growth in energy supply since the late 1960s.

[00:03:50] So the world has been using all sorts of very clever means of adapting to that underlying fundamental problem now for more than fifty years, and pretending or hoping that it'll all be okay. And what the Iran war has done is kind

The Great Simplification

of rip the Band-Aid off of that and just show how fundamentally dependent we are on ever-increasing energy growth.

[00:04:24] And you suddenly remove, you know, let's just say ten million barrels a day, like almost overnight, and it just reveals, you know, just how incredibly unprepared we are for a blow like that, much less just the ongoing status quo.

[00:04:44] **Nate Hagens:** You said that energy, the amount of energy we have continues to grow year by year, with the exception of two thousand and eight and two thousand and twenty, but that the rate of growth peaked in the '60s, late '60s and '70s and has been in decline ever since, which I think is an important thing to note.

[00:05:05] Is that coincidence that the same thing is true with population and population growth rates?

[00:05:13] **Art Berman:** Yeah. So there's so many things here. First of all, we have a global system, a civilization that requires enormous stocks and flows of energy. And whether we like it or not or prefer it, 80% of that is still fossil fuels, and oil is by far the most important component of the fossil fuel category.

[00:05:43] And so all of our ingenuity and innovation and technology, it looks like we're, you know, we're getting farther and farther ahead, but that's... The part that's unseen is that every technology and every innovation requires increasingly more energy to support it. And, I guess the part that is not clear to most people is just how much energy is required as overhead just to support the system we have, not grow it, just to keep it up and running.

[00:06:28] That is an absolutely enormous thing to have at the scale of 8.2 billion people. And that's why increasing the rate of energy growth is so important to all of the stories that we tell ourselves about ourselves and about our wish for a

The Great Simplification

better future. it's, a, it's not something that is, known by most people or understood

[00:07:00] **Nate Hagens:** I would've thought, and you would've thought, and we both did think that the February, shot across the bow, as it were, would have woken people up to this.

[00:07:14] now we're in September. Some people are waking up to it. Certainly countries outside of the United States, countries in Asia and the Middle East are f- really suffering and, having rationing and shutting down industries and other things. They're w- well aware of it. But here, it seems like there is a delay in the recognition of our dependence on energy, the recognition that technology is but a passenger in a physical car run on energy and materials.

[00:07:53] Why haven't things been more catastrophic than one would've originally thought, losing 10 million barrels out of 100 million, per day?

[00:08:04] **Art Berman:** So that is, that is the, you know, among the core questions and, and, a difficult one. and, the simple answer is, as you alluded, first of all, it depends on where you are, okay?

[00:08:20] But, you and I are, both in the United States, and so let's just talk about that for a moment. And here in the United States, my life has not changed very noticeably as far as the things that are available to me. Now, the price of some things is higher, but, I mean, it's not like the bottom has fallen out.

[00:08:46] And so why is that? and part of the answer is that the United States has a tremendous endowment of all natural resources, but particularly oil and natural gas and coal. So we are in a much better place than, say, the parts of the world that are hurting, which are predominantly Asia and parts of Africa that essentially have no indigenous energy resources of their own.

The Great Simplification

[00:09:16] **Nate Hagens:** And Europe as well. I would include Europe in that list.

[00:09:20] **Art Berman:** Fair enough. Europe used to have a fair amount of energy resources, and they've pretty much blown through them. And I think the second part, though, is just how remarkably and impressively adaptable the energy system has shown itself to be.

[00:09:41] It surprised me, Nate. I mean, I... When we talked about Iran a couple of months ago, you're right, I got, you know, I got the diesel prices and some of the product prices right, but there were some things that I didn't get right. And I thought that, you know, that this Hormuz restriction was gonna be an immediate heart attack for the world.

[00:10:07] Most of the analysts that I respect were pretty much in the same boat. So we were all wrong to some extent. and what we were wrong about is just how amazingly, cleverly the system adapted and adjusted. And so instead of losing 20 million barrels a day, we ended up only losing maybe 10 million barrels a day because there were all sorts of clever things.

[00:10:35] There were bypass pipelines. There were strategic petroleum reserves that we could draw on. And then there's this mystery of China deciding to stop importing four and a half million barrels of crude oil a day. So all of those things just kind of stacked up and what should have been or seemed like it should have been, you know, a trip to the emergency room turned out to be, you know, a trip to the drugstore for, you know, some Tylenol.

[00:11:05] **Nate Hagens:** Is the trip to the emergency room on the horizon?

[00:11:08] **Art Berman:** We're getting the car warmed up right now, I think, Nate.

The Great Simplification

[00:11:11] **Nate Hagens:** Okay. I wanna cover two things. First of all, you mentioned the Strategic Petroleum Reserve. I mean, there's different ones in different countries. Let's talk about the United States. my understanding– Mm–hmm

[00:11:24] is at 40, 50–year lows, and there's not so much lower we can go before those caverns start to not be able to function. Can you give us an overview of that situation?

[00:11:36] **Art Berman:** Right. and there's a lot of controversy. Let me just say, first of all, everything you just said is 100% right. What I'm gonna say next is not to in any way discount it.

[00:11:47] It's to say that because we've never been at these levels, no one, including the Department of Energy, really knows, well, what is the level at which we run into big trouble? And so the Energy Information Administration, about three or four weeks ago, suddenly pulled down all of the data that it had on strategic petroleum reserves and posted a notice and said, "Okay, we're kinda revising what we think about this."

[00:12:16] And the revision did not particularly satisfy me. But what I feel like I can say with a fair amount of confidence is that we are... If we continued to draw on our strategic petroleum reserve the way we did in the first few months of this crisis, we would be somewhere near that critical level. Now, the rate of withdrawal, and again, you know, this is a theme that I'm gonna emphasize throughout everything I talk about here, there are– there is the absolute amount of oil that you're either adding or using or drawing, and then there's the rate at which you draw it.

[00:12:59] And the rates are always more important, certainly for, well, for me, but also for markets. And the rate of withdrawal from that SPR has reversed, okay? So June was the maximum rate of withdrawal. So we're still drawing every, every

The Great Simplification

week, but we're only drawing a couple of hundred thousand barrels a day per week, whereas before it was millions.

[00:13:26] Now, that– that's not good news. Don't get me wrong. I don't wanna, you know, I, I don't wanna give the wrong impression.

[00:13:32] **Nate Hagens:** Is that because they're trying to save it for a rainy day or because they can't find the pairing type of oil to make the product from?

[00:13:40] **Art Berman:** Honestly, Nate, I don't know, except to say that for as many questions and doubts I have about the judgment of some of the people in the United States government, the United States government is not dumb.

[00:13:57] **Nate Hagens:** Well, I mean, as a citizen, I would assume that is a last resort safety valve, that if we're in a depression and we can't get product to businesses and farmers, let's tap the Strategic Petroleum Reserve. I don't think it ever was intended to make a political statement that gas prices are too high in a time when the stock market is near all-time highs and the economy's growing.

[00:14:29] Anyways, but what happens when global inventories are drawn thin and we can't rely on the SPR much, and there's still 10 million plus barrels missing from the Middle East, we are then either much higher prices or demand destruction, meaning someone does, goes without, or both. Yes?

[00:14:59] **Art Berman:** And it's both. It's absolutely both.

[00:15:03] and these are difficult volumes to measure with reliability in real time. And so if you look at the International Energy Agency's latest oil market report, they're talking about numbers in April and May because those are the numbers about which they have confidence. Well, April and May was, you know, might as well have been, you know, in another lifetime compared to what's going on today.

The Great Simplification

[00:15:35] **Nate Hagens:** So let me ask you this. you point out the resilience of what we refer to as the economic superorganism that we adapted to this shock. When does that resilience become a full-out depletion of the buffers that made the resilience possible? Do you have any forecasts of that?

[00:15:55] **Art Berman:** I think we're there.

[00:15:57] Yeah. I mean, I think we've probably been there for weeks. But you mentioned in the beginning of our discussion this latest, attack on the Saudi Aramco pipeline– Yeah ... that bypasses the, the Persian Gulf, and I think that was, that, that was certainly not the trigger for a realization that we're pretty much at the end of our buffers, but I think it, it, tied a bow around that fact that if, suddenly, you know, 5 million or 4 million barrels a day of our supply is no longer available, that, that pushes you over the edge.

[00:16:39] That pushes you to say, "Okay, you know, n– now we've got a serious problem."

[00:16:43] **Nate Hagens:** So there's a narrow boundary, perspective on what you just said and a wide boundary one. The narrow boundary one is our buffers, the SPR and China's extra stocks and the floating amount of oil that's on ships. But in a way, civilization's buffers of low entropy, high quality liquid, hydrocarbons are also known as the Middle East.

[00:17:10] Maybe the world shouldn't be considering those as well, we're gonna eventually use that oil. I'm, I mean, I think this not only has an economic where are the barrels going, how much can we produce, how, damaged are the fields in the Middle East because they were shut in, and all those questions But as we talked about, I think, in our May conversation, where are the longer term alliances and contracts, and is the oil going to flow northward and westward, the way it once

The Great Simplification

was when we had, unipolar military superiority and all our bases and status quo, and now that's all up in the air.

[00:18:00] So this gets back to what we were talking about 20 years ago about the carbon pulse and the eventual peaking of oil might likely be more about above ground factors, some of which I just mentioned, than strict geological depletion. What do you think of all that?

[00:18:19] **Art Berman:** There are so many layers to what you just said.

[00:18:23] **Nate Hagens:** I know.

[00:18:23] **Art Berman:** I know. And, so the first layer is up until now in this conversation, we've been talking about flows, and flows are very important. But stocks are ultimately much more important. In other words, how mu- wh- where do the flows come from? And the flows come from fields. And the best information that we have today is that 14 million barrels a day of Persian Gulf production is shut in.

[00:18:58] 14 million barrels.

[00:19:00] **Nate Hagens:** Not sitting in storage and missing from the world, but actually shut in. The fields are shut in. Shut in. Has that ever happened in the world before that much?

[00:19:10] **Art Berman:** No.

[00:19:11] **Nate Hagens:** So this is a, and equals one experiment. We don't know what h- what's gonna result from that.

[00:19:17] **Art Berman:** Right. So we ha- we have had other oil shocks, and right away, I mean, a shock implies that it's something temporary, and it'll go away.

The Great Simplification

[00:19:33] economists invent these terms because, well, because. But the historical oil shocks in the 1970s and the early 1980s, those were comparable in size to what's happening right now as a percentage of total supply. In other words– Mm–hmm ... the world uses a lot more oil today than it did in– Right ... say 1980. so the amount of oil that we're losing right now is actually more, but as a percentage it's about equal.

[00:20:09] Now we have to step back just to understand what happened then, not that it will be repeated. But that shock, and let's just talk about 1979, 1980, '81, that was the Iran–Iraq War. That was the beginning of the Islamic Republic of Iran. The effects of that on the global economy and on oil prices and on oil production lasted 15 years.

[00:20:42] Okay? So call it whatever you want, call it a shock, call it a, you know, long COVID, but the world did not get over that shock very quickly.

[00:20:55] **Nate Hagens:** And we had lots of oil in the ground after that. We don't have as much as, both absolute and relative than we did then.

[00:21:03] **Art Berman:** Well, so in my view, there are probably more reasons why things were easier to recover then than now.

[00:21:15] One of them was that higher prices led to a flurry of oil exploration, which paid off in a big way, principally with deep water production. I could go into, in, into some others. You know, the Soviet Union fell right after that, and a lot of oil was suddenly available for international development.

[00:21:47] And so we had a much bigger base of proved reserves and undiscovered potential than we do right now. and that's just simply a question of scale and timing. We've had, you know, 45 years and a population increase of, you know, let's just say a doubling. And so the fact that we don't have nearly as

The Great Simplification

much to go back and try to, you know, replace or discover shouldn't be surprising, but people don't ordinarily think this way.

[00:22:25] So that's a problem. The second problem, though, is that back then, I mean, oil was pretty much it. I mean, fossil fuels were pretty much it. We didn't have, you know, wind and solar. We didn't have a climate change problem that we knew about. And so you gotta have energy, so you're gonna go for the energy that you have and you know.

[00:22:51] We have had a, a, a big change in our investment mindset, and so we've just been through 20 years of, well, we don't like fossil fuels anymore. I mean, I'm not saying I don't or that I do, I'm just saying this is kind of the investment mindset, that we're gonna have a green revolution. You know, we're gonna go to electricity.

[00:23:12] And so the future is in other energy. It's new energy. It's not in old energy, okay? And the investment market has been quite convinced about peak oil demand for some time. So you have, okay, we think this industry is a twilight industry, is basically what the markets have been hearing consistently for 20 years from political leaders and from experts.

[00:23:39] So who the hell wants to invest in deep water exploration or Arctic exploration, or more relevantly, to build new oil refineries, to make more diesel? Nobody wants to do that. These are high capital upfront expenses that are, you know, 30, 40-year life. Who wants to put their money into something like that?

[00:24:04] No one does. So it's a completely different investment environment than it was in the early 1980s.

[00:24:12] **Nate Hagens:** But if you look at an aerial view of society, and you started this conversation by saying we need not only flat, but increasing energy

The Great Simplification

availability every year What are the people choosing not to invest in drilling and refining, how do they think we're gonna increase our total amount of energy, with solar and wind?

[00:24:39] **Art Berman:** Well, again, this gets back to what might seem like a subtle point to, you know, to many people, but increasing our supply of energy, while that is important, is not what matters. It's the rate of increase, and the rate of increase is getting slower and slower But the demands that the economy is making on energy are not decreasing, and the scale of the system is so large that to maintain it now requires more than it did to supply the whole thing including growth 40 or 50 years ago.

[00:25:25] All I'm saying is that it used to be growing at two million barrels a day, and now it's growing at one million barrels a day or... And, of course this year and next it'll be a lot less than that. But it is that rate. We're not growing the rate of increase fast enough, and that has very important consequences.

[00:25:44] **Nate Hagens:** So 10 years ago or so, and I think in my book, I had a concept that I called the biophysical gauntlet- Mm-hmm ... which was would prices for energy, in this case oil, be high enough to spur investment of the next generation of supply, but too high for a debt-laden economy and- Mm-hmm ... strapped consumers to afford?

[00:26:11] And, you know, wartime volatility also makes it harder to commit to long-term cycles. So did this crisis widen or narrow that band between what producers need and what consumers can pay? And what will that do to investment in the oil and refining sector going forward?

[00:26:29] **Art Berman:** Well, the honest answer is I don't know.

The Great Simplification

[00:26:34] But I will speculate, because you asked an important question. What an investor has to look at is In the 1980s, we did not have a fragmented energy system. We had a Soviet Union that was weakening. We had a Western bloc, which I guess was strengthening or kind of winning the Cold War. But energy was, pretty much, a globalized system.

[00:27:10] That's not the case today. We have a highly fragmented energy system. We certainly have China and Russia that are actively trying to reorganize, energy flows and currency flows around their preferences. And, then we have all these wars, Ukraine and Iran, to, you know, to mention the, the, the two most important ones.

[00:27:38] And so we have a fragmented system. and, a point that I have to make is that all of this adaptation that we've discussed, it isn't free. Okay? So you can get barrels out of the Persian Gulf that a few months ago we couldn't, and so there are these special shuttle vehicles that shuttle oil from a tanker inside the Gulf to a tanker outside the Gulf.

[00:28:11] It takes... There's risk, there's liability, but that's happening. You know, they do ship-to-ship transfers between a tanker inside and a tanker outside. Okay? So great. Chris Wright, our energy secretary, says, "Hey, you know, we're getting twice as much oil per day out of the Persian Gulf as we were a few months ago," and maybe he's right.

[00:28:31] But it isn't free. It comes with a cost. Those transactions cost money, and they cost time. Okay, so then you get it... y- you put oil in a pipeline that goes across Saudi Arabia to the Red Sea, and you say, "Okay, look, how great we are. You know, now we've got five million barrels a day that's available that wasn't before."

[00:28:55] Brilliant.

The Great Simplification

[00:28:56] **Nate Hagens:** Until the next drone.

[00:28:58] **Art Berman:** Well, yeah, that too. But it goes to the Red Sea. All right? The Red Sea, first of all, wasn't designed to take oil to Asia, but now you have the Houthis, I mean, before the pipeline explosion. And so- The oil was being rerouted north through the Suez Canal, and there are logistical problems with that, but the bottom line is, A, takes more time, B, costs more money, and with a success case, now you're in the Mediterranean.

[00:29:35] Well, that doesn't help Asia at all. That's not where Asia gets its oil from. That's where the Atlantic Basin gets its oil from. So now you've got the whole oil system in the wrong place at the wrong time. So the, y- you know, the, the headline is, "Yay, we're getting more barrels out of the Persian Gulf."

[00:29:56] The, you know, read the article and the article says, "Yeah, but that's not so great because we're adding there's a lot more friction in the system and we're not getting the oil to where it needs to be."

[00:30:07] **Nate Hagens:** Well, it's kind of Orwellian, some of the comments that senior political officials have had.

[00:30:17] I think President Trump this week said around the time or just after the election, this war will be over, and the price of gasoline is gonna drop like a stone. I think if the price of gasoline drops like a stone, it could mean that we're in a deep recession or depression. Otherwise, it's not gonna drop like a stone, no matter what happens with a memorandum of understanding or a peace, because there's so many parts and components of the apple cart that have been upset by this.

[00:30:52] But let's just assume that everything is smooth sailing and there's a fraternity and goodwill, and the war is over. How does that really change the flows

The Great Simplification

of oil, and where they go and the production? And you mentioned how many million barrels are shut in. How's that gonna come back online fully?

[00:31:15] Is it all gonna be in the open market? What happens if we d- don't have the military bases there anymore, and the reason that a lot of Middle Eastern countries made deals with us is that we would protect them militarily? To me, I think, economic depression aside, these are now the new floors for oil and refined products, not the ceiling going forward.

[00:31:44] **Art Berman:** Well, those are some very important observations, and, going back to the 1980s, that's exactly what happened, that oil prices got to, like, \$145 a barrel or something like it in today's dollars. And then from 1986 until the end of the 1990s, they were, like, \$45 a barrel, and that was because much of the world, particularly the developing world, was in fact in an economic recession of major proportions.

[00:32:21] Okay, now, the United States was able to recover from that, but that, you know, that, that's another conversation. But... I think the other thing that people have to understand is that in your scenario Peace breaks out tomorrow or after the election or whatever, okay?

[00:32:45] **Nate Hagens:** Mm-hmm.

[00:32:45] **Art Berman:** So, I mean, we still have months and months before anything like normalization of shipping channels in the Persian Gulf recovers.

[00:32:59] I mean, these oil tankers are hundreds of millions of dollars of hardware carrying hundreds of millions of dollars worth of oil, and they have to carry insurance, and they have real people that are running these things. And in order to get the, the person or people in the shipping companies to say, "Okay,

The Great Simplification

let's go," that's a whole 'nother decision down, you know, downstream of the political leaders making an agreement.

[00:33:31] And, I mean, you know, we just had a, a tanker hit a mine last week. and so nobody knows how many mines are in these shipping channels. Probably not the Iranians either. So it's going to take a considerable amount of time after peace breaks out, assuming that ever happens, before anyone is comfortable with the risk of moving their ships through the strait.

[00:34:00] So, that's number one. But the real concern is the production. I, in my life, have worked for companies that have production. I don't own any myself and never have, but I've acted for them, and I'm gonna tell you that the very last thing that an oil producer wants to do under any circumstance is shut in an oil well.

[00:34:31] Even if it's just for maintenance for a couple of days, you don't want to do that if you can avoid it because you never know what is gonna happen on the other side of that decision. And the reason for that is this is a plumbing system of massive complexity, okay? We just had some people working in our neighbor's yard yesterday on his main water line, and they shut off my water for five or 10 minutes.

[00:35:06] Okay, when I turned it back on, you know, it was spitting out the sink. There was brown water. It took several minutes for the pressure to equilibrate and the water to turn back to, to clear. Okay, that's in a, you know, a very short length PVC pipe. All right? In, in the case of, oil production anywhere, you're talking about thousands of feet underground And thousands more feet away from that pipe in rock.

[00:35:43] Okay? This is not a PVC plumbing system. These are pore spaces in a rock, and to try to reestablish communication through all those microscopic tortuous pathways is among the riskiest things that you can imagine. And so my

The Great Simplification

guess, and nobody knows, but from experience elsewhere, my guess is that probably five to 15 or 20% of that production, once it's turned back on, will never come back to levels that it was before.

[00:36:24] Whatever returns will take a whole lot longer than me turning on my faucet yesterday. It's gonna take, in the best case, it'll take weeks to months to reestablish those pressures.

[00:36:39] **Nate Hagens:** Talk to me, a little bit about the importance or the different signals that crude oil markets are giving relative to refined products like diesel fuel, jet fuel, and the like.

[00:36:54] my understanding is, the diesel equivalent price of oil right now is over \$200, and in China and other places it's, like, \$240 or something like that. Meaning if you were to buy a barrel of diesel, it would be more than two times what a barrel of oil would be. What, what's going on there and how's that gonna unfold?

[00:37:17] **Art Berman:** Nobody that I know owns a barrel of oil. I mean, the only people who buy oil are refineries.

[00:37:25] **Nate Hagens:** Right.

[00:37:25] **Art Berman:** Okay? And if I owned a barrel of oil, I don't know what I'd do with it. I mean, I can't put it in my car, I can't, you know, I can't put it in my lawnmower. I mean, so what people buy and what people need are the refined products that come out the other end of a refinery.

[00:37:41] We need gasoline, we need diesel, we need jet fuel, we need kerosene, petrochemical feedstocks, all of that stuff. Okay. So what's been happening is that before this war began, we already had a restriction in refinery capacity for the

The Great Simplification

reason that I described before, which is what some people would call under-investment.

[00:38:07] The bottom line is that nobody's building new refineries. The only new refinery I know of that's been built in recent years is Dangote in Nigeria, and that's a big one, so that's important. But for the most part, nobody's building refineries.

[00:38:22] **Nate Hagens:** What are we thinking? What's the aggregate intelligence there if no one is building refineries?

[00:38:27] We'll just invest in maintenance and let ours go a little bit longer? Or someone else's problem 2040, when we're gonna need refined products.

[00:38:35] **Art Berman:** We're all gonna be driving electric vehicles and living off of electricity.

[00:38:41] **Nate Hagens:** But even if we buy an electric car, Art, you're well aware that parts of the barrel of oil go to the plastics that are in the electric car and the asphalt that makes the roads and all the other things, so we're still gonna need the oil to be refined.

[00:38:55] **Art Berman:** Well, now you're, into complex thinking, Nate, and that's not the way that a lot of people think. And there's a narrative out there that you deal with every day and I deal with every day where people say, "but, you know, we don't need the oil." We're just gonna... We should have started building out renewables 50 years ago, and then we wouldn't have this problem.

[00:39:20] and don't get me wrong, I mean, I am, I'm not against renewables. I mean, I don't know how you can be against an energy source. They just have different capabilities than oil, natural gas, and coal. and The idea that you can run

The Great Simplification

the global economy on anything other than fossil fuels in the main part, for now, is a fantasy.

[00:39:50] It can't be done.

[00:39:51] **Nate Hagens:** Run the current global economy. We could run an economy, perhaps.

[00:39:55] **Art Berman:** Oh, we could absolutely run an economy, but not an economy that would support 8.2 billion people. Yeah. It'd be a very different civilization, and in many ways, I think a better one. It's just that, you know, you don't get from here to there in a single step.

[00:40:12] I mean, you're talking about a long transition.

[00:40:15] **Nate Hagens:** So let me ask you this. we had an energy shock in the '70s, and- Mm-hmm ... society responded to that. We had nuclear build-outs and efficiency standards, and they, f- found oil in the North Sea. And today's options, the way things are going, are faster electrification, a return to coal.

[00:40:41] Have you seen China's 2027 expected gigawatt expansion of coal? It's massive. What else? Resource nationalism, stockpiling, and different countries are doing different things. So what do you think this 2026 Iran war energy shock could be setting in motion? And does the shock speed up or slow down the energy transition story?

[00:41:11] **Art Berman:** Well, first of all, let me just say there never has been an energy transition. This is a lovely story and it's just not true. I mean, there... what, what has existed, and I'm talking about, you know, since 10,000 years ago, have been energy additions. And so early man used human and livestock muscle, wood, and other biomass.

The Great Simplification

[00:41:42] Okay? The amount of biomass that is used today is pretty much the same as it was in 1800. We didn't have good records back then. So we never stopped using biomass. We simply layered on coal on top of it. But as a world, we have, at the very least, over the last f- 20 or 30 years, we've, actually, we've, kept our coal consumption flat or increased it slightly.

[00:42:11] So biomass, we never decreased it. Coal, we never decreased it. Then we got oil, and we added that on top, and that's never decreased. Natural gas came later. That's never decreased. Hydro, nuclear, all those things, we kept adding them on top of each other. We never transitioned from anything to anything. I'm not bringing this up because it's a semantic problem.

[00:42:35] It's that the entire mindset that our investment world is in is one of substitution. We're gonna substitute renewables or EVs or whatever for our current system, and yet there's no historical precedent for ever doing that. That doesn't mean you can't do it. It just means that the probability is quite low, and certainly the probability is low in the near term.

[00:43:02] **Nate Hagens:** What's this gonna change?

[00:43:04] **Art Berman:** I mean, everything has changed. We just don't know it yet.

[00:43:07] And so what I think is most probable is that we'll see a run-up in prices, which we're seeing right now. We're gonna demand destruction. It'll vary from place to place depending on the capacity of that location to get its supply chains and deal with the financial fallout.

[00:43:29] And at some point, we're gonna see a version of what happened after the first oil shocks, which was, in that case, a decade and a half of essentially global recession and depression. That's why we had low oil prices. And as I've

The Great Simplification

said, this is not gonna play like that movie did because the scale of our economy and the complexity of our economy today is so much greater than it was in 1980.

[00:43:59] **Nate Hagens:** What about US shale? What's happened since February? What did US shale do in response to this crisis? What didn't it do, and what does that imply about shale for the next five years?

[00:44:15] **Art Berman:** It's no longer viewed as having the potential to make a difference. It's part of the background.

[00:44:23] **Nate Hagens:** Oh, so they know that we're producing 10 million barrels or whatever, but it's not gonna double, and we don't have, like, totally new green pastures ahead on shale.

[00:44:36] **Art Berman:** Right. But for years— Every day when I get online, you know, it's, "Oh, there's been this great new breakthrough. We've got this new drilling technology. We've got this new chemical. You know, shale is to the moon, and it's, you know, it's, a, world-changing event," and there's no end to it. And for the last, well, longer than six months, for probably a year, that's gotten real quiet.

[00:45:04] **Nate Hagens:** People are, not dumb, Art. No. And we've got five-year or 10-year treasuries today at 5%, which is a new thing. Mm-hmm. We're \$40 trillion in debt. We're not building new refineries to speak of. We're, we've peaked in all the shale plays except for maybe the Permian. our relationship with the fossil bank account in the Middle East is deteriorating.

[00:45:38] Our missile banks and our military bases in the Middle East that provide the security architecture that supports those flows are waning. We are losing the carte blanche gravitas respect of the world, especially because a lot of countries in the world are having to pay through the nose for energy, gas and natural gas and oil and diesel, which are a much higher percent of their daily

The Great Simplification

purchases than the United-- they are in the United States And renewables are adding to the system, not replacing it.

[00:46:19] It does not take a genius to connect those dots to come up with quite a risk-prone outlook for our energy and economic and social situation in the next 18 months. And yet, y- the narrow boundary views, AI is here, stock markets are up, what's there to worry about? We'll figure out this Iran situation and oil prices will come back down.

[00:46:49] It still boggles my mind, how people aren't... Well, I guess, the DiCaprio movie, the Titanic hit an iceberg, and for the first third of the movie, the band was still playing and, all the things and the human drama on the upper decks. Anyways, what do you think about all that?

[00:47:09] **Art Berman:** I agree with you, but I, the...

[00:47:11] I mean, the technology myth, and when I say myth, I don't mean... I mean, I mean it in the literal sense, that it is a mythology. It is a magical story. and it has been a pretty incredible story. I mean, the technological advances that we have seen over the last couple of hundred years, have been absolutely mind-boggling.

[00:47:39] It's true.

[00:47:40] **Nate Hagens:** With a tiny little asterisk, every one of those years- A big asterisk ... with the exception of recessions, depressions, and oil shocks, we had more energy every single year to support that technology.

[00:47:52] **Art Berman:** The two things are part of the same process. That is exactly right. And so the popular conception, and when I say popular, I don't just

The Great Simplification

mean the people, I mean among very sophisticated investment analysts and, fund managers, is we've always figured out a way.

[00:48:13] Surely we will find one this time. That has been our history. Technology always comes through. As an example, the, the green revolution in agriculture is the textbook story that, I mean, that, supposedly disproved, you know, Thomas Malthus and all of these, you know, these economists that felt eventually food would be the, you know, the constraint on human population growth.

[00:48:41] That, fertilizers and all of the, the, mechanized agriculture that, that came into being after, pretty much after World War II did tremendously increase the productivity of agriculture. But as you-- but it all has a cost, and that came at a time when energy supply, energy consumption was increasing at fantastic rates and then there are the externalities, the pollution that comes from all that fertilizer, the depressing water tables, the, the salt that, that forms in the soil, all of these things.

[00:49:19] So everything-- nothing is free. Technology has great benefits. It has an energy cost, it has an environmental and ecological cost, and it has a human cost, and eventually you reach a point of diminishing returns with all technologies, and that's the part that I think some people don't either fully understand or would prefer not to understand.

[00:49:46] **Nate Hagens:** If we do another podcast in six months, I f-- I believe some of these things are going to seep into our psyches more, unless there's some miraculous, stick save here, in, in the global markets. Let me ask you this. We focus on oil because you're an oil expert, but Qatar has LNG and a large share of the globally traded urea and ammonia and such move through the same choke points.

The Great Simplification

[00:50:23] I'm hearing from multiple people that there's going to be a caloric shortfall in 2028, if not 2027, and part of that is due to the lag of fertilizer shortfalls being, one or two growing seasons later. But also there's a massive drought in Europe where they can't even sow the fields to plant next year's crops, and we've got the Super El Niño, which hasn't fully reared its head yet.

[00:50:55] That's gonna be next year. And Ukraine and Russia, large grain exporters, have some of their ports closed. What is the non-oil story here? Do you have any update on that? What's happening to natural gas and LNG and fertilizer?

[00:51:13] **Art Berman:** The natural gas story is every bit as urgent as the oil story. And I mean, there are, you know, there are not riots, but fairly, strident protests going on in many parts of the world, including, Syria and Bangladesh and Pakistan.

[00:51:39] **Nate Hagens:** Because of higher prices?

[00:51:41] **Art Berman:** Because of higher prices of, natural gas, because those countries, certainly Bangladesh and, Pakistan, they rely on imported LNG for their electric power generation, and the people are feeling it, and the governments are, having to, promise interventions and subsidies, so that they don't have, have civil unrest.

[00:52:05] Europe, I mean, is, paying, you know, I mean, like, you know, \$25 per-

[00:52:10] **Nate Hagens:** I know ...

[00:52:11] **Art Berman:** you know, per million BTUs, when we in the US are, you know, paying not even three.

The Great Simplification

[00:52:17] **Nate Hagens:** Volkswagen is shutting down production plants in Germany because of this and other stories.

[00:52:23] **Art Berman:** I mean, the natural gas story was a big headline before the Iran war because Europe relied on natural gas supply from Russia primarily.

[00:52:36] And I mean, we were, you know, you were talking to guests about the deindustrialization of Europe, partly as a result of that. None of that has stopped. Europe has now replaced its dependence on Russia with dependence on imported LNG from the United States, from Qatar, from other places, and it's paid a massive premium in order to do that.

[00:53:03] Now Qatar, its LNG is not available. A- and so, you know, we talk about oil and we can do ship-to-ship transfers and all of this kind of gymnastics. You can't do that with gas. Can't do that.

[00:53:20] **Nate Hagens:** Why not?

[00:53:22] **Art Berman:** Because the gas that you ship has to be super cooled to, you know, you know, hundreds of degrees below zero to put it in liquid form.

[00:53:35] Right. And so you can't just move it to, you know, to some other ship. It stays where it is.

[00:53:41] **Nate Hagens:** Let me ask you this: Among the unexpected new trends and outcomes from this war, do you think it's likely that energy producing countries and energy importing countries will both try to create energy buffers?

[00:54:06] The producers will create buffers for their own populations, and the importers will start to try to build up their own buffers in s- in case some of this happens again. And that changes the kind of the smorgasbord that the markets

The Great Simplification

would clear from the past into a new game theory going forward for high quality energy flows.

[00:54:32] can you speak to that?

[00:54:33] **Art Berman:** Well, you had Jeff Curry on, not very long ago, and he made the comment about expecting more state capitalism in the future. and I think that was a, you know, an important observation on his part that if the private sector is unable or unwilling to put money into refineries and oil and gas exploration and you name it, then perhaps that falls into the realm of the state.

[00:55:05] **Nate Hagens:** So state capitalism could be a different term, might be resource nationalism?

[00:55:10] **Art Berman:** absolutely. and you're seeing, you know, more than hints of this from the Trump administration, right? I mean, so the United States is now a major shareholder or participant in, you know, some venture in Venezuela.

[00:55:26] **Nate Hagens:** Yeah.

[00:55:26] What's up with that? Is that gonna, is that gonna matter much or, not in the near term?

[00:55:31] **Art Berman:** It matters from a, a talking points perspective that, if we're, if, you know, if, we're failing on the, from the public perspective of, "Oh my God, you know, my gasoline prices are going up," and et cetera, well, don't worry, we're gonna take care of that with Venezuela.

[00:55:47] I mean, that's ridiculous of course, because Venezuelan crude, you can't make gasoline from it, to start with. But even if you could, I mean, y- you know, the time lag between whatever's happening in talk and, actually getting those barrels is, way beyond the, the timeline that most consumers care about.

The Great Simplification

[00:56:08] **Nate Hagens:** Well, you could make gasoline from it if you paired it with our light oil in a refinery, yes?

[00:56:17] **Art Berman:** Well, not exactly. So I mean, we don't wanna get too deeply into refinery mechanics, but, the reality is, that US oil is super good for making gasoline. Okay? We don't need anybody's help.

[00:56:35] if the world ran on gasoline, the United States would be the king. Yeah. Because US oil has been cooked in the oven a little bit too long by Middle East standards, which means that a lot of the heavier stuff that we use to make diesel and other things has been cooked off, okay? it's not a, it's not a mistake, it's just, it's nature.

[00:57:00] **Nate Hagens:** So we do need Venezuelan oil to make diesel?

[00:57:04] **Art Berman:** Yes, and that's the distinction. So what the US lacks are the heavy components that are needed to make diesel. And so when we import oil from Canada, which is our major source of imports, I mean, we import four million barrels a day from Canada, why we're picking fights with our, most important- Yeah

[00:57:29] The supplier of anything is beyond me, but we are. Okay? But just to keep it on the oil, what happens is we take that very heavy oil, whether it's from Canada or Venezuela or a little of it's left in Mexico, and that goes into a completely different part of the refinery than what most people think about.

[00:57:49] That goes into a part of the refinery where it goes through all these catalytic converters, and basically you upgrade that crappy tar, which is essentially what it is. You add a lot of hydrogen to it, and you put it through a lot of, you know, chemical processes that, that kind of simulates the components you need for diesel, jet fuel, and kerosene.

The Great Simplification

[00:58:16] But no, it is not used to make gasoline. It is used to make heavier things.

[00:58:22] **Nate Hagens:** Yeah. So th– this is much Orwellian language. Here's a question that I wanted to ask you, and I asked Robert Pape this recently. The petrodollar and the military technology defense, the kind of agreement we have with Saudi Arabia and other nations, has depended on stable US military bases and air and sea power and such.

[00:58:56] What happens when the security architecture supporting the flow of the spice from the Middle East falters and slows?

[00:59:07] **Art Berman:** There are a couple of important things that come from that question. The very first is that the entire Global security and trade architecture, including oil, but not just oil, is founded on the US being the guarantor of free maritime trade.

[00:59:29] And one of the benefits that the United States extracted from the rest of the world after World War II in exchange for that was to be the world's reserve currency. Now, that wasn't explicit in any document, but that's kind of the way it worked. And so what has happened since this Iran war began is that the United States has failed.

[00:59:55] We have failed in our responsibility and role to guarantee free maritime trade. We have, abjectly failed, and nobody's talking about that, but everybody knows it, okay? So the United States, it's not just a status issue, it's a power projection issue, and it has tremendous implications for the way currency and financial tra– transactions proceed in the future.

[01:00:23] Now, every Gulf country is being very nice and polite about this, but they're all pursuing other deals, other ways of trying to get the security that they

The Great Simplification

no longer expect from the United States. This has world-changing implications for the way the balance of power works, not only in the Middle East, but everywhere else in the world.

[01:00:49] So, so, so that, that's piece number one. Now, the petrodollar story is a little bit more iffy because the petrodollar was something that Henry Kissinger worked out initially with the Saudis, which, you know, when the US first started having to import a lot of oil, the way that, was worked out and, made less uncomfortable was, "Okay, we'll buy the oil from you.

[01:01:15] You'll do all your deals in US dollars, but you're gonna turn around and take those US dollars and invest in the United States." And so the story that could be told to the financial institutions and the American people was, "This isn't costing you anything. This is free." Okay? The petrodollar system has not really existed for a long time, probably not for the last 20 years anyway.

[01:01:42] What does exist is the euro dollar system, and you know more about this than I do, Nate. The way that that credit is created, out of nothing in the world is still pretty much an American monopoly despite, you know, a trend in the direction of other currencies coming in and replacing it. I don't wanna get, you know, too far into things that I don't know enough about.

[01:02:10] but the connection is that as US performance fails to meet the grand bargain that was made, suddenly, you know, that starts to... A level of uncertainty is introduced in- into that arrangement, and that has at least a- as profound, implications a- as does the, the geopolitical. but I think this all speaks to your point.

[01:02:40] We don't know. I don't know where this is going, how it's gonna turn out. But when I start adding up the uncertainty factors going forward, I mean, we are not going back to January 2026 In any way that I can imagine

The Great Simplification

[01:03:00] **Nate Hagens:** I agree with that

[01:03:01] **Art Berman:** Whether it's oil, whether it's LNG, whether it's fertilizer, food, geopolitics, currency, finance, I mean, this is a world-changing event.

[01:03:11] Now, I don't know 100% what that means right now, and I don't want to sound, you know, apocalyptic. I'm just saying that w- we are not going back to anywhere close to the way things were, and I don't think anybody knows what will come after. But I doubt that very many people will like it if they liked what they had before.

[01:03:36] **Nate Hagens:** So what's the broader message here? What, is the Iran war ultimately telling us about the future of human civilization?

[01:03:48] **Art Berman:** It's telling me that we are going to be involved in a far more intense and open competition for the critical resources that remain. That I think that's a very unmistakable subtext of this conflict and all of the other geopolitical hotspots in the world.

[01:04:21] And I don't know what goes on inside the White House or the Pentagon, nor do I know what goes on inside of China and Russia, but I do know that the public documents and statements that are made by the Chinese and the Russians, plus their actions, give me very strong confidence that they are way ahead of us in the United States and in the West in general on anticipating the critical and urgent nature of this competition.

[01:05:01] China has been working on gaining access to global resources, processing and refining supply chains of everything from, you know, oil to silver to, you know, e- every mineral you can imagine for decades Russia, part of the-- I mean, we've talked about this before. Russia happens to be, I mean, one of the,

The Great Simplification

the biggest producers of a lot of important commodities, not the least of which is oil, but many others.

[01:05:35] And so my sense is that we're, you know, we're in a competition, and the competition is ahead of us. And I think a lot of the things that the Trump administration is doing, some of the positive things, recognize that and say, you know, we've got to catch up. We've got to do something more on critical minerals.

[01:05:56] We have to start being more proactive about that. Some people in the world who are running the world recognize that we don't have an infinite pot of resources, and the winner, such as they might be, are the ones that have the most access to it. And by the way, you and I have talked about this before, World Wars I and II were won and lost on the basis of availability of oil.

[01:06:25] **Nate Hagens:** What would change your mind, Art? What sort of evidence, in the next twelve months, would tell you that the system and the United States' role in it is more robust than you currently think?

[01:06:38] **Art Berman:** The very first thing that would change my, what I've said so far is that we enter into authentic talks with the opposition. Now, you know, what does authentic mean?

[01:06:52] Well, let- let's just settle for talks.

[01:06:55] **Nate Hagens:** Yeah.

[01:06:55] **Art Berman:** I mean, as long as there's no talking, then there can be no resolution. We have already discussed that a political or a diplomatic resolution is a long way from a resolution, but it is a first step, okay? It'll be a data point that's important to me. rebuilding buffers.

The Great Simplification

[01:07:18] we spent a lot of time early in this conversation talking about the depletion of buffers. Will, anybody, will countries start to refill their strategic reserves? It's hard for me to imagine where that's gonna come from or what the motivation will be, but if there could somehow be a, you know, a, an un- a, a, an outcome where more oil starts coming out of places like Hormuz and the Red Sea without coercive security arrangements, you know, if the system somehow adapts to that level, you know, that, that would be another very important data point.

[01:08:02] you know, it's hard to... it's hard for me to imagine how that could happen or why that would happen, but if it did, I would say, "Wow, okay. you know, may- maybe this is... may- maybe there's something new going on." But most important is let's get the production started again, and let's see how that works. And let's see where all these additional barrels that the IEA and the EIA and others say are coming, let's see them.

[01:08:37] **Nate Hagens:** In the same way that, the data on the strategic petroleum reserve went down temporarily, I do sometimes wonder if the EIA and the IEA's raison d'être is only on the upslope, that we're not going to be- looking at the EIA forecasting for perpetual decline in US oil production. That just won't be a thing anymore. So they have an optimism bias built into their forecasts, I would say. I mean, that's just kind of a random thought, but why would they exist on the downslope for the public?

[01:09:17] **Art Berman:** Well, no, you're, right.

[01:09:21] and, the... But the, the positive part of those agencies is that they do produce a lot of good data-

[01:09:28] **Nate Hagens:** Yeah ...

The Great Simplification

[01:09:29] **Art Berman:** which people like me and a lot of others can use in ways that perhaps, you know, they don't choose to, you know, to publicly show.

[01:09:39] **Nate Hagens:** No, I'm not disputing that. I'm just saying if they really, did believe we're gonna be down 10 million barrels a day 18 months from now, I don't think they're gonna put out a report pointing out that fact.

[01:09:54] **Art Berman:** They're not. But at the same time, and this, is deviating from your question a bit, but I mean, their forecast, and it's not only theirs, it's OPEC's and IEA doesn't do that kind of forecasting, but, you know, the forecasts are that a year from now things are gonna be better than ever.

[01:10:14] **Nate Hagens:** Better than they were in January of '26?

[01:10:17] **Art Berman:** Oh, yeah, just gonna... Yeah. We'll be at 112 million barrels a day is what EIA says.

[01:10:22] **Nate Hagens:** How is that possibly gonna happen?

[01:10:25] **Art Berman:** I'd love to be able to raise my hand and ask that question, you know?

[01:10:29] **Nate Hagens:** Yeah.

[01:10:30] **Art Berman:** Tell me, how does that work? but the... So my point is that I, you know, you asked me a question, I gave you some answers.

[01:10:38] I put a very low Probability that I'm gonna see any of those things, but if I did, that would change my opinion. And I started this conversation by acknowledging that, you know, I got some things wrong, back six months ago. So I'm s- fully capable of being wrong.

The Great Simplification

[01:10:57] **Nate Hagens:** You and me both. but you really haven't been wrong about the broader swath here.

[01:11:04] Do you have any other insights, or what should the viewers be taking away? What's the bottom line, here, September 19th, 2026?

[01:11:15] **Art Berman:** The bottom line for me is don't get distracted by the little stuff. Don't get distracted by, you know, are there seven million barrels a day or nine million barrels a day getting out of Hormuz?

[01:11:31] I mean, I'm not saying that's unimportant, but I mean, 90% of what comes across my feed is that. The more important thing is how much of the shut-in production is getting turned back on, and how well is that recovering? How are the rest of the people in the world responding to much higher diesel prices and jet fuel prices where that affects them?

[01:12:01] the China story, you know, I mean, I just have a very difficult time believing that China made a policy decision to cut 4 million barrels of crude imports a day. I mean, to me, that almost has to be a big, demand destruction story in there somewhere. We don't talk about that very much, but that has been an element of every one of these shocks along the way, and so to think that somehow we're gonna get a pass on that this time, I think is unlikely.

[01:12:35] So my advice to people is, you know, if the small stuff interests you, and I'm, and when I say small, I don't mean it's unimportant. It's just, it's, the narrow boundary kind of stuff. you know, follow that if you like, but, you know, keep the bigger perspective. How is the world adjusting to this?

[01:12:58] That's the real question, and I think that's, you know, that, that's what most of both of our comments have been about. And, the simple answer is that neither of us nor anyone else knows. But you and I share, based on data, a

The Great Simplification

common view, which is however this turns out, we're not going back to the way things were not very long ago, and that should be, very top of mind for anyone who cares about the state of the world and where it's going.

[01:13:32] **Nate Hagens:** Well said. Thank you, for your time today, and for your continued, perpetual sleuthing on the energy and civilization story. We'll talk again, six months or so and see what we will see, and thanks again, Art.

[01:13:52] **Art Berman:** always a pleasure. Thank you, Nate.

[01:13:55] **Nate Hagens:** If you'd like to learn more about this episode, please visit thegreatsimplification.com for references and show notes.

[01:14:02] From there, you can also join our Hilo community and subscribe to our Substack newsletter. This show is hosted by me, Nate Hagens, edited by No Troublemakers Media, and produced by Misty Stinnett and Lizzie Sirianni. Our production team also includes Leslie Batt-Lutz, Brady Heine, Julia Maxwell, Gabriela Sleiman, and Grace Brunfelt.

[01:14:26] Thank you for listening, and we'll see you on the next episode