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**Marty:** [00:00:00] Yeah, we'll start there. Okay.

So California's got some crazy EPA rec regulations or,

**Brian:** yeah, I was just talking with the California Fuels and Convenience Alliance the other day, giving them a little talk cuz they're, they're getting together folks to go advocate in Sacramento. Because there's been so many, so much regulation, so much restriction on anyone in the oil and gas supply chain, basically.

And the many of these small gas stations are just small family owned businesses mostly. Most of 'em are immigrants, minority owned, small businesses, and they're paying the highest labor rates in the country because la, for example, has minimum wage requirements of 1670 8 cents an hour. They're paying massively more for electricity, 36% more than most of the other country for, for that type of business.

And then their land costs are soaring, as you can imagine, over time. [00:01:00] Mm-hmm. . So all of these things are just pressuring and crunching, crushing these small businesses. And then California has put forward a little while ago, this ban on. Any kind of internal combustion via cars and light trucks. By 2035, they say, no more sales of new cars.

Now this will be phased in. So it's not that you're waiting until 2035 actually starting in 20 26, 30 3% of the new vehicle sold in California, which I believe there's about a million vehicles sold in California a year. So it's not an insignificant amount of vehicles, will have to be quote zero emission, which ultimately means electric because there aren't a lot of other alternatives.

There's very few hydrogen cars right now. I mean, in the Bay Area, I think there's one hydrogen station. I looked, uh, at least there was when I looked at it up maybe a year or two ago. I don't think that's changed much. Not a lot of hydrogen vehicles on the road. So in essence what we're talking about is, is [00:02:00] electric vehicles and at the same time that these vans are going in and we're gonna ratchet up.

The amount of electric vehicles on the, were, our grid in California is so fragile and so unreliable. Last September, I'm getting alerts on my phone saying, Hey, don't charge your electric vehicle if you have one, because the state might go into, um, rolling Blockouts . So, so, and, and we only have a really small percentage of the vehicles right now that are electric, so I'm not necessarily anti electric vehicle.

I'm, I'm pro technology in general. If the technology is better and people want to buy it and it's convenient, they should buy it. Uh, but we have to be strategic and thoughtful and you can't cram down policies. These centrally planned policies from the top crushing small businesses in the process, crushing consumers in terms of the cost of electricity and gasoline, and expect everything to work out because we don't even [00:03:00] have the infrastructure, the, the distribution grid, the high as well as high.

Um, capacity transmission network to support all of this electrification, we just don't have it yet. No,

**Marty:** and it's, there's many things to touch on there. And number one, like going back to like the gas station owners, that was probably one of the most despicable things that come out. The Biden administration over the last year was blaming these small business owners for price gouging, and you just laid out, particularly in California, all the overhead costs that they have on an ongoing basis.

Electricity, land, cost, uh, the initial fuel costs. Like these businesses typically make money by people coming in and buying. like, like chips and stuff, correct?

**Brian:** Like that's where most of their margining comes from. Yeah. They have razor thin margins. Anyone that says that the oil and gas industry is probably scouching doesn't even understand basic supply and demand in economics.

It's pure political power play, right? It has. It's not how the market works. If that were true when oil was negative $37 a barrel, [00:04:00] why were they pricing it? Everything fuels so low. I mean, if they could just fix the price wherever they wanted, why would they have it? Why would it go negative? I mean, it just makes no

**Marty:** sense.

No, not at all. And then we get into the complete logical contradiction, which is if you're getting alerts in September of 2022, not to plug your electric vehicle in because of the potential for rolling blackouts. How in the world does Governor Newsom and the other supporters of this type of initiative to transition to a full EV fleet by 2033?

Think. That that's gonna be possible, like how much more grid infrastructure would need to be built out, and most importantly, reliable

**Brian:** grid infrastructure. Yeah, and a lot of the gas station owners that we're talking about, they say, oh, well, why don't they just switch to install electric charging stations?

Well, to install a new electric charging station in California costs up to $150,000 per charger. When you take the [00:05:00] equipment, the permits, the fees, the installation costs, when you add it all up around $150,000 per charger. Now imagine you're a small family owned business scraping by making tiny margin on selling Reese's pieces, and then all of a sudden they're saying, These kind of cars, your customers cars are banned from going here.

They have to charge electric. And by the way, oh, you might have to spend $150,000 a charger to install these things in your station if you're gonna transition to your revenue model around charging electric vehicles. Oh, and by the way, many of these gas stations don't have the room. I mean, so it's not even, even if they wanted to do it, they don't have the space.

Many of them. I mean, some do obviously, but many don't.

**Marty:** No. And then you can't factor in like the time value of money. Like maybe you can, let's just run with the hypothetical that some of these gas stations could scrape up the money to invest in these charging stations. Maybe get five or [00:06:00] six, like a typical amount of gas pumps that exist.

Like it takes much longer to charge a car than it does to fill it up with gas. So then your total addressable like revenue stream gets shrunk as well because you're waiting for people to charge their cars where. when you're filling your gas tank, maybe takes five minutes parked to cap the, the tank and go on your

**Brian:** way.

Yeah. In five minutes you're in and out of a normal gas station in for electric vehicle charging. Obviously it depends on how much charge you have and how much you wanna charge up, but you're talking 40 minutes, you know, between 30 and 60 minutes, let's say 40 minutes, somewhere in there. On average, if you're gonna, if you're somewhat low charge and really want to bring it back up to 80% and somewhere in there, it's obviously gonna make a difference on the type of charger and the model of the car.

And there's a variety of factors, but that, that's a good range. So what, first of all, people are gonna sit at a gas station for 40 minutes to, to, to charge their car. I mean that just doesn't seem very realistic. No.

**Marty:** And [00:07:00] even if it's a supercharger, what they can do 15 minutes now still three x the time it takes to fill your car with gas, then it's like, well most people will probably charge their cars at home.

And it's like, okay, let's run with that. Like what does that do for their, well think

**Brian:** about, think about the person that says this though. Oh, people can just charge in home. They have their own garage and they'll just spend the money, first of all, and the electrical upgrades in their home, which could be several thousand dollars putting in a home charger.

Well that assumes you're a homeowner, that you have a garage. Right? A lot of people rent and not everyone lives in a single family home with a nice garage in, in space. So what are we talking about here? You're basically, this is a regressive tax on lower income and middle income families. That's what it is, cuz those are the people that don't have the ability to charge the car in their garage overnight.

And they certainly don't have the money to pay $65,000, which in the United States, the average electric car is [00:08:00] $65,000. That's more than double a typical sedan for a conventional vehicle. who is buying that? Those are, we know who, they've done the market research, they've done the surveys. Most of the people that are driving electric vehicles make over six figures are of the upper income, upper middle income class.

So it is, it is truly an unfair policy that's putting the burden on lower and middle income people. Yeah. And

**Marty:** then on top of that, if we were to say, all right, maybe the price of the cars comes down and it can become accessible to lower income individuals, you still have the problem of charging in a space that they don't own or simply don't have enough space to charge or the electrical infrastructure.

But then is it possible from like a raw material, raw input perspective to, to actually make this a possibility? Like how many. , how [00:09:00] much cobalt, how much lithium, how much rare earth rentals would need to be taken out the ground to actually produce a fleet of this size for California. And we're only talking about California alone and we know that there are some people throughout the federal government who would like to make this a national policy.

Like

**Brian:** the amount, we have plenty of minerals in the earth. So it, it's not that there's scarcity in terms of the actual supply of the minerals they exist. The problem is getting them, digging them out of the ground in the timetables that the policy makers have set. We don't have enough existing mines or planned mines to come anywhere close to hitting the various clean energy goals of transitioning to solar, wind, and electric vehicles.

When you look at what that would require, and there's various goals by 20 30, 20 50, these various milestones, and you just look at the amount of minerals that would be required. To meet those goals. The mining infrastructure doesn't exist. And according to the [00:10:00] International En Energy Agency, on average, it takes 17 years to bring a new mine online.

It's one of the most overregulated r ridiculous processes you can imagine. That takes decades. I mean, they, they think in decades, not, not a few years. Now, let's just say, you know, some of these mines may be because of political expediency. They can fast track and they can make it happen. Even in the best case scenario, it would be 10 years in the best case scenario.

And that's not gonna happen very, it's certainly not gonna happen in most western countries, but maybe in other developing countries, they can fast track it and get something up and running in 10 years in the United States. Forget it. I mean, you're talking 20 years, 15, 20, 25 years. Uh, at least. Yeah. What is there?

A

**Marty:** large cobalt deposit up in Maine, but they've refused to, to dig it cuz they don't wanna. They don't wanna perturb the, uh, the natural landscape up in Maine. They'd rather allocate those, um, [00:11:00] that process to, to somewhere like the Congo. That's the other, that's the most frustrating thing about this is just the, the hypocrisy of individuals pushing this, particularly like Western, um, environmentalist who have this not my backyard mentality.

When you actually dig in under the surface, it's like, I want this to happen, but I don't want to happen in my backyard. I don't want you to dig up the mountains, Maine, to get us the rare earth metals. We need to actually build out this

**Brian:** infrastructure in pushing all of this mining or all the oil and gas development overseas to countries typically that have much weaker environmental requirements, much weaker labor requirements.

Let's just, since we're talking about California, it's a great example cuz they've pushed the envelope more than anyone and are the. Are so hypocritical that it's, it's crazy. So California's sitting on 1.5 billion barrels of oil, mostly in Kern County, in southern California. Tons of oil here. We could produce it [00:12:00] here.

And most of it's under the desert. I was down visiting an oil lease, uh, not too long ago, and it's just desert. I couldn't see a single plant, a single tree. There's nothing. When I came to the site, there was a team of surveyors that were walking around flagging off where they were going to be drilling, looking for lizards, endangered lizards in marking the area so they would fence it off to make sure they weren't disturbing any area with this lizard.

Now, contrast that. So we're not that. That's what we do here. That's the level. Regula, which is admirable. It's noble. We do want to protect our environment. We don't want to cause pollution unnecessarily. And if you're going to drill, you should drill there, right? in the middle of the desert with no plants, where it's highly regulated and we have full control.

Instead, what California prefers to do, instead of using this resource that comes in an environmental friendly way with good labor requirements, we, [00:13:00] California imports over 70% of its oil from foreign countries. Three countries represent 50% of that Ecuador, Iraq, Saudi Arabia. Now, who do you think has stricter environmental concerns?

Iraq or California? . I mean, Iraq will just set whole oil fields on fire. I mean, they, they don't have near the kinds of constraints or rules or care at all in, in terms of these kinds of things. And in Ecuador, you're basically, Slashing and burning the rainforest. They don't have any kinds of controls that we have here in terms of the production.

There's all kinds of contamination and spillage and, um, destruction of a very sensitive ecosystem versus the barren desert in California. Then all of those environmental impacts are happening down there. So we're destroying wildlife, we're contaminating water. We're [00:14:00] unnecessarily flaring gas down there that we don't, we're not allowed to flare gas here, for example, in terms of production.

So all that's happening. Then you gotta put it on a big oil tanker and you gotta burn a bunch of fuel oil, which is the dirtiest type of, uh, of fuel. It's much more knitting than traditional gasoline that we use in cars and like trucks. So you're burning all of this polluting fuel oil to transport. All of this, these hydrocarbons across the ocean from Iraq, from Saudi Arabia, from Ecuador.

Then you come to the Long Beach in LA ports, and then all of these ships idle sitting out there, and all the trucks that are coming in to transport this are spewing tons of pollution into the neighboring communities that happen to be low income, mostly minority communities that live near the Long Beach in LA ports.

And so the people who claim that we're protecting the [00:15:00] environment, were protecting low income people by getting rid of fossil fuels in California, are doing exactly the opposite. They're harming the low income people, the most, the people that live near the ports and have to deal with all this extra smog and.

The amount of smog and pollution associated just with all of this oil transport is equivalent to 6 million cars on the road across the region. It's a massive amount of smog and air pollution. Then you're also nailing these same low income people throughout the state in terms of the cost, because all of this cost money to, you know, all of the additional fees and taxes and things that California adds on.

For all the climate programs and all of the cap and trade, there's a dollar and 18 cents a gallon on every gallon of gasoline in California. That just represents taxes and fees in cost for climate programs. So all of this is getting burdened on lower income people. So when you start adding all. And really [00:16:00] what is the goal that we're trying to achieve with this?

We were trying to protect and improve the quality of human life, improve, improve human welfare. We're trying to protect and improve the quality of your environment. And we're doing the exact opposite through these insane policies. Yeah.

**Marty:** And then on top of that, cause I imagine you, I think I saw a tweet you met with Mike Umbro down in Current county, so yeah, that's Lisa.

Lisa Aza. And he sat in that chair about a year ago, almost exactly, I think. And he was explaining that the demand for oil has remained constant, if not grown over the same time period. So it's not like, yes, you. Reallocating that production elsewhere, but you're not consuming less oil. And that's something you actually tweeted out earlier today from Robert Bryce is, despite all this renewable slash sustainable energy infrastructure, there's no been no material dent in the amount of emissions.

And it's been a, [00:17:00] a double whammy because the price of electricity has risen alongside

**Brian:** that as well. Yeah, the price of electricity in California is the highest of any other state except Hawaii. We, we've just increased at this rapid rate. And when you look at the data and you look, well, when do all these prices start escalating?

It's when the state put these mandates in for renewable energy and set these really, really aggressive goals. Now, I don't have inherently a problem with any technology that's generating energy, more energy in the world the better. However, when you start misapplying those technologies and requiring them and cramming them down from the top, From the government in mandate making it happen.

You're perverting the entire marketplace. You're sending false price signals into the market. They become parasitic on thermal power, thermal power plants because you can't operate to operate a power plant. You obviously have to sell a certain amount of power. If you're competing against someone that doesn't even have to [00:18:00] sell power cuz they make most of their money on the subsidies, the various tax credits and subsidies, then you're at a serious disadvantage to them.

So you just shut down and you don't build them who's gonna invest in it? And then all the incentives are flowing in flooding into renewables. So of course investors are gonna keep pumping money into that because they get great tax benefits from it. Um, and they don't have to deal with the unreliable unreliability of the electric grid.

That's not their problem.

**Marty:** No it's like a It is very, uh, I mean it's fascinating cuz this is a Bitcoin podcast and I truly think this is. stems, the core of this problem stems from the fact that the government could just print money and throw money at these subsidies where you just have these negative externalities that arise because we can print money at will and throw it where we deem most productive, which is turning out to be not very productive at all and actually counterproductive to [00:19:00] the end goal.

Like you mentioned, making quality of life better for lower income individuals and providing more reliable energy infrastructure. It's doing the exact opposite.

**Brian:** Yeah, I mean, we, there's basically three paths that we have. We can surrender the environmental goal, meaning we can go and, you know, do whatever we want, pollute all the water, pollute the air, do all that we can surrender the human goal and, you know, have people live in poverty and not lift them up and, and able to live and, um, prosperity and flourish, or we can figure out ways to make better energy.

And we know how to do this. We don't have to surrender any of these goals. Those it, those are kind of a false equivalency. We don't necessarily have to go all in on humans or all in on the environment. We can have both. Yeah.

**Marty:** And this, what, what do you think is the best solution for both? Is it

**Brian:** nuclear?

Nuclear and natural gas? I think in the United, now, energy [00:20:00] is very localized, right? It really, there's a bunch of criterion factors that I think are important to weigh. And the availability of the resource where you are trying to deliver it is important. Also, the level of economic development of a country.

I'll give you an example. If you're in India right now, India has tons of coal. They have a huge economy that's reliant on coal. They need to burn. They don't really have another choice they can't afford just to shift overnight to nuclear power. The, the cost of that kind of infrastructure shift, although that should be the long term goal, and they should aim eventually to go into a cleaner burning fuel source, such as nuclear power.

It's not realistic for them to do that. E even in, in the next couple decades. It's gonna take many decades just like it did for Europe and the United States. So we have to think of these things o over time and what's appropriate for different regions. So I [00:21:00] think you gotta map out all the evaluation criteria and what is gonna be affordable, what is gonna enhance energy security, what's going to provide reliability.

All of these things need to be weighed and balanced, and there's no perfect solution. There's not one thing that's ideal and perfect in every situation. Yeah,

**Marty:** you can, you can even add geography into it. Don't build a nuclear power plant on a coast or on a fault line. Like there's, uh, you're probably gonna have natural gas facilities closer to the source, so close to natural gas pipelines and, uh, wells where it's being, um, extracted from.

And yeah, it's the nuance that you just described never enters the question, it's broad brush, no, we need to do this, we need to do it in haste as soon as possible. And it's stay on nuclear too, cuz that's like the most dis encouraging theme in the energy sector right now is this inability. It seems like over the last year actually, [00:22:00] um, people have begin, have begun to shift their mentality as it pertains to nuclear because we've recognized, uh, the problems that's caused countries like Germany and states like California.

Like what, what is the path forward to make it so more nuclear power plants are spun up and. We, we actually begin reinvesting in this technology and actually building it out because it seems like it's been pretty stagnant for, for many decades

**Brian:** now. The world is shifting on nuclear energy right now.

We're watching it happen in real time. You have countries like Japan that obviously suffer the, the terrible accident Fukushima who turned off over 50 nuclear power plants. That was the dominant electricity source. Well, they're now turning those back on. They're turning 'em back on as fast as they can. I, it's a phase process cuz it's not so easy just to flip a switch and turn a nuclear power plant back on.

But they're, they're rapidly moving towards turning on as many of those units as possible. [00:23:00] Korea had started to divest and were going in a different direction just towards a renewable destination and they've corrected course now they're going all in on nuclear power. France, the same thing. Even though France 70% of.

Electricity in France comes from nuclear energy. However, in 2015, they enacted legislation called their energy transition law. That was in essence going to deprioritize nuclear and go more towards renewables. Well, now they've doubled down on nuclear power again and they're gonna be building uk. Yeah, go.

Well, going back to back to language.

**Marty:** Go like that. That whole, this is what's so odd. It's like they were gonna deprioritize nuclear to go prioritize renewables, but wouldn't, shouldn't nuclear be considered like the most renewables, the most energy dense. If you run your power plant correctly, it is extremely clean.

The gas coming out [00:24:00] of these reactors is not, is not toxic. It's water vapor. Um, like that's the other thing is like how has nuclear been siphoned off into this dirty energy when it is arguably the cleanest. that we may have on the planet.

**Brian:** It is a concerted effort over many decades of environmental groups and politicians as well as, um, some folks originally in the fossil fuel industry, cuz they saw it as a con natural gas competitor.

Yeah. Uh, to basically attack it and to spread tons of misinformation. When you look at the data, nuclear power is, well first of all, it's the only 24 7 truly clean energy source that has zero emissions, you know, in, in terms of emissions coming outta the power plant. Of course there's some emissions associated with mining, et cetera, in the, in the whole life cycle.

But in terms of actual emissions from the plant, it's zero air pollution, zero CO2 emissions. So when you look actually at the [00:25:00] data across the last 70 years of commercial operation, There's the, I think solar's the only one that has slightly less dust per kilowatt hour . So it's the, it's safer than wind power, right?

It's certainly safer than natural gas and other types of fossil fuels. And yet we have put it in this category to where it's this unknown, dangerous thing when it, it's not dangerous. Um, of course you need certain level of regulation. You have to be safe and thoughtful, just like any industry. But for some reason we don't.

I mean, we have chemical accidents all the time. We just had a plane, a train derail. We, these things ha happen. It's, it's part of running a modern society. There's some degree of risk involved, but that doesn't mean we shut down the entire chemicals industry because there's an accident every once in a while.

**Marty:** No, I think people point to Cher Noble, particularly, let's say this was terrible event. We don't wanna replicate this, but if [00:26:00] you dig into the history of Cher Noble, obviously HBO had that, that show. It was really a managerial crisis and not really a crisis of the actual nuclear power itself. It was human error at the end of the day.

**Brian:** Yeah. And when we take that accident, which is a horrendous accident, and, and there's, there's no, uh, sugarcoating whatsoever still, when you even look at that, which is the, the worst accident that's ever happened, about 200 people total, including all of the first responders, including factoring in any kinds of, um, health related impacts, post-disaster, died a associated with that event, which is a tragedy.

You never want people to die, of course. I mean, we have millions of people to die every year due to coal power plants. Right. And we don't shut down coal power plants cuz the benefits outweigh the side effects. We have a rational waiting in view that yes, we know that coal does create air [00:27:00] pollution, which does create adverse health effects in some communities, but it's worth it because of all the benefits that it brings.

Yeah.

**Marty:** And so what do you think the future of nuclear is? Are you bullish on small modular

**Brian:** reactors? I think it depends on where we're talking about, right? And so in Europe and in the Middle East and in Asia, they're gonna build large reactors as well as small reactors, which I think is great. I'm a fan of both.

I think we need, it's almost thinking about this problem is similar. I view trains, cars, and airplane. . They, you need 'em all. They serve different functions within the transportation network. So we, we need the large lightwater reactors of the large, uh, plants. And we also need small modular reactors. We need micro reactors, we need all of it cuz they serve different purposes for different applications.

So in the UAE for example, they've shown that we can do this quickly. So [00:28:00] just about 2008, 2009, they, they started a nuclear power program. And in the last three years they've turned on a new reactor each year. Um, and the fourth reactor is built. It's just not turned on yet. And they will have 25% of their electricity will come from nuclear power in the near future.

And they had nothing. They had no nuclear power program, they had nothing. Now they partnered. North, uh, North Korea, South Korea, to help them develop that program. North Korea could use some nuclear power. Yeah. . Yeah. That might be a little slightly different, uh, situation. But no, South Korea has the knowledge and expertise and they partner with them, but it shows you can go from zero to one very quickly in, in basically a decade.

They went from zero to now, in essence having about 25% of their electricity coming from a hundred percent clean energy source. And that's, that gives me hope, that gives me, that shows me it can be done [00:29:00] when there's the political will and joined with the right engineering expertise.

**Marty:** Yeah. It's replicable, but it seems like here in the United States, political will isn't there yet.

There's a lot of red tape that any company trying to build reactors has to

**Brian:** get through. There's there's a lot of headwinds for sure, and I think we will be building a lot of small reactors in the United States. Unfortunately, I don't see. us building large reactors in the near future, and here's why. So right now we have two units going in in Georgia at the Vogel plant.

Unfortunately, because we hadn't built any large plants in so long, we, there was many confounding reasons why con converging reasons why this project, um, ended up taking way too long and for way too much money. It's six years behind schedule and 16 billion over budget. And there's no excuse for that. I mean, yes, we had Covid, yes, the company was going through a bankruptcy at the time.

Yes, [00:30:00] there was some significant technical errors there. There's all kinds of reasons why that happened. Regardless, there's no, excuse me, it's just, it's, it set the whole industry back a very long ways because, but with that kind of investment that's necessary, utilities don't have the balance sheet. To be able to even finance something like that.

And why would they ca take on that kind of risk? There's no way. It, it, it would be irresponsible for a utility to take on that level of risk, um, given these recent events in the near term when their balance sheet can't really accommodate it. And so I don't see it happening in the United States for a while.

I think we will eventually build large plants again. But I think what will happen is over the next one to two decades, we're gonna build a lot of small plants and people are gonna understand it, get educated [00:31:00] and see the benefits. And then we're going to take a lot of that knowledge and a lot of that political will and then we'll build large plants again eventually.

But I think it's not gonna happen for a while. .

**Marty:** And what will the dynamic between small communities and these SMRs look like? Again? What does the application. look

**Brian:** like there's lots of applications. I mean, this is, uh, I work on this in, in my day job and what I see happening right now is we're, there's industrial customers that are very interested in lowering their emissions and finding reliable power.

So this could be petrochemical facilities, refineries, um, energy intensive factories that are making all kind, you know, that are really going to become more automated, use more energy. The amount of energy required in a lot of these factories is just off the charts. And especially as they're trying to get [00:32:00] permitted, they have to show that they're not going to increase emissions a lot because all the states and the government doesn't want to, to, they won't be able to hit their various goals, et cetera.

So there's a lot of pressure on companies that are building out these kinds of industrial facilities. So those are some of the kind of industrial facilities, mining sites. can access it. They, they have huge power requirements for mining operations, for processing the minerals, et cetera. And then data centers is a huge opportunity as well as in bitcoin mining, obviously.

Um, data centers right now, the highest concentration in data centers in the world is in Northern Virginia. I think something like 70% of all internet traffic goes through Northern Virginia. It's an incredible, uh, concentration of capacity. And right now, Google, Microsoft, Amazon, et cetera, they can't build more data centers because there's transmission bottlenecks.

There's not enough electricity that can get through the wires to where [00:33:00] they want to build them. And so these companies are considering and looking at small modular reactors, micro reactors, as a solution to solve power availability. Because now if you can plunk down a data center or Bitcoin mine, anywhere, , right?

You're not constrained by grid congestion. You're not constrained by lack of generation capacity in the region. It really opens up the whole field of your opportunities.

**Marty:** And what does connection to these data centers or plants look like? If it's like off grid, not connected to, is there an interconnect

**Brian:** or, well, you're, you're connected.

The, the reactor has a power conversion system, so there's different components. So you, you have the reactor itself that if, if you're zooming out and just thinking what is in the simplest form, what is this thing? , you have basically a big stainless steel tank, uh, that you have some kind of liquid in it.

Different reactors use different types of coolants. [00:34:00] Um, in the bottom of the tank, you have hot rocks, which is uranium, right? Those hot rocks are, are creating heat that is then getting transferred to a liquid of, of some kind of coolant. Then, That is going through a heat exchanger, and at the end of the day, all you're doing is boiling water and creating steam.

The whole power conversion system off of most of these systems is the exact same, whether it's a natural gas plant, a coal planet, it's just you're boiling water to create steam to turn a turbine, right? So it's just how do you boil water? Mm-hmm. that, that's really what we're talking about here. So they connect in a similar way than any power plant would connect.

I mean, there's obviously wires that are connecting the, the power conversion system to whatever the facility is, but instead of sending those wires, you know, miles and miles or a hundred of miles away, you're just, you're setting down right next to it and connecting. There's also additional benefits about resilience [00:35:00] and reliability because now if your generation source is right next to the data center, right next to the Bitcoin mine, you don't have to worry about the grid going down.

You know, trees, storms coming and knocking down the grid. Or knocking down the, um, distribution wires. So there's an inherent enhanced resilience to having this onsite generation and nuclear reactors run 24 7 365. The only time you take 'em offline is when you have to refuel them. And depending on the reactor design, uh, some of the designs go all the way out to every 10 years.

You basically don't have to refuel 'em for 10 years. So there all these benefits really lend themselves, enhance reliability, enhance resilience, and they can be very cost effective as well. Yeah, that's what, that's

**Marty:** the next question I was gonna ask, like, what is the, uh, what's it do from the cost side?

Like how, how cheap can you get your electricity down?

**Brian:** I think we're going to in see this rollout in [00:36:00] phases, right? You're gonna have the initial units and as we get more economies to scale, the price is gonna drop lower and lower. There's also different business models within the SMR community. Some of the business models are centered around the traditional model where you, you design the reactor, you license that technology to a utility, that utility builds it and operates it, and then maybe that company has a service contract or something to support in some way if some, some issues arise.

So that model is very different than offering a power purchase agreement where some, some of the companies are basically owning and operating the reactors themselves. And then just selling heat or power to the customer on a long-term contract basis. So maybe 20 years, 25 years, they're signing some agreement.

Maybe there's some escalators in there. But basically the customer's locking in a long-term power contract for a fixed amount or a known [00:37:00] amount of energy each year. Yeah,

**Marty:** pick way miners would love that.

**Brian:** That's, yeah, that's, but to answer your question directly, I think what we're seeing in the near term is six to 9 cents a kilowatt hour in the lower 48 us.

So Alaska's its own beast, obviously Hawaii's separate, but in, in the lower 48, I think you're gonna see six to 9 cents depending on the location, depending on variety of factors. Um, for the cost per kilowatt hour. And I think in probably, Once we get a, a dozen or so of these out in, in getting going and start standing up some of the economies of scale, I think it's possible to get 5 cents or less in some cases.

Um, for, for larger sites.

**Marty:** And obviously the m and SMR is modular, like how, how small of a scale are we talking, uh, in terms of megawatts produced from, from some of these

**Brian:** reactors? Yeah, there's a whole spectrum [00:38:00] and it's great to see this whole ecosystem of companies starting to emerge. There's about 50 different designs out there for, for reactors and there's, I would say there's 12 companies that are well capitalized that are engaged with the regulator or going through the regulatory process and have some level of traction.

So with those, you're gonna see the majority of them are focused in ranges, I would say, in. 300 to 500 megawatt range is, is what you're looking at. Like for example, Terra Power has natrium, it's 345 megawatts. Um, then you have what are classified as micro reactors. And with those, they can go down as small as one megawatt.

But generally, I think what you're gonna see in the micro reactor range is 10 to a hundred megawatts is gonna be a nice sweet spot because there's a lot of customers, you know, data centers are a good example [00:39:00] where not a lot of data centers want 400 megawatts. I mean, that's a huge cam. I mean, that's a huge campus or something like that, but there's quite a lot that if you don't come in at 25, 50, 75 megawatts, that's, you know, would, would serve a lot of potential customers.

Yeah,

**Marty:** yeah. Just again, using Bitcoin mining as an analog, that's, I run a company or co-founded a company. Tom, my, uh, partner Matt, they really run it at the end of the day, but, uh, that's what we're targeting, that like 10 to 25 megawatt, um, size site up in Appalachia in Tennessee and Kentucky. Mm-hmm. and, and like this Maja reactor, um, design and the idea behind it is always intuitively made sense to me.

You have to imagine if these companies are able to get through the red tape, hopefully the red tape gets less, um, less stringent as we move forward. Like, how much of the cost on the front end is purely [00:40:00] compliance and regulatory, like,

**Brian:** well, it's, it's not cheap, that's for sure because the, the Nuclear Regulatory Commission builds out on an hourly basis, and I'm trying to remember the exact number.

I don't wanna give a wrong number, but I think it's something like a just shy of $300 an hour or something like that. , it's like $290 an hour something. And that you're talking about. Massive amount of time investment, of reviewing all of the design doc, all the design documentation, et cetera, through these projects.

But I think what the advantage of the small reactors and what a lot of these companies are doing in creating these modules is that they can be replicated. They're not gonna change mostly, right? Mm-hmm. , I mean, each company has a slightly different strategy, but generally they're trying to create something.

So once you get the first one through and approved, most of the applications for future licenses will be referencing 80 to 90% of the application. And then only 10 to 20% will be for [00:41:00] local environmental changes of that site. You know, if you're in Arizona or if you're in Minnesota or where, wherever you are, and you're dealing with those local environmental conditions.

80 plus percent of the of the application will already have been reviewed for the safety case, for the major features within the reactor. So I think what we're gonna see is this has been incredibly painful, incredibly slow. We haven't seen a lot of progress for many years until it changes. And I think we are on the cusp of seeing a big shift in the amount of reactors that get out there.

I think we're gonna see in the late 2020s, we're gonna have dozens in the us IMP implemented in the 2030s, we're gonna have hundreds, and then hopefully moving up from there. So I think we are going to see a radical shift in the deployment of micro reactors and small modular reactors.

**Marty:** What do you think is the main driver behi behind the shift and sentiment right now?

Is it people waking up to, oh crap, energy's [00:42:00] pretty important. It seems like, um, we've left ourselves in a bit of a vulnerable situation. From an energy grid perspective. Is it looking at. Examples like the UAE and others that are doing it successfully and saying, Hey, we need to participate in that combination of everything.

Or

**Brian:** I think from a political standpoint, it's clearly greenhouse gas emissions and climate change. I was just at, a few days ago, I was in a conference in Houston, so petrochemical conference, you might as well have been at the Green Festival, , I mean every single session. Every session, whether it was in finance, whether it was in technology, whether it was in legal, the entire conference was infused with all about electrification, CO2 reduction, decarbonization sustainability.

Every session was talking about it. And this is the, this is not a green conference. This was the petrochemical conference. So I think what we're seeing is [00:43:00] the policy level, both at the state and federal level is, is. Push this to a point where whether companies like it or not, they realize if they want to operate and they want to grow, they're gonna have to do something.

And so they're all looking for solutions and they obviously the solutions need to be affordable and cost effective, et cetera. So that's a huge driver. Yeah.

**Marty:** Government man, just forcing all these, these regulations on people, perturbing the market. Just let people go, let 'em run. I mean, and bringing this back to like wind and solar in California too, like again, I think the peace that you shared from Robert today, like leaning into the prices, like the proof is not in the pudding.

Like going back to the subsidies, we may have discussed this the first time you were on, but even if we did, I think it's important to rehash it. Like many people will point at the subsidies given [00:44:00] to wind in solar projects and say, Hey, this is pretty insane. How many subsidies, uh, these industries are getting, and then people from the wind and solar industry will turn around and say, you're like, well, uh, oil and gas is getting the same amount of subsidies.

Is that true? Like what? No, no, no. What is the magnitude of

**Brian:** it? Yeah. I'm trying to remember the exact number, but it's many, many times more subsidies on wind and solar versus the oil and gas industry. I mean, I've tweeted about this in the past, I'm trying to remember the exact stat, but it's not even remotely close in terms of order of magnitude.

Um, wind and solar have been subsidized in every possible way from tax credits, rebates, incentives, preferential treatment on the grid, access, all of these things. They get huge, huge advantages on and in terms of money spent to influence policy. Robert, uh, Bryce had, uh, a recent CK article on this where he showcased there was 4.5 [00:45:00] billion a year.

Being spent to on campaigns, basically to mislead people about the dangers of fossil fuels in nuclear power and focus on renewable energy. I mean, there's just so much money in all of these environmental NGOs that is going towards just hammering and bombarding the public and policy makers about the dangers of nuclear power, about fossil fuels are destroying the planet.

We must do this transition. And when you look at that, compared to, I think the spending was four to one in, when you look at the oil and gas industry and what they're spending to try to influence policy makers in the public. So the spending is way different in terms of both the money that's flooding in to influence policy and politics as well as just, that's why I think what we're seeing on downstream of that, which is where all the subsidies are actually flowing.

**Marty:** Yeah, yeah. No, we, I mean we see it in the B Bitcoin mining industry, particularly here in [00:46:00] Texas where. , a lot of mining operations are going after these wind and solar projects cause they're just like heavily subsidized on the front end and throughout the lifestyle they're able to get really cheap power.

But it's because these credits come into play, these renewable credits and it's not really that cheap without the subsidies, which is a blind spot I think a lot of miners have in the long run because of those subsid, I mean, just look at the state of the country right now. We have a banking crisis going on.

Looks like we're about to hit, um, the budget limit and whether or not the political will's there to keep raising the, uh, the ceiling on that limit is yet to be seen and, and would not rule out the possibility that one day you wake up at the end of the 2020s and those credits aren't there and then you're, you're actually sitting there mining at the true cost of power, which would be significantly above what, what you thought it was with the

**Brian:** credits in place.

Oh, when you, when you add up the true car, this is just partial cost [00:47:00] accounting. It's just, it's silliness to say that wind and solar are cheaper. There's, it's just, it's just not when you add up the real cost, that's why in every single place you have a high percentage of, of renewable penetration in a market.

They have higher electricity bills. I mean, it's, it's true in Germany, it's true in California, it's true in the 28 other states that in the US that have renewable energy mandates, it's just more expensive because renewable. is an expensive, wasteful, add-on to the existing grid. You don't get rid of the need to have a power plant.

Right. And don't even get me started on the batteries. Okay. Batteries, batteries. Today are, I sort of wanna get you started on the batteries. batteries are meant for shaving off peak. They're, they're used for these four hour windows when there's a peak in demand into basically offset that, right? They're not meant for long duration storage.

We don't really have that technology yet. People are working on it and maybe we'll get there. I'm sure we will get there. We're very innovative [00:48:00] humans, then people, really smart people are working on it. However, we don't have long duration battery storage, especially not long enough to go for weeks or months, which is what we need.

And when people are talking, oh, all we need is a day or 12 hours or a few hours, no. We look at the data. They did this analysis in Germany. They went back for 34 or 35 years of actual data. And looked at heating degree days, cooling degree days, looked at the amount of wind resource that was available, and they were trying to calculate, well, if we actually did shift the whole grid to renewable energy, could we do it?

How much storage would we need to overcome when the wind wasn't blowing? And when we had clouds, especially in a, in a country like Germany's Northern Latitude, they ha their solar power systems only have a 10% capacity factor. That means solar's only generating power 10% of the time, degenerating maximum power, um, of, of, of the day of the year.

So when you're in [00:49:00] that environment, you need a massive amount of storage and for seasonal storage. Right, because what they found was there was 64 days during a period of time where there was just scarce s wind and. . And when they went and calculated that, how much battery storage they would need, given that lack of resource, what they found was, I think it was 24 days of storage, 24 days, 24 7 for each day.

Obviously , I mean, it's just a massive amount. The, the price tag for something like that is so expensive and so ridiculous. You, you wouldn't even bother with the calculation because you don't need to, you, you just know that it's unaffordable. There's not, it's not even a possibility. No.

**Marty:** And it's, again, it's just indicative of the clown world because, uh, after Covid, we moved outta New York City, we moved to a small island barrier, island town, uh, near the southern tip of New [00:50:00] Jersey.

And in the causeway, when you're off island, you go shopping off island, you go to the, the store and then you go back on island on the causeway, you have a speed barometer. Um, it's solar powered. , uh, and in the middle of winter when the sun was laying low for, for most of the day or most of the winter months, and then it got cloudy because it was cold and it started snowing.

Like there are days where that barometer just simply wasn't on because it was solar powered. And you just use that as a small example, like that's one speed limit barometer that doesn't take a lot of electricity. But you use that as an example of like, this thing doesn't work. How do you think like a whole grid run on solar is gonna work?

**Brian:** Well, it, it's not just the amount of battery storage. You also have to overbuild tremendously because, so what they're, what the proponents of renewable energy say they want to do is they're going to overbuild the amount of solar, [00:51:00] wind you need. They're going to build out massive amount of new transmission lines so that they can interconnect large geographic areas so that if one place supposedly is.

Is cloudy or lack of wind, then you can basically import the electricity from another place and then you'll use some type of storage, whether it's hydrogen or whether it's battery storage to accommodate the rest. And all of those things make no sense. First of all, the building out the transmission capacity is just completely unreasonable.

For example, in California, they're saying they need to triple the size of the transmission capacity, triple the grid. Well, you can't even build anything in California, and now you're gonna triple the grid. You can imagine the amount of land use conflicts and fights and legal battles over that. That's not gonna, that's nowhere near going to happen.

And when you consider the alternatives like hydrogen, well, hydrogen is a wonderful chemical. I mean, we use it to. Ammonia, which is used to make [00:52:00] fertilizer, which is feeds, you know, half the world. So it's, it's great. And hydrogen's also used in industrial applications to remove sulfur from petroleum products.

Wonderful. You know, it's a great product. We make it today. The, the oil and gas industry is made hydrogen for decades. Right. However, when you're starting to use it as a fuel, which it's not, it's a carrier, it's not, it's not, you don't, it's not a fuel into itself. You have to make it, you have to make the energy or generate it from somewhere.

And it just makes no sense beyond a certain amount of niche applications when you start transport it. So for example, if you wanna start sending hydrogen around, well, you need to compress it because it's very light molecule. It wants to slip outta everything and it leaks everywhere. Right? And it needs a high amount of compression.

So you spend three times the amount of energy to compress the gas, to put it in a pipeline. Then you do natural gas. Three times. Um, [00:53:00] and then even back up a second, just to make it so you gotta make it somehow. So today it's made from natural gas. They basically strip it out of natural gas. The proponents of this renewable energy fantasy say that they're gonna use electrolysis, they're gonna split water, and they're gonna pull off the hydrogen.

Well, there's, there's so many flaws in that thinking that it would take us an hour to walk through everything, but let's just take a few of them, which is number one, the electrolyzer is the most expensive part of that whole setup. When you have an expensive piece of equipment, you have to run it all the time.

It has to run like 24 7. That's why all of these industrial facilities they run 24 7, they never shut down. Because if they shut down, the economics don't work to even build it in the first place. Well, people will say, well, we'll just store the excess wind and solar. Um, we'll put it through an electrolyzer when we have excess and we'll make hydrogen.

Well, no, because then the whole thing, will the economics [00:54:00] completely fall apart? You need that electrolyzer working 24 hours a day all the time, seven days a week. And then maybe it makes sense for some applications. But that goes against the whole idea of the intermittent power source. Cuz we know that it's not going to, the sun is not gonna generate power 24 hours a day.

So therefore, just on the face of it, the whole economics are destroyed. It makes no sense. That's before you get into needing to transport it, spending three times the amount of, uh, energy to compress it. Then the fact that tons of it is gonna leak out of the pipeline, which by the way is a greenhouse gas, um, more so than even methane.

I mean, in, in a lot of ways it's, it's a bigger problem. If, if we were doing this, no, it's not a problem today because we don't have a lot of it. And, but all of a sudden if we were trying to scale this up at the scale of natural gas, um, we would have a problem with emissions of leaking. Hydrogen because it would be coming outta everywhere.

It, it gets out. It is so small and [00:55:00] slippery. It, it comes outta everything out of welds, outta cracks everywhere.

**Marty:** Didn't we learn a lesson from the Hindenberg too? Wasn't that

**Brian:** hydrogen based? Yeah, it's, it's, I mean, we know how to control things safely, but that's a dangerous gas. You wouldn't want it going everywhere.

All of certainly would never want it pumping into people's houses or businesses. Yeah. For, for certain niche industrial applications, hydrogen might make sense, um, beyond its use as a chemical. But when people start talking about that it is going to be the replacement for natural gas and we are going to ship it all around the world, we're gonna compress it and ship it and move it and put it on boats, that is absolutely insanity.

It makes no, the thermodynamics of that make no sense whatsoever. And as soon as my, my litmus test with with hydrogen is, are they going to generate it and use it in the same place? If, if so, maybe it's worth a further look and maybe it makes sense as soon as someone starts talking about transporting it.[00:56:00]

I know they have not done any work on this topic and they haven't researched it because there are so many issues and we haven't even gotten to the embrittlement issues. It actually doesn't work in a lot of pipelines cuz it eats away and in brittles the pipeline makes so it depending on the type of steel.

So there are, so it is just a terrible fuel source. It's a great chemical, a terrible fuel source. Are people

**Marty:** seriously talking about replacing home natural gas

**Brian:** with it? Oh yeah. Oh, lots of people are proposing this. Yeah, they, hydrogen, there's so much hydrogen hype out there right now that this is the panacea of the solution.

The only thing that's hyped more than hydrogen is maybe fusion, , , but, but it's, it's a close second. Um, because there, they. Our viewing, it is the solution to this intermittency of wind and solar. So I think the achilles heel of renewables is everyone, it's so obvious that you have to have a long-term [00:57:00] storage solution in a way to deal with that.

So people point to batteries and hydrogen are the solutions. We know. I mean, it doesn't take a rocket scientist to realize that we don't have long duration battery storage yet. I mean, we just don't, we have great batteries for certain applications. It's limited, like we said. So like four hours after six

**Marty:** months, my phone won't make it through the night.

Like how do we think we're gonna create like batteries

**Brian:** for, oh, in what about in cold weather, which obviously many parts of the world have. I mean this going back to batteries in its role, even in electric vehicles, when you're driving in cold climates, your range can be cut in half up to, depending on the temperature obviously.

But if you get down to single digits, um, in let's say the US. Fahrenheit, then you could be cutting your range between 40 and 50%, and it can take three times longer to charge that car. So imagine you're trying to, I mean, fine, if you're just doing short commutes to work and you happen to have a garage and you happen to [00:58:00] have cheap electricity, then great.

Get an electric car. Knock yourself out. But that's not the reality for the majority of people that drive. Majority of the country lives in cold climates. They drive longer distances, and they don't want to have the inconvenience of waiting to charge their vehicle. Right? I mean, it's just, it's not a practical solution for many people.

**Marty:** No. Then again, think of the economic costs. Remove the need for battery infrastructure and charging station infrastructure. But going back to the time need of the charge, like the collective man hours spread out against, uh, over the life cycle of one of these cars. Like how much time is wasted? Like how much potential economic value.

Productivity could have been produced. Uh, if you did not have to wait to charge your car . It's like, like are these factored into these infrastructure bills, these economic analysis?

**Brian:** Probably not. No. I mean, this is all being driven. Again, back to your point, this, these [00:59:00] technologies are mostly being driven by this top down policy regime that is pumping massive subsidies to prop them up based upon an ideology.

That's why, that is why it is happening. If there were no subsidies for wind and solar, we would not be building them, except in maybe some niche applications where someone lives in a rural area and it costs too much to bring power lines to them. Or maybe there are some cases in sunny Arizona or sunny California for certain types of homes where it makes sense, great do it.

But that's not what they're proposing. They're proposing to have it be the dominant supply of energy. To run civilization. That's what they're proposing. California says, we're gonna be a hundred percent renewable by 2045. People say this to me all, all the time on Twitter, no one's advocating for a hundred percent renewable energy.

Like, what are you talking about? We have law, there's laws of states that actually say this and [01:00:00] yes, no, they, they are saying this right. That that is the stated goal. It's in enacted in legislation. Yeah.

**Marty:** And how many, like rolling blackouts or brownouts does California need to go through

**Brian:** before more pain required?

You think so? Oh, much more pain. I mean, it, I mean, I live in San Francisco. You, you see the politicians, the all the problems are right in front of you, and yet they're doubling down on all the policies that created the problems in the first place. And we see this at the state level as well. And it's just a shame because there's gonna be, unfortunately, a lot of unnecessary suffering.

again, back to the people that will suffer the most, will be lower in middle income families. They're gonna suffer the most because of these bad policy decisions.

**Marty:** Yeah. Yes. I mean, San Francisco is one of the extreme cases, not only from like energy, but just local city politics and the DA's office there and how they, I mean, I'll let you speak for the city since you live there, but [01:01:00] now I'm from Philadelphia.

We're going through similar things up in Philly, but it just seems like there's this political unwillingness to actually fix the problems. And I know you're good friends with Michael Shellenberger who wrote San Francisco Sicko and is really focused on this problem as well as the energy problem. Like what?

What do you like? Yes, things need to get worse, but like what? The, the rock bottom point where San Franciscans and then others wake

**Brian:** up, I would've, I would've thought we'd been there by now. I mean, I, I've had, I've had the privilege to travel quite a bit around the world, and unfortunately, I've gone to certain, certain places where I've seen some incredible levels of poverty in parts of India, for example, in parts of Peru that I visited.

And I can tell you when I go to the gym in the morning, um, in downtown, it is worse than some of those areas in Peru, in India. It is just incredible the level of just [01:02:00] self-destruction and, um, just suffering that we're witnessing. And the, the fact that we just allow this to happen, that just be, we walk by, I, I'm myself, I mean, I've become somewhat immune to it because it's everywhere.

You, you just are immersed in it. So it's really, really sad to see and how we, how easily we have to adapt to it. . Yeah.

**Marty:** And there's this weird juxtaposition where you have all that suffering and the like open drug trade and like just the unwillingness to actually change it, like with Silicon Valley tech, companies like that have built modernity in the digital age that we're afforded today.

It's just so odd that you have like all this immense wealth in the form of these tech companies and then in this city that seems to be getting into a more desperate place. Every day. Every day. You, you see it in the news? Yeah.

**Brian:** Well, these, these policies are being driven by [01:03:00] ideology. And I, I, ideology is coming from a place of people are wanting to do good.

I think most of, most, not all, but most of these actors are wanting to contribute to something bigger than themselves. They're seeking a sense of purpose. They're seeking meaning in their life, and they've embraced a set of ideas and the ideology. that fulfills that. And although that ideology is not grounded in reality, it, it is serving a function and a purpose for them.

And unfortunately, it has catastrophic consequences, um, when it goes awry. Yeah.

**Marty:** The, uh, the urge to help leads to, to mass suffering many times. Yeah. It's the, uh, that's why we have human action here. It's like, just pull yourself up from your bootstraps. Um, try to be productive and take care of yourself first.

And then naturally a bunch of individuals doing that together should, [01:04:00] should help each other and provide a quality of life that, that everybody's happy with. Um, which gets like to another question I wanted to ask you. Like if you had a magic wand, you, Brian Git were deemed energies are of the United States.

**Brian:** What would you do? Well first I'd fire myself. That would be my first action . Um, cuz I don't think anyone should have that position. That's the problem. It's the central planning, cramming down certain ideas on everyone. I think the most important thing that I could do in that position is actually to fire myself and remove as many barriers as possible.

Um, cuz that's really the, the, that's the genesis, that's the root of the problem, is we've layered on, although many of these are well-intentioned, we've layered on so many rules and regulations and requirements that it has just piled and piled and piled higher. [01:05:00] And, and it's gotten to a point where, and it's been obviously perverted by the political process and money that's influencing that process, et cetera.

So there's, there's many confounding factors to this, but right now the incentives are so misaligned. That that's why we're investing in the wrong technologies and that's why we're building an energy system that is gonna be more polluting and more harmful and more expensive, versus achieving the aims that we're setting out to do.

So I think price signals are incredibly important. Just the idea of a price is so powerful, right? Because it allows a large group of people to react to incentives and act very rationally and engage in free commerce with each other. So you want is the least amount of distortion is possible on that price signal.

And we've done just the opposite because we've loaded up certain technologies with tons of subsidies, rebates, and tax credits. [01:06:00] We're penalizing others we're, we're basically doing everything we can to obscure what the real price is and the real value is. And that's the root of the problem. If we could get out of the way.

Yes, there's certain we need a minimum number of regulations and rules. I'm not saying to go back to the free for all Wild West, but it's gotta be the minimum bar, right? That, that we should always look for the minimum threshold. We always now are looking for the maximum threshold. It's the inverse.

**Marty:** Yeah. I completely agree.

It's, uh, it was a trick question. I was hoping you were gonna fire yourself because, uh, , because that is the problem. Central planning and price distortion, it's again, going back to the money, like what the fed's doing, what they have been doing. Like we have this banking crisis because the Fed manipulated the pricing mechanism of the world via interest rate policy.

And we have all these distortions throughout the financial system that [01:07:00] are, have made it extremely fragile over the last five decades. And we find ourselves in a situation where, Jerome Powell and Janet Yellen look very worried right now because I think deep down they understand the gravity of the situation and the ill effects of messing with the pricing mechanism of the world.

**Brian:** It, it's astounding to me that someone would have the hubris to think that they could control and manage a system that is so comply. Our financial system, our energy system. These are two of the most complicated, nuanced networks and systems of, of trade and interaction that exist on the planet. How could any group of hu, small group of humans think that they could somehow put their thumb on the scale and control it in, in a, in figure out what the desired outcome and, and actually achieve it?

I, I think it's impossible, and that's what the whole idea of a price signal is, is the fact that you can get millions or even [01:08:00] billions of people to coordinate. Effectively with the right incentive structure. So I think it's, it all comes back to what you're saying, it's this kind of centralized control and centralized decision making, um, that, that hubris to believe that you can even do that is the huge part of the

**Marty:** problem.

Yeah. Complacency. Complacency and hubris, or why we find ourselves in this terrible situation that we do in the financial sector and the energy sector, the, like, American populace at large has probably got a bit complacent, not understanding the, the systems they're operating within, and then the hubris of the government to give the, the populace, the, um, the courage to believe that the government has, uh, their best interests of mind and can make the best decisions for them.

**Brian:** And this is, it's a really hard problem because I, I'm, I've been very guilty of this myself. I mean, I spent 20, 20 years of my career. [01:09:00] pursuing a lot of the ideas that are opposite of what I'm saying right now. And so it's, it's really hard. How do you question your beliefs? How do you, how do you know when you're being overly biased and overly influenced?

Because we're all biased, obviously in, in some way, shape, or form. And it's really hard to change your beliefs because your beliefs are rooted in your identity and your identity is tied to all of your social relationships and how you see yourself and how other people see you. So if it's really challenging to think about, how do you shift a belief cuz then this can change my identity, that might change my friends, that might change my professional network.

All of those things. So it's easier. And all of us, myself included, we like, we like the path, at least resistance. We don't want, you don't wanna wake up every day and have that kind of cognitive load to figure out like everything, right? So we have all these heuristics and these. These ways of kind of fast tracking [01:10:00] things, but how do you know when you're too much on autopilot and not really questioning some of those core beliefs and assumptions?

And, you know, I've, I've been wrong so many times, and unfortunately that led me to waste decades of my life working on the wrong problem. So I get this, I mean, I'm not actually, that's why I'm not blaming people generally. I mean, of course there's some bad actors, but I think for the most part, people are well-intentioned.

They're stuck in their, their biases and their programming. And I don't disparage them, but we need to shake them and we need to educate them. Uh, just like I need to be, I needed to be shaken and educated. And, um, you know, part of it, the reason that I had the opportunity to question my police was I suffered some serious pain.

You know, I made some serious bad investments. I lost millions of dollars. of my own money and other people's money based upon a [01:11:00] belief system that was wrong. Right? And so when you go through that kind of pain, I guess you, I guess you could continue to, to to blindly follow. But it's, it, most people, I think in this situation would say, they'd step back and go, man, I never want to do that again.

Yeah. What did I, what decisions did I make? What beliefs do I have that allowed me to think this was the right way to go?

**Marty:** Yeah. And so you would define that part of your life as a waste of time?

**Brian:** Well, it's hard to ex, you know, it's hard to extract all this. I mean, I did, I wrote this article on how I wasted 20 years of my life, uh,

Cause I, I was basically working on energy efficiency, renewable energy for, for two decades. It's hard to to know what's truly a waste, cuz we all learn from our experiences and we grow and we couldn't be where we're at now without those experiences. But objectively, if I really sat back and, and thought about it and [01:12:00] in terms of trying to achieve the goal of the problem I was working on, which is how do you create clean energy?

How do you create, um, environmental protection in the world? And, and, um, yeah, I failed . Absolutely. It was a waste because if I would've been spending that time pursuing, uh, working in the nuclear power industry or working, um, in the natural gas industry and working on other technologies, I could have been contributing in a much more meaningful, productive way, but instead I was part of the problem.

**Marty:** Yeah. And it does take a lot to admit that, to look internally and to say you were wrong. Right. It's, I mean, that's part of what, uh, led me to Bitcoin. Like I studied economics, I studied. finance in college, I got a job trading, worked at a fund that traded currencies, and I was like, I wanted to be an economist of some sorts.

Like I looked up to, [01:13:00] uh, the Federal Reserve, uh, chair chairperson at any even Bernanke Yellen for a period of time, for short period of time. But, um, I wanted to be that like macro expert that, that really understood why currencies were trading the way they were, because I thought there was, um, validity in the idea that economists were necessary to make sure that the global economy could actually function.

And it wasn't until it was a few years into the industry and I started realizing how markets were trading off of what these Fed shares were saying. I was like, wait, this doesn't make any sense. And luckily I found Bitcoin and was able to be like, oh, this makes a lot more sense than this. And started, uh, dedicating my life to that.

But yeah, I mean, that happened. In my early twenties, luckily for me, but no, it was, it was a bit of a shock being like, oh, I just spent all this money on this degree for something that is complete bullshit, .

**Brian:** Well, it sounds like you, you, you didn't [01:14:00] do too badly though. If you found out in your early twenties what, you know, kind of a better path.

Yeah,

**Marty:** yeah. It's um, and that's the thing. I think that's true. That's why we have it outside. Fix the money, fix the world. Cause I do think going back to like creating accurate pricing signals throughout the economy, you can only do that with a good money that allows you to actually create like a metric stick of value that which you can then go put prices on things.

**Brian:** Yeah. Money, energy are the foundations of, of civil, modern civilization. Right? I mean, those are the, that's the backbone, uh, the rails that everything rests upon. And I think the, the worst part about on the energy, well, on the money side too, but is that, We're pulling up the ladder behind us and subjecting the developing world to energy poverty in the name of environmentalism and climate.

Right? It, it makes no sense. I mean, we still have 40% of the [01:15:00] population on the planet, all three and a half, 4 billion people that live in energy poverty of some type. Now, there's obviously a spectrum of extremes. We have about 700 million that have no electricity, that cook and heat their homes with wood or animal dung in terms of generating heat.

They're breathing. Uh, most of the women that are doing the cooking with their kids are breathing the equivalent of two packs of wood smoke to cook with and just to heat their homes. They're breathing in the equivalent of two packs of cigarettes a day. They're going in, spending an hour a day to gather wood for cooking and an hour a day to gather water for drinking and cooking.

This is the reality for billions of people, right, and telling those people. Oh, you can't burn fossil fuels. We're not gonna pay for that. We're not gonna finance that power plant. We're not gonna build that pipeline. We're not gonna let you burn coal. That's the height of hypocrisy when over 80% of our world runs [01:16:00] on fossil fuels and all of our wealth was built on fossil fuels, and we are going to subject them to living that life in, in the name of us being somehow, uh, idealistic and thinking that we're do-gooders.

I mean, that's the height of hypocrisy. Yeah. And

**Marty:** I really hope it changes. And I do agree. I do think the sentiment is beginning to change. I think there is a bunch of people, obviously not all there, there are people who are pot committed to fighting for the cause, but I, I do think the quote unquote silent majority of people who have that.

Intuition in their stomachs. They have that gut feeling like something's not right, like something needs to change. I think they're beginning to do more research and really shake themselves out of being complacent and begin to focus on this. Cause I think whether it's the financial system, the energy systems, um, the overall [01:17:00] health of the country, I think people are beginning notice like, Hey, something's, something's gone wrong here.

I need to dig

**Brian:** into this. Yeah. When you go to the bank and your money's not there, , or when you, your electricity gets shut off because there's not, uh, a stable source of electricity. People wake up quick and it's very fast. It, that's why I am, it is inevitable that we are going to get rid of this ridiculous idea of powering the world with wind, solar, and hydrogen or whatever.

That's never gonna happen. It's just how much suffering is going to have to unnecessarily take place to get there. Because once the pain comes and it's going to come, The natural human response is going to be to throw out the politicians that got us there and put in some new ones. And that is inevitable.

It's gonna happen. We're already seeing it starting to happen in certain parts of the world. So it's just, it's just a shame that people will have to suffer along the way. Yeah.

**Marty:** Do you, do you think it happens in California in the next few years? Uh,

**Brian:** we're [01:18:00] not there yet, but I think, I think if we continue, and it's an, if there's always the, I'm, I'm always an optimist and hopeful that we can course correct.

I mean, the definition of intelligence is air correction, and we do have the possibility to change and to shift, but right now we're doubling down on all of the bad policies that are creating the problems, and it's gonna exacerbate and make it worse. So if we, if we truly continue down this path to try to get to this 100% renewable energy goals, if we are banning all traditional, conventional cars, by 2035.

In what? Oh, the thing we started this whole conversation on was, it's not just cars. Now they're going to medium and heavy duty trucks like diesel trucks, you know, 18 wheelers. Right. They're trying to, that basically the EPA has granted California this exemption to, to basically pursue this, it looks like.

And so none of this stuff makes sense [01:19:00] in the realm of thermodynamics and, and economics and, and reality. We don't have any of that charging infrastructure for those trucks. We're expecting the small business owners that run these trucks to go spend hundreds of thousands of dollars on new trucks when they don't even have the infrastructure to charge them.

And they're not even certain that we'll have the energy available that they need when they need it. And it doesn't even make sense given the routes and the their time duration that they're gonna have. They're not gonna sit and charge the truck. For hours, the weight that they're carrying. Yeah. I mean it's, it, so these are the kinds of things that aren't gonna work.

We know they're not gonna work cuz it's obvious just from a physics and economics, thermo thermodynamic standpoint. So will we course correct? Yes. Eventually. Will it happen in the next few years? I, I would, I wouldn't bet on it unfortunately. Uh, cuz it seems like we haven't, until we have more pain, people aren't [01:20:00] gonna change their minds and wake up.

**Marty:** That's annoying because we know these problems. I mean, you've been, you've dedicated your career to it. We've ta discussed it. Um, at least over the last year, probably more, um, both together and then separately via our newsletters and social media presence. I guess that's the one question. . I want to ask as well, which is like how, like the people listening out there all over the world that agree with us, maybe they're a bit silent.

Like what would you tell them in terms of like giving them the ability to affect change by speaking up? Like how do we, like how do we tell people listening to this, how do we teach them to go shake others to get them to wake up so that we can course correct before people die? I mean, cause I mean, if we get rock [01:21:00] bottom and this goes unperturbed into a future where they're trying to power every California, uh, truck with, as an electric vehicle, like people are gonna die.

Especially if you, you're depending on grid infrastructure for this, because power is essential for life particularly. In the western world, like you mentioned, the billions of people who live without power every day, they're used to it. But if you have a situation in America where people, their whole lives have been, uh, accustomed to reliable energy, they go into a, a room and flip the light on and has worked their whole lies.

If that archetype of a person and the privileged westerner, if you will, uh, gets put in a situation where they go to turn the lights on and it doesn't go on, like they don't have the experience to actually survive without

**Brian:** reliable electricity. Yeah, I mean, a lot of people rely upon health equipment and various things for, to live, right?

I mean, even in [01:22:00] the, the Texas blackouts a couple years ago, there's a couple hundred people or more that died in that in those few days just because of lack of power. So it's not, it's not a, a minor topic. This is a really deep, important topic. When the lights go out, people die. That, that's what happens.

And so we should be taking this really seriously. And I think to answer your question directly, more of us need to start speaking up about this and not just kind of putting our head down and say, oh, okay, I'm just, well, I, you know, I'm busy doing X, Y, Z unless more of us are vocal and speak out about it and push back a little bit against this, and we can do it in a very respectful and engaging way.

I'm not saying to get in fights with people about it or anything, but we have to speak up about this, these topics, or nothing's going to change. Because most it, it's the, the Green Emperor has no close. Mm-hmm. really doesn't, I mean, it's, that's what I feel like we're doing right now. We're saying, look, the emperor has no clothes and yet it, it's [01:23:00] obvious.

And people, as soon as a few more people and enough people, Look and agree, then everyone's gonna agree because I think everyone is, has common alignment and common incentives to agree ultimately in this. Um, it's just people are fearful and they've been told a certain narrative that is just untrue and they haven't, you know, most people are busy, they're trying to run their lives.

They don't have a chance to research all this stuff and dig deep into it. But once they start realizing the stakes of their health, their family, their, their livelihood or at stake, then it becomes serious. So hopefully more people can speak out and be a little more courageous on these topics in the near term so we don't have to get to that emergency point.

Completely

**Marty:** agree. Go speak out freaks. It's important. And thank you for speaking out. I think what you're doing is incredible, both on the content side of things, what you do on Twitter, what you do with your newsletters and um, what you're doing at Okla. I mean, I think, um, the SMR [01:24:00] movement is very important.

Um, It makes sense, right? Like it, it makes a lot of logical sense that we would go towards this extremely dense energy source that that has been neglected here in the United States for, for way far too long. So again, on, on both fronts, the education front and actual like trying to get nuclear across the line, I think it's gonna be a p massive positive e ev for society.

And maybe you're 20 years in, in the renewables wasn't a waste cuz it, it drove the fire under you that you have now to, to make sure that

**Brian:** we course correct. Well I like your little tagline in your email, we will win . Yeah, I like that. We're gonna win so we're gonna win. Uh, so thank you for having me on. I really appreciate it.

It's always a pleasure talking with you. No,

**Marty:** I'm glad we were able to do it in person this time. So much better than an over

**Brian:** zoom call. Oh my God. Yeah, I agree.

**Marty:** Yeah. before we wrap up. Where can people find you?

**Brian:** They can find me. The best two [01:25:00] places are on Twitter. I, I try to share what I'm learning every day or almost every day at Brian Git.

And then my website i brian git.com. I haven't been writing as many articles recently, but I've been working on this little mini book project that I'm gonna be launching soon, going through an independent publisher. And so go, you can subscribe to my website, get articles about energy investing, decision making, and then you'll, things like this book project, obviously you'll hear about that in other videos.

So those are the two places. Hell yeah.

**Marty:** Well, it's a hell of a way to end a Friday. A hell of a way to end a week. Great conversation. Yeah.

**Brian:** Thank

**Marty:** you. Thank you. That's all we got today. Freaks. Peace and love.