

Scott Tinker ([00:00](#)):

Next on Energy Switch, we'll discuss whether the US should support or move away from its oil and gas industry.

Scott Tinker ([00:07](#)):

How affordable is oil and gas as an economic multiplier today?

David Victor ([00:12](#)):

Our lifting costs, or the cost of bringing oil out of the ground or gas out of the ground, tend to be higher than the lowest-cost producers in the world. That's bad news for the US oil industry looking into the future.

Matt Gallagher ([00:23](#)):

Not all jobs are created equal. One thing you get from a US barrel is that known product of the employee base, because of the requirements that we have on safety, and we should compare that to a global product.

Scott Tinker ([00:36](#)):

Coming up on Energy Switch: does the US need a thriving oil and gas industry?

Speaker ([00:41](#)):

Funding for Energy Switch was provided in part by Microsoft and by the University of Texas at Austin.

Scott Tinker ([00:53](#)):

I'm Scott Tinker, and I'm an energy scientist. I work in the field, lead research, speak around the world, write articles and make films about energy. This show brings together leading experts on vital topics in energy and climate. They may have different perspectives, but my goal is to learn and illuminate and bring diverging views together towards solutions. Welcome to the Energy Switch.

Scott Tinker ([01:23](#)):

The US is now the largest producer of oil and gas in the world. We'll talk about its many benefits to US jobs, industry and the economy. And we'll talk about its challenges in CO2 emissions, in transitioning itself to become a lower carbon business and to transition to energy alternatives, and the difficulties that may pose to the communities that depend on the oil and gas industry. My guests today are Dr. David Victor is a professor in the school of global policy and strategy and co-director of the Deep Decarbonization Initiative at UC San Diego and a Brookings Institute senior fellow. Matt Gallagher is the former CEO of Parsley Energy, founder and CEO of GreenLake Energy Ventures, and a venture partner with NGP Energy Capital.

Scott Tinker ([02:12](#)):

On this episode of Energy Switch, does the US need a thriving oil and gas industry? Let's just dive right into it. We're going to look at the economic benefits and challenges to begin with. So how affordable is oil and gas as an economic multiplier today?

David Victor ([02:30](#)):

Well, oil and gas today is extremely affordable. That's why they are dominant energy sources. That's why oil is in the transportation system. Natural gas plays a critical role in heating, in the electric power system. I think one of the challenges going forward is how do you keep energy sources affordable while also dealing with other kinds of challenges in particular climate change?

Scott Tinker ([02:49](#)):

Right.

Matt Gallagher ([02:50](#)):

I like the word economic multiplier. We've really seen a Renaissance in industrial capacity over the last decade in the US. A lot of that due to affordable, reliable energy, reshoring a lot of them and being able to navigate this global economy right now.

David Victor ([03:08](#)):

The oil and gas industry are doing a lot of different things in the economy. They're providing fundamentally raw energy, which is then used for moving things around, for illumination, for heat and so on. And then they're also providing the raw materials for the petroleum chemical industry. There's really interesting series of studies that the International Energy Agency released last year that looked at the future at what happens if we were to essentially eliminate emissions of greenhouse gases over the course of the next few decades. What happens in the oil industry's really interesting, is it shrinks globally by a factor of five, roughly. And what's left over is the portion of the industry that really has no easy substitutes, which is plastics, petroleum chemicals, pet chem.

Scott Tinker ([03:46](#)):

Right.

David Victor ([03:47](#)):

And so I think that's... We have to have some kind of strategy that retains those kinds of functions, but then also recognizes for a lot of other areas, oil and gas are not exclusive in their capacity to provide that.

David Victor ([03:58](#)):

And I think in particular, we have to grapple with the trade offs, obviously about climate change and emissions associated with climate change while taking not just seriously, but putting front and center that this industry today produces, depending on how you count, several hundred thousand jobs for Americans that are many of them well paying jobs. I think one of the things we as a country have not really done as well as other countries is figure out how to help people who are doing one job, do a different job. Because if we don't do that well, then the transitions that we're going to be talking about those transitions are going to be very, very painful.

Scott Tinker ([04:32](#)):

Yeah. And may get some pushback.

David Victor ([04:36](#)):

Not may, I think guaranteed we'll get political pushback. And then frankly, this country, that's a disadvantage to this country because if we don't have the capacity to build an industry of the future here, we know others will do that because they're doing it right now.

Scott Tinker ([04:49](#)):

Right. You mentioned 300,000 US jobs.

David Victor ([04:52](#)):

Yeah. Although I think a big difference is that the US industry has a very different structure.

Scott Tinker ([04:58](#)):

Yeah.

David Victor ([04:58](#)):

Price structure from the global industry. And this is, I think, going to be one of the big challenges for United States is that what our lift, what are called lifting costs? So the cost of bringing oil out the ground or gas out the ground tend to be higher than the lowest cost producers in the world, like in the Persian Gulf. And so one of the concerns for the US industry is that if we go to a future where oil consumption's radically lower, that the fraction that's left over to be supplied is going to be dominated by the countries that have the lower lifting costs. And that's for all the great news for the US oil industry in the last two decades, that Matt knows so much about, that's bad news for the US oil industry looking in the future.

Matt Gallagher ([05:35](#)):

Well, I think we got to put that into a holistic context of what is in that cost. And when we talk about an ESG impact of our industry, there's social and there's governance cost in there too. So the US industry has the highest standards of DEI, of human rights. We should know where our energy is coming from. We should know who the employers are and we should compare that to a global product. It's not potentially just a commodity. One thing you'd get from a US barrel is that known product of the employee base. And not only...

Scott Tinker ([06:09](#)):

Yeah, that's interesting.

Matt Gallagher ([06:11](#)):

I think we have roughly four to 500,000 jobs just here in the state of Texas. So I think the industry is quite a bit larger across the US and it's not all jobs are created equal. The hourly equivalent wage we put it well into probably the multiple millions. We're talking about highly compensated, highly trained individuals in the US because of the requirements that we have on safety. So just from an economic point, I love the idea about how are we going to retrain and how fast are these positions because you're leaving communities really high and dry. And when I think about manufacturing in the US and offshoring that dynamic and what it left the Northern manufacturing cities, we did things a little too quickly without thinking about the impact on the worker.

Scott Tinker ([07:00](#)):

And that kind of leads me into the, in some ways, into the boom and bust cycles, what are the impacts of those? And is it different this time?

Matt Gallagher ([07:07](#)):

Boom and bust cycles have a horribly negative impact to any business. So just over two years ago now we saw negative oil prices. And once it happens, if you're an insurance actuary, you have to account for it potentially being able to happen again. So that increases the financing cost, the risk factor to any individual industry. And this industry is seeing the implications of that. New students graduated from the Colorado School of Mines and talked to that campus recently. And they're asking, is there a future? What should I choose? We still need bright minded people to be doing this the best we can. So you got to lay the playing field out there. These are the risks. These are the realities, here's the opportunity. There's a huge opportunity growing in wind, solar, hydrogen, and we need bright minds going after that too. So you got to follow your passions, but these boom and bust make it very, very tough.

Scott Tinker ([08:05](#)):

Yeah, talk about the shaky investor environment for oil and gas. Let's hit that a little bit. Engine Number One, a group formed by who?

David Victor ([08:13](#)):

The founder, Chris James has a long history of investing. And I think with the genius behind what he and the core group at Engine Number One did, is that they spoke to the oil and gas industry around shareholder returns. And so it's not a bunch of dope smoking, tree hugging, Birkenstock wearing people saying, Hey, you know, go hug the planet. It was, if you don't as an industry, get ready for this future you will be destroying shareholder value. This is an industry. The oil and gas industry has gone from one that reliably was generating 10, 20% returns, to one that is basically generating commodity-like returns that are not dissimilar from commodity solar, not dissimilar from all kinds of other highly regulated industries. And yet it has more volatility associated with it. And so in that world, not surprisingly, shareholders are saying, why should I be here?

Scott Tinker ([09:04](#)):

You put low returns in ESG. Boom.

David Victor ([09:07](#)):

And I...

Scott Tinker ([09:08](#)):

Money leaves, right?

David Victor ([09:10](#)):

Yeah. Or it gets destroyed.

Matt Gallagher ([09:11](#)):

I personally share and welcome Engine Number One's approach and it's highlighting another... I come from a little bit different background, grew up in a very small family oil and gas company, 1000, 2000 foot wells, you lived off cash flow and we had no multi-state or multi country contracts. So I think you're

exactly right that energy companies, whether they be extractive fossil companies, whether they be oil, whether they be gas, you're just a company and you need to be generating returns for your investors and planning a strategy for the future. And they were not vocal about the transition strategy for the future.

David Victor ([09:56](#)):

So these firms are under pressure to do something about climate. They have a limited number of strategies that they can follow. They can be kind of last man pumping, kind of the lowest costs and keep on pumping, or they can invest in areas where they have skills that overlap with the energy transition as we so gently call it. They're good at hydrogen because they do a lot of hydrogen refineries right now. I think that actually is one of the most promising areas. They're very good at down hole. And so that means that if we have a future where we capture the CO2 and put it underground, then they're going to be very good at doing that. The carbon capture storage industry and then also geothermal. There's... While we been sleeping, there's been amazing innovation in drilling for geothermal. Geothermal could become a big part of a renewable future because unlike solar and wind, the variability is much lower. And so geothermal is one of those energy sources where the innovations on drilling matters.

Matt Gallagher ([10:46](#)):

I think you and I share the exact same concern. You know, how is it going to affect Joe Public tomorrow? And I'm worried that we're in such a binary world. The switch is on, the switch is off. The answer is this or the answer is that. And it's not... It has to be a mix of all of this, but how do we keep the urgency?

David Victor ([11:07](#)):

There's an anti-government kind of feeling in a lot of the energy business. It's a frontier mentality. And then when you look behind the curtain, what do you see? The government's actually done a lot of things that have been very helpful. The horizontal drilling and fracking revolution, not all of it, but a big part of the early investments were frankly government backed in one way or another. So it's a mixture of public and private. This is an area where I think there's a very important function for government, along with other social institutions, churches, and so on, is we have to make a credible offer to the communities that are going to be harmed by the loss of employment that comes from the elements of this energy transition. Yep.

Scott Tinker ([11:45](#)):

Yep, completely. We've talked a lot about economic benefits and challenges of the oil and gas industry. Let's look at some of the environmental impacts and let's just start right with the big one, CO2 emissions. What level emissions are oil and gas responsible for and what are some of the things we can do about it?

David Victor ([12:01](#)):

Well, globally oil and gas together are about 18 billion tons of CO2. So a little bit more than coal. So oil and gas together are a central part of the global buildup of carbon dioxide. And therefore they have to be a central part of the solution.

Scott Tinker ([12:14](#)):

Is it a fuels issue or is it an emissions issue? What can we do to capture some of those emissions?

Matt Gallagher ([12:18](#)):

Well, I do think it's an emissions issue and let's tackle it and improve and clean up our own act. We have to cut out the low hanging fruit. These are methane emissions, methane leaks. These are flaring. Why are we flaring? Sometimes you have an exploratory well, you don't know how large you're going to build your facilities and you have temporary flaring. And then you put it in a pipe. But not on large scale basins where we know the resource is going to be found. We should come to agreement and eliminate that or nearly eliminate flaring. So we can be a leader in the US in oil and gas. Once we set that tone, set that pace, we should demand that the globe follows or not use that energy here in the US. So I think there's a lot of options and a lot of opportunity for us to be leaders.

Scott Tinker ([13:05](#)):

Yeah. Lead technologically.

Matt Gallagher ([13:07](#)):

Yeah.

Scott Tinker ([13:07](#)):

Carbon capture and storage is talked about a lot, a way to capture the emissions, post combustion out of power plants and refineries and stacks of different kinds. And then you put it back in the earth. That's a subsurface challenge. Is this someplace you can lead to, or...

Matt Gallagher ([13:22](#)):

It is. And there's a lot of synergistic opportunities there. So you think about these fields, these reservoirs, subsurface that we've extracted from for now close to a hundred years, over a hundred years in some cases, they've left some void space, some reservoir space, some of these are within five, 10, 15 miles of some of the largest power plants in the US. We can put the capturing systems on the tail end of those power plants, use the same pipelines, put it right back into those fields where a lot of it came from, those reservoirs. So these are large scale projects, large scale opportunity, capture millions of tons of CO2. And so the industry can close the loop, so to say, of the emission cycle.

David Victor ([14:08](#)):

This is an area I completely agree with Matt. This is an area where the US could be an enormous leader and we're doing some projects. I'm really worried about us staying the course. We've been talking a lot about it, not doing so much. The death rate between announcement and actual project for the big carbon capture storage projects that involve power plants and so on is like 95%. And so it's because somebody says, I want to do a project. And then the government says we will support it. Or somebody else says they'll support it. And then something comes apart and the financial glue melts away. So we've got to do more of these projects and actually carry them to fruition, learn from them, because leadership by itself doesn't solve the climate problem. It's actually followership that solves the climate problem. It's because the US is one fifth of global emissions and shrinking. And so we need to develop those industries because it's going to be good for Americans and American jobs, but also because by demonstrating the technology, you then make it possible for others to follow along.

Scott Tinker ([15:07](#)):

Yeah. I've had a team called the Gulf Coast Carbon Center, the last two decades leading these big experiments in brines, putting it in salt water. But like you say, the commerciality of this, it seems to be mostly be an economic challenge, not so much a technical one anymore. We know places to do this and you can put it at rate and volume, but how do you get the right cash streams in place?

David Victor ([15:33](#)):

So I think this is the key point is it's to put a sharp, even sharper point on it, is it's a finance challenge. Companies that sit behind these projects need to be able to see a stream of payments that make the risks that are intrinsic in working in new technologies bearable. This is the big difference between CCUS and CCS. So CCUS is carbon capture, utilization, and storage. The idea that you take the carbon dioxide from a power plant, for example, you put it underground and you use it for some commercial purpose, like extracting more oil. So that's a way to get the industry started.

David Victor ([16:05](#)):

But the really big game is CCS. It's just carbon capture and storage. Yeah. Not producing more hydrocarbon or having some of that come back up. So if you can learn from the CCUS in a way that makes CCS more transformative than fantastic. But this is an area where, to the question of our debate today, about a US oil and gas industry, this is where a US industry that learned in oil and gas and applies the same skills or similar skills to carbon management. That's a vibrant industry.

Scott Tinker ([16:36](#)):

Absolutely. And big volumes and big dollars. People will pay for it. It comes out somehow. Let's... Methane leaks. Why are they important? Why does methane matter? And what can we do about it?

David Victor ([16:49](#)):

It matters because methane is an extremely strong greenhouse gas. And depending on how you account, it's 20 to more than a hundred times more potent as a greenhouse gas compared with carbon dioxide, but it has a short lifetime. So when it goes in the atmosphere, it causes a lot of warming quickly, but then it's removed from the atmosphere on the scale of about a decade, as opposed to on the scale of about a hundred years for carbon dioxide. So it matters because it is accelerating warming at a time when the world's warming is already accelerating.

Scott Tinker ([17:17](#)):

Right, right.

Matt Gallagher ([17:18](#)):

And I'd say, it's the product we sell to use for much more beneficial purposes than leaking into the atmosphere. So we should capture the product and sell it and not let it leak through lazy operations, cost cutting measures and improper maintenance. And we're at this nice confluence where we have amazing technologies that can help us. I mean, there are satellites flying overhead right now, imaging methane emissions. We have these thermal imaging cameras. We plug those in to the cloud and we can look at abnormalities. As soon as that sees something different, we can call out someone right away and we can stop the leak.

David Victor ([18:01](#)):

Turns out for a long time, one of the largest sources of fugitive methane emissions in the US was pneumatic valves on gas pipelines, because the pipeline used the pressure of the gas to move the valve and then just leaked a little bit of that into the atmosphere. And that was all, when you added it all up was a huge amount of methane. You can change the different kinds of valves that have no leak. And nobody had an incentive to do it. Now they have an incentive to do it, and the industry's responding.

Scott Tinker ([18:26](#)):

Right. Can we lead there? The world, there's a world oil and gas industry. Does it do it as well as we do?

Matt Gallagher ([18:33](#)):

So the Europeans are doing a very good job of it, but I think a lot of these sovereignties, they answer to a different client. And that's the one that we're going to have to watch. You have all of the OPEC plus members with extremely large volumes of production and pretty high emissions in a lot of cases. So that's going to be a challenge.

Scott Tinker ([18:51](#)):

Look, hydraulic fracturing, cracking rock through hydraulically pressured fluids, been done a long time in vertical wells and now horizontal wells. Fracking is the vernacular. What are the actual concerns? The things that have shown to actually impact human health or the environment and things that didn't?

Matt Gallagher ([19:10](#)):

I think through multiple years and multiple studies, the human health component is negligible. Over hundreds of thousands of wells, that's been shown. But the environmental impact is still out for debate. We're using a lot of water to do this. If we're using fresh water and we're using it in the frack process, we're eventually disposing of it. So what you can do is you can use produced water, which was already 10,000 feet under the surface.

Scott Tinker ([19:37](#)):

Old oceans, buried in the porous space in the rocks.

Matt Gallagher ([19:40](#)):

Yes. And it's mixed with oil already. So you use that produced water and then you actually recycle it. So I think that has to be a larger component. So this is a great point where we can't just focus on CO2. We have to focus on the whole impact, but no, the early concerns of the human impact, shallow water aquifer impact almost completely dispelled through proper practices.

Scott Tinker ([20:05](#)):

Right.

David Victor ([20:06](#)):

That's the key thing though. Proper drilling and well completion resolves the concerns about shallow aquifer impacts. But only if everybody does it. And that's, I think, what's been learned is that there's still a big variation in behavior inside the industry. Big operators have a big incentive now, a growing incentive to make sure that the small operators play ball because the reputation of the entire industry is at stake.



Matt Gallagher ([20:32](#)):

The Santa Monica oil spill, even though that was a small producer and the cause is still being studied, it hurts the whole industry. So everybody has to up the standards and make sure everybody's playing with the same high standards.

David Victor ([20:48](#)):

But I think one of the things we've also learned from this is that people process information about risk and impact in very different ways. All these industries in various ways have environmental impacts. The oil industry has impacts from oil leaks. The renewables industry has environmental impacts from land that's taken over at very low power densities and larger and more expansive areas of land. And this is a very important area for the civilized debate to focus on what are the real trade offs that we want to bear as a result of the way we get energy.

Matt Gallagher ([21:21](#)):

I think it's interesting to think about what is a renewable spill because once up and running pretty low impact industry at the source of the energy capture.

Scott Tinker ([21:33](#)):

I mean, occasionally a turbine blade will fly off or one will burn up, but it's way low.

Matt Gallagher ([21:38](#)):

So I think...

David Victor ([21:39](#)):

But the land use impacts are really big.

Matt Gallagher ([21:40](#)):

So that's one.

David Victor ([21:41](#)):

This was... Jesse Ausubel had this really important set of insights about power density and is absolutely right about this. And the industry cannot be reckless about this question. This is why there's such a big difference between shifting to 60, 80% renewables versus a hundred percent renewables. And a hundred percent renewables is, almost everywhere, a reckless idea because the extra land you need for all that solar and wind, especially solar, that's a waste of natural resources.

Matt Gallagher ([22:11](#)):

Yes.

Scott Tinker ([22:12](#)):

Well, look, we've had a wonderful conversation. How would you sum it up? You know? Matt?

Matt Gallagher ([22:18](#)):

Sure. Maybe I'm a little biased, but I think we need domestic energy champions. We need people that are taking a leadership stance, doing it the right way. We need to be embracing all of the above, the energy everything bagel, but domestic oil and gas has a great strategic advantage due to the infrastructure we've already had in place, the resources below our feet, the way we operate above ground and the way we hold both the social and government standards at a high regard, too.

Matt Gallagher ([22:52](#)):

What that's going to lead to is I hope a discussion when you're filling up your car, when you're heating your home, when you're cooking, when you're using the plastics in our everyday life, where did that molecule, where did that energy come from? And I think that drives a little bit of preference to make sure it's coming from either a European or the US platform in general. And this domestic energy is supporting hundreds of thousands of high paying, high skilled jobs and affecting millions of people every day, economically. So we need to bridge that in a methodical manner, but it's an innovative industry. It's got a ton of grit. And I do think through the 21 hundreds, we're going to have a thriving place, a thriving role to play.

Scott Tinker ([23:41](#)):

Yeah. Well, thanks for that. That's that nice summary. Just flip the same question over your way.

David Victor ([23:48](#)):

I think, I mean, I think the energy everything bagel is right, but it has to be everything bagel that is essentially pollution free. We're going to go to something close to zero, radical reduction in emissions. So that has huge implications for the oil and gas industry, which makes and delivers principally fossil fuel. So that then raises the question of what is the future of that industry. I think if the industry converts itself into a carbon management business where it specializes on providing useful energy services, but in a way that radically reduces carbon dioxide emissions, either because you capture the carbon dioxide emissions before they go up in the atmosphere, because you're in the business of producing and selling biofuels, or you're in the business of producing and selling and managing hydrogen as an energy carrier, then those are all viable parts of an industry of the future that build on, not perfectly, but build on at least elliptically, the skillset that exists inside the industry.

David Victor ([24:44](#)):

To me, what's interesting about the industry is that the industry leaders right now just don't know what that future looks like. And so you see a lot of experimentation and no clear direction, and therefore the risks of not really taking the problem seriously now, even though it's uncomfortable, those risks are actually profound, not only for their shareholders, but they're profound for the communities that depend on these companies in various ways to be well managed.

Scott Tinker ([25:11](#)):

Affordable and abundant oil and gas has been an economic multiplier in the US helping to support and bring back industry. It's difficult to calculate how much employment the industry provides since it's interconnected with so many other industries. Studies I found range from over a million to over 10 million well paying jobs. It would be very hard to transition this many workers to other fields and they may not want to change careers anyway. We can be sure there would be pushback. The industry could potentially transition to lower carbon energy services, but we'd still need petroleum chemical feed stocks for plastics and many other materials. Investors are nervous about volatility in the industry, but

lack of investment will weaken supply and drive up price. Advocates see a future for many decades to come, but political and voter decisions on carbon policy will partly determine that.

Speaker 4 ([26:36](#)):

Funding for Energy Switch was provided in part by Microsoft and by the University of Texas at Austin.