The challenge of 'renewable' energy.

By Isaac Saul – 28 Jul 2022 – View online →

I'm Isaac Saul, and this is Tangle: an independent, ad-free, subscriber-supported politics newsletter that summarizes the best arguments from across the political spectrum on the news of the day — then "my take."

Today's read: 7 minutes.

Editor's note: *Reminder, we are taking a break from our normal newsletter format today because I am competing in the World Ultimate Club Championships in Cincinnati, Ohio. Yesterday, my team (Pride of New York) won our first elimination game and advanced to the quarterfinals. Today, we play the best men's team from Japan, the Buzz Bullets, at 2 p.m. EST. It should be an unbelievable game, and you can watch a live stream by clicking here (or watch in person at Lebanon Sports Complex on the showcase field).*

A few months ago, I sat down for a dialogue with Dr. Scott Tinker. It was a deep, non-partisan, civil and impactful discussion. Much of it got me thinking in different ways about our energy resources and the path forward. Several readers have asked for a summary of our discussion, which was released in full as a podcast.

Below — with the help of Scott and a very generous reader who volunteered to transcribe some of our interview — is a concise summary of Scott's side of that conversation, distilling a nearly hour long conversation into a six minute read. Scott and I agree in many places and disagree in others, but I'm sharing his thoughts here because I think they are intelligent, informed, and thought-provoking.

You can listen to our full interview here. At the end, we also share a link to my FreedomFest debate and some "quick hits" on some very important news that broke in the last 24 hours.

"There is no such thing as renewable energy."

Without energy, we are cold and hungry and naked in the dirt, literally, and there are many people who live that way in the world today.

All forms of energy have their pros and their cons. The binary good-vs-bad, clean-vs-dirty dichotomy might sound appealing; however, it does not exist in the real world of physics and economics. No form of energy is completely clean and no form is completely dirty.

Energy has long been used as a weapon. The current Ukraine situation and its impact on households in most of Europe highlights an issue that has been brewing for decades: the apparent conflict between having *secure energy* —energy that is affordable, available and reliable — and protecting our total environment of air, land, water and atmosphere.

It is a myth, now popular in places like Europe and California, that the sun, the wind and batteries can give us secure energy that is also clean. Those technologies have low atmospheric emissions, which is a very positive thing, but they impact the land and water in ways that are dirty, such as mining and landfill disposal. Nor are they more available, more reliable, and certainly not cheaper,

than coal and oil and nuclear power. When you hear that, it is talking about the Levelized Cost of Electricity (LCOE). But that is the cost at the plant gate, not the cost to you and me. Because the sun does not always shine and the wind does not always blow, redundant infrastructure is needed to back up "clean" energy and make it reliable, like gas powered plants or batteries, which are neither cheap nor clean.

In Europe, right now, some are paying $20 a gallon for gasoline. When they charge their electric cars, the electricity costs even more per mile than gas. This is the result of decisions made over the past decade by European leaders. These costs are regressive because those who earn the least money pay the most for energy as a share of their income. Then, too, there are people in large parts of the world who simply do not have access to energy.

Secure energy is prerequisite to the prosperity that lifts people out of poverty. At the same time, we want to protect the environment while providing this secure energy. Achieving that will require competing interests to play together in the "radical middle" where conflicting goals collide around energy, the economy and the environment.

Oil is a finite resource. There is only a certain amount of it in the earth today and it takes a long time to make more. And yet, although we have extracted a lot of oil, a tremendous amount still remains, not just undiscovered, but also left behind. The *reserve* of oil that we can extract with today's technology and at today's price is only a fraction of the total *resource*. Although the resource is finite, the reserve grows as technology evolves and the price of oil rises.

Oil is made in rocks beneath the earth; primarily shale, which acts like a kitchen to cook it up. This shale is full of microscopic holes filled with water and organic muck from primordial oceans. That's where oil is made. Being lighter than water, some of the oil leaks out of the rock and forms vast pools in conventional reservoirs. We pump from those pools in places like Saudi Arabia and Russia. In a few places, mostly the U.S. so far, we also drill into the kitchen to get oil left behind that is still embedded in the shale. The shale is called an unconventional reservoir.

Some of those who tap the conventional pools of oil have funded a lot of anti-fracking propaganda, much of which—although distorted or downright false—is widely believed. They are selling conventional oil that costs less to produce and they don't want the competition from fracking to lower their profit margins. It's business.

Because of evolving technology, over the next few decades, or even up to a century, there is plenty of oil still to be had when it is needed and becomes affordable. This will not change until something better than oil comes along.

Oil is an amazing fuel. It is dense and yet easily transported. You can drive your car 300 miles on just 20 gallons of gasoline and the only residue—admittedly not a good one—is carbon dioxide. There is no ash or waste to haul away and dispose of. It all goes right out the tailpipe, and a century of improvements to the internal combustion engine has greatly reduced those harmful emissions.

Replacing that dense and efficient tank of gasoline with something better is the real challenge. It embraces more than just transportation. Most of the clothing that you wear, all the plastics you use, the pharmaceuticals and fertilizers, roof shingles and asphalt pavement, and almost everything else in our modern lives comes partly or entirely from feedstock molecules in oil and natural gas.

The US and Western Europe are now fairly advanced economies; however, looking back, we built those modern economies primarily on coal. Human energy was originally hay and wood. Hay to fuel their engines, which back then were horses and oxen, and wood to burn for cooking and keeping warm. All such forms of energy are carbon based and not very dense.

Eventually these nascent economies discovered coal, a dense biomass, and realized that they could get a lot more energy out of it, so they started burning coal to boil water, make steam, run machines and, ultimately, to generate electricity. Next, they turned to hydrocarbons, which are liquid carbon, and the hydro part of that is hydrogen. Then they moved on to natural gas, which is methane or CH4, with one part carbon and four parts hydrogen. Coal to oil to natural gas and beyond — decarbonization — is a natural progression that we are living through in all modern economies.

Most of the world is not there yet. China makes much of their electricity from coal. Rural India cooks mainly over charcoal or wood. Vietnam uses coal that they mostly mine. Why? To compete with China and make your stuff and my stuff—the stuff that we demand—and we want it cheap. More than half of what we consume in the world today is made in countries that use coal to make it. So, we sometimes close our ears and eyes, and say, "We're green. Just keep making our stuff over there and we'll buy it on Amazon and have it delivered to our door one small thing at a time." This is not good for the climate.

On a per product basis, something made in Asia releases more CO2 into the air than the same thing made in the US. This is primarily because we have stricter environmental rules here—emission standards—and we follow them. But how many atmospheres do we have on our planet? Just one; and like the oceans, it is really well connected up there. Emissions in Asia go into the one unique atmosphere that we all share, and by not reducing our consumption of products, we are simply moving the source of those emissions far away.

Climate change matters tremendously, of course, and yet the biggest challenge is lifting people up out of poverty and into prosperity. Much of the world lives in abject poverty, and without access to secure energy, that poverty gets pretty severe. Secure energy underpins healthy economies that can reduce poverty. Healthy economies, in turn, invest in caring for their environment.

We in the US have the cleanest air in the world because we clean it up and keep it clean. We must: We have clean air standards and we follow them. When you look at world maps of air quality, you see that air is cleanest where people are rich and most polluted where people are poor. The same is true for water. And soil. We can afford to take care of these big components of the environment only where we are wealthy.

Now, we cannot expect everyone living in poverty just to stay there so that they don't have an impact on the environment. Our challenge is to raise their standard of living to where they can begin to care for the planet.

There is no such thing as renewable energy. The sun, and the wind that the sun causes, are renewable, at least on human timescales; however, everything needed to collect and use energy from the sun and the wind—the panels and the turbines and the batteries—comes from the earth, gets manufactured, and eventually gets dumped back into the earth when it wears out. That's not renewable.

We do not recycle all that much either because recycling is expensive. To make wind turbines and solar panels and batteries and the like, we mine necessary metals such as cobalt, nickel and rare earths, and especially copper, which wind turbines and electric cars use a lot of. That mining often destroys vast areas of land. Eventually those same metals return to the earth in dumps and landfills.

As I explained in a recent TEDx talk, it's sort of like the dietary choice between kale and cow. Kale is healthy, but it is not dense calorically, so you would have to eat a lot of it. Beef is dense with calories to sustain life, but too much of it is not all that healthy. Wind and solar and hydroelectric power are like kale, ideal if only you could live on the energy it provides. Coal and oil and natural gas and nuclear power are like cow, less benign, but energy dense. Not just a little denser. Several hundred times denser.

Batteries wear out and must be replaced. Solar panels get less effective as they age. Wind turbine blades abrade and become inefficient and must be replaced every decade or two and they are presently not recyclable; we must cut them up and bury them. Texas alone today has 40,000 wind turbine blades. At least they are inert, unlike solar panels and lithium batteries, which are highly toxic.

In summary, there is no good energy and no bad energy. Every form of energy has its merits and its drawbacks. To minimize environmental impact, we must seek secure energy that is affordable, available and reliable. Secure energy will lift an economy out of poverty and into prosperity. That prosperity, in turn, motivates and funds taking good care of the environment, as the most prosperous places are doing even now.

It means raising the standard of living, in poorer economies, to the point where they can begin to care for our planet. It means recognizing that the solutions are not simple, but they are solvable, if we seek to understand them on a deeper level and then engage in civil dialogue to address the real global challenges that we face going forward.