

## ESG Now Podcast

# “How I Learned to Stop Worrying About Nuclear Energy”

Transcript, 28 June, 2024

Mike Disabato ([00:00](#)):

What's up everyone? And welcome to the weekly edition of ESG now, where we cover how the environment, our society and corporate governance effects and are affected by our economy. I'm your host Mike Disabato, and this week we are going to talk about how I stopped worrying and decided to embrace the new world of nuclear power. Thanks as always for joining us. Stay tuned.

([00:30](#)):

We need more electricity because we are driving electric cars, using electric buses and of course asking AI to create picture of a beer, drinking a man, and all those things are pushing the demand for electricity to high levels in the us. For example, everyone has been talking about how demand for electricity has begun to surge after staying flat for two decades. Paradoxically, at least when it comes to electric vehicles, this is not good for our climate goals because renewables aren't at the level yet where they can handle such an increase in base load demand. This is especially true for data centers that need to run on a more 24 7 type schedule. Wind speed and sun be damned. So because of this, some have said that we need to re-embrace the infamous member of the renewable energy clan nuclear energy. Nuclear energy is providing 10% of global electricity generation already, and its supporters hope to see that number grow and it's a desire I wanted to learn more about.

([01:33](#)):

So I called up Elchin Mammadov, who is my colleague and guest for today's episode, and who recently researched the state of nuclear energy and the financing thereof around the globe. So here's what I wanted Elsin to do for us today. First, I want him to give us an overview of the nuclear space in 2024, whether it can save us from this energy influx and what companies are involved in its development. Then I want him to get into the investment side of the equation because to be honest, I did not know if investors have embraced nuclear energy or if it's just a push by various governments to build more of this very potent energy source. So let's start off with the first thing that I want EL to talk about. Here's what he had to say about the broader nuclear landscape.

Elchin Mammadov ([02:21](#)):

I don't think any one technology will be able to do everything for everybody. So there's definitely a big place for nuclear. If you look at the top performance in s and p year to date, constellation energy is fourth beyond Nvidia and SMC, and the third is actually another utility ra. So there's a huge bet that market is making on ai, powering the energy demand, the electricity demand, and nuclear is a really good way to do it because yes, there are demand response for some technologies where if it's less windy and you have the capacity, you reduce your demand. Unfortunately, for a lot of data centers, that's not an option, which is why we've seen some deals with Google's and other big tech companies. But merging together and putting RFPs to build nuclear, they're happy to fund it because again, as I said, you cannot build as much solar and battery technology in one space in certain spaces where it's constrained particularly. And nuclear can be an answer for that in other cases, in other geographies or environments. For other kind of customers, wind and solar is a perfect solution, especially if they have a flexibility of demand. But as you increase the penetration of renewables, you need some firm power and nuclear can help with that.

Mike Disabato ([03:45](#)):

Yeah, an RFP request for proposal. It's when a tech company or any company is shopping for something new and they put out this document that says, tell us all about yourself. In this instance, tech companies are shopping for nuclear companies to build them reactors so they can deal with their seemingly insatiable grab for AI that doesn't further doom the planet. Microsoft and Google, for example, teamed up with a company called Core to develop advanced nuclear reactors among other renewable projects to power their data centers. And why not? On the environmental side, the big probe of nuclear energy is that it can produce energy without any emissions. It is self-sustaining and it can produce that energy no matter the weather or time of day. But there are other benefits compared to fossil fuels that are less apparent. Nuclear uses a lot of water, sure, but our analysis showed that nuclear is much better at using recycled or alternative water sources to cool their facilities compared to coal and gas-fired power plants that use a lot of water to cool their facilities also.

([04:46](#)):

Now that being said, the cons for nuclear can be devastating and a lot of us know about them. There is the meltdown problem, the waste problem, and the problem of nuclear proliferation. Something that is even more pressing now that there are even floating nuclear power plants out there like the one in Russia. These shouldn't be downplayed if nuclear power proliferates. There needs to be a more understanding throughout our society and governments to ensure that infrastructure is in place to prevent and cope with events which could cause severe domestic and extraterritorial environmental and human health damage as some experts have called it. Then we could be in serious trouble if they don't do that. And that sort of thing requires capital investment in both facilities and education around nuclear safety. This ain't like building a solar farm in terms of long-term safety procedures that need to be in place still, that hasn't deterred countries from throwing their weight behind. The energy source and the landscape of companies involved in nuclear is evolving.

Elchin Mammadov ([05:51](#)):

The way you should think about the nuclear landscape is you have the conventional nuclear, which is old, massive. It's a very old technology. Again, there are iterations of it, which makes it safer, et cetera, a bit more efficient. But at the end of the day, you have a large scale nuclear power plants and a lot of them are being developed by state owned or state backed companies in a lot of the times and with some exception. So you've got EDF in France, you have Kepco in Korea, you have CGN in China, you've got Ross. Ross Atom is in Russia. They're building a ton of nuclear around the world. And then you've got also a few other companies and some of them are privately held like Westinghouse in the us so this is an old guard and they're building in a large conventional nuclear power plants.

([06:45](#)):

Then you've got this new upstart and some of the old guards are trying to also come up with this new product, which is called small modular reactors. The great thing about them is that they are relatively small and they're relatively modular. So the idea is we don't have too many of them around, but the idea is you will make them in a factory, not on the site where the nuclear is located and as you increase your demand, you can bring more of them over. It's like a Lego, right? You just add them up and stack them up. It sounds great in theory. I dunno how it's going to pan out in practice because we keep having new and new designs rather than just picking one design and churning it out in order to achieve the economies of scale in order to deal with the construction delays, et cetera. So we have a lot of this first of a kind reactors, and again, there's all sorts of companies that are building them.

Mike Disabato ([07:43](#)):

Economies of scale will be particularly nice for small modular reactors or SMRs that Elian mentioned. Think of an SMR, like a reactor used on a nuclear sub. It's small. They theoretically have standard parts that can be easily replaced and it doesn't need that much water to run. And they're mobile, meaning you can move them to places like a far away mine that can source renewable energy to decarbonize its operations. But that doesn't mean that they're cheap to run or produce less waste. The union of concerned scientists, for example, say that they may even produce more waste than large reactors or they're any safer. They may even be less safe if

they're moved around frequently. Still, a lot of established large companies are starting to pitch and develop SMR projects to generate electricity, which may power our homes and data centers one day. That sort of attention by the household name companies like Rolls Royce that CHE mentioned again is useful when it comes to economies of scale.

[\(08:42\)](#):

The more investment, the more attention the better. But nuclear investment is no small thing. It's billions, it's tens of billions of dollars. The payoff can be a long-term thing as it's no small process to get a reactor up and running and it's marred by the sort of production delays all construction projects have to deal with. But just add a couple of factors to that because of the complexity of the build, and there are a lot of different types of reactors that these companies are putting forward in the west. So that means different designs, different materials, different recycling processes, all that. And as a side note, that is actually different in Russia than China. That's why I said the west there. China is building the most nuclear reactors in the world at the moment and they as well as Russia have stuck to one design and are pushing it forward into their markets by making them really cheap to build anyway. On a global scale, what does the investment landscape look like right now for nuclear energy? Is it just impact investors, those concerned with the environment that can handle the risk because of the possible benefits that nuclear can deliver to carbon emissions or are the more traditional financial return oriented investors also flocking toward the industry? I asked Elgin,

Elchin Mammadov [\(10:01\)](#):

The way to think about is you've got an impact investor, right? And the way you want to do impact varies a lot from one country to another, right? So if you are an impact investor in France, which is very pronuclear or other countries including Middle East, right? UAEs is building new nuclear. You've got India trying to get nuclear off the ground, Turkey, et cetera. So it all depends on which countries. If your country is pronuclear and you as an investor are pronuclear, then you do want to look at not just the returns that you're going to get risk adjusted, but also at the impact and that makes nuclear more lucrative. And yes, you have the issue of waste handling and storage, but overall if you look at where the temperatures are going, nuclear could be the answer in the short and medium and long-term. So you've got the impact investors from pro-nuclear region let's say, but then you've got investors from Germany and Austria and other countries that are very anti-nuclear and remain anti-nuclear.

[\(11:02\)](#):

And then you've got countries like Netherlands, Belgium and a few others and Sweden for example, which some of them had a moratoriums on nuclear and now they decided to actually we want to build new reactors. So it all depends where, which impact investor you are, where you're based, you would be either pro-nuclear or anti-nuclear, but then you've got investors that are focused on returns and there unfortunately the situation for nuclear is very challenging if you are extending the life of existing nuclear reactors and many utilities across the world have them and many, some of them already have issued a bunch of green bonds to do precisely that, then that's derisked investment. The reactor is there, generates tons of cash. A lot of those reactors have been already fully depreciated, so they've been extended beyond the 40 year of their lifetime. So unless you have some operational issues, those reactors are moneymaking machines. The risk is low, the carbon emissions are low, everything is hunky dory and they're profitable in many cases

Mike Disabato [\(12:05\)](#):

In the US there's also the inflation reduction act that includes a number of tax credits which support the existing US nuclear fleet. And there are also more innovative pushes like in countries such as the UK for the government to de-risk nuclear projects by first supporting their builds and then getting more capital from the private sector once the project is more stable. They call it the regulated asset-based model. The older builds though, the ones that just need retrofitting, they're cash cows for utilities. Those seem to already have all the investment attention that they need. But the new style, the new tech, surprisingly it seems investors are shying away. It's just too risky. Elgin says, but that's sort of risk could attract certain investors like venture capitalists that can handle the long returns and high risk investments that nuclear might promise, albeit they would

probably still need government support in some way. So I asked Elgin about that. If what we may see in the nuclear sector is more of the UK based model where we assign the risk of building these nuclear reactors to governments that can handle them, but also try and secure adequate financing from the private sector to see more capital growth and attention.

Elchin Mammadov ([13:19](#)):

Absolutely. When it comes to new build, the nuclear is unfortunately in the realm of either the governments or the impact oriented investors because again, the risk adjusted returns are just not there. However, also the thing that does not help is a lot of taxonomies and sustainability frameworks around the world still view nuclear with suspicion. Some of them either don't view nuclear as dark green but put them in light green bucket. Others say they're out of scope altogether, like for example, the proposed Australian framework because in Australia there's still moratorium on building nuclear, therefore their sustainability framework assist nuclear not as sustainable. They don't say it's not green, but they don't say it green. So nuclear in the kind of limbo. But what we've seen is a lot of the frameworks are gradually moving towards being more nuclear friendly in a way. And we've seen it with Canada, which is very pronuclear, their green taxonomy, and we've seen it with EU taxonomy, which with a lot of caveats, if you can get past that, do no significant harm criteria and you can meet it, then your new nuclear reactors are considered to be green. And what we've seen is the second party opinion providers when it comes to green bonds, they've changed their stance as well. A lot of them increasingly are certifying the nuclear projects as being green when it comes to green bond insurance.

Mike Disabato ([15:00](#)):

By the way, green bonds are the type of fixed income investment designed specifically to support projects that have positive environmental impacts. And there are methodologies that set criteria for what can be labeled as a green bond because there are potential tax incentives and cost of capital considerations for investors to buy green bonds, meaning if nuclear was included in the definition, more investors might take the risk. We actually have a really restricted green bond methodology, and at the moment we don't include nuclear energy, but some do. Now the taxonomy discussion, that is an important one, and I could probably have an entire episode on taxonomies and I think I actually have had an entire episode of taxonomy, so you should go listen to it. But those taxonomies are part of this push to better define the various tenants of sustainable finance. They state what technology is considered green and which is not, and its purpose is to better direct investments toward economic activities that are actually environmentally friendly.

([16:01](#)):

The EU has the largest and probably most well-known one, but they're popping up everywhere as Elchin said. So if nuclear isn't included in a taxonomy, then an investor would not be able to include a company that has a certain percentage of its revenue generated from nuclear power in a fund that is labeled as sustainable. They just wouldn't be able to do it because it's not included in its region's taxonomy. And of course you can flip that around and if it is included, then you can build it into a fund that's considered sustainable. Now, perceptions are definitely shifting in the investment world around the idea of nuclear, and that's in part because of this embrace that some of these taxonomies have allowed.

Elchin Mammadov ([16:48](#)):

I do think that the future looks bright for nuclear. I don't think it's going to be the main technology. I think wind and solar and hydro and battery storage and perhaps even hydrogen are going to be the main technologies around. But I think there will be a space for nuclear because it solves specific problems for specific customers that want baseload power that is clean and not many other technologies can achieve it at a scale. I think the taxonomies are moving in the right direction for nuclear, they're becoming more accommodative for nuclear over the next decade. We may see the small modular reactors getting scaled up, but more importantly, I think we are going to see a resurgence in conventional large scale nuclear. And I think that's where I'm most excited about more than small modular because small modular, there's still a lot of risk, technology risk, et cetera.

([17:47](#)):

So I think we are going to see being built large scale nuclear reactors both in the west and in the emerging markets, but especially in the emerging markets. And I think because of the decarbonization challenge, we do need nuclear. It'll play its role. And as you get governments and financial community coming together and trying to de-risk it and come with innovative solutions and involve the consumers of power as well, like the Googles, the paper makers in Finland, et cetera, then we are going to see much more investment in nuclear. At least that's how I see it.

Mike Disabato (18:23):

And if that's how Ocean sees it, then that's how I see it. Now, the only thing that we need to worry about is the lack of employees that have a skillset to build all these nuclear plants, but that's a different problem for a different time and a different podcast. Thanks as always for joining us. I wanted to thank Elgin for talking to me about the news with an ESG twist, and I want to thank you so much for listening. If you like what you heard, don't forget to rate and review us and subscribe wherever you get your podcast. Thanks again and talk to you soon.

Speaker 3 (19:11):

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