

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

Next on Energy Switch, we'll look at the changing geopolitics of energy with some of the most revered thinkers in the space.

Dan Yergin ([00:07](#)):

Not so many years ago, we were importing 60% of our oil. Today, we are the world's largest producer of oil. It's now the big three, United States, Saudi Arabia and Russia.

Ernie Moniz ([00:19](#)):

Frankly, I think that those who want to narrow the solution space are working against our shared goals of a clean energy transition.

Scott Tinker ([00:30](#)):

Coming up on Energy Switch, the new geopolitics of energy.

Speaker ([00:35](#)):

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

Scott Tinker ([00:47](#)):

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.

Scott Tinker ([01:14](#)):

Welcome to the Energy Switch. Different nations have different energy supplies and demands and this impacts geopolitics. Rising US oil production has changed our relations with Middle Eastern and other countries. Differing emissions reduction goals sometimes pit countries with mature energy systems against those who are still developing. Across all nations the energy mix is evolving. I'll talk about all this with two world leading experts.

Scott Tinker ([01:43](#)):

Dr. Ernie Moniz is a nuclear physicist who served as US Secretary of Energy, directed the MIT Energy Initiative and now leads the Energy Futures Initiative. Joining him is Dan Yergin, the Pulitzer-Prize Winning author of *The Prize*, *The Quest* and *The New Map*. He's also Vice Chairman of SMP Global, a leading information service provider.

Scott Tinker ([02:07](#)):

On this episode of Energy Switch, the new geopolitics of energy. Let's just jump right into it. US oil industry's done pretty well in the last few years. What's that doing to change our position globally?

Dan Yergin ([02:19](#)):

It's changed the economic position of the United States. It's changed the balance of payments of the United States. Saved maybe \$400 billion a year. And it's given the United States a new degree of influence and a different dimension of influence in the world that it didn't have before.

Scott Tinker ([02:35](#)):

Yeah, yeah.

Ernie Moniz ([02:36](#)):

I would just add that it's also clearly changed the dynamic of the other oil producing countries in the Middle East. So I agree with Dan, this is certainly a big change in the geopolitical dynamic.

Dan Yergin ([02:49](#)):

Not so many years ago we were importing 60% of our oil. Today we are the world's largest producer of oil. It's now the big three, United States, Saudi Arabia, Russia.

Scott Tinker ([03:01](#)):

What could change it? Double oil production less than 10 years, probably one of the fastest changes in energy terms we've seen.

Dan Yergin ([03:09](#)):

The fastest in history for oil.

Scott Tinker ([03:12](#)):

So what could change that? What are the dynamics there? Could we go right back down?

Ernie Moniz ([03:18](#)):

Well, I think the big wildcard is going to be the pace of decarbonization of the economy. I believe that there is no doubt that the energy economy globally is headed towards low carbon, whether it's net zero by some date definite or not, we are heading that direction. When that begins to bite in terms of oil demand, then we're going to see another reshifting I think of the dynamic.

Dan Yergin ([03:52](#)):

Yeah. I think that the world oil demand's going to continue to increase probably into the early 2030s. So I think that for the next several years, unless something really surprising happens, the US remains at the forefront among the top producers. But then come the time when demand starts to shrink as the energy mix shifts, then I think you'll see there's some expectation on the part of some of the major exporters in the Middle East and elsewhere that they will be the ones who will actually gain market share. Beyond 10 years, as often happens, the outlook is murky.

Ernie Moniz ([04:31](#)):

Yeah. That's exactly the dynamic that I would envision as well. But I would add also one other feature and that's on the end use side, the fuels market. That is today, essentially we can talk about different slates coming out of a refinery, but it's all petroleum based fuels in effect. Whereas as we go forward, we'll have everything from electrons for light duty vehicles, there may be hydrogen for heavy trucks.

Scott Tinker ([04:57](#)):

There'll be some fuel cells.

Ernie Moniz ([04:59](#)):

Yeah, et cetera. So I think that one of the big challenges in the oil and gas sector is going to be a business model that recognizes there's going to be many, many different services required for what today is served almost exclusively by petroleum.

Scott Tinker ([05:17](#)):

Right. Right. How has our growth here changed that dynamic in the Middle East and what's the significance? You wrote about this way back in The Prize? You taught us all about some of these things with that dynamic and how do you see that changing?

Dan Yergin ([05:32](#)):

Well, I think it is changing, whether consciously or unconsciously. I heard a prominent sort of moderate US democratic Senator say the other day, "We should right-size our commitment to the Middle East." Well, he wouldn't be saying that, whether he recognizes it or not, if we were importing lots of oil from the Middle East. I think the producers in the region sort of see the US becoming less engaged. Something that got lost here, but this peace treaty between the United Arab Emirates and Israel that has recently happened, it's a really big deal. I think there are many reasons for it, but one of the reasons is they're both saying, "Well, the US may just be less involved in the Middle East and we have to find our own security solutions," so that's an example of the impact.

Scott Tinker ([06:19](#)):

That's interesting.

Ernie Moniz ([06:20](#)):

But one is seeing Saudi Arabia, the Emirates and others in that region really looking at this question of, shall we say, evolved business models. Clearly they are so dependent on oil revenue that they clearly have to look forward to economic diversification.

Dan Yergin ([06:42](#)):

But the diversification, and particularly if you look at Abu Dhabi, which is part of the United Arab Emirates, they've done a remarkable job. They were almost entirely dependent upon oil for their GDP at the beginning of the century. Now more of their GDP comes from non oil and so they have had a very concentrated program of being in other things like semiconductors and advanced material.

Scott Tinker ([07:05](#)):

And tourism.

Dan Yergin ([07:06](#)):

Yeah. Tourism.

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

Tourism, right.

Ernie Moniz ([07:08](#)):

And also they're out there with major carbon capture and sequestration projects. And also one sees in the region looking at hydrogen as a way of providing some of those disaggregated fuel services. I referred to earlier, well, they're doing it. They're getting into the business of ammonia exports to Northeast Asia, for example. So I think one has to give them credit for really being out there. Frankly, I have to say, I wish more of our American companies were being as aggressive in terms of thinking how business models need to evolve.

Scott Tinker ([07:49](#)):

That's interesting. I spoke the government of Oman earlier this year and it's kind along the lines you're talking about. Just a couple thoughts on China in this whole scene. Well, how do you see that and coming to you first?

Dan Yergin ([08:00](#)):

I think it's been a dramatic change in US relations with China. If you look at the last national security statement from the Obama administration in 2015, it talked about engagement, constructive relationship. Fast forward to the first national security statement from the Biden administration. It's strategic rival, it's great power competition. And it's the same people from one administration to another. So this was not just about Donald Trump around 2015, 2016, things changed in the relationship between the US and China geopolitically. It's changed in China, they say the same thing. They talk about what they call unilateralism or great power hegemony that they're rebelling against. It's sort of almost becoming one system against another. And yet at the same time, we're really tightly engaged. 42% of all the containers that come into the United States come from China. So and this has a lot of energy ramifications to it.

Dan Yergin ([08:54](#)):

So, and including on existing energy sources and on the net zero energy resources. Solar costs have come down dramatically, really dramatically. One big reason is because of the vast scale of Chinese manufacturing, which has driven everybody else out like over 80% of solar panels are from China or Chinese controlled companies. So there's a new geopolitical angle to this new energy world that we're moving into. What I'm hearing from more and more people in developing countries is a sense that we have a new north south divide with the north being Western Europe in the United States and Canada telling them how to run their energy systems. And they saying, well, you know, you can't impose your model of an energy transition on us. We need a different one. We need to use natural gas because we need to get solid, reliable electricity to people.

Dan Yergin ([09:52](#)):

The 1.1 billion people in Sub-Saharan Africa, if you just take out South Africa generate 50% less electricity than the 29 million people who live in the state of Texas. So that disparity is huge. And they need capital to develop. So they need to go down multiple paths.

Ernie Moniz ([10:18](#)):

The biggest problem in this electricity access equation is actually roughly speaking the last mile. The distribution of electricity is in very, very, very, very bad shape. Those companies are almost all essentially bankrupt. So there's a lot of work needs to be done here. I'll also note that we emphasize population growth quite appropriately and expecting, say 10 billion people by mid-century. So another two plus billion people. What we don't emphasize in my view enough in this energy context is that net those additional two and a half billion people are all going to be in cities. We passed 50% urbanization by the UN definitions early in this century, we're going to be at 70% urbanization in 2050.

Dan Yergin ([11:20](#)):

Well, and that means more electricity, more energy.

Ernie Moniz ([11:22](#)):

And it provides there's risk, but there's also opportunity.

Scott Tinker ([11:26](#)):

There is, yeah.

Ernie Moniz ([11:27](#)):

There can be more electrification, for example, urbanization is something we need to focus on and really bring energy delivery in that urban context.

Dan Yergin ([11:37](#)):

But Scott, I think still where we are today, the World Health Organization has said that the biggest environmental problem in the world today is indoor air pollution, which comes from cooking with wood, animal crop waste, charcoal and so forth. And the number they put on it is something like close to 3 billion people, which is like 35%, 40% of world population. So while that last mile electrification, but for a lot of people, it's also getting them propane, so that they can cook with propane rather than with those waste products. That's why in India, you see that there's a big focus on, yes, we're going to build wind and renewable. We're also going to use commercial energy, particularly natural gas, big \$75 billion program to build a natural gas system because we got to address those indoor pollution questions.

Scott Tinker ([12:32](#)):

And India exports gas to Nepal, where we filmed to address exactly that things. They bring natural gas in as LPG and using it for cleaner indoor cooking. Gas isn't the villain.

Dan Yergin ([12:43](#)):

Right. No gas is a savior for people. It saves their life. It saves their health.

Ernie Moniz ([12:48](#)):

I think another enormous factor that comes into the need to address that is what it can mean for freeing up women. And having them become much productive members of the economy and not spend all day gathering firewood-

Scott Tinker ([13:04](#)):

Water.

Ernie Moniz ([13:05](#)):

... and water.

Dan Yergin ([13:07](#)):

Ending the drudgery.

Ernie Moniz ([13:08](#)):

And so these things ripple through the entire social structure and are going to be central to development.

Dan Yergin ([13:15](#)):

And that's why for what you hear in these developing countries, they have such a different perspective on what the energy agenda is. What I hear is that the Netherlands or Germany, these are rich countries. We're in a very different state and you can't impose your solutions on us when we have also imperatives of reducing poverty, imperatives of economic growth, improving health, we've got to do all those things. Or by the way our governments don't survive.

Scott Tinker ([13:40](#)):

How does the US and how do we invest so that they can grow with true options? What is our best place dollar? What's the best way to do that to see these emerging economies build themselves?

Dan Yergin ([13:56](#)):

I think it's question of maybe not the best dollars, but diverse dollars and it's having the finance flow and it's not just what the governments do. It is the flow of capital from banks and getting the right criteria.

Scott Tinker ([14:11](#)):

That's right.

Ernie Moniz ([14:12](#)):

Bottom line is I think we're going to need policies in the wealthy countries that provide risk mitigation on finance. That's the bottom line with traction in that area. There are going to be plenty of opportunities to do good and do well. But, they're going have to provide risk mitigation upfront to get that moving.

Dan Yergin ([14:39](#)):

Your problem... let's get practical here. If you're a bank on the one hand, you have an emerging market business, big one, it's important to you. You really want to develop that support those economies, your problem where here is your regulators are saying, well, you really shouldn't be investing supporting a natural gas development there because our policies here are not to support that. The banks themselves are caught in the middle here. So that is a non-financial barrier to the flow of finance.

Ernie Moniz ([15:07](#)):

And that's where we the wealthy countries have got to face up to the need to sensibly invest in these countries in order to accomplish the dual purposes of economic development. Plus the low carbon transition. It's not going to happen just by itself.

Scott Tinker ([15:30](#)):

We've talked about the developed world, the developing world. Let's look to the future. How are we going to actually address this dual challenge of energy in the environment? Ernie, let's start with you. You've done a lot of thinking on this and how does this happen globally in a way that we're collaboratively moving forward?

Ernie Moniz ([15:47](#)):

Well, I think Publix around the world, including in the United States have moved dramatically in a short time towards recognizing and supporting the need for action. And let's face it, the main driver, certainly in this country is weird weather. More intense consequences of hurricanes and wildfires and droughts and floods and we could go on. In less wealthy parts of the world those factors then translate into major migration patterns, which create other kinds of major stresses. So I think that the pressure to act is going to get greater and greater.

Ernie Moniz ([16:37](#)):

I actually believe that the rich countries are going to move much more aggressively along the lines of bluntly wealth transfer to the poor countries for achieving both goals. How's it going to happen? First and foremost, we'll be a considerable expansion of renewables, wind, and solar. I would include hydro in Africa as controversial, but major hydro opportunities we all know. I think in the United States by the way, by 2030, we could have a tripling of wind, a quadrupling of solar. But there will also be continuing increased recognition that weather dependent resources leave you vulnerable to weather.

Scott Tinker ([17:34](#)):

That never happens in Texas.

Ernie Moniz ([17:35](#)):

Despite all the wind in Texas, that there are 90 days a year, a quarter of the year with essentially no wind. The solar insolation is double in the summer, what it is in the winter. We had to design the systems around resilience, risk management, recognizing if we are going to go to weather dependent resources, we better damn well solve things like long duration storage.

Dan Yergin ([18:08](#)):

I think Ernie made a really good point that it's that these new resources are weather dependent themselves whether it plays out in more than one way when the wind doesn't blow. The UK has made a big commitment to offshore wind. It's a one quarter their electric capacity, I believe, but in the autumn of 2021, when they had their energy crisis, one of the reasons was the wind didn't blow. And suddenly they had to use gas and, you know what? They even had a startup coal plants that they hadn't used. So that question that Ernie said of reliability and resilience of your electric power system. As you get more electrified, as you have electric cars on the road becomes more important and that's why you need a balanced system.

Scott Tinker ([18:48](#)):

Right. And so that's that tension between reliability, affordability and clean emissions, clean is real. How can we improve that? How can we improve that conversation so that it's not a either you're clean or you're reliable and affordable?

Ernie Moniz ([19:07](#)):

First of all, we don't want to get deflected from the idea that we can solve this. We can have very, very low greenhouse gas emissions, CO2 emissions, and provide reliable, resilient power. But to do so, we have to keep a focus on those emissions and understand that every tool in the toolbox has to be used and will be used unless we put up artificial barriers in different ways, in different regions. Frankly, I think that those who want to narrow the solution space are working against our shared goals of a clean energy transition.

Scott Tinker ([20:00](#)):

That's very well said.

Dan Yergin ([20:02](#)):

Yeah. So it is a question that's still going to be an energy mix. It's just going to be a different mix and sometimes lose sight of it. Technologist Ernie ran the energy initiative at MIT and then a secretary of energy focused on of course, where the real answers are going to come from technology. There's 60 groups working in the United States on advanced nuclear power. How many people know that 60 groups in the United States are working advanced nuclear power. Things are going to come along as surprise. Hydrogen wasn't really on the agenda a couple of years ago. Now it's a big deal. It'll be very interesting to think what's going to be on the agenda that we don't quite see today 10 years from now that will change the discussion just to shale change the discussion or just as the plummeting cost of solar change the discussion.

Ernie Moniz ([20:50](#)):

And I think what's worth adding is that there has never been so much innovation in the nuclear realm than we have today. And it is remarkable how the private sector financing led that innovation change.

Dan Yergin ([21:05](#)):

It takes a certain degree of courage after everything that's been said and done about nuclear in this country to say, let's go out and write.

Ernie Moniz ([21:11](#)):

What you mean is it takes a lot of courage and I would agree with that, but now-

Dan Yergin ([21:16](#)):

And some money.

Ernie Moniz ([21:17](#)):

... and no, and now the government, the department of energy, the government, the Congress have been moving in the last few years in terms of public private partnership on nuclear fission technology.

And now we're seeing the beginning of that in nuclear fusion technology. There have been several nuclear fusion companies supported with private funding and have made enormous progress to the point where the scientific challenges of fusion may be resolved in this decade. Now I can't say here today, 100% that's going to work, but that's an example. A total game changer, that could be very much something that we'll understand within say five years.

Scott Tinker ([22:06](#)):

So let me come back to the energy mix and we'll kind of wrap this up. How do you see this global energy mix and the different geopolitical dynamics playing out to address the dual challenge affordable while energy improved environment?

Dan Yergin ([22:24](#)):

Well, I think the key word is energy mix that the mix will shift. The balance will shift. There'll be competition among energy resources, which way you go. I think technology will come along and deliver surprises along that way. What's really important is to keep an open mind and not get locked into one set of views as this is the way. And that's the only way adjust to understand other people have other points of view and other needs. And also that things will change and the facts on the ground will change. And we have to continue to think in an open minded way about the future. And by the way if we're open-minded, we'll all get along better too.

Ernie Moniz ([23:08](#)):

I think we see in front of us an array of options that will be mix and match in different ways in different places. So today, I mean again, wind, solar, some degree of storage with that hydro, geothermal, nuclear fission, natural gas will play an important role in particular carbon capture and sequestration will come in with gas and maybe with coal as well. And we may have the quotes surprise, something like fusion. So-

Scott Tinker ([23:46](#)):

Inefficiencies.

Ernie Moniz ([23:47](#)):

... Oh no, no, efficiency across the board. Right, of course for everything. An efficiency by the way, especially in the nearer term is going to be very, very important in the transportation sector and the building sector, but across the board. But the point there is you can see to go to this deep decarbonization in electricity sector, the reality is we do have a lot of options. The fuel situation is far more murky. Today, there's no doubt about the hydrogen discussion being the dominant one. And that may very well be the solution. Alcohol fuels like ethanol, which we could do more with. We have so called electro fuels. We have many, many more options that are being discussed and let's develop them all.

Dan Yergin ([24:41](#)):

There's a lot of pessimism and apocalypse and disaster pending. And maybe some of that is necessary to motivate people and get attention. But I think actually when you look at what's, look at the amount of effort and scientific talent and research and everything that's going into this. That actually, I think there's grounds, this is shocking to be optimistic. I think there's going to be a widening array of choices.

So I think two qualities that would really help in this discussion one is being open minded and two actually being optimistic.

Scott Tinker ([25:17](#)):

Rising US shale oil production has changed geopolitics. Reducing our dependence on and changing our political dialogue with the Middle East. Meanwhile, rising energy consumption, particularly in Asia, will see global oil demand grow into the 2030s. After that, carbon reduction policies may slow demand. Emerging and developing areas like Africa and India desperately need energy for their growing populations. They'll focus mostly on expanding grid electricity from coal, gas and hydro and modern cooking fuels that produce less particulate air pollution. There and around the world, emerging technologies may disrupt energy markets. We need to keep an open mind to new technologies and new ideas and to different energy mixes geopolitically.

Scott Tinker ([26:36](#)):

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