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# The future of capitalism: Building a sustainable energy future

**In a collaboration between Duke University's Fuqua School of Business and McKinsey, a panel of experts and CEOs from leading energy companies debate the critical scientific, resource, and policy issues challenging energy sustainability today.**



As global climate talks get underway in Copenhagen, questions of a sustainable energy future will come to the fore as participants discuss the challenges from rising demand, affordability, and energy security. Should we focus on energy efficiency solutions? Where should we place our innovation bets? How can we align public policy to match our energy goals? In this video, three CEOs—Tom Albanese of mining giant Rio Tinto, Aubrey McClendon of Chesapeake Energy, and Bill Timmerman of the energy company Scana—offer their perspectives on the practical issues stifling energy independence, where to prioritize short- and long-term goals, and alternatives that can improve our energy future. George McLendon, dean of the Trinity College of Arts and Sciences at Duke University, and Scott Nyquist, a director in McKinsey's Houston office, also participated in the panel.

This edited panel discussion is the first in our “Future of capitalism” series, which will explore the important issues shaping the business landscape in the aftermath of the credit and economic crises. A collaborative effort between the Fuqua School of Business and McKinsey, the series will comprise four forums over the course of the current academic year on energy, the financial system, globalization, and the role of business education in society. Blair Sheppard, dean of Fuqua, moderated the energy panel, which took place in November 2009.

### **Defining the issues: Demand vs affordability**

**Blair Sheppard:** There are three issues: affordable demand, energy security, and protecting the climate. First question is really two parts: Are those the right issues? And what's your sense of the relative priority, if you would put one on? Let's start with you, Tom.

**Tom Albanese:** We have probably about a billion people in the world that live at a relatively comfortable lifestyle, which means you have four billion people out there that would like to live like that other billion. And they have every reason to want to live like that. So you have to exponentially increase the demand for energy [in order] to keep up with some basic human needs for the bulk of the world to live like what the minority of the world now lives like. And who are we to say that people in China shouldn't have a cell phone or shouldn't have access to a TV or shouldn't have access to air conditioning when it's hot or central heating when the temperature is cold? That's a moral question. And we don't have the moral right to say, “You can't live like that,” because we've put this CO<sub>2</sub> in the air and so we've basically created it. So we have to work toward, first and foremost, a solution of dealing with this rising energy demand. That is an imperative that is going to be with us whether we like it or not.

That then creates the need to solve the next two, because if we just go on the current path we will increasingly put that supply–security problem on the backs of too few countries. And frankly, it's very politically incorrect, but for some of those countries, we shouldn't put all of our eggs into their baskets. We have to be looking for a range of energy alternatives. And on a priority basis over the next ten years, that's the most important thing because

unfortunately the problem with carbon is that we really will not see the side effects of that for plus-30 years from now.

So that means that someone in the next ten years has to begin to actually start addressing this problem, even though every bit of capitalism, every bit of [net-present-value] analysis, every bit of all the other tools you learn in the classrooms you're going to here, would say that is too far out of problem to have an economic payback.

So I think the first piece of it is the urgency around this demand growth. That will then create an immediate necessity of reducing the risk of the supply that we now have. But someone out there today needs to be thinking about, "How do we fix a problem that won't manifest itself into an absolute disaster for 40 to 50 years?"

**Blair Sheppard:** Other reactions? Are those three the right issues, and do you agree just to agree?

**Bill Timmerman:** To me, I look at it two different ways. One is more from a domestic perspective because that's the market I serve. Just protecting access of my customers to affordable energy, as well as having energy available for the factories and other businesses in our area to create the jobs that sustain the economies of the Carolinas and Georgia, is a critical thing for me. That's the world I live in.

You're right. For most folks in the NASCAR nation or in the South, that I'm most familiar with, what's going on 40 years from now is totally irrelevant. What's going on two weeks from now is completely relevant. And so the point I'm trying to make is the affordability issue is the one that comes to my mind first and foremost when we start talking about these issues.

### Defining the issues: Conservation

**George McLendon:** So, I thought when you started answering this that it sounded like you were going to say a little bit about conservation as the cheapest form of power that you can create for your customers. But then you didn't go there.

**Bill Timmerman:** Well, I didn't go there for two reasons. One is, this is my fourth cycle through demand-side management in our industry and in my career.

**George McLendon:** Right. And so you've done a lot of the easy stuff?

**Bill Timmerman:** We've done a lot of the easy stuff, and not much of it ever worked very well, frankly. Probably the best examples you can find of demand-side management working are out in California, where they're currently paying somewhere between 18 and 20 cents a kilowatt hour for electricity.

So it's very expensive, it's twice as expensive as it is here. And the statistics and the experts that we've had help us with our programs would say to you that if you can get a half of percentage point a year in demand reduction from your demand-side management programs, that's what they're achieving in California. And that's orders of magnitude ahead of whatever else is out there.

Secondly, it is expensive. It disproportionally falls on the backs of our poorer customers, who cannot access the equipment, cannot access the insulation, don't have tax returns, so tax credits don't really mean that much to them. They live in rental homes, live in manufactured housing, which are not susceptible to insulation. So, to me, it's about finding a workable answer for the bulk of society, not just for a few at the top of society.

### **Exploring alternatives: Natural gas**

**Blair Sheppard:** So think about what the two of you just put together. Aubrey, I'd love to hear your view on this.

**Aubrey McClendon:** What's happened in my industry is that we have partially stumbled and partially created a third way here. We have discovered a new way to find natural gas from the most abundant rock in the earth's surface, called shale. These natural gas reserves are capable of growing in this country by 5 to 8 percent per year. And we can do so at a price that is stable and also substantially less than where we've been in the past.

So as you look at how to accommodate the world's growing needs for energy, you can say that we don't have to burn as much coal as we have then, because we can burn more natural gas. If you look at energy security, I agree with the comments about people not in this room being less concerned about climate change than what's going to happen two to four weeks from now.

And so the current tragedy is that we can't focus on two things at once. That we're focused on the long-term issues of climate change, which are enormously important and we have to get right. And certainly to the elites in this room and the elites across the country, it is the single biggest issue.

But to the vast majority of people in this country and around the world, the more important question is, "How do we get people cheaper energy, cleaner energy, and do so from sources that are distributed more fairly around the world than oil is?" And the answer is natural gas. Two years ago I couldn't have made this statement. And it's all about the discovery of shale gas in the last couple of years.

### Exploring alternatives: Nuclear

**Blair Sheppard:** So you agree?

**Bill Timmerman:** I would agree to a certain extent. I think, though, that there are extraordinary opportunities in the application of electric vehicles fueled by nuclear power at night. Because that is totally a zero-emission event.

Everybody likes to talk about these things like there's this magic silver bullet that's out there, and if we just somehow throw the rascals out of the oil companies and get Congress focused and all this other stuff, there's one magic answer that's going to appear, and all our problems are going to go away.

It's not that. It's a lot of different things. And I think the constants in the discussion have to focus on the impact on the environment, but also, as Aubrey correctly points out, cost to the ultimate consumer, because those are the people that vote.

**Aubrey McClendon:** But my comments were more directed towards the traditional, the so-called fossil fuels of oil.

**Blair Sheppard:** But you would agree that nuclear—accelerating nuclear—

**Aubrey McClendon:** Yes. This country has 104 operating nuclear plants. I believe they produce about 20 percent of our power, probably right now at, by far, the cheapest rate of any power in the country. The average age of a nuclear power plant, I think, is around 30 years. And they were designed for 40 years. They're all going to get recertified for probably another 20 years or so.

**Bill Timmerman:** Yes. Most of them have already been extended out to 60.

**Aubrey McClendon:** So let's say 60 years. If you begin to realize that a new power plant, a nuclear power plant, takes probably 5 years to permit and at least 5 years to build, maybe probably a 10-year start-to-finish cycle, and if you begin to think about how these 104 plants expire over the next 20 or 30 years you realize that we probably need to be building 3 to 4 to 5 new power plants a year just to keep nuclear at 20 percent.

**Bill Timmerman:** We have 6 under construction. The Chinese company that I talked to, their chairman—and I've got his chart in here that he showed me—they're going to build 100 plants between now and 2020.

And I've been to their factories and I've been to their sites, and they are scaled up to build 100 of these rascals, and they're exactly the same plants we are building—same designs, same everything. So they're going to build them to [Nuclear Regulatory Commission]

standards, but they're going to build a 100 of them, and we'll probably get 6 done, maybe, in the same timeframe.

**Tom Albanese:** I do think that from a nuclear perspective, you've got to solve three issues. Nuclear storage, and that has been a big problem in the US. And I think that US policy is gone way in the wrong direction on that. And that needs to be addressed as a high priority in [Washington,] DC. There is nuclear safety. And I think that's going to be something with technology and the next generation—the types of technology that they're going to need to really keep going.

**Bill Timmerman:** We're really there on that technology now.

**Tom Albanese:** Exactly. And then nuclear proliferation, which is going to just be hard work, and the whole world has to work together on that.

I don't think nuclear is the only piece of the solution. I think coal's going to be a big part of it. It's going to be a big part in China. It's going to be a big part in the US. It's going to be a big part in India. India's possibly a bigger problem than China because they're still a long ways away from a larger number of people needing to get up that curve. And they will rely on coal for that growth.

### **Exploring alternatives: Carbon capture and sequestration**

**Blair Sheppard:** So let's do coal for a minute.

**Tom Albanese:** The solution for coal, to some extent, is also the solution for natural gas. Because natural gas is, as you say, half of the carbon loading of coal. If you have [liquefied natural gas], it's less than that because LNG is not too far off of coal in the pool cycle.

But in both cases, you're going to need to have carbon-capture-and-sequestration technology in place to get that 450 ppm target. We're talking about 80 percent of the carbon being pulled out of the world. That means a decarbonization of most of the processes, including, I'd argue, natural gas.

So I do think first and foremost, and probably more important than nuclear technology, is getting an answer to carbon capture and sequestration. A precombustion technology is here today. The know-how, the pieces together, bolting them together on an industrial scale, needs to be done.

What that requires is capital. It doesn't require new science. Postcombustion, which is actually going to be the more important technology—that's going to be what you do to retrofit the existing plant—does take some more work. But I would argue, get the precombustion right first. Because then you can start having some confidence about the

carbon-capture-and-sequestration piece. And then you can start talking about that science of postcombustion.

**Scott Nyquist:** I think you've raised the big dilemma for all this, which is if you're a developing country and you're trying to build your economy, what you focus on is these hundreds of millions of people that are living below poverty and just beginning to [reach] the point where they want to get some energy. They want to buy it cheaply. And you have coal in your country. So what you're going to do is, you're not going to think about carbon capture and storage. You're going to build these coal plants as cheaply as you possibly can with whatever standards you think you can make them operate.

So then it comes back to the US, where we have lots of coal plants. And if we wanted to do something in a most economically efficient way, at the moment we'd probably build some more coal plants. But then we say that if we think about what the cost is of taking carbon out of those coal plants, the most expensive way to reduce greenhouse emissions is coal with carbon capture and storage.

When we think about all the things you can do to reduce greenhouse gas emissions, it's coal with carbon capture and storage. It's a very expensive capital cost to these things. And then all of the legal regulatory things. So, yes, the question of why should we ever do that? And many other solutions in the near term of gas or nuclear can be done particularly if we can do it the way the Chinese would do it, which is much more economically attractive.

The practical reality is that these coal plants are going to be built, and we'd better find a way to put in postcombustion processes on them because at some point in time we're going to either allow the carbon to be produced out of those plants in developing countries or we have to find the solution. So we do need some science and technology investments to make it happen. But we have this huge economic gap between doing what's right for the long term versus the short-term economic imperative.

### **Finding Solutions: Reducing emissions**

**Blair Sheppard:** So there is a huge economic gap. But then there are some things that are actually economical to do but we're not doing. So let's parse this into two pieces. One piece, I think all of three of you have said, which involves a conversion cost, but actually it's not that expensive to do. We're just not doing it.

So build more nuclear, convert to natural gas, do the inexpensive part of carbon capture with coal. There's some stuff we can do right now, which would have a huge effect, profound effect, but we're not doing it fast enough. That's one part. Then let's go to your second part. And then the third one, which is, what do we do about the world when actually we don't do this fast enough? But let's do the first one.

**Tom Albanese:** There's one more part of that. And that is that the US really should be setting a global example. We can't go to China and say, "Oh, you're doing it the wrong way." Or, "India, you're doing it the wrong way," or any country in the world and do any kind of preaching when we're not living up to it ourselves. It really is up to the US to be setting a scientific, an economic, and frankly a moral example for the rest of the world. If we don't do that, game over.

**Aubrey McClendon:** We believe that you could take the 50 filthiest plants off the grid pretty immediately, write a check for that, and you would be able to reduce CO<sub>2</sub> emissions from the coal industry by about 20 percent, almost like that. So again, it doesn't fix the whole problem. But there are some pretty easy things to do. And, one of the things that we find a little fascinating in our industry is all this interest on trying to clean coal up when the technology to do so is expensive, as we talked about, and not really here.

So I think there are some immediate things we could do. This retirement of coal plants and the transportation sector—it's real easy. There's a bill sitting in the House and Senate today that has 15 senators behind it and has over 110 House cosponsors, it's called The Nat Gas Act.

It would require the federal government over five years to transition half of their fleet from gasoline and diesel to natural gas. It would require our seven million trucks, which use as much gasoline as about 150 million cars, to convert over the next seven years to natural gas.

We may drive a battery car some day. But you're not going to drive a battery 18-wheeler over the Rockies. That's not going to happen. So those are some things that you could do really quickly that are economical. The gas is there. And we're not saying dismantle the existing system, because you can't do that. But we could reduce oil consumption by two to three million barrels a day, and we could reduce CO<sub>2</sub> emissions from the power industry by around 20 percent, pretty quickly.

**Blair Sheppard:** You buy it, Bill?

**Bill Timmerman:** We've already done that. We took our worst character and converted it into gas in 1994.

### **Finding Solutions: Battery technology**

**Tom Albanese:** Aubrey was raising a good point, which I actually completely agree with, and that is the transportation system. I think part of it is converting internal combustion to natural gas.



But another big part of it I think is, actually, we've seen a phenomenal market-driven success of hybrid vehicles. That was the market. That wasn't the governments; it was the market. It was Toyota coming up ahead of anyone else. And it was basically some good science, good innovation, good marketing.

I've been living in Europe about ten years now. I see electric vehicles actually becoming more and more popular. And I actually think that there is a market there, particularly in urban areas in the US. It won't be the 18-wheelers, because they're going to need another generation of hybrid to make all of that work.

Another thing that the US should be doing from an innovation perspective is battery technology. Frankly, the batteries we're working with now are a hundred years old, in terms of technology. There's not a lot of new stuff that has been thought about for batteries.

How do you convert that battery to energy? The whole concept of recharging—[there has been] some really good stuff by Toyota being done over the past ten years. If you go to China, they're actually more focused on leap-frogging the internal-combustion engine. There are 100 million electric bicycles in China right now, in addition to the 20 million new modern vehicles. And I can see a point in five, ten years where you have tens of millions of electric vehicles, electric automobiles, of relatively comfortable class for four to six people being on the road in China, a year.

The US is going to fall behind that technology unless the universities, unless the government, unless private enterprise, says, "Okay. Let's actually put some brains to work to figure out battery technology." Because it is something the markets will accept. And frankly, it's the single best way of getting off the dependence on Middle East oil.

### **Finding Solutions: Solar and wind**

**Blair Sheppard:** So where should we place our innovation bets?

**George McLendon:** The situation with solar and with wind is that they're incredibly capital intensive. And the variable cost is great. The variable cost is as close to zero as you can get. At night, you do have a bit of a problem with solar. But the cost per kilowatt, the cost per watt of wind, which is the most competitive—there's no way to do it for less for \$2 a watt.

And for solar, it's about three to four times that, depending on who you actually believe. And so getting your capital investment amortized is a problem.

**Scott Nyquist:** If you look at the economics today, where wind and solar just look terrible compared to just about anything, you would lead yourself not to make these kinds of investments. But then if you look at 2050 and if you believe you have to be at, again,

90 percent reduction of greenhouse gas emissions and you look at all the alternatives, that means we'll have to have coal with carbon capture and storage.

We'll have to have, you know, carbon capture and storage and gas. And then you start saying, "Well, all these technologies look equally horrible." And also the leapfrog that'll have to go on in terms of technology between now and then is highly uncertain.

So you end up saying, "Well, we need to spend the next 10, 15 years investing in a pretty broad slate of new technologies," just given the uncertainty around how this stuff will play out. And this is a role that the US and Europe should be playing: having investment in the upfront R&D across a very broad range of technologies—storage, wind, all these fundamental sciences. Such that when we actually need to make these big infrastructure investments post-2020, -2025, we can actually begin to put them in place and get down to zero carbon by 2050.

### **Looking ahead: What's at stake**

**Blair Sheppard:** We agreed it's a three-part issue, a three-criterion issue. And we agreed that we got a set of short-term solutions that we can get to; we're just not getting to [them] fast enough, in some ways. We've got to invest in a long-term set of answers, [because] there's this real cliff if we don't do it. I want to talk about this cliff. Let's go out 30 years, 40 years from now, and let's imagine we just don't do it fast enough. So what?

**Aubrey McClendon:** Well, the biggest thing is you're going to have five billion people still living in poverty every day, half of whom don't have electricity. And we will have failed our fellow men in doing something that in my view is imminently achievable. My problem with the whole deal is we cannot seem to get energy policy in this country thought through intelligently by intelligent people.

I don't imagine for a second that 100 years from now our economy's going to be 100 percent natural gas. I'm hoping that it's generations beyond that. But I thought it was interesting that Bill ticked off all the things about natural gas. I counted. There were 14 positive things, and 1 negative.

And the 1 negative was, it makes 2020 achievable, but it hurts your 2030. That's 20 years from now. We're not doing anything to get to 2020 right now. Why not pursue a path that gets you to 2020? And by 2020, all these things that George and all our other smart people are working towards will allow us to, I think, scale alternatives all around the world.

So, to me, if we don't get it right today, we will have short changed a lot of people that we owe an obligation to because we consumed all the \$10 oil and all \$30 oil and all \$50 oil. And we've put all the CO<sub>2</sub> in the atmosphere. So I think we have an obligation. But also, I think there's a commercial opportunity here, as well, that we ought to take advantage of.

**Tom Albanese:** I'm going to look at this from a global perspective because this is really much a global issue. And I think instead of this being seen as a cliff out there 30 years from now, think of it rather as going down a set of rapids. They're going to get faster and they're going to get tougher along the lines.

Climate change will not be gradual. All the science suggests, first of all, wet areas get wetter, dry areas get drier, but extreme weather events get more common. You could be in a situation where because you've lost that 20 years of the first part of the slope, it's very, very hard to move off that from that point onward.

And then you begin dealing with, I think, some very difficult issues that people today don't want to tackle. But they will be the next-stage questions. One will be adaptation; that is, how do you start building walls around cities? How do you move people away from coastlines? That will be the item on the table.

If you start thinking about how scary that is now, that gives you an added urgency about what we should be doing today.

**Bill Timmerman:** I'm the one that lives in the here and now because I have to go face the customers a lot. We run a program called PaCE [Palmetto Clean Energy], where you have an opportunity to buy as much or as little certified green electricity for your house as you care to. And all we ask you to do is tell us how much you want and pay for it.

We are a capitalist society, still, sort of, and pay the incremental cost of the green power. This is the vote, OK? The program's been in place now two years. It's been heavily promoted, heavily advertised, heavily sold. And the people that are in the program are paying about 4 percent more on an average bill of \$100 to get 12 percent of their power from certified green sources.

We have 250 people—out of 750,000 customers—that are in the program. You ask why we're having trouble coming to a national consensus on an energy policy. Because the people that vote are not interested, don't feel the sense of urgency. It's kind of like me every January. My resolution is I'm going to lose weight and get in shape. And I kind of look about the same at the end of the year as I did at the beginning of the year.

So maybe I live in the world of what people do, not what people say they're going to do. But I see it more as a political issue in terms of creating a national will, if you will, to absorb these extra costs, assuming that somehow or another the extra costs associated with all of this do not really adversely affect our standard of living as jobs migrate, intellectual capital migrates, and we become a very noncompetitive place. So how do our people make a living?

### Looking ahead: Consumption taxes

**Bill Timmerman:** People ought to be able to spend their money the way they want to spend their money. And we can have a whole other week discussing tax policy here and tax incentives and disincentives and the level of taxation. You want to really get into a political upset, we can crank that topic up.

**Aubrey McClendon:** The reality is, Western society—and for that matter, any industrialized society—today exists because of the energy system that we have, which has created huge human utility and human wealth. And a kind of general life satisfaction. And so one of the challenges is you're trying to move away from something that has worked very, very effectively.

Cheap energy, particularly cheap energy found in the US, has been the foundation of the rise of American power in the past 100 years. My fear is that we don't appreciate that. We don't understand that. And that in the next 10 years to 100 years, [as a result of] our failure to take advantage of all the energy that is latent in our country today—wind, solar, nuclear, and natural gas—[we will] lose that economic leadership because we will no longer be able to rely on the cheap energy that we've had.

It's always important to keep in context that the reason we love cars, and the reason we love gasoline, and the reason we love coal-fired power is that it's cheap. And it's very, very difficult to imagine that you could go and impose a gasoline tax or an electricity tax on the American people and not be a one-term whatever you are.

So my view is we ought to embrace that and say, "The goal should be more portable, affordable power for all." We've got to drive down the cost of alternatives. And we've got to use more nuclear and more natural gas to keep power affordable, but also de-carbonize the system.

**Scott Nyquist:** Well, I was just going to comment there a little bit on where Bill started with. If you look ahead with all this rapid economic growth around the world, and what that's going to do to energy demand, and all the problems with oil supply, you can see that in a year or two some of these tax issues will be taken care of by \$150 oil.

So when we look at the world going forward, we see this oil-price shock coming. And the issue for us is, what's going to be the response, politically and [from] consumers? And that'll be the cattle prod that I think will get a lot of these things accelerated.

**Tom Albanese:** I might just comment on the consumption tax on oil specifically, but also from a carbon perspective. I understand. I see your logic that if you pay a little more at the station and if that money is specifically to protect oil security in the Middle East or something else, it makes some sense for conservation and a lot of other things. But

unfortunately, it's a regressive tax. The people who can least afford to pay for it are paying most of it. And so it just doesn't fly politically.

### **Looking ahead: Carbon tax vs cap and trade**

**Tom Albanese:** I know that, Aubrey, you've raised concern about cap and trade. Our view is that cap and trade's probably the way to go, in a global basis.

The alternative for pricing carbon is going to be on some type of carbon tax. Then the question becomes, "Should that be a producer tax or should it be a consumer tax?" I'm involved in a debate with some Australians right now. And generally, in the developed world, who are producers, they would say the tax should be on the consumer.

But frankly, this debate globally is being driven by the Europeans. And they are net consumers. And they will rule the end of this one. They will basically call it a tax on the producer. There are a lot more consumers than there are producers in the world. And it's easier to tax those specific points of production rather than all the billions and billions of points of consumption.

**George McLendon:** The current UN regulations for figuring out who gets carbon credits for what could probably best be described as bizarre, in the sense that if you're trying to get zero-carbon emissions you might say, "Well, great, a nuclear plant is good, or a wind farm is good." But in fact, there's the intentionality requirement that says, "Really, you can only get the credit if this is a really bad investment that you would never do in a sensible world."

That's not a very thoughtful policy, to encourage people to make really bad investments. So what I would have thought is, if you wanted to incentivize wind farms to develop the technology, you'd say, "Go find every class-7 wind site you can. Every time you build one of these, instead of doing a diesel generator we'll give you X. And you can do an NPV calculation and reduce your upfront capital costs."

**Tom Albanese:** Of course the UN's going to be driven by the fact that most of the people voting in the UN are [from] developing countries. And it's basically a net-wealth transfer to developing countries.

**George McLendon:** But the developing countries are the ones that are capital poor. So giving them an incentive structure that would actually allow them to develop a renewable by being able to capitalize on it would be vastly beneficial for them. Telling them, "You can only get this credit if it's the worst place you can possibly site your wind farm" is crazy. And I'm not convinced that our cap-and-trade bill currently is vastly superior, as written, to the current versions.

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## Looking ahead: How to create markets

**Tom Albanese:** I’d like to comment on the [intellectual-property] piece of it, because it’s an important part of what you can do—how do you make money out of this? I think there’s a macro part of the IP, which is something that should be encouraged on an open-source basis.

One example would be precombustion carbon capture and sequestration. [There are] no individual components that are not already patented or not already known, but it hasn’t been put together in total know-how. The FutureGen project was going to be essentially an open-access type of thing.

And that was something that the US Government could be seen to be supporting and offering the world, saying, “We’ve done our bit. Now, the rest of the world, get your act together and start trying this out yourself.” Now, individual pieces of it are going to be then subject to refinement and improvement and components of intellectual property.

So that’ll give the GEs of the world, that’ll give the Siemens of the world, that’ll give a whole range of technology providers more room to create new innovations and capture intellectual property itself. So if you can create some broad enablers and then allow that on an open-source basis, that allows the individual components to be continued to be improved upon and protected by intellectual property.

**Scott Nyquist:** When we look at this, it’s similar to your perspective in that we do see a lot of wealth creation that will take place with people who crack these issues of the biofuels, of the solar, and the storage issues, the carbon capture and storage.

But in terms of creating wealth to the economy and creating jobs and GDP growth, it’s going to be from those countries able to deploy it in an economically efficient way, and [from] the people who make these decisions [in such a way] so as not to squander their capital base by making a high-cost investment.

So I think it’s overplayed a bit in the US about how important it is that we win in each one of these areas. If someone comes up with it somewhere around the world and we deploy it in a more effective way, that will create more value to our economy than being the one guy who finds the answer. 