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Dialogs

Where will our energy come from?

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Vast reserves of natural gas in Appalachian shale could shift the entire energy market. Indeed, if gas prices fall, the challenge of increasing the use of renewable sources of energy will rise. The head of a private equity firm with major investments in oil and gas exploration discusses the structure of the energy industry and what it means for sustainability efforts.

Q: You invest in oil and gas exploration. What are you looking for right now?
My firm specializes in starting energy companies and financial services companies. In the short time we've been in business — four years — we've started five oil and gas exploration companies and five other companies. To date, our portfolio is not directly sustainable, if I understand the meaning of that term. We've looked at a number of renewables, but at the moment, our portfolio is focused more on hydro-carbons than on non-hydrocarbons. It is often said that I invest only in the "dark side," but I hope we are more open minded than that.

Q: When you're starting a company, you must be looking out far into the future to try to understand what kind of returns it's going to bring over many years. You're investing in natural gas, so I take it you're not worried that renewable energy is going to largely displace oil and gas in the foreseeable future.
No. We appreciate that there is a lot of momentum behind sustainability, and we know that companies like BP, when they look at projects, price carbon into their analysis — there's a shadow price for carbon in their analysis.

It is a real factor out there, and I think most of the industry would like to see some certainty in the regulatory environment with respect to carbon. It would add a lot of clarity to the investment process. But the problem is that without a direct charge for carbon or other sustainability factors, renewables are just not economically competitive.

Q: Could you talk about the potential of natural gas production from shale and how that affects the equation?
Shale is an overnight success after 20 years, as the joke goes. The ability to produce natural gas from shale deposits is not new, quite frankly. There are some shales in Appalachia that have been producing for 100 years. But the ability to produce natural gas in large quantities economically is the result of some work that began in the 1990s and reached fruition in the early 2000s. I've been investing in companies active in producing natural gas from shale since about 2003, so I've watched the evolution of this resource from up close.

The potential is just enormous. The estimates in the press range from 800 trillion cubic feet to 2,000 trillion cubic feet of reserves. To put that in perspective, we consume about 20 trillion cubic feet a year. So it's somewhere between 40 and over 100 years of supply.

If you take a step back, natural gas today is no longer in short supply. It's in excess supply. The

question is, having found it, is there a market for it? The logical market for natural gas is stationary power in the short term and, in the longer term, the transportation fuels market. And the issues surrounding those markets are as much political as they are economic. Why do I say that? If you look at the natural gas business, the best economic analog now is the coal business. We know there's several hundred years of coal out there. If you wake up one day and someone tells you that you have coal underneath your land, the best thing to do is to continue growing apples on your land. The coal itself as a resource has very little value, because it is in excess supply. What has value is the infrastructure to recover it and the contract to sell it.

Natural gas is going to move in that direction. Then the economic imperative for natural gas producers is to enter into long-term contracts with stable prices, because the risk in the business is going to be that the volatility in prices is on the downside and not on the upside. Economically, the scarce factor in the value chain will be the consumer, and he will capture the rent in the system.

The reason this is an issue for sustainable resources is that the price at which natural gas can come into the marketplace is going to be much lower in the future than it is today. If you look at the cost to produce these shales, no one is quite sure whether it's going to be $4 per million BTUs or $8 per million BTUs, but it's likely to be in that range. To put that into perspective, $4 per million BTUs is the equivalent of $24 oil, and $8 per million BTUs is the equivalent of $48 oil. So we have this huge supply of this resource available at prices which are substantially below today's price. It's the same thing that happened when we dis-covered East Texas in the early 1900s and displaced whale oil, or when Saudi Arabia was discovered in the 1930s and became the low-cost supplier.

The good news is that it's easy for natural gas to displace coal in the short run. We have a lot of natural gas plants that run at 20% or 30% capacity, and coal plants that are running above 60% of capacity. If you flip those proportions, you would get the United States a good way toward its 2020 carbon goal very quickly. But how do you make this happen in the marketplace? Displacing coal means displacing coal jobs. And that's an issue.

You could say that all new generation should take advantage of the supply of natural gas. Well, natural gas at $5 per million BTUs produces power at $35 to $40 per megawatt hour. And the best I've seen for renewables is about double that, and that’s after government subsidies. You'd have to have an immense carbon tax in order to make renewables economic. So the second challenge of getting cheap natural gas into the marketplace is that it makes the price of carbon much higher, and that's another political issue. A $30 carbon tax doubles the price of power between the Rockies and the Appalachians, according to what I've been told.

I see the transportation side as more a national security issue than a sustainability issue. Oil and electricity generation are really different issues. Oil is for transportation. Most of the carbon we generate comes from power generation, the big source being coal-fired plants. But transportation is a major source of carbon, and we could both reduce that and reduce dependence on foreign oil by using more natural gas there.

In the short run, you're not going to have natural gas refueling stations for consumer vehicles. But it is possible to build stations in places where fleets are used — municipal cars and buses and UPS trucks and Federal Express trucks. And there is great potential for long-haul trucks as well. There's no real reason why we shouldn't figure out how to get all those vehicles natural gas-fired. You could back out a not insignificant portion of U.S. gasoline demand in a pretty short run without a big expenditure. I think if you factor into the benefits the fact that oil prices would likely come down, it would pay for itself in a very short period of time.

Q: You said that there's a strong incentive to create long-term contracts in building out natural gas infrastructure. Is regulatory uncertainty inhibiting that now?
Yes and no. The way the power business was deregulated created a problem that people did not expect, which is that in a deregulated world, it's very difficult to incent people to build new power plants without long-term contracts. The economic solution for the price of long-lived capital assets is not well defined. Most economists will disagree with that. The theory says the price goes up to the point at which you induce the next unit of supply. The problem in that analysis is the definition of the price of the next level of supply is not precise with respect to the cost of capital or, more importantly, the period of time over which you recover your capital. If you're building a power plant, if you have to recover the cost of that power plant in three years or in 30 years, you get a very different cost of power.

In the 1990s, when the energy market was first deregulated, the market quickly went into excess supply, at which point in time the price for capacity went to zero. The profit you can make selling into today's markets is not big enough to induce new capacity since the price for power no longer has any capacity charge in it. That's good for consumers. Power is cheap. Consumers like cheap power. But the problem is no one will build new power now without contracts.

On the other hand, renewables are being built because long-term contracts are available even though renewables are much more expensive.

Q: That's where people start thinking they'll price in carbon or the other negative externalities of extracting gas or oil…
Right. But even if you put in a best-available-technology price for carbon, you still need to subsidize the renewables. And my view as an economist is we ought not to burden the taxpayers with that. We ought to burden the user. With subsidies, the distribution of the burden is different than the distribution of the use.

Q: Are you interested in investing in renewables?
I'm uncomfortable investing in businesses that require the maintenance of government subsidies to make a profit. The risk in that is not something my investors like to take. I'm not opposed to renewables. You just have to know that that is a more expensive solution than a nonrenewable solution. It's probably more expensive than any politically acceptable carbon tax.

Q: Do you have concerns about unintended consequences in these government decisions about energy policy?
In today's world, the renewable portfolio standards [RPS] are so large that the only way any utility can meet its RPS requirement is for all of the new generating capacity to be renewable. We recently looked at a project that was very interesting. The state had a renewable portfolio standard mandate. And the statute said that if you don't meet your renewable requirement, you have to pay a penalty of, I think, $45 per megawatt hour for every hour that you are out of compliance. This is in a state where the average nonrenewable cost is about $40, so when we talk to this utility about their willingness to enter into a contract to support a very attractive biomass project, they said, well, we can only do that if the price you give us is less than the penalty we have to pay for being out of compliance. That makes sense from their perspective, right? Well, that price isn't high enough to get this project built. So there is an RPS. There is a penalty for noncompliance, and the penalty, which is 100% of the price of power, is not enough to bring the renewables into the market. Now that's only one state, that;s one potential environment. But that, in a nutshell, to me, is the issue with renewables. It's a great idea, but the economics of it are daunting.

Q: Are there significant successes you could point to in moving towards more renewables or cleaner sources?
We've done a great job putting wind into the marketplace with tax credits. That's been a success. In Europe, they have these feed-in tariffs, and they set the price so high that they're flooded with renewables. So you can do it.

The political issue is that getting rid of carbon is expensive. To make it happen, we have to be prepared to pay the price and assure the people who are bearing the burden that that price will be recoverable in their products over a long period of time. If you can provide longevity, you can reduce the price. To recover costs over 20 years is cheaper than to recover them over three. But the problem with a long time frame like 20 years is that, if you think about it, I am promising to pay you above-market prices for 20 years. That's fine. I can do that. But you as the person who is lending to that project, you ask yourself the question, how good is my credit if I undertake this obligation? That's where the rubber hits the road. And so to get those long-term contracts which bring down the price of this power, you have to assure the credit of the person at the end for a long period of time. It's a hard problem.

Q: Can you talk about any of your companies that are looking to extract natural gas from shale? What's the scale that's necessary to build a successful business?
To produce an enterprise which will actually wind up producing natural gas over a period of time requires several hundred million dollars, so they're very large enterprises. Each individual well is small, so you have to drill a lot of them. That has implications for land use. Instead of having an offshore oil and gas platform in the middle of the ocean, we'll have several hundred wells spread out over 30,000 or 40,000 acres.

So you have to sort out land-use issues in order for a natural gas enterprise to work. Again, the industry's perspective is, look, you want us to restore the land, we'll restore the land. Just tell us what the environmental regulations are and we'll price the cost into the product. We understand that carbon has a cost. We're perfectly prepared to collect that cost on your behalf. Just tell us what it is. You can put all the burdens you want on industry, but those costs will always be shifted to the consumer though higher prices anyway, which they should be. Ultimately, capital is not going to bear them.

Make the rules clear. Make them enforceable. And enforce them and don't change them. It's unfair for us to commit all this capital and then for you to come in and change the rules. But it's perfectly appropriate for government to say: "Here are the rules. Now, do you want to commit capital?"

Interview conducted and edited by Jonathan T.F. Weisberg.