

PROJECT FINANCE

NewsWire

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The Business Model in Transition

David Crane, president and CEO of NRG Energy, said provocatively in the spring that people will soon be buying the equipment they need to generate their own electricity at Home Depot. He suggested in view of this that it is not a good long-term business strategy to be putting money into electric distribution companies or into building new central station power plants. Is he right?

Chadbourne hosted a lively debate on the topic in late June. The debaters are Neil Auerbach, CEO and managing partner of private equity fund Hudson Clean Energy Partners, and Ben Cook, vice president of structured finance of SolarCity, taking David Crane's side, and Larry Kellerman, CEO of Quantum Utility Generation, and Michael Storch, executive vice president and chief commercial officer of Enel North America, arguing that Crane is wrong. (Auerbach and Kellerman were former partners at Goldman Sachs.)

An audience vote before the debate showed 36% of the audience agreed with Crane and 64% disagreed. The moderator is Kenneth Hansen with Chadbourne in Washington.

MR. HANSEN: Neil Auerbach, you have five minutes to speak in favor of the proposition.

MR. AUERBACH: I am sure that for many of you, David Crane's statement is a bit far-fetched. So why is he saying it, and why am I willing to come here with firm conviction to argue that he is correct?

Nearly a decade ago, I made my first solar investment into SunEdison. At the time, SunEdison was selling solar photovoltaic systems to commercial and / *continued page 2*

IN THIS ISSUE

- 1 The Business Model in Transition
- 12 Irrational Exuberance About Africa?
- 20 Tales From the Dark Side of Emerging Markets
- 24 Opportunities Abound?
- 34 Solar Securitizations
- 40 DOE Window Reopens for Renewable Energy Loan Guarantees
- 44 New Financing Trends
- 53 The Business Model in Transition: Part II
- 60 The US Government Moves to Encourage More P3s
- 62 A Brighter Outlook for the "Other" Tidal Power
- 65 Latin America: Practical Insights from Developers
- 71 Environmental Update

IN OTHER NEWS

ADDITIONAL CONSTRUCTION-START guidance that the Internal Revenue Service issued in early August will allow more wind farms to be financed in the tax equity market.

That was the verdict from two tax equity investors who participated in a webinar hosted by the American Wind Energy Association on August 20.

John Eber, head of energy investments for JPMorgan Capital Corporation, said that between the guidance and what he heard from IRS officials participating in the webinar, "I think we are all going to be more comfortable going forward looking to finance many projects that have basically been sitting awaiting further clarification." Peter Lanza, tax director and vice president-taxes of GE Energy Financial / *continued page 3*

Transition

continued from page 1

industrial customers for around \$12 a watt. First Solar was selling its innovative thin film modules for more than \$4 a watt. Today, First Solar produces modules at a cost of around \$0.50 a watt, and SunEdison can install solar systems at a sales price of as low as \$1.50 a watt for some of its largest power plants.

For years, we have heard naysayers in this country and elsewhere around the world criticize the solar industry as a massive subsidy sink in a technology that can never compete with fossil fuel-based power generation. If you wanted to heap scorn on the industry, then all you had to do was say one word: Solyndra.

Today, most industry watchers are singing a different tune. By next year, solar PV will be the number one technology choice for new power generation installed around the world. As the industry continues to scale, costs will keep coming down as a highly competitive industry continues to sharpen its collective pencil on every item of cost.

US solar rooftop installations are expected to increase by 40% to 50% a year over the next several years.

Today the biggest components of cost for residential solar systems are the balance of plant, installation costs, and soft costs such as financing and customer acquisition costs. In the US residential solar markets, the average solar system costs around \$4.70 a watt, resulting in a delivered cost to power for retail customers in California of around \$0.14 a kilowatt hour and around \$0.16 for retail customers in the Northeast. Retail customers pay on average a little more for their power in both places when they buy it from their local power company.

The availability of easy financing from companies such as SolarCity, Sunrun and others has led to an unprecedented boom in the installation of solar PV systems around the country. This

year, more than 1,500 megawatts of residential PV systems will be installed in the United States, and that figure is going to increase by 40% to 50% a year over the next several years. And that is all beginning to happen in a market with close to zero demand growth for power.

So where does Home Depot fit in all of this?

The answer is cost. The next frontier in reducing the cost of solar PV for homeowners is outside the module. It is hardware and soft costs such as installation, permitting, financing and customer acquisition. And that is where Home Depot comes in. Home Depot is a metaphor for how the industry is going to cut the cost of finding customers and getting the PV systems on the roof cheaply. In order to get the cost of solar PV to continue coming down, we need to find the cheapest way to identify customers and get their solar PV systems assembled on their roofs, and Home Depot is a master at bringing low-cost solutions for home renovations.

David Crane's comment is pretty hard to argue with because Home Depot is already partnering with the likes of SolarCity to offer solar PV solutions for residential customers. And that is just the tip of the iceberg.

So the question is, how much can Home Depot and others do to reduce the cost of residential PV?

Five years ago, German homeowners needed to be bribed to install solar systems with a feed-in tariff of over twice the retail power rate. Today in Germany a residential solar system costs a little over

\$2 a watt, and homeowners can generate their own electricity at a cost one-third below regular retail electricity rates. Now that is incredible. The same system installed on a German rooftop costs less than half of what it costs in the United States. You can bet Home Depot senses an opportunity to make a bucket load of money.

So let's look into our crystal ball. The costs of residential solar PV will continue to fall 10% or more a year. Utility rates are going to continue to climb 3% to 4% a year. So ponder that. Five years from now, the cost of residential solar PV is going to be at least 30% to 40% less than it is today and utilities will be charging around 15% more.

So it is becoming a little bit clearer as to why David Crane said not to invest in central station power plants and electric distribution companies. Central power stations and local distribution companies are going to have a hard time retaining market share in the face of this enormous competitive threat. Five years from now, solar PV will not be competitive in just 10 states like it is today, it is going to be 30 states. Once residential solar PV costs 10¢ a kilowatt hour, which will happen in many places in the US within the next five years, there will not be many places in the US with a traditional model of electricity generation and distribution that will not be threatened. And if regulators start charging PV customers with access charges to compensate utilities for having to supply grid backup support, the long-term impact will be to convince more utility customers to cut the cord completely to their utilities by going completely off grid and buying a battery. Then those utilities will find themselves in what industry watchers have been calling the utility death spiral.

The changes to the utility business model will not happen overnight. Local distribution companies are not disappearing and central station power plants are not going on display in the American Museum of Natural History. There will still be plenty of local distribution companies 10 years from now, and there will still be plenty of central station power plants, but, in both cases, there will be fewer than today, and that is David Crane's point.

It is not a lot of fun to be in an industry that is destined to be playing musical chairs for decades. You do not need to agree with the speed at which these events will unfold to agree on the general trend. Recent industry research reports from the likes of Goldman Sachs, Morgan Stanley and Barclays all point to the same phenomenon. Although their estimates of the size of the opportunity for rooftop solar PV in the US range from 40,000 megawatts to over 400,000 megawatts over the next five to eight years, all of them are bearish on the traditional utility sector as a consequence.

This is the same thing that happened to traditional telecom companies 50 years ago when they started losing market share to wireless carriers who were vastly more expensive at the time. Just last year, Verizon Wireless bought out the minority stake of Vodafone in Verizon Wireless for \$159 billion. That transaction valued the land-line business of Verizon at less than 10% of the total market capital of Verizon. That's the possibility to which David Crane is alluding.

I want to end by quoting Mahatma Gandhi. "First they ignore you. Then they laugh at you. Then they fight you, and then you win." Until five years ago, the utility / *continued page 4*

Services, said "the guidance was extremely helpful."

This is the third round of guidance the IRS has issued about what had to happen by last December for projects to be considered under construction. Wind, geothermal, biomass, landfill gas, incremental hydroelectric and ocean energy projects had to be under construction by December 2013 to qualify for federal tax credits.

There were two ways to show a project was under construction in time. One was by incurring at least 5% of the project cost. The other was by starting "physical work of a significant nature" at the project site or at a factory on equipment for the project.

The IRS tried in the latest guidance to address the uncertainty that has caused tax equity investors to back away from financing projects that relied on the physical work test to start construction. Investors worried that minimal physical work like excavating a handful of turbine foundations or putting in a few hundred feet of string roads at a project site is not enough.

A group of wind generators and tax equity investors encouraged the IRS to provide several clear examples of what qualifies as significant physical work.

The IRS did not want to draw more bright lines like it has already done with the 5% test.

Instead, the agency said: "Assuming the work performed is of a significant nature, there is no fixed minimum amount of work or monetary or percentage threshold required to satisfy the Physical Work Test."

The agency drew attention to several examples of significant physical work that were in earlier guidance.

Those suggested that significant physical work begins with "the beginning of the excavation for the foundation" or with "physical work on a customer-designed transformer that steps up the voltage" or with string roads at a project site.

Some tax equity investors read an example in earlier guidance to / *continued page 5*

Transition

continued from page 3

industry pretty much ignored the solar industry. After the Solyndra debacle, it started to laugh at the solar industry and, more recently, it has started fighting the industry. In the not too distant future, the solar industry is going to win. The lessons of the past and the trends of the present point to the future described by David Crane. [Applause.]

MR. HANSEN: Speaking in opposition to the motion will be Larry Kellerman.

Advantage: Utilities

MR. KELLERMAN: In 1882, the central station electric business was born at the corner of Fulton and Pearl Street in downtown New York City with service to 85 different customers and, behind those customers, there were 400 lamps. Ever since that time 132 years ago, there have been the Cassandras of our industry suggesting that the central electric utility business model was going to be defunct and that new emerging technologies would overtake the business model.

Yet the integrated utility model has not only survived, it has thrived this past century and a third and will continue to serve society for many decades to come, not despite the advent of new technologies such as solar photovoltaic, but actually because of them.

As inexpensive as these new forms of self-generation are, with few exceptions, they are not as cost effective as grid-supplied power. The reason is there are three natural advantages that the utilities have and will continue to have. I will describe those in detail. The three advantages are sustainable.

Number one is economies of scale. The utilities are in a better position to reduce capital costs by building new units at scale.

Number two is the cost of money. We are in the most capital-intensive industry on earth, and he or she who has the lowest cost of money wins. Guess who has the lowest cost of money? It is not my friends opposite. It is the electric utilities of North America.

Number three is utilities have an integrated, robust system. It is a network. It is a system. The competitors have at best only part of a system to offer.

There have been naysayers about the utilities for many years. One of the most renowned of those in past history was the CEO of a fortune 50 company who famously called utility executives

dinosaurs and predicted their demise. His name is Jeff Skilling, and he currently residing in an all-expense-paid extended-stay facility with iron bars.

Let me drill down into the three reasons the utility business model will thrive for a long time to come. Economies of scale matter a lot, and utilities can dramatically lower capital cost.

Go to Home Depot. See the guy in the yellow smock. Buy your solar equipment from him and have some guy in a pickup truck install it on your roof. That five kilowatts on a per-kilowatt basis is going to cost you 2.5 to 3.0 times the amount that a utility building a 50- to 100-megawatt grid-scale system can either buy or contract from an independent power producer, meaning the utility has a dramatically lower per-kilowatt cost for installation, and the advantage is not simply in the per-kilowatt cost of installation.

Where are you going to have your installation done? It will be done on your roof. Let's talk about where most solar installations take place: California. If you have a roof in California, that roof is over your head. Where do you live? If you live in California and you live near the coast, the direct normal irradiance or DNI of where you live is 5.0 or less. Where are the utilities and the contractors building their mega-scale projects? They are building them at 3,000 feet in the Mojave Desert where the DNI is 7.3 per unit of solar cell installed, and where the utilities are generating 1.5 times more kilowatt hours over any given year than a residential system where people actually live in California.

Then you have the cost of operations and maintenance where there is an order of magnitude difference in terms of per-unit cost to maintain a residential system versus a central station power plant. It is not that we do not believe in solar. We believe that the rightful owners, the societally most cost-effective owners of solar, are the utilities.

Utilities have a lower cost of money than you. Simple example: the average cost of utility debt is 4.0% for 20-year debt. I pulled SolarCity's recent 10Q. SolarCity's cost of long-term debt is 7%. Let's take that 300-basis-point delta, apply it to 20-year financing on a \$20,000 solar system on top of your roof. The total difference in cost of money over that 20-year system is \$8,400. Who wins in the long term? The party with the lowest cost of money wins.

Utilities have an integrated, robust system. It is reliable and, unless you want to be Grizzly Adams and live without power for an extended period of your life, in today's modern world where electricity is not a luxury but a necessity, it is also a

necessity to have the grid backing you up. Paying for that necessity at a regulated cost of service is something that will be sustainable for many decades to come. [Applause.]

MR. HANSEN: Larry Kellerman, thank you. Ben Cook from SolarCity will correct misimpressions that took place. [Laughter.]

Consumers Driving the Bus

MR. COOK: More than 500 SolarCity employees working in Home Depots sell rooftop solar systems. SolarCity sells a system every two minutes during the work week. These are not two guys in a truck. These are branded SolarCity employees who do everything from first customer contact to getting up on your roof, to manning call centers 24-7 in case you have any problems. This is an integrated system that enables customers for the first time to pay no money down and save money month one. The average customer from the first time he or she goes into a Home Depot to buy a bag of dirt, a ladder or a hose meets a SolarCity employee and signs up in under 15 days for a \$25,000 or \$30,000 purchase of electricity over 20 years. That's one of the biggest purchases that an average customer will ever make.

Why does the customer do it?

Electricity is a commodity that the customer can get less expensively from SolarCity than from the electric utility. This is a trend that is happening not just in energy, but across the market.

I come from Silicon Valley where competitive destruction is a fact of life, and every year we see another Airbnb, Uber or another entrant changing the market. Traditional industries that have not met customer needs as much as customers would like are being replaced by better, cheaper alternatives. That is exactly what is happening here.

However, it is more fundamental than that. After 100 years, we are finally moving from a top-down system to a bottom-up system.

We heard that utilities have the advantage in terms of scale economies. Yes, but with rooftop solar, for the first time, you have the ability for homeowners to generate power where it is consumed, and that brings its own savings. There is no need to move electricity long distances from central station power plants. Every year, rooftop solar reaches grid parity in more markets. It is creating a perfect storm.

Bloomberg called it the "phase change" in which the physical system transitions to another state. We are not talking about adding a little bit of solar or a little bit of wind to the system. We are talking about a fundamentally / continued page 6

suggest that a wind developer relying on work on turbine foundations needed to have started on at least 20% of them in 2013. The IRS said it did not intend to suggest there is a 20% threshold or any fixed minimum amount of work required.

The agency has said all along that a developer had merely to start work on a significant task in 2013, but not to complete the task in 2013.

Will this be enough to reopen the tax equity market for developers who relied on the physical work test? The two tax equity investors said yes.

The new guidance addresses two other issues.

Some larger wind companies stockpiled turbines or other equipment in 2013. They may have had a list of projects at which they might use the equipment. Companies have been asking whether they can change their minds — for example, can a company decide in 2014 to use the equipment at a project it acquires from another developer who did not start construction in time on his project, use the stockpiled 2013 equipment, and treat the acquired project as under construction in time on grounds that at least 5% of the project cost was incurred in 2013.

The IRS said yes.

Some developers incurred a lot of costs but not 5%. Some who fell short of 5% asked whether they can claim tax credits on a fraction of the project. The IRS said yes, as long as at least 3% of the total project cost was incurred by the end of 2013. For example, if 3% of the project cost was incurred in time, then tax credits can be claimed on 60% of the electricity output or project cost. The IRS has traditionally treated each turbine, pad and tower at a wind farm as if it were a separate power plant. A developer who incurred 3% of the project cost must draw a circle around whole turbines with a cost 20 times the 2013 incurred costs rather than simply claim tax credits on 60% of the electricity output.

The additional guidance is in Notice 2014-46.

The Senate tax-writing committee voted in April to extend the deadline / continued page 7

Transition

continued from page 5

different organizing principle for the system.

How should we think about investing in central station power plants or distribution networks? Germany has gone through a transition already. It spent \$166 billion over the last 10 years on renewables and, in the process, E.On and RWE collectively went from a market cap of \$170 billion to \$70 billion. One of the directors of E.On, Leonhard Birnbaum, said, “Whatever you believe, it will happen more dramatically and more aggressively.”

If you believe we will see some renewables, but not mass adoption, this is what we thought in 2008. If you believe no aggressive dynamic evolution, this is what we believed in 2005. We have already made these mistakes. Be more forward looking.

Home Depot sells a new solar system every two minutes.

Larry Kellerman says that utilities have access to cheaper money, but that assumes in the long run that utilities can supply electricity more cheaply. They have no natural advantage. The cost of capital derives from the underlying market position and, right now, Barclays is saying, “We see long-term risk to credit with utilities falling behind the solar-plus-storage adoption curve and long-term risk from comprehensive reimagining of the role utilities play in providing electric power.”

So if today you say that utilities have an advantage over decentralized energy sources, remember that these are 30-year bets that are being placed. A case in point about how rapidly a venerable business model can change is the publishing industry.

In 1982, the internet was invented by Al Gore. [Laughter.] In 1992, the web came along. In 1997, the smartphone came along. In 2006, Twitter was founded. In 1982, McClatchy’s stock price was \$73; it now sits at \$5. The advertising revenue that peaked in 2006 is now at 10% of what it was just 10 years ago.

Are you ready to place a 30-year bet on something that is in the middle of a perfect storm? [Applause.]

MR. HANSEN: The last word in the first round goes to Michael Storch.

When Subsidies Disappear?

MR. STORCH: Thank you SolarCity. I am a customer of SolarCity and it has been an absolutely fantastic experience. Acura contacted me through email. SolarCity was offering Acura’s customers an incentive to install solar. I contacted SolarCity. Google Earth was utilized, and a little more than two weeks later, I was signed up. It took a few months to get everything permitted, but it was unbelievable. The customer service was fantastic. The system is working beautifully.

So it will come as a surprise that I recommended you sell SolarCity short.

This company is able to do what it does because of tremendous subsidies that hide what rooftop solar really costs. The tax subsidies translate to about a 50% reduction in the effective cost of the systems. Once the tax subsidies expire, instead of roughly 40% of electricity users

representing a potential opportunity for the solar rooftop companies, the number will be much smaller.

And that is not the only magic on which the solar rooftop companies rely. The other magic is called net metering, which is a fantastic deal for consumers. As a SolarCity customer, I am getting full credit at roughly 19¢ a kilowatt hour for energy that I generate from my rooftop system. I am burdening the rest of the folks on the grid, since I am no longer bearing a share of the cost. Net metering is a fantastic deal, but it is not going to last.

Net metering is undermining the fundamentals of the utility business. The battle has already been joined and is becoming heated. Arizona Public Service waged an extensive campaign

to attack net metering. It was not a great success, but the utility managed to get an incremental charge of about \$5 a month from the typical customer with solar on his roof.

It is not a fair or sustainable system to have a dwindling group of customers bear the full cost of the grid.

The utilities will wake up and they will start to work aggressively to preserve their market shares. [Applause.]

MR. HANSEN: So we now move into two interactive phases. Initially, the panelists will have a Q&A among themselves, but then we will have Q&A between the panelists and the audience. Neil Auerbach, do you have a question for the other side?

In Your Eye

MR. AUERBACH: Yes. It seems to me that in order to disagree with the resolution, you basically have to believe that customers will stop coming to Home Depot and will instead go to Larry Kellerman's solar stations in the desert. You are going to have to convince Congress to repeal the 30% tax credit right away, and you are going to have to convince 43 states to get rid of their net metering laws immediately. It sounds like what you guys are saying is David Crane is wrong because all three of these things will happen. Did I get that right?

MR. KELLERMAN: Thank you Neil, but you got it completely wrong. [Laughter.]

I agree that there will continue to be cost reductions in solar generation. I believe that there will be a robust number of choices available to customers, but I also believe that if a customer is logical and acts in his or her own self-interest, he or she will go to the local utility. It is cheaper for Southern California Edison or Arizona Public Service to build a 100-megawatt solar power station, cheaper by far than for a customer of Home Depot to build one, own it and operate it on his own roof.

The utilities recognize that they are the more cost-effective choice. They are starting to use their comparative advantages to fight back. The community solar offerings are an example. Why own a solar system on your roof? You can own an undivided interest in a community solar project that is built at much lower cost per unit, financed at a much lower cost of capital and operated at a much lower O&M cost. That is a superior choice.

I believe customers like solar and will continue to like solar, but I fundamentally believe more strongly that customers like money.

MR. HANSEN: Mike Storch, do you have a question for the other side? I am pretty sure that whatever it is, Neil has a response. [Laughter.]

/ continued page 8

to start construction to qualify for tax credits to December 2015. This provision is part of a broader package of tax extenders.

The package has stalled in the Senate. However, the Senate majority leader, Harry Reid (D.-Nevada), has said he will try to bring it up again in a "lame-duck" session of Congress in late November or December.

CORPORATE INVERSIONS are leading to more hand wringing and possible government action in Washington.

European and Asian companies with US subsidiaries are starting to pay attention because of the potential for any fix to affect them as well.

A corporate inversion is where a US corporation with substantial foreign operations inverts its ownership structure to put a foreign parent company on top with the aim of keeping future earnings from its overseas businesses outside the US tax net. The foreign parent may also "strip" earnings from the US subsidiary by capitalizing the subsidiary with debt so that earnings can be pulled out of the United States as deductible interest on the debt.

Congress amended the US tax code in 2004 to make it painful for US companies to invert. Most inversions today involve a merger of a US corporation with a foreign corporation. The shareholders of the US company retain less than 80% of the shares of the combined enterprise. If they retain 80% or more, then the IRS will treat the foreign parent as a US corporation, subjecting it to tax in the United States on its worldwide earnings. A merger done properly allows the merged company to incorporate in a third country with lower taxes. Ireland and the United Kingdom have been popular destinations.

Senator Carl Levin (D.-Michigan) and Rep. Sander Levin (D.-Michigan) introduced bills in the Senate and House to reduce the 80% threshold for treatment as a US corporation to 50%. The bills have a retroactive effective date of May 8, 2014. Alternatively, the foreign parent would be treated as a US corporation if it

/ continued page 9

Transition

continued from page 7

MR. AUERBACH: Yes. [Laughter.]

MR. STORCH: We are talking about central station generation and a grid in the United States today of more than a million installed megawatts. The total capacity of solar in the US is basically a rounding difference. So even with robust growth in the industry and without the current subsidies continuing for an extraordinarily long period of time, how is it possible for any meaningful penetration given a base of that size?

The cost of rooftop solar will fall by 10% or more a year while utility rates continue to climb by 3% to 4% a year.

MR. AUERBACH: The 10% investment tax credit for solar is permanent. A recent Morgan Stanley research report projects penetration for both commercial and industrial and residential solar over the next eight years of as much as 400,000 megawatts. You do not have to support that wild claim, which is made by a pretty eminent researcher, to support the resolution, but the growth will be big.

MR. COOK: Taking SolarCity as an example, we have said that by 2018, we would like to be at a million customers. That pace is less than our current growth rate. The potential market is 41 million rooftops. The opportunity is there. That is why earlier this week we announced that we were going to start manufacturing our own solar panels in a bid to become more vertically integrated. The opportunity for growth is so great that we want to make sure we have all the tools needed to be able to act on the opportunity.

MR. HANSEN: Neil Auerbach, do you have more questions as well as answers for the other side?

MR. AUERBACH: Mike Storch, I do not want to be at all mean spirited because this is a wonderful dialogue, but I found it interesting to hear from Enel Green Power, which is one of the

largest owners of wind power in the world, that the subsidies cannot last. The question is: Are you willing to throw the baby out with the bathwater? Are we arguing against subsidies going away for all renewables or is it just the ones that threaten the central station power plants? How does Congress evaluate a claim that subsidies are overdone for one renewable technology and not another?

MR. STORCH: Subsidies are a social choice. Enel is obviously a strong supporter of renewables. My point was not that subsidies have no place, but it would be foolish to assume they will remain indefinitely.

MR. HANSEN: Larry Kellerman, you get the last question if you have one.

MR. KELLERMAN: The greatest investor of our time is Warren Buffet. Our opponents here appear to believe Warren Buffet is stupid because Warren Buffet has spent \$15 billion in the utility space over the last decade. His most recent acquisition to close just months ago was Nevada Energy, a utility

that serves one of the highest solar insolation regions of the country. So if there is any utility that is going to be right in the path of the bulldozer that David Crane sees coming, it is the one the smartest investor on earth has just bought.

So, Neil, please explain, as a former Goldman Sachs partner, why you believe the world's greatest investor is stupid? [Laughter.]

MR. AUERBACH: Thank you, Larry. [Laughter.] We were former colleagues at Goldman Sachs, and before I made my first investment in wind energy in a company Horizon Wind, I had go to Larry to get permission because they did not think anything that did not burn could create electricity.

Look, Warren is not stupid. Warren has made a lot of very good bets, but what Warren is also doing is buying a lot of long-dated cash flows. If you look at his investments in solar central station, those have very long power purchase agreements, and he is very happy in this stage in his career to generate those 10%, 11% and 12% returns. But that does not mean that David Crane is wrong.

What will happen over the next 10 to 20 years will be a seismic shift. The SolarCity stock price right now is trading at 16 times current revenue. Smart investors are not all so blinded

by Elon Musk's charm to bid up the stock price on that basis. The reason why they are making that bet is they see the growth rate.

Investment in the solar rooftop sector is a trickle compared to where central station power and utilities are today. Tomorrow it will be a flood.

MR. HANSEN: Moving to the third phase of this debate, do we have any questions from the audience?

Audience Questions

MR. JOSHI: Anuvrat Joshi, CFO of Sunsuperior Solar. Question for Larry Kellerman. Doesn't the fact that many utilities are considering investing themselves in solar rooftop businesses support David Crane's view?

MR. KELLERMAN: No. It actually supports our proposition that utilities are durable, sustainable enterprises and that they recognize changing technology. We are all in favor of solar. Solar is a fantastic technology and its cost has been plummeting, and those are great things for society. Utilities are adaptable entities. The reason they have been around for more than a century is that they have been able to adapt. Utilities see the money. They also realize that the future is at least partially a solar future, so utilities want to invest in it. The three advantages that they enjoy over distributed generators will make them formidable competitors.

MR. AUERBACH: It is interesting that you said that utilities are flexible. A report issued by the American Energy Innovation Council in 2011 — that is a group that Bill Gates and Jeffrey Immelt helped launch — said that the utility industry has the lowest investment in innovation of any industry in the world: 0.3% of revenue. So it is a little bit difficult to understand the proposition that utilities are flexible.

The social contract in this country and in many places around the world is really simple. In order to provide reliable power, the states grant monopoly status effectively to utilities, and regulators are there to tame the beast to protect customers from monopolistic behavior.

That is not a business model that encourages innovation, and so when seismic shifts happen, they catch monopolies by surprise. That is what is happening here. Yes, of course the utilities will invest in solar power at utility scale because they have been told to do it and because they are going to earn their regulated return if they are doing it through a rate base, but that does not suggest David Crane is wrong.

/ continued page 10

remains managed and controlled from the US and at least 25% of its employees, employee compensation or assets are located in or derived from the United States. Neither bill is expected currently to be enacted because of opposition from Republicans, who control the House. A bill must pass both houses of Congress to become law.

Republicans believe that the only effective deterrent to inversions is to reduce US corporate tax rates. The US tax rate has remained unchanged at 35% since 1986. In 1986, the rate was in the middle of the pack among peer group countries. Today other countries' rates are between 20% and 30%.

Martin Sullivan, an economist who writes for *Tax Notes* magazine, argues that reducing tax rates will not stop inversions and that the US needs to move to a territorial tax regime where US and foreign corporations are treated the same.

US multinational corporations have \$1.95 trillion parked in offshore holding companies. The earnings cannot come back to the United States without being taxed. A key driver in many inversions is greater flexibility where to invest offshore earnings without subjecting them to US tax. Many US companies are also becoming more international in scope and are earning an increasing share of their income outside the United States.

Democrats are expected to introduce another round of bills in September to reduce the amount of earnings stripping that the United States will tolerate.

The US Treasury is also exploring whether it can tighten any US tax rules to discourage inversions without waiting for Congress to act.

Senator Charles Schumer (D.-New York) described a proposal in mid-August to make earnings stripping more difficult that he plans to introduce in bill form in September. The US does not allow interest payments by US corporations to foreign related parties to reduce the adjusted taxable income of the US corporation by more than 50%. The limit applies only if the US corporation has more than three */ continued page 11*

Transition

continued from page 9

What utilities have the hardest time of all doing is adapting. They have to be forced to adapt by regulators. I have no problem with competition, and I stand in favor of competition, but utilities traditionally are not pro-competition. That is not their business model, and it hasn't been that way for a hundred years.

MR. CHERRY: Bud Cherry, CEO of Eagle Creek Renewable Energy. I think the analogy of distributed generation to cell phones is strained at best. What happens if you live in Brooklyn, Queens, the south side of Chicago, Detroit, Cincinnati? You don't have an opportunity to put solar panels on your roof. What happens when the sun goes down? California will lose more than 10,000 megawatts of generation at sundown that must be replaced by conventional generation.

MR. KELLERMAN: I look at California. Justin Bieber can put solar panels on his estate in Calabasas. With net metering, he will pay little or nothing for electricity for his estate. Who is bearing the cost? It is the folks in the inner city and the folks who live in apartments, trailer courts and other parts of southern California who cannot afford to or do not have the wherewithal to put solar on their roofs.

Net metering has been a strong stimulant to growth of solar rooftop power, but it creates a perverse societal subsidy. It is the poor members of society who have to pay higher rates that are subsidizing the richer members of society who can afford the larger roofs. That is a social and structural issue that regulators will have to ponder deeply if there is greater penetration of this technology.

A rooftop system will still cost as much as three times per kilowatt of capacity what a utility-scale solar facility costs.

MR. AUERBACH: Whether or not the analogy to cell phones is correct, it is close enough to understand how to behave to get ahead of the curve.

The social problem that Larry identifies is not an issue today. It is an issue 10 to 20 years from now. However, one of the big issues that must be figured out is the socialization of cost for those who cannot afford solar. If you have a FICO score of 650 or higher, you are able to have solar on your roof. It does not matter whether you are well off or middle class. The poor is where the problem is.

We are not standing for the proposition that there will not be a grid. Change always bring new problems that have to be addressed. Elon Musk at Tesla will bring even more change with his gigawatt factory to make batteries and then watch out, because the cost of total off-grid solutions in the next five years will come down to the point where people can cut the cord completely and regulators cannot stop it. That is not what regulators are there for. They are not there to prevent consumer choice.

The bottom line in support of the proposition is that consumers are voters who are voting with their feet, and they are going to continue to do so in growing numbers. [Applause.]

Closing Statements

MR. HANSEN: With apologies to all the raised hands in the audience, the clock says that we need to move to closing statements. Neil Auerbach, you are first.

MR. AUERBACH: We do not have to like the world that David Crane is painting. We are allowed to be a little bit afraid about whether it will happen just the way he portrays and whether it will cause people economic loss.

Is David Crane right about the future? Look at GDF Suez, one of the largest power companies in the world. Several months ago, it announced €14 billion of write-offs associated with its thermal generation investments. That is not a pretty thing. Joseph Schumpeter described capitalism as a process of creative destruction. People are always figuring out new and better ways to do things.

To support the resolution, you simply need to be convinced that David Crane is onto something real. This is not make believe. The trend is inescapable. It is visible today. Even if the 30% investment tax credit for solar is not extended, it will be only a short-term blip and we are going to see, over the next five to 10 years, explosive growth of distributed generation in this country. It will take decades to reach the full potential because it takes hundreds of billions of dollars. Distributed solar will eventually be cheaper — without subsidies by the way, Mike Storch — than central station power. Once that happens, the trend is unstoppable.

MR. KELLERMAN: Solar is a technology of tomorrow just like nuclear was 55 years ago. Fifty-five years ago, people were using the term, “too cheap to meter.” That was how the threat nuclear represented to the utility business model was being described, and what happened? A bunch of DOUGS like me — DOUG means dumb old utility guys — are still here, and where is nuclear? The utilities embraced nuclear and used it for a cost-effective period of time. Fifty years from now, there will be another new technology that has overtaken distributed solar, but utilities will still be here. The DOUGS will embrace the new technology of solar just like they embraced old technologies of nuclear, combined-cycle gas and smart meters, and they will deploy it effectively and end up owning a lot of the distributed generation because of their three advantages: scale, a lower cost of capital and the presence of an integrated, highly-reliable redundant grid.

MR. COOK: It is interesting to hear those great innovators the electric utilities described as forward looking and ready to embrace new technologies as they upset the traditional business model. David Crane’s proposition is that if people can walk into Home Depot and make a choice, they will choose distributed solar. Clearly there are policy implications and losses in value for stranded assets, but fundamentally the resolution is that we are in a period of creative destruction in the power sector where consumers are choosing a new direction. Rooftop solar and batteries have an incredible opportunity to disrupt the way electricity has been produced and sold.

MR. STORCH: A lot of utilities are dinosaurs, but they are waking up. Who are the biggest investors in the renewable energy business today? Foreign utilities and the unregulated affiliates of US utilities. They are spreading their wings, moving around the world and chasing innovations in how electricity is delivered. That information is leaking back into the regulated side of the business. Solar has a great / continued page 12

parts debt to two parts equity. Any interest that cannot be deducted can be carried forward until a year when there is room within this formula to deduct it. If the US subsidiary has an “excess limitation,” meaning it could have deducted more interest in a year, then the excess limitation can be carried forward for up to three years.

Schumer would bar US corporations from using interest paid to related parties to reduce income by more than 25% and apply this limit regardless of how much debt a US corporation has in relation to equity. He would not allow any excess limitation or disallowed interest deductions to be carried forward to a later year. These rules would apply only to inverted companies. The reason the bill language has not been released yet is he is still working on a definition of inverted company. More punitively, he would require inverted companies to ask the IRS in advance for approval for the terms of transactions with related parties for the next 10 years after the inversion.

Schumer said at a July 22 Senate hearing on inversions that his proposal would provide a retroactive fix. “Any company that did an inversion six months ago, a year ago, five years ago will lose this deduction,” he said, calling it “a prospective policy action to counter past and future inversion activity.”

Rep. Sander Levin released a separate draft earnings stripping bill in early August and is collecting comments through September 5. Levin is the ranking Democrat on the House tax-writing committee. His bill is similar to the Schumer proposal, but would not be limited to inverted companies and it would allow disallowed interest deductions to be carried forward for up to five years. The bill would be effective in tax years ending after it is enacted.

Senator Ron Wyden (D.-Oregon), the chairman of the Senate tax-writing committee, said he and Orrin Hatch (R.-Utah), the senior Republican on his committee, are talking about a proposal that Wyden hopes to put to a vote in the committee in / continued page 13

Transition

continued from page 11

future in this country, but it will be the utilities that will ultimately move it forward on a massive scale.

MR. HANSEN: Thank you, panelists, for a stimulating debate. Our audience was split before the debate 36% in favor of the proposition and 64% opposed. Our vote counters have tabulated the votes at the end of the debate. The side in favor of the resolution gained ground with the final vote now a perfect deadlock of 50-50, so whichever direction we go in the future, you heard it here first. [Laughter.] ©

Irrational Exuberance About Africa?

The Obama administration hosted a commercial summit among heads of 50 African countries in Washington in early August. Interest in Africa is growing among private equity investors and developers as the region seems poised for a period of sustained economic growth. The World Bank projects a growth rate of 5.2% in 2014, up from 4.7% in 2013. There was a 16% increase in net foreign direct investment flowing into the region in 2013 with another increase expected in 2014. The United States launched a Power Africa initiative in 2013 with the goal of doubling access to electricity in sub-Saharan Africa by 2018.

However, developing projects in emerging markets is notoriously risky. Is there irrational exuberance about Africa? Does great need mean great opportunity? A panel discussed these questions at the 25th annual Chadbourne global energy and finance conference in late June. The panelists are Jennifer Cooke, director of the Africa program at the Center for Strategic and International Studies, Cheikh Gueye, mission chief in the Africa department at the International Monetary Fund, Maureen Harrington, head of the international development group at Standard Bank of South Africa, and Jerome Niessen, until recently principal investment officer for Africa infrastructure at the International Finance Corporation and currently managing director of NedPower, a project developer. The moderator is Ikenna Emehele with Chadbourne in New York.

MR. EMEHELE: One of my mentors keeps telling me, "Africa has a lot of promise, and it always will." Maureen Harrington, is the current exuberance about Africa misplaced?

MS. HARRINGTON: That is a huge question. Maybe I can start by telling you a bit about Standard Bank so that you will understand my perspective when I talk about potential opportunities for US companies in Africa.

We are Africa's largest bank. We are headquartered in South Africa. We operate in 19 of the 54 countries in Africa. We have approximately \$2 billion in market cap. I work from our office in New York where our focus is to look after our customers that are doing business in Africa. We focus on three main sectors in Africa: power infrastructure, mining and metals and oil and gas. We have underwritten about \$2 billion worth of power deals in Africa in the last three years. It is a sector that we know quite well, and there is clear demand for more power in Africa.

Only about 30% of Africa's population has access to power. The continent has the fuel sources: coal, gas, wind, sun, geothermal. The ingredients are all there. One of the biggest challenges has been developing a regulatory environment that facilitates private investment into utility-scale independent power projects. There are probably six or seven countries out of the 19 where we operate where the environment is in good shape to make those kinds of investment. Others are improving quickly.

There are also opportunities for distributed generation. Again, they vary by country based on local regulation.

MR. EMEHELE: Cheikh Gueye, are the companies and private equity funds rushing into Africa likely to be disappointed?

MR. GUEYE: I think the time is great for Africa. Growth is rising, and we have been experiencing a decade of strong market economic policies that are starting to bear fruit. Various countries are becoming more integrated into international markets. We believe this trend will continue in the future, although there are some risks. We think the larger countries have strong economic teams that will be able to manage through the tail wind that is starting to emerge in the international arena.

MR. EMEHELE: Jennifer Cooke, irrational exuberance? Too much risk still?

MS. COOKE: It is easy to fall into simple narratives on Africa. Ten years ago, it was a hopeless place. Now the simple narrative is the continent is about to take off.

There have been growth spurts in the past. The current growth is qualitatively different than some of the growth fueled by commodity booms in the past. We have seen a decade

now of sustained growth coupled with high demand for commodities, particularly from China.

There is a diversification that we did not see in the past. Much of the growth in the last decade has been driven by construction, by telecommunications, by financial services and so forth.

You have a consuming class in Africa that generated less than \$1 billion in consumer demand in 2008 that is expected to grow to \$1.4 trillion in 2020.

There is something qualitatively different in the use of new technologies by more entrepreneurial globally-connected younger generations.

All of that said, one of the key features of Africa is something Maureen Harrington pointed out: divergence. Some countries will become important markets by virtue of their sheer size. Think of Nigeria with 170 million people or Ethiopia with 70 million verses a Malawi, Namibia or Sierra Leone, which are much smaller. Geography is another distinguishing factor: whether a country is landlocked, its ability to import and export products and the attitude of the government to a market economy. When we look at growth trends, we have to look at what drives that growth and whether it is sheer commodity export or whether the country is beginning to branch out into other areas.

I think there are opportunities, but there is no guarantee, and some are going to get it right and some are going to get it wrong.

MR. EMEHELU: You have been involved in high-level talks with African governments about access to energy resources.

MS. COOKE: Nigeria and Angola will continue to dominate in the oil sector, but there is a new producer, Ghana, and Uganda, Liberia and Sierra Leone have the potential to become smaller oil producers.

The big story is in the natural gas off the coasts of Mozambique and Tanzania and shale gas in South Africa. Mozambique and Tanzania have the kind of resources to meet real world class demand. This has led to huge expectations in those countries about what this might mean, but there are still significant uncertainties. Unlike oil, there is a lot of uncertainty about the global natural gas market going forward, and that makes it harder for investors who have to make massive upfront investments into infrastructure to produce and ship the natural gas. Put at the top of the list political risk, public expectations and governments that do not have the capacity to put complex deals together and who might change / *continued page 14*

September. Wyden said the fact that merger agreements now make it a condition to closing that the US government has not taken action to stop inversions belies the claim that the transactions have nothing to do with taxes. Hatch said he is open to a short-term fix, but any fix must move the US toward a territorial tax system in which companies are taxed only on their income from US sources, be revenue neutral and not be retroactive. Even if Hatch were to go along, there does not appear to be any path forward through the House.

President Obama said in early August that the US Treasury Department is looking at what regulatory measures can be taken to stop inversions without waiting for Congress. The Treasury had said earlier that there is not much it can do without legislation. The Treasury search is expected to take at least into September.

Many tax experts are skeptical about whether Treasury can take meaningful action on its own in part because Congress already drew clear lines in the tax code for earnings stripping and corporate inversions.

However, Stephen Shay, a Harvard law professor who has had two tours as the senior international tax official at Treasury, suggested several ways the Treasury can limit inversions in a widely-read article in *Tax Notes* magazine on July 28. Shay suggested using section 385 of the US tax code, a 45-year-old provision that gives the IRS broad authority to draw lines between debt and equity, to reclassify as equity some debt on which earnings are being stripping by inverted companies. He would reclassify debt into equity to the extent a US corporation's debt-equity ratio after an inversion exceeds a three-year historical average amount of debt for the larger group now headed by a foreign parent or, if less, if the foreign parent is using interest on debt to strip more than 25% of the average income of the US corporation for the past three years.

Shay also called attention to other tax code sections that the Treasury could invoke to prevent offshore subsidiaries of former US companies from making "hopscotch" / *continued page 15*

Africa

continued from page 13

their minds about leaving key resources in private hands.

So there is a lot of exuberance, but I think you need on the natural gas side in particular to do a reality check.

Practical Tips

MR. EMEHELU: And for a reality check, I want to get to Jerome Niessen. You were most recently on the Africa desk at the International Finance Corporation. It was your second tour at the IFC. Since then, you have been developing independent power projects. Is Africa a great opportunity for investors?

MR. NIESSEN: You know what they say about developers: they need to be optimists to survive. I did a short stint at the IFC about a year and half ago for a bit more than a year working on Africa infrastructure, but at heart I am a developer. And just to be clear: while I have spent years developing projects in emerging markets, my focus at the moment is in the US.

I remember 20 years ago when nobody wanted to touch Africa because it was a continent where nothing was happening and with wars and horrendous corruption. I was away from the IFC for 18 years. When I returned, lots of people wanted to work on Africa.

Only about 30% of Africans have access to electricity.

One hears from everyone that Africa has tremendous needs and there are lots of opportunities. I say that is indeed true, but let's look closer. I worked in Tanzania and Uganda in particular. Only 4% of the people in both countries have power. So the government will come out with a report: we need 5,000 or 6,000 megawatts of additional generating capacity. I don't

know whether this is the right number, but it works for purposes of the point I want make. No one will contest the need.

Developers start to get dollar signs in their eyes. It reminds me of the early days in India with 27 fast-tracked projects. Everybody rushed into India talking about building thousands of megawatts.

Guess what? The utilities that are the potential offtakers are bankrupt. They are \$150 million in the hole.

When you talk to your esteemed bankers at the IFC and Standard Bank about sovereign guarantees to support the power revenues, maybe the government can only afford to support 600 or 1,000 megawatts. You have to put these things into perspective.

Here is another point. I was trying to finance a solar power plant in Tanzania and the Spanish solar developer offered the government 12¢ a kilowatt hour. That is damn good for Tanzania because the project was in a remote area in which any other power would cost much more than 12¢. But you know, even though this developer was the lowest bidder, we did not get anywhere because the government wanted 4 1/2¢. The real handicap that I have noticed in Africa and, by the way, it is not unique to Africa, is you have governments with unrealistic expectations.

It is a recipe for frustration. I am not saying you should not go there as a developer, as the opportunities are vast, but know what you are getting into. It remains a tough place to do business.

MR. EMEHELU: Renewable energy projects have high upfront costs. Perhaps the governments need to take into account what they would otherwise pay for diesel when evaluating these types of projects?

MR. NIESSEN: True. Maureen Harrington mentioned distributed generation earlier. There are mining companies in remote areas that pay 35¢ to 40¢ a kilowatt hour for electricity. If you can produce solar power at 14¢, then there is clearly an opportunity. Choose your targets wisely. Make sure the project makes economic and common sense over the long term.

MS. HARRINGTON: We are seeing quite of bit of that with

solar developers proposing inside-the-fence projects for mining and cement companies and beer breweries who are all power producers in their own right and are trying to get out of that business. The governments like these kinds of projects because they take pressure off the grid.

It is possible to structure deals that make economic sense in Africa. South Africa is an interesting case study. South Africa embarked on a renewable energy drive. Three years ago, South Africa was a developing market for renewables. Three or four rounds later, it is a developed market for renewable energy, and that happens with the snap of a finger.

There are lessons to take away from the experience with renewables in South Africa. There are quite a few American companies that are involved in solar projects in South Africa and are having success in that market. The risk there is around the rand. The deals in South Africa are being financed in rands rather than dollars, which can create challenges for companies that do not have a lot of use for rands.

MR. EMEHELU: The two financing challenges that one hears about most frequently in Africa are foreign exchange risk and loan tenor. Many projects are financed with debt from domestic banks. In the first round of privatizations in Nigeria, Nigeria raised \$2.4 billion. Almost all of it was sourced by domestic banks, but the banks do not lend longer than three years generally, maybe five if you are lucky. So there is an immediate refinancing risk.

How can you bring institutional money from US and European sources to help address the need?

MS. HARRINGTON: That's a really interesting question.

The South Africa banks have a long track record of taking the upfront construction risks with five- to seven-year money. We would normally bring in the development finance institutions to do some of the longer-tenor aspects of the deal. Now with the constraints of Basel III, the South African banks — which are Basel III compliant already — do not get the benefit of their stronger balance sheets because our ratings are capped by the sovereign. We are Basel III compliant and we still have the rating issues to deal with, so our cost of capital is high.

So there is a lot of thinking being done today about how to bring in institutional investors in the US and Europe who are looking for high yields. A threshold impediment is a mismatch in the level of knowledge of risks. You have African banks and developers who understand how to structure deals and have done so with a very different set of investors in terms of risk appetite. We still do not understand / continued page 16

loans to lend parked offshore earnings to the new foreign parent, bypassing the former US parent. The foreign parent then either relends the money to what is now its US subsidiary or makes a capital contribution to the US subsidiary. Shay acknowledged that it is easier for Treasury to tax foreign earnings moving to the US as back-to-back loans than as capital contributions from a foreign parent.

Any regulatory action by Treasury could limit benefits to companies that have already inverted. However, it could also complicate any future moves to address inversions in Congress since Congress would not be credited with having brought in more revenue, thereby reducing the attraction of an anti-inversion bill as a “pay for” for other tax changes that Republicans want to enact.

The US government is awarding more than \$1 billion a year in federal business to more than a dozen expatriated US companies, according to research by Bloomberg. Clauses have been added in the House to the 2015 appropriations bills for energy, water, defense, transportation and housing and urban development to bar the federal government from awarding contracts to inverted companies, but the clauses would only bar such contracts for US companies that inverted by moving to Bermuda or the Cayman Islands. Rep. Rosa DeLauro (D.-Connecticut) is the principal advocate behind these provisions. The most recent rider to the energy and water appropriations bill passed the House by 221-200 in July. DeLauro said she will try to expand the ban in the future to all inverted companies. However, it is unclear whether any such ban will make it into a final spending bill, especially since the Senate has so far failed to pass any appropriations measures for 2015. Government agencies usually end up operating under a continuing resolution authorizing them to continue spending at the same level as the year before.

Democrats, led by Senators Carl Levin and Richard Durbin (D.-Illinois) in the Senate and Reps. DeLauro, Levin and / continued page 17

Africa

continued from page 15

well what key concerns American and European institutional investors have or what your hurdle rates are. If we were able to bridge that knowledge gap, then we could go a long way in terms of structuring something that makes sense for institutional investors. There are certainly deals that make sense for such investors, but we need a better understanding of your risk appetite so that we can structure accordingly.

It is easy to fall into simple narratives that Africa is hopeless or the continent is about to take off.

Chinese Competition

MR. EMEHELU: Jennifer Cooke, we have not discussed the dragon in the room, which is China. American and European developers are finding that it is hard to put in a competitive bid when one of the competitors is supported by the Chinese government.

MS. COOKE: We have to have a little bit of humility when looking at the impact of China, particularly with the kind of resources that China has. The United States and US companies need to find where they can add the most value. It is also up to African governments to find the most competitive offer rather than the least costly. With this in mind, some US companies have been pressing African governments to look at the life cycle of projects rather than focus solely on the upfront cost.

There was an early kind of uncritical embrace of Chinese investment as an alternative to the West both for political and economic reasons. Many countries are taking a harder look at their relationships with China. They are not turning away from China, but they have become more sophisticated comparison shoppers.

MR. EMEHELU: The Chinese offer a 1% interest rate and they do all the work. Cheikh Gueye, those are tough numbers to beat, no?

MR. GUEYE: It is difficult for what I would call the other investor to match China. The way the Chinese package their offers is completely different. The criteria that they are using to evaluate investments is different also.

To bring US and European institutional investors to Africa, you have to address their fear of political risks. Do the Chinese really pay as much attention to political risk? The African governments have work to do to minimize these risks before they will attract large sums of institutional money.

From our standpoint, we think it is critical to continue the market-oriented, micro-economic policies that these countries are undertaking because that is the only way to mitigate this risk. You can use structuring, you can use unbundling, but in order to address the risk head on, you have to put forward strong micro-economic policies.

That is what African countries have been doing for almost 10 years. Over time, it will be an impressive enough track record to breed more confidence in the economy.

MS. COOKE: Another big area is on the regional integration front. I wonder if you could say something about East Africa? There are so many small markets. Half of sub-Saharan economies are under \$10 billion. Without regional integration, it will be tough for really tiny economies to draw serious investment. East Africa appears to be getting it right. Kenya has had a 15-year process of trying to reform the power sector to make it attractive and is also driving regional integration in East Africa. It strikes me that there are pockets of opportunities that are worth investigating.

MR. GUEYE: I think you are right. Integration is key, whether it is East Africa or West Africa, and there has been progress in both places. For instance, take Benin and Niger. They are starting to build communications links between the two countries. The same thing is happening between Niger and Cameroon. We have to move in this direction. Developers should not write off small markets without exploring what steps are being taken toward regional integration.

MS. COOKE: It also makes the deals much more complicated to put together.

MS. HARRINGTON: Correct. The regulatory environments are not consistent across borders, so it can become very challenging.

Returning to the issue of China, if you are competing on price, most American companies will lose. However, if you look at our pipeline of infrastructure deals and the ones we have closed, most are driven by western sponsors or there is western equipment involved because the kind of initiative required to put these projects together is something at which our culture is very good. There is plenty of room for an American or western approach to building power and infrastructure on the continent. There is also room for an eastern approach. The demands are so enormous that there is room for both.

It may be more difficult for American companies that are trying to compete for government procurement deals because pricing ends up being so important, but when it comes to more complicated projects, there is plenty of room for a western-style approach.

MR. NIESSEN: What I have observed about Africa and China is the following. China often finances projects in the public sector. We are talking here about having our private sector compete with its public sector.

You will not see many Chinese developers. I know of none that is working on an independent power project in Africa.

China comes in with cheap money and Chinese labor, and the latter is leading to a backlash. China comes in with 2,000 Chinese laborers to build a project. There is little or no local labor involved. People are not going to like it. The quality is not always there. Numerous Chinese projects have had quality issues.

So I do not want to minimize what the Chinese are doing, but there are plenty of opportunities for quality developers from the US and Europe to do their own thing.

Let's also give the Chinese credit. They woke us up. We all have been sleeping on the wheel in terms of opportunities in Africa, and it was the Chinese who first spotted the opportunities based on minerals. They moved in a big way, and that is one reason why I think we are now interested in Africa. Another reason is returns are better than in competing markets. The returns have been falling across Latin America and Asia.

/ continued page 18

Lloyd Doggett (D-Texas) in the House, introduced a bill in late July to deny federal contracts to inverted companies. The bill would treat companies as inverted for this purpose if the combined entity created by merger is owned 50% or more by shareholders of the former US company.

Meanwhile, investment bankers are starting to talk about "spinversions," where a large diverse company distributes part of its business to shareholders in a tax-free spinoff and combines it with a foreign entity. This would expand the pool of potential merger partners. In order to have a valid tax-free spinoff, shareholders of the US company must retain more than 50% of the merged entity. However, they would have to stop short of 80% to avoid having the merged company taxed like a US corporation. There must also be a valid business reason for the spinoff other than reducing US taxes.

The intense focus on inversions has caused several companies to pull back from potential such transactions. Mark Cuban, owner the Dallas Mavericks basketball team and star of a widely-watched US television program called *Shark Tank*, tweeted in late July: "If I own stock in your company and you move offshore for tax reasons I'm selling your stock." He complained in a subsequent tweet that inverting companies are shifting the burden of helping pay for the US military and other government services to other US companies and citizens.

Inversions could play into the debate whether to extend production tax credits for renewable energy facilities at year end as well as affect the odds that the next Congress will take up major corporate tax reform. Any effort to add an anti-inversion provision to the extenders bill would complicate passing that bill. Failure to do anything this year will increase the odds that the next Congress will have to take up corporate tax reform.

REITs are getting new attention after an IRS ruling to a telecom company.

/ continued page 19

Africa

continued from page 17

Rooftop Solar

MR. EMEHELU: Are there any audience questions before we move to the next topic? Keith Martin?

MR. MARTIN: Some people think that rooftop solar has great potential in Africa because you do not have to rely on building transmission lines. However, rooftop solar does not take hold in markets where electricity prices are subsidized. Is there an opportunity?

MS. HARRINGTON: The opportunity is just starting to appear in parts of Africa, particularly East Africa. Some companies are trying to adapt a SolarCity model — and, in fact, SolarCity just made an investment in a Tanzanian company that is mimicking the approach in the US where the solar company puts the solar equipment on the customer's roof for free and the customer signs a long-term contract to lease the equipment or buy the electricity. But then the customers have to prepay part of what they are expected to owe over time, and that is a critical issue in most parts of Africa.

One of our key challenges as a bank when making consumer loans is people do not have credit histories. It is impossible to make credit decisions on an individual basis in many parts of the continent.

So what you see a lot of these distributed solar companies doing is trying to adapt the same technology that has blossomed across Africa around prepaid mobile phone cards where you have to pay for the power upfront and you get a code that you type into the machine in your home to buy a fixed quantity of electricity. All of sudden, it has become the model of choice for dealing with payment risk.

It is too early to say how the model will work. It worked in the telephone market, but the capital investments are much smaller. Many people thought cell phones would not develop into much of a market because most Africans cannot afford to make phone calls. Maybe they can't, but it is a service they really need, and you will probably find the same thing with electricity. My gut feeling is it is a huge opportunity.

MR. EMEHELU: Jerome Niessen, you have developed projects in India, Europe and the US. What would make you go to Africa?

MR. NIESSEN: I would not go to Africa, but only because I am a small developer. I am a strong believer. There are great opportunities for some. However, the only way I would do business in Africa is if I could diversify. When you are big enough to diversify your risk by placing more than one bet at a time, then absolutely. It is still risky.

For those of you who have never done a project in an emerging market, the problem I find is you can have all of your ducks lined up nicely in a row. You do everything according to the book. Then there is one thing that can kill you, and it may be totally irrational. For example, I was developing a wind farm in India and had to get approval from the foreign investment approval board for 100% foreign ownership. Guess what? Never came through. Why? Presumably because somebody was holding out his hand. That is why I am saying that, as a developer in Africa, you had better be big enough to diversify.

Government Finances

MR. EMEHELU: Ken Hansen?

MR. HANSEN: Cheikh Gueye, I know a number of developers that are taking African opportunities really seriously right now. They recognize the problem that was flagged, which is that outside of South Africa, there basically is not a solidly credit-

worthy offtaker utility anywhere in the neighborhood, so they are looking for credit support from finance ministries. If you speak to the finance ministries, some are sympathetic and say, "We would provide the support, we are willing to bet on the development of our country, we recognize the need and the relevancy of this project, but we can't act

Consumer demand in Africa was less than \$1 billion in 2008. It is expected to reach \$1.4 trillion by 2020.

because the International Monetary Fund says that we are stretched too thin.”

They identify you and your colleagues as a major impediment to these deals getting done. I guess what I am looking for is not your defense, but your analysis of how to get over the IMF standing in the way.

MR. GUEYE: It boils down to the credibility of the project. If your project is credible, if your project is bankable, then why do you need the support of the government?

MR. HANSEN: Because we need to be able to persuade the banks or the IFC that we will get paid for the power the project generates.

MR. GUEYE: If a project is credible, then the IMF would not advise policies that would go against it. What we consider is the welfare impact of the project in the long term. The welfare of the project should be sustained by the market because if it depends solely on the support of the government long term, then we could conceive of a situation where the government has helped launch the project, but the economic burden causes it to lose interest over time.

MR. NIESSEN: If I may, since I have been working for one of the sister organizations, I look at it a little differently. You cannot expect the IMF or anybody else simply to say all right. Government X may be keen to have the power, but it can only afford so much in guarantees. Any commercial bank would reach the same conclusion.

Having said that, these are development institutions after all, and we have to find a way to help the continent develop. There is political risk even in South Africa that the government will say no tariff increases for the next five years. That is why these projects ultimately need guarantees from the World Bank and so on. I do not think anybody in this room would do a project in an emerging market without those kind of guarantees in place.

Parting Advice

MR. EMEHELU: It is time to wrap up. Let me go across the panel and ask for final thoughts.

MR. GUEYE: I encourage developers to look at where Africa is headed rather than where it has been. If we look at economic policies 20 years ago, we can see that things are moving.

These are markets where the pace of development is accelerating.

MR. NIESSEN: I have a simple analysis. It is Africa’s turn. There are many opportunities. Having said that, / *continued page 20*

Arkansas telecom company Windstream Holdings Inc. said in a securities filing in late July that it plans spin off its fiber optics and copper lines, real estate and other fixed assets into a separate company that will qualify as a real estate investment trust or REIT. It said it received a favorable private letter ruling from the IRS about the transaction.

The REIT will lease the assets back to Windstream.

The move is expected to save Windstream more than \$100 million a year in taxes. The company had \$6 billion in revenue in 2013. About \$650 million in annual earnings would be shifted to the REIT through rents to lease back the assets.

A REIT is a corporation or trust that is not taxed on its earnings to the extent the earnings are distributed each year to the owners. It must hold at least 75% of its asset value in real estate and cash. It must also satisfy separate 75% and 95% income tests: at least 75% of its gross income each year must be rents from real property, interest on loans secured by mortgages on real property and other types of income tied to real estate and at least 95% of its income must come from real estate plus passive sources like dividends and interest.

About 1,100 REITs file tax returns with the IRS. Most are not publicly traded.

The Windstream ruling may cause phone and cable TV companies, electric and gas utilities and chains like fast-food restaurants and big-box stores to take another look at spinning off real estate assets into a REIT and leasing them back. However, there may not be much benefit to utility shareholders if the regulators require any tax savings to be passed through to ratepayers.

Cell tower operator American Tower Corp. converted into a REIT in 2012 and has had \$1.2 billion in tax savings since then. Iron Mountain, a data center company, said in late June that it received a favorable IRS ruling that will allow it to spin off its real estate assets into a REIT.

The IRS released a redacted private letter ruling in early June that / *continued page 21*

Africa

continued from page 19

do not go with dollar signs in your eyes, and do not think it is a gold rush. If you go in with that attitude, for sure you are going to get hurt.

MS. HARRINGTON: The US is behind. Africa is not a frontier market for other companies and countries that have been active in Africa, and the Africans themselves are starting to drive a lot of the opportunities. If you are thinking long term for your company and trying to figure out where the next growth opportunity is, then you have to start looking at the continent and, even if you start by looking slowly, find a good local partner and realize that people are already there well ahead of us trying to harness the opportunities. If we can help you, we would be delighted.

MS. COOKE: There has been a qualitative change in the mindsets of many African governments who see an opportunity for long-term growth in jobs and manufacturing. The US government and US companies in power and other sectors are just waking up to the opportunities. President Obama has scheduled a summit this summer in Washington with the African heads of state. We have the Power Africa initiative, but the US is beginning to realize that it has to bring institutional players as well into the mix on Africa policies and not limit our efforts to conflict analysis and health development. We are coming late to the game, but what President Bush and now President Obama and probably the next administration are starting to do is think more strategically on the commercial front, informing US investors of the opportunities and putting the Commerce Department, OPIC and the US Export-Import Bank on the ground to help. ☺

Tales From the Dark Side of Emerging Markets

by Kevin Atkins, in London, and Rahwa Gebretsaie, in Los Angeles

Government intervention in emerging markets is a constant challenge.

The following article looks at some instances where host governments have intervened in transactions in the oil and gas sector and the effects they have had on the transactions. The same risks are present in other sectors.

Doing business in emerging markets can be challenging even without government interventions for a number of reasons, not least of which are differing cultural sensitivities, bureaucratic hurdles and investment motives. The challenges facing investors in emerging markets can increase exponentially when host governments are interventionist and prioritize nationalistic policies over the development of resource wealth. While the underlying sentiment can be well placed and fuelled by a desire to enhance the domestic economy, interventionist tactics can destabilize the investment climate within a country and deter investor appetite, thereby stalling the very economic growth that the host government is seeking to achieve.

Disclosure of Confidential Information

Kosmos Energy is a joint venture partner in the Jubilee field oilfield development off the coast of Ghana and is, accordingly, party to the petroleum agreement and joint operating agreement governing operations within the field.

However in 2009, two years after the initial oil discovery was made, Kosmos sought to exit and sell its interest in the field to a third party.

As part of this sale process, Kosmos made available to bidders copies of the petroleum agreement and joint operating agreement to which they would become party upon acquisition and copies of seismic data that Kosmos had available to it as a result of past operations. Without access to such information, it would have been impossible for bidders to come up with an accurate valuation of the interest being marketed.

The government of Ghana accused Kosmos of breaching its confidentiality obligations under the petroleum agreement.

The government may also have considered tortious

interference claims against the bidders by asserting that each bidder effectively procured a breach by Kosmos by expressing an interest in bidding; the argument would have been the expressions of interest induced Kosmos to breach its obligations.

Section 3 of the Petroleum (Exploration & Production) Act 2010 says that all petroleum data and information belongs to the Ghanaian government (although the prior petroleum law in force when Kosmos commenced the sale process did not contain an equivalent provision). However, the 2002 model form petroleum agreement used by the government permits the disclosure of data and information “to a bona fide potential assignee of all or part of Contractor’s Interest hereunder provided the Ghana National Petroleum Corporation is notified concerning such potential assignee, subject to approval of GNPC (not to be unreasonably withheld).” Disclosures to third party purchasers are not subject to prior approval in other countries. Angolan and Nigerian production sharing contracts are examples.

Kosmos, as a matter of ordinary course, had each potential bidder execute a confidentiality agreement to hold all data and information confidential on terms no less than those imposed on Kosmos under the petroleum agreement.

Kosmos refutes the claim that it failed to notify the Ghanaian government of the identity of bidders. Given that Kosmos would only have invited experienced international oil and gas companies into the data room as bidders, it is unclear on what grounds the Ghanaian government could have refused consent. The standard of when it is reasonable to withhold consent is determined under Ghanaian law as the governing law of petroleum agreements in Ghana, but under English law, which tends to be the prevailing law in a substantial number of African oil and gas joint venture arrangements, a standard of reasonableness in relation to an oil and gas joint venture is commonly understood to refer to financial and technical capabilities.

The Ghanaian government asserted that it also had a pre-emption right over any sale by Kosmos. Under section 26 of the Petroleum (Exploration & Production) Act 2010, the Ghanaian government has a right of first refusal to acquire the interest at a fair value. However, as a right of first refusal, this is not something that Kosmos can be compelled to accept and, in any event, what constitutes a “fair value” can only be ascertained when judged against what third parties are willing to pay for the asset in the market. The government can make an offer. Kosmos can then sell to any third party / continued page 22

lists services that data center companies can provide tenants and still treat rents paid by the tenants as entirely for use of real property. The services include installation, “cross-connect” services — data centers own wires and cables that connect and interact with the tenants’ computer equipment — and “remote hands” services. Examples are rebooting a server or changing a backup tape without having to log into a tenant’s computer.

The ruling is Private Letter Ruling 201423011.

A number of data center companies have set up REITs, including CyrusOne, CoreSite Realty Corp., Digital Realty Trust and DuPont Fabros Technology Inc. Several others are in the process of doing so.

Despite the potential new interest, REIT initial public offerings were down significantly in the first half of 2014. There were 15 new IPOs of REITs in 2013 valued at nearly \$5.7 billion. There have been just two REIT IPOs valued at \$103.2 million through July 2014.

MASTER LIMITED PARTNERSHIPS received a jolt in early August with news that Kinder Morgan, one of the first adopters, is abandoning the structure and moving its assets into a corporation.

At the same time, Perry Capital, a hedge fund, is encouraging International Paper and other corrugated paper and packaging companies to boost their share prices by putting some assets into MLPs.

MLPs, or master limited partnerships, are large partnerships whose units are publicly traded. No taxes are collected at the entity level. Rather, earnings are taxed directly to the partners. MLPs must receive at least 90% of their income each year from good sources. Good income includes rents from real property, interest, dividends and from “exploration, development, mining or production, processing, refining, transportation . . . or the marketing of any mineral or natural resource.” Companies organized as MLPs can raise equity at high multiples to earnings because no taxes are / continued page 23

Emerging Markets

continued from page 21

offering a higher price. The Ghanaian government does not have a last-look matching right as long as the third party bids a higher price than the government offered.

The effect of the allegations by the government was to significantly impede the Kosmos sale. Bidding had to be suspended twice, and bidders had to reassess their risk appetites.

In the end, Kosmos did not sell its interest, notwithstanding having found a willing buyer (ExxonMobil) that was prepared to offer approximately US\$4 billion for the interest. The sale did not receive the consent of the Ghanaian government. Unlike the consent provision included in the confidentiality clause, the consent to an assignment was not subject to a standard of reasonableness.

Partly due to the experience of Kosmos, it is not uncommon today for confidentiality agreements entered into in proposed oil and gas acquisitions to include a representation from the seller that it has all the approvals and consents necessary to disclose the information to bidders, thereby giving bidders a means to hold the seller accountable if a host government raises questions.

Non-Payment of Exit Taxes

In 2009, Heritage Oil & Gas entered into an agreement to sell its assets in Blocks 1 and 3 in the Lake Albert basin in Uganda to Eni. However, Tullow Oil exercised pre-emption rights under a joint operating agreement with Heritage and stepped into the shoes of Eni as buyer on the same terms as were agreed between Heritage and Eni.

The purchase would have given Tullow a monopoly over the Ugandan upstream sector and, as such, Tullow's acquisition from Heritage was on the understanding that it would sell down a proportion of the acreage acquired to two new market entrants (CNOOC and Total) with each taking a one-third stake in Blocks 1 and 3 and Block 2 in which Tullow already held a 100% interest before the acquisition.

The purchase price for Tullow to buy the Heritage acreage was US\$1.45 billion, and the Ugandan government imposed a 30% capital gains tax on Heritage.

Heritage refuted the tax charge on the basis that it was inconsistent with past practice and previous acquisitions had not been taxed in this manner.

Heritage's case appeared to hinge on section 89G of the Income Tax Act of Uganda which, as it applied when Heritage entered into its production sharing contract with the Ugandan government in 2004, waives any taxes on gain upon a transfer of interests in petroleum operations. However, section 89G of the Income Tax Act of Uganda was repealed by the Finance Act 2009.

Upon completion of the purchase by Tullow, Heritage disputed the tax charge being levied on it and, in accordance with Ugandan law, paid 30% of the disputed tax charge to the government pending resolution of the dispute. This left a significant amount of unpaid taxes (approximately US\$313 million) that the Ugandan government asserted were due. Tullow deducted the tax from the purchase price to Heritage and put it in an escrow account pending the outcome of legal proceedings that Heritage had commenced against the Ugandan government. Obviously, Heritage was no longer in-country after the sale of all its Ugandan assets to Tullow.

The Ugandan government took action against Tullow to try to seize the money. It said failure to pay the tax invalidated the acquisition as the consent it granted for the acquisition was conditioned on the tax owed by Heritage being paid.

The Ugandan government looked to Tullow to pay the taxes, and it had the upper hand. There were discussions about whether various licenses that Tullow acquired from Heritage would be renewed or revoked, thereby jeopardizing operations. The government explicitly conditioned its consent to the required subsequent sell down by Tullow to CNOOC and Total on the payment of the outstanding balance of the taxes.

This left Tullow in a sticky situation given that it remained in-country with substantial assets in Uganda.

After months of wrangling, which involved escalation of the matter to ministerial representatives from the United Kingdom and the Ugandan government, an agreement was reached that the sale by Tullow to CNOOC and Total could proceed. However, the outstanding tax owed by Heritage had to be paid, and a similar capital gains tax also had to be paid by Tullow as a consequence of its sale to CNOOC and Total.

CNOOC and Total eventually deducted the capital gains taxes owed by Tullow, on both Tullow's purchase from Heritage and their own purchase from Tullow, from the purchase price payable to Tullow and paid the amount to the government. Tullow pursued a claim for taxes against Heritage, and Heritage pursued its own claim against the Ugandan government over the legitimacy of the tax charge in the first place (in which to date Heritage has been unsuccessful).

It is possible that in a less high-profile transaction that does not involve parties with such credible financial strength, the proposed purchasers to which a tainted asset is marketed would have backed away and withdrawn from the acquisition, leaving the seller, who inherited the tainted asset from a third party no longer in-country, attempting to deal directly with the host government over the unpaid claim.

Corporate Takeover

In early 2009, the shareholders of Verenex, an oil and gas company listed on the Toronto Stock Exchange with assets in Libya, received a takeover offer from the China National Petroleum Corporation at CN¥10 a share that valued the group at about CN¥460 million.

Shortly thereafter, the Libyan government notified Verenex that it intended to exercise a pre-emption right in its favor and acquire Verenex on the same terms as were offered by CNPC.

However, later in 2009, the actual offer received by Verenex from the Libyan government was only CN¥7.09 a share, or a drop of almost 30%. While this much reduced offer met with resistance from certain Verenex shareholders, the offer was eventually approved, and a purchase agreement was signed in November 2009.

The precise scope of the pre-emption right that the Libyan government invoked remains unclear. For example, did the right apply to a corporate takeover of a non-Libyan company, and did it apply only to Libyan oil and gas assets so that, if Verenex held a mix of both Libyan and Nigerian assets, could the Libyan government have pre-empted the entire group and taken both the Libyan and Nigerian assets?

It is not uncommon for a transfer of shares in a company holding oil and gas interests to require the prior approval of the host government in which the oil and gas assets are located. This is always the case with a direct transfer of assets and sometimes the case for a transfer of shares in a company.

A pre-emption right is a different beast. In this case, the exercise by the Libyan government of the pre-emption right had a material and adverse effect on the exit strategy of Verenex and its shareholders and sent a dangerous signal to the international oil and gas market that the Libyan government can step in and do as it pleases.

Once the discounted offer was made to Verenex, the options open to its shareholders were not appealing. They wanted an exit. Aside from seeking another purchaser and hoping that the Libyan government would not

/ continued page 24

taken out of the earnings at the company level. Investors also pay a premium for liquidity or the ability to sell the shares on a stock exchange or in a secondary market.

Kinder Morgan plans to pay \$44 billion to buy and consolidate two MLPs and put their oil and gas pipelines under a single taxable corporation known as Kinder Morgan Inc. The goal appears to be to simplify what had become too complicated an ownership structure and to realize still greater tax savings by operating in the future as a corporation.

The two MLPs are operated by a Kinder Morgan management company that is a corporation. Management companies earn larger splits or fees the more cash they can distribute each year to partners. Between 45% and 50% of the cash generated by the MLPs was passing through the management company in fees. The corporation is buying the MLPs for a mix of stock and cash. It will get a step up in asset basis and be able to depreciate the assets anew. It will also be able to use interest deductions at the corporate level as additional tax shelter.

The company expects to realize \$20 billion in tax savings over the next 14 years.

The tax advantages are expected to allow it to increase its dividend per share from \$1.72 to \$2 next year. It said it expects dividends to increase by 10% a year through 2020. The company will pay a 15.4% premium to the MLP unit holders in the buyout.

Many, perhaps most, unit holders will end up having to pay more taxes than they will receive in cash. One analyst estimated that the average investor in the larger of the two MLPs could owe between \$12.39 and \$18.16 in taxes per unit while he or she is expected to receive only \$10.77 in cash per unit. The analyst compared the buyout to a transfer of tax benefits from unit holders, who have been able to defer taxes on their capital gains, to Kinder Morgan Inc., which will now be able to depreciate the MLP assets anew.

/ continued page 25

Emerging Markets

continued from page 23

prohibit the sale, their best alternative would have been taking action against the Libyan government to compel it to match the offer from CNPC in a proper exercise of the pre-emption right. However, as with Tullow, Verenex would have remained in-country battling the host government while trying to operate an asset that it no longer wanted to own. The cards were stacked in favor of the government.

Lessons

What lessons should one take away from these experiences?

The demands of the host government can never be ignored.

These issues will become more frequent as more and more transactions take place across emerging markets.

A number of US independent oil companies have already exited Africa in the last 10 years. While this may in large part have been driven by their desire to focus on the US shale market, the fact that the US is a known market and also offers a more stable fiscal investment environment and supportive legislative regime must also have played some part in the decisions to exit.

Provided Asian demand for energy grows, the oil price should remain high enough to make new exploration and development economic in the near term, and oil and gas companies will continue to invest in frontier basins and emerging markets in the hope of finding and monetizing the next big discovery. However, there will inevitably come a tipping point when demand slows, gas prices de-link from oil and the oil price drops when investors decide that the political risks present in emerging markets outweigh the potential marginal benefits of further discoveries.

Who knows when that day will come? We are inching ever closer to it as developed countries pursue their own shale gas and shale oil resources and new technological advances make renewable energy as or even more cost effective than fossil fuels for new generating assets. When that day comes, the memories of government actions taken in the name of resource nationalism will be an enormous impediment to foreign investment. ☹

Opportunities Abound?

Many people remain bullish about the long-term prospects for renewable energy, but does it feel that way inside the utility-scale renewable energy companies?

A group of CEOs talked about the mood in the market at the Chadbourne 25th annual global energy and finance conference in late June. The panelists are Gabriel Alonso, CEO of EDP Renewables North America, Michael Alvarez, president of First Wind, Douglas Egan, CEO of Competitive Power Ventures, Declan Flanagan, CEO of Lincoln Renewable Energy, and Sandy Reisky, CEO of Apex Clean Energy. The moderator is Keith Martin with Chadbourne in Washington.

MR. MARTIN: Declan Flanagan, how optimistic are you about the prospects for building more utility-scale renewable energy projects in the United States? You said in an email earlier this month, “Developers were all doing wind, then they switched to solar. Will we all be doing natural gas next?”

MR. FLANAGAN: Let me start with reasons for optimism. The cost of constructing wind farms continues to decline. We have big projects in the middle of the country, and the capital cost of these projects is materially cheaper than it was 10 years ago. We have moved much lower than we were in 2008 and 2009, so that the cost is back to a competitive level.

Turning to utility-scale solar, panel prices have leveled off, but the balance of system on large projects continues to go down and there are performance and operating cost efficiencies.

So we are doing fairly well on the cost side. But the challenge in the US renewable business is that there is no market for the output from these projects.

We had figures for what was technically under construction at the end of 2013. Fully half of it by my calculation is in Texas. If you look at what is actually getting done or will get done, if it wasn't for the Texas Public Utility Commission signing off on CREZ four or five years ago, the market would be massively smaller. Texas cannot be the market of first and last resort forever.

MR. MARTIN: How can things be massively smaller if the US market is basically one state?

MR. FLANAGAN: Very easily. There is no market. Texas has carried the wind business, and perhaps Texas is where the last wave of big utility-scale solar will take place because solar is

increasingly becoming a distributed generation business, behind the meter and 20 megawatts and below.

You need a market. That has always been the problem.

MR. MARTIN: Gabriel Alonso, you looked into distributed solar. You decided not to take the plunge. You have gone back to utility scale. Smart move?

MR. ALONSO: We could not get the level of returns and the volume that we get with utility-scale wind. That was the primary reason. We would have needed to develop a very intensive manpower organization. We are just 300 people here in North America, and in order to get just 100 megawatts worth of distributed solar capacity every year, we would have had to multiply the organization by several times.

MR. MARTIN: Michael Alvarez, you are called First Wind, but you have now started doing utility-scale solar. How does the market feel to you?

MR. ALVAREZ: We have had a good run recently. We just transitioned into solar when it looked like the production tax credit for wind was not going to be revived. We now have our first solar project in service in Massachusetts in a challenging SREC market. We have about 350 megawatts of solar contracts in Utah and another 100 megawatts in development. We have about 150 megawatts under development in Hawaii. We have pretty much stuck to our core markets.

MR. MARTIN: Sanford Bernstein, the independent Wall Street research house, suggested in a report in early June that distributed solar will take 7% of the retail sales from utilities on average in the United States, but in Hawaii, the figure is much higher. It is 20%. How is there still a utility-scale market when distributed solar is taking away so much of the retail sales?

MR. ALVAREZ: Hawaii is a unique case because it is such a small grid. We are able to prosecute some utility scale there because of the need to avoid what I will call class warfare. That is, a lot of people cannot afford to put solar on houses because they do not own homes or they are in condos or other multi-unit residences. In Hawaii, the cost differential between distributed generation and utility scale is very significant. Utility-scale generation may be a third as expensive. So I think there is still a case to be made there, but to your point about solar rooftop penetration, I think the rooftop companies are installing about a megawatt a month on Maui, and the electricity load there is only 200 megawatts peak, so it is definitely putting pressure on our ability to do utility scale anywhere but Oahu.

MR. MARTIN: Doug Egan, Declan Flanagan asked somewhat facetiously, “We’re doing wind, / continued page 26

Meanwhile, paper company share prices jumped in July after Perry Capital, a hedge fund, said in a second quarter letter to its investors that converting into MLPs could boost share prices by 50% to 100% across the industry.

The hedge fund said it hired PricewaterhouseCoopers to confirm that some paper company operations can be moved into MLPs, and the accounting firm said the structure works for mills that make containerboard largely from virgin logs and wood chips. The mills would have to use less than 25% recycled fiber.

The International Paper Co. CEO said in late July that conversion into an MLP is “theoretical” without an IRS ruling. He acknowledged that the company has been investigating the structure.

The IRS has a hold currently on MLP rulings while it wrestles with a “hamburger stand” issue. The issue is how closely involved in exploring for or producing oil, gas and other minerals a company has to be before its income qualifies as good income. For example, the agency had been issuing favorable rulings to companies that provide various production-related services to gas companies engaged in fracking.

Companies that are thinking of spinning off assets into a REIT could also operate through an MLP since “rents from real property” are good income for an MLP. The IRS issued proposed regulations in April to bring the definition of real property for REIT purposes up to date. The Solar Energy Industries Association urged the IRS in comments on the proposed regulations in August to adopt a slightly broader definition of real property for REIT purposes, but said the same definition should not extend to master limited partnerships.

A PURCHASE PRICE ALLOCATION worked in the taxpayer’s favor.

ABC Beverage leased a plant in Hazelwood, Missouri for bottling Dr. Pepper and Snapple soft drinks. The rents the company was paying under the lease were above market: for example, it paid \$1.1 million in rent in 1997 / continued page 27

Opportunities

continued from page 25

now we're doing solar. Will we all be doing gas eventually?" You are already doing gas. What is your view of the market outlook?

MR. EGAN: For the last seven or eight years, we have been building one gas-fired power plant per year and one large-scale, 150- to 300-megawatt wind project. Given the fuzziness of the market right now, the wind project that we were going to do ourselves this year has been sold to someone else and we have walked away from a fair number of sites and kept just our three or four best sites to see what happens next year or the year thereafter. We will focus on natural gas in a big way over the next couple years.

MR. MARTIN: So you are giving up wind for now, and I don't think you have even tried solar.

MR. EGAN: We have never tried solar. As I said, we are putting wind on the back burner until we know what the rules to the game are.

MR. MARTIN: Sandy Reisky, you made a fortune by developing sites for wind farms during the first wave of interest in wind and then selling the sites to BP or was it Shell?

MR. REISKY: BP.

MR. MARTIN: Soon after that, I met you on a plane. You were coming back from a solar conference. Now you have gone back to wind in a big way. How are you able to get traction in wind in this market when other people are starting to wonder whether wind is the right place?

MR. REISKY: We took a point of view in 2009 when we got back into the market that we are investing in the fundamentals of wind. It is getting cheaper over time. It does not use water. There is a product in which the market has an interest. We moved back into the market at a time when it had little access to capital. It was at the height of the financial crisis, and our mantra was, "Let's pick up projects at good prices that are in danger of going off the cliff because the developers have run out of capital. Let's find good projects that have good fundamentals and build a portfolio that way."

Over time as the production tax credit has cycled, we have repeated that pattern to build a large national portfolio. We do not know exactly where markets might open up, but we want to have projects ready, and that game plan is starting to pay dividends. We have about 700 megawatts of projects with power purchase agreements that we plan to build in the next year, and we are building a 100-megawatt project now for Ikea.

Legacy Construction

MR. MARTIN: Of those 700 megawatts, how many would you say were under construction by the end of 2013 for purposes of qualifying for tax credits?

MR. REISKY: All of them.

MR. MARTIN: Michael Alvarez, how many megawatts of wind projects did you have under construction in time?

MR. ALVAREZ: About 750 megawatts, possibly 900 depending on what the IRS says in additional guidance that is expected.

MR. MARTIN: So we have 1,600 megawatts possibly on this panel. Gabriel Alonso, how many?

MR. ALONSO: We have 1,100 megawatts, but given how much cushion we built into some of the safe harbor components we acquired, we could expand that to 1,300.

MR. MARTIN: So we are at least to 2,700 megawatts. Declan Flanagan?

MR. FLANAGAN: We have tended recently to sell projects when they hit the notice to proceed. We have 500 megawatts of wind that has hit that point in the last 12 months.

MR. MARTIN: "Hit that point" meaning under construction in 2013 or that you sold?

MR. FLANAGAN: Under construction in 2013.

MR. MARTIN: So we are at 3,200 megawatts at a minimum.

MR. REISKY: We actually qualified over 1,300 megawatts through physical work on transformers.

MR. MARTIN: Now you're throwing off my calculation entirely! So revise the figure you gave me before to 1,300 megawatts. Gabriel Alonso, data shows that whenever the production tax credit expires, new wind installations plummet. Does that mean that this industry still needs the tax credit?

MR. ALONSO: Yes. Installations plummet because there is an expectation in the market that we are selling power in Oklahoma at \$25 per megawatt hour. Without the PTC, we cannot sell below \$40 to \$45 a megawatt hour.

Is it a bad deal to buy for 20 to 25 years at \$40 to \$45 a megawatt hour. No, I don't think so, but when your expectation is \$25, why would you as an offtaker move quickly to buy at \$45. When the PTC expires, the immediate reaction is for the market to wait. That is why construction stops.

The reality is we still need the PTC. The economics of wind continue to improve. My main concern is that for turbine suppliers to keep investing in new technology, to keep designing longer blades, taller towers and improving the efficiencies of these pieces of equipment, they need growth not only in the US, but also worldwide, and I do not see that happening right

now. Europe is pretty much gone as a market for driving growth. Asia, particularly China, is not a technology-driven market. It is a commodity-driven market. South America is not that relevant. Africa is a big hope, but it is not there yet. Extension of the PTC is important if we want to keep seeing turbine suppliers investing in technology and driving down the cost of producing wind.

MR. MARTIN: Is the PTC needed if after it expires, market expectations take time to adjust, but they do adjust eventually?

MR. ALONSO: They will not adjust to the level of demand required to keep the turbine suppliers interested in continuing to pour money into improving the technology.

Declan pointed out another issue: we have a problem of markets. Some utilities are buying more than they actually need under state renewable portfolio standards because, at \$25 a megawatt hour, it makes sense to buy. They would not do that at \$45. If legislators decide that state residents are suddenly having to pay \$20 more for renewable electricity to meet RPS standards, then we are at risk of losing state RPS programs. The legislatures are already under pressure to repeal the programs. Loss of the PTC will add fuel to that fire. We need to be mindful of this when we stop the PTC.

MR. MARTIN: Declan Flanagan, yes or no, the PTC is still needed?

MR. FLANAGAN: Yes, it is still needed because there will be a big slowdown if it goes away. If your time frame is five or 10 years, yes we can adjust. But there is no turbine supplier that can go without a few years of orders. There is no developer that can keep 300 people on the payroll for a few years of no activity. Over 10 years, it picks back up. It will get back to the starting point. Pessimism is an essential ingredient of any successful developer, so you always have a “glass half empty.”

MR. MARTIN: An essential ingredient of an Irish developer. [Laughter.]

MR. FLANAGAN: Maybe my Irish Catholic pessimism is a key ingredient to our business success. That being said, the US market and US renewables specifically is a more interesting place for me to work than elsewhere. The challenge with which you have to deal is this PTC cycle. Be prepared if the PTC goes away, be prepared if it comes back, be prepared to play it in the way that Sandy Reisky mentioned. The 500 megawatts of wind that we sold recently were all projects we acquired in December 2012. We had no idea the PTC was going to be extended later that month. Maybe we will get it wrong the next time. This uncertainty around the PTC is an odd way to try to do business. / continued page 28

compared to \$356,000 that an appraiser said would have been the market rent.

ABC had an option to purchase the plant for its fair market value. It offered the landlord \$9 million. The landlord countered with \$14.8 million. The parties settled on \$11 million.

ABC had three independent appraisals, all of which concluded that the plant had a fair market value of only \$2.75 million. Consequently, ABC treated its purchase price for the plant as \$2.75 million and deducted the balance of \$6.25 million as a payment to cancel the disadvantageous lease. Lease termination payments are deductible immediately.

The government conceded that the amount could have been deducted if ABC had terminated the lease without also buying the plant, but said the entire \$11 million should be treated as the purchase price for the plant.

A US appeals court disagreed.

Section 167(c)(2) of the US tax code says that someone buying a building or other property “subject to a lease” should treat the entire amount paid as purchase price for the building.

The court said the section does not apply since the phrase “property acquired subject to a lease” does not cover a situation where the lessee buys out the lease while acquiring the property. The lease disappeared with the purchase.

The court said, “The government concedes that ABC could deduct a lease termination payment if it first pays to terminate the lease and then purchases the property. But that concession and this transaction have the same substance . . . We decline to elevate this transaction’s form over its substance.”

The case is ABC Beverage Corporation v. United States. The court released its decision in June.

MINNESOTA took the first step in early August toward assigning a value to solar electricity.

The local electric utility, Xcel, is proposing to build community / continued page 29

Opportunities

continued from page 27

I have been in the US for 11 years now, and I think the longest plan horizon in terms of PTC clarity I ever had was maybe 24 months.

But all that being said, there is still a deeper set of opportunities than we have seen in other countries when you scratch beneath the surface.

MR. MARTIN: Doug Egan, why have you given up on wind? You are now exclusively gas, at least for the next two years you said.

MR. EGAN: We still have probably 1,500 megawatts of wind sites and, if we get the PTC back and if the rules are clear, then we will jump back in, but for the time being, we are out of that market.

Firmer Product

MR. MARTIN: Sandy Reisky, did you ever jump into solar or are you exclusively wind?

MR. REISKY: We are working on solar in areas of the country where it makes sense and where we already have a wind project underway. The marketing pitch is that we can add solar for a buyer as a way to have a better delivery of power if there is a dip in the wind during the day. Solar can fill the gap.

MR. MARTIN: Michael Alvarez, how do you see the prospects of solar versus wind?

MR. ALVAREZ: We're pretty excited about our solar opportunity at this stage because we have been so successful at landing these contracts, but we have not given up on wind at all, particularly in New England where we see a pretty significant opportunity still ahead of us, possibly with a hybrid product that might combine wind and hydro to make for a more firm product. New England is still short renewable power.

MR. MARTIN: Let me go across the panel. How many megawatts will you install this year and how many next year, starting with Declan Flanagan.

MR. FLANAGAN: We did 30 megawatts of solar in the last 12 months. Gabriel can count this in his numbers as well because we sold the projects to EDP at notice to proceed. A lot of projects get double counted in this business. We also sold 500 megawatts of wind. We are now in a sort of reload, so we do not plan to bring any projects to the notice-to-proceed stage in the next 12 months. We are now more focused on the next cycle across ERCOT and PJM, the markets we understand the best.

MR. MARTIN: Gabriel Alonso, how many megawatts this year, how many next year?

MR. ALONSO: This year, around 350 in the US. Next year, 400 to 450.

MR. MARTIN: And are you also handling Mexico or just the US?

MR. ALONSO: Yes, Mexico and Canada.

MR. MARTIN: And are you counting Mexico and Canada in those numbers?

MR. ALONSO: No.

MR. MARTIN: How much in Mexico or Canada?

MR. ALONSO: Nothing through 2015. In 2016, another 200 megawatts.

MR. MARTIN: Michael Alvarez, megawatts?

MR. ALVAREZ: We have currently 300 in construction, and another 200 about to come on line. Next year, depending on how the additional guidance the IRS is expected to issue on the construction-start rules comes out, somewhere in the neighborhood of 300 to 400 megawatts.

MR. MARTIN: Doug Egan, guess how many megawatts.

MR. EGAN: We have 800 in construction currently and will have another 800 at notice to proceed by the end of the year.

MR. MARTIN: Gas-fired power projects in which states?

MR. EGAN: Maryland and New Jersey.

MR. MARTIN: Sandy Reisky, how many megawatts do you think you will install?

MR. REISKY: We are building 100 megawatts now, and we will install 900 megawatts next year.

Hard-Earned Wisdom

MR. MARTIN: Declan Flanagan, someone once said, "No mistakes, no experience; no experience, no wisdom." You have been in the development business a long time. You started Airtricity in the US. You sold it. Now you have Lincoln Renewable Energy. What have you learned about the development business, perhaps through the school of hard knocks, that would count as wisdom?

MR. FLANAGAN: I always worry most about a project that has not almost died at least three times because you have not found its problems yet.

MR. MARTIN: You really show your Irish roots. [Laughter.]

MR. FLANAGAN: Yes, very comfortably so. [Laughter.] The other thing is not to let the perfect be the enemy of the good. When you have a good deal, take it, whether it is a PPA or a turbine supply agreement, whatever the element. I think there are a lot of projects now hanging around that were waiting for

the perfect deal that will miss their window, particularly in this very choppy and unpredictable cycle. When you have a good deal, take it. It is all about momentum.

MR. MARTIN: Gabriel Alonso, you were president of Gamesa US, and now you have been heading EDP Renewables North America. You were also the chief development officer in between for EDP. What hard-won lessons have you learned about the business?

MR. ALONSO: The hardest won is that in 2007 and 2008, everybody was looking at having the biggest pipeline of projects under development. Ten thousand megawatts were not enough. It had to be 20,000 and, in the end, the cost of making sure you had a pipeline pretty much in every state so that you can take any opportunity is extremely expensive.

Moving that whole portfolio one inch forward is extremely expensive.

If you are building 500 megawatts per year and you are expecting to make \$X million of net present value over the following 20 years, but you are spending to preserve optionality a big fraction of that future net present value, then you are pretty much killing your own business.

It is not possible to be everywhere. You have to be very selective about where you go.

MR. MARTIN: Michael Alvarez, hard-won lessons?

MR. ALVAREZ: Probably three: first, don't believe a wind forecast that comes out of the box the first time. Cut it at least twice. Second, even though we are striving for innovation, all the time be very cautious about testing out new technologies because any problems will stick with you for quite a long time. The third is something that I did not appreciate early on and is what I call regulatory creep. It is starting to bind us as if we are nuclear power plant operators, and it is becoming very difficult to plan ahead in such an environment. It requires greater and greater overhead to be able to operate with the growing volume of rules and regulations.

MR. MARTIN: Regulatory creep at the state level or at the federal level?

MR. ALVAREZ: Both.

MR. MARTIN: What is an example?

MR. ALVAREZ: The recent attempt to treat each wind turbine as a single generating facility.

MR. MARTIN: For what purpose?

MR. ALVAREZ: To regulate it as a bulk electric facility.

MR. MARTIN: Doug Egan, hard-won lessons?

/ continued page 30

solar facilities — photovoltaic arrays in which customers who cannot put solar on their roofs or prefer not to do so can still own solar panels in a community array and receive credit against their utility bills for the electricity fed into the grid. Customers would buy allotments in 200-watt increments. They would continue buying all their electricity from the grid and receive credit for now at the retail electricity rate for the power fed into the grid, but once the Minnesota Public Utilities Commission decides on the value of the solar electricity, that price will supersede the retail rate.

The commission is collecting comments through October 1 on what value to assign.

COLORADO treats sales of electricity as a “service” rather than a sale of “property,” the state Supreme Court ruled.

The ruling by the court in late June could make construction of new power plants in Colorado more expensive.

The state collects a 2.9% sales or use tax on equipment sold in state or bought out of state and imported for use in Colorado. There are city and county sales taxes on top of the state rate.

Like most states, Colorado has a manufacturing exemption: equipment is not subject to sales or use tax if it is purchased for use in manufacturing “tangible personal property.” In many states, generating electricity is considered manufacturing tangible personal property, but because Colorado considers the provision of electricity a service, the manufacturing exemption does not apply, the court said.

The decision was in a case called Colorado Department of Revenue v. Public Service Company of Colorado. Two lower state courts had said electricity is tangible personal property.

CALIFORNIA extended a property tax exemption for active solar systems through 2024.

Such systems are */ continued page 31*

Opportunities

continued from page 29

MR. EGAN: If you are going to fight the federal government, you have to have a really deep pocket. It has been difficult.

MR. MARTIN: Litigation in this country is a custom to which we resort when two people who are so angry they do not want to talk hemorrhage money instead on lawyers until that becomes more painful.

MR. EGAN: It is remarkable how many steps there are in the process. We won two cases in federal district courts in Maryland and New Jersey. Now we will see if the third and fourth circuit courts of appeal see the issues the same way, in which case it will probably go to the Supreme Court, where it will cost us even more.

MR. MARTIN: Sandy Reisky, hard-won lessons?

Moving a large portfolio of development projects one inch forward is extremely expensive. It is better to focus.

MR. REISKY: We are seeing the conventional sources of fuel really push back. There is a huge effort underway to try to roll back renewable portfolio targets in state after state. Gandhi had this saying, "First they ignore you, then they laugh at you, then they fight you, and then you win." I think there is a lot of fight still ahead of us. Ohio was a bit of a wake-up call. The industry is working really hard and did a great job pushing back on a lot of the other efforts, but there is still a lot of work to do.

MR. FLANAGAN: Building on the comment about regulatory creep, all of these things have the effect of narrowing the potential market. Eagle take permits are becoming a bigger issue. Ohio froze its RPS target for the next two years. Turbine set backs are being adjusted. The renewable energy opponents

are becoming very sophisticated. If you want to see how this story can play out, just look at how sophisticated onshore wind opposition has become in places like Ireland and the United Kingdom where they know precisely how to adjust set back limits to destroy huge swathes of projects.

You have increasingly sophisticated opponents of renewable energy who are able to use regulatory creep to their advantage. Add to that utilities that have no incentive to enter into long-term power contracts to buy the output.

The only way you can get utilities to sign PPAs right now is to tell them that the PTC is about to disappear so that this is the best deal they are likely to get, which is not a very sustainable business plan.

Evolving Strategies

MR. MARTIN: Sandy Reisky, I read in a piece in the New Yorker magazine about Cory Booker, the US Senator from New Jersey. When he started raising money for his political campaigns, he learned an important lesson from an investment banker. Investors are interested in the business plan but they are more interested in the people because successful people find a way to be successful ultimately. Most business plans evolve over time. How has your business plan evolved?

MR. REISKY: In my experience, if you are looking to raise money and you ask for money, you will get advice. If you ask for advice, you are more likely to get capital.

We have moved out of brownfield development. When we launched the business, we thought there was an opportunity to put smaller-scale sites for utility scale wind near load centers where the power might have a higher price. The lesson we learned, and maybe not quickly enough, was that it is awfully expensive to try to overcome all of the challenges on a brown-field site.

MR. MARTIN: Doug Egan, how has your business plan evolved?

MR. EGAN: We have narrowed our focus to what we can do for the next two or three years, and it is natural gas.

MR. MARTIN: Michael Alvarez?

MR. ALVAREZ: We expanded into solar. We have done some careful evaluation of storage. We put in place a financing vehicle in the Northeast through a joint venture with Emera that has been very successful, and we have stepped up our M&A activity by an order of magnitude. The business has become so capital intensive in terms of the resources needed to develop and letters of credit. Development costs and security have gone through the roof, and there are a lot of developers who are failing as a consequence. They lack the means to put that kind of capital to work, so we see an opportunity to pick up some additional projects.

MR. MARTIN: If the cost of capital is an increasingly important element of the business, how do you drive down the cost of capital for a company like First Wind?

MR. ALVAREZ: Through the joint venture that I described earlier. We have a long-range opportunity to put projects in the Northeast into a joint venture with a Canadian utility holding company at a pre-ordained rate as long as the projects meet specified criteria. We have looked at yield cos, but I am of the same view as Declan who asked, “Where is all the product going to come from,” so I think our opportunity may be in supplying product to the yield cos that will be hungry to meet their earnings projections.

In the long term, we need to find another source of capital that is easy to replicate.

MR. MARTIN: Gabriel Alonso, how has EDP’s business plan evolved?

MR. ALONSO: We are making sure we diversify our footprint so we have now an operating wind farm in Canada, and we will have one soon in Mexico. We are not exclusively relying on the wisdom of this Congress to extend the PTC. Within the United States, we are making a huge effort to understand and anticipate where future demand will be located so that we have, in line with my previous comments about optionality cost, a much more focused greenfield approach to our development activities. We are trying to make sure that we are not already eating today the future profits of the wind farm we eventually build.

MR. MARTIN: You sold electricity from an Oklahoma wind farm to Southern Company in Atlanta, Georgia, correct?

MR. ALONSO: Yes.

MR. MARTIN: How does that make sense? How does it work?

MR. ALONSO: It is a complex structure. We relied on the existing transmission system in both SPP and Entergy to do that. It took us 18 months of negotiations. / continued page 32

exempted from property tax assessment the first time they change hands after being newly constructed. Assessments are delayed until there is a later sale of the project or change in control of the project company. Property tax rates vary by county. They can be as high as 2% of assessed value.

The special solar exemption had been scheduled to run only through 2016. California Governor Jerry Brown signed a bill extending it in late June.

The bill makes clear that batteries are considered part of the solar facility. The exemption is in section 73 of the state Revenue and Taxation Code.

Separately, California explained in late July under what circumstances companies holding interests in limited liability companies that have a connection to California must file state tax returns.

The explanation is in Legal Ruling 2014-01.

The ruling is important for anyone invested in an LLC that is headquartered or owns a project in California or that sells electricity or other products into California.

The state accepts the same classification of LLCs as corporations, partnerships or “disregarded entities” as the LLC uses for federal income tax purposes.

The following rules apply to LLCs treated as partnerships.

If the LLC is registered to do business in California or is organized under California law — meaning that it is a California LLC as opposed, for example, to a Delaware LLC — but it is not actually doing business in the state, then the LLC must pay an annual LLC fee, but the members have no obligations. The fee for 2014 is \$900 for LLCs with total income of \$250,000 to \$500,000, \$2,500 for LLCs with total income of \$500,000 to \$1 million, \$6,000 for LLCs with income of \$1 million to \$5 million and \$11,790 for LLCs with income of \$5 million or more.

If the LLC is managed from California or is doing business in / continued page 33

Opportunities

continued from page 31

It was not easy, but we were able to crack the Southern code, and the Public Service Commission in Georgia a few weeks ago voted 5-0 in favor of the PPA and actually encouraged Georgia Power to do more because our PPA price, even after you add the transmission costs, is below the long-term avoided cost of Georgia Power.

MR. MARTIN: It must be a swap so you avoid the wheeling charges.

MR. ALONSO: No, we are not avoiding the wheeling charges. We have purchased transmission capacity to move power from Oklahoma all the way to Southern Company.

MR. MARTIN: Declan Flanagan, how has your business model evolved?

MR. FLANAGAN: In any business, big or small, it is always important to have a plan of record, but you have to be willing to scrap your plan of record and adopt a new one on short notice. As an example, due to the risks around tax credits for wind and solar, we have been developing natural gas projects for over a year now. We are actually in the process of changing our name from Lincoln Renewable Energy to Lincoln Clean Energy.

My experience has been that success is about working backwards from the market. Understand the market dynamics, customers and transmission and do not try to be just a wind guy or a solar guy regardless of the market. It is too tough to manage all the risks. If you are just a utility-scale solar developer, there is just not enough product as the market shifts to a more distributed focus. If you are just a renewables guy, there is a risk of having 2016 be a very slow year due to tax credit expiration.

A Better Use of Time

MR. MARTIN: A question from Scott Bank with Chadbourne in New York.

MR. BANK: The IRS made it easier about a month ago for renewable energy companies to convert into real estate investment trusts or REITs. Is anyone on the panel thinking of moving to a REIT structure?

MR. FLANAGAN: To be honest, I spend much less time thinking about the capital structure than thinking about how we can get someone to put his or her balance sheet behind a power purchase agreement. Our challenge in this market is not capital as much as lack of a market for the output.

A disproportionate amount of effort goes into solving the wrong problem: capital versus customers.

We have seen Microsoft, Ikea and others get into long-term offtake contracts. The regulatory focus should be how can you encourage more of that. Let's put thousands of Washington, DC hours into that because I think the capital structure will solve itself very easily if there are power contracts with creditworthy offtakers.

MR. ALONSO: That is a very important comment. Utilities have a load migration problem. It is very complicated for them to predict how much load they will be serving 10 or 15 years from today. They do not know whether to buy 10% wind or 30% or 40%.

This is something that we need to work on as an industry because it can really open up the market. The signals that we have received from Walmart, Microsoft and these other companies are a very promising opportunity for us because we are talking about creditworthy companies.

MR. MARTIN: What do you tell companies like Microsoft to get them to buy? You have an intermittent supply of power. How do you sell them on buying that?

MR. ALONSO: It takes time. There is an educational process.

The good news is that there is already a mimic effect. When Microsoft or Google does it, immediately the management of other companies asks whether it is something they should do as well. Fundamentally what you tell them is they need to look at the long-term profile of their cost of energy. How variable is it? How susceptible is it to fluctuations and price shocks? How can they fix the long-term price of electricity? The best way to do it is a long-term power contract with a wind project.

Industry Business Model

MR. MARTIN: Last topic. It seems like the power industry business model is undergoing a major transformation of the sort that happened after the Arab oil embargo when the independent power industry was born. You have very slow growth in demand for electricity: just 0.9% a year in this country. The new global warming regulations the Obama Administration announced are expected to reduce the extent to which we rely on coal for electricity from 38% to maybe 30% over an extended time period. There is not much opportunity there, and then what opportunity there is being taken up by distributed solar.

Do you sense the business model is changing? Is there room for independent power companies? Is there room for much growth?

MR. ALVAREZ: Yes to all three questions. I spent most of my career looking at 3% per year of load growth. Now we are less than 1% per year load growth. But in fact what will happen over the next few years is there will be coal retirements, and that creates an opportunity. The key is to look for specific spots on the grid that are not being served the way they should be, and that is what we have been doing for the last two or three years.

MR. MARTIN: Or do what Gabriel Alonso suggested; join the crowd with the distributed generators by picking off retail customers like Microsoft and Google?

MR. REISKY: I think also it may not be on the radar in the near term, but electric cars are really coming, and this will lead to a significant increase in electricity demand. All the major manufacturers are bringing models out. The electricity to run them is four times cheaper than gasoline, so there is a fundamental market driver for consumers to switch once the range, battery and infrastructure issues are addressed. The long-term outlook is very bullish for the electrification of transportation.

MR. ALONSO: I expect that utilities that have not been active in owning wind farms will become more active because if you are the CEO of a large utility in the US, how are you going to deliver growth to your shareholders? We will see more utilities owning wind farms, maybe not within their own service territories, but through unregulated affiliates. There are few ways for utilities today to deliver growth. Cutting costs cannot be a permanent solution.

MR. MARTIN: So is that an opportunity for you? You become a feeder for utilities?

MR. ALONSO: No, for us it would be competition. I expect that there to be more room with coal retirements and I agree with Sandy that electric cars are the future, but I think there will be more competition on the supply side.

MR. MARTIN: Sandy Reisky, you had another thought?

MR. REISKY: We are trying to position ourselves not to be captive owners, so we are interested in selling high-quality projects into the capital markets or in a build-transfer scenario to a utility. Our business model is built to anticipate a market in which utilities start looking for growth or there are yield cos looking for growth.

MR. MARTIN: Rob Morgan, chief development officer for RES Americas, you get the last question.

MR. MORGAN: I am curious to hear your views both personally and what your company might be doing about storage. Are you seeing a market developing for storage?

MR. FLANAGAN: I do not see an IPP / continued page 34

California — for example, it owns a project there — or its sales, property or payroll in California exceed low thresholds in section 23101 of the state Revenue and Taxation Code, then the LLC must file tax returns and pay the annual fee, and its members are considered doing business in California and must also file income tax returns on the income they are considered to earn from California sources.

The Franchise Tax Board said it does not matter whether the members participate in management. For example, it does not matter whether the LLC is member managed or appoints just one of the members as the manager: all the members must pay state taxes if they are considered engaged in business in the state through the LLC.

CFIUS lost a round in court.

This is the first time a court has ordered it to give a foreign investor an opportunity to see the evidence behind a decision and to rebut the evidence.

CFIUS — short for the Committee on Foreign Investment in the United States — is an inter-agency committee of 16 federal agencies that reviews foreign investments in US companies for national security concerns. Submission of proposed deals is voluntary. However, the committee has authority to set aside transactions after the fact that were not submitted for review.

In 2012, the US government ordered Chinese-backed Ralls Corporation to divest the development rights to four wind farms that the company bought in Oregon at which Ralls hoped to deploy turbines made by its affiliate, the Sany Electric Co. Ralls waited until after buying the four project companies to file for CFIUS review. One of the wind farms would be close to a US Navy base that provides training for drone aircraft.

The company sued in federal court to have the order set aside on grounds that the order is an unconstitutional taking of private property without due process. A US / continued page 35

Opportunities

continued from page 33

opportunity in storage. Storage is a technology play more than a project-financed developer play. It will probably be the next step in the distributed generation model at a small scale. We looked at storage from an IPP mindset. We looked at the PJM ancillary service market, and we looked at it for the return to equity for uncontracted cash flows with regulatory risks — the type of revenue stream that can disappear with a signature — and it did not seem to make sense.

MR. ALVAREZ: This is a California biased view, but we talked last year at this conference about the “duck curve,” or the problem that 13,000 megawatts of solar capacity will drop off the grid each day between 4 p.m. and 6 p.m. That will require a lot of storage. There is no other way for the system to address this problem.

MR. MARTIN: California is about a 60,000-megawatt peak market. Losing 13,000 megawatts of electricity in that sized market is a big deal. ☹

Solar Securitizations

What has the market learned from the solar securitizations to date? How much do they reduce the cost of capital? What are their potential uses?

The key players in the transactions to date talked about them at the Chadbourne 25th annual global energy and finance conference in late June. The panelists are Stephen Viscovich, managing director, securitized products group, at Credit Suisse, Michael Cheng, director, structured credit, with Deutsche Bank Securities, Andrew Coronios, a partner with Chadbourne in New York, and Xilun Chen, director, structured credit ratings, at Standard & Poor's. The moderator is Eli Katz from the Chadbourne New York office.

MR. KATZ: Steve Viscovich, we have been talking about securitizations in this market for three to four years, and only in the last year have people finally cracked the code. What happened that made all the stars align?

MR. VISCOVICH: A number of things happened. First, we finally had a solar company with a large enough portfolio of installed rooftop systems with long-term contracts with creditworthy customers to access the rated securitization markets.

Second, SolarCity, Chadbourne and we, working with Standard & Poor's, were able to work out the criteria, a deal structure and a process for getting to a rating. Third, enough data was collected on system performance to allow potential investors to make an evaluation.

If you think about securitization in general, the biggest challenge is trying to figure out what the stress and base case scenarios should be for a 20-year revenue stream when there are only a couple of years of performance data. We tried to make as many correlations as possible to utility receivables, but the comparison is not exact.

MR. KATZ: Michael Cheng, same question.

MR. CHENG: I think of each securitization as building a pipeline from the asset to the capital markets. Focusing on the PACE securitization that we did in March, it took a number of years after enactment of the PACE legislation for the originating entities to build out their IT platforms and their channel partners and work out arrangements with the municipalities involved. After that, it was collecting performance data and working with the rating agencies to work out their criteria.

Once we crack the code on an asset class, then what remains to be done is to optimize the initial structure. We are looking to build out the asset class and broaden the investor base.

MR. CORONIOS: On a legal side, solar securitizations required adapting concepts used by other asset classes for use with solar assets. But what it really took was the commitment of the originator, SolarCity, to devote the resources to get the securitization rolling. The solar company must have enough manpower to handle the asset due diligence and build the IT platform and infrastructure to service customers. People talk about scalability of the pipeline. Once you invest the effort in setting up your internal processes, then you can use that to roll out securitizations on an ongoing basis.

MR. KATZ: As the solar rooftop industry matures, it looks to push down the cost of capital. We clearly see that happening. We see various forms of tax equity, yield cos, REITs and securitizations. What are some of the tradeoffs with choosing securitization as a form of financing?

MR. VISCOVICH: All the sources of capital you mentioned will have to work together harmoniously for this industry to reach its potential.

Comparing securitizations to yield cos, people get too caught up sometimes in the headline numbers and think incorrectly that the dividend yield for a yield co is the real cost. With a yield co, there are also growth expectations. It is far cheaper to raise

money through securitizations than yield cos. Securitizations are borrowing in the public debt market. A yield co is a path to raise equity. Debt is always cheaper than equity.

Securitizations are repeatable and scalable and, once you have a process down, it becomes something that is efficient from an execution standpoint. People focus on how long the first deal took. We had a lot of rough months along the way, but I think Andrew Coronios and I spent a total of seven or eight months really focused on the transaction and working with the rating agencies. We closed the second deal in eight to nine weeks. It will take a little longer once you start including tax equity or pairing a securitization with a yield co, but these structures, once they have been worked out, scale rapidly.

MR. CHENG: Securitization is another pocket of capital to add to the capital structure. Having lower-cost debt can improve the returns for the equity.

Advance Rates and Tenors

MR. KATZ: Xilun Chen, what makes a securitization attractive from a pricing perspective, and how should one think about them?

MR. CHEN: We have rated two solar securitizations to date. The maturity date for the debt has generally been beyond the contractual term of the customer agreements that are the source of revenue. The customer agreements generally run 15 or 20 years. As a rating agency, we have to take into account uncertainties related to asset and customer performance as well as regulatory uncertainties.

As for the advance rate on the debt, I think of it as a net present value number. The advance rate is a function of the discount rate applied to the customer revenue streams.

MR. KATZ: Let me make this easier for those who do not follow the asset-backed securities market. Suppose I can borrow from a bank 80% of the asset value. What advance rate would I get in a securitization?

MR. VISCOVICH: Part of the challenge is the value may look different depending on who is assigning a value. When we go in for a rating, we are approaching it from the perspective of someone who lives in a “what’s expected” world. The rating agencies live in a “what if” world. What if this happened? What if that happened? There is a bell curve of outcomes. What’s expected is the mid-point of the curve, while the rating agencies, depending on how much history you have with the asset, want to go farther and farther out the tail. So we tell them some of the stress cases they run are ridiculous. / continued page 36

appeals court said in July that the company should have been shown all unclassified information that led to the government order and given a chance to respond.

The court said Ralls did not forfeit any protections by failing to seek review of the deal before buying the companies.

Due process requires “at the least, that an affected party be informed of the official action, be given access to the unclassified evidence on which the official actor relied and be afforded an opportunity to rebut the evidence.”

The court called the actions in this case a “clear constitutional violation.” It acknowledged that the government has a national security interest in withholding classified information, but that does not extend to any unclassified information used to block the transaction.

It sent the case back for further proceedings in a federal district court that had held earlier for the government. (For earlier coverage, see the December 2013 NewsWire starting on page 33 and the February 2014 NewsWire starting on page 25.)

REFUNDABLE STATE TAX CREDITS must ordinarily be reported as income, the IRS said.

The agency analyzed the tax treatment of a refundable tax credit in Massachusetts in an internal memo in 2012. The memo has a good analysis of the law in the area. It was not made public until June 2014 as ILM 201423020.

Massachusetts offers low-income elderly homeowners and renters a tax credit to help defray the costs of housing. The credit can be claimed by elderly couples who earn up to \$60,000 a year (\$40,000 if single). Any house owned cannot be worth more than \$600,000. The credit is capped at \$750 a year.

For a homeowner, the credit is the amount of property tax the homeowner pays above 10% of his income for the year. For a renter, 25% of rent is assumed to go for property taxes, so the credit is the amount by which 25% of the annual rent paid exceeds 10% of the renter’s income.

/ continued page 37

Solar Securitizations

continued from page 35

As there is more history, the ratings improve and move more toward the middle of the curve.

The value in a securitization has two components. One is the discount rate applied to the revenues under the customer agreements. You also have 20-year customer agreements with 30-year assets. That is where you will get your advance rate.

Everyone in this market knows that there is value beyond those 20 years of contracted cash flow. There is a renewal value, and it is not being taken into account currently in the ratings. It will take more time before the rating agencies feel comfortable including it.

So we used two terms in the deals. We talked about the “aggregate discounted solar asset balance,” which is just a discounting of the contracted cash flow. We also talked about the “total solar asset value,” which includes some assumption about renewal cash flows. Clearly there will be a power market in 20 years. The only question is what will be the cost to participate in that market. The net renewal revenue has to be greater than zero.

PACE Securitizations

MR. KATZ: Michael Cheng, the securitization you closed in March was a securitization of payments under a PACE program. What was the advance rate?

MR. CHENG: Maybe I should give a little background for folks in the audience who may not be familiar with PACE programs.

PACE, which stands for “property assessed clean energy,” was an Obama White House policy initiative, in conjunction with the Department of Energy, that was implemented in the fall 2010 under which a home or business owner can borrow from a municipality to retro-fit existing infrastructure to improve the energy efficiency. The home or business owner might install solar roof panels. It could be HVAC systems, energy-efficient storm windows or any number of other improvements. The loan is repaid through additional property taxes over time. There is a voluntary additional property tax assessment on the property owner.

From a securitization standpoint, the credit profile is robust. You have very lightly levered property and low loan to value.

The advance rates have been around 10% loan to the value of a residential property. As for the first transaction, on which

Deutsche Bank was fortunate enough to act as sole lead and that closed in March, we were able to achieve a AA-rated senior tranche at a 97% advance rate with an 11-year average life note.

The credit spread was approximately 180 basis points over the swap rate. The all-in coupon was 4.75%.

It was well received by the investor community because the asset-backed securities market has a lot of capital to deploy in the current credit cycle. It is very interested in this new emerging asset class. We were overrun with interest when we brought the deal to market. We had more inbound calls asking about the transaction than any other pending deal. We look forward to optimizing the structure on a go-forward basis. We think the market for PACE paper is massive.

MR. CORONIOS: One difference that struck me between PACE and the solar asset securitizations that Steve Viscovich and I have worked on is the difference in the ratings. The ratings are driven by the historical performance data. How were you able to get to an AA rating with the PACE paper?

MR. CHENG: There is really no directly observable collection history for PACE special assessment receivables. We were able to convince the rating agency to use the county’s tax collection history as a proxy for performance. For the property tax jurisdiction where the initial pool was based, property tax collections were greater than 100% of the billed amounts because of penalties and late fees. Everyone pays property taxes eventually or he loses his house or building. That’s why we were able to achieve a 97% advance rate.

MR. VISCOVICH: The PACE loan is a lien on your house that primes the mortgage; talk about something that has hard collateral behind it! The lien also travels with the property. If someone wants to sell the house when there is still a balance remaining on the PACE loan, then the balance will need to be cleared up.

These are two different products. Compare a solar securitization that is really just based on the solar rooftop system and monetizing the electricity it produces over its life to a PACE securitization with less than a 10% loan to value. This has a huge effect on the rating. The PACE securitization is secured by the entire house or building and it sits ahead of other debt that may already have been rated AAA.

There is an interesting tension in the market between the solar rooftop companies, which are offering customers a solar rooftop system through a lease or power contract, and the PACE providers who are making loans to help customers buy the systems. The tension is over which business model will prevail in the long run.

A homeowner has to consider whether he wants to put a lien on his entire house or just have a payment obligation secured solely by the solar rooftop system.

MR. KATZ: So PACE is the easier one to securitize, but it is a much smaller market, right? How large is the PACE market? How big do you think it can get? Do you think the growth in securitizations will be with the SolarCity model or the PACE model?

MR. CHENG: Keep in mind the PACE legislative framework has only been in existence for three and a half years. It takes time to build out a functioning asset platform. The first deal, which was a pilot or proof-of-concept securitization, was \$100 million.

Our clients have suggested they expect origination within the jurisdictions where they have coverage in California to exceed \$1 billion this year, with substantial growth thereafter.

As background, 31 states have adopted PACE statutes. The program is most active in California, but there are active programs as well in Connecticut, Florida, Louisiana and New Jersey among other states. Thus, the market is still developing. We expect that there will be a healthy flow of capital into the space and very brisk development of the asset class as it rolls across the country.

Commercial and Industrial Market

MR. KATZ: One challenge the solar industry faces when trying to do securitizations is to have standardized customer agreements. Xilun Chen, how much of a challenge was this for rating the SolarCity transactions and how big a challenge will it be when other solar companies try to do the same thing?

MR. CHEN: I can only speak to the two SolarCity transactions that S&P rated. In those two transactions, the customer agreements have many similar economic terms, including the lease and PPA rates and some form of prepayment, purchase option and inflation adjustment and varying production estimates and guarantees. We felt that some of the differences in contractual terms may not have much of an economic impact, but nonetheless are probably quite important, such as access rights to site locations for maintenance and other purposes.

MR. CORONIOS: One of the things that made the first securitization successful was you had an integrated developer with robust standardized forms, and that let the rating agency look at a pretty standardized process. As for the rest of the market going forward, the Department of Energy has a group called Solar Access to Public Capital, or SAPC, that has put in a lot of effort into trying to standardize

/ continued page 38

The IRS said there are three general principles for refundable tax credits.

First, cash payments from the state are generally included in income.

Second, government payments do not have to be reported as income if they fall under the general welfare exclusion. However, for a payment to fall under the general welfare exclusion, it should be made from a governmental fund, be for the promotion of general welfare, meaning that recipients are chosen on the basis of need, health, educational background or employment status, and not be made for services that the recipient provides.

Third, a “tax benefit rule” requires anyone receiving a refund of taxes that he or she paid in an earlier year to report the refund as income. However, there is no income to report if the refund is of taxes that were not deducted earlier.

Putting everything together, the IRS said the following about the Massachusetts credit.

A refund to a renter is not taxed under the general welfare exclusion.

A refund to a homeowner who does not claim itemized deductions and, therefore, does not deduct his or her property taxes is not taxed. The payment is from the state government and property taxes are paid in Massachusetts to local governments, but the state and local governments are considered the same for this purpose. Therefore, any tax credit refunded is considered a partial refund of property taxes paid earlier. However, there is no income to report if the taxpayer does not deduct the property taxes he pays.

Finally, a refund to a homeowner who itemizes deductions and deducts property taxes must be reported as income under the tax benefit rule. Reporting the refund as income reverses the earlier deduction for taxes the homeowner did not end up paying in fact.

FOREIGN SHIP OWNERS who hold permits to operate on the US outer continental shelf and have not filed US tax returns are being contacted by the IRS.

/ continued page 39

Solar Securitizations

continued from page 37

documentation going forward. The group has posted a residential power purchase agreement and residential lease to its website. It is working on similar agreements for use with commercial and industrial customers. These forms will be a huge help.

It would be prohibitively expensive to do a deal with thousands and thousands of contracts with different terms. The due diligence would be impossible.

MR. KATZ: Do you see solar securitizations moving next to the commercial and industrial sector?

Solar securitizations are expected to grow into a multi-billion dollar market in the next couple years.

MR. CORONIOS: Commercial deals are a more difficult market, but the developers in that market very much want to see it so, yes, the forms will be standardized through a group like SAPC and the bigger developers will have to keep their forms as standardized as possible. In the residential market, the companies are better able to impose standardized terms on customers.

The deals are bigger in the commercial and industrial market and the terms are more likely to be negotiated on a deal-by-deal basis. Every customer will have a lawyer look at the agreement. Once you get lawyers involved, trying to keep to a standardized document becomes a real challenge.

MR. VISCOVICH: The effort by SAPC will be very helpful for smaller developers who lack the resources to develop their own contracts. The market will not work with 100 different types of contracts.

However, if sponsor A has its standard contract and sponsor B has a different standard contract, that's okay, provided each contract has the important terms: for example, it is enforceable, the customer cannot just walk away without making the full payments, etcetera. Each company has its own sales pitch to customers. Contracts are bound to vary at least to that extent. The market should be able to handle different solar business models.

Minimum Deal Size

MR. KATZ: What is the minimum size pool of assets required before a company can do a securitization?

MR. VISCOVICH: We look at the issuance size as opposed to the asset pool. The first SolarCity deal was \$54 million, which is really small for securitized markets, but it was almost a pilot offering to prove the market. It is expensive to do your first deal with all of the diligence, setting up the legal structure and going through the contracts. Once you get it set up, then efficiencies kick in on future deals. You probably do not want to go smaller than \$50 million to make it economic after the transaction costs. We

used to say \$75 to \$100 million was a good sweet spot, but it depends on what your alternative source of capital costs you.

These are numbers for a broadly distributed deal. There is also the option of a single investor deal where one investor buys the whole thing. The minimum size for a single investor deal is probably around \$40 million.

MR. CORONIOS: This product is still in its infancy, so the fact that the first deal was a publicly-rated deal was highly unusual. Before the 2008 financial crisis, this kind of asset class would have started by emerging through commercial paper conduits or bank-sponsored financing where the players and the market already understood the asset.

MR. VISCOVICH: And that step normally helps accelerate the growth of the market and acceptance of the asset class. However, we see this being a multi-billion dollar issuance asset class in the next couple of years based on the projected number of residential and commercial PV installations. There is a lot of

buzz in the market about the deals that have been done to date. Doing the rated deal early and getting it out to a broader universe of investors will help the market because now you have a larger investor base looking to absorb the projected volume.

MR. CHENG: The analysis of the optimal size for securitization is no different from one asset class to the next. Two key factors are the amount of leverage you can carry and the cost of that leverage, including transaction costs. The legal fees will be the same whether it is a \$10 million deal or a \$100 million deal. Bankers will charge what they will charge regardless of the deal size. The first PACE transaction was a hair over \$100 million. Again, that was proof of concept. The remaining deals this calendar year will probably be three or four times that size.

MR. KATZ: All PACE?

MR. CHENG: All PACE, and mostly on the residential side. To convert that into a data point for this audience, that is \$120 million of actual solar product financed through PACE.

MR. KATZ: Xilun Chen, what do you think is the pipeline of securitizations in the sector?

MR. CHEN: We can't comment on discussions with clients, but we are constantly hearing from market participants. Some of the challenges we see are the amount of data on asset and customer performance and regulatory uncertainty. An overarching focus for us is the value proposition itself: how much are the customers who use the product expected to save over time on their electricity bills?

MR. VISCOVICH: The industry needs to drive down the cost to be able to continue to compete with utility rates in a post investment-credit period. Everybody makes electricity payments. I do not know anyone here who fails to pay his utility bills. The question for the future of this industry is: who are you going to pay, your solar provider or your utility? It will come down to which one is cheaper.

Combining With Tax Equity

MR. KATZ: Most solar rooftop developers have been using tax equity to finance their systems. How will securitization fit into the tax equity structures?

MR. VISCOVICH: It has to. It is still a work in progress among all of the parties involved. If you go back and look at the securitization market in general, we always talk about two different worlds: pre-crisis and post-crisis. It is not new to combine securitizations with tax equity. If you go back to the late 1990s and early 2000s, we did deals where there were leveraged sale-leasebacks, and what we ended up / continued page 40

About 100 companies have been contacted so far. The IRS notified Adams Offshore Services, Ltd. in March 2013 that the company owes back taxes and penalties of \$23.9 million for the period 2005 through 2008 on \$45.57 million earned from operating support vessels that help with subsea exploration or production of natural resources.

The company is based in Bahrain. There is no statute of limitations on IRS claims where a company failed to file tax returns.

The company challenged the IRS assessment in March 2014 in the US Tax Court. The IRS moved to dismiss the case on grounds that the company had only 150 days to file after the notice date. The company said the notice was sent to an old address, and it filed within 150 days of actual receipt.

The IRS takes the position that any activity related to oil and gas or other mineral exploration or production on the US outer continental shelf subjects a foreign company to US taxes on its income from such activity. The US outer continental shelf can extend 200 to 350 miles offshore.

The IRS lost a case in 1991, and again two years later on appeal, where it tried to collect US taxes on premiums a foreign insurer earned from writing insurance on offshore oil rigs. The US Claims Court said the activity was too far removed from exploration or production of natural resources. The IRS has taken the position in several rulings that companies that transport oil workers to offshore rigs are engaged in activity in the United States for tax purposes.

CHINA is requiring that capital gains taxes be paid on some indirect sales of shares in Chinese companies.

The transactions involve sales by foreign sellers of shares in offshore holding companies that own shares in Chinese companies. China said the offshore holding companies lack economic substance and, / continued page 41

Solar Securitizations

continued from page 37

securitizing were rents paid on portfolios of auto and other equipment lease portfolios. The tax equity was effectively the lessor, and the deal was done at the lessor level.

It is really just a matter of getting people to sit at the table and understand the real risks as opposed to just saying no. There is plenty of precedent with other securitization asset classes for combining securitized debt and tax equity, and we think you will see the same thing in this market.

MR. CORONIOS: The tax equity investor will want to remain in place and not suffer any recapture loss. The securitization party has to be able to make sure he can get his hands on the cash flow and the assets that are supporting the financing. The first deal combining tax equity with securitized debt in the solar market will be an inverted lease structure, which is the easiest to do because there is no transfer of title. Partnership flips and other structures may get a little more complicated.

MR. KATZ: That is clearly the next frontier, right? Let me see if the audience has any questions.

MR. GREENWALD: Steve Greenwald with Credit Suisse. Are the payment obligations from the home owners unconditional or are they in any way conditional on the panels working?

MR. VISCOVICH: It depends on the form of customer agreement. Some customers lease the systems for a fixed rent each month. Some sign power contracts and pay for the kilowatt hours of electricity produced.

MR. SILVESTRINI: Mike Silvestrini with Greenskies Renewable Energy. Are some forms of tax equity transactions more easily combined with securitizations than other forms?

MR. CORONIOS: Any structure that requires a transfer of the asset out of the tax equity vehicle is a non-starter because the transfer would trigger recapture of investment tax credits. So that makes partnership flips the hardest ones to make work. The inverted leases are the easiest because the legal ownership remains with the lessor. ☺

DOE Window Reopens for Renewable Energy Loan Guarantees

by Kenneth Hansen, in Washington

The US Department of Energy reopened the window in July for applications for federal loan guarantees for innovative renewable energy projects. The window will remain open until January 14, 2015.

An estimated \$4 billion in financing will be made available.

The available funding is estimated rather than exact because of its sources. While \$2.5 billion of the total is precisely allocated from guarantee authority provided in the 2007, 2009 and 2011 appropriations statutes, the balance will consist of as much guaranteed financing as can be supported by a 2011 appropriation of \$169,660,000 in "credit subsidy cost." The amount of financing that the appropriation can support depends upon the estimated credit risks of supported projects and is uncertain until those financings close.

More about credit subsidy cost below, but first, here is what is available.

Eligible Projects

Eligible projects must employ an innovative technology for renewable energy, efficient electrical generation, transmission or distribution or energy-efficient end use. The project must avoid, reduce or sequester anthropogenic emissions of greenhouse gases and be located in the United States.

The standard to be innovative remains the same as in past DOE loan guarantee solicitations. The project must employ a "new or significantly improved technology as compared to commercial technology in service in the United States at the time the term sheet is issued." A technology already employed in the United States in three or more projects for more than five years will not count as innovative. Overseas deployments of the technology, regardless of how long-standing, do not reduce a technology's innovativeness for purposes of this program.

The Department of Energy has identified an assortment of potentially -eligible projects, but illustratively only and without prejudice to other projects that meet the eligibility criteria. The following categories of projects are examples of what it thinks of as potentially innovative.

One category is advanced grid integration and storage projects, including micro-grid projects that reduce CO2 emissions at a system level and storage projects that enable greater adoption of renewable generation.

Another category is new bio-refineries or conversions of existing ethanol plants to produce gasoline, diesel fuel or jet fuel.

A third category is landfill gas and waste-to-energy projects.

A fourth category is enhancements to existing facilities, like adding turbines to dams that are not used currently to generate electricity or retrofitting existing wind farms.

A fifth category is efficiency improvements that reduce energy usage in homes and office buildings or generate steam or electricity from waste heat.

Another category is efforts to dispatch, control or stabilize intermittent power to the grid.

This is a summary of the list of eligible projects. It is worth looking at the full list before applying because while DOE says that its list is not exhaustive, it also notes, in bold-face type, that for “Eligible Projects that are not on the sample list of potential types of Eligible Projects, DOE encourages Applicants to highlight, in the Project description, the potential for the Project to have a catalytic effect on the commercial deployment of future Renewable Energy Projects and/or Efficient Energy Projects that replicate or extend the innovative feature of the Eligible Project.”

Poison Pill

The 2009 and 2011 appropriation statutes barred projects from getting DOE loan guarantees that benefit separately from other “federal funds, personnel or property (tangible or intangible).” Several carve-outs in the acts limited the impact of that exclusion. For instance, tax benefits do not disqualify a project, nor does the fact that the project is on federal property if the lease is on arms-length terms. Further, DOE has interpreted the prohibition as applying to immediate benefits to the project applying for support. So, if a project employs a technology that was developed in part with a federal government grant, then that history of federal support would not preclude the project from getting a DOE loan guarantee.

The 2007 appropriations statute, which is contributing \$1 billion of the guarantee authority being allocated under the latest solicitation, did not include the / continued page 42

therefore, the sales should be treated as sales of Chinese company shares directly.

The provincial level office of the State Administration of Taxation in Guangdong released details of two indirect share transfer cases in June. In one, a British Virgin Islands company sold a Hong Kong holding company that owns shares in Guangdong FION Leather Stock Co. Ltd. The second case involved a Hong Kong company selling another intermediate holding company in Hong Kong that also owns shares in FION.

The buyer in both cases was in Hong Kong.

Hong Kong does not impose a tax on capital gains from selling share. The sales prices for the sales were based solely on the value of the shares held in FION.

Another country, India, has also asserted the right to tax foreign sellers on indirect sales of shares in Indian companies. India has been fighting a long-running battle with Vodafone over this issue. (See the May 2012 NewsWire starting on page 15.)

ARIZONA remains a battleground for solar rooftop companies.

SolarCity and Sunrun asked the state tax court for a declaratory judgment in late June that rooftop solar systems that the companies own and lease to customers in Arizona are not subject to property taxes.

By statute, a system that a homeowner owns and uses to generate electricity for his own use is not considered to add to the value of the house for property tax purposes. The Arizona Department of Revenue said in a 2013 memo that this provision does not provide any relief from property taxes to a solar company that owns a system independently from the house.

The two companies argue that the exemption applies to equipment that is “designed for the production of solar energy primarily for on-site consumption” and, under this standard, the leased systems are exempted from tax.

/ continued page 43

Loan Guarantees

continued from page 41

prohibition against other kinds of federal support. The solicitation says:

Under the 2007 Appropriations Act, DOE may be able to issue loan guarantees under this solicitation to projects that will benefit from some limited federal support (“Federally Supported Projects”). Under federal budgeting practices the credit subsidy cost estimate must reflect the economic substance taking into account all aspects of a project. Applicants are advised that the credit subsidy cost of a Federally Supported Project with a significant degree of Federal support is likely to be higher, and possibly substantially higher, than the credit subsidy cost of an equivalent project that is not a Federally Supported Project.

The US Department of Energy is taking applications through January 14 for loan guarantees for innovative renewable energy projects.

The main point is a project that is enjoying some other support from federal funds, personnel or property is not disqualified from applying under this solicitation. However, that support might prove costly in terms of escalated credit subsidy costs. Quoting the solicitation, “DOE discourages applicants from investing time and resources on a Federally Supported Project in cases in which the credit subsidy cost would likely be prohibitively expensive such as projects that are sponsored, owned, or controlled by Federal entities, and/or are dependent on Federal offtake.”

The 2007 appropriations statute did not appropriate any credit subsidy cost for the DOE to allocate to projects, so it appears that applicants will be responsible to cover 100% of whatever their credit subsidy requirement turns out to be to the extent they benefit from the \$1 billion DOE is making available under the 2007 statute.

Loan Terms

The DOE “guarantees” are, assuming the applicant seeks 100% coverage of the loan, actually loans that are funded by the Federal Financing Bank, an office in the US Treasury. These loans are offered at the rates at which the US government can borrow for debt of a comparable average life, plus a small spread. In the past, that spread was uniformly 37.5 basis points.

This time, it depends. DOE has introduced a “credit-based liquidity spread” that will impose an additional spread that grows as the credit quality of the project falls. There is no increment for projects rated AA or better. It then kicks in with a 0.035% increment for projects rated AA-. The supplement rises with the rated credit riskiness of projects up to 1.625% for a project rated B-.

The program imposes no minimum required rating other than the statutory requirement of a “reasonable prospect of repayment.” However, given that B- is as far as the DOE illustrated the supplemental spread, one might infer that DOE may not welcome applications that cannot achieve at least that rating.

Fees

There is a limit to the credit subsidy costs to be paid by the applicant.

A factor that haunted past solicitations under the DOE loan guarantee program before 2009, and returns with this one, is that applicants are responsible to pay their own credit subsidy

cost. Credit subsidy cost is a risk premium sufficient, on average, to fully compensate the government for any projected losses from issuing the guarantee. It is like an insurance premium.

By regulation, it cannot be paid with federally-guaranteed funding so, unless co-financing is involved in the project, it is an equity charge. Further, the amount is not determined until a few days prior to closing. Thus, a potentially substantial equity cost is unknown until just before it is due to be paid.

The process for determining the credit subsidy cost was not as transparent in the past as it might have been. However, in the past, the concern for prospective borrowers was timing rather than amount, since the DOE paid 100% of the credit subsidy cost from a Congressional appropriation. The amount was determined in the final days before closing, and some closings were delayed while waiting for DOE and the Office of Management and Budget to agree on the appropriate calculation. Further, since

Congress had initially appropriated more funding than DOE appeared to need, DOE's incentive was to move the process through OMB quickly rather than to fight hard to minimize the amount that was calculated.

That has led to some concern that earlier loan guarantees may have set some precedents with relatively high credit subsidy costs that will carry over into the determinations made under this solicitation.

There is good news on that front, one piece of which is that the credit subsidy cost recently determined for the Vogtle nuclear power project was 0%. Also, more generally, notwithstanding early inter-agency conflicts over the very existence of the program, DOE now has established a satisfactory overall success record in its supported projects. Its aggregate loss rate, notwithstanding the huge hit taken with Solyndra, is less than 3%. That track record should support more modest credit subsidy cost determinations.

The current costs of admission to the program are one area where the latest solicitation differs markedly, and adversely, from its predecessors for renewable energy and energy efficiency projects.

The fee to submit a part I application is \$50,000.

The part II application fee depends on the amount of financing sought. Applicants seeking up to \$150 million in guaranteed loans must pay a part II application fee of \$100,000, for a total application fee of \$150,000. Applicants seeking more face a part II application fee of \$350,000, for a total application fee of \$400,000.

In contrast, the part I application fee under past solicitations for renewable energy projects was, for up to \$150 million in financing, \$18,750. The corresponding part II Application fee was \$56,250, for a total application fee of \$75,000. Previously, the maximum application fee for applications for more than \$500 million in financing was \$31,250 for the part I application and \$93,750 for the part II, for a total application fee of \$125,000. Thus, the application fees have doubled to more than trebled, depending upon the amount of financing sought.

Successful applicants are also required to pay a facility fee of which 25% is due at issuance of the conditional commitment, with the balance due at financial close. That fee consists of 1% of the first \$150 million of financing committed plus 0.6% of any additional amount. Thus, for instance, for an application for \$150 million of DOE guaranteed loans, a facility fee of \$375,000 would be due at conditional commitment with an additional \$1,125,000 due at closing. / continued page 44

The state has started sending valuation notices to rooftop companies as a step toward collecting taxes starting in 2015.

The tax would run \$152 a year for a typical system, eating up about 42% of the \$360 in annual savings a homeowner realizes by adding solar. Leases may require homeowners to reimburse the solar company for such taxes. The solar company must value the system for property tax purposes at 20% of its depreciated cost.

Separately, Arizona Public Service asked the Arizona Corporation Commission in July for permission to install 20 megawatts of solar rooftop systems on about 3,000 homes and put the costs into rate base. The systems would be used to supply electricity to the grid. The utility would pay customers \$30 a month to lease their rooftops for 20 years.

Many solar companies believe regulated utilities have an unfair advantage in competing for solar customers if they can put the systems into rate base. The commission will have to decide.

Last year, it rejected a request by Arizona Public Service to let the utility charge solar rooftop customers a back-up charge of \$50 to \$100 a month for remaining connected to the grid and to credit solar customers who send excess electricity to the grid through net metering only at the wholesale rate rather than the retail rate for electricity.

The commission approved a charge of roughly \$5 a month for the average customer and said it would revisit both the backup charge and net metering in the next rate case the utility files.

A SOLAR ROOFTOP COMPANY that entered into a long-term power contract to supply electricity to a city building in Dubuque, Iowa is not violating the monopoly the local utility holds to make retail electricity sales in the area, the Iowa Supreme Court said in July.

The decision is important because it suggests a path for solar rooftop / continued page 45

Loan Guarantees

continued from page 43

This is roughly equivalent to what was required in past solicitations.

DOE also charges an annual fee for post-closing monitoring. Under the current solicitation, that monitoring fee will be “up to \$500,000” per annum per project. That is up by a factor of five to 10 times versus past solicitations, where the monitoring fees fell in a range from \$50,000 to \$100,000. Apparently DOE expects these new projects to be more expensive to monitor than their predecessors.

As before, applicants will also be responsible to cover the costs of DOE’s advisers, consisting of external counsel, independent engineers, insurance consultants and also, in some cases, financial advisers and market consultants.

Application Process

As in all DOE loan guarantee solicitations since 2008, the application process unfolds in two rounds.

Applicants first submit a part I application containing information that the DOE believes will suffice to determine both whether the proposed project qualifies for support and its likely attractiveness for support in comparison with other applications.

DOE then conducts a comparative review of the full cohort of applications that arrives by a given part I application deadline. Here, those deadlines are October 1, 2014 and January 14, 2015. The projects deemed worthy of further consideration will be invited to submit part II applications, providing more substantial technical and financial data, which in this round will be subjected to more substantial DOE diligence, including in due course, if all goes well with the application, by DOE’s external advisers, for whose fees the applicant will be responsible.

A happy characteristic of this solicitation is that, unlike the prior rounds, there is no deadline for achieving financial close. In 2011, dozens of successful part I and part II applicants, including projects for which DOE advisers had been appointed and were being paid, received “Dear John” letters from DOE reflecting DOE’s judgment that, notwithstanding the assorted merits of those projects, they lacked a realistic prospect of achieving closure by the statutory deadline.

One could have imagined a firestorm of protest, and sending those letters constituted an act of real courage, as well as good sense, by the DOE. In fact, there was little pushback. And DOE

seems to have made the cut at about the right spot. Most of the projects invited to continue in the process successfully achieved financial close before — and in several cases just hardly before — the deadline.

Twenty-eight projects beat the deadline, while roughly 40 received the Dear John letters. One has to wonder how many projects DOE might have been able to support absent the deadline.

If the former round of the loan guarantee program is prologue, then one can predict substantial demand for the next wave of loan guarantees, and, without the deadline to cull out deserving projects with less of a head start, this round of applicants may well enjoy a higher success rate. ☺

New Financing Trends

A group of veteran investment bankers and commercial bankers did the equivalent of a journalist panel on the Sunday morning talk shows — they had a wide-ranging discussion about new financing trends, including the term loan B market, green bonds, state green banks, yield cos, financing for merchant plants and other topics — at the Chadbourne 25th annual global energy and finance conference in late June.

The panelists are Michael Eckhart, managing director and global head of environmental finance at Citigroup Capital Markets, Thomas Emmons, managing director and head of renewable energy financing at Dutch bank Rabobank, Steven Greenwald, managing director for global project finance at Credit Suisse, Michael Kumar, managing director and head of project finance for Morgan Stanley, and Andy Redinger, managing director and group head of utilities and power at Keybank Capital Markets. The moderator is Rohit Chaudhry with Chadbourne in Washington.

MR. CHAUDHRY: Andy Redinger, what are the key trends in financing this year? How has the market evolved since last year?

MR. REDINGER: We have been lending to renewable energy companies since 2007. In the past, these were project-level loans. This past year, we reached a watershed of sorts in that we saw more holding company loans. Key Bank is much more interested today in talking to developers about providing holding company loans versus just project finance, and that tells me the industry is maturing.

MR. KUMAR: There is a more widespread acceptance in the institutional debt market of project risk. There was a time when you would do a long roadshow to explain the risks. Such roadshows have become less common in the last 12 months.

MR. EMMONS: We are seeing more liquidity. The additional liquidity is coming not only from the traditional sources like banks and institutions, but also from other sources like yield cos and securitizations, so it is a good market for developers to be doing financings.

MR. ECKHART: The big trends are yield cos and multi-project instruments so that institutional investors do not take project risk, but do take multi-project managed risk. We also saw the emergence this year of green bonds with the acceptance of a set of green bond principles in January. Green bonds are expected to become an enormous market. The third trend has been the re-emergence of the multi-lateral development banks, which are moving more than \$50 billion a year into the space and, as we heard in one of the Chadbourne briefings this morning, the World Bank is now prepared to guarantee power contract revenues in some emerging markets.

MR. GREENWALD: Liquidity is the big thing. Tom Emmons mentioned it, but I call it liquidity squared because the amount of bank money available today for even large projects is far greater than what was available a year ago.

Lots of Liquidity

MR. CHAUDHRY: Michael Kumar, one trend has been the increased volume of deals in the term loan B market. How liquid is that market? What deal volume do you expect in that market this year compared to last year?

MR. KUMAR: Last year, the market was north of \$3 billion. This year, already year-to-date as of yesterday is \$1.8 billion. Given these trends and the fact that a lot of transactions tend to get done in the third quarter, volume will probably double this year compared to last year. What is interesting about the term loan B market is that it is the merger of three distinct investor bases: CLOs, long-term loan funds and banks. We priced a transaction yesterday for Bayonne where about half the book was commercial banks.

MR. CHAUDHRY: How does the term loan B volume compare to the volume of commercial bank deals?

MR. EMMONS: Commercial bank volume was around \$20 billion in 2012 and \$25 billion in 2013.

MR. CHAUDHRY: When you said the term loan B market was on a tear, I had expected it to be more significant in relation to the volume of bank deals.

/ continued page 46

companies to sell electricity — rather than lease customers the systems — in states with retail sale restrictions.

Eagle Point Solar owns a solar system installed on a city building in Dubuque. The city buys the entire output from the system at a per-kilowatt-hour charge. It also shares in a third of any revenues that Eagle Point Solar receives from selling renewable energy credits tied to the electricity.

Interstate Power & Light Company, a regulated utility, has a monopoly to supply electricity to retail customers in the area. It called the arrangement an unlawful incursion into its exclusive service territory. Eagle Point asked the Iowa Utilities Board for a declaratory order that the arrangement does not violate state law.

The board sided with the utility. However, an Iowa district court overturned the decision and, on review, the state Supreme Court agreed with the district court.

The court said the arrangement would have infringed on the local utility's monopoly if Eagle Point Solar was either a "public utility" or an "electric company" as defined under Iowa law. It said Eagle Point is not a "public utility" because it is not furnishing electricity "to the public," at least not in a manner that requires the state to force it to submit tariffs for review and to provide service to all who desire it.

It said Florida had found independent generators are public utilities, but other states — Arizona, Nevada, New Mexico and Oregon — have declined to do so.

The case is SZ Enterprises, LLC d/b/a/ Eagle Point Solar v. Iowa Utilities Board. (For earlier coverage, see the June 2013 NewsWire starting on page 5.)

SOLAR ROOFTOP SYSTEMS in Puerto Rico qualify for investment tax credits and accelerated 5-year depreciation if owned by a US partnership with all US corporations or citizens as partners, the IRS ruled.

/ continued page 47

New Financing Trends

continued from page 45

MR. KUMAR: Certain types of transactions will always go to the traditional commercial bank market. For example, a wind construction loan is never going to get done in the term loan B market. The large construction facilities for LNG projects at least initially are always going to get done in the commercial bank market. Merchant power is going to get done in the term loan B market. When we parse it, the term loan B market is on a tear, but it is used for certain niches in our sector. B loans are used for riskier projects.

MR. CHAUDHRY: Steve Greenwald, people have been talking for the last couple years about the demise of commercial banks in the project finance market. Basel III and other market reasons are supposed to lead to a big withdrawal of commercial banks, but these numbers do not show that. Why? Were the predictions wrong?

MR. GREENWALD: That is the \$64,000 question. I was talking to a colleague about it last night. While Basel III was not expected to put the kibosh on commercial banks, it was expected to lead to shorter tenors. Commercial banks are showing a strong preference for loans with five- to seven-year tenors. The Cameron LNG deal just got done with roughly \$2 billion of commercial bank debt with a term of 16 years. The Japanese banks are in the market in a very big way, lending long term and with big checkbooks, and we are seeing many European banks doing the same. The US banks are still not interested in long-term lending.

There is a lot of liquidity in the bank market. Raising \$4 to \$10 billion for large LNG projects does not seem to be an issue if you keep the loan tenor in the sweet spot of five to seven years. I do not know why some banks are willing to lend 15 or even 17 years. You hear stories of their arms being twisted by the sponsors.

MR. EMMONS: The term loan B market is really not cannibalizing the bank market. The two markets have different objectives. The bank market is always going to be there for complex deals and for deals that require flexibility in terms of funding. For instance, banks will do construction debt. Banks will do highly-structured deals.

MR. REDINGER: The pricing in a lot of these deals was out of line in relation to risk. The asset class was largely misunderstood. Lenders have a better understanding today of the riskiness of the asset class. It is becoming a more mature market.

MR. ECKHART: Our perception of risk has a lot to do not only with the project, but also with who are the sponsors and the other participants. As a 200-year-old bank, we have clients we have worked with for decades, and our knowledge and level of comfort with these companies is key to our project financings.

The developers whose projects Basel III makes it harder to finance are the smaller independent sponsors who do not have that history or relationship. The fact that we have known a sponsor for decades is a material factor in our risk evaluation.

MR. GREENWALD: I would take issue with that. The Freeport LNG project on which we are working has never had a banking relationship. We went out for \$4 billion, and we have multiples of that in terms of orders. Admittedly, the sponsor had a fine track record with respect to a re-gas terminal it built four or five years ago, but it has no real banking relationships. A good project, even with a relatively unknown sponsor, will attract a lot of bank capital which is not something I would have said a year and a half ago.

MR. REDINGER: I tend to agree with Steve Greenwald. The bank market is alive and well. If you are look for a loan with a tenor of up to 10 years and you price it appropriately, you can raise an incredible amount of capital.

MR. CHAUDHRY: So the bank market will take the risk on a well-structured project, but the term B lenders tend to be more aggressive on risk. Is that right, Michael Kumar? What is the risk appetite in the term loan B market? What kind of things are lenders in that market willing to take?

MR. KUMAR: That is a good way to put it. Broadly speaking, the bank market is a triple B or triple B minus — maybe BB plus — type of credit. Once you get below that level, the banks will generally not touch it. There are

Green bonds are expected to be a \$50 billion market in 2014.

a few exceptions. The term loan B market will go from a single B all the way to investment grade. It is a market for projects with more merchant risk or other exposures that are not what the commercial bank market will take. The term loan B market can price risk. The bank market is generally binary.

MR. CHAUDHRY: You told me earlier that the term loan B market is starting to do covenant-lite deals again. What is a covenant-lite deal, and what kind of risks are lenders taking in such transactions? How much can a sponsor get away with?

MR. KUMAR: A sponsor can get away with a lot these days, unfortunately. It is a question of how much of a bubble there is. It goes in waves. Long loan funds will do covenant-lite without any problem. The CLO's are much more disciplined because they have in their CLO charters that they have to have covenants, but what the covenants are is open to interpretation. Often you see transactions that notionally have covenants, but the thresholds are set so low that they are meaningless.

MR. CHAUDHRY: Let me ask that question in reverse. What kind of risk is the term loan B market not willing to take? When you go to investors, what the types of things are complete non-starters?

MR. GREENWALD: The term loan B market is less willing to take construction risk than the banks are. The banks understand that risk better. The reason you go to the term loan B market is the project has a post-construction risk profile that does not fit the banks.

Green Bonds

MR. CHAUDHRY: I want to move beyond bank and term loan B deals into green bonds. Michael Eckhart, you mentioned green bonds as one of the trends you see. What is a green bond?

MR. ECKHART: It is term for bonds whose proceeds will be used in ways that help reduce global warming. Citi and BAML wrote a set of green bond principles almost exactly a year ago. We had placed a \$1 billion green bond for the International Finance Corporation in February 2013 and sold it in an hour.

Why was there so much demand for the bond offering? In talking to our bond sales people, it was clear that the attraction was not only the triple A credit and the IFC track record, but also the IFC was doing something that the investors liked and trusted, and trust was the key word.

The IFC was declaring its investment criteria for the funds and what decision-making process it would follow. It committed to track the funds separately and, most importantly, it promised to report after the fact what / *continued page 48*

This is the third such ruling the IRS has issued involving renewable energy facilities in Puerto Rico.

The US tax code says equipment used in a US possession does not qualify for these tax benefits unless it is owned entirely by US corporations or citizens. The ruling is Private Letter Ruling 201426013. The IRS made it public in late June.

A DEPRECIATION BONUS may extended.

Companies putting new equipment in service in the United States have been allowed off and on since 2001 to deduct a fraction of the cost or "basis" immediately. The remaining basis is deducted over time as regular depreciation. This "depreciation bonus" was 50% when it expired at the end of 2013 for most renewable energy projects. It remains available through 2014 for equipment at conventional power plants.

The House voted in July to make the bonus permanent.

The Senate tax-writing committee voted in April to extend it for another two years. Congress is expected to make decisions about a long list of "tax extenders" in late November or December.

AUSTRALIA rescinded a carbon tax in July that had been in effect for the past two years. Australia required about 370 large greenhouse gas emitters to pay A\$23 per metric ton of carbon released. The tax rose to A\$25.40 this year. The Australian government still has a goal of reducing carbon emissions by at least 5% below 2000 levels by 2020.

MUNICIPAL WATER COMPANIES have been writing the US Treasury and IRS asking them to make it easier for municipalities to enter into long-term contracts with private companies to manage their water systems without jeopardizing the tax-exempt bonds used to finance such systems.

Private companies operate more than 2,000 municipal water and / *continued page 49*

New Financing Trends

continued from page 47

specific projects the funds went into so that investors could, should they wish to, calculate the environmental or climate impacts of their investments. Those four things are the green bond principles.

We debated three big issues while writing the green bond principles. One is: “What is green?” That is an on-going debate. We are trying to create, not contain, a market. We are trying to prevent any gatekeeper from controlling the market with any single definition. The second issue is: “What should be the effect on pricing for the bond issue?” We decided not to touch that. The third issue is how to maintain the trust, transparency and integrity of the market. That is the one thing we decided to address, and it turned out to be the correct choice. To use the term “green bond,” the issuer must adhere to the green bond principles.

We are in the process of getting a trademark and copyright for the term green bond. Anyone who wants to use the term will be allowed to do so; it is a free license to any issuer who pledges to follow the principles.

The green bond space is a transparency and disclosure space at this point. A little over \$20 billion in green bonds have been issued since January 2014 when the green bond principles were adopted. We should be at \$25 billion by mid-year and \$50 billion for 2014 as a whole, which compares to \$14 billion in green bonds issued last year. We think the market will double every year.

MR. CHAUDHRY: Those are big numbers. That is way bigger than what was mentioned earlier for the bank market and the term loan B market. Will this market eventually dwarf the bank market, term loan B market and project bond market?

MR. ECKHART: Yes. It has been 25 years to get to a project bond market. The reason the principles were issued is that there were rumblings of bad behavior, so all the banks came together. Now 75 organizations have signed up as members or observers in green bond governance. Eighteen are on an executive committee, and there will be a serious global meeting in China on green bonds in two weeks. This is an instant global institutionalization of the market to protect the integrity of it. We do not want any bad behavior.

MR. KUMAR: But this is not the same as the bank- and term-loan-B-type of credits that we were talking about before. These are really full corporate or super-national credits.

MR. ECKHART: That is correct.

MR. REDINGER: The definition is use of proceeds. The focus in bank deals and the institutional debt market is the source of repayment and not the use of proceeds.

MR. CHAUDHRY: I still want to understand this. If you do get the certification of being a green bond, what benefit does that give you in marketing the bond? Pricing? You said you did not touch pricing. What is the benefit of being a green bond?

MR. REDINGER: We have not seen a real benefit from a pricing perspective.

MR. ECKHART: Correct.

MR. CHAUDHRY: So how would green bonds benefit the people in this room most of whom are developers of renewable energy, conventional power and other types of infrastructure projects?

MR. ECKHART: The benefit is not to the issuer. It is to the investor. This was not created as a marketing gimmick for issuers. There is a green halo effect, but it is a nonfinancial green halo.

The benefit is to the investors; the benefit is the integrity of green. Is anybody going to trust this? There was a considerable degree of distrust. What we have seen with placements we have done so far — GDF Suez, Toyota, Unilever — is a definite spreading of the investor base for each of those companies. In the case of Toyota, which was not considered a green company, many investors bought that bond who had never shown any interest before in Toyota paper. The Unilever offering drew nine green investors who originally distrusted the space, but who now trusted it because of the principles. You have a spread of the investor base and a green halo, but that was not the purpose of the enterprise.

Green Banks

MR. CHAUDHRY: Moving beyond green bonds to state green banks, how many state green banks are there today? Tom Emmons?

MR. EMMONS: I think there are about five. They are in New York, Connecticut, New Jersey, Hawaii and maybe another one.

MR. CHAUDHRY: Why should developers be interested in green banks? What do they do?

MR. EMMONS: I am most familiar with the New York Green Bank because it is the newest one, and it has been quite high profile. Its main objective is to mobilize private capital. It has been in the market asking financiers what is preventing financing of certain types of projects: things like particular risks to

which banks and insurance companies are allergic or structures that can be enhanced by the capital of the New York Green Bank. It is not trying to raise lots of money to lend directly. It is trying to raise enough capital to be able to take risks and then apply that risk taking to particular elements of structures so that the private capital is mobilized.

MR. CHAUDHRY: Andy Redinger, what is your view of state green banks. We heard your views on green bonds.

MR. REDINGER: I think the industry spends way too much time on trying to solve the debt issue. Debt has been widely available to the industry for a long time. It is even more available this year. To spend more time developing other avenues to provide debt to projects is marginally productive; debt has never been cheaper.

There is a role for green banks in providing capital in situations where the commercial banks are not interested in providing financing: to new technologies and those types of things. The green banks are still trying to find their way.

MR. CHAUDHRY: Mike Eckhart, is there a role for state green banks?

MR. ECKHART: I was just in Paris last week for the first world meeting organized by the OECD on green banks. The biggest one of course is in the United Kingdom with £3.2 billion in funding. It has put out just over a £1 billion so far in 26 projects. Others will copy what the British are doing.

New York has yet to do its first deal. Connecticut is a government program that changed its name from a program to a bank. There are green banks now in Malaysia, India, Indonesia and Japan, and more are coming.

Governments are realizing that they cannot reach scale with clean energy solely by spending taxpayer money through grants. Someone put a bee in their bonnet that a financing facility that allows the government to get its money back and earn a return is a very attractive proposition. The UK Green Bank reported that it is earning a 9% return. The UK is in a different position than we are. It is helping local projects and also educating local lenders that lack the expertise to make a decision about these kinds of local projects: waste energy, biomass, local wind and solar. Green banks become the expertise that the local lenders can ride. It is an interesting little sub-niche.

MR. CHAUDHRY: Tom Emmons, what kinds of risk are state green banks looking to enhance? What kinds of credit enhancements are they willing to provide?

MR. EMMONS: An example of the type of thing the New York Green Bank is looking at doing is if a / continued page 50

wastewater facilities. The contracts can run as long as 30 to 40 years. They may take the form of a concession, a lease of the water system or a contract merely operate the system. The water companies call these arrangements a form of public-private partnership or P3.

The interest on bonds used to finance a municipal water system will become taxable if there is more than 10% "private business use" of the system. The IRS has rules in Rev. Proc. 97-13 for when a contract with a private operator goes too far. The typical P3 contract signed by a municipal water company strays outside the IRS guidelines.

A municipal water company that allows too much private business use after bonds have already been issued must take one of several permitted remedial actions or the bondholders will have to pay taxes on the interest they receive.

There are three possible remedial actions in the context of a water system, but none of them works, according to the water companies.

One is to redeem the bonds on the first possible call date and to defease them in the meantime by setting aside enough money in an account to pay the future debt service and redemption price. The water companies say this is too expensive.

Another remedial action is to leave the bonds outstanding, but basically treat them as a new bond issue and make sure they meet all the requirements for a new tax-exempt bond today. Bonds with more than 10% private business use are considered "private activity bonds." Each state is limited in the number of such bonds it can issue each year. The water companies say it is too hard to get a share of the scarce state volume cap.

The other remedial action applies in cases where there has been a cash sale or other "disposition" of the facilities financed with the tax-exempt bonds. The bonds will retain the tax exemption as long as the municipality uses the cash received from the sale or other disposition within two years for another governmental purpose. / continued page 51

New Financing Trends

continued from page 49

project contract in a particular market can only be five years because the market is not mature or deep enough, but the probability is that the contract will be extended, a green bank could wrap the later years of the contract in order to make the project bankable. A relatively new technology could be proven, but not quite as predictable as some of the more established technologies that we are used to financing. These are risks on the margin. The bank could also price merchant risks.

MR. GREENWALD: Are the green banks basically writing insurance policies?

MR. EMMONS: Again, I do not know about the other ones, but the New York Green Bank is brainstorming now and is getting input from lots of people. It has an RFP out inviting people to submit projects with requests that particular risks be wrapped by the bank. I do not think they would write it literally as an insurance policy, but it would function effectively as an insurance policy covering certain risks.

MR. CHAUDHRY: When the US Department of Energy tried to do the same thing, it was a long laborious process. Should developers be wary of similar efforts by green banks?

MR. REDINGER: No, we should embrace the green banks. They are another tool in the toolbox. What they are trying to do is useful.

MR. GREENWALD: If you are embracing a green bank, you are probably not looking to retire in the next six months. If the DOE is a precursor to what you will be dealing with, you have a long road ahead.

MR. ECKHART: Let's not leave the impression that these are insurance operations. The UK Green Bank is run by an ex-partner of Hudson who is a very sophisticated financier. The New York Green Bank is being run by Richard Kauffman who had a distinguished career on Wall Street. The president is Alfred Griffin who used to work at Citi and is a 15-year structured finance wizard. We have some pretty smart people running these so-called government operations. I would look to them to be risk mitigators and credit enhancers for sure, but they are also going to put money into deals.

Yield Cos

MR. CHAUDHRY: Moving on to the next topic, which is yield cos, three have closed to date. Michael Kumar, how many more yield cos do you see closing before the end of the year?

MR. KUMAR: At least another three significant ones. After that, I suspect that this is a tapering phenomenon. This year might be the peak year for yield cos.

MR. CHAUDHRY: And what is the reason for the tapering?

MR. REDINGER: I am not sure I share the view that it is going to taper.

MR. CHAUDHRY: Then how many do you foresee this year?

MR. REDINGER: Three or four is probably an accurate number for this year.

MR. CHAUDHRY: And you do not see it tapering because . . . ?

MR. REDINGER: Ultimately, we believe the yield cos focused solely on the US will end up expanding their footprints and buying international assets. The investor base will understand the need to go international because North America may not be the best place to deploy capital. It may be better to put

capital to work in Brazil or Mexico, and having the flexibility to move capital around to countries where it can earn a higher return should be attractive to investors. There is also a need to expand beyond North America because yield cos will need to grow in order to continue to trade the way they do. Although very large, the US market is finite. Yield cos will need to find other ways to feed the beast.

Yield co investors are looking for a 12% to 15% total return. Low dividend yields mean the rest has to come from capital gains.

MR. ECKHART: Didn't we try that about 10 years ago?

MR. CHAUDHRY: Michael Kumar, coming back to you in terms of yields. What yields are investors earning on the existing yield cos, and where do you see yields headed as more yield cos come to market?

MR. KUMAR: It is better to focus on total return than yield. An equity investor looking at yield cos and master limited partnerships is probably looking for a 12% to 15% total return. His return is the sum of his yield and capital gain. If the investor expects more assets to be dropped in on an ongoing basis, then there will be a low yield. If the investor does not believe there will be future growth, then he will demand a higher yield. That's why I expect there to be a tapering effect because the number of assets that are available to be put into yield cos in North America is limited.

MR. ECKHART: There are three kinds of yield cos. There is the NRG-style yield co where a 30% ownership interest is sold to investors and the projects do not really move. The original sponsor still manages them and retains majority control. There is a big inventory of projects still to be moved into the yield co. Another type is the Pattern Energy model where both assets and the team that manages them are moved into a new yield co. The third type is a roll up of assets acquired from third parties, like some people are trying to do with solar projects, and then take the company public. It is still a young market in my view, and the final pattern or method has not been settled.

MR. CHAUDHRY: Keith Martin calls yield cos vacuum cleaners sucking up assets. Michael Kumar, what impact are yield cos having on strategics and infrastructure funds as they bid for assets? Are strategics and infrastructure funds changing strategies because of what yield cos are doing?

MR. KUMAR: Absolutely. Yield cos are winning the bidding in asset auctions because they have the lowest cost of capital. It is very hard for an infrastructure fund to compete with a yield co. You see the same phenomenon in the mid-stream space where it is very hard for a private equity shop to compete with a mid-stream MLP. Yield cos are the most competitive and most aggressive buyers because they need to grow. Let's see if that continues.

Distributed Portfolios

MR. CHAUDHRY: I am going to go to the last topic before we run out of time. Andy Redinger, you said one of the trends you see is debt at a holding company level to finance portfolios of residential solar systems and other / continued page 52

The water companies are asking for "clarifications" of this last option. They want to treat the long-term P3 contracts signed with private operators as "dispositions" of the water systems so that this remedial method is available even though the contracts are not treated as a sale of the systems for other tax purposes. They also want to modify the two-year window to require that the municipal water company expect to spend the cash within three years after execution of the P3 contract or, if later, within one year after receipt of the cash. Finally, they want an acknowledgement that the cash can be used to pay debt service on other debt of the municipality or to make contributions to public pension funds.

Guidance of the sort the municipalities want can take a year or more to be issued.

ADVANCED COAL PROJECTS that were awarded investment tax credits by the US Treasury may be given more time to use them.

The credits are in section 48A of the US tax code. They are 15% to 30% of the project cost depending on the type of advanced technology employed at the project to generate electricity from coal. The amount of potential tax credits under this section is limited, so developers had to apply to the US Department of Energy and the IRS for an allocation. Any project awarded credits has to be placed in service within five years after the award.

Russ Sullivan, who was until recently staff director of the Senate tax-writing committee, wrote the assistant Treasury secretary for tax policy in July asking for more time to complete projects that are under construction at the five-year mark using a continuous construction standard like was used for Treasury cash grants for renewable energy projects. Sullivan made two other suggestions for how to give the projects more time if this one does not appeal.

Unused tax credits go back into a pool to be rebid.

/ continued page 53

New Financing Trends

continued from page 51

forms of distributed generating assets. How are lenders getting comfortable with the risks associated with so many small assets? How are they structuring the deals? Do the deals involve blind pools of assets?

MR. REDINGER: We look at the company. We focus on how the company chooses its customers. We do not try to look at every single customer during diligence, but rather we zero in on the process and procedures the company has in place to acquire that customer.

MR. CHAUDHRY: Tom Emmons, do corporate revolvers of blind pools of assets, where you do not know what you are financing, truly work or do lenders end up having to do continuous diligence as additional assets are added to the pool?

MR. EMMONS: There are not many examples. Construction revolvers have been used to finance pools of assets with predetermined criteria so that each project does not have to be analyzed fully. It is prohibitively expensive to do a full analysis on every small project going into a construction revolver. We have done a couple. We use preset criteria, and then we look more closely at anything falling outside the box.

Distributed generation is becoming a very, very deep market. We are basically doing project financing of portfolios. A developer will come to us with 10 or 50 projects of relatively small size, but with at least \$40 million in capital cost so that there is enough scale to make the financing economic. We do diligence on a sampling basis. We work with an engineer to come up with a diligence method that will give us comfort in the whole portfolio, but without looking at each individual project in the same depth that we do large projects, and then the debt is drawn down over six to 10 months. The loan becomes a project finance term loan, but with many projects rather than a single project.

Other Trends

MR. CHAUDHRY: My last question for each of you is what other trends do you see beyond what we have already discussed?

MR. GREENWALD: This is a great market for borrowers, and it will remain so as long as the Federal Reserve keeps interest rates low.

MR. ECKHART: Next year will be global. Don't think US. Don't think Europe. Don't think London, because the action is shifting

to Asia. Those of us in this business have to think globally.

MR. EMMONS: We are in the middle of a cycle. The current cycle started in 2009 when credit was very tight. We are not yet into the over-aggressive phase, but we know these things go in cycles. There is no such thing as stasis or equilibrium. We are trending toward greater liquidity and greater risk taking. The current cycle probably has at least another couple years to run.

MR. CHAUDHRY: How far away is the next crisis, Michael Kumar?

MR. KUMAR: When the Fed raises interest rates. As long as interest rates stay put, this will remain a very favorable market for borrowers. We expect a lot of activity in North America in the next two years — probably more in mid-stream oil and gas and LNG than in power and renewables, but both will be healthy — and there should be a lot of activity in the next 18 to 24 months.

MR. CHAUDHRY: Andy Redinger, the final word?

MR. REDINGER: Lots of assets changing hands.

MR. CHAUDHRY: Good projection. We have time for two audience questions.

MR. CHERRY: Bud Cherry, CEO of Eagle Creek Renewable Energy. Talk about merchant versus contracted projects. How does merchant risk play in your assessment of deals?

MR. KUMAR: In this market, there is a price for everything. I think that as long as the underlying project has robust economics, meaning if it has locked in fuel costs and will be well positioned on the dispatch curve, it can be financed today. It could not get financed 18 months or even two years ago and it may not be able to get financed 24 months from today, but today there is a price for it.

MR. CHERRY: Is that in the B loan market?

MR. KUMAR: Yes.

MR. CHAUDHRY: And is that with or without a hedge?

MR. KUMAR: Without a hedge. We priced the Bayonne transaction yesterday. A portion of it is hedged. There is a capacity market obviously, but it is essentially a merchant plant.

MR. CHAUDHRY: In which markets do you see merchant plants getting financed: just PJM and Texas or more than that?

MR. KUMAR: Primarily PJM and Texas, but depending on the situation, there may be an ability to do something in other markets as well.

MR. CHAUDHRY: Last question.

MR. FREEMAN: Rob Freeman, CEO of TradeWind. One of you made the comment that the total return for equity investors in yield cos is in the 12% to 15% range. How does that translate

into a discount rate that yield cos use when valuing assets?

MR. KUMAR: If you ask institutional investors who play in the yield co space what returns they are expecting when they buy the stock, they would say 12% to 15%. That's what they hope to receive. Whether they actually achieve it is to be determined. Now what are they targeting when they bid for an asset? They are targeting anything that is accretive to their business model, meaning what is the dividend they are paying currently and what can they afford to pay for additional assets that help grow the dividend? The focus is on the margin. If a yield co has a 5% yield, then it should be buying north of 5%. It should not be buying inside of 5%.

MR. FREEMAN: What about renewable energy credits? Are they assigned a value as part of the future revenue stream?

MR. EMMONS: The answer is the same as for electricity. Contracted RECs get full credit as long as the counterparty is strong. As for merchant RECs, the bank market generally discounts, but maybe the term loan B market will give them some credit.

MR. ECKHART: There is risk around renewable portfolio standards because of the efforts by well-funded conservative groups to roll back current targets. Ohio is a little worrisome because of what has happened there. Is Ohio a trend or will concern about global warming cause states to adopt even higher targets? Will we move to a carbon tax in place of renewable portfolio standards? There could be a lot of tumult in the next few years. ☉

The Business Model in Transition: Part II

The current power industry business model is under pressure as solar rooftop companies and regulated utilities compete for retail market share. Independent generators are also affected since there is less need for additional capacity to the extent load growth is met through distributed generation. The tensions are playing out to varying degrees in 36 states and will lead to changes in the playing field on which rooftop companies, regulated utilities and independent generators compete. What will the industry look like in the future? What opportunities does change create? What casualties will be left in the wake?

A panel debated these issues at the PV America convention in Boston in late June. The panelists are / continued page 54

MINOR MEMOS. Bernstein Research said in a July 1 report that almost all regions of the United States are expected to need additional capacity over the next 10 years to maintain reserve margins over peak electricity demand that are set by the North American Electric Reliability Corporation or NERC. Bernstein estimates that around 67,000 megawatts of additional capacity will be needed. However, the growth in rooftop solar could cut significantly into the need. Bernstein said that if rooftop solar keeps growing at the current rate, then it would displace the need for all but about 25,000 megawatts of additional capacity. There are currently roughly 24,000 megawatts of additional nuclear and gas generation under construction . . . Total US wind capacity was just under 62,000 megawatts at the end of June. Wind developers added 619 megawatts of new capacity in the second quarter of 2014, nearly three times the first quarter number. Total US solar capacity was a little under 7,500 megawatts through the end of May . . . The US House of Representatives voted in July to cut the IRS budget by \$1.4 billion, or 13%, for the next fiscal year that starts in October. This is on top of a \$526 million budget cut in 2014. The House also voted to bar IRS employees from attending conferences.

— contributed by Keith Martin in Washington

Business Model

continued from page 53

Ann Berwick, chair of the Massachusetts Department of Public Utilities, David Field, CEO of OneRoof Energy, Vadim Polikov, CEO of Astrum Solar, and Ron Gerwatowski, senior vice president for US regulation and pricing with National Grid. The moderator is Keith Martin with Chadbourne in Washington.

MR. MARTIN: Sanford Bernstein, which is an independent Wall Street research house, estimated in June that solar rooftop companies would take away, on average, 7% of retail electricity sales nationwide from utilities. It expects certain states to be more heavily affected. The figures for some selected states are Arizona 34%, New Mexico 31%, California 23% to 26% percent, Connecticut 25%, Massachusetts 21% and New York City 14%. Ann Berwick, do these figures sound right?

MS. BERWICK: No.

MR. MARTIN: Why not?

MS. BERWICK: I cannot imagine where the figure for Massachusetts came from. When the current administration started almost eight years ago, we had four megawatts of solar. We are now up to about 515 megawatts, and the governor has set a goal of 1,600 megawatts by 2020. Even the 1,600-megawatt goal is between 3% and 5% of our electricity load. This is far from 21%.

MR. MARTIN: David Field, what do you think?

MR. FIELD: The numbers are way too high. I have looked at a lot of the research data, coming from different analysts, and the tendency is to focus on gross numbers when drilling down into the numbers would tell a different story. For example, suppose we can sell a home owner on buying solar electricity at 15¢ a kilowatt hour. How many other home owners will we be able to persuade to take up solar at that price? You really have to look at market by market. The end numbers will be much smaller.

MR. MARTIN: Your company is based in California. What do you think will be the figure for California?

MR. FIELD: I am not sure, but I agree with Ann Berwick. Our market share will reach the single digits: a maximum of 5% or 6%.

MR. MARTIN: Ron Gerwatowski, does National Grid have its own estimates?

MR. GERWATOWSKI: I think you just have to look at the targets in each state and do the math as Ann Berwick did.

MR. MARTIN: SolarCity says that Home Depot is selling one

new rooftop system every two minutes. That is rapid growth.

Vadim Polikov, will the economics of rooftop solar change once the 30% investment tax credit expires, and will the rooftop companies therefore lose traction?

DR. POLIKOV: I am much more bullish about the potential for solar, especially residential solar, which is my area, than the others are on this panel.

The 30% federal tax credit going away will have a big effect. We hope that, in the next two to three years, the cost will come down by more than 30% to offset the loss of the tax credit. We see no reason why that cannot happen with all the opportunities for cost savings in materials, labor and customer acquisition.

I do not believe the figures you quoted earlier are too high. It is a matter of cost and time horizon. If you asked whether we can reach those figures next year or in two years, the answer is absolutely not. But if you look 10 years in the future at the trend line for costs and new energy storage and other technologies that are coming to market, sure, 25% of homeowners in the states in which we operate could go solar and reduce utility load by at least 25% to 30%.

MR. MARTIN: That is that developer optimism I like to hear. David Field, how important is the 30% tax credit to continued growth? The US Department of Energy shows solar flat lining once the credit goes away until about 2030.

MR. FIELD: Vadim Polikov made a good point.

The solar residential tax credit for homeowners who buy solar systems will disappear after 2016. However, the investment tax credit for solar companies that own systems and sell electricity or lease the systems to homeowners will remain, but at a 10% level after 2016 as opposed to 30% today. There may be more incentive after 2016 to deal with solar companies rather than own systems, especially when you take into account that solar companies can also claim accelerated depreciation on the systems, which homeowners who own cannot.

When we look at multi-year cost projections, Vadim is correct. The costs continue to fall. It is not just customer acquisition costs, which are the really big one by the way, but also better installation and a lower cost of capital as solar rooftop companies securitize customer revenue streams to borrow at lower interest rates.

Cellphone Analogy

MR. MARTIN: There was a debate at a conference last spring in New York about whether solar rooftop is to utilities like mobile

telephony was to land lines. Ann Berwick, is that a good analogy?

MS. BERWICK: Not really. People can just bail from their land lines, as all of my kids have done. Cellphones can do lots of things, as we all know, sitting here, waiting, with everybody on their cellphones . . .

MR. MARTIN: Let the record show that we are 10 minutes into this panel and no one has pulled out a smartphone. [Laughter.]

MS. BERWICK: So I don't think it is a good analogy. With storage, the analogy gets a little better but still . . . Think about what cellphones can do for you versus what your land line can do.

MR. MARTIN: Is that the only flaw in the analogy that cellphones can do more than a solar panel? Is the analogy accurate in that younger people rely solely on their mobile phones? Will they also move to solar panels?

Estimates that rooftop solar will displace 21% of retail electricity sales in Massachusetts sound way too high.

MS. BERWICK: No. They can't right now because, in the absence of readily available storage, with solar, unless you are willing to forego power at various times, you cannot actually leave the grid.

MR. MARTIN: So you need both at a minimum. Does anybody think that mobile telephones were to landlines what rooftop solar is to utilities? Ron Gerwatowski, you are shaking your head no.

MR. GERWATOWSKI: It is not a good analogy for reasons that Ann Berwick mentioned. You also have the issue that not everyone can switch to solar. If you have the money and income, you can get a cellphone. If you have shade or live in an apartment building, rooftop solar is not an option. I also think everyone will

still rely on the grid for reliability reasons. Another thing that is lost on the analysts is we fund all of our clean energy initiatives in the Northeast by having utilities collect for them through utility bills. If we want to bring electricity from distant wind farms or utility-scale solar projects to large cities, you need transmission and distribution lines. Will some folks leave the system? Sure, but it will not be as destructive as what happened in the telecommunications industry.

MR. MARTIN: Vadim Polikov, you are the youngest member of this panel. What is your view? Will we reach a time when the only people buying central power are those who are too old and resistant to change?

DR. POLIKOV: I think it has much more to do with whether your home is suitable for solar than whether you are old or young. Not everyone has the ability to put solar panels on his or her roof. But if the cost of storage comes down as the trend lines suggest, then when you combine solar panels with storage, the analogy becomes fairly close.

Cellphones can do so much more than your land line, but that was not the case when cellphones first came out. They looked like a big brick, and they were uncomfortable to use. Over time, they became smartphones. Imagine a system where, in the future, your home energy system does a lot more for you. It manages your home. It does a lot of the home automation stuff that today is being sold separately by other companies.

Low Cost Provider?

MR. MARTIN: You said the cost will come down. Won't the competition between rooftop solar and utilities distill ultimately to who can deliver electricity more cheaply?

Ron Gerwatowski, utilities have the advantage of scale. They can put a large, central power plant — a solar power plant — in a place where the solar insolation is greatest.

MR. GERWATOWSKI: National Grid does not own any power plants. We are strictly a wires company. But if you are a vertically-integrated utility in Arizona that owns both wires and generating facilities, then you are right. / continued page 56

Business Model

continued from page 55

We are a delivery company like the FedEx truck delivering boxes, but not manufacturing the product. From our perspective, we have no issues with displacing the generation. We have the fixed cost of the delivery system, and we have some rate-making issues that will have to be addressed. From our perspective, we do not think of ourselves as losing retail sales. We just see it as a need to rearrange how we are covering the cost of the delivery system.

MR. MARTIN: But does a wires company have less product to carry if people are generating it themselves?

MR. GERWATOWSKI: It is not really a question of volume. The issue is whether you need the grid as an insurance policy. Are you willing to disconnect and put redundancy in your house or business or industrial park or will you still rely on a pretty cost effective system that is already in place to provide the insurance? Maybe I am not forward thinking enough, but I have doubts about whether we will see a wholesale exodus of people who are willing to build redundancy into their homes and businesses.

MS. BERWICK: I am probably just about as bullish as Vadim on solar. I wonder what happens when there is a new technology. I have no idea how close we are to this, but what about solar panels that are part of the siding in cases where a roof will not accommodate solar? Technology will expand the potential reach of solar over time.

MR. FIELD: Keith, I would like to go back to your analogy of a moment ago because there is a point that everybody misses: why have cellphones proliferated so widely versus land lines?

It is not just the technology. It is not just the infrastructure. Cellphones addressed the issue of consumer choice and that is what gets lost in the discussion about the electric power industry in the United States today.

The reason why new solar companies sign up a customer every two minutes at Home Depot is consumer choice, and it should be a huge wakeup call for a lot of people. Consumers want something more. It is not just about savings. There are a lot of consumers who put a solar system on the rooftop and really do not save much money at the end of the day, but they want independence. They want the pride of clean energy.

Last month, we as a company began experimenting here in Boston with a bundled energy package. The idea is if solar provides, say, only two thirds of a homeowner's electricity, why

not also provide the remaining third from another source?

When you look at the number of consumers who actually make the choice in Massachusetts, it is alarmingly small. People do not want to deal with the hassle of changing electricity providers, and yet they are willing to sign a 20-year solar lease for very little savings today. Those are the types of things that we as an industry need to understand so that we can be the better solution for the homeowner.

MR. MARTIN: If your customers are not saving very much money by switching to solar, then how are you weaning them away from the local utility?

MR. FIELD: It is really interesting when you ask homeowners why did you go solar? You are saving \$10 a month; why go solar? They will say, "I don't like my utility." Now we may all agree that the infrastructure is critical and it has to be paid for, but homeowners are switching for small savings.

MR. MARTIN: Why don't they like the utility?

MR. FIELD: It is a behavioral issue. They do not like being forced to buy from a single source.

DR. POLIKOV: Returning to the technology question, from what we have seen, the technology seems to be getting more efficient every year. The change is not by leaps and bounds; maybe it is improving at the rate of 5% a year. Now compound that over 10 years, and suddenly it is a much more efficient system. The point is correct that there are people today who cannot go solar because they have too small of an unshaded roof space and, in the future, that will not be a problem because the panels will be much more efficient. There are billions of dollars going into research and development at universities and in companies to keep driving this forward.

You are absolutely right about why people go solar. Most people think that people go solar for the green aspect of it, and there are certainly some people who do. A much larger portion of our customers go solar because they want to get away from the local utility.

Ratepayer Erosion

MR. MARTIN: Your companies are draining revenues from the utilities. As the utilities lose customers to solar, they have less revenue. The utilities earn revenue from delivering and, in some cases, selling electricity. They then have to increase rates to cover their fixed costs and that drives even more people away. Ann Berwick, is that correct and does it worry you in Massachusetts?

MS. BERWICK: That is the direction in which we, at least in Massachusetts, and in the longer term the country, are headed, but I actually think it is a boon for utilities in the following sense. We have no option, if we are going to deal with climate change, to decarbonize the electric grid. Once we do that, then we have to move toward electrifying building heating and cooling and transportation. In the big picture, that is how you deal with climate change. The point is we are moving to much more electrification than we have now. When you look at so-called anemic load growth, I think that is merely a short-term issue.

MR. MARTIN: Ron Gerwatowski, the Edison Electric Institute issued a paper a year and a half ago called “Disruptive Technologies.” It was worried about potential credit downgrades for utilities as they lose revenue. Is that potentially an issue for wires companies?

MR. GERWATOWSKI: Not really, and I agree with Ann Berwick. We see change as an opportunity.

MR. MARTIN: Do you believe that the solar rooftop customers should be required to pay a backup charge to remain connected to the grid?

MR. GERWATOWSKI: I think when we use the phrase “backup charge,” it pushes buttons for some folks. What we see developing in Arizona and California, and we are considering in Massachusetts, is having some basic minimum so that customers understand they are receiving a delivery service from the utility even when they are able to use net metering to eliminate the charges. There are three levels of service that customers with solar rooftop systems receive. One is ordinary service at night when the sun is not shining. Another is during daylight when the solar system is producing, but the customer still needs voltage support. The third service is where the solar customer uses the grid as a storage device because the solar panels are over producing. The excess electricity must go somewhere. A minimum bill can be modest in amount and still serve its purpose.

MR. MARTIN: David Field, is a backup charge appropriate?

MR. FIELD: I agree with a lot of what Ron just said. It is in the interest of our society to have a healthy utility industry and not to create stranded assets that weaken the grid. The issue really becomes what is a fair charge and how do you calculate it? The issue has become highly politicized in places like Arizona and California. The good news is that with costs falling, we should be able to absorb a minimum charge and still provide homeowners with a real choice and savings.

MR. MARTIN: Another area of contention between solar rooftop companies and utilities is over net metering. Utilities say that they should not have to pay retail rates for electricity bought from homeowners; they can buy the same electricity more cheaply in the wholesale market. Ann Berwick, are backup charges and net metering on the agenda in Massachusetts and, if so, where is the state headed?

Value-Based Solar

MS. BERWICK: Yes. I made sure they are on the agenda. The interesting thing to me is that we assume that having utilities pay retail rates for solar electricity is overpaying; I don’t know why we make that assumption. It may be right, but maybe they are underpaying. Minnesota and Austin, Texas are looking at the value of solar electricity. I don’t think we know the answer. Whenever I ask the question, everybody freaks.

MR. MARTIN: On both sides?

MS. BERWICK: Both sides. Everyone says it is rough justice for utilities to pay retail rates. I think everyone is afraid that his or her side will lose if the issue is really examined.

MR. MARTIN: Value-based solar is a hot-button issue. Can you explain what Minnesota or Austin, Texas is doing?

MS. BERWICK: Someone else might be better able to explain it. I do not think Minnesota has moved beyond the theoretical. I am not sure where Austin is. It is an effort to look at the question what the solar electricity being supplied to the grid is worth. If we had a price on carbon, then the answer would be different depending on whether the carbon price is \$12 or \$100. We have a carbon valuation proceeding pending before us at the Massachusetts Department of Public Utilities currently. Without a price on carbon, it is hard to assign a value to solar electricity.

MR. MARTIN: So your view is running the meter backwards at the retail rate may be assigning too high a value to solar electricity - or too low a value - you just don’t know yet. I think the Austin, Texas and Minnesota approach is to have the solar customer sell his entire electricity to the grid and then buy back what he needs, but the sale to the grid is at whatever the value the state thinks is appropriate.

MR. MARTIN: Do the rest of you have a view on value-based solar? David Field?

MR. FIELD: The location matters. It is hard to look at an entire state and say “This is the price across the state.” There should be a public debate, and not a debate in the press or in closed-door sessions.

/ continued page 58

Business Model

continued from page 57

MR. GERWATOWSKI: I am glad to hear you say that because it really is location. There are some places where it could have a really high value and others where the value may be low. We need to find a price for solar electricity that actually gets the solar built, does not overpay, does not underpay, but hits the sweet spot. We do that in regulation all the time. It is something that we are considering here in Massachusetts now, with a little bit of controversy associated with it. What is the return really needed by a solar developer? What else do you need in order to get a customer to put solar on the roof?

MR. MARTIN: Should utilities, Ann Berwick, be able to move into rooftop solar and put the assets into rate base?

MS. BERWICK: Massachusetts allows utilities to put up to 15 megawatts of solar into rate base. No utility has taken full advantage of this.

MR. MARTIN: Why do you think that is true?

MS. BERWICK: Maybe we should ask Ron Gerwatowski.

Imagine a future where home energy systems manage many automation tasks that are being sold separately today by other companies.

MR. GERWATOWSKI: We have five megawatts installed. We have a proposal before the department to do more. We are testing the technologies by putting solar in places where we think it has value and then having our engineers evaluate it. But it is really hard for us at this point to say we want to put solar on the roofs of residential customers because it elevates the temperature of everybody in this room that somehow we are going to dominate the market. Utilities would be perfect partners for solar companies. It would help get more solar on roofs to have a partnership relationship rather than a competitive relationship. That is something that may unfold in the future.

MR. MARTIN: How would such a partnership work?

MR. GERWATOWSKI: Like what we do for energy efficiency today. We do not install the light bulb or dimmer switches; we have incentive programs where we work with vendors. There is room for something like that to happen in solar.

Rate Based Solar

MR. MARTIN: Vadim Polikov, does the thought of utilities owning rooftop systems and putting them in rate base make the hair stand up on the back of your neck?

DR. POLIKOV: Honestly, it does. The utilities have market power and recognized brands. It does not really cost them to install because they can put the cost into rate base. This allows them to do things that the private market cannot do. It is not a fair competition.

It is really hard to sell this stuff because it is not an absolute need; it is a want. The cost of customer acquisition is so high because finding customers is not easy.

People generally do not like the local utility because it is a monopoly. It does not offer the kind of service that you would expect in a competitive market. I do not think the consumer would be well served if the monopoly provider ends up dominating the market.

MR. GERWATOWSKI: We heard at least three or four times that customers hate the utility. Our customers tell us, "We trust you. Which vendor should we work with?" There is something incoherent about the idea that our customers hate us

and trust us at the same time.

DR. POLIKOV: I think you can both trust the government and hate the government at the same time.

MR. GERWATOWSKI: Really?

DR. POLIKOV: Or trust the utility and hate it at the same time. They trust that their lights are going to be on. They trust that if they ask you to come fix a downed power line, it will get fixed. But they hate the idea that they cannot choose who is providing the service, and they dread the idea of waiting on the phone to get through to a customer representative and then trying to get a problem with a bill fixed. We as consumers are so used to having choices that when we are faced with having to deal with

the cable company or the utility company, it is a source of despair.

MR. MARTIN: The problem is the fear of calling to get repair service and being on hold for half an hour. The problem may be more with the cable company than the local utility, but people tend to lump them together. Ann Berwick, you have a comment.

MR. BERWICK: We are talking about the fact that customers are motivated to go to solar in part because they “hate their utility” and then when we talk about letting a utility into the business, solar companies are afraid that they will not be able to compete. There is a disconnect.

DR. POLIKOV: If utilities had to compete through an unregulated affiliate, I guarantee they would not be able to compete. The ability to put systems into rate base gives them an unfair advantage.

MR. FIELD: I think that ultimately utilities will be in the business. It is a capital-intensive business. The utilities have brand recognition. A customer may not like his utility, but he trusts it to be able to provide the service.

MR. MARTIN: Then what is the future of your company?

MR. FIELD: We built our company to be a transaction platform for others. We have water and gas utilities coming to us and saying, “We would like to cross sell rooftop solar leases to our customers. How can we partner with you to be able to do so?” We are happy to partner with them.

As Vadim said, this is a hard business; 95% of solar in America is sold door to door. It is not scalable. It is not low cost. Utilities will make headway in the market because people buy from companies whose brands they trust.

MR. MARTIN: Vadim Polikov, if David Field is correct, what is the future of your company?

DR. POLIKOV: Let me make sure I say what I actually believe.

I think utilities will get into the solar rooftop business through their unregulated affiliates. Exelon has a minority stake in my company, Astrum Solar. A lot of utility holding companies are trying to get into this space, and for good reason, as this is the future. To use an analogy from earlier: this is AT&T getting into mobile telephones. AT&T knows this is the future.

But I do not think that it is the regulated utility that will end up in the business; it is the unregulated side that knows how to sell to customers and how to be innovative, and that is fine. I am not against having large energy companies take over this space. I am just concerned about rate basing and using the regulated utility.

MS. BERWICK: I agree with Vadim, although I would make an exception for communities that are underserved. We are going to have the same conversation about electric vehicle charging stations. Should utilities be in that business? Should unregulated affiliates be in the business? Should we leave it to a thoroughly nonutility world? The issues are the same.

MR. MARTIN: There are some utility commissioners who believe the utilities should be held at bay to let innovation take hold and give smaller companies time to develop. What is your view?

MS. BERWICK: We have a pending proceeding on electric vehicle charging infrastructure and one of the specific questions in the proceeding is that very question, so it is not a question I can answer yet.

MR. MARTIN: Let me challenge in the other direction. Is the boom in rooftop solar just a fad? Will homeowners decide that they are better off having an engineer at the utility handle the power supply and not have to worry whether their own equipment is working? David Field, will we go back to central station power plants?

MR. FIELD: There are many CEOs of energy companies who believe the next turn of the wheel is for energy to go through the same transformation that communications has.

Predictions

MR. MARTIN: So the genie is out of the bottle. Last question: Ron Gerwatowski, what is the future for the power industry business model? Do we continue with what we have or, if not, how will it change?

MR. GERWATOWSKI: We will always need a central grid, but we will see new configurations. The system at the distribution level will have to accommodate more distributed generation. The engineers will design the system differently, and we will get to a point of equilibrium between the rates needed to support the grid and the desire not to erect barriers to distributed generators.

MR. MARTIN: And do you think it is inevitable that we will move to some sort of flat monthly charge?

MR. GERWATOWSKI: Utility customers will always pay a mixed rate. Net metering has a significant value and is important for the solar industry, particularly for residential customers who want to put solar on their roofs. However, if the part of the rate that pays for the commodity ends up being three quarters of the bill, then net metering does not affect a delivery company like National Grid. It will create some issues for utilities that still own generating assets.

/ continued page 60

Business Model

continued from page 59

MR. MARTIN: Vadim Polikov, what is the future of the power industry business model?

DR. POLIKOV: The cost of distributed solar is coming down quickly. Energy storage is not here yet, but it will be here in the next two to four years. If you look 10 years out, there will be a lot of people who can put solar on their roofs with storage and no longer need to rely on the grid. If you look at the moves that Exelon, GDF Suez and other large and established power companies are making, they are moving into distributed solar because they know that it is the future. Consumers will benefit. We will have more options within our houses than we can even dream of today. Who would have dreamed of smartphones in 1995. It is impossible even to imagine all the possibilities once you have a digitized system in your home for energy.

MR. MARTIN: Ann Berwick, what is the future of the power industry business model?

MS. BERWICK: I think we will find out more about it in Massachusetts in the very near future. The Massachusetts Department of Public Utilities issued two new orders about 10 days ago, one on hybrid modernization and the other on time-varying rates. These orders start introducing real opportunity for the utilities to look at providing a platform for a whole range of services.

MR. MARTIN: So it is a brighter future for the regulated utilities?

MS. BERWICK: We are giving them a lot of opportunity to define this space. The bottom line is we need to ensure that the utilities remain healthy because, unless we live in a very different world than we are imagining, we will continue to need the services they provide.

MR. MARTIN: David Field, same question.

MR. FIELD: I was at the DNV Kema conference in Scottsdale, Arizona last month. It is the retail conference for all of the energy providers. The CEO of nearly every company said that his or her company plans to go into rooftop solar. We are starting to see thousands of newly-appointed sales reps in that market. That is just an example of how a disruptive change is coming to the industry. Big data is trying to get into the sector. Pretty soon we will be able to take a million addresses here in the Boston area and automatically map every rooftop, identify which are best suited for solar, cross reference that to credit scores, cross reference that utility estimated data and be able

with pinpoint accuracy go to individual houses, give the owner a two-page customer solar proposal, tell him or her how much can be saved on the utility bill and list other services that we are able to bundle for them. That is where this whole industry is going. ☺

The US Government Moves to Encourage More P3s

by Doug Fried, in New York, and Jake Falk, in Washington

President Obama launched a “Build America Investment Initiative” in July that directs federal agencies to encourage broader public and private sector collaboration on infrastructure projects and to expand opportunities for public-private partnerships, or P3s.

The details of the initiative remain to be fully fleshed out. In the near term, the effort will focus on using existing authority to encourage P3s, particularly in the transportation sector. The initiative and the President’s support for P3s should help increase private investment in US infrastructure.

The initiative comes at the same time that a special panel of the House Transportation and Infrastructure Committee is looking into the potential for expanding use of P3s. The panel was created in January this year and held several sessions with industry participants through July. The work of the panel could help Congress figure out how best to encourage P3s as part of the next reauthorization of federal surface transportation programs and in other infrastructure bills. The deadline for reauthorizing federal surface transportation programs was recently extended to May 31, 2015. The task will fall to the new Congress that will be elected in November.

Build America

The part of the President’s new initiative that could provide the most immediate benefit is creation of a new office within the US Department of Transportation called the Build America transportation investment center. The center will open by November 14. The President said it will serve as a “one-stop shop for cities and states seeking to use innovative financing and partnerships with the private sector to support transportation infrastructure.”

The center will play an informational role. It will make federal resources more understandable and promote access to federal credit assistance programs to help finance transportation infrastructure. Among the credit assistance programs in the Department of Transportation toolkit are TIFIA (for the Transportation Infrastructure Finance and Innovation Act), use of tax-exempt private activity bonds and a railroad rehabilitation and improvement financing program called “RRIF.”

The center will also provide technical assistance, particularly for cities and states that are not using P3s yet. It also has a goal

The Obama administration is moving to promote broader use of public-private partnerships for infrastructure projects.

of trying to streamline the permitting process for P3 projects.

The US Department of Transportation has already been promoting use of P3s for transportation. For example, the department already set up a project finance center in 2012 to provide technical assistance to state and local governments considering innovative financing tools. The Federal Highway Administration, an office within USDOT, is in the process of developing guidance on best practices for P3s and standard contracting provisions. The Federal Transit Administration, another USDOT office that focuses on public transit, has been directed to do the same thing. Coordinating these and other efforts through the new Build America center should help provide more effective support for P3s.

The new Build America center will provide a sharper focus for federal P3 efforts. There is no additional money under the Obama initiative. However, the fact that the President is talking more about P3s should cause policymakers across the federal government to advocate for broader use of P3s as opportunities arise.

Summit and Working Group

As part of the new initiative, the Treasury Department will host an infrastructure investment summit on September 9, 2014. The summit will highlight opportunities for private investment and increased collaboration between the public and private sectors.

In addition, an inter-agency working group has been set up to focus on P3s with Treasury Secretary Jacob Lew and Transportation Secretary Anthony Foxx as the co-chairs. The group will review ideas to increase private investment in US

infrastructure beyond the transportation sector and is expected to make recommendations for how the government can promote broader use of P3s for US infrastructure.

Twelve agencies will participate in the inter-agency working group. This gives an idea of sectors, besides transportation, where the Obama administration sees other potential uses of P3s. The other agencies include the Departments of Defense, Interior, Agriculture, Commerce,

Labor, Housing and Urban Development, Energy, Homeland Security and the Environmental Protection Agency.

The group has until November 14 to issue an action plan with a timeline and list of goals.

There are three things, among others, that the group could include on its list of goals.

One goal could be to find new sources of revenue for infrastructure at the federal, state and local levels. The cities and states that thus far have had the most success with P3s and related federal financing programs are the ones that have the means to make availability payments or create some other revenue stream that can be used to pay debt service plus an equity return on infrastructure projects. The working group could recommend that P3 participants be able to earn revenue in other ways. For example, earlier this year, USDOT proposed that Congress provide more flexibility for cities and states to charge tolls on interstate highways. This proposal was included in the draft surface transportation reauthorization bill that the Obama administration sent Congress. / continued page 62

P3s

continued from page 61

Another goal of the working group could be better coordination of existing federal financing programs across federal agencies. The group could share best practices for program management. The current federal infrastructure financing programs are dispersed across a string of agencies, including USDOT, the Department of Energy and the Environmental Protection Agency. Applicants under these programs could benefit from a more coordinated approach. Sharing of best practices could be particularly useful for the recently-passed “Water Infrastructure Finance and Innovation Act” program, known as “WIFIA.” The WIFIA program, which is based on TIFIA, was established by Congress earlier this year to be implemented by EPA and the US Army Corps of Engineers. Both agencies could probably benefit from the experience that US transportation officials have had with the TIFIA program.

Another goal could be simplifying federal requirements for P3s. Private investors in P3s have to contend with a host of federal requirements for federally-funded infrastructure projects that can differ from agency to agency. These requirements include compliance with the National Environmental Policy Act review process, payment of prevailing federal wages under the Davis-Bacon Act and other statutes and “Buy America” preferences. The working group could put out clearer guidance about these requirements and focus on simplifying the rules so that there is not so much variation in terms. ☺

A Brighter Outlook for the “Other” Tidal Power

by Ted W. Verrill, with Halcyon Tidal Power in Southport, Connecticut

[Ed. A discussion in the June 2014 Project Finance NewsWire suggested that tidal power is still some years away from being able to compete with other forms of electricity generation except in remote locations. The CEO of a tidal power company argues that his company has a form of tidal power that has the potential to reach scale more quickly.]

The “other” tidal power is tidal range power - power created from the head pressure of tidal waters against an enclosure.

Tidal range power is an existing technology to which the addition of key advancements could lead to worldwide deployment of a zero-emission renewable resource capable of satisfying 10% to 20% of global electricity demand, a scale that would have a meaningful impact on climate change in short order.

At scale, tidal range facilities can produce power at market rates for the first 20 to 30 years and below-market rates for the remainder of their 120-year useful lives, without subsidy. Tidal range power can provide all of this while also offering compelling financial returns.

Jigar Shah, founder of SunEdison - one of the world’s leading solar services companies - succinctly states the case for existing technologies in his new book *Creating Climate Wealth: Unlocking the Impact Economy*: “We must invest money in deployment of existing technologies that drive economic growth and jobs, demonstrate the scale needed to impact climate change and offer compelling returns.”

Why Existing Technologies?

Despite a few naysayers, climate change “waits for no man.” Experimental renewable energy development is useful, but is it likely to have a significant impact on climate change in the next 10, 20 or 30 years when, at its current pace, climate change is likely to become irreversible? According to the International Panel on Climate Change, irreversibility will likely occur when the Earth’s surface temperature passes the 4° C threshold. In fact, many climatologists suggest that if we do not leave 80% of known fossil fuels in the ground over the next 20 odd years, we will easily pass the point of no return. But this is a bit of a digression.

Even though wind power on terra firma is now technologically well-established - producing reasonable returns and offering market rate power - can we wait another 20 odd years of government subsidized experimentation and development for the next new renewable resource to leave the drawing board? Is it worth the effort when such experimental renewable resources may have other shortcomings - such as the inability to satisfy more than a small fraction of worldwide electrical demand, or have a relatively insignificant impact on climate change, or have an indeterminate intermittency, or have a low capacity factor?

Is it also worth the effort when there are existing technologies that with advancement or refinement can create climate wealth

while having a significant impact on climate change now?

Already Deployed

Tidal range power is an existing technology. Successful modern tidal range facilities have been in continuous operation for decades, including a 240-megawatt tidal range facility in La Rance, France (in operation for about 60 years) and a 20-megawatt tidal range facility in Annapolis-Royal, Nova Scotia (in operation for more than 20 years). Tidal range facilities have also been seriously considered in the Bay of Fundy, Canada for a century and in Bristol Bay, United Kingdom for at least as long. Indeed, “tide mills” (grain milling facilities using the release of tidal waters captured in a reservoir behind an enclosure to turn a water wheel) have been in operation since the Middle Ages with more than 750 operating in the United States and Europe during the 18th and 19th centuries.

Notwithstanding the successful operation of several modern tidal range facilities, they have not proliferated.

This has been due principally to the environmental harm created by existing facilities, the perceived or anticipated environmental harm expected from some of the newly-conceived facilities, and the high cost of construction. Rather than focus on remedies or advancements in technology to resolve these issues, developers, government agencies and other promoters have shifted their focus to hydrokinetic forms of tidal power, or “underwater windmills,” if you will. However, the development of hydrokinetic tidal power is at a pre-commercial stage and, therefore, cannot provide any certainty that deployment at scale is possible, and it is unlikely to have any meaningful effect on climate change in the next 20 to 30 years. It would be prudent to consider existing technologies that can be exploited now.

What are the key advancements to tidal range power that could bring the resource to the forefront of clean renewable power?

The key to bringing any technology to market, beyond its efficacy, is the cost to end users. If the cost of electricity generated by a particular technology is far beyond current market rates, then the technology may require years of subsidy until costs are contained or the technology is improved. As mentioned in the June 2014 issue of the *Project Finance Newswire*, the cost of electricity from existing in-stream tidal pilot-scale projects is at least \$320 a megawatt hour. Nova Scotia is subsidizing the deployment of developmental and pre-commercial hydrokinetic tidal power devices at between \$375 and \$575 a megawatt hour. This is essentially the same evolutionary scenario that has played out with land-based wind power, with hydrokinetic sources of power potentially requiring several decades of improvements before

commercial-scale deployment and power production at or about market rates.

Possible Cost Reductions

In order to make tidal range power economic currently, something had to be done to reduce the cost of construction.

Historical embankment or barrage construction has consisted of substantial quantities of stone and earth placed at the narrowest part of an estuary. Even then, the cost of construction has proven to be prohibitive with the width of the barrage increasing exponentially with the depth of the surrounding waters. This is essentially the same as levee construction on the US Gulf coast or dike construction in The Netherlands. Not only is this type of construction expensive, it has been shown to be short-lived: witness the effects of Hurricane Katrina in New Orleans.

The construction of the La Rance tidal range project included the cost of two cofferdams and required four years to complete. After 60 years of operation, it now produces power for less than \$30 a megawatt hour; however, it took several decades to amortize the construction costs and bring electricity prices in line with or below market prices.

Tidal Lagoon (Swansea Bay) plc is currently considering a 320-megawatt tidal range facility using existing technologies in Swansea Bay, on the Welsh side of Bristol Bay. (See tidallagoon-swanseabay.com.) As the name of the company suggests, a tidal lagoon structure is being employed. Although similar to traditional embankment construction (a pyramid structure with a large base and narrow top), the project will use geotextile casings, known as “geotubes,” that will be filled with dredged sandy material from within the lagoon. Additional sand, small rocks and then larger rocks will protect the outer layer against degradation.

Unfortunately, this construction methodology may retain some of the shortcomings of embankment construction: it is meant for shallow locations as it becomes prohibitively expensive to construct at depth, construction time may be rather lengthy and removal is difficult at best. The low-head bulb bi-directional turbine technology to be used is similar to what Halcyon will deploy, although Swansea Bay will use a Kaplan-style runner blade. While Halcyon believes that its tidal range patented construction and operational methodologies are superior to those of Swansea Bay, the cost, scale and near-term deployment using existing technologies are probably sufficient to move the Swansea Bay tidal lagoon concept forward.

Rather than inventing a completely new technology to replace typical barrage or embankment / *continued page 64*

Tidal Power

continued from page 63

construction, Halcyon has borrowed two existing technologies — pile-supported technology perfected over several decades in the offshore oil and gas and bridge construction industries, and reinforced concrete resistant to seawater from the bridge and dam construction industries. (An article in *The Washington Post* on July 13, 2014 about the 50th anniversary of the construction of the Chesapeake Bay Bridge and Tunnel illustrated the use of concrete pilings driven in sand - not bedrock - to support the bridge.) By setting pilings in bedrock, prefabricating concrete panels on shore, floating or barging the panels to the facility site and locking them between the pilings, Halcyon has reduced the cost of constructing a tidal range enclosure by 50%, reduced construction time by 50%

Tidal range power has the potential to reach scale quickly with some changes in how the projects are built.

and permitted construction of a “Halcyon enclosure” at depth and over long distances, creating tidal lagoons that avoid sensitive estuarine environments.

This prefabricated modular construction method permits step-wise construction, carried out almost exclusively from the water side, without the need for a cofferdam or other construction enclosure. It also permits ready decommissioning of the facility at the end of its useful life, an unlikely event for traditional embankment or barrage construction. Illustrations of the Halcyon enclosure can be found on the Halcyon website at halcyontidalpower.com.

What does a 50% reduction in cost mean to the price of electricity provided by a Halcyon tidal range facility? In the first instance, it means that special government subsidies are unnecessary to support the development, construction and operation of the facility. Depending on the jurisdiction, it may also mean that such a tidal range facility will produce power at current market prices out

of the gate. In almost all cases, it means that the price of electricity produced will be below market prices after amortizing the cost to construct over 20 years.

Complaints

The ability of a Halcyon tidal range facility to avoid sensitive estuarine environments is a perfect segue to the further reduction or elimination of environmental harm caused by traditional tidal range facilities, the remaining key to the proliferation of tidal range power. Halcyon can now locate its tidal range facilities along shorelines, creating tidal lagoons that do not enclose sensitive estuaries. Along with a construction methodology that limits or avoids environmental harm, Halcyon has also engineered an advanced operating cycle from existing technologies. In collaboration with the hydro turbine division of

Alstom Power, Halcyon has taken bulb turbines off the shelf and will be deploying them horizontally at the base of its enclosure, generating power at both the ebb and flood tides as well as using them as high-volume pumps during slack tides to realign sea water (within the basin created by the Halcyon enclosure) with the natural intertidal zone.

This effort is critical to maintaining natural hydrology, preventing sedimentation and otherwise maintaining the marine environment. As feeding or migrating fish and invertebrates move in and out of the basin, care must be taken to assure that most, if not all, are able to do so unscathed. Most of the fish and invertebrates will have little difficulty moving through the three-meter diameter turbines themselves or through the sluiceways, which will be open at various times throughout a tidal cycle. However, in order to accommodate the normal activity of marine life, Halcyon and Alstom have further modified the bulb turbines by reducing the number of impellers from four to three, by thickening the leading edges of the impellers and by reducing the speed of the impellers through gearing modifications. Furthermore, safeguards will be put in place to prevent cetaceans or other large marine mammals from entering the basin or at least guiding them away from the turbines. Finally, Halcyon will make special accommodation for unique species that use the basin on a

case-by-case basis.

Another complaint levied against tidal range power is the use of an enclosure. Many detractors have likened the enclosure to a dam. The definition of a dam is a barrier that impounds water or diverts water from its natural course. Hoover Dam is a dam because it impounds a large portion of the water volume from the Colorado River in Lake Mead. Existing tidal range facilities share most of the attributes of a dam: they impound water, produce power only on the ebb tide, change the characteristics of the intertidal zone and ultimately fill the basin with sediment.

This is not the case with a Halcyon tidal range facility, which produces power on both the ebb and flood tides without impounding or diverting water from its natural course, maintains the natural intertidal zone, with pumping if necessary, and sustains the natural hydrology of the water, preventing sedimentation. While obviously of lesser importance, a Halcyon enclosure does not look like a typical dam either, as over 75% of the enclosure lies permanently below the surface of the sea. The portion of the enclosure sitting above the water line can be modified to accommodate aesthetic considerations.

Best Sites

Where are tidal range facilities likely to be deployed?

The website GreenRhinoEnergy.com suggests that there are only five regions in the world where tidal range power could be generated. It is assumed that this site determination was based on the economics of those facilities where the tidal range is more than eight meters (the distinguishing criteria apparently used). This conclusion appears to be drawn from facilities using typical embankment or barrage construction rather than the far less expensive Halcyon enclosure construction methodology. With Halcyon advancements, a tidal range facility can be constructed efficiently and economically, on five continents, not just five regions, as well as many more locations on these continents. Please see the seminal work on tidal power by L.B. Bernshtein, *Tidal Energy for Electric Power Plants*, published in 1961 and translated from the Russian in 1965, for a discussion of these locations.

Halcyon is currently developing a 25-megawatt facility in Cobscook Bay, Maine and considering an 1,100-megawatt facility in Scott's Bay, Nova Scotia. It is also proposing to develop a facility on the English side of Bristol Bay. The Cobscook Bay power plant, sized to be the "showcase" Halcyon tidal range facility, is economically viable at five meters of tidal range. In sum, Halcyon intends to construct its facilities as tidal lagoons

along shorelines in places where the tidal range is approximately five meters or more, such as the Bay of Fundy and Bristol Bay, where, in actuality, several of these facilities could be considered without altering the natural hydrology.

Tidal range power deserves a serious second look by the renewable energy and clean tech sectors and, in particular, the ocean energy subsector. ☺

Latin America: Practical Insights from Developers

What practical lessons are developers taking away from projects in Mexico and Chile? How do risk-adjusted returns compare on Latin American projects to projects in the United States?

Four developers — one wind, one solar, one geothermal and one hydroelectric and coal — discussed these and other questions at the Chadbourne 25th annual global energy and finance conference in late June. The panelists are John Haberl, a director with The AES Corporation, Natalie Jackson, managing director for project finance at SunPower Corporation, Greg Raasch, co-founder and executive vice president of geothermal developer GeoGlobal Energy, and Niels Rydder, CEO of wind developer Oak Creek Energy Systems. The moderator is Todd Alexander with Chadbourne in New York.

MR. ALEXANDER: Niels Rydder, it is a big world. You have worked in many different countries. Why pick Mexico as your next focus?

MR. RYDDER: We picked Mexico about two and a half years ago when we started to sense the opportunities in the US were waning. I have been here for 30 years, and there have been many times when we have had to take a break from the US market because production tax credits have expired. Each time, we looked elsewhere so that we could maintain a stable business. The first time, we went to Europe and then to Canada and now to Mexico.

MR. ALEXANDER: Why Mexico?

MR. RYDDER: I work for a subsidiary of Marubeni Corporation. Unfortunately, my share of the market is limited to North America, so it is Canada, the US or Mexico. / continued page 66

Latin America

continued from page 65

We saw an opportunity in Mexico two and a half years ago, but I have to admit that is a totally different discussion than we are having today. The projects on which we have been working were under a legal regime that is about to change. [Ed. See “Mexico is Set of Open its Power Sector” in the June 2014 *Project Finance NewsWire* starting at page 32.] Many more opportunities are opening up. The Mexican market will soon be in transition. Whether we should stay in Mexico is actually another question.

MR. ALEXANDER: We will come back to that. Natalie Jackson, SunPower is owned 60% by the French oil company Total. You, too, have the whole world to choose. Why are you devoting so much energy to Mexico and Chile?

MS. JACKSON: We have been thinking about where we want to focus after 2016 when the current tax subsidies for solar expire in the United States. We have identified certain markets, but we continue to explore others, particularly in the Middle East and Africa because of Total’s presence there.

We began looking at Latin America two years ago. We identified Mexico and Chile as two of the most attractive markets based on sunlight and the political and regulatory climates. It was helpful that Total already had people on the ground in both countries.

We are in the middle of building our first large project in Chile in the Atacama desert. We are the solar panel supplier and EPC contractor. For future projects, we are co-developing with Total, and we are looking to hold an equity position as well.

It was possible two years ago to see that changes were coming to Mexico, but we saw opportunity in Mexico even before the latest changes. Given the possibilities that we see with the changes, we are pretty excited about it, but we recognize that it will develop on a slower time frame than Chile. We have offices now in Mexico and Chile, and we are actively developing our second and third projects in Chile.

MR. ALEXANDER: Greg Raasch, why Chile?

MR. RAASCH: GeoGlobal Energy is the other renewable, geothermal. We have to go where the resource is, and it turns out that Chile has some great geothermal resources. Chile is blessed with 10% of the world’s volcanoes, and there is a huge need for power in Chile. Some of you may have read that last week the government finally cancelled the Hydro Aysen hydro-electric project, which removes 2,500 megawatts from the

10-year plan, so Chile is a great place to do business, and it is going to be an exciting place in the next five to 10 years.

MR. ALEXANDER: John Haberl, AES was a pioneer years ago in Chile.

MR. HABERL: Our strategy has changed over the last couple years and may change again. We used to be in 28 countries. We have been selling assets that no longer fit our strategic plan. We remain in 21 countries today. Chile and Mexico are two of those countries. We own a publicly-traded subsidiary in Chile that has about a \$4 billion market cap.

MR. ALEXANDER: Why exit seven other countries, but hold on to assets in Chile and Mexico?

MR. HABERL: We chose to remain in countries where we feel we have a competitive advantage. We have a very significant presence in Chile. We have 1,000 megawatts of additional generating capacity under construction in Chile. Our new strategy is to build in places where we have a presence and we think our development efforts will be more successful as opposed to the strategy in the past of going anywhere there was a deal. Similarly in Mexico, we have 1,000 megawatts: one project where we sell to the CFE and two self-supply projects. We have been more successful in self-supply, but with the new regulations, Mexico will become an area of increasing focus.

Mexico in Transition

MR. ALEXANDER: Clients are always asking lawyers where we see new deals as a way of picking up market intelligence. My answer the last few years has been Mexico. I have been telling them everybody is looking at Mexico, and the country looks fantastic.

However, I was just down there a few weeks ago and, with all the reforms that are going on, it looks horrible, especially for renewable energy projects. Everything seems paralyzed.

Niels Rydder, your company is a developer with long experience in these markets. Which of these two views is more accurate?

MR. RYDDER: The primary focus in Mexico currently is a little like it was in the US last year. We are trying to preserve as many projects as possible through grandfathering. The primary focus of the wind association, for example, is to decide which projects can be grandfathered under the old rules and which projects work under the new rules. It is not yet clear how projects work under the new rules.

As a developer, you want everyone else to stay away from Mexico and leave it to us. We are perfectly happy to be alone in that market.

MR. ALEXANDER: Natalie Jackson, the solar market has not been great in Mexico. Only one large project has been done to date.

MS. JACKSON: The country has favored wind. The sole large solar project was a merchant deal in Baja. We are all waiting to see the new rules for opening the power sector to more private investment and specifically what happens to renewables. We expect that the rules will be more favorable than they have been. The solar resources are great in certain parts of Mexico. We have been actively developing projects in the country for a little over a year and a half, and we have found some good sites. Our plan is to focus on a couple projects where we are pretty advanced in terms of getting permits in the hope that those projects will be grandfathered. These are self-supply projects rather than under the small producer contracting scheme.

Merchant in Chile

MR. ALEXANDER: Let me shift focus to Chile. Unlike Mexico, Chile is not in the midst of structural reforms. Developers usually do not feel they have a project until they have signed a long-term power purchase agreement to sell the electricity. Chile seems to be moving in a unique direction with lenders willing to finance merchant projects. John Haberl, how important is it to AES to have a PPA in Chile?

MR. HABERL: The market in Chile is well functioning, so people will take some merchant exposure.

One of our new projects currently under construction is at a mine, and we were able to get contracts in place prior to construction so that the financing was arranged on a partly contracted basis with the lenders taking the remainder of the merchant risk going forward.

Our other new project is a hydroelectric facility. It was a lot more difficult to get a contract for it because the construction period is so long and offtakers do not want to wait five years, and there is some uncertainty around when the project will be finished, so we went to the banks and asked whether they would finance the project on a merchant basis. Most said no, so we ended up relying on the multilateral lending institutions. The multilaterals have a good understanding of the market and actually, in some cases, preferred that we not enter into a contract because of their experience with a contracted hydroelectric project where construction was delayed. The local banks in Chile were also comfortable with the market and were willing to let us go into construction with no contracts. We have an obligation to put contracts in place during construction.

MR. ALEXANDER: Why is AES comfortable taking merchant risk in Chile?

MR. HABERL: We know the market very well. We are a top-three power producer in the country. The hydro project is not far from Santiago, which is a major load center. The project is zero variable cost, so it will always be dispatched. In the north of the country where our mine project is located, it is a little more difficult because the merchant markets have been soft and there is competition from gas with nearby LNG facilities. So we ended up on the project contracting for 100% of the electricity output before closing.

MR. ALEXANDER: Natalie Jackson, does SunPower have the same view as AES of merchant risk in Chile?

MS. JACKSON: Our first project is fully merchant and was financed with the Overseas Private Investment Corporation. We could not have secured financing from the commercial banks either locally or internationally.

Our next projects will not be merchant. Our management is not comfortable moving forward with another merchant project at this point, so we are looking actively for offtakers. The challenge with talking with the mining companies is they are looking for 24-7 power. That is not what a solar project produces.

There are a lot of solar developers chasing contracts, and the offtakers do not want to commit until they know there is a viable project. Many of them are saying we will contract with you when you complete the project. That is not very helpful for financing.

We are finding that there are local commercial banks and a couple international commercial banks that will agree to a pretty low debt service coverage ratio for the contracted piece of the project and a different debt service coverage ratio for the merchant piece with an ability to borrow more if you add a PPA later.

Chile is also talking about possible reforms. The way the local electric distribution companies are procuring power is not very favorable for renewable energy. We are hoping that some of that will change.

MR. ALEXANDER: It does not take long to build a solar photovoltaic project. Have you given any thought using your own equity to build and then financing the projects after they are in service?

MS. JACKSON: We are weighing out all our options. We would like to be in construction with our next project by late 2014 or early 2015.

MR. ALEXANDER: Greg Raasch, will you / *continued page 68*

Latin America

continued from page 67

start drilling geothermal wells in Chile before you have a power contract?

MR. RAASCH: We did.

MR. ALEXANDER: I guess you will then. [Laughter.]

MR. RAASCH: Two years ago, we drilled the largest geothermal well in Chile and for that matter in South America. It is a 12-megawatt well. We decided on that basis to move ahead with building a demonstration plant. It will be the first geothermal power plant in Chile. The PPA market is poorly developed in Chile. It is hard to get a long enough tenor, and the PPAs impose terms that make projects difficult to finance. Therefore, we approached the multilaterals, and we got term sheets from OPIC, the Inter-American Development Bank and the International Finance Corporation. We also got some interest from commercial banks, especially ING, which had just worked with us on a successful project in the US. We have had no trouble going merchant with the international financial institutions. The 5-year running average for spot prices in Chile is \$151 a megawatt hour, so merchant does not look bad in Chile.

Crime in Mexico

MR. ALEXANDER: Let's focus on some other practical advice for developers. Niels Rydder, when you first went into Mexico, how did you figure out the self-supply market and how to set up your own offtake arrangements?

MR. RYDDER: We bought into an existing company, so we did not start from scratch. The company we bought had been working on projects in Mexico for five years, and we bought into the company two and a half years ago. We kept part of the existing team obviously because it is best to assume when entering

a new country that you do not know anything. Our biggest concern in Mexico is in which part of the country to focus our efforts. We chose to be where fewer people are and that means you have security issues, and transmission from such locations is always a big issue.

MR. ALEXANDER: Your project is in northern Mexico in Tamaulipas. By security concerns, do you mean police-type security?

MR. RYDDER: It is different.

MR. ALEXANDER: So we are not talking about a security interest. How do security concerns factor into your risk-adjusted return?

MR. RYDDER: The way to deal with security in Mexico is to take the concern seriously. You choose contractors and suppliers who have done projects there and have dealt with the situation and can demonstrate how they mitigate the security issue and have the presence to handle it.

MR. ALEXANDER: How receptive have you found the bank market to projects in areas where security is a concern?

MR. RYDDER: Many investors and turbine manufacturers do not want to deal with it. You have a much smaller selection of manufacturers who want to sell you turbines in those areas. Many investors do not want to do the extra diligence to understand the situation and evaluate our risk mitigation strategies, but you also have investors who see things as we do and see that if we can solve the problem, the lack of market competition is a good thing. We have to compete with all the biggest companies in the world like AES. As a small company, we have to sneak into an area where they do not want to be. Even though we are a part of a big company, we are operating as a small company.

Rates of Return

MR. ALEXANDER: John Haberl, what returns are you getting on your projects in Chile? How do they compare to the United States? Do you view Chile as a better investment than the United States in terms of risk-adjusted returns?

MR. HABERL: Chile is a core market for us, and we view it pretty much identically as the United States.

A lot of attention currently in Mexico is on identifying projects that can claim grandfather status under the old rules.

MR. ALEXANDER: So are you looking for returns under 10%?

MR. HABERL: We actually have not done much in the United States recently. We have done more in Chile. In Mexico, we have been looking for more of a premium. The one thing that we do to help our returns is we try to be more efficient with our capital by selling down a piece of each project. For example, we sold 40% of a project recently to a Japanese partner, who then brought financing from an export credit agency. We sold 40% of another project to another investor who brought a PPA.

MR. ALEXANDER: Is 40% a magic number?

MR. HABERL: We want to maintain operational control. A lot of these players have cheaper forms of capital than we do.

MR. ALEXANDER: Natalie Jackson, you will be one of the first movers in solar in Mexico. Is that an advantage or a disadvantage?

MS. JACKSON: We are not planning currently on maintaining majority equity positions in our projects. We are looking for both debt and equity investors. Mexico is a great international banking market, but there are also local development banks like Banobras and Nafin that offer really attractive pricing and longer tenors and are anxious to do solar.

MR. ALEXANDER: What returns are you looking for in Mexico, and how do they compare to return in the United States and Chile?

MS. JACKSON: We work backwards from what we think equity investors will require. As a minority equity participant, we have our own thresholds that we set on a case-by-case basis. We are more complicated than other companies because we are a vertically-integrated supplier of solar panels for these projects. All of that said, Chile is attractive and more competitive than Mexico, say 11% to 13% in Chile for a contracted project on a levered basis and Mexico is a little higher in the mid-teens.

MR. ALEXANDER: Greg Raasch, what are your returns in Chile?

MR. RAASCH: We have been looking at projects in Chile with returns in high teens to as high as 20% to 21%.

MR. ALEXANDER: How does that compare with a project in Germany or the US?

MR. RAASCH: We have some projects in Germany that we are looking to finance currently, and the returns on them are in the mid-20s. You are probably thinking, "Germany? I didn't know they have volcanoes in Germany." Germany is one of those places where, if you drill deep enough, it gets hot enough. The government is shutting down the nuclear power plants and

looking to establish a viable renewable energy industry of which geothermal is a part.

Germany enacted a very attractive feed-in tariff. Germany is an incredible opportunity because it is low risk and high return.

MR. ALEXANDER: How about Chile?

MR. RAASCH: Chile has good returns but, at the same time, the geothermal industry is in startup there. The first person in is going to pay a higher price. It is always costly to get started. The resources look good, but there is start-up risk.

Financing Terms

MR. ALEXANDER: Natalie Jackson, what terms are you getting from the multilaterals and banks on financings in Mexico and Chile?

MS. JACKSON: For Mexico, longer-term financing is available at fairly attractive rates. The local development banks are more interested in lending pesos, so we will have to involve an international bank in the syndicate that can lend in dollars. We are also looking at tapping into the project bond market, but any such financing would have to be in the US in dollars.

MR. ALEXANDER: Niels Rydder, same question.

MR. RYDDER: We are financing our first project with OPIC. We talked to the commercial banks initially, but commercial bank debt was going to be hard to arrange on terms that worked for the project. I think project bonds are the way to go ultimately, but Mexico has to turn into a more mature market before that is an option.

MR. ALEXANDER: John Haberl, your hydroelectric project in Chile was financed by the development banks, which is surprising given that Chile is a fairly developed market. Was the problem the bank market is not deep enough to do a project of the size you are building?

MR. HABERL: The development banks were able to participate because there is a lot of risk involved. We are digging 67 kilometers of tunnels. There is merchant risk. They stepped up because they recognized that the project was not going to happen unless they came in.

They did not lend all of the debt — they put in about half — but that provided a seal of approval for the project that caused some local banks to come along as part of the syndicate.

We could not have done a coal-fired power project with the development banks, but hydro is good. The project had a limited environmental impact, although the / *continued page 70*

Latin America

continued from page 69

development banks made us do a lot more environmental diligence than usual.

The other project we have under construction is a coal-fired power plant, so the development banks are out. We had power contracts. We brought in a partner who could deliver an export credit agency, which lent a large amount of money, and we raised the rest from commercial banks.

We funded about \$3.4 billion in projects last year in Chile. We put in about \$600 to \$700 million in equity. We raised other, local equity. We sold corporate-level bonds to raise all but \$100 million of the AES equity investment. The coal project was not down the middle of the fairway. It is a brownfield development from an existing facility, and we have a lot of shared services and infrastructure. The project does not necessarily work without the other project. This made for complicated discussions with the lenders.

MR. ALEXANDER: So there is a lot of liquidity in the market for projects in Chile?

MR. HABERL: In my view, yes.

MR. ALEXANDER: The hydroelectric project is over \$1 billion, correct?

MR. HABERL: You cannot just go to commercial banks and say, "I want to borrow \$1 billion." The market is not deep enough to do that. You have to have an export credit agency or multi-lateral lending agency willing to lend a significant percentage of the capital.

MR. ALEXANDER: Greg Raasch, how deep is the market for debt in these countries and how do the lenders view geothermal?

MR. RAASCH: Debt is not an issue. The Chilean pension plans are very active, and there was a lot of interest expressed by local banks, but none of them has geothermal experience. That is another way of saying we did not have much success with local banks, which is why we ended up going with the international financial institutions. We ticked all their boxes, so there was a lot of interest from them in doing the first geothermal project in Chile.

Disadvantaged US Equity

MR. ALEXANDER: Have you seen more appetite from Europeans and Asians to invest in Chile and Mexico than from Americans? From what I have seen, it looks like American investors are demanding higher returns.

MS. JACKSON: We have seen a lot of interest from European and Asian funds on the equity side, but when you say American investors, what do you mean?

MR. ALEXANDER: I mean US-sourced equity.

MS. JACKSON: That is available, too, but US-based funds tend to have higher hurdle rates.

MR. RYDDER: I can confirm that. There is also a tax issue. The tax treaty for US investors is really bad, so an American investor would have to invest through an offshore blocker corporation, which complicates things. This puts American investors at a disadvantage when competing with Asian, European and Canadian investors.

The other reason is American investors are more concerned about peso risk. Every American investor to whom I talk wants to discount the pesos. Local investors have a different view. The gap in views can be quite large for projects with long-term contracts.

MR. ALEXANDER: We have time for one more question. In the back of the room.

MR. CRESWELL: Lachlan Creswell from Macquarie Capital. There are energy reforms underway in both Mexico and Chile. Both are high-priced markets, and that is part of the driver for energy reform. Both countries have high-quality renewable resources. Do you think that the renewable industry has a big enough voice in the policy debates to push for better structures and incentives? Natalie Jackson spoke about the difficulty getting PPAs in Chile and the uncertainty that wind developers are facing in Mexico.

MR. RYDDER: One thing to pay attention to in Mexico is Mexico wants to get to 35% renewable energy by 2024, within 10 years. There is strong political support in Mexico City for renewables. There is more support there frankly than there is currently in Washington.

MR. RAASCH: Chile has a 10% renewable portfolio standard of sorts that must be fulfilled by 2025. The government is very responsive to renewables. There is a bill moving through the Congress to add a \$5-a-ton carbon tax on all projects. Chile is a neo-liberal economy; it has a free market, and the government does not like to get too involved, but the government is strongly behind renewable energy. ☺

Environmental Update

New proposed rules that the US Environmental Protection Agency issued in early June to limit greenhouse gas emissions from existing power plants have been met with both a chorus of praise and a political and legal battle intent on defeating the proposed rules or delaying their implementation.

A coalition of 12 states sued EPA in federal court in August to try to derail the rules. The 12 states all rely heavily on coal. They are Alabama, Indiana, Kansas, Kentucky, Louisiana, Nebraska, Ohio, Oklahoma, South Dakota, South Carolina, West Virginia and Wyoming. The latest suit follows another suit filed in June by Murray Energy Corporation, one of the nation's largest privately-held coal mining companies.

These lawsuits, and those that will inevitably follow, begin what is sure to be protracted litigation testing whether the government has authority under section 111(d) of the Clean Air Act to pursue reductions in carbon dioxide emissions from existing power plants in the manner it proposes. EPA has proposed individual carbon dioxide emissions rates for the power sector in each state, and the states would then have to find ways to meet the standards.

The plaintiffs argue that the proposed rules are illegal because power plant emissions are regulated under another section of the Clean Air Act. The US Senate and House arguably had different and unreconciled interpretations of how emissions from stationary sources like power plants could be regulated under the 1990 amendments to the Clean Air Act. Both lawsuits argue that if an industry is regulated under section 112 of the Clean Air Act, as power plants are, then it cannot also be regulated under section 111(d) as EPA seeks to do under its proposed rule.

The government response is that if a pollutant is not regulated under section 112, as is the case with carbon dioxide, then it can be regulated under section 111(d). EPA is expected to ask the courts to dismiss the lawsuits, relying on the deference traditionally given to federal agencies to interpret ambiguous statutes.

Public Hearings, Praise and Protest

The rules limiting greenhouse gas emissions from existing power plants are expected to be reissued in final form by June 1, 2015, and states have to submit their plans to the EPA

by June 30, 2016 for approval. In advance of both deadlines, the agency is required to hold public hearings and receive and respond to public comments. EPA held its first public hearings on the proposals in several cities, including Atlanta, Denver, Washington, D.C. and Pittsburgh. Protestors showed up at several of the hearings. The agency has received close to a million comments, most by email.

Critics of the new proposed rules say they will cause some coal-fired power plants to close, killing jobs and hurting the economy. They also argue that the US cannot go it alone on global warming (ignoring the efforts being made by European countries), while the broader world is using more coal and more fossil fuels every day. EPA was also criticized for not holding hearings in states that rely most heavily on coal. The coal industry says the new rules would largely preclude states from relying on coal to generate electricity. Industry groups have called on EPA to conduct additional economic analyses before issuing a final rule.

Environmental groups argue that industry has historically overestimated the cost of complying with air pollution regulations in an attempt to scare the public. Coal-fired power plants are the single largest domestic source of greenhouse gas emissions in the nation. Many environmental groups are pushing for greater emissions reductions from the power sector through increased investments in renewable energy, energy efficiency and demand reduction programs.

The Environmental Protection Agency estimates that its new rules for existing power plants would reduce greenhouse gas emissions by 30% by 2030 from 2005 levels at a cost to the power industry of \$8.8 billion through 2030. However, it also sees between \$55 billion and \$93 billion in offsetting savings in health care costs by 2030. It says it has given states enough flexibility in determining how to meet their individual goals that states that use coal currently could continue to do so.

Many state regulators support the EPA rules, but some states that need their legislatures to pass new laws are asking the agency for more time to comply. Some southern states are also asking the agency to give them more credit for actions they have already taken to reduce greenhouse gas emissions.

The comment window will remain open through October 16.

/ continued page 72

Environmental Update

continued from page 71

United Nations Climate Summit

President Obama will attend a one-day global leader summit on climate change on September 23, 2014 at the United Nations. The focus of the summit is an international agreement that world leaders hope to reach in 2015 on how to address climate change. The summit will be held as part of the 69th session of the UN General Assembly, which runs from September 16 to 29 in New York.

The climate summit will allow world leaders to make additional pledges in advance of the 2015 international climate negotiations in Paris. The hope is that an agreement can be reached in Paris on reducing greenhouse gas emissions to limit global temperature increases to two degrees above current levels.

Any global climate agreement that would not go into effect until 2020.

The world's largest emitters of greenhouse gases, China and the US, recently pledged to work cooperatively toward a global climate change agreement in 2015. These pledges were made during a strategic and economic forum in Beijing in July. Carbon emissions have begun to decline slightly in a number of wealthy countries, including the US, but the gains are being lost to emissions from rising economic powers like China and India.

Chinese Solar

China added 3,300 megawatts of new solar generating capacity in the first six months of 2014. Of this amount, 2,300 megawatts were utility-scale photovoltaic power plants. Distributed solar made up the rest. This is double the new capacity additions in all of 2013. China now has 23,000 megawatts of solar capacity. China is making a push to install more renewable energy to help address its significant air pollution problems.

— *contributed by Andrew Skroback in Washington*

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