

VERO BEACH UTILITIES COMMISSION MEETING
Tuesday, April 12, 2016 – 9:00 a.m.
City Hall, Council Chambers, Vero Beach, Florida

AGENDA

- 1. CALL TO ORDER**
- 2. APPROVAL OF MINUTES**
 - A) February 22, 2016 – Special Joint Utilities Commission / Finance Commission Meeting**
 - B) February 25, 2016 – Joint Airport Commission / Utilities Commission Meeting**
 - C) March 8, 2016 – Regular Utilities Commission Meeting**
- 3. PUBLIC COMMENT**
- 4. NEW BUSINESS**
 - A) State Representative Debbie Mayfield to Discuss HB579 and Indian River Lagoon Cleanup Tax**
 - B) Optimization Study Presentation – Power Services**
 - C) Quarterly Report on Power Outages – James O’Connor and Ted Fletcher**
 - D) AWWA Public Affairs Advisory on Lead and Copper Rule (LCR) – Rob Bolton**
 - E) Water Sampling Program – Rob Bolton**
 - F) Measures the Community Can Take to Reduce Contaminants Within Their Water – Rob Bolton**
 - G) Follow-up to FMPA Presentation on Solar Power– Robert Auwaerter**
 - H) Potential Cybersecurity Vulnerabilities in our Utility Systems – Robert Auwaerter**
- 5. OLD BUSINESS**
- 6. CHAIRMAN’S MATTERS**
- 7. MEMBER’S MATTERS**
 - A) Possible Change in Day/Time of Commission Meetings**
- 8. ADJOURNMENT**

This is a Public Meeting. Should any interested party seek to appeal any decision made by the Commission with respect to any matter considered at such meeting or hearing, he will need a record of the proceedings and that, for such purpose he may need to ensure

that a record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based. Anyone who needs a special accommodation for this meeting may contact the City's Americans with Disabilities Act (ADA) Coordinator at 978-4920 at least 48 hours in advance of the meeting.

SPECIAL CALL JOINT UTILITIES / FINANCE COMMISSION MINUTES

Monday, February 22, 2016 – 9:00 A.M.

City Hall, Council Chambers, Vero Beach, Florida

PRESENT: Finance Commission: Chairman, Peter Gorry; Vice Chairman, Glen Brovont; Members: Nathan Polackwich, John Smith, Alternate Member #1, Daniel Stump and Alternate Member #2, Victor DeMattia **Utilities Commission:** Members: Chuck Mechling, Judy Orcutt, Stephen Lapointe, Bill Teston, Laura Moss, Indian River Shores Alternate Representative, Richard McDermott, Jr., and Alternate Member #1, George Baczynski **Also Present:** City Manager, James O'Connor and Deputy City Clerk, Sherri Philo

Utilities Commission Excused Absence: Robert Auwaerter

Finance Commission Excused Absence: Kathryn Barton

1. CALL TO ORDER

Mr. Gorry called today's meeting to order at 9:00 a.m. He explained that he would be running today's meeting as the Utilities Commission does not have a Chairman or a Vice Chairman present. He noted that if a vote is to be taken today each Commission would make a separate motion. He pointed out that what they are hearing today on the stormwater management only applies to the customers who live within the City of Vero Beach.

2. PUBLIC COMMENT

None

3. PRELIMINARY REPORT / STORMWATER UTILITY STUDY – COLLECTIVE WATER RESOURCES, LLC

*Please note that questions and discussion took place throughout today's presentation.

Mr. Monte Falls, Public Works Director, reported that he and Mr. Matt Mitts, Assistant City Engineer, would be giving a brief Power Point presentation of the stormwater system in the City and then Ms. Amelia Fontaine, Collective Water Resources, LLC, would be presenting their study. He explained that the goal for today is to get the Finance/Utilities Commission's recommendation on if they want to proceed in looking into a stormwater utility and if so, they need to look at the rate structure and billing method.

Mr. Gorry said that he didn't know if they had sufficient time to contemplate making a specific recommendation on the rates and the structure.

Mr. Falls explained that they were not looking for the rates, but the rate and billing methodology.

Mr. Mitts said before they discuss a stormwater utility, he felt it was important for them to discuss stormwater and what the City does related to it. He said when it rains the water hits the ground and turns into stormwater runoff. That runoff is a source of pollution because everything that water encounters on its way to the river is a source of pollution, such as fertilizer, grass clippings, etc.

Mr. Mitts and Mr. Falls gave a Power Point presentation on *Stormwater Management in the City of Vero Beach – An Overview of the Past, Present, and Future State of Stormwater Management Goals for the City and Indian River Lagoon* (attached to the original minutes). Mr. Falls referred to the slide, *2015: Royal Palm, Miracle Mile, and Vero Isles*. He explained that on the map the pipes are shown in blue and the ditches are shown in orange. They have 77 miles of pipe in the ground, 43 miles of ditches, and somewhere around 6,000 drainage structures. The value of this infrastructure is estimated in the neighborhood of \$25 million dollars. The bulk of the infrastructure was installed prior to the 1990's. This means that most of it is approaching 50 years old, which is considered the design life of a lot of this type of infrastructure. So, if they were to get on a 50 year replacement cycle, it would cost about \$500,000 dollars a year in repair and replacement (R&R) for that system. Mr. Mitts referred to the slide, *Stormwater Infrastructure – Flood Protection*. He noted that is just to move stormwater and flood protection. There is no treatment in place. Mr. Falls referred to the slide, *Treating and Moving Stormwater – 2010 Humiston Park Project – A Success Story*. He said they chose this project to highlight the difference between a water quantity or just moving stormwater to a water quality or treating stormwater project. He referred to the pipe that discharges into the ocean in the Humiston Park area. He said prior to 2010, all the water that drained from Ocean Drive was collected at Easter Lily Lane and pumped directly into the ocean. From 2001 to 2009, they had 21 recorded beach closures because of bacteria in the water. In 2010, the City constructed an exfiltration system on top of the dune in the grassy area of the Park. Now when the water is collected instead of the water being pumped directly into the ocean it is pumped into the exfiltration system, which allows the water to percolate back into the groundwater. With the installation of this they have reduced the discharge into the ocean by 90%. Only when there is a very large storm event that the system can't handle all the runoff from the road is any water discharged into the ocean. Since this system was installed there has not been one (1) beach closure due to water quality.

Ms. Amelia Fontaine, of Collective Water Resources, LLC, reported that they were contracted by the City to do a Stormwater Utility Study. They completed the preliminary analysis and evaluation of options for the rate structure and billing method. They have estimated the projected total billable Equivalent Residential Units (ERU's) and projected revenue in looking at

all the parcels within the City. She noted that there are more details in the Stormwater Utility Report that the Commission members received than what she would be providing in today's presentation (report on file in the City Clerk's office). She then gave a Power Point presentation (attached to the original minutes).

Mrs. Moss said after reading the Brevard County Study, it was her understanding that there is runoff on the surface and then there is a base flow, which is absorbed by the soil, which will also have an impact. She asked Ms. Fontaine if they accounted for both of these.

Ms. Fontaine answered yes. She said they looked at the water table elevation throughout the City when they looked at the pervious area.

Mr. Brovont said they only looked at 20 houses out of 5,000. He felt that was a small number to look at.

Ms. Fontaine said they can get more accurate results if they look at more parcels, which they discussed with City staff.

Mr. Gorry asked if there is a Park that has parking spaces, does that count as impervious. He asked is that counted as developed or undeveloped.

Ms. Fontaine explained that the building impervious areas throughout the City are defined. The non-building imperviousness, including parking lots, is where the sampling came in. She said they would not be accounting for parking areas at a Park at this point.

Mr. Brett Cunningham, of Jones Edmunds and Association, Inc., referred to Mr. Brovont's question regarding the 20 parcels. He explained that for all parcels it is important to understand that there is some record of imperviousness in the Property Appraiser's data. What they don't have is a complete record of all the imperviousness so their analysis was to try and fill in the gaps. For example, a typical residential within the City might have about 3,500 square feet of imperviousness and of that maybe 2,500 to 3,000 square feet is accounted for in the Property Appraiser's data so they did the sampling to try to estimate the gap. He said the purpose was to try to do something fairly quick to come up with a good estimate of the number of ERU's.

Ms. Camille Tharpe, of Government Services Group, noted that this was the first pass at all the data. If the City decides to move forward there will be a lot more rigorous analysis of the impervious area information. She briefly went over the billing methods of the Power Point presentation with the Commission members. She referred to the slide, *Billing Methodology Pros and Cons*. She noted that there is a third method, which is a separate bill, but it is not recommended because they have two (2) strong methods for collection. However, the separate

bill could be used in cases where the City might not have met the statutory deadlines to put it on the tax bill or if there were some issues to putting it on the utility bills right away. She explained that they could send a separate bill for an interim period and eventually roll it into the tax bill or the utility bill. She noted that all three methods could be used together.

Mrs. Moss said the City does not have a separate stormwater utility at this time and it is her understanding that would require a referendum. At this time it is handled through Public Works. She asked does the billing methodology take that into consideration.

Ms. Tharpe answered no. She explained that the collection method is the City's choice.

Mrs. Moss asked what were their instructions.

Mr. Gorry asked Mr. Falls to address the issue of what it is and isn't in terms of who is going to manage it and where the manpower would come from.

Mr. Falls said if the stormwater utility is enacted it would still be managed through Public Works with the same staff they have today. No additional staff would be required.

Mr. Gorry said essentially the stormwater utility would be a funding mechanism managed by Public Works.

Mr. Falls said that is correct.

Mr. James O'Connor, City Manager, referred to Mrs. Moss's question. He explained that the only instructions given to the consultants were the feasibility and the design of a stormwater utility. They did not discuss referendums or anything else. They are looking at it from an engineering and scientific method.

Mrs. Moss said one reason she asked was because within the preliminary study they are recommending advertising to the public and they have to be careful as if it were to go to referendum advertising is prohibited.

Mr. O'Connor explained that advertising is for information only, such as today's meeting is for information.

Ms. Fontaine said they are asking the Commission members to make a recommendation on if they want to proceed, the rate structure, and the billing methodology.

Mrs. Moss asked how much money has been spent on the study.

Mr. Falls said about 50% of the project is completed. He said the City issued a scope of services with the first action to present their preliminary findings, which he thought the cost was around \$53,000 dollars. If they are going to move forward with the stormwater utility, they would take the study through the final phases, with the total cost being around \$100,000. If they are not going to move forward they would draw the line now and stop. He said staff is looking for a recommendation to bring to the City Council on if they want to move forward with the stormwater utility or stop here. If they are going to go forward staff would like their recommendation on the methodology on the rate structure.

Mr. Mechling asked Mr. Falls to go more in depth on the problem with the infrastructure that is currently in place.

Mr. Falls explained that the infrastructure that is in the ground started in the 1950's and went through the 1990's. He said they never know when something is going to happen because the infrastructure is aging.

Mr. Teston asked is there a like system outside the City limits.

Mr. Falls said they are discussing maintaining the infrastructure inside the corporate limits, which is needed. He said there are two components to it. One is the R&R of \$500,000 dollars a year based on the value and the age and the second being the water quality component of it. He explained that Indian River County has a system, but not a stormwater utility. The City of Fellsmere and the City of Sebastian have a stormwater utility. He said all the new developments in the County have their own stormwater system and after the 1988 time frame they all had a water quality component to them.

Mr. Mechling said U.S.1 goes through the City of Vero Beach and the stormwater runoff goes through the pipes. He asked whose responsibility is that.

Mr. Falls explained that it is in the City limits and is in the City's watershed, but maintenance is the Florida Department of Transportation's (FDOT) responsibility. He said the City has been working with FDOT over the past 10 years and all of the major outfalls that discharge into the lagoon have been treated with some type of baffle box.

Mr. McDermott asked how the current infrastructure was paid for over the years.

Mr. Falls said the funding source for the infrastructure that is in place was paid for by the one-cent sales tax. He said they have some grant funding to help with water quality projects. All the maintenance of the systems is from ad valorem taxes.

Mr. McDermott wondered why they were going elsewhere in trying to come up with complicated ways to pay for new infrastructure.

Mr. Falls said they have the need for about \$1 million dollars a year in infrastructure. They can continue to get the funding from sales tax revenue. The only other two funding sources that he knows of is increasing the ad valorem tax rate or enacting the stormwater utility. The stormwater utility would more fairly assess all the land and not just the land on the tax roll.

Mr. Lapointe said that he was interested on how incentives could be given to encourage responsible behavior.

Mr. Falls said there are credits that could be given. He explained that a site developed prior to 1988 would not have a water quality management system. A newer project would be eligible for some portion of a credit.

Mr. Brovont said the Study suggests that there will be some need for staff to help mitigate some of the credits property by property. He asked is that correct.

Ms. Tharpe said it would be incumbent of the property owner to apply.

Mr. Falls said it would be done with existing staff.

Ms. Fontaine referred to the process for credits and any adjustments to parcels. She said if they were to drive around a newly developed area throughout Florida they would see that almost all the private properties have a stormwater pond. When driving through Vero Beach you would not see that. Therefore, what they want to do is try to encourage private property owners to put in place best management practices to treat stormwater runoff on their own properties.

Mr. Gorry said if the City Council deems a stormwater utility is necessary and they don't have the stormwater funding mechanism, it is clear that they would do it 100% through ad valorem taxes.

Mr. Brovont said they have to be careful when construction costs are fiddled with as it may adversely impact the ability to maintain some houses and make them more viable to the current environment verses what they were built like in the 1950's.

Mr. Falls said in developing a commercial site today they are going to have to take a percentage of that land for stormwater management. He said developments, such as Miracle Mile that was developed in the 1960's, zero percent of that land has stormwater management.

Mr. Smith questioned using utility bills. He asked what happens with rental units. He said the ERU's are assigned by parcel and utility bills are by individual users.

Ms. Tharpe said they would prorate that parcel's impervious area on ERU's and the renter would pay it if they are the utility owner. With the tax bill collection method, the property owner would pay it and pass the cost to the tenant through their rent.

Mr. Smith said they would have to do that unit by unit.

Ms. Tharpe said if it is a condominium they would split it between the units. If it is a multi-family apartment they might do it on an average. There is not just one answer.

Mr. Brovont said in reading the study, they are recommending that the City go with Program 1B and with the utility billing system. He asked is that correct.

Ms. Fontaine said that is the recommendation given to City staff.

Mr. O'Connor clarified that this is just the initial stage of this discussion. He said there is no reason to spend any more money on this project if they don't want the stormwater utility. He said this gives them an outline, justification, the exercise, and the process. Staff has no position on the stormwater utility. They are just showing them a funding mechanism that they think is fairer than ad valorem taxes. He said if this is something they don't want to do then they need to tell staff. They needed to do the first phase of the study in order to educate the Commission members and the City Council.

Mr. Mechling asked could this be handled under the Public Works Department or were they talking about forming another entity in the City.

Mr. O'Connor said his challenge to Mr. Falls and to the consultants is that the City pays no labor costs out of the stormwater utility. The Public Works Department absorbs it. But, the City will be contracting out jobs, such as a pipe that needs to be replaced. The plan is there would be no additional manpower accredited to stormwater utility as assigned by a City employee.

Mr. Brovont said these funds would be dedicated exclusively for this use and would not bleed over into other divisions.

Mr. O'Connor said that is correct.

Mr. Smith said one benefit that he hasn't heard mentioned is if they go with the stormwater utility then this comes off the ad valorem tax. If they don't and leave it as it is, it is part of the revenue the City has to raise.

Mr. O'Connor said that is correct.

Mr. Teston said it is his understanding that staff is not asking for any type of recommendation other than a go or no go (to continue with the study or to stop).

Mr. O'Connor said they really have two questions. If it is a no go then it stops here and they don't need any more answers. If it is a go then staff would like a recommendation on how to do the billing.

Mr. Teston felt that more information was needed. It sounds great to put it on the utility bills, but there could be multiple utilities on one given property and the question would be how they would allocate the costs.

Mrs. Orcutt said that she attended the Indian River Lagoon Symposium and there was a question on seagrass and sadly the forecast for the lagoon is not good. She said seagrass is not anticipated to recover so she felt this was a very important thing for the City to move forward on. She said if they were going to do some water retention the City might have to purchase land or allocate some City land for water retention because there are areas, such as the downtown area, that has property where there isn't any space for water retention. Another thing being addressed in other counties along the lagoon is muck, which the City has not addressed. She felt that it was pointless to address the muck issue until they address what is going into the lagoon, but at some point they might need to do some muck dredging. She felt this was an important step in the right direction.

Mr. Falls said the muck problem is going to be more of a regional solution. He said there are three components to the City's stormwater operation. One is operation and maintenance, which is the \$700,000 dollars the City spends annually that is paid from ad valorem taxes. The other two components are capital components, which are water R&R and water quality. These two components are what they are discussing the need for a funding source, whether it be additional ad valorem taxes levied or a stormwater utility. Staff's position is that this work needs to be done and the funding mechanism is what they are looking at.

Ms. Cindy Lawson, Finance Director, explained that the situation the City is currently in is that all staff and personnel costs are part of the City's General Fund, which is paid for with ad valorem taxes. But, when they get to vehicles and the actual capital projects, currently they are part of Fund 304 that is funded by grants and mostly by one-cent sales tax. She said the City

takes in about \$2.3 or \$2.4 million dollars each year in one-cent sales tax and before they even start projects the City pays \$700,000 in debt service and \$400,000 to \$500,000 of capital lease purchases. Therefore, they historically have somewhere between \$600,000 to \$800,000 each year that they put into Fund 304 for all capital projects, which includes road paving, projects associated with aging infrastructure in the Recreation Department, stormwater, assorted Public Works projects, etc. She said that the math doesn't work when they are talking about \$500,000 just to maintain the current system and another \$500,000 to improve it to these upcoming standards. She said they probably need to be spending between \$300,000 to \$500,000 each year on road paving to maintain the road infrastructure. She said the reason for discussing the stormwater came up when looking at the budget for the past two years as they realized they had tremendous pressure on capital projects with a very limited source of revenue. She said in the 2015/2016 budget they took almost all of the stormwater funding out of Fund 354, leaving only about \$50,000 in case something fails, in anticipation of a conversation regarding a stormwater utility.

Mr. Lapointe said this issue is worthy of a study. He said if all that is needed from the Commissions at this point is a green light to continue the study then he would like them to move towards approval.

Mr. Gorry said staff is looking for a go or no go. If it is a go staff wants a recommendation on the rate structure and billing method, which he was not comfortable with at this time.

Mr. Mark Mucher asked the Commission members to remember that this whole scheme was initiated by three (3) members of the City Council who have large homes and didn't want this done on an ad valorem tax basis like other communities do and like the City has done up until now. He said it sounds like they don't want to pay any more for their valuable, perhaps larger, property than he does for his little two (2) bedroom home. He would like to see what the charges would be on ad valorem verses non-ad valorem for the average homeowner. He said that he would also like to know the definition of stormwater discharge.

Mr. Brovont said the initial \$51,000 for this study was done by the City Council without any input from this group or any other group. They just gave the authorization to spend \$51,000. Now the City Council is coming to them to push the camel through the tent and he has yet to hear that the City Council is going to have the courage to pass through another \$1 million dollars to the taxpayers. He said the City Council raised taxes last year by over \$1 million dollars. He referred to an analysis on the City's operating statements that was done by Mr. Gorry, which suggested that the City has \$1 million dollars in gas fuel costs in the budget. In his analysis the City could have \$600,000 to \$800,000 in savings in gas fuel costs. Mr. Brovont said that would suggest that at the end of year the City could have dropped down revenue gain of \$500,000 to \$600,000. The question is do they need to be authorizing another \$1 million dollar tax increase,

which is sort of what they would be doing if they choose to move forward. He asked is the City really going to pass this on or are they going to eat another \$50,000 and put the study on the shelf for a few years to see what the City's operating statements do. The City still has \$15 million dollars added to the balance sheet at \$1.5 million dollars a year for the past three (3) years in post benefits. Now here they are discussing another tax increase, which is really what they are discussing. He said that he is not disputing the fact that they need this because he felt they do, but questioned if they need to do it now before the budget is in place and they have a chance to review the City's operating statements. He asked if there was a possibility in going forward, because of the great benefit of lower fuel costs, that the City would sustain three (3) or four (4) years where the City could allocate what they need for capital projects without adding to the burden of the taxpayers.

Mr. Gorry said the numbers in his analysis were true, but the vast amount of expenses in fuel oil is in the Water and Sewer Fund and not in the General Fund.

Mr. Brovont said they have stormwater and they have water and sewer, but it is still taxpayer's money.

Mr. Gorry said that is not correct. He said when discussing the issue of fuel costs it is the ratepayers, not the taxpayers.

Mr. Brovont said all that he was suggesting was that maybe they don't have to authorize this right now. That they look at the budget more carefully this year to see if there is a way of handling more capital structure without adding to the burden of the ratepayers and the taxpayers.

Mr. Baczynski felt they needed to differentiate between operating costs, which is out of the City's control. The price of gas is controlled by the fact that there is a glut of oil in the market, which could stop at any time. He said operating costs was not something they should be looking at lightly because they are not under the City's control. He felt that capital projects should be funded on its own as a self sustaining entity, which is what is being proposed and he felt this was the direction they should go. He said they need to go ahead with this because at some point it is going to be mandated and the City is going to have to fund it, which means tax increases. The real question is how to allocate these increases as fairly as possible. Whether through ad valorem, the utility bills, or a mixture of both, he did not know, but felt that was something that needed to be looked at. He did not think they needed to be tied into recommending one or the other exclusively because he did not feel they were in the position to make that kind of recommendation and he was not sure they should. He felt their recommendation should be limited to if they go ahead with this now when they can do it by choice or if they should wait until it is mandated. He said it was always better to do things by choice rather than by mandate.

Mr. Stump said that he agreed with a lot of financial information that Mr. Brovont provided. But, he didn't feel staff or any of the consultants who worked on the report made a case for the go ahead. He said in staff's presentation it was stated that there were 21 beach closures and after the City's project there had not been any beach closures. He said that was done in-house without a stormwater utility tax, which is the way it should be. At the start of Mr. Falls' presentation he stated that they were asking for a recommendation on if they should continue with the study. Then they went right into a methodology of a collection, a methodology of tax, etc. They did not go into whether or not they needed to have a separate tax. He said that he did not hear any valid reasons to do this. He heard that the City of Fellsmere and the City of Sebastian has a stormwater utility. He said the City of Vero Beach is different. He heard that if they have this utility it would improve the Indian River Lagoon. He did not think this would have much of an impact on the lagoon. The pollution in the lagoon is caused by fertilizer runoff and defective septic tanks. He agreed with Mr. Brovont. He does not see any reason to go forward at this time.

Mrs. Orcutt said that she could think of three (3) very good reasons why they should move forward. One is because the nutrient reductions are going to be State mandated and in order for the City to receive grant funding they have to have designated funds set aside to match them. By having the stormwater utility fee it gives existing properties that didn't meet the new regulations to have an incentive to implement best management practices on their own in order for them to reduce their fee. She referred to Miracle Mile and said they could have incentives, which they could create stormwater retention in some of the parking areas. She said there are a lot of creative ways stormwater retention can be done and be very attractive. Another example is the old Albertson's store that Wal-Mart is renovating. She said because they are not tearing the building down and building a new building, they don't have to bring it up to current code and they don't have to do any stormwater retention. But, with the fee coming they would know their fee would be high if they don't implement stormwater retention so it would encourage them to do it. One more reason it is important is because the non-profits don't contribute at all, but they do contribute to the burden.

Mr. Herbert Whittall felt that a stormwater utility was needed. He said that he lives in Vero Isles and the drainage system is old, plugged, and goes directly into the Indian River Lagoon. He said lets go ahead with this.

Mr. Gorry clarified that if this goes forward it will be a recommendation to continue the study, not a recommendation for a stormwater utility.

Mr. Teston asked how much more will it cost to complete the study.

Mr. Falls said they were about halfway done and it would cost approximately \$50,000 to complete it.

Mr. Brovont said all that he was saying is the taxpayers just went through a \$1 million dollar tax increase and now they are discussing another one. He felt before they do that, they should relook at the budget so the taxpayers and the ratepayers are not faced with another increase.

Mr. Baczynski felt they should look at the budget carefully every year to see where they are spending money wisely and where they are not and make adjustments accordingly. But, this is something that could affect not just the Indian River Lagoon, but the viability of the City. If they don't contribute to improving the lagoon and it keeps deteriorating, there is no reason for people to come to Vero Beach.

Mr. Mechling said as a member of the Utilities Commission, his take on this is that they have pipes and structures that are in need. He questioned if this would be brought back before the Utilities/Finance Commission at a joint meeting. He asked would this be going to a referendum.

Mr. O'Connor said every step of the way they would come back before the Utilities/Finance Commission at a joint meeting or independently.

Mr. Mechling said obviously when they have infrastructure this old there needs to be a step up process somewhere, sometime, and in some way. He said that he has not heard enough information one way or the other. He is a proponent of not increasing taxes and he would like them to spend what they have wisely. He understands the recommendation that they should relook at the budget, which he felt needed to be done. But, at the same time they need to move this forward in some fashion to fix what they have.

Mr. O'Connor noted that the Finance Commission does review the budget annually. He said a referendum is not required, but he thought the City Council has said it would be an issue to go to a referendum.

Mr. Smith agreed with moving this forward. He said these capital costs are not going to go away and he felt this was probably the best time to move forward as they have crumbling infrastructure. He suggested in doing this study that they simplify the reports. He felt that they should receive a clear summary of the report and then they can go back and look at the details.

Mr. Lapointe suggested that they include an executive summary and a table of acronyms.

Mrs. Moss said it would be helpful if they received information in advance as they received just received some of this information this morning.

Mr. O'Connor noted that today's presentation was taken from within the study itself.

Mrs. Moss said that she was not comfortable voting on any type of rate methodology today. She felt it should be either to proceed or not to proceed with the study.

Mr. O'Connor noted that they are going to have to run the analysis on both options so there could be some additional costs.

Mr. Falls said infrastructure is the issue they have and Public Works is in charge of it. He said what people don't think of is if they have water failure, their water doesn't work. If they have a power outage, their power doesn't work. If they have a failure in a stormwater pipe, it really isn't a major personal inconvenience to anyone. He said since the budget was adopted in October, they have had numerous failures that they are trying to find a way to fix. He said the cost is somewhere around \$200,000 and the City is going to have to do a budget amendment to reallocate funds to fix them. His point is that the need for infrastructure is there. Staff is not advocating how to fund this, but they are showing there is a need.

Mr. Carter Taylor, of the Executive Committee for the Indian River Neighborhood Association and the South Beach Property Owner's Association, said that he lives in south beach and therefore would not be a customer of the City's stormwater utility. He said both organizations that he represents are very much in favor of this and would like to see it move forward. He said it will provide a more fair and equitable way to provide long term financial resources for these needed projects. He warned the members not to conflate a tax increase with a structure upon which taxes or fees are raised in order to pay for infrastructure. He said it would be possible, depending on the rate that is eventually set, that this could be revenue neutral.

Mr. McDermott felt they should move forward as he felt life in the lagoon was suffering and the longer they wait the worse it will get. He didn't understand why they couldn't put a motion on the table to spend the additional \$50,000 dollars and encourage the Finance Commission and the City Council to find as much money as they can in order to reduce the overall additional tax on the residents.

Mr. Mark Mucher said that he strongly feels they should perform all these functions, but that doesn't equate to establishing a stormwater utility. The question is, if they are going to perform all these functions how are they going to pay for it.

Mr. Gorry said that he supports going forward with the study.

Mr. Richard Winger, Councilmember, said no one is saying to raise taxes. This is a procedure to fix infrastructure. He said that he has wrestled with the budget for the past six (6) years and what

happened last year was the City was faced with more expenses than they could fund. What happens every year is infrastructure gets kicked down the road. He said what this really does is it takes it out of the hands of the City Council to kick the can down the road and not fix infrastructure. He would like to see a mechanism whereby they are assured that this problem gets fixed, not just for now, but for the future of their children and grandchildren.

Mr. Brovont said it is his opinion that the real plus of this is that they have dedicated funds. He said they need the capital investment. He is not opposed to the program, but how they are handling it.

Finance Commission:

Mr. Brovont made a motion to move forward and approve the City spending another \$50,000 to complete the study. Mr. Gorry seconded the motion and it passed 4-1 with Mr. Stump voting no, Mr. Smith yes, Mr. Polackwich yes, Mr. Brovont yes, and Mr. Gorry yes.

Utilities Commission:

Mrs. Orcutt made a motion to go forward and spend the extra money to finish the study. Mr. McDermott seconded the motion.

Mrs. Moss asked that even though staff stated that the study would come back before them, that Mrs. Orcutt amend her motion and state within the motion that the study is to be brought back before both Commissions and that there will be a public referendum on this since evidently it is not a matter of law (that it be brought to referendum).

Mrs. Orcutt said that she would not accept the amendment to her motion.

Mr. Teston said that he would like to vote on the initial motion.

Mr. Mechling asked Mrs. Orcutt why the issue of a referendum is a concern.

Mrs. Orcutt said at this point she did not want to make the decision that it has to be a referendum. The decision that they are making today is to move forward with the study.

Mrs. Moss said that she mentioned it because staff stated that it was not a matter of law and she felt it was very important that the public makes the final decision.

The motion passed 7-0 with Mr. Baczynski voting yes, Mrs. Moss yes, Mr. McDermott yes, Mr. Teston yes, Mr. Lapointe yes, Mrs. Orcutt yes, and Mr. Mechling yes.

Mr. O'Connor said it was his understanding that the Finance/Utilities Commission recommend that they move forward and finish the study. He did not want them to limit the cost because in moving forward there could be some unforeseen additional costs.

4. AJOURNMENT

Today's meeting adjourned at 11:52 a.m.

/sp

JOINT AIRPORT COMMISSION / UTILITIES COMMISSION MINUTES

Thursday, February 25, 2016 – 9:30 a.m.

City Hall, Council Chambers, Vero Beach, Florida

PRESENT: Airport Commission: Chairman, Barbara Drndak; Vice Chairman, Richard Cantner; Members: Melvin Wood, Arthur Hodge, Louise Vocelle, Jr., Alternate Member #1, Mary Wood and Alternate Member #2, Carole Jean Jordan **Utilities Commission:** Members: Judy Orcutt, Stephen Lapointe, Bill Teston, J. Rock Tonkel, Laura Moss, and Alternate Member #1, Victor DeMattia **Also Present:** City Manager, James O'Connor; Airport Director, Eric Menger and Deputy City Clerk, Sherri Philo

Utilities Commission Excused Absences: Robert Auwaerter, Chuck Mechling, and Richard McDermott, Jr.

1. CALL TO ORDER

Today's meeting was called to order at 9:30 a.m.

2. SOLAR FARM PRESENTATION – ConEdison Solutions

*Please note that questions and discussion took place throughout the presentation.

Mrs. Drndak explained that the purpose of today's meeting is to discuss the potential for a solar farm at the Airport that would tie into the City of Vero Beach utilities.

Mr. Eric Menger, Airport Director, said they began thinking about having a solar farm at the Airport through the Airport Master Plan process. He reported that ConEdison Solutions prepared the Feasibility Study at no cost to the City in an effort to educate them and to see what type of facility would work at the Airport.

Mr. Craig Fisher, of ConEdison Solutions, said that he would be presenting a Feasibility Study on the possibility of locating solar photovoltaic systems at the Airport. He then gave a Power Point presentation on Solar Photovoltaic Feasibility at the Vero Beach Regional Airport (attached to the original minutes).

Mrs. Moss referred to page 12, under the bullet point, *JEA – Issued 3 phases of solar RFP's in 2015 Florida Municipal Solar in 2015*, where Mr. Fisher stated, *“The developers who were awarded the projects are looking for investors like ConEdison and he reviewed the economics and plan to compete for long term ownership and operation of these assets.”* She asked Mr. Fisher to explain what he meant by “ownership.”

Mr. Fisher explained that a lot of small scale developers answered the Request for Proposal (RFP). They submitted to JEA a price per megawatt hour that they believed the investors would be interested in taking ownership. Once JEA finalizes a Power Purchase Agreement (PPA) at that negotiated rate with that early developer, that early developer needs to find an investor that would finance the construction of the project. What that

basically means is ConEdison Solutions would take ownership of that project and the PPA for the next 20 years. ConEdison Solutions would finance the project, construct the project, and own and operate it for the 20 year term of the agreement. JEA would only be responsible for purchasing the power.

Mrs. Moss asked how does the project relate to property taxes.

Mr. Fisher said ConEdison Solutions would be financing the ownership of the solar system on the property. They also would have a site lease agreement with the property owner, which is also a cost that is factored in.

Mrs. Moss asked does that mean that ConEdison would be paying property taxes because they have the lease.

Mr. Fisher answered yes. He said with some projects the owner developers went to the County and negotiated payment in lieu of taxes, which is a negotiated rate below the full property tax value. He said it basically is seen as an economic tax abatement.

Mrs. Moss referred to page 10, *Legislative Update*. She asked how far along is the legislation and how will it affect contracts that are already signed.

Mr. Fisher said a lot of the projects were approved by JEA, the site lease agreements are in place, and a lot of the early developers are waiting to see how the legislation goes through the Florida legislative process before they accept offers.

Mrs. Drndak said that she has been watching the State Bill on exempting solar, but there was already a Constitutional Amendment that passed a few years ago. She asked how is it that the State Legislature can continue to deny what is already in the State Constitution.

Mr. Fisher said solar farms that already exist in the State of Florida have to pay property taxes. He said this Bill would alleviate that.

Mr. Tonkel referred to page 14, *VRB Airport Solar Opportunity - Estimated Project Cost*. He asked is the estimated project cost in today's dollars.

Mr. Fisher answered yes. He said it is a preliminary estimate in which once they do the engineering, that number would be plus or minus 10 %. He noted that this price is for an investor to build the system if it is procured through a PPA.

Mr. Tonkel asked what would the cost be per megawatt hour.

Mr. Fisher said they project the range to be somewhere between \$60 to \$80 per megawatt hour.

Mr. Baczynski referred to page 14, *Annual Production: 33,580 MWh*. He presumed that is based on average weather patterns.

Mr. Fisher said that is correct. He said the weather file that was put into the simulated model came from the Vero Beach Airport.

Mr. Vocelle asked does ConEdison own or operate a system that has been through a hurricane.

Mr. Fisher answered yes. He said several of their systems located in the northeast went through Super Storm Sandy and they had very little damage to the infrastructure. He said they might have had one or two panels that came loose, but they passed through the storm with flying colors. Last year they had a system with over 1,100 panels that went through a tornado and they only lost three (3). He reported that these systems have been tried and tested and structurally engineered with storms in mind.

Mr. Tonkel asked has the City's Finance Department looked at this.

Mr. James O'Connor, City Manager, answered no. He noted that the two options are options the City is currently trying to get out of, which are the 25 year commitment to a power supply and getting out of power generation.

Mr. Fisher explained that what they are currently doing is providing the basic details for staff to go back and evaluate. This is just showing the options from a procurement standpoint and what they would be looking at in terms of the cost of energy.

Mrs. Moss said it appears that the annual operations and maintenance (O&M) costs increases almost 50% by year 20. She asked what is that based on.

Mr. Fisher said it is a 2% annual escalation in O&M price, which is pretty much the industry standard.

Mrs. Moss asked what is the industry standard based on.

Mr. Fisher said it is based on the Consumer Price Index (CPI).

Mr. Tonkel asked is the cost of debt to finance the project in determining the possible rates that would be established included in the proforma provided.

Mr. Fisher answered yes. He said it is 3%, which is their current market rate for a 20-year tax exempt lease purchase.

Mr. Randy Old, Vice Mayor, said that he put a PV system on his home about six (6) years ago and now everything is better and he cannot change it out. He asked as efficiency of the solar system gets better, is there a way to change out the panels or would they be locked in with the old system.

Mr. Fisher said that could be negotiated in the PPA. He said the panels are about 33% of the overall cost of the project. The panels have a 25 year warranty so it is typically not something that is done.

Mrs. Orcutt assumed that the City would have to put out an RFP to get the best price for the ratepayers. She asked at what point does that fit into the process.

Mr. Fisher said the volume of work they are currently doing is at their (ConEdison Solutions) risk. If the City was to decide they do not want to move forward then that is ConEdison Solutions cost of doing business and they accept that.

Mr. Baczynski asked Mr. Fisher to send the Commission members information on the change of efficiency in panels over the past 20 years, as well as the change in the cost of panels over the past 20 years.

Mr. Fisher said since he has been involved in these projects (2008), he has seen the panels go from about 14% to about 18% in efficiency.

Mr. Teston asked if there is a failure in panels, can they change out the panels without shutting down the system.

Mr. Fisher said they can change out panels live. He reported that under the maintenance of the system, they would take one inverter off line at a time.

Mr. Teston asked what is the failure rate of panels.

Mr. Fisher said it is less than 1%.

Mrs. Moss asked Mr. Fisher who he prepared this presentation for. .

Mr. Fisher said the idea of locating solar was in the Airport Master Plan. He said that he offered to do this early development at their own cost to show the City what it would mean to own a solar system.

Mrs. Moss said that she was trying to place this within the context of the Orlando Utilities Commission (OUC) contract and the Florida Municipal Power Association (FMPA) contract. She asked when do these contracts end and what is the City required to spend on the OUC contract.

Mr. O'Connor said the FMPA contracts probably have 40 years, depending on the life of the St. Lucie Plant. But, that is a small component. The City's power supply is really with OUC and the renegotiated contract expires in seven (7) years. He noted that 23 megawatts would not be an issue.

Mrs. Drndak said the interest of the Airport is the lease of the land. She asked the Utilities Commission members if they felt this would make sense for the City.

Mr. O'Connor noted that the two (2) options that are viable in this are two (2) options the City extricated themselves from and he not sure ready to jump back into that hot oil again.

Mr. Dick Winger, Councilmember, said the current cost of acquired power is about \$71 and they are not satisfied with that cost. He said the City could do better if they didn't have the contracts they have. The City has been going in the direction of getting out of the power business.

Mrs. Moss said this information was very helpful and thanked the Airport Commission for inviting the Utilities Commission to today's meeting. She felt that if they were going to further explore this, that they have a joint Utilities/Finance Commission meeting.

3. PUBLIC COMMENT

Mr. Tim Zorc, Indian River County Commissioner, said the goal of the Airport should be to increase revenue by renting property, but they should also look at things that drive down costs. He said the County is looking to save \$500,000 to \$600,000 a year on their campus (County Building A and B and the Health Department Building) in electricity by installing a combined heat and power (CHP) system. He noted that this is a 24 hour system so when the sun goes down the system still runs.

Mrs. Drndak reported that Mr. O'Connor wanted to address the Utilities Commission regarding a proposed Resolution.

Mr. O'Connor reported that he just received the proposed Resolution (on file in the City Clerk's office) yesterday so he did not have time to vet it through the process (referring to a Resolution to express support for the construction of the Groveland Reservoir and Treatment area and requesting the St. John's Water Management District (SJWMD) to protect and preserve the Florida Aquifer Public Water Supply by restricting withdrawals from the Floridan Aquifer for electric utility use). He reported that there would be a Technical Staff Advisory Report that would be going before the Board of the SJWMD next week. He reported that it was first believed that the City had until March 7, 2016 to submit their comments, but they have until April. He asked the Utilities Commission to put this off until their next regularly scheduled meeting to allow the City to do their due diligence.

4. ADJOURNMENT

Today's Joint Airport Commission / Utilities Commission meeting adjourned at 11:49 a.m. and the Airport Commission called their regular meeting to order at 12:04 p.m.

/sp

VERO BEACH UTILITIES COMMISSION MINUTES
Tuesday, March 8, 2016 – 9:00 a.m.
City Hall, Council Chambers, Vero Beach, Florida

PRESENT: Vice Chairman/Indian River Shores Representative, Robert Auwaerter; Members: Chuck Mechling, Judy Orcutt, Stephen Lapointe, Laura Moss, J. Rock Tonkel (arrived at 9:14 a.m.) and Alternate Member #1, George Baczynski **Also Present:** City Manager, James O'Connor; Water and Sewer Director, Rob Bolton and Deputy City Clerk, Sherri Philo

1. CALL TO ORDER

Today's meeting was called to order at 9:00 a.m.

2. APPROVAL OF MINUTES

A) February 9, 2016

Mr. Auwaerter referred to page four of the February 9, 2016 minutes where it states "*Mr. Auwaerter asked have they identified anything other than the PLC and the inverter.*" He noted that what he actually asked was: "*have they identified any other single point of failure other than the PLC and the inverter.*" He felt this was an important clarification in terms of what they were discussing.

Mr. Mechling made a motion to approve the minutes of the February 9, 2016 Utilities Commission meeting as amended. Mrs. Orcutt seconded the motion and it passed unanimously.

3. ELECTION OF OFFICER

A) Chairman

Mr. Auwaerter thanked Mr. Scott Stradley for his service on the Utilities Commission. He said they had a lot of meetings this past year involving the revised contract with the Orlando Utilities Commission (OUC) and felt that Mr. Stradley's work, along with the other Commission members, got Vero Beach into a better contract than the one they were originally presented with.

Mr. Mechling nominated Mr. Robert Auwaerter for Chairman of the Utilities Commission.

Mr. Auwaerter nominated Mrs. Laura Moss for Chairman of the Utilities Commission.

Mr. Auwaerter was concerned about serving as Chairman of the Utilities Commission because he is on the Commission as a representative of Indian River Shores and some

people in the community might think he has motives other than trying to lower the cost of services.

Mr. Mechling seconded the nomination for Mrs. Laura Moss to serve as Chairman of the Utilities Commission.

There were no other nominations.

Mrs. Laura Moss was unanimously appointed Chairman of the Utilities Commission.

4. PUBLIC COMMENT

None

5. NEW BUSINESS

None

6. OLD BUSINESS

A) Solar Photovoltaic Project Presentation – Ms. Michele Jackson of Florida Municipal Power Agency (FMPA)

*Please note that questions and discussion took place throughout today’s presentation.

Ms. Michele Jackson, of Florida Municipal Power Agency (FMPA), introduced herself to the Commission members.

Mrs. Moss referred to the memorandum from Ms. Jackson on Solar Photovoltaic Projects that was included in their backup information (attached to the original minutes). She said it seemed to be almost contradictory. She read *“Due to a steady decline in technology prices and with the assistance of federal and state subsidies, nearly 784,000 U.S. homes and businesses have “gone solar” as of December 2014”* and immediately below that it states *“However, the high cost of PV modules and equipment ...”* She asked are they talking about two different things.

Ms. Jackson said if they go back to the history of when photovoltaics were invented they would see that they were 100 times more expensive than they are today. Gradually through the years the prices have come down, but they are not down to a point where they are competitive with traditional central power plants. She reported that if they were to construct a solar photovoltaic (PV) project today and compare it with other traditional technologies, the cost of electricity from a solar PV Plant is 78% greater than the cost of electricity from a conventional natural gas fired combined cycle facility. She said from a household prospective, homeowners can install rooftop systems, which will cost about \$30,000.

Mr. Auwaerter asked does her calculations take into account for a private investor, the 30% investment tax credit plus the accelerate depreciation in the first two years of the life of the plant.

Ms. Jackson answered yes. She noted that the chart provided in their backup information shows the cost with and without subsidies.

Mr. Baczynski asked what is the average payback assumed for rooftop solar equipment for a homeowner.

Ms. Jackson said in the studies they have done it is 40 to 50 years.

Mr. Baczynski said that is longer than the life of the panels.

Mr. Lapointe said on the Solar Nation website that Ms. Jackson site quotes an average residential installation of 5 kilowatts with a \$21,000 installation cost minus the 30% there is a \$14,700 installation cost to the homeowner with an estimated payback period of 12 years.

Mr. Baczynski said that sounded more reasonable.

Mr. Lapointe said those calculations don't include the benefit to the homeowner in resale value.

Ms. Jackson thought Solar Nation was able to quote that because they might be citing customers who are living in California in the Pacific Gas & Electric Company (PG&E) service territory. She said PG&E has a net metering tariff that currently pays .32 cents a Kwh for any excess energy fed into the grid. Also, those net meter customers get that credit off their bill. PG&E has time of use rates. Electricity is .20 cents a Kwh during the peak period. She said there is pressure across the nation with Public Utility Service Commissions hearing appeals from utilities on changing net metering laws. In fact, Arizona is successfully appealing their service commission to state that net metering rates should be at wholesale so if any excess solar is fed into the grid, they should only be paid the wholesale costs. Therefore, a rooftop customer has to be very careful when hearing from different vendors about payback because a lot of the payback equation depends on net metering, legislation and the utilities current rates. There is also a great movement across the Country where utilities are realizing that rooftop customers are not paying their fare share of the fixed cost of the distribution system. She said when they think about it, a rooftop customer is sitting there a few hours of the day not using the electric grid, but then leaning on the grid at night. Because the way utilities charge customers for their fixed costs, there is cross subsidization happening.

Mr. Auwaerter said that he was having trouble with the 78% number. He said the Commission recently received a presentation from ConEd Solutions who is talking with Airport staff about a potential solar farm on Airport property. He said ConEd Solutions wants to do a Purchase Power Agreement (PPA) with the City and he questioned why they would even think about this if the power costs are 78% higher. He said the cost of

panels have dropped dramatically over the past few years. He said they are seeing the amount of solar power installation skyrocket, which does not jive with the 78% higher number.

Ms. Jackson said the price of panels have dropped dramatically. She said FMPA invested their member's money for a study on what it would cost to construct a Plant. She then went over the *Solar Project Installed Cost Elements for Utility Scale Projects* and *Cost to Install fixed tilt Solar PV in Florida* of the Power Point presentation with the Commission members.

Mrs. Orcutt referred to the slide, *Solar Project Installed Cost Elements*. She said it is possible if ConEd Solutions came in, a big part of the savings could be under the engineering and procurement.

Mr. Auwaerter did not agree. He said they have a return on investment. It is not going to work if the cost of the supply power is 50 to 70 percent higher than the utility. He said no utility is going to do that.

Ms. Jackson said at their Board meeting they all acknowledged that they were not making a decision for solar based on economics. It was because customers want it.

Mr. Tonkel asked do you have the total installed cost for each project.

Ms. Jackson answered no.

Mr. Tonkel explained that he was trying to find a way to verify her projections.

Ms. Jackson said the source of this information came from a report that was done by Black and Veatch. She noted that the report is available.

Mr. Tonkel asked is there any way of estimating what the installment cost is.

Ms. Jackson answered no.

Mr. Tonkel said then there is no way to validate her projections at this point.

Ms. Jackson said she would use them as a benchmark.

Mr. Lapointe said the only reasonable way for a small entity like Vero Beach to finance a project like the one they are envisioning at the Airport (ConEd Solutions) would be to have a third party developer and enter into a PPA that stipulates the price at or below market fuel costs. He asked is that reasonable. He asked is there a third party developer that would even come close to such an agreement.

Ms. Jackson said the investor owned utilities are required by the PSC to offer what is called "*Standard Offer Contracts*," which means that any power plant developer could come in and build and interconnect with FPL or Duke Power and receive a price for their

energy based on the cost that FPL or Duke Power offer, which is pretty much the market at that hour. She said there haven't been any developments like that in Florida because developers are not willing to take a Standard Offer Contract.

Mr. Auwaerter referred to bullet point "7 new PPA's for 31 MW ac," on the slide "JEA Develops New Solar Farms." He asked do you have the cost per megawatt hour.

Ms. Jackson said that might be redacted by the developer.

Mr. Dan O'Hagan, Associate General Counsel for FMPA, said the third party developer may consider it confidential business information and might redact it. He said that it wouldn't hurt for them to request it.

Mr. Auwaerter said that is the bottom line number.

Ms. Jackson said in a few weeks they are going to ask the FMPA Board for approval to proceed with a Request for Proposals (RFP) for PPA's. Their intent is to issue a Notice of RFP Issuance in April and go out for a RFP in August. She explained that they are going to do their own investigations on the cost of PPA's.

Mr. Auwaerter asked is that information going to be public record or is it going to be redacted.

Ms. Jackson said as a member, Vero Beach is invited to join in what they are calling their "Multi Member Funded Solar PV Project."

Mr. Auwaerter asked is it going to be in public record where everyone can see it.

Mr. O'Hagan said third party developers might consider it confidential. FMPA wouldn't consider it confidential unless they are required to by the developer.

Mrs. Moss requested that the Commission members receive the information mentioned today (the Black and Veatch Study and the RFP).

Ms. Jackson said that she would forward the information to the City Clerk's office to be distributed to the Commission members.

B) Resolution Expressing Support for the Construction of the Groveland Reservoir and Treatment Area and Requesting St. John's Water Management District to Protect and Preserve the Florida Aquifer Public Water Supply by Restricting Withdrawals from the Floridan Aquifer for Electric Utility Use.

Mrs. Moss gave some history of the proposed Resolution. She read from the minutes of the February 9, 2016 Utility Commission meeting, where Mrs. Orcutt stated, "At this point in time, FPL's discussion with St. John's Water Management District (SJWMD) is not really addressing the requirement to have FPL utilize the surface water. Therefore,

she felt it would be important for the Utilities Commission to request that SJWMD consider or require FPL to use surface water if it becomes available. She then handed out to the Commission members a few pages from the memorandum they received on Friday from Rich Burklew, Bureau Chief of the Bureau of Water Use Regulation (attached to the original minutes). She felt that with this new information, the timing of the Resolution was inappropriate, the context was misleading in that it does not acknowledge existing documents and dictates of the Bureau, and there is nothing in the Resolution that has not already been cited by higher authorities. In addition to that, her concern is it could give an appearance of impropriety in that the Groveland Reservoir is not public and is in fact a property of Evans Utilities. She then read from the information she passed out, from page one, "Recommendation: Approval of the Agency Report and conditions regarding the site certification application (SCA) for the Florida Power and Light (FPL) Okeechobee Clean Energy Center (OCEC)." page 28, "Surface Water Sources: Ft. Drum and Blue Cypress are regulated water bodies requiring operational flowrates and criterion to meet environmental needs. Neither sources is capable of providing a reliable or adequate quantity of water for the operations of the OCEC and are therefore considered not environmentally feasible for use." page 29, "The GLRSTA is currently in the conceptual evaluation phase and there are a number of environmental, financial, technical, and regulatory issues requiring resolution before the GLRSTA project would become available to potential users. FPL's investigation indicated that if all the foregoing issues are resolved, the design and construction of the GLRSTA would occur in five to six years, after which water may be available for use at OCEC. As a condition of certification, and upon notification by the District of a potential alternative source, FPL will be required to evaluate and report to the District regarding the potential use of any identified source. If deemed feasible, the licensee will be required to propose a plan to maximize use of these alternative sources. It is anticipated that the District will request investigation of the use of GLRSTA within the first six years after licensing." and page 34, "Recommendation: The District has reviewed the SCA for the OCEC pursuant to the above described requirements and is recommending approval of the SCA with the conditions listed below." She noted that the conditions listed were recommended by the SJWMD. She said within this context of the Resolution it does not cite any of this and therefore it seems to be inappropriate in timing and misleading in that it doesn't acknowledge any of these documents.

Mrs. Orcutt asked Mrs. Moss if she had the revised Resolution.

Mrs. Moss answered yes. She said the Resolution gives the impression that Groveland Utilities is not a "company." She felt that was inappropriate and misleading. It should be stated that it is a company.

Mr. Tonkel asked Mrs. Moss if she was indicating that the Resolution, although perhaps incomplete and unsatisfactory at this point, is something that should be reworded to reflect her concerns and views.

Mrs. Moss answered yes. She felt the timing was inappropriate as this has already been addressed by a higher authority and this Resolution isn't suggesting anything new. She said unless they think they know more than the Bureau of Water Use of the Florida

Department of Environmental Protection (EPA) she was not sure they would want to direct them. She felt it was inappropriate. She passed out to the Commission members information that she received from the internet titled "*Groveland Utilities, LLC; Financial Feasibility Study of the Groveland Reservoir.*" She read from page ES-4, *Other Potential Beneficiaries: Another potential beneficiary is FPL. In the event that it chooses to site a new power plant in northeast Okeechobee County, water from the GLRSTA Project could be used for power plant cooling.*" She said they are listed again at the bottom of this laundry list of other "so called" beneficiaries, which she would assume would be a customer. She then read from page ES-5, "*The annual revenues and costs were calculated each year from 2015, the presumed year when project design begins, to the year 2020, when the project becomes operational ...*" She said so this project won't be operational until the year 2020 and they are writing a Resolution in affect directing two companies about something that has already been addressed by more than one authority and will not occur until the year 2020.

Mr. Auwaerter said that he had a different view. He accepts her point that this project is going to take quite awhile, but he thought they were putting a marker on the table that they would prefer to have surface water drawn from farm rather than the aquifer. He said it might lessen the flow into the Indian River. That was all they were attempting to do.

Mrs. Orcutt said as a Utilities Commission, their purpose should be looking out for City utilities, which includes potable water. She said the City draws from the same straw. The purpose of the revised Resolution was to support the SJWMD's recommendations to FPL and also support Groveland Utilities' efforts to build this reservoir and stormwater treatment facility as being positive to help protect our water supply. She said that she would have preferred to take it one step further to encourage FPL to work with Groveland Utility now so that as the planning process occurs for both the Power Plant and the Groveland Utility reservoir and stormwater treatment area, it is done efficiently and cost effectively by working together. She said nine (9) million gallons of water coming out of the water aquifer per day is very significant. If FPL waits until the entire reservoir is constructed to begin their feasibility it would delay the process significantly. She would urge FPL to start working with Groveland Utilities now so that it expedites the entire process to save that aquifer. She said this Resolution doesn't go that far, that it simply supports SJWMD's effort to encourage FPL to

Mrs. Moss said the Resolution doesn't state "encourage," it states "required." She read Section 3 of the Resolution, "*The City Council hereby urges and requests the SJRWMD, through its CUP process, to require FPL to utilize water from the Groveland Reservoir ...*" She said that is requiring one company to utilize water from another company. If they want to dictate what one company does with another than she feels it should be stated as such. They should not use "*Groveland Reservoir,*" but use the name of the company, which is "*Groveland Utilities, LLC.*" She invited the FPL representatives who were present for today's meeting to the dais if they would like to speak on this matter.

Mr. Mechling thought that Mrs. Moss was looking at the wrong Resolution.

After a brief discussion it was determined that Mrs. Moss was referring to the first draft of the Resolution. She was then given a copy of the draft Resolution that is before them today.

Mr. Bart Getzen (spelling may be incorrect), Internal Affairs Manager for FPL, said they have a west energy center in West Palm Beach where they initially started pulling from below the aquifer with the Avon Park area being their primary source of water. He said when the County was prepared to provide reclaimed water to them they started using it.

Mr. Tonkel asked where this initiative came from. He asked did it come from the City Council, the City Manager, etc.

Mrs. Orcutt felt this was like a citizens' initiative to be concerned about the amount of water that is going to be withdrawn from the aquifer. She said nine to eleven million gallons of water is being drawn per day, which is probably more than what the entire County uses.

Mr. Getzen noted that FPL is using 9 to 11 million gallons per day and they are putting 80% of it back through deep well injection.

Mrs. Orcutt said polluted.

Mr. Getzen said not necessarily polluted, but more or less expended.

Mrs. Orcutt said it would be so laden with materials that it has to be put into the boulder zone where it won't ever be part of the water system.

Mr. Getzen did not think the term "polluted" applied.

Mr. Auwaerter asked Mr. Getzen to explain the word "expended."

Mr. Michael Tamara (spelling may be incorrect), Environmental Attorney for FPL, said there are two things operating that were kind of touched on. The first is the legal requirement from the SJWMD that FPL use the lowest quality water they could possibly use for the intended use. The second is the requirement to use an alternative water source when it becomes economically, environmentally, and technically feasible. As described, they have a situation with their west county energy center where they are now using 100% reclaimed water where the Plant was initially built using groundwater. He said they just licensed two new nuclear plants where they are using 80 to 90 million gallons of reclaimed water per day. With SJWMD insisting that they use the lowest quality water available, they are installing a series of wells very deep into the saline portion of the Floridan Aquifer and testing them to see how much water than can get from the Avon Park producing zone, which lies below the Floridan Aquifer. If they can get a lot of the water from Avon Park they would then abandon a Floridan Aquifer well and install a deeper well. They will do that continuously until they have maximized the usability of the water in a conservation sense, meaning that they would be acquiring the lowest water that they can, still cycle it five times at which point what can't be used would be injected

into the boulder zone. He said they are all on the same page. FPL has a corporate ethic and an incentive to do this.

Mrs. Orcutt asked what would be the barriers to using surface water. She asked assuming there is a lot of surface water available to them, what would be FPL's economic or environmental concerns.

Mr. Tamara said with surface water it is often its availability. He explained that if you use surface water and it's not available year round then they need a completely redundant backup system.

Mr. Mechling asked Mr. Tamara if he had the chance to review the latest Resolution.

Mr. Tamara was unsure if he seen the latest Resolution.

Mr. James O'Connor, City Manager, reported that at least two representatives of FPL reviewed the latest Resolution and they did not have any objections to it.

Mrs. Moss said FPL is listed as a beneficiary in the Groveland Utilities Financial Feasibility Study. She asked does FPL see itself as a beneficiary.

Mr. Tamara said that he would not say they were a beneficiary in a financial sense because in the end the ratepayers pay whatever the cost is because it goes into their rates. He said they are not a financial partner and they do not see themselves as a beneficiary.

Mrs. Orcutt said that she would like to see the Resolution move forward to show support to SJWMD and the Groveland Utilities project.

Mrs. Moss was glad to see in the latest version of the Resolution the requirement that companies do business with each other was removed. She thought the current version was greatly improved.

Mr. Mechling made a motion to move the Resolution (revised version) forward. He did not believe that it does anything other than what FPL would have to do in their regulatory process and felt that they were just supporting the fact of that process. Mrs. Moss seconded the motion.

There was no one else from the public who wished to speak.

On a roll call vote, the motion passed 7-0 with Mr. Baczynski voting yes, Mr. Teston yes, Mr. Lapointe yes, Mr. Orcutt yes, Mr. Mechling yes, Mr. Auwaerter yes, and Mrs. Moss yes.

7. CHAIRMAN'S MATTERS

Mrs. Moss reported that she attended last week's City Council meeting and the City Council voted 3-2 in favor to continue the stormwater study. The City Council also voted

to limit the Study to Option 1. She said it was not clear on the part of the City Council that there would be a Referendum and she felt there should be as the public should be the final decision maker on a stormwater utility.

8. MEMBER'S MATTERS

Mr. Baczynski referred to the article, "*the guardian: Water utilities serving American cities use tests that downplay contamination*" that he provided the Commission members (attached to the original minutes). He explained that the purpose in bringing this up was to reassure the Commission members and the citizens that the City's utility system is doing everything necessary to protect the quality of the water people are drinking. The question that has come up is apparently the EPA has changed specifications for collecting samples of water for testing and for some reason a large number of water utilities have been ignoring that recommendation. As a result, they are using a sampling method that minimizes the concentration of potentially toxic materials in the water. He wanted to be sure they were all aware of this and that the City's water supply is being tested properly.

Mr. Rob Bolton, Water and Sewer Director, said that he did not have a chance to look at the information.

Mr. Teston thought what they were doing was flushing the lines before they do the test, thereby minimizing the pollutants that are in the lines. He asked when the City does their testing do they flush the lines prior to testing or do they leave the lines as the water is delivered to the customer.

Mr. Baczynski said apparently the testing should be done at the customer's faucet. He did not know what percentage of customers are contacted to take those samples. He asked is that the only place the City takes samples.

Mr. Bolton said it is a burden on staff because they have to find customers who will commit to doing the testing, which they have had the same people doing it for years. He explained that staff drops the bottles off, the residents have to follow the procedure of running the water from their faucet for a certain amount of time, and then they have to collect the sample for the City to pick up. He said the problem they would have with lead is that it would come from the resident's home. The City does not have any lead pipes in their system or lead services in their system.

Mr. Auwaerter asked if he understood it correctly that the City uses the same homes every year. He asked statistically wouldn't they want to randomize the test as that would be more accurate. He asked why would they use the same people.

Mr. Bolton said it is hard to get someone to commit to do the testing. He said they try to get as many users as possible to participate.

Mr. Tonkel asked how many people are doing the sampling.

Mr. Bolton did not have that information with him. He noted that they do have to show the DEP that it represents the City's entire system.

Mr. Mechling asked was there a clean bill of health in their latest sampling.

Mr. Bolton answered yes.

Mr. Tonkel thought that when he previously served on the Utilities Commission a Resolution was passed to have some type of reporting mechanism on incidents of the utilities.

Mrs. Moss said that was one of this year's goals, but they did not establish a timeline. She felt that quarterly reports would be good.

Mr. O'Connor agreed. He said the Utilities Director can give a quarterly report on if they had any significant outages and what the causes were.

Mrs. Moss said that she would put this on their April meeting agenda.

Mrs. Orcutt asked how the Commission ended up holding their meetings on Tuesday mornings. She asked is there any flexibility in their meeting schedule.

After a brief discussion, the Commission members agreed to have their meeting days and times as an agenda item for their April meeting.

9. ADJOURNMENT

Today's meeting adjourned at 10:54 a.m.

/sp

How bills of interest to Treasure Coast fared

DIED

Florida Municipal Power Agency

Mayfield filed HB 579 to require the agency, a cooperative of municipally owned utilities that provides power to Vero Beach and Fort Pierce, to file an annual financial report. Among the information in that report would have been the fair market value of power generating assets determined by assuming the "price that a willing buyer would pay a willing seller." That's of particular interest for Vero Beach, which wants to sell its utility to Florida Power & Light Co. but says it can't get an exit price from its contracts with the FMPA for interests in two coal plants near Orlando and the St. Lucie Nuclear Power Plant. Those contracts don't have an exit clause, so the FMPA isn't required to provide a figure. The FMPA gave the city a \$46.1 million estimated exit price in June 2014 for another contract. The agency says its financial information already is public under Florida's Sunshine Law; and it's unfeasible to provide the fair market value of power plants because there's a limited pool of buyers looking to buy such facilities.

Indian River Lagoon cleanup tax

A bill by Altman and Republican Rep. Debbie Mayfield would have allowed counties to levy a half- or one-cent sales tax to pay for muck dredging in the Indian River Lagoon and other waterways, if approved by voters.



City of Vero Beach Electric Utility System Study

Presented by:



RL Willoughby- Vice President

Linda Kushner- Special Projects Manager

Lloyd Shank, Jr., PE- Senior Project Manager

Electric Utility System Study

Five major components:

1. Generating Plant Property Options
2. Resource Adequacy (Reliability)
3. Pole Attachment Agreement
4. Transmission and Distribution Planning
5. Other Optimization Strategies

Primary Focus:

Identify short and long term cost optimization

Electric Utility System Study

Process:

- Submitted Data Requests
- Interviewed Staff
- Interviewed Management
- Researched Publicly Available Materials / Matrix
- Utilized PowerServices' experience with Operations, Management, Acquisition of Electric Utility Systems by Electric Utilities

Generating Plant Property



Generating Plant Property

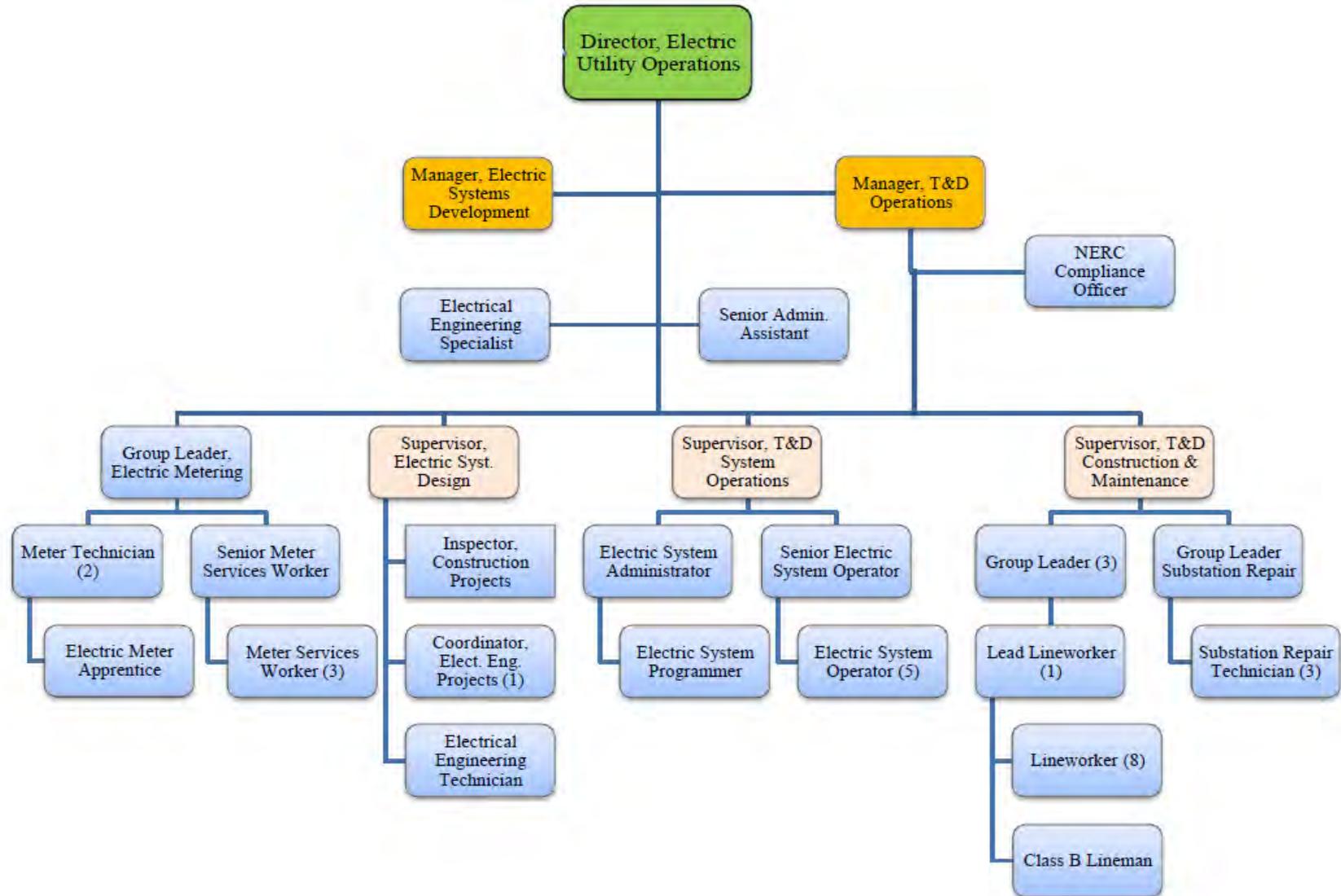
Current Status:

- City decommissioned plant and is proceeding with salvage and demolition
- Main building to be cleared of hazard material and equipment
- Building and substation initially remain in place for electric service continuity

RESOURCE ADEQUACY



Resource Adequacy



Resource Adequacy

Determine if Electric Department is effectively staffed

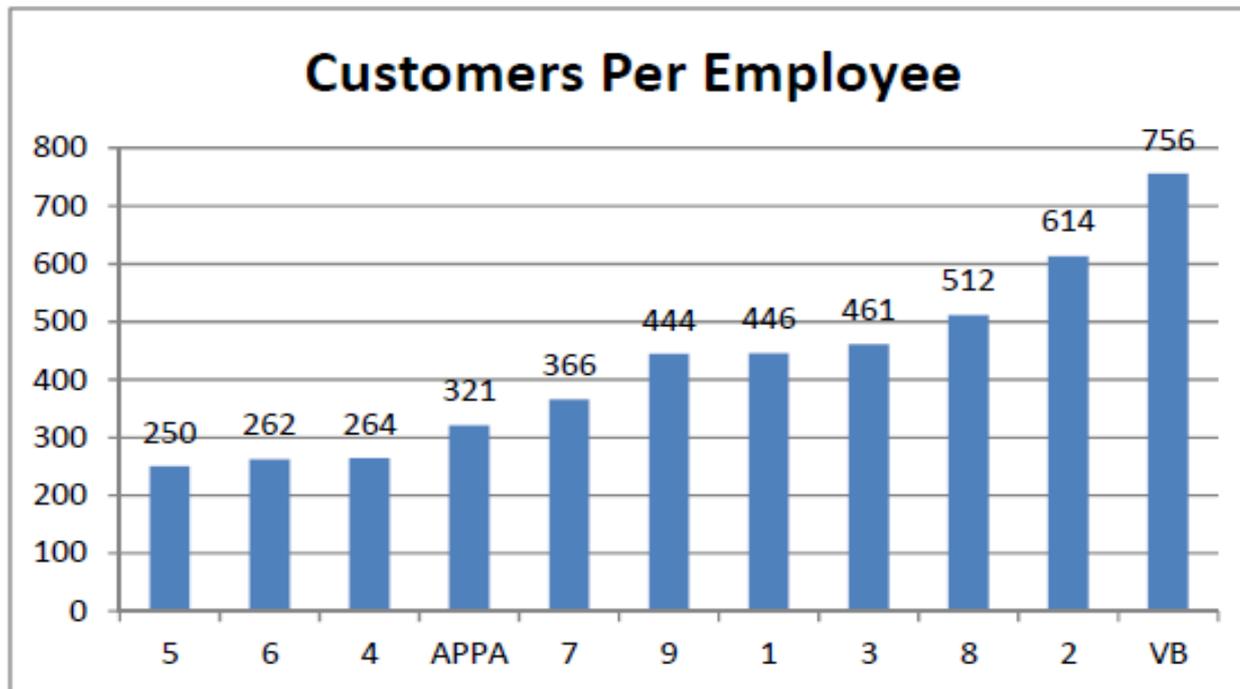
Process:

- Compared Transmission & Distribution (T&D) department against similarly sized municipalities in Florida and American Public Power Association members across the U.S.
- Analyzed City's budget and fund transfers
- Did not evaluate customer service or generation departments

Resource Adequacy (Staffing)

Findings:

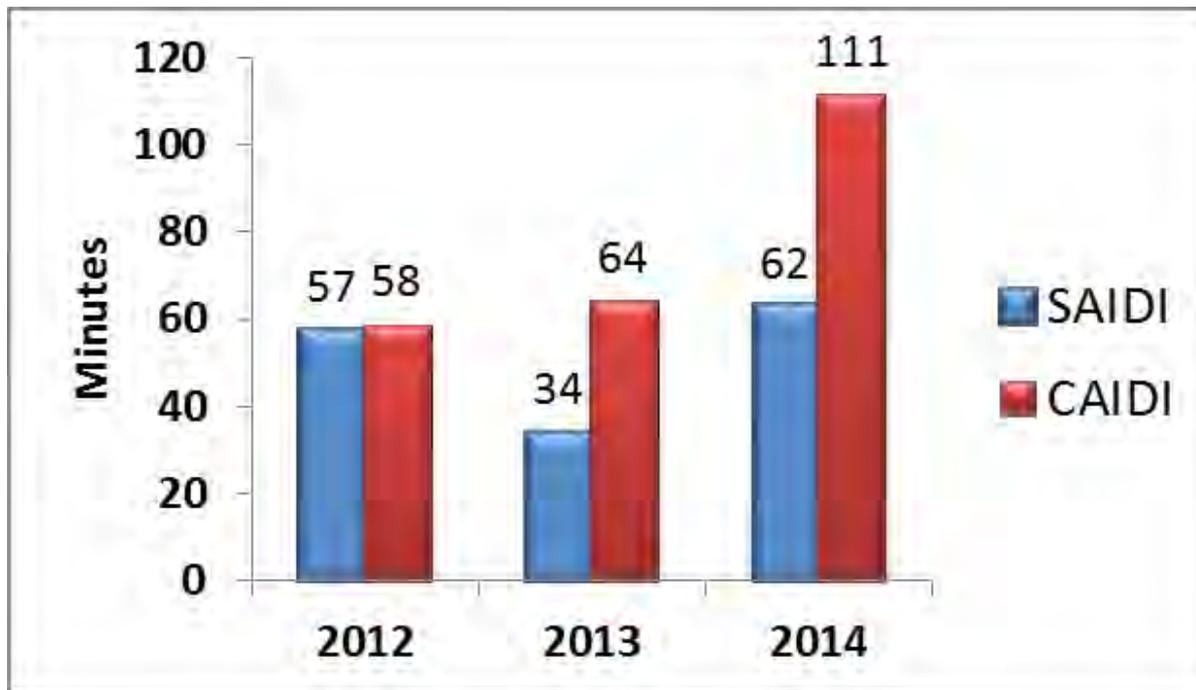
- T&D staffing levels were evaluated
- 45 positions identified at time of report



Resource Adequacy (Reliability)

Findings:

- Reliability trends indicate opportunities for improvement



Resource Adequacy

Findings:

- Based on possible sale of the electric system, routine and preventative maintenance may have suffered
- Local distribution costs (LDC) are higher than industry metrics, but consistent with Florida municipalities
 - 3.62¢ /kWh

Resource Adequacy

Recommendations:

- Create strategic plan and set goals
- Emphasize reliability
- Accelerate replacement of faulty underground cable
- Implement comprehensive meter testing program
- Evaluate staff vacancies and skillsets
- Leverage external contractors for short term support

Resource Adequacy

Current Status:

- Over the past two years, T&D department has refocused resources on preventative maintenance
- Improvements may not immediately evident
- City should invest in system and technology improvements identified in companion reports

Pole Attachment Agreements



Pole Attachment Agreements

Evaluate and recommend modernization, including safety and revenue enhancements

Process:

- Compared to recently executed agreements
- Calculated updated rates
- Considered state or local regulations

Pole Attachment Agreements

Findings:

- Agreements are outdated and do not enforce current engineering, construction, and safety standards
- Companies install facilities without permission
- City is not adequately protected and is receiving rates below costs

Pole Attachment Agreements

Recommendations:

- Implement an application and permit process; emphasize safety
- Perform an inventory
- Calculate updated rates
- Execute new agreements with both AT&T and Comcast

Current Status:

- City is working with FMPPA to develop and negotiate new agreements
- Expect to execute by July 2016

20 - YEAR LONG RANGE PLAN (LRP)



20-Year Long Range Plan (LRP)

Guide orderly development of the transmission and distribution system to...

Stress the system

- Provide long-range service life
- Maintain adequate service reliability
- Mitigate early obsolescence
- Provide flexibility to adapt to growth patterns
 - Timing of growth

Evaluated three key areas:

- System Improvements
- Contingency
- System Condition

20-Year LRP - System Improvements

Process:

- Modeled and analyzed distribution system
- Estimated annual load growth rate of 2%
- Evaluated in 3 steps
 - 2016-2020 (five years)
 - 2021-2025 (five years)
 - 2026-2035 (ten years)
- Considered historical trends; current power requirements projections, and economic, environmental, and demographic factors with input from City management and engineering

20-Year LRP - System Improvements

Findings:

- Voltage and capacity issues identified throughout planning horizon (typical in LRP)
- Substation transformers overloaded
- Substation 1 is critical due to location on power plant site
 - *Emergency repair scheduled due to bus outage*

Recommendations:

- Multiple circuit upgrades and reconfigurations required
- Transformer replacements
- Majority of work scheduled in first five years

20-Year LRP - System Improvements

Item	Cost Estimate (2015 \$)			
	Step 1 2016-2020	Step 2 2021-2025	Step 3 2026-2035	Total LRP Cost
1 Line Changes	\$6,209,645	\$60,000	\$3,295,189	\$9,564,834
2 Capacitors	\$652,500			\$652,500
Total - DISTRIBUTION	\$6,862,145	\$60,000	\$3,295,189	\$10,217,334
3 Substation 7 Metalclad Switchgear	\$180,000			\$180,000
4 Substation 10 Transformer	\$1,570,000			\$1,570,000
5 Substation 1 Rebuild	\$5,544,950			\$5,544,950
6 Substation 9 Transformers		\$1,300,000		\$1,300,000
7 Substation 10 Transformer			\$650,000	\$650,000
8 Substation 11 Transformer			\$650,000	\$650,000
TOTALS	\$14,157,095	\$1,360,000	\$4,595,189	\$20,112,284

20-Year LRP - Single Contingency

Process:

- Utilize model to evaluate the worst case of a substation failure, loss of one transformer in a substation or loss of a transmission line segment
- Outcomes of various scenarios indicate where system will not meet voltage and capacity requirements

20-Year LRP - Single Contingency

Findings:

- System could be configured to serve the system demands through line backfeed
- Exception is loss of transmission between Substations 3 and 7
- The City's transmission loop and distribution switching capabilities are beneficial

Recommendations:

- Various distribution line work required
- Construct 69 kV transmission line
- Estimated cost: \$750 K

20-Year LRP - Condition Assessment

Process:

- Field visit to inspect substations and transmission
- Reviewed test records
- Identified areas that require immediate maintenance
- Separate assessment of 69 kV submarine cable

20-Year LRP - Condition Assessment

Findings and Recommendations:

O&M

- Most items may be addressed through the City's standard practices
- All work is recommended as soon as practicable, unless noted otherwise
- Estimated cost: \$177 K

69 KV submarine cable

- Cable is operating within its design capacity
- Predicted useful life is 40 years (2027)
- If future testing indicates deterioration, recommend replacing.
- Replacement cost: \$7.4 M (not in plan)

OTHER OPTIMIZATION

Flexible Communications Interface
Enabling Multiple Smart Grid Applications



Other Optimization

Determine if City is optimizing technology in current practices

Process:

- Evaluated City's current practices
- Reviewed data collection methods
- Determined technologies to be further pursued

Other Optimization

Findings:

- Many systems in place, but lack advanced capabilities
- City is pursuing an outage management system
- City has not installed advanced metering
- System is lacking in system automation and coordination
- Technology deployment requires comprehensive plan

Other Optimization

Recommendations:

- Create strategic planning approach for systematic deployment
- Deploy Advanced Metering Infrastructure (AMI)
- Evaluate Load Management and pre-paid customer programs
- Upgrade automated devices on worst performing feeders as pilot project
- Optimize transformer loading and purchase practices
- Perform a sectionalizing and coordination study (**priority**)



Cost/Benefit

<i>(\$ approximated)</i>	Investment/Cost	Annual Revenue Enhancement/Benefit
Resource Adequacy (Reliability)	\$60,000	\$100,000
Resource Adequacy (UG cable)	\$550,000	reliability
Pole Attachment	Legal/ consultation fees	\$100,000
Other Optimization	\$5,700,000	\$1,100,000
Total	\$6,310,000	\$1,300,000

Cost/Benefit

20-Year Long Range Plan	Cost Estimate
Improvements	\$20,112,284
Contingency	\$750,000
Maintenance	\$177,000
Total 20-year Long Range Plan	\$21,039,284



Questions?



Power Services

Engineering and Management Services®

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Fax: (919) 256-5939

Branch Offices: Maitland, FL and Clemson, SC

EXHIBIT F RECOMMENDED IMPROVEMENTS AND COST ESTIMATE BY STEP

City of Vero Beach Electric Distribution System 2016-2035 Long Range Plan Comprehensive Cost Estimate (2015 \$)												
Substation, Transmission, and Critical Equipment Assessment Projects (MAINTENANCE)		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-2035
1	Install battery room exhaust fan & control (Sub 5)	\$ 1,000										
2	Install battery room exhaust fan & control (Sub 7)	\$ 1,000										
3	Remove moisture from oil in Transformer T1 (Sub 8)	\$ 45,000										
4	Replace/remediate transformer T1 fans (Sub 9)	\$ 8,000										
5	Install battery room exhaust fan & control (Sub 9)	\$ 1,000										
6	Remove moisture from oil in Transformer T1 LTC (Sub 10)	\$ 10,000										
7	Replace surge arresters (Sub 10)	\$ 9,000										
8	Install battery room exhaust fan & control (Sub 10)	\$ 1,000										
9	Install battery room exhaust fan & control (Sub 11)	\$ 1,000										
10	Miscellaneous Substation O&M (see Appendix 5)	O&M										
11	Miscellaneous Transmission O&M (see Appendix 6)	O&M										
12	Test submarine cable (Line 69-0609) (Appendix 7)											\$ 100,000
ANNUAL MAINTENANCE BUDGET:		\$ 77,000										\$ 100,000
STEP 1 (2015-2019)		STEP 1					STEP 2					STEP 3
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-2035
LRP IMPROVEMENTS												
13	Replace Metalclad Switchgear (Substation 7)	\$ 180,000										
14	Add Second Transformer (Substation 10 -20/37 MVA)		\$ 1,570,000									
15	Line Construction & Circuit Reconfiguration (Substations 9 & 10)		\$ 3,963,487									
16	Rebuild Substation 1 (2-30/56 MVA Transformers)			\$ 1,108,990	\$ 1,108,990	\$ 3,326,970						
17	Line Construction & Circuit Reconfiguration (various substations)					\$ 2,246,158						
18	Line capacitors (various locations)					\$ 652,500						
ANNUAL TOTAL STEP 1:		\$ 180,000	\$ 5,533,487	\$ 1,108,990	\$ 1,108,990	\$ 6,225,628						
TOTAL STEP 1:							\$ 14,157,095					
STEP 2 (2020-2024)												
19	Replace Transformers (Substation 9 - (2) 20/37 MVA)								\$ 1,300,000			
20	Line Construction & Circuit Reconfiguration (various substations)										\$ 60,000	
ANNUAL TOTAL STEP 2:							\$ -	\$ -	\$ 1,300,000	\$ -	\$ 60,000	
TOTAL STEP 2:											\$ 1,360,000	
STEP 3 (2025-2034)												
21	Replace Transformers (Substation 11 - 20/37 MVA)											\$ 650,000
22	Replace Transformers (Substation 10 - 20/37 MVA)											\$ 650,000
23	Line Construction & Circuit Reconfiguration (various substations)											\$ 3,295,189
TOTAL STEP 3:												\$ 4,595,189
TOTAL LRP IMPROVEMENTS												\$ 20,112,284
LRP CONTINGENCY												
24	Transmission Line (1.4 miles - Substation 5 to Line 69-069)					\$ 750,000						
ANNUAL CONTINGENCY:		\$ -	\$ -	\$ -	\$ -	\$ 750,000	\$ -	\$ -	\$ -	\$ -	\$ -	
TOTAL CONTINGENCY:												\$ 750,000
BUDGET SUMMARY		STEP 1					STEP 2					STEP 3
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-2035
2016-2035 ANNUAL MAINTENANCE BUDGET		\$ 77,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 100,000
2016-2035 ANNUAL LRP BUDGET		\$ 180,000	\$ 5,533,487	\$ 1,108,990	\$ 1,108,990	\$ 6,975,628	\$ -	\$ -	\$ 1,300,000	\$ -	\$ 60,000	\$ 4,595,189
2016-2035 LRP & MAINTENANCE BUDGET BY STEP		\$14,984,095					\$1,360,000					\$4,695,189
GRAND TOTAL 2016-2035 MAINTENANCE & LONG-RANGE PLAN							\$21,039,284					

4-6)

Power Purchase Agreement Checklist for State and Local Governments

This fact sheet provides information and guidance on the solar photovoltaic (PV) power purchase agreement (PPA), which is a financing mechanism that state and local government entities can use to acquire clean, renewable energy. We address the financial, logistical, and legal questions relevant to implementing a PPA, but we do not examine the technical details—those can be discussed later with the developer/contractor. This fact sheet is written to support decision makers in U.S. state and local governments who are aware of solar PPAs and may have a cursory knowledge of their structure but they still require further information before committing to a particular project.

Overview of PPA Financing

The PPA financing model is a “third-party” ownership model, which requires a separate, taxable entity (“system owner”) to procure, install, and operate the solar PV system on a consumer’s premises (i.e., the government agency). The government agency enters into a long-term contract (typically referred to as the PPA) to purchase 100% of the electricity generated by the system from the system owner. Figure 1 illustrates the financial and power flows among the consumer, system owner, and the utility. Renewable energy

certificates (RECs), interconnection, and net metering are discussed later. Basic terms for three example PPAs are included at the end of this fact sheet.

The system owner is often a third-party investor (“tax investor”) who provides investment capital to the project in return for tax benefits. The tax investor is usually a limited liability corporation (LLC) backed by one or more financial institutions. In addition to receiving revenues from electricity sales, they can also benefit from federal tax incentives. These tax incentives can account for approximately 50% of the project’s financial return (Bolinger 2009, Rahus 2008). Without the PPA structure, the government agency could not benefit from these federal incentives due to its tax-exempt status.¹

The developer and the system owner often are distinct and separate legal entities. In this case, the developer structures the deal and is simply paid for its services. However, the developer will make the ownership structure transparent to the government agency and will be the only contact throughout the process. For this reason, this fact sheet will refer to “system owner” and developer as one in the same.

While there are other mechanisms to finance solar PV systems, this publication focuses solely on PPA financing because of its important advantages:²

Figure 1
Contracts and Cash Flow in Third-Party Ownership/PPA Model



Source: NREL

1. No/low up-front cost.
2. Ability for tax-exempt entity to enjoy lower electricity prices thanks to savings passed on from federal tax incentives.
3. A predictable cost of electricity over 15–25 years.
4. No need to deal with complex system design and permitting process.
5. No operating and maintenance responsibilities.

¹ Clean renewable energy bonds (CREBs) are also available to municipalities and other public entities as an alternative means of benefiting from federal tax benefits.

² For a full discussion of alternative financing mechanisms, see Cory et al. 2009.

Power Purchase Agreement Checklist

High-Level Project Plan for Solar PV with PPA Financing

Implementing power purchase agreements involves many facets of an organization: decision maker, energy manager, facilities manager, contracting officer, attorney, budget official, real estate manager, environmental and safety experts, and potentially others (Shah 2009). While it is understood that some employees may hold several of these roles, it is important that all skill sets are engaged early in the process. Execution of a PPA requires the following project coordination efforts, although some may be concurrent:³

Step 1. Identify Potential Locations

Identify approximate area available for PV installation including any potential shading. The areas may be either on rooftops or on the ground. A general guideline for solar installations is 5–10 watts (W) per square foot of usable rooftop or other space.⁴ In the planning stages, it is useful to create a CD that contains site plans and to use Google Earth software to capture photos of the proposed sites (Pechman 2008). In addition, it is helpful to identify current electricity costs. Estimating System Size (this page) discusses the online tools used to evaluate system performance for U.S. buildings.

Step 2. Issue a Request for Proposal (RFP) to Competitively Select a Developer

If the aggregated sites are 500 kW or more in electricity demand, then the request for proposal (RFP) process will likely be the best way to proceed. If the aggregate demand is significantly less, then it may not receive sufficient response rates from developers or it may receive responses with expensive electricity pricing. For smaller sites, government entities should either 1) seek to aggregate multiple sites into a single RFP or 2) contact developers directly to receive bids without a formal RFP process (if legally permissible within the jurisdiction).

Links to sample RFP documents (and other useful documents) can be found at the end of this fact sheet. The materials generated in Step 1 should be included in the RFP along with any language or requirements for the contract. In addition, the logistical information that bidders may require to create their proposals (described later) should be included. It is also worthwhile to create a process for site visits.

³ Adapted from a report by GreenTech Media (Guice 2008) and from conversations with Bob Westby, NREL technology manager for the Federal Energy Management Program (FEMP).

⁴ This range represents both lower efficiency thin-film and higher efficiency crystalline solar installations. The location of the array (rooftop or ground) can also affect the power density. Source: <http://www.solarbuzz.com/Consumer/FastFacts.htm>

Renewable industry associations can help identify Web sites that accept RFPs. Each bidder will respond with an initial proposal including a term sheet specifying estimated output, pricing terms, ownership of environmental attributes (i.e., RECs) and any perceived engineering issues.

Step 3. Contract Development

After a winning bid is selected, the contracts must be negotiated—this is a time-sensitive process. In addition to the PPA between the government agency and the system owner, there will be a lease or easement specifying terms for access to the property (both for construction and maintenance). REC sales may be included in the PPA or as an annex to it (see Page 6 for details on RECs). Insurance and potential municipal law issues that may be pertinent to contract development are on Page 8.

Step 4. Permitting and Rebate Processing

The system owner (developer) will usually be responsible for filing permits and rebates in a timely manner. However, the government agency should note filing deadlines for state-level incentives because there may be limited windows or auction processes. The Database of State Incentives for Renewables and Efficiency (<http://www.dsireusa.org/>) is a useful resource to help understand the process for your state.

Step 5. Project Design, Procurement, Construction, and Commissioning

The developer will complete a detailed design based on the term sheet and more precise measurements; it will then procure, install, and commission the solar PV equipment. The commissioning step certifies interconnection with the utility and permits system startup. Once again, this needs to be done within the timing determined by the state incentives. Failure to meet the deadlines may result in forfeiture of benefits, which will likely change the electricity price to the government agency in the contract. The PPA should firmly establish realistic developer responsibilities along with a process for determining monetary damages for failure to perform.

Financial and Contractual Considerations

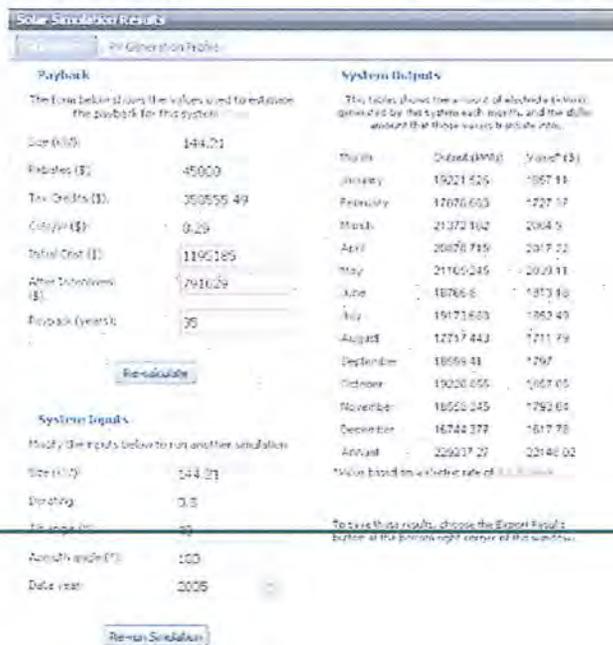
The developer's proposal should include detailed projections of all financial considerations. This section helps the government agency become a more informed purchaser by explaining key components that are needed for a complete proposal.

Estimating System Size

One of the first steps for determining the financial feasibility of a PPA is to estimate the available roof and ground space, and to approximate the size of the PV system or systems. NREL provides a free online tool called In My Backyard (IMBY) to make this assessment—the program can be found at <http://www.nrel.gov/eis/imby/>

The IMBY tool, which uses a Google Maps interface, allows users to zoom-in on a particular building or location and trace the approximate perimeter of the potential solar array. From this information, IMBY simulates financial and technical aspects of the system; the results provide a first-level estimate and might not capture the exact situation (system performance, system cost, or utility bills) at a particular location (an example is shown in Figure 2). IMBY estimates the system size and annual electricity production as well as the monetary value of the electricity generated by the photovoltaic system. Users can adjust primary technical and financial inputs to simulate more specific conditions. The amount of electricity generated by the solar system can be compared to the facility's monthly utility electric bills to estimate potential offset capacity of the PV system.⁵

Figure 2
IMBY Example



Source: NREL

PPA Pricing

A key advantage of power purchase agreements is the predictable cost of electricity over the life of a 15- to 25-year contract. This avoids unpredictable price fluctuations from utility rates, which are typically dependent on fossil fuel prices in most of the United States. The approval of climate change legislation also may cause utility electricity rates to

⁵ It is important to be cognizant of any planned or potential changes to the facility that could affect the electrical demand (and, therefore, electricity offset) such as the additions to the facility.

increase significantly; thus, the projected savings may be further accentuated. In a PPA, the electricity rates are predetermined, explicitly spelled out in the contract, and legally binding with no dependency on fossil fuel or climate change legislation.

The most common PPA pricing scenarios are **fixed price** and **fixed escalator**. In a **fixed-price** scheme, electricity produced by the PV system is sold to the government agency at a fixed rate over the life of the contract (see Figure 3 for an example of this scenario). Note that it is possible for the PPA price to be higher than the utility rate at the beginning. However, over time, the utility rate is expected to overtake the PPA price such that the PPA generates positive savings over the life of the contract. This structure is most favorable when there is concern that the utility rates will increase significantly.

In a **fixed-escalator** scheme, electricity produced by the system is sold to the government agency at a price that increases at a predetermined rate, usually 2–5% (see Figure 4 for an example of this scenario). Some system owners will offer a rate structure that escalates for a time period (e.g., 10 years) and then remains fixed for the remainder of the contract.

Figure 3
Fixed-Price PPA

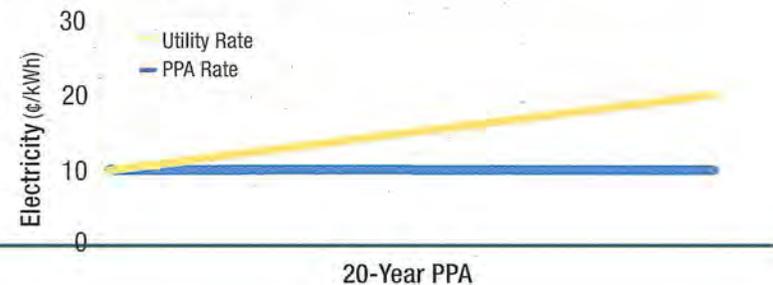
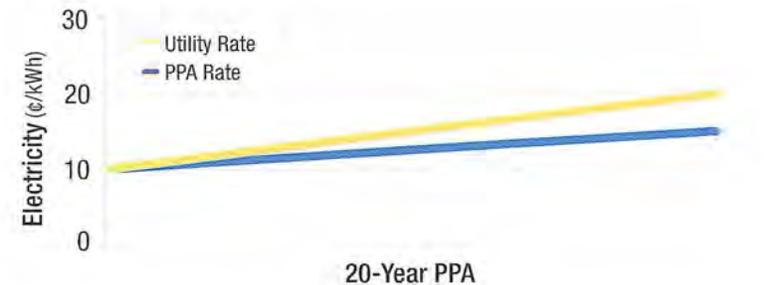
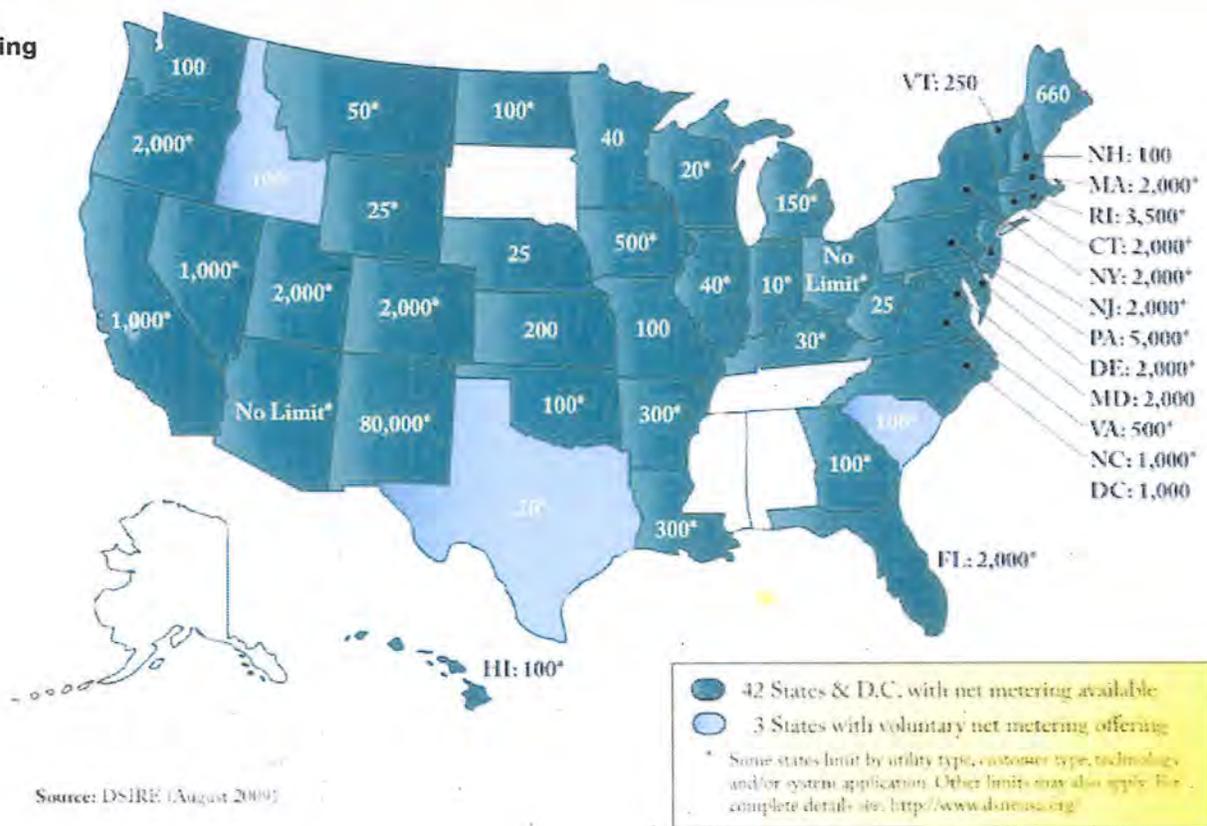


Figure 4
PPA Price Escalator



Power Purchase Agreement Checklist

**Figure 5
Net Metering**



A less common PPA pricing model involves the PPA price based on the utility rate with a predetermined discount. While this ensures that the PPA price is always lower than utility rates, it is complicated to structure and it undermines the price-predictability advantage of a PPA.

A recently emerging PPA structure has consumers either 1) prepay for a portion of the power to be generated by the PV system or 2) make certain investments at the site to lower the installed cost of the system. Either method can reduce the cost of electricity agreed to in the PPA itself. This structure takes advantage of a governmental entity's ability to issue tax-exempt debt or to tap other sources of funding to buy-down the cost of the project. Prepayments can improve economics for both parties and provide greater price stability over the life of the contract. Boulder County exercised this option by making investments to lower the project costs (see the table on Page 10, which provides examples of PPA pricing and structures from state and local government projects in California and Colorado).

Interconnection and Net Metering

Interconnection to the existing electrical grid and net metering are important policies to consider.⁶ Interconnection standards vary according to state-mandated rules (and sometimes by utility), which regulate the process by which renewable energy systems are connected to the electrical grid. Federal policy mandates that utilities accept interconnection from solar power stations, but each utility's process varies. The system owner and utility develop an interconnection agreement, which spells out the conditions, equipment, and processes. Such conditions may include standby charges, which are fees that utilities impose on solar system owners to account for the cost of maintaining resources in case the solar system is not generating. Additionally, the project host and developer should consider utility tariff charges applicable to electricity purchased in backup mode—contact your local utility to fully comprehend the process of interconnection in the early stages of RFP development. The Interstate Renewable Energy Council has a report on state-specific interconnection standards, which is available at <http://www.irecusa.org/index.php?id=86>.

⁶ The 2008 Edition of *Freeing the Grid*, issued by the Network for New Energy Choices, provides a listing of the best and worst practices in state net-metering policies and interconnection standards. Much of the report discusses the technical aspects, which your developer should be able to address. http://www.newenergychoices.org/uploads/FreeingTheGrid2008_report.pdf

Net metering is a policy that allows a solar-system owner to receive credit on his/her electricity bill for surplus solar electricity sent back to the utility. The electricity meter “spins backward,” accurately tracking the excess electricity. Net-metering regulations vary by state but typically include specifications for the amount of excess electricity that the utility can count, the rate at which the utility can produce the credit, and the duration of the agreement (Rahus Institute 2008). States that do not have net-metering guidelines may require the system owner to install a second meter.

States differ on their net-metering pricing scheme, but they fall into three basic categories: (1) retail rate (the rate consumers pay), (2) the wholesale rate (market rate), or (3) the utilities’ avoided-generation rate. Time of use (TOU) net metering is a system of indexing net-metering credits to the value of the power sold on the market during that time period. This is advantageous to solar power because it is strongest during electricity peak demand times (Rahus Institute 2008). Figure 5 shows the states with net-metering policies in place.

Sizing PV systems for specific locations/applications depends highly on energy demand schedules as well as net-metering laws. When sizing a PV system, it is important to avoid the potential for overproduction. If there are unanticipated changes in demand, or if electricity production is not coincident with electricity consumption at the site, the PV system may generate more electricity than the utility can credit the customer for—some net-metering laws cap this amount. The risk is overproducing and sending electricity to the grid without compensation. A facility can produce a disproportionate amount of energy during peak periods and may not make up for this discrepancy during off-peak periods (Pechman 2008).

Federal Tax Incentives for the System Owner

An important aspect of the PPA structure is that a system owner can take advantage of federal tax incentives that a tax-exempt entity cannot. The two most significant tax benefits are the investment tax credit (ITC) and accelerated depreciation. The ITC offers tax-paying entities a 30% tax credit on the total cost of their solar system.⁷ Accelerated depreciation is an accounting practice used to allocate the cost of wear and tear on a piece of equipment over time – in this case, more quickly than the expected system life. The Internal Revenue Service (IRS) allows a five-year modified accelerated cost recovery system (MACRS) for commercial PV systems. Although a solar array may produce power during the entirety of a 20-year PPA, the system owner can take advantage of the entire tax benefit within the first five years. Both of these incentives

⁷ Under the American Recovery and Reinvestment Act (Recovery Act), tax-paying entities can elect to recover the ITC using a Department of Treasury grant, once project construction is complete. This is expected to improve the financial benefits of the incentive.

alleviate a great deal of financial risk for system owners, encourage project development, and help make renewable energy an affordable alternative to fossil fuel energy sources.

The Value of Renewable Energy Certificates

Twenty-nine states and the District of Columbia have implemented renewable portfolio standard (RPS) policies. An RPS requires utilities to provide their customers with a minimum percentage of renewable generation by statutory target dates. Failure to meet these requirements usually results in compliance penalties. Figure 6 shows these RPS policies by state.

Utilities typically prove RPS compliance using renewable energy certificates (RECs), which represent 1 megawatt-hour (MWh) of electricity produced from a renewable source. In many states, RECs can be traded separately from the electricity. In these cases, the RECs represent the environmental attributes of renewable energy. In addition, some states offer carve-outs for solar renewable energy certificates (SRECs) or distributed generation (DG) (see Figure 6). These states create separate markets for these RECs (usually at higher prices) or offer multiple credits for each megawatt-hour. For example, a 3x multiplier allows the utility to count each REC from solar electricity as 3 MWh for compliance purposes.⁸

States with RPS policies are known as “compliance markets.” In these markets, utilities can include purchased RECs in demonstration of compliance with state energy mandates. This can provide an important source of cash flow to PV system owners. In addition, states with carve-outs for solar or DG can realize even higher prices for SRECs.

“Voluntary markets” also exist in which residential, commercial, and industrial consumers can buy SRECs from system owners to claim their energy is produced from renewable technologies. The advantage is that consumers do not have to develop renewable projects but still can claim the environmental benefits (Cory 2008).

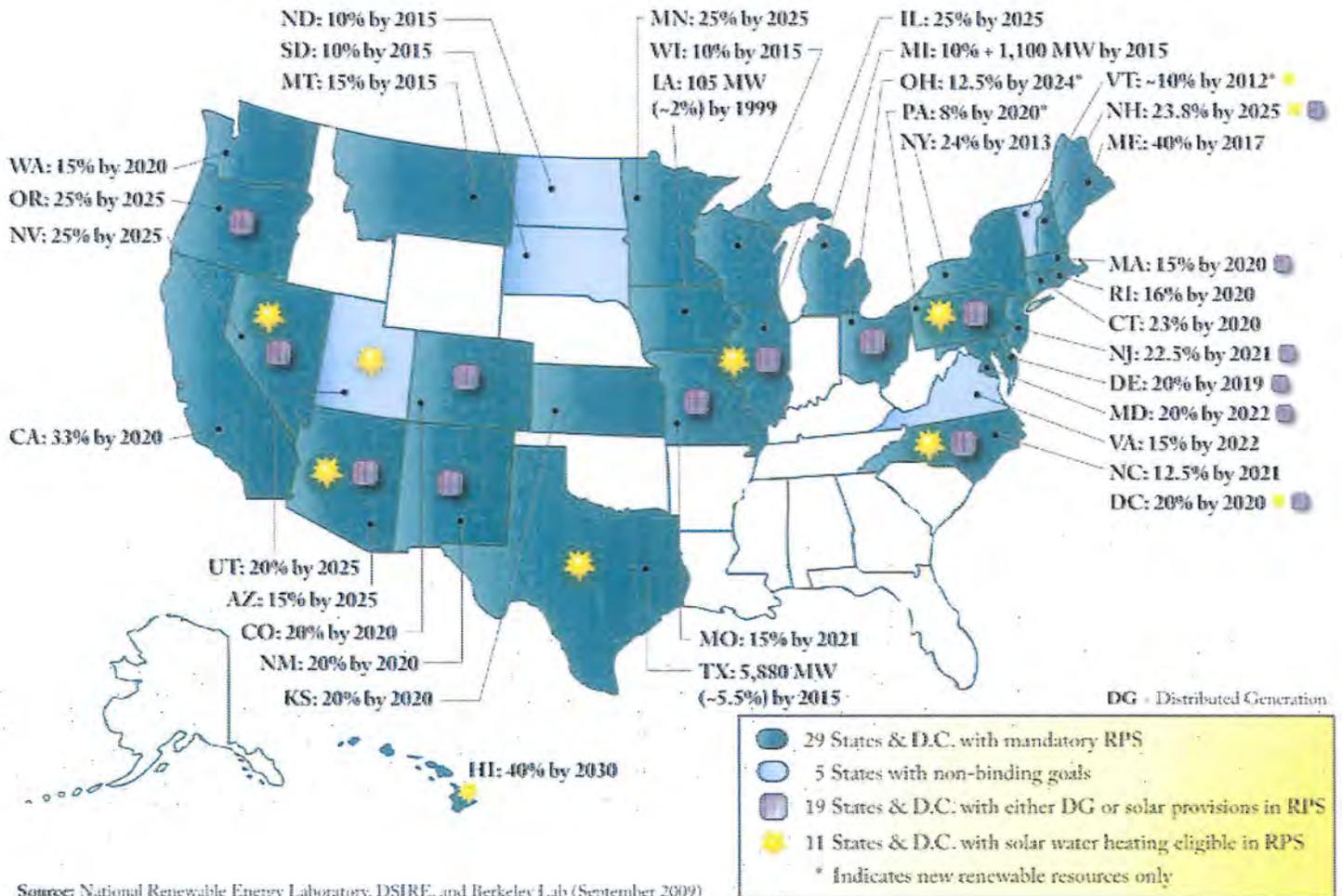
In general, PPAs are structured so that the RECs remain with the system owner. However, the host can negotiate to buy the RECs along with the electricity. This will drive up the price per kilowatt-hour in the PPA to compensate the system owner for the RECs. If the host does not buy the RECs, it is important to manage the claims made regarding the PV system. The government agency can say it is hosting a renewable energy project but it cannot say that it is powered by renewable energy. One option is an SREC swap. In this case, the host would decide against buying the solar RECs from the PPA provider and instead buy cheaper replacement RECs (wind or biomass, for example) in the voluntary market (Coughlin 2009). REC prices in the voluntary markets are substantially

⁸ Under the Waxman-Markey bill (as of July 2009), Congress is considering a federal solar multiplier of 3x for all distributed generation projects.

Power Purchase Agreement Checklist

Figure 6

States with Renewable Portfolio Standards (indicating solar/DG set-asides)



lower than in the compliance market. This REC swap would allow the host to claim green power benefits (but not solar power because the replacement RECs were not SRECs).

State and Utility Cash Incentives

Other important state-level programs are those that provide cash incentives for system installation. These programs (often called “buy-down” or “rebate” programs) come in two varieties. The capacity-based incentive (CBI) provides a dollar amount per installed watt of PV. Incentives can also be structured as performance-based incentives (PBI). They do not provide up-front payments, but rather provide ongoing payments for each kilowatt-hour of electricity produced over a time period (e.g., five years). Consumers will normally prefer CBIs because of the up-front cash. However, some states

prefer PBIs because they encourage better performance. The downside of these more recent programs is that the government agency must finance a large part of system costs (if not under a solar PPA) and incur performance risk (Bolinger 2009).

Approximately 20 states and 100 utilities offer financial incentives for solar photovoltaic projects. Depending on the state and local programs, these incentives can cover 20-50% of a project’s cost (DSIRE 2009). Specifics for individual state programs can be found on the Database of State Incentives for Renewables and Efficiency (<http://www.dsireusa.org/>). Additional government incentives include state tax credits, sales tax exemptions, and property tax exemptions, which can be important under the solar PPA model.

System Purchase Options

If the host prefers, the solar PPA can include provisions for a consumer to buy the PV system. This can occur at any point during the life of the contract but almost always after the sixth year because of tax recapture issues related to the ITC. The buyout clause is phrased as the greater of fair market value (FMV) or some "termination" value (that is higher than the FMV). This termination value often includes the present value of the electricity that would have been generated under the remaining life of the PPA. Buyout options are more readily available in third-party PPAs in which the investors are motivated by the tax incentives rather than long-term electricity revenues. A different set of investors may have a longer-term investment horizon and may be less likely to favor early system-purchase options.

When issuing RFPs and evaluating bids, it is important to understand the project goals of the potential developers and decide which most closely align with those of your organization. From the government agency's point of view, there are both benefits and responsibilities that come with owning the system. The obvious benefit is that the electricity generated by the PV system can now be consumed by the host at no cost (financing charges notwithstanding); the costs and responsibilities revolve around the need to operate and maintain the PV system. Owner's costs include physical maintenance (including inverter replacement, which can be costly) and monitoring, as well as financial aspects such as insurance.

Although PPAs are inherently structured as a contract by which a government agency can buy electricity, system ownership may be a viable option at some point. If the buyout option is not available or not exercised by the end of the contract life, the government agency can purchase the system at "fair market value," extend the PPA, or request the system owner remove the system (Rahus 2008). Government hosts may want to consider requiring (in the RFP and the PPA) that the system owner pay for the cost of equipment removal at contract maturity.

Logistical Considerations

Appropriate roof or land areas must be identified, and there are also important logistical requirements to consider. The issues discussed in this section should be included in the RFP because they will allow the developer to provide a firmer bid with less assumptions and contingencies.

Rooftop Mounted Arrays

After the RFP, the winning bidder will conduct a structural analysis to determine whether the roof can sustain the load. By documenting the condition in the RFP, you may avoid potential adjustments. It is important to assess the following information:

- **Roof structure and type** (flat, angled, metal, wood, etc.) – determines the attachment methods that may be used.
- **Orientation of the roof** – especially important if it is a sloped roof. Southern facing roofs are ideal but not necessarily mandatory.
- **Roof manufacturer's warranty** – usually lasts a minimum of 10 years but can extend over 20 years. Before installing solar panels, it is important to ensure that the solar installation will not void the warranty. Systems that do not penetrate the roof surface or membrane are usually acceptable, but it is important to obtain this allowance in writing prior to moving forward with the solar project.
- **Planned roof replacement** – if it is to be scheduled within a few years, it is a good idea to combine projects, which will cut costs and minimize facility disturbance.
- **Potential leak concern** – if this exists, you may opt for a formal roof survey to assess and document the condition of the roof prior to the solar installation.
- **Obstructions on the roof** – items such as roof vents and HVAC equipment can hinder the project.
- **Shade from adjacent trees or buildings** – can reduce solar potential.

Ground-Mounted Systems

Ground-mounted photovoltaic systems are advantageous in some situations because they can be cheaper and easier to install and can be scaled-up more easily. This reduces the cost per kilowatt-hour and translates into cheaper energy costs for the consumer. Additionally, ground systems offer flexibility in the type of technology that can be used. For example, the project may have tracking technologies, which can result in higher energy output and better project economics. One of the key logistical issues for ground-mounted systems is the wind speed the system is designed to withstand, which depends primarily on the location of the project site (e.g., hurricane risks); the soil type and strength characteristics are also important. To obtain more accurate bids, consumers often will have a third-party conduct soil sample tests prior to issuing an RFP. Wind and soil conditions can greatly influence the design and cost of a project. Perimeter fencing and site monitoring should be specified in the RFP to ensure security, safety, and compliance with local codes.

Power Purchase Agreement Checklist

General Logistical Considerations

Electrical upgrades or changes may affect the system design and potential interconnection to the electrical grid. Any planned changes should be documented within the RFP.

For proper maintenance, accessibility to the inverter and solar array will be important to the system owners throughout the life of the project.

Fire departments will have building accessibility requirements, particularly for roof-mounted systems. Some jurisdictions formally specify these standards and will confirm that the system meets the requirements during the permitting phase and final approval process. In states that do not have such requirements, it is important for the government agency and the system owner to gain fire department approval early in the process.

Contractually, operation and ongoing maintenance of the solar system is typically the responsibility of the system owner unless otherwise specified.

Insurance⁹

While many governmental entities may be able to self-insure, it is important to investigate the minimum insurance required by your utility's interconnection rules. The requirements may necessitate additional coverage through private insurance.

Unfortunately, insurance underwriters charge fairly high premiums for PV installations. These premiums can represent approximately 25% of the annual operating budget and may be as large as 0.25% to 0.50% of the project installed costs. According to discussions with developers, the cost of insurance can increase energy pricing by 5–10%. The high premiums are due to two underlying reasons: 1) Insurance underwriters still view PV as a risky technology due to its lack of long operating history, and 2) the relatively low number of projects do not allow underwriters to average risk across a large number of installations (i.e., “the law of large numbers”). Until recently, Lloyds of London was the only underwriter for PV in the United States; however, Munich Re, AIG, Zurich Insurance Group, ACE Ltd., and Chubb are also actively pursuing renewable energy policies. Reportedly, a fifth underwriter is developing a PV product, but no public announcements have been made (Kollins et al., forthcoming).

In general, insurance is the responsibility of the system owner (developer). At a minimum, the system owner should be expected to carry both general liability and property insurance. Additional considerations may be given to separate policies for location-specific risks (e.g., hurricane coverage in Florida), property-equivalent policies (which cover engineering), and environmental risk (inclusive of pre-existing conditions). If covered by the system owner, the cost of insurance will be factored into the PPA cost of electricity and not passed through separately. Thus, a fairly recent realization is that it may be cheaper for the government agency to insure the system directly, although they don't actually own the system. Then, the system owner is named as an additional insured party on the policy and agrees to reimburse the government agency for the premiums. Insurance companies have agreed to this in previous PPAs (Boylston 2008). Because this can reduce overall project costs, this arrangement deserves further investigation with a provider.

One final note concerns indemnification for bad-acts and pre-existing structural or environmental risks. Whether contractual or not, the government agency may want to acquire its own insurance to protect itself from the potential of future liabilities.

Potential Deal Constraints Embedded in Municipal Laws¹⁰

Municipal laws were written before PV installations were even a remote consideration. While each jurisdiction operates under its own unique statutes, this section lists some common constraints that may be encountered. Listed below are the categories that may require investigation. More detail on the following specific issues is provided at the end of this fact sheet:

1. **Debt limitations** in city codes, state statutes, and constitutions
2. Restrictions on **contracting power** in city codes and state statutes
3. **Budgeting, public purpose, and credit-lending** issues
4. **Public utility rules**
5. Authority to **grant site interests and buy electricity**

⁹ Much of this section is adopted from a forthcoming NREL paper: “Insuring Solar Photovoltaics: Challenges and Possible Solutions”; Speer, B.; Mendelsohn, M.; and Cory, K.

¹⁰ Much of this section is adapted from the transcript of a June 12, 2008, NREL conference call led by Patrick Boylston of Stoel Rives LLP.

Conclusions

Financing solar PV through a power purchase agreement allows state and local governments to benefit from clean renewable energy while minimizing up-front expenditures and outsourcing O&M responsibilities. Also important, a PPA provides a predictable electricity cost over the length of the contract.

This fact sheet is a concise guide that will help states and municipalities with the solar PPA process. The following five steps are recommended to formally launch a project (and are described in this brief):

Step 1: Identify Potential Locations

Step 2: Issue a Request for Proposal (RFP) to Competitively Select a Developer

Step 3: Contract Development

Step 4: Permitting and Rebate Processing

Step 5: Project Design, Procurement, Construction, and Commissioning

The U.S. Department of Energy (DOE) can help facilitate the process by providing quick, short-term access to expertise on renewable energy and energy efficiency programs. This is coordinated through the Technical Assistance Project (TAP) for state and local officials.¹¹ More information on the program can be found at <http://apps1.eere.energy.gov/wip/tap.cfm>.

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¹¹ TAP currently has a focus on assisting programs that are related to Recovery Act funds.

Power Purchase Agreement Checklist

Sample Terms of Executed Power Purchase Agreements (PPAs)

Government Level	State	County	City
Name	Caltrans District 10 Solar Project	Boulder County Solar Project	Denver Airport Solar Project
Location	Stockton, California	Boulder County	Denver, Colorado
Customer	California Department of Transportation	Boulder County	Denver International Airport
Utility	Pacific Gas & Electric	Xcel Energy	Xcel Energy
Size (DC)	248 kW	615 kW	2,000 kW
Annual Production	347,407 kWh	869,100 kWh	3,000,000 kWh
Type	123 kW rooftop, 125 kW carport	570 kW rooftop, 45 kW ground	Ground-mount, single-axis tracking
Location	Maintenance Warehouse Maintenance Shop Parking Lot Canopy	Recycling Center Courthouse Clerk and Recorder Addiction Recovery Center Justice Center Walden Ponds (ground-mount) Sundquist	Ground of the Denver International Airport
Area	22,200 sq ft	8 county buildings	7.5 acres
Developer	Sun Edison, LLC	Bella Energy	World Water & Solar Technologies
Owner	Sun Edison, LLC	Rockwell Financial	MMA Renewable Ventures
PPA Terms	20 years, 5.5% discount from utility rates	20 years, fixed-price 6.5 ¢/kWh for first 7 years, renegotiate price and buyout option at beginning of year 8	25 years, fixed-price 6 ¢/kWh for first 5 years, buyout option at beginning of year 6 or price increases to 10.5 ¢/kWh
Status	Completed September 2007	Completed January 2009	Completed August 2008
Contact	Patrick McCoy (916) 375-5988 patrick.mccoy@dgs.ca.gov	Ann Livingston (303) 441-3517 alivingston@bouldercounty.org	Woods Allee (303) 342-2632 woods.allee@flydenver.com

Source: NREL

Potential Deal Constraints Embedded in Municipal Laws

This table lists potential constraints posed by municipal laws. Not all issues will pertain to your jurisdiction; however, this table can serve as a short checklist for use in your investigation. The request for proposal (RFP) issue column is meant to qualify each issue as to whether it needs to be highlighted in the RFP.

Category	RFP Issue?	Issue	Implication	General Findings and Next Steps
1. Debt Limitations in City Codes, State Statutes, and Constitutions	No	Is PPA debt or contingent liability?	Debt would require public vote for approval. Contingent liability is allowed under purchasing authority without a vote.	Most states see as purchasing only what is consumed. Thus, a vote not is required. PPA agreements usually called "energy services agreement" to avoid any appearance of debt. Must be wary of "take or pay provisions" in PPA requiring payments regardless of use. Also, be careful to size so as to not over-produce based on net-metering rules
	No	Is system purchase option debt?	A vote will be required to approve debt for system purchase.	It is important that the PPA deems the purchase as optional at fair market value so that a vote is not needed until the option is exercised.
2. Restrictions on Contracting Power in City Codes and State Statutes	Yes	Contract Tenor statutes (e.g., limited to 10 yrs or 15 yrs)	May limit choice of developers based on investment goals.	Research of local rules and precedents may be required.
	Yes	Ability to buy/sell RECs	When codes and statutes were created, RECs were not envisioned. May determine where beneficial REC ownership is assigned in PPA.	Each jurisdiction will be different. Research of local rules and precedents is required. Is there enough general authority under electricity purchases (or other) to justify REC trading?
	Yes	Public bidding laws	May preclude RFP process unless there is an applicable exemption to public bidding laws.	Research of local rules and precedents may be required. Developer will ask for representation and warranty that the contract is exempt from public bidding rules.
3. Public Purpose and Lending of Credit Issues	Yes	Pre-paying for electricity	Is this a grant to a for-profit LLC that owns the PV system?	In most states, authority exists (such as in the opinion of attorneys general) that it is permissible if the entities are fulfilling a government purpose. Research may be required if pre-payment is envisioned.
4. Public Utility Rules	Yes	How many entities will be buying electricity (i.e., city, county, and/or other government entities occupy site)?	Most state laws and/or rules clarify that if you are selling electricity to a certain number of consumers, then you are a utility and subject to Public Utility Commission (PUC) regulation. ¹² This can be prohibitively expensive for the developer.	Developers will generally want to contract only with a single entity that owns the meter. The costs can then be divided among various entities. If the entities are all behind the meter, then they would not be subject to PUC regulations.
5. Authority to Grant Site Interests and Purchase Electricity	No	Lease or easement?	A lease can have problems with disposal and interest in public property, which may require a public-bidding or offering process.	Framing the document as an "easement" instead of a "lease" has worked well. Works much like a lease except without ability to transfer it—except in accordance with agreement (usually restricted).

Source: Boylston 2008

¹² The threshold is set differently by each state. Most are in the two-five range.

Power Purchase Agreement Checklist

Sources for Sample Documents

Samples of requests for proposals can be found using simple Web searches—the links below will get you started in your search.

NV Energy (Nevada Power Company) is a good source for documents which have been previously tested in the marketplace:

<http://www.nvenergy.com/company/doingbusiness/rfps/>

Oregon University System

http://www.ous.edu/bapp/contractfiles/20090522_1545_Photovoltaic%20Power%20Purchase%20Agreement/RFP%202009-06%20Solar%20PPA.doc

City of Santa Ana

<http://www.ci.santa-ana.ca.us/pwa/documents/RFP-SolarProjectandGuideline.pdf>

The U.S. Navy recently released an RFP that is very thorough in its specifications:

<http://www.allenmatkins.com/emails/Renewable/Img/NAVY.pdf>

Example RFPs from several California municipalities:

<http://www.lgc.org/spire/rfps.html>

A current federal government RFP:

<https://www.desc.dla.mil/DCM/DCMSolic.asp?SolicID=1533>

Other Useful Documents:

The documents below are more detailed, in-depth solar financing guides.

The Customer's Guide to Solar Power Purchase Agreements, by the Rarus Institute
<http://www.californiasolarcenter.org/sppa.html>

Solar Photovoltaic Financing: Deployment on Public Property by State and Local Governments, by Karlynn Cory, Jason Coughlin, and Charles Coggeshall. This NREL report (May 2008) examines ways that state and local governments can optimize the financial structure of deploying solar PV for public uses. It can be accessed at <http://www.nrel.gov/docs/fy08osti/43115.pdf>

Solar Photovoltaic Financing: Residential Sector Deployment, by Jason Coughlin and Karlynn Cory. This NREL technical report (March 2009) can be accessed at <http://www.nrel.gov/docs/fy09osti/44853.pdf>.

Solar Photovoltaic Financing: Deployment by Federal Government Agencies, by Karlynn Cory, Charles Coggeshall, Jason Coughlin, and Claire Kreycik. This NREL technical report (August 2009) can be accessed at <http://www.nrel.gov/docs/fy09osti/46397.pdf>

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Utility-Scale Solar 2014

An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States

Mark Bolinger & Joachim Seel

Lawrence Berkeley National Laboratory

September 30th 2015

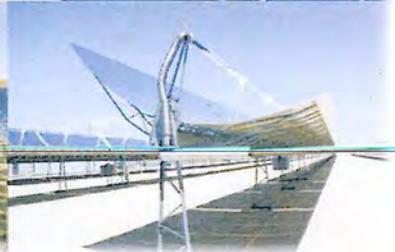
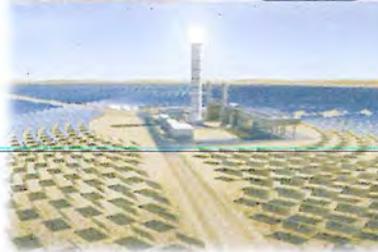
This research was supported by funding from the U.S. Department of Energy's SunShot Initiative.

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September 2015



ENERGY TECHNOLOGIES AREA



Presentation Outline

Strong growth of the utility-scale solar market offers increasing amounts of project-level data that are ripe for analysis.

1. Introduction to the project population and description of broader technology trends

Key findings from analysis of the data samples:

2. Installed project prices
3. Operation and maintenance (O&M) costs
4. Performance (capacity factors)
5. Power purchase agreement (“PPA”) prices
6. Future outlook

We define “utility-scale” as any ground-mounted project that is larger than 5 MW_{AC}.
Smaller systems are analyzed in LBNL’s “Tracking the Sun” series.



Total utility-scale solar project universe is dominated by PV projects

PV project population: 192 projects totaling 6,201 MW_{AC}

- This population's characteristics are described in the next few slides

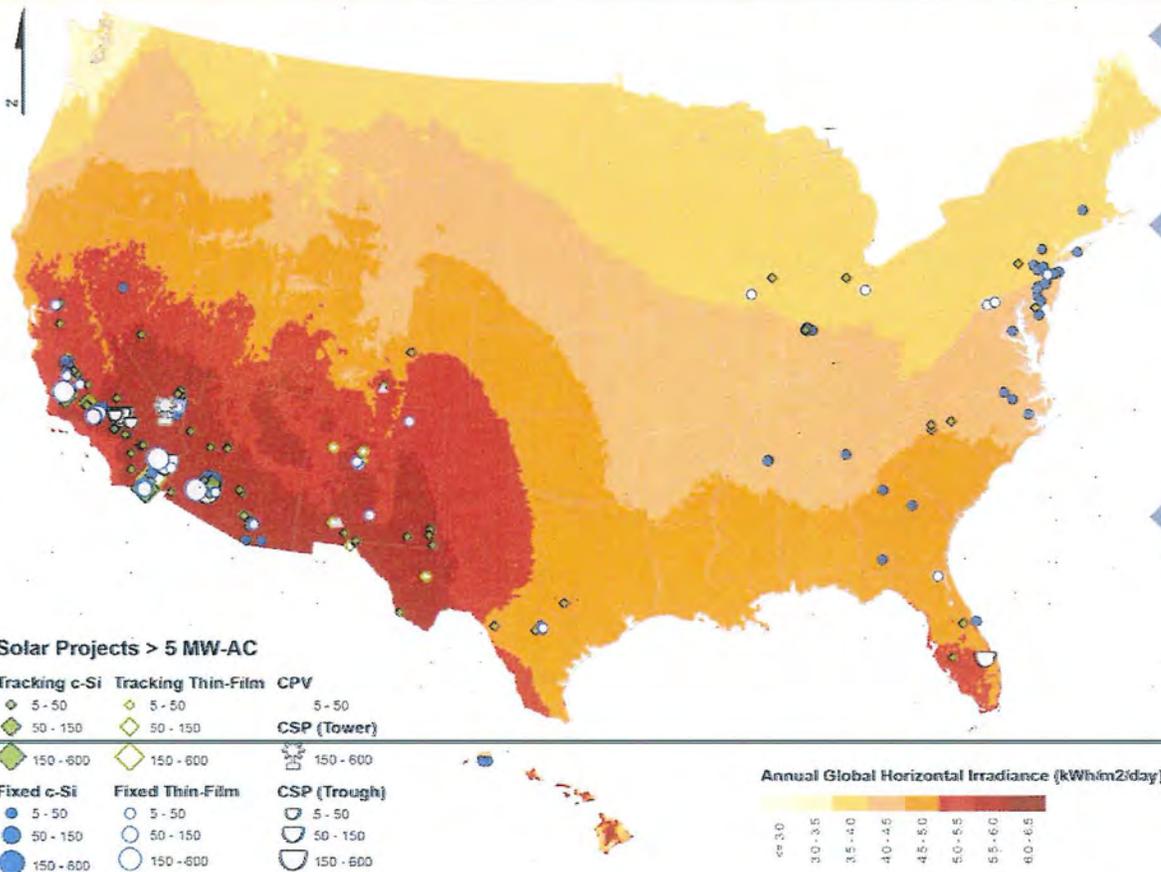
CPV project population: 2 projects totaling 35 MW_{AC}

- Both almost 4 years old, use Amonix high-concentration technology, are sited in similarly excellent solar resource areas, and have inverter loading ratios of ~1:17

CSP project population: 16 projects totaling 1,773 MW_{AC}

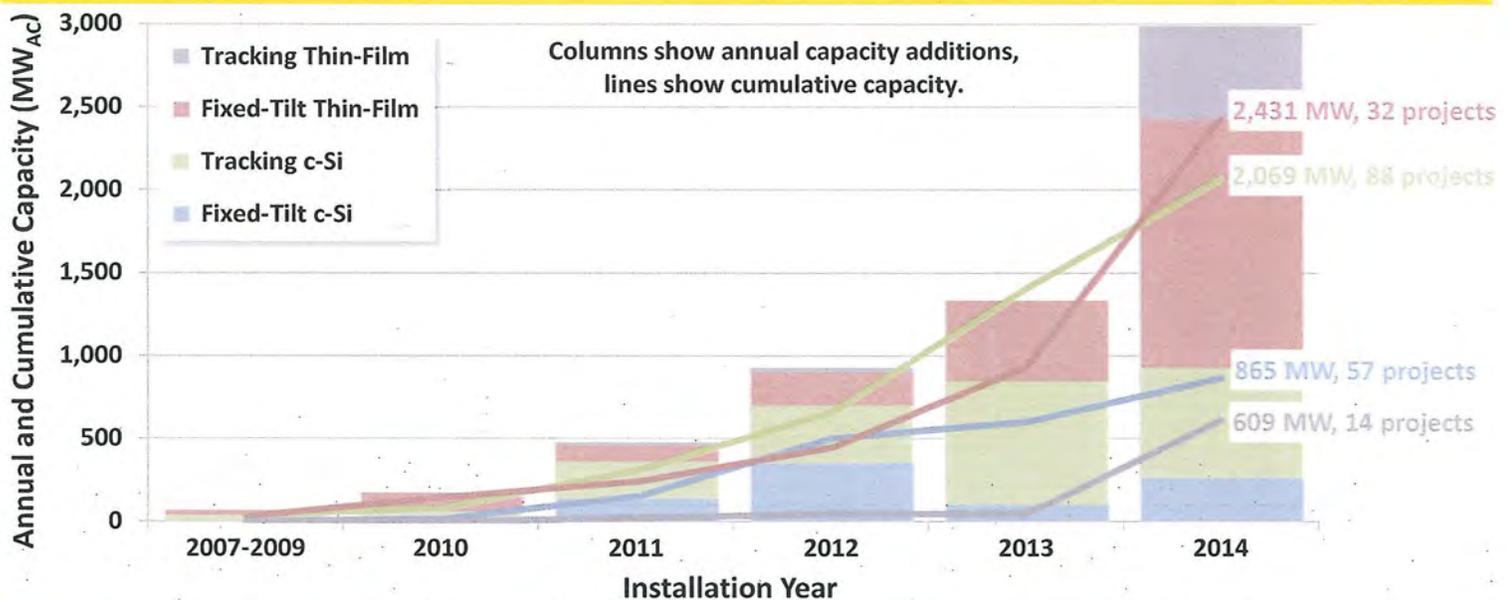
- After nearly 400 MW_{AC} built in the late-1980s (and early-1990s), no new CSP was built in the U.S. until 2007 (68 MW_{AC}), 2010 (75 MW_{AC}), and 2013-2015 (1,237 MW_{AC})
- Prior to the large 2013-15 build-out, all utility-scale CSP projects in the U.S. used parabolic trough collectors.
- The five 2013-2015 projects include 3 parabolic troughs (one with 6 hours of storage) totaling 750 MW_{AC} (net) and two "power tower" projects (one with 10 hours of storage) totaling 487 MW_{AC} (net)

Historically heavy concentration in the Southwest and mid-Atlantic, but now spreading to Southeast



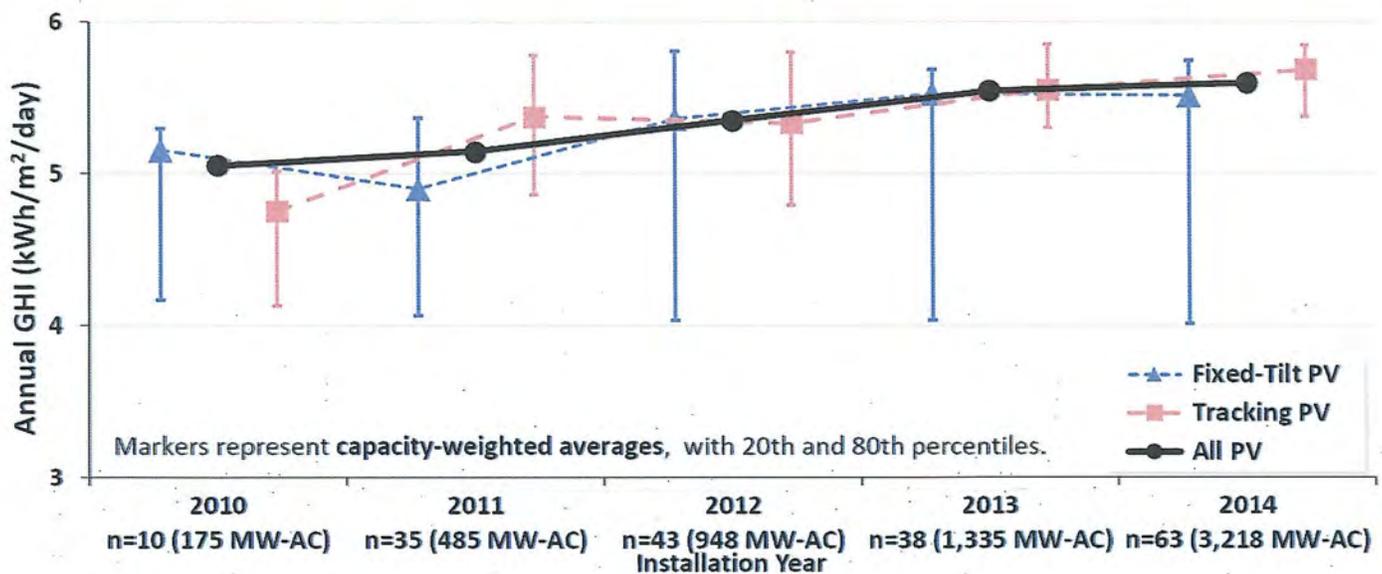
- ◆ Primarily fixed-tilt c-Si projects in the East
- ◆ Tracking (c-Si and, increasingly, thin-film) is more common in the Southwest
- ◆ Total MW share:
 - 1) CA – 59%
 - 2) AZ – 17%
 - 3) NV – 5%
 - 4) NM – 4%
 - 5) TX – 3%

PV project population broken out by tracking vs. fixed-tilt, module type, and installation year



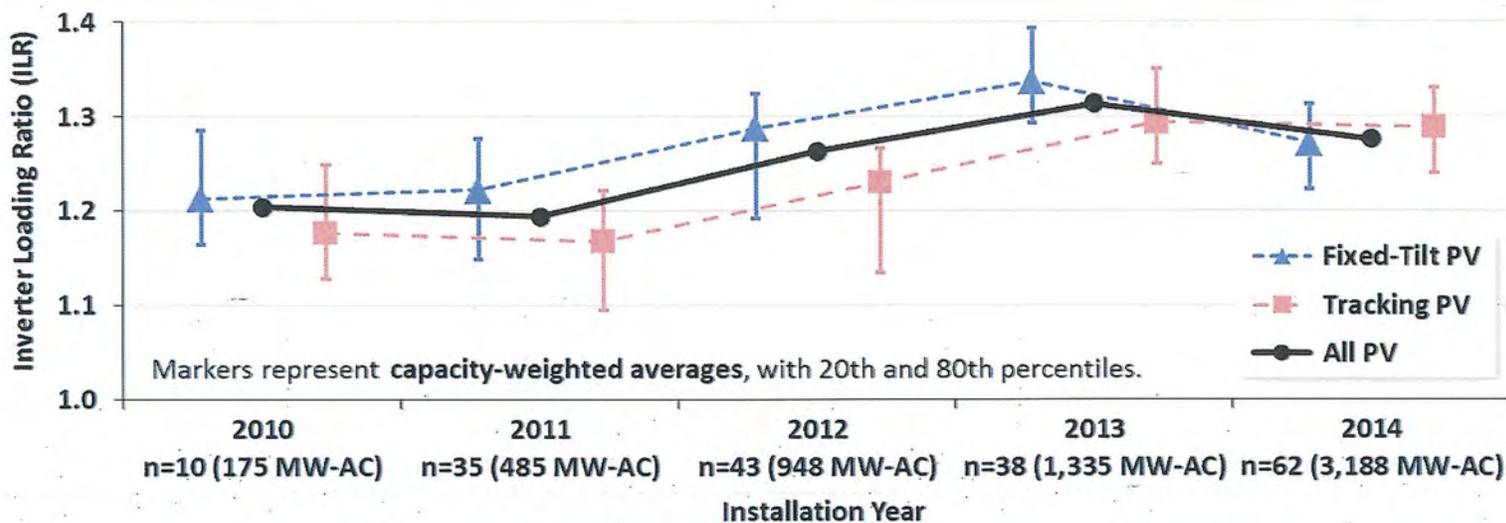
- ◆ 48% of cumulative PV capacity in population came online in 2014 (70% in 2013-2014)
- ◆ 50% of PV capacity that came online in 2014 was from *just three* large thin-film projects: Topaz (586 MW_{AC}), Desert Sunlight (563 MW_{AC}), Agua Caliente (348 MW_{AC})
- ◆ “Tracking c-Si” and “fixed-tilt thin-film” have been the predominant configurations over time, but this is changing: more tracking (12) than fixed-tilt (4) thin-film projects came online in 2014 (though fixed-tilt thin-film capacity far outweighed tracking thin-film)

On average, more recent project vintages have been built in higher-quality solar resource sites



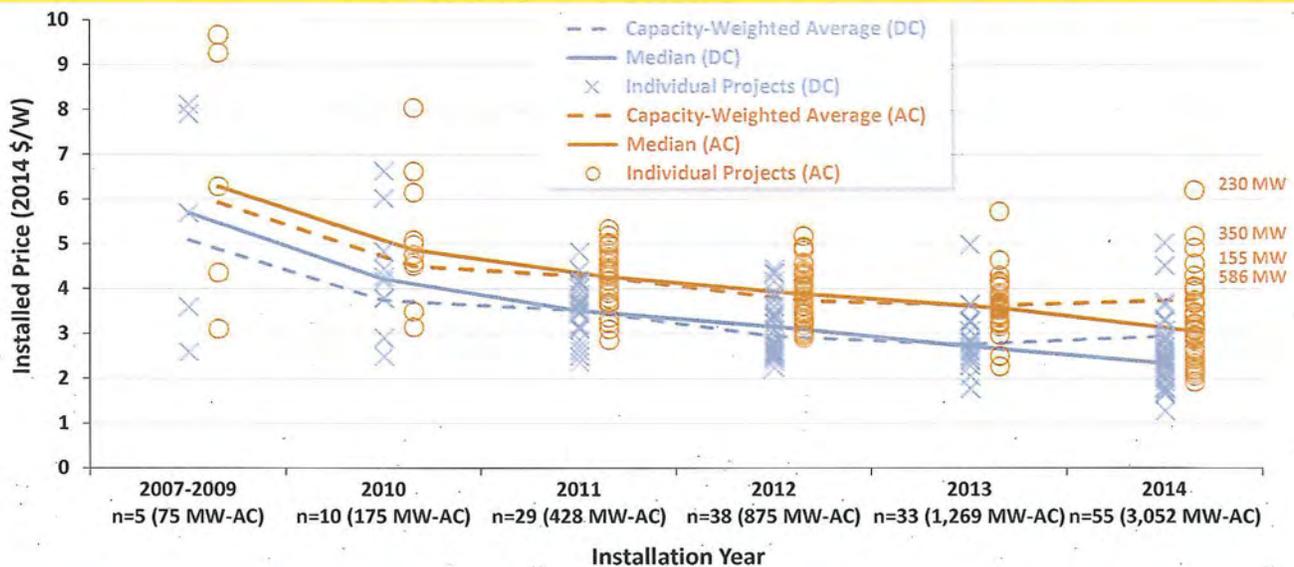
- ◆ An increase in the average GHI by project vintage simply reflects a relative shift in newer capacity towards the high-GHI Southwest
- ◆ The wide 80/20 distribution of fixed tilt PV reflects deployment throughout the US, whereas tracking PV is concentrated more in the high-GHI Southwest
- ◆ All else equal, higher GHI should boost sample-wide capacity factors (reported later)

The average inverter loading ratio (ILR) has increased over time, to around 1.3 in 2013-14



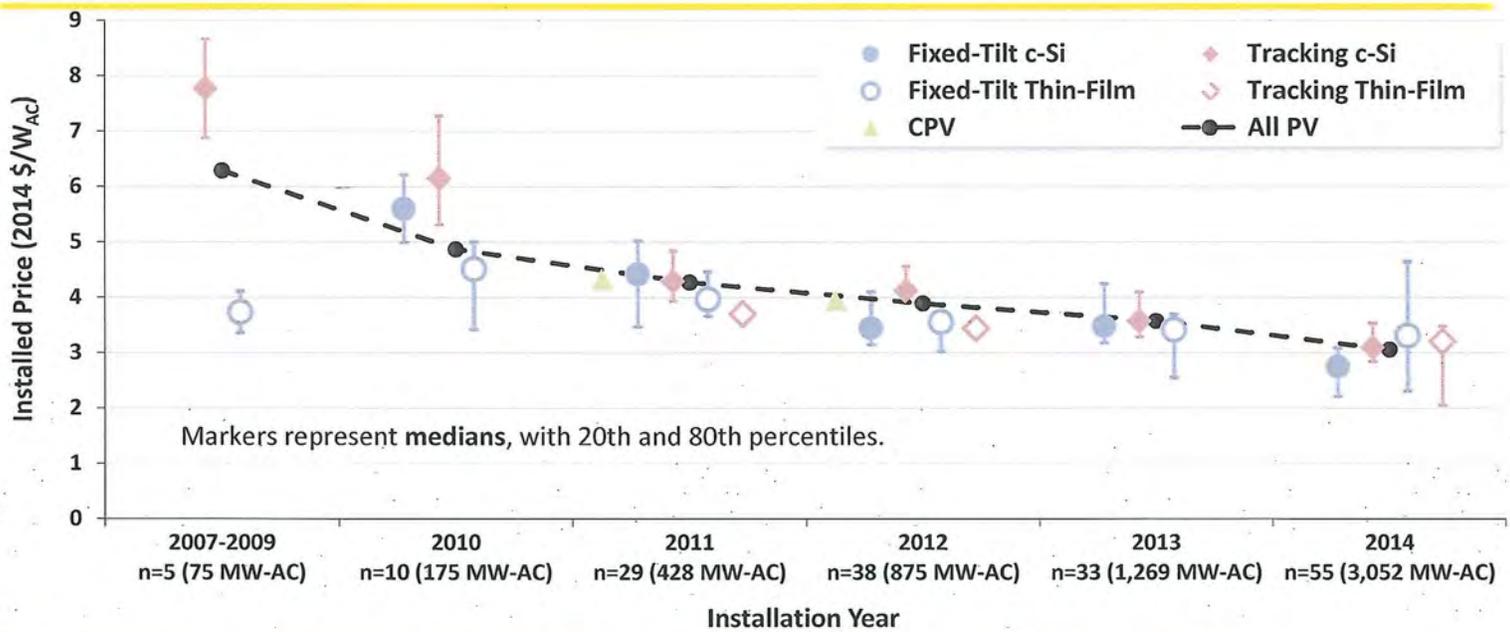
- ◆ As module prices have fallen (faster than inverter prices), developers have oversized the DC array capacity relative to the AC inverter capacity to enhance revenue
- ◆ The apparent decline in the capacity-weighted average ILR from 2013 to 2014 is related to several large projects – the median ILR (not shown) held constant in 2014 (was 1.29 in both years)
- ◆ Except in 2014 (skewed by several large projects), fixed-tilt PV generally has a higher average ILR than tracking PV (fixed-tilt has more to gain from boosting ILR)
- ◆ All else equal, a higher ILR should boost sample-wide capacity factors (reported later)

Median installed price of PV has fallen steadily, by more than 50%, to around \$3/W_{AC} (\$2.3/W_{DC}) in 2014



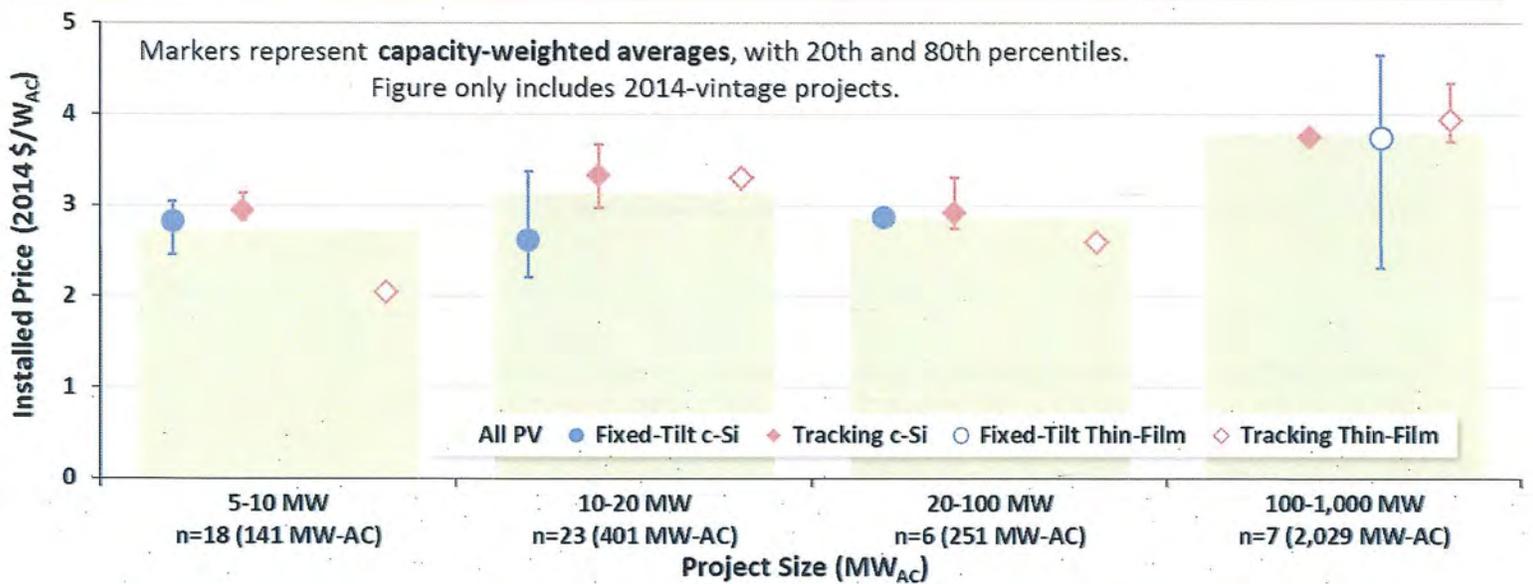
- ◆ Installed prices are shown here in both DC and AC terms, but because AC is more relevant to the utility sector, all metrics used in the rest of this slide deck are expressed solely in AC terms
- ◆ The lowest 20th percentile fell from \$3.2/W_{AC} in 2013 to \$2.3/W_{AC} in 2014
- ◆ Capacity-weighted average prices were pushed higher in 2014 by several very large projects that had been under construction for several years (but only entered our sample in 2014, once complete)
- ◆ This sample is backward-looking and may not reflect the price of projects built in 2015/2016

Installed price decline led primarily by c-Si



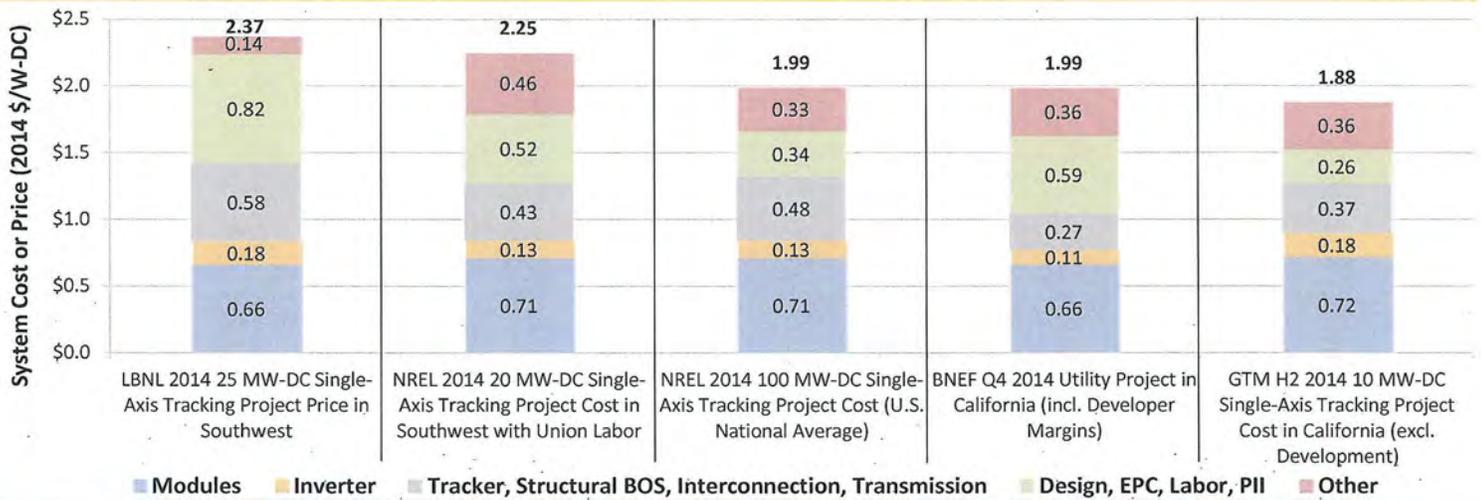
- ◆ Pricing has converged among the various mounting/module configurations over time
- ◆ Not surprisingly, tracking appears to be slightly more expensive than fixed-tilt (at least for c-Si)
- ◆ Large 80/20 range of fixed-tilt thin-film in 2014 reflects several mega-projects with high prices
- ◆ The two CPV projects built in 2011 and 2012 were priced similar to PV at the time

2014 project sample does not reflect economies of scale



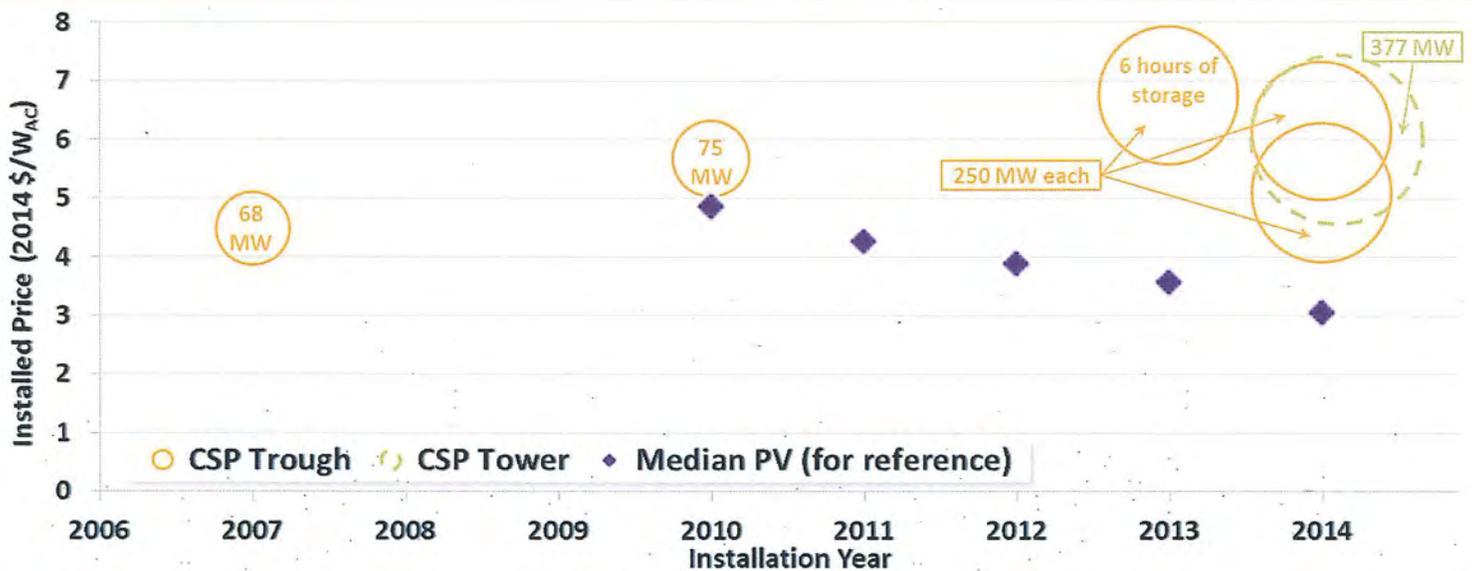
- ◆ Modular/scalable “power block” solutions from manufacturers like SunPower and First Solar may have already wrung out most of the cost savings otherwise available to larger projects
- ◆ Several of the 100+ MW projects have been under construction for several years, possibly reflecting a higher-cost past
- ◆ In general, larger projects may face greater development, regulatory, interconnection costs that outweigh any economies of scale

Bottom-up modeled installed prices are lower than our empirical data



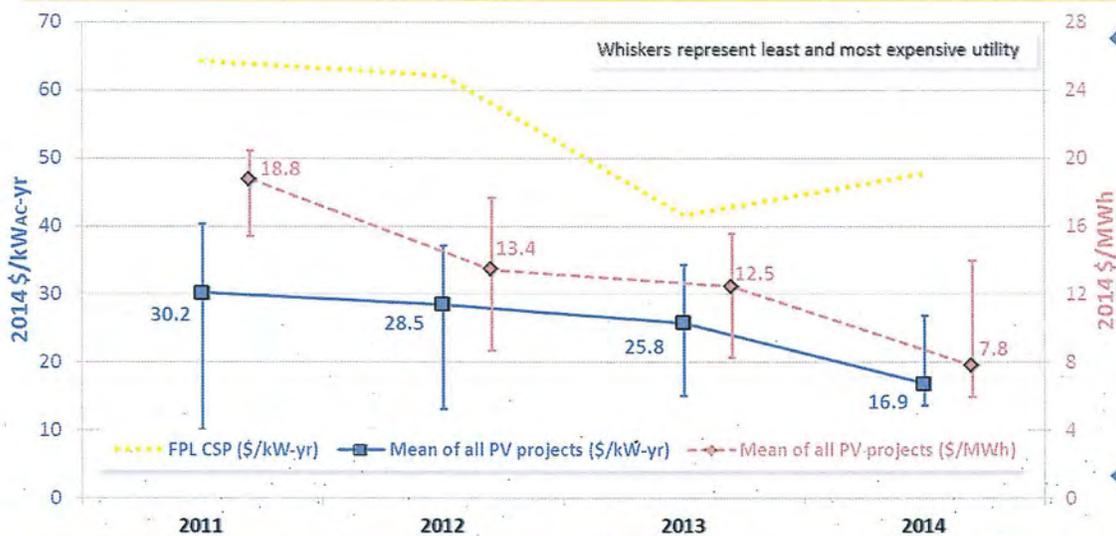
- ◆ Prices presented here in DC terms, to be consistent with how presented by NREL, BNEF, GTM
- ◆ Empirical LBNL project (far left) is most-expensive at \$2.37/W_{DC}, despite reporting among the lowest module costs (\$0.66/W_{DC})
- ◆ Largest discrepancy is in EPC category – perhaps reflecting forward-looking modeling vs. backward-looking empirical data (sample LBNL project achieved commercial operation in 2014)
- ◆ There are also discrepancies in terms of what costs are captured by the various modeled estimates relative to the empirical data (e.g., development costs, financing costs)
- ◆ There is fairly substantial variation even among the various bottom-up modeled estimates

Not much movement in the installed price of CSP



- ◆ Small sample of 6 projects (4 built in 2013-14) makes it hard to identify trends
- ◆ That said, there does not appear to be much of a trend – CSP prices seem to be moving sideways (in contrast to PV's downward trend)
- ◆ To be fair, newest projects are much larger, and include storage and/or new technology (power tower) in some cases, making comparisons difficult

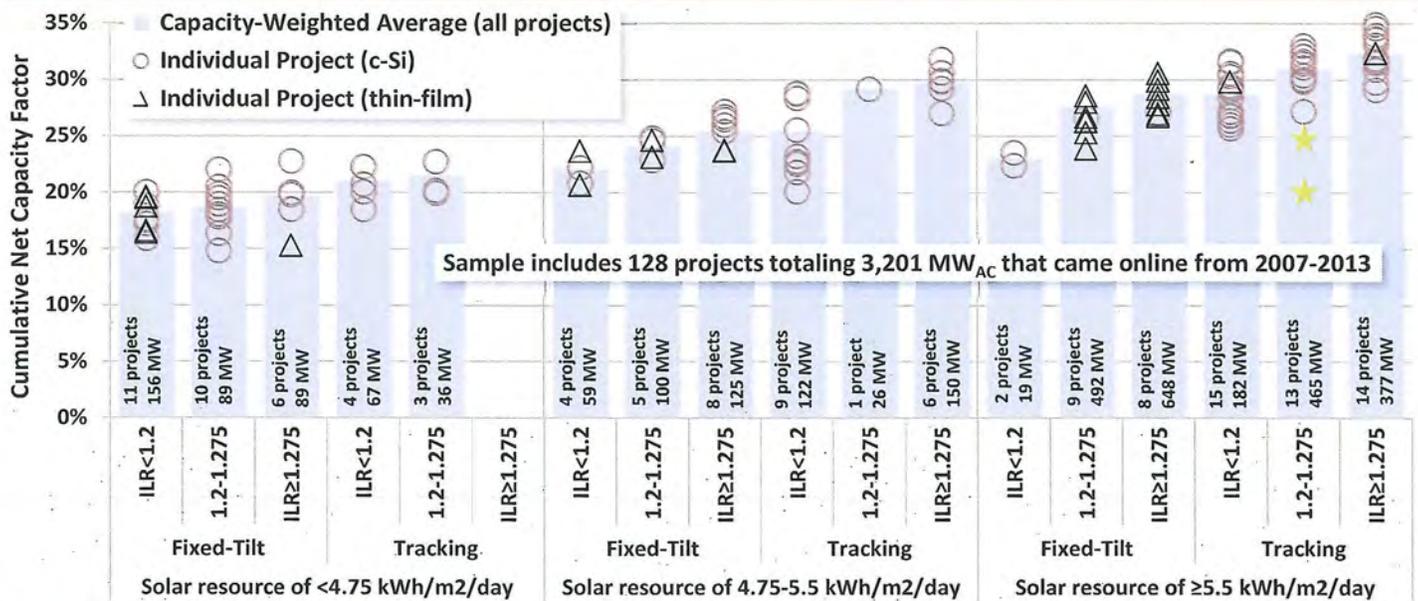
O&M cost data still very thin, but largely consistent with early years of cost projections



- ◆ Only a few utilities report solar O&M costs (see table), and tend to report fleet-wide averages rather than project-level costs (which limits the usefulness of the data)
- ◆ O&M costs appear to be declining over time as fleet size increases, but hard to tell (e.g., missing PG&E data for 2014 could be skewing sample)

Year	PG&E		PNM		APS		FP&L	
	MW _{AC}	# projects	MW _{AC}	# projects	MW _{AC}	# projects	MW _{AC}	# projects
2011	N/A	N/A	N/A	N/A	51	3	110	3
2012	50	3	20	4	96	4	110	3
2013	100	6	42	4	136	6	110	3
2014	N/A	N/A	65	6	168	7	110	3
predominant technology	fixed-tilt c-Si		fixed-tilt thin-film		primarily tracking c-Si		mix of c-Si and CSP	

27.5% average sample-wide PV net capacity factor, but with large project-level range (from 15%-35%)

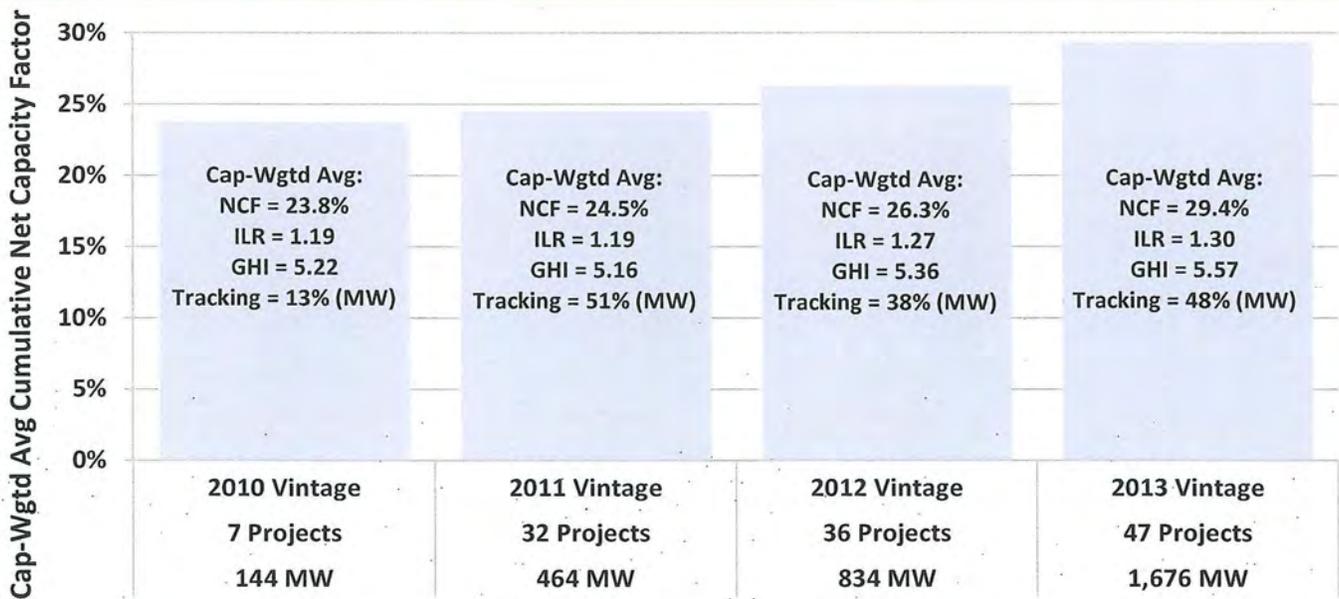


Project-level variation in PV capacity factor is driven by:

- ◆ Solar Resource (GHI): Highest resource bin has ~8% higher capacity factor than lowest
- ◆ Tracking: Adds ~4% to capacity factor on average across all three resource bins
- ◆ Inverter Loading Ratio (ILR): Highest ILR bins have ~4% higher capacity factor than lowest
- ◆ Module type: No discernible pattern between c-Si and thin-film

The two CPV projects (see green stars) have underperformed relative to similarly configured PV projects

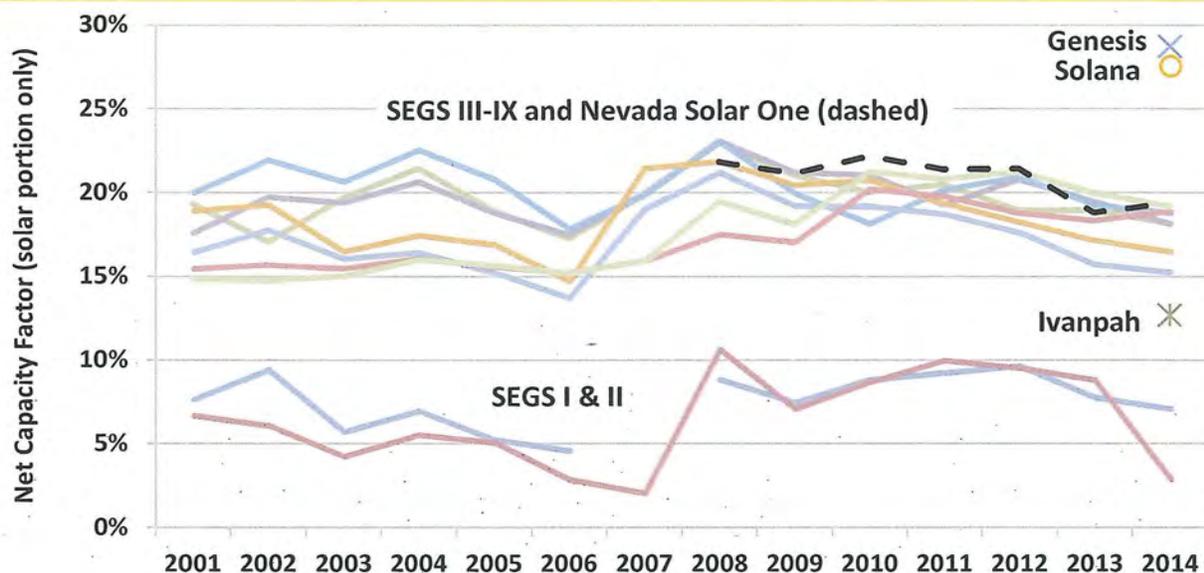
More recent PV project vintages have higher capacity factors on average



Higher capacity factors by vintage driven by an increase in:

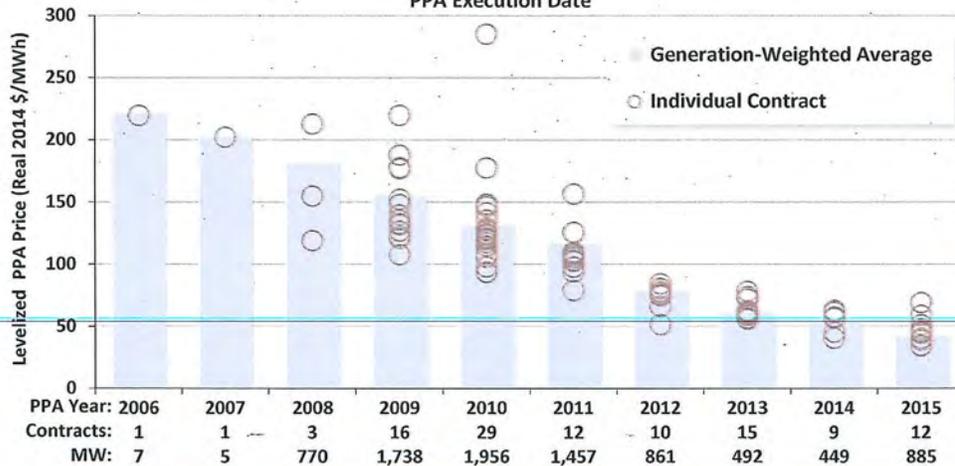
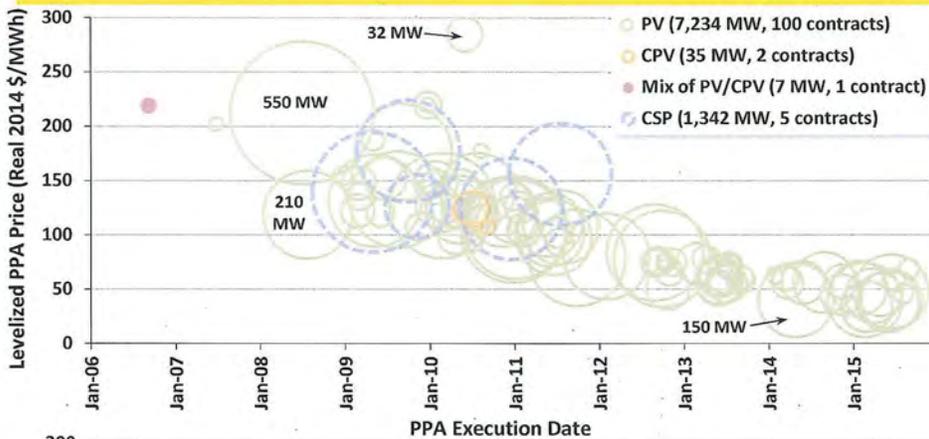
- ◆ Tracking in 2011
- ◆ Inverter loading ratio (ILR) in 2012 and 2013
- ◆ Strength of the solar resource (GHI) in 2012 and 2013

Two of three new CSP projects struggled with teething issues in 2014 (but improving in 2015)



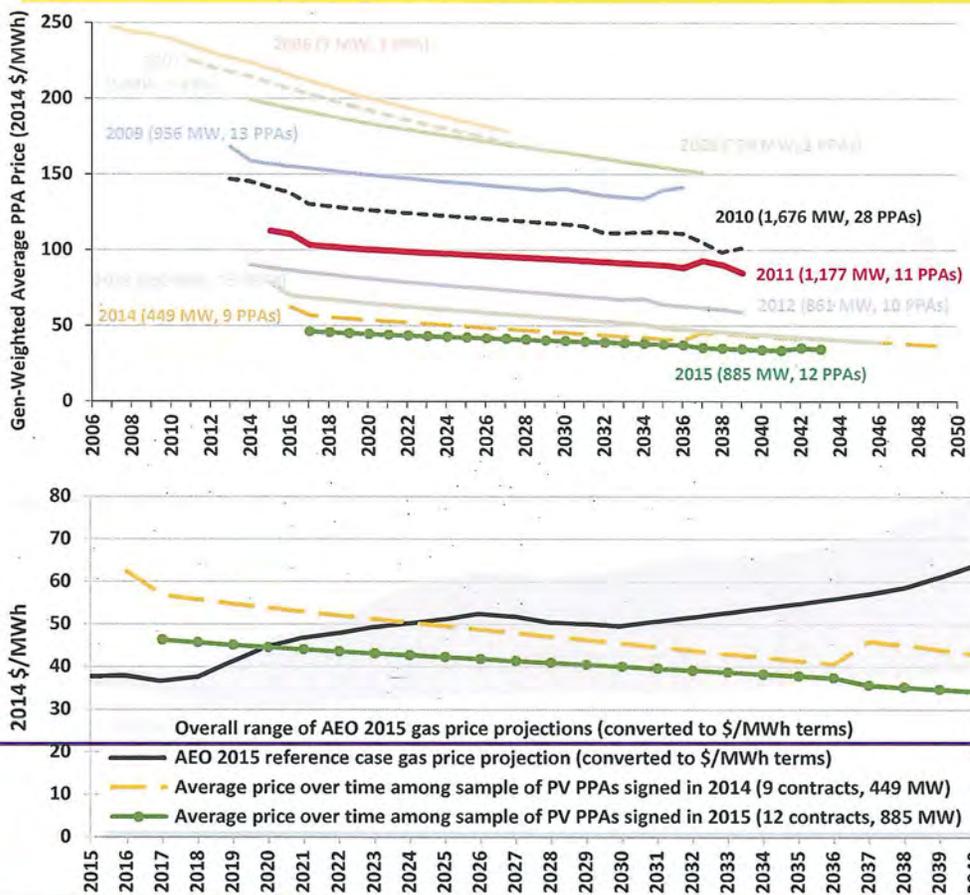
- ◆ SEGS III-IX from the 1980s still chugging along (not far below 2007's Nevada Solar One), while SEGS I-II have lower NCFs (due to a variety of factors)
- ◆ Among newer projects: Genesis matched expectations, but Solana (expecting ~41%) and Ivanpah (expecting ~27%) fell short – *but improving so far in 2015*

Levelized PPA prices have fallen by more than two-thirds since 2009



- ◆ PPA prices are levelized over the full term of the contract, after accounting for any escalation rates and/or time-of-delivery factors
- ◆ Strong/steady downward price trend since 2006
- ◆ Smaller projects (e.g., 20 MW) no less competitive
- ◆ CPV and CSP largely competitive *at the time*, but little visibility recently
- ◆ >75% of the sample is currently operational
- ◆ Broadening of the market in 2015 (AR, AL, FL)

PV PPA prices generally decline over time in real dollar terms, in contrast to fuel cost projections



- ◆ ~70% of PV sample has flat annual PPA pricing (in nominal dollars), while the rest escalate at low rates
- ◆ Thus, average PPA prices *decline* over time in real dollar terms (top graph)
- ◆ Bottom graph compares 2014- and 2015-vintage PPA prices to range of gas price projections from AEO 2015, showing that...
- ◆ ...PV can compete with *even just the fuel costs* of gas-fired generation, and also provides a long-term hedge against potential fuel cost increases

Apparent deep market at these low PPA prices

Austin Energy:

- ❑ 600 MW solar RFP received 7,976 MW response (33 bidders, 149 proposals)
- ❑ Almost 1,300 MW were offered at levelized prices of \$45/MWh or less.

Southwestern Public Service:

- ❑ 200 MW solar RFP received 5,250 MW response
- ❑ ~3,000 MW priced at \$40-50/MWh, ~1,800 MW priced at \$50-60/MWh (levelized)

NV Energy:

- ❑ 200 MW renewable RFP received 2,537 MW response (90% of which was PV)
- ❑ Two 100 MW winners ~\$40/MWh levelized; others reportedly at similar prices

Idaho Power and Rocky Mountain Power:

- ❑ These two Idaho and Utah utilities have been inundated with >2,000 MW of requests for "avoided cost" PURPA contracts at prices of ~\$50-70/MWh

Across the South:

- ❑ Recently announced PPAs in Alabama (\$61/MWh), Arkansas (~\$50/MWh), Georgia (~\$65/MWh), Florida (\$70/MWh)

Financial modeling also supports low PPA prices – and suggests modest set-back in 2017

Now:

Using aggressive-but-achievable empirical data drawn from this slide deck, along with basic finance assumptions, yields a real levelized PPA price of \$43.5/MWh – *consistent with the data sample*

- Empirical project assumptions: \$2/W_{AC} CapEx, 33% net capacity factor (with 0.5% annual degradation), \$30/kW-year total OpEx
- Financing assumptions: 30% ITC, 5-year MACRS depreciation, 40.2% combined tax rate, 25-year PPA term, 10% after-tax equity IRR, 17-year debt at 5.5% interest and 1.35 DSCR

Post-2016:

If 30% ITC reverts to 10% in 2017, this very same project would need a PPA price of \$54.2/MWh, all else equal

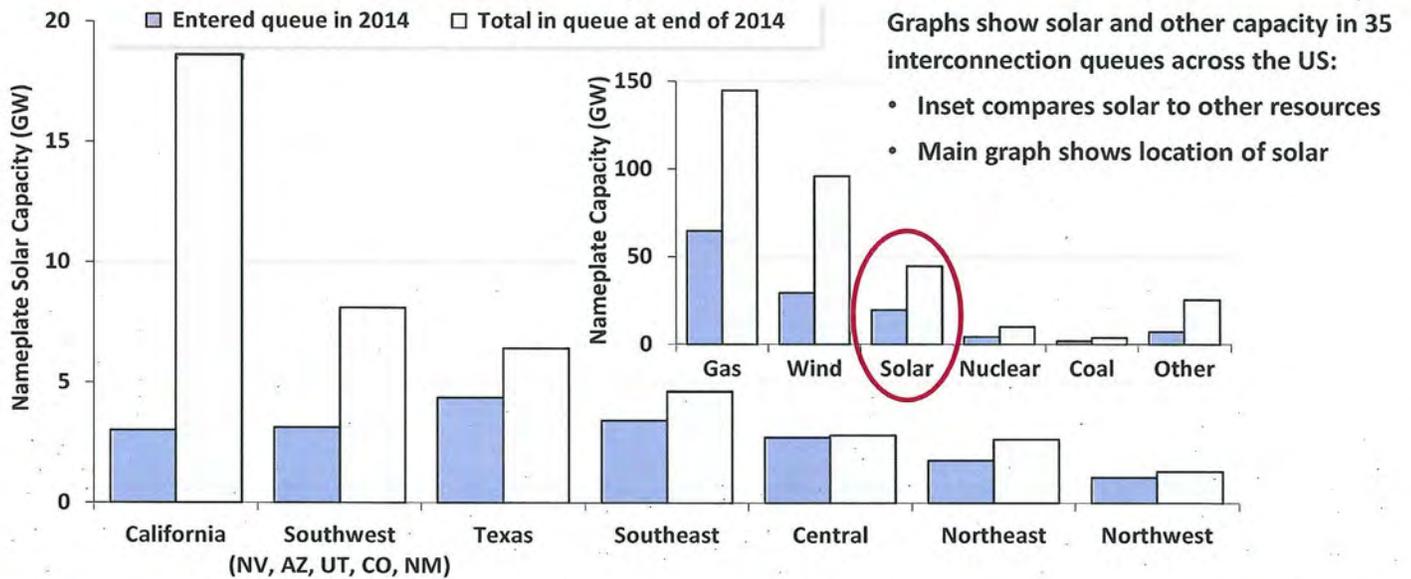
- PPA price increase is limited to \$10.7/MWh by a boost in leverage from 44.3% to 58.6%, which reduces the WACC from ~7% to ~6%, thereby partially mitigating the reduction in the ITC
- Though certainly not \$43.5/MWh, \$54.2/MWh is still not too shabby (think back a few years...)

To get back to \$43.5/MWh under a 10% ITC through CapEx reductions alone, installed cost would need to drop by \$0.50/W_{AC} to \$1.5/W_{AC}

- Some 2015/16 projects may already be at or close to \$1.5/W_{AC} (recent financing announcements)
- First Solar's CEO recently promised "fully installed" costs of less than \$1/W in 2017 (even if he was thinking in DC terms, this is still at or below \$1.5/W_{AC})



Looking ahead: utility-scale pipeline has grown, driven by an expanding market outside of the Southwest



- ◆ 44.6 GW of solar was in the queues at the end of 2014 (up from 39.5 GW at end of 2013): *more than 5 times the installed solar capacity in our project population at the end of 2014*
- ◆ Solar was in third place in the queues, behind natural gas and wind
- ◆ Expanding market: Texas and Southeast had more new entrants than California or Southwest in 2014; other three regions saw an unprecedented influx of new solar capacity in 2014 as well
- ◆ *Not all of this capacity will be built!* (but much of what is will likely be built prior to 2017)

Questions?

Download this report and all of our other solar and wind work at:

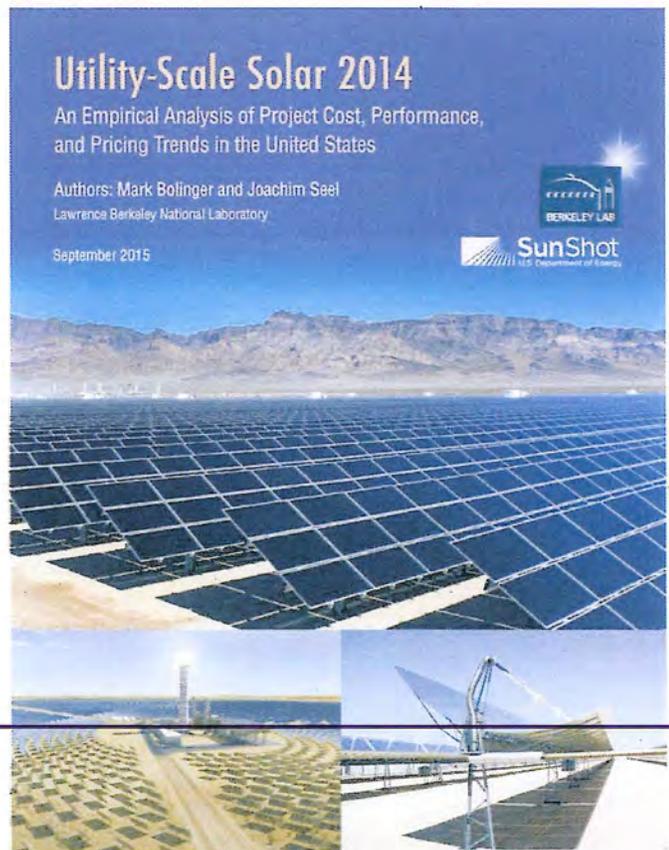
<http://emp.lbl.gov/reports/re>

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Attacks Against SCADA Systems Doubled in 2014: Dell

By [Mike Lennon](#) on April 13, 2015



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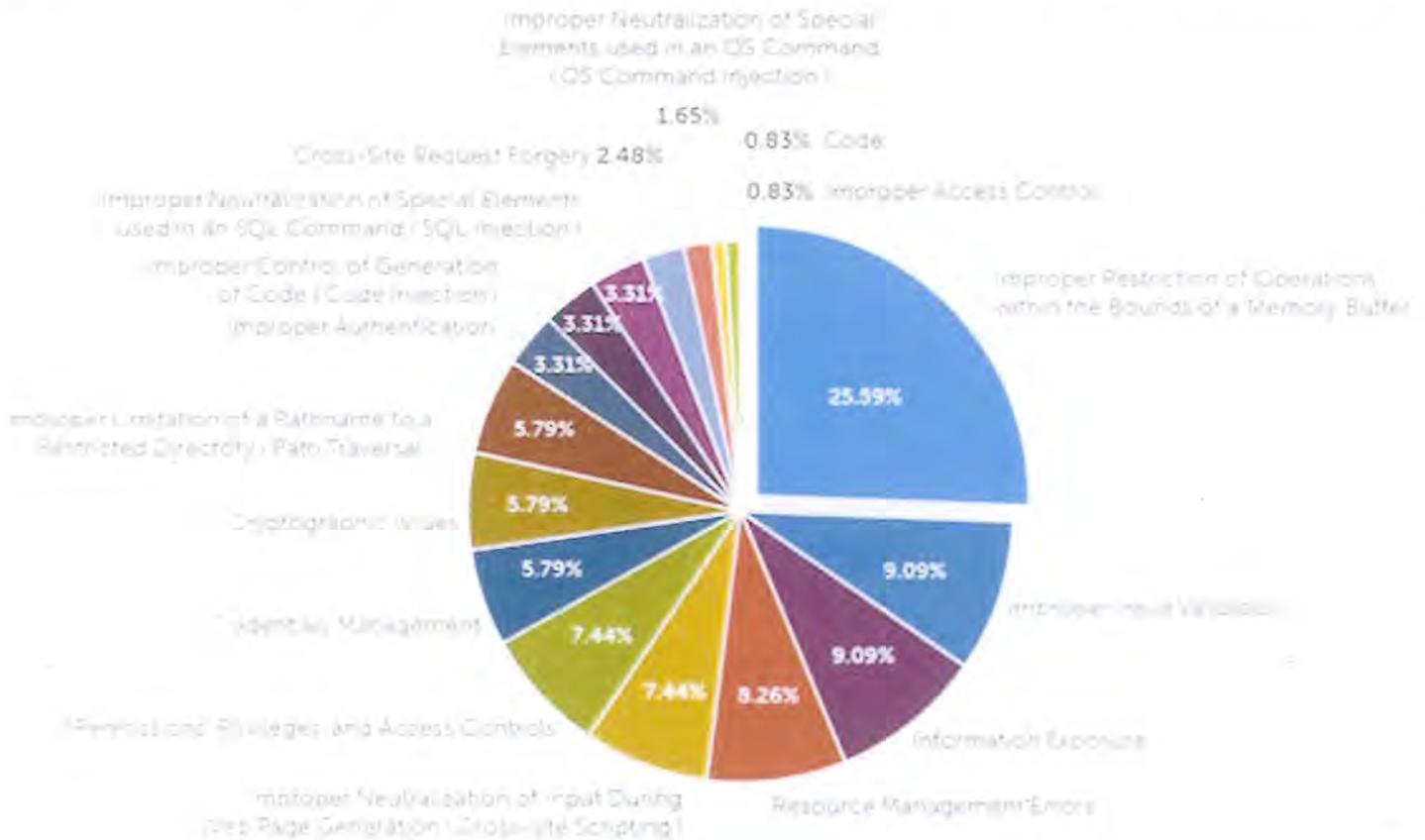
Cyber attacks against supervisory control and data acquisition (SCADA) systems doubled in 2014, according to Dell's annual threat report, released Monday.

Dell SonicWALL saw global SCADA attacks increase against its customer base from 91,676 in January 2012 to 163,228 in January 2013, and 675,186 in January 2014.

“Attacks against SCADA systems are on the rise, and tend to be political in nature as they target operational capabilities within power plants, factories, and refineries,” the tech firm said.

Whereas the motive behind data-focused attacks is typically financial, SCADA attacks tend to be political in nature, since they target operational capabilities within power plants, factories, and refineries, rather than credit card information, Dell said.

Buffer overflow vulnerabilities were the primary point of attack against SCADA systems, which control remote equipment and collect data on equipment performance, accounting for 25% of the attacks witnessed by Dell.



The majority of these attacks targeted Finland, the United Kingdom, and the United States, Dell said, noting that the reason is likely the fact that SCADA systems are more common in these regions and more likely to be connected to the Internet.

In 2014, Dell said that it saw 202,322 SCADA attacks in Finland, 69,656 in the UK, and 51,258 in the US.

Dell's threat report leverages research from the company's Global Response Intelligence Defense (GRID) network and telemetry data from Dell SonicWALL network traffic to identify emerging cyber threats.

"Since companies are only required to report data breaches that involve personal or payment information, SCADA attacks often go unreported," said Patrick Sweeney, executive director, Dell Security. "This lack of information sharing combined with an aging industrial machinery infrastructure presents huge security challenges that will to continue to grow in the coming months and years."

"Because companies are only required to report data breaches that involve personal or payment information, SCADA attacks often go unreported," Dell said in its report. "As a result, other industrial companies within the space might not even know a SCADA threat exists until they are targeted themselves."

A recent [report](#) published by the Industrial Control Systems Cyber Emergency Response Team (ICS-CERT) showed that while ICS vendors have been targeted by various types of malicious actors, over half of the attacks reported to the agency in 2014 involved advanced persistent

threats (APTs).

ICS-CERT has issued alerts for multiple campaigns over the last year, including one which focused on the use of the [Havex RAT](#) in attacks aimed at ICS, and the second related to [BlackEnergy attacks](#) exploiting vulnerabilities in products from GE, Advantech/Broadwin, and Siemens.

“Lack of information sharing combined with the vulnerability of industrial machinery due to its advanced age means that we can likely expect more SCADA attacks to occur in the coming months and years,” Dell's report concluded.

Organizations such as the Industrial Control System Information Sharing and Analysis Center ([ICS-ISAC](#)) and Electricity Sector Information Sharing and Analysis Center ([ES-ISAC](#)) allow for reporting and sharing information about SCADA attacks and can help the industrial community become aware of emerging threats.

The report also highlighted a surge in point-of-sale (POS) malware and increased malware traffic within encrypted (https) web protocols.

The full report is [available online](#) in PDF format.

Related Event: [Learn More at the 2015 ICS Cyber Security Conference](#)



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For more than 10 years, Mike Lennon has been closely monitoring and analyzing trends in the enterprise IT security space and the threat landscape. In his role at SecurityWeek he oversees the editorial direction of the publication and manages several leading security conferences.

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