 

SunSpec

Event Planning Manual

*Advertise*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Send out newsletter |  |
|  | Create Eventbrite |  |
|  | Prepare website |  |

*Speaker Coordination*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Review for PowerPoint Slides |  |
|  | Audience question suggestions |  |
|  | Send speaker releases |  |
|  | Request bios & pictures |  |
|  |  |  |

*Design*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Trifolds/Literature  Update dates, contact info, member list |  |
|  | Banners & Signs |  |
|  | Speaker releases |  |
|  | Certificates |  |
|  | Agenda |  |
|  | Speaker deck/slides |  |
|  | Music Playlist |  |
|  | Audience questions |  |

*Reserve*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Room/Venue |  |
|  | Catering |  |
|  |  |  |

*Reserve*

**PRE-EVENT CHECKLIST**

*Print & Pick up*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Trifolds/Literature |  |
|  | Banners & Signs |  |
|  | Speaker releases |  |
|  | Certificates |  |
|  | Agenda |  |
|  | Speaker deck/slides |  |
|  | Guest list |  |
|  | Badges/labels |  |

*Bring*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Trifolds/Literature |  |
|  | Banners & Signs |  |
|  | Speaker releases |  |
|  | Certificates |  |
|  | Agenda |  |
|  | Labels/Badges |  |
|  | Music |  |
|  | Laptop + Cables |  |
|  | Pointer |  |
|  | SunSpec shirts |  |
|  | Business cards |  |
|  | Guest list |  |
|  | Camera(s) + tripod |  |
|  | Microphone |  |

**PRE-EVENT CHECKLIST**

Eventbrite

* Required fields for signing up
  + First Name, Last Name
  + Email
  + Company
  + Job title
* If printing guest list, remember to print waitlist as well
* Include any sponsor logos
* Include location: maps & directions

Venue

* Study room specs ahead of time

Scouting

* Be familiar with current alliance members/partners
* Bring business cards

Timing

* Start afternoon events within two hours of exhibition end
* Always start with a warm up speaker prior to the headliner
* Afternoon exhibition events should be 90 minutes or less
* Always confirm 3X room capacity on free events

Other

* Use standard form invitations, confirmations, music play lists, and other documents in a standard repository located at …
* Print certificates and have them available at show time

**TIPS/TO REMEMBER**

*Attendee follow-up*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Recap via newsletter |  |
|  | Send notes |  |
|  | Process business cards |  |

*Speaker follow-up*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Mail certificates of appreciation |  |
|  | Write thank-you letters |  |
|  | Post notes to website |  |
|  | Post speaker PowerPoint slides to website |  |

*Notes*

|  |  |  |
| --- | --- | --- |
| Check | To do | Assigned to |
|  | Compile and review notes |  |
|  | Create condensed PDF version |  |
|  | Post notes to website |  |
|  | Post speaker PowerPoint slides to website |  |

**POST-EVENT CHECKLIST**

SUNSPEC ALLIANCE PERMISSION RELEASE

**Please complete this form, make copies for your records and email a signed to copy to releases@sunspec.org**

**The SunSpec Alliance** (“SunSpec”)will be recording all the presentations at the Solar Finance and Asset Symposium event to be held July 7, 2014 (the “Event”). Beyond the Event, the goal of SunSpec is to spread great ideas, by making these presentations freely and widely available to a global audience.

This release (the “Release”) will serve as our agreement concerning your participation at the Event. In consideration for the platform provided to you, and in support of the goal of “spreading great ideas about solar” you grant SunSpec and other entities — e.g., broadcasters — as SunSpec may designate from time to time (collectively, the “SunSpec Parties”) the right to record, stream, film and photograph your presentation at the Event (the “Presentation”) and to distribute, broadcast, edit, translate (as discussed below) or otherwise disseminate it, without any further approval from you, in whole or in part, throughout the world, in perpetuity, in any and all media now known or hereafter developed. This grant to the SunSpec Parties includes, but is not limited to, the right to use the Presentation either alone or together with supporting information, such as your name, voice, photograph, likeness and biographical data (collectively, “Supporting Information”).

Examples of permitted uses of the Presentation and Supporting Information include displaying the Presentation on the SunSpec YouTube channel or on SunSpec’s website, SunSpec.org; broadcasting the Presentation on television; and distributing the Presentation on DVDs, mobile phones, films, and other video distribution channels, such as iTunes.

SunSpec encourages intelligent public debate around each presentation. Accordingly, your Presentation may be distributed under a “Creative Commons” license, which allows each distributed presentation to be re-published in non-commercial, non-derivative works, as long as appropriate credit is given and the presentation is not edited or distorted. By signing this Release, you acknowledge and agree that you do not object to the distribution of the Presentation by the SunSpec Parties under a Creative Commons license.

In addition, you understand and agree that: (i) SunSpec isn’t obligated to use the Presentation or Supporting Information in any way; (ii) you won’t receive any form of payment in connection with the use of the Presentation and/or Supporting Information; and (iii) you may not revoke the rights granted in this Release.

You affirm that: (i) you have the full power and authority to grant the rights and releases set forth in this Release; (ii) you are the sole author of the Presentation; (iii) you own all rights to the Presentation, including, but not limited to, all copyrights and trademark rights; (iv) you will advise SunSpec in writing of all third-party material contained in the Presentation (to which you have not secured all necessary rights); and (v) use of the Presentation as permitted by this Release will not violate the rights of any third party.

If any third party claims that the use of the Presentation violates its rights, you agree to cooperate fully with SunSpec and to defend against or otherwise respond to such claim.

This Release contains the entire understanding between you and SunSpec regarding the Presentation and/or Supporting Information and may not be modified except in a writing signed by both of us.

Name (Signed)

Name (Print)

Date

This Release shall be exclusively governed by California law without regard to choice-of-law principles. Any dispute concerning the Presentation and/or Supporting Information, or arising out of or relating to this Release, shall be resolved in the courts of the State of California.

**PLEASE SIGN, DATE & EMAIL to the SunSpec Alliance at releases@sunspec.org**

**Sample email: I**nvitation to speak

Dear Seth,

We are doing the Solar Finance and Asset Symposium at InterSolar conference again and would like you to join and support SEFA and SAPC.

So on behalf of Intersolar and the SunSpec Alliance, we wish to invite you to speak at the Intersolar “Solar Asset and Finance Symposium IV” held in San Francisco on July 7. This is the fourth year this special symposium has been held to cover important finance topics of the solar asset class. A synopsis of the program is attached.

We are interested in having you participate on four-person panel moderated by Tim Keating of SunSpec titled “Investment and Asset Management: Best Practices and Emerging standards”. We expect this session to be 45 minutes long, including questions from the audience. We will focus on moving forward the vision of Growing Solar as an Asset Class and discuss the requirements to achieve that goal as well as the impact on the industry.

We expect 120 to 140 people to attend the symposium.  Keynote speakers include Michael Eckhart, Global Head of Environmental Finance and Sustainability for Citibank; Steve Viscovich, Director of Securitized Products for Credit Suisse; Minh Le, Director, Solar Technologies Office of the U.S. Department of Energy; and a host of other executives from throughout the solar value chain.

Please reply to confirm your participation so we can formally add you to the agenda.   
Kind regards,

TJ Keating   
SunSpec Alliance   
650-804-2867

[tjkeating@sunspec.org](mailto:tjkeating@sunspec.org)

[www.sunspec.org](http://www.sunspec.org/)

**SPEAKER COMMUNICATION**

**Sample email:** Speaker confirmation + event information

Dear Michael,

First of all, I would like to thank you again on behalf of the SunSpec Alliance and InterSolar for speaking at The Solar Finance and Asset Symposium IV July 7th in San Francisco.

This is the fourth year for the event and each year it has gotten better.  The reception to the event so far has been great. We are quite excited for this year’s event.

Details below; I would like to have a call as soon as possible to discuss your presentation, we will need any power point materials by July 1. I can do a call as soon as Friday June 6 at 11:30 EDT or  4:30 pm or Monday June 9th at 12:00 pm or 3:30 pm EDT, please suggest a time for a call and I will set it up.

Here is a Link to event page: InterSolar: Solar Finance and Asset Symposium IV < \_\_\_ > ; feel free to promote the event and your participation by including this link on your website and announce the event in your communications.

1)  Your Registration: You have already been pre-registered by Intersolar for the conference, Speaker badges will be available at the speaker conference registration desk at the Intercontinental Hotel. Your badge will include access to the Intersolar Trade Show held next door at the Moscone West Center.  We have received all bios, you are live on the website.

2)  Place: we are on level 3  Intercontinental Hotel: 888 Howard Street, San Francisco, CA 94103, badges will be at the conference desk in the InterContinental Hotel.

3)  Time: The conference runs 9:00 AM to 5:00 PM on July 7th and speakers are encouraged to participate in the whole symposium. Your speaking time is noted below.

4)  You are also invited to the InterSolar kick of Keynote at 5:30 pm in the same area and reception to follow, Governor Brown of California is scheduled to speak.

5)  I would like to have a call as soon as possible to discuss your presentation, we will need any power point materials by July 1. I can do a call as soon as Friday June 6 or Monday June 9th  as noted above, please suggest a time for a call and I will set it up

Your Presentation:

9:15am - 9:45am         Keynote: Solar Finance Past, Present and Future

Michael Eckhart, Managing Director, Citigroup Capital Markets, Inc.,

Some topics and questions that come to mind for you presentation I am sure you have your own ideas:

- Where we started in renewables finance

- Where we are and how we got there

- What is next, biggest challenges, the grand challenges and opportunities

- Readiness of standards in credit, servicing, documentation to support lower cost sources of capital

The complete Symposium Agenda is below and attached.

I look forward to speaking with you soon and to meeting each of you at the event. Please do not hesitate to contact me with any questions or needs.

**Sample email:** Speaker confirmation + requesting speaker information

Dear Pablo,

This is the fourth year I have produced this conference with InterSolar.  It is nice to hear that you will be joining our conference on July 7th and I look forward to meeting you again.

On behalf of Intersolar and the SunSpec Alliance we would like to confirm your participation as a panel speaker the Intersolar “Solar Asset and Finance Symposium IV” being held in San Francisco on July 7. This is the fourth year this special symposium has been held to cover important finance topics of the solar asset class. A synopsis of the program is attached.

You are scheduled to participate on five-person panel: Investor and Developer Roundtable moderated by Haresh Patel of Mercatus, Inc.  The session is scheduled for 11:30 am. We expect this session to be 45 minutes, including questions from the audience.

Your registration for the conference will be handled by SunSpec/InterSolar, please supply the following information by return email to me for your registration:

       Name:

       Title:

       Company Name

       Email address

       Phone

       Mailing address

       Plus Bio and photo for the program and website

Conference Background: We will focus on moving forward the vision of Growing Solar as an Asset Class and discuss the requirements to achieve that goal as well as the impact on the industry.

We expect 120 to 140 people to attend the symposium.  Keynote speakers include Michael Eckhart, Global Head of Environmental Finance and Sustainability for Citibank; Steve Viscovich, Director of Securitized Products for Credit Suisse; Minh Le, Director, Solar Technologies Office of the U.S. Department of Energy; Shayle Kahn of GTM Research and a host of other executives from throughout the solar value chain.

More logistics and preconference coordination calls will be held over the next three weeks. If you have any question or would like a personal briefing call, please do not hesitate to contact me.

Kind regards,

TJ Keating

 SunSpec Alliance

 650-804-2867

[tjkeating@sunspec.org](mailto:tjkeating@sunspec.org)

[www.sunspec.org](http://www.sunspec.org/)

**Sample email:** Keynote speaker reminder

Dear Stephen; Solar Finance and Asset Symposium Speaker,

We are less than 2 weeks away, and the conference is shaping up nicely.

New in this mailing:

A)    Reminder: Please send slides for your presentation by  Monday June 30th; if this is a problem please let me know.

B)     We will be in the room: “Telegraph Hill” on the 4th floor for the symposium, (still go to the Registration desk on 3rd floor to get badge) InterContinental Hotel, 888 Howard Street, San Francisco, CA;

Discount Code for colleagues or associates: Promo Code: ISNAGRP161025;   
Here is a Link to event page: [Intersolar: Solar Finance and Asset Symposium IV](http://conference.intersolar.de/cgi-bin/x-mkp/congress/section.pl?language=1&eve_id=19&div_id=92&sec_id=705&cda_date=1404684000)

Feel free to promote the event and your participation by including this link on your website, mailings and announce the event in your communications.

C)     Trevor D’Olier-Lees from S and P has joined the conference

I look forward to seeing you all on July 7th.

Other Conference details and briefing below:

The Intersolar Tradeshow and our Solar Finance and Asset Symposium is less than 2 weeks away, below are the details and logistics for your panel and the whole day program.

Here is a Link to event page: [Intersolar: Solar Finance and Asset Symposium IV](http://conference.intersolar.de/cgi-bin/x-mkp/congress/section.pl?language=1&eve_id=19&div_id=92&sec_id=705&cda_date=1404684000)  ; feel free to promote the event and your participation by including this link on your website, mailings and announce the event in your communications. The agenda is also attached for your convenience.

1)     Your Registration: You have already been pre-registered by Intersolar for the conference, Speaker badges will be available at the speaker conference registration desk at the InterContinental Hotel. Your badge will include access to the Intersolar Trade Show held next door at the Moscone West Center.  We have received all bios, you are live on the website.

2)     Place: For Registration go to Level 3  Intercontinental Hotel: 888 Howard Street, San Francisco, CA 94103. Badges will be at the conference desk in the InterContinental Hotel. The Symposium itself is taking place in the room: Telegraph hill” on the 4th Floor

3)     Time: The conference runs 9:00 AM to 5:00 PM on July 7th and speakers are encouraged to participate in the whole symposium. Your speaking time is noted below.

4)     You are also invited to the Intersolar kick of Keynote at 5:30 pm immediately after the Symposium in the same ballroom area and reception to follow, Governor Brown of California is scheduled to speak.

Thank you,

\_\_\_\_\_\_\_\_\_

**NOTES FROM 2013**

**SolarTech Performance Committee**

**‘Solar as an Asset Class’ Symposium III**

**July 08, 2013**

**Intersolar 2013, San Francisco CA**

***Opening Keynote Address: NREL Securitization Activities, presented by Michael Mendelsohn***

Opening statement - “Need a lot of capital by 2020, needs to double”

Mission

* Expand capital
* Lower cost of financing
* Lower transaction costs

Rating agencies and investment communities are iterating towards investable assets.

1). New finance structures can reduce LCOE 16% to 18% and expand projects available.

2). Solar Access to Public Capital (SAPO) – standardizing documents & best practices.

* Market Maker – warehouse assets
* Mock Filing – time line in place

3). Credit Enhancements – may be key to stimulate financing.

4). Solar REITs – complex, “double edge sword”

More data available in NREL report <http://www.nrel.gov/docs/fy12osti/55021.pdf>

***Session 1: Minimizing Risk from the Start, Moderator Tim Keating***

Fast growth >> 94% of modules installed in the last 5 years

* Panel degradation – 0.2% to 2%

System modeling (eg. PVSyst): varying results PVPMC.org

1). Uncertainty (bank use worst case scenario):

* At design
* At Commissioning Reducing uncertainty & cost of capital
* At O&M

Centrosolar: trying to standardize data collected for apples to apples comparison between projects.

2). STC is typically used for performance modeling. New standard – IEC 61853 (4 temp I/R curves)

* 10% performance 3% IRR
* SolarTech Report / Recommendation on Commissioning and O&M which metrics are best and why available on line.

3). Pyranameters vs. Reference Cells – total energy (closer to PV cell)

* NREL articles discussing benefit of Reference Cell
* $0.50/watt drives material changes , testing standards - accelerated testing key
* As industry grows and $ go up standards must get tougher / more rigorous

4). Standards -

* &M would help underwriters
* New Standards – also look at performance over time. There’s no defacto standard for estimating and measuring performance.

5). Module quality scare: margins are squeezed. Need accelerated testing.

**Q&A:**

Q1). Open source platform for standards?

Answer: IEA PVPs

Q2). Political risk (international & local)?

Answer: Needed locally & internationally; disappearance incentives should enable more

consistency in standards.

Q3). Performance Guarantees?

Answer: Banks put burden on EPCs.

***Session 2: It’s All About the Data, Moderator Tom Tansy***

Solar originators currently don’t have a major “platform” to support process (exists in auto & home industries).

Better data should lead at least indirectly to lower rates, e.g.; debit coverage ratio:

* Wells Fargo - typically doesn’t need string level monitoring
* SMA string - level is good

Securitization is tricky – FICO is defacto now but isn’t adequate.

Two types of data:

* Quality & reliability of “as-built” system
* O&M

Larger systems >> more data:

* Constrained by data transmission bandwidth
* Needs to be digested

Larger installers are looking more at self-finance

Trend to “loan to own” vs. 3rd party ownership – banks rely on varying proxies to assess risk.

Residential projects – performance if not as critical especially Lease vs. PPA, structure of Asset matters.

Those taking more risk want/need more data to minimize downtime.

Rich data set can help identify technology risk of system in field.

1). SunSpec standard will help compare performance data across geography and companies:

* Banks are starting to collect performance data to better evaluate investments
* AG C & I lending rate 9% - 12%
* Need ratings (from rating agency) to bring in more investors

2) SMA is moving toward aggregating monitoring data (includes residential solar):

* Need standard methods of data access
* There’s public data only from SCTY (SolarCity?) (they’re not making money yet)

3). Larger companies managing & collecting data will give higher confidence to investors.

4). Ned data transparency to homeowners as well as financiers – across value chain, transparency

exposes latent risk.

5). Need compliance / licensing of service providers – SSAE16.

6). Standards are not rocket science, need the will to contribute (quote from John Hunnelly, SunSpec)

***Luncheon Keynote Address: An Outside View, presented by Ron D’Vari***

Credit card and auto loans are paid on time because losing access has BIG penalties (no credit card, no car).

Financing = funding of asset + insurance of asset

Separation can increase access to capital

Solar – long and stable cash flow (like insurance)

1). Deals with strong Balance Sheet of operator will lead where insurance risk is eliminated (SolarStar)

* Bottlenecks for solar project trance panel price volatility, varying local requirements
* Electricity market variations, no standards PPAs, leases, insurance
* Uncertain technology advances obsolescence
* Homeowner default
* Long lease with short period data

2). Chicken & Egg issue for securitization: no one wants to warehouse $1B Asset without assurance of

market for exit:

* Gov’t may help to kick start securitization with guarantees

3). Ratings exist for Buffett level solar – not indicative of the rest of the industry:

* 3rd party verification of assets:
  + Common at utility scale
  + Happening at smaller scale, e.g. for fraud prevention
* Banks are eager to participate (need platform)
  + CFPB will participate over time

4). Ability to turn off solar production may increase ongoing payment of PPA / Lease.

5). Securitization learning of mortgage industry:

* Need actionable data for investors
* Most securitizations worked well even through credit crisis (except RMBs & mfg housing)

***Session 3: Standard Contracts, Moderator Dirk Michels***

Standard contracts can provide leverage

1).Standardization helps velocity as well as transaction costs:

* Far more likely that a homeowner will default on their mortgage vs. PPA

2). Getting participants to accept a standard contract:

* Should be easy for residential
* Commercial solar – like real estate try to get lawyers who are familiar & educated in solar is needed

3). For commercial projects – need credit enhancement where there’s no rated debt:

* Commercial difficult to move – paperwork
* Residential easy to standardize – less paperwork
* Difficult to find off-takers for SMB paper
* An organizations standard contract must be recognized by multiple entities
* Early Model:
  + Supplier provides guarantees which drives standard contracts
* Other industries don’t compete on terms of contract (auto rentals):
  + Standard contract required for BIG Scale

4). Education and data needed to convince rating agencies.

5). New standards for contract exit (end of life).

**Q&A:**

Q1). Problem with owner / tenant solar?

Answer: Need to find a way for owner to participate I the upside.

***Session 4: Emerging Solar Market, Finance Platform, Moderator John Joshi***

Should government take 1st loss position? Community banks need to band together to go solar wiser.

May lead to negative outcome (mortgage)

Residential metrics for underwriter on:

* Homeowner (FICO)
* Installer
* Project
* Utility investors are going to DG – Mercatus

Issue – matching / modeling PV System size and actual customer energy usage

Underwriting criteria – Wiser Capital:

* Host ability to pay
* Legal risk
* Ability of contractor to deliver on panel performance (bankability)
* 3rd party services

Horizontal 1st loss retained by originator?

1). CPF Services:

* Origination
* Underwriting
* Servicing
* Platforms beginning to deliver for multiple segments;
  + Main Street – Wall Street
  + Commercial & Residential
* Need “Main Street” not just “Wall Street” capital;
  + Community banks understand platform processing (standard process)

2). Need standards, analytics and scoring evolving:

* Credit include wrapping entities (EPC)
* Depends / varies with financier needs / wants

3). Contract must be thorough;

* Default risk
* Legal risk

**Q&A:**

Q1). Component selection – investors decides?

Answer: Let investor, EPC close but scrutinize technology & warranty, minimize 3rd party insurance in residential

Solar.

Q2). Insurance?

Answer: typically provided by burden (commercial & investor), residential add-on to existing policy.

***Session 5: Rating Agencies, Moderator Tim Keating***

1). Residential lease losses have been very minimal:

* ~ 0.2%
* ≤ 2.25% 90+ days past due, mostly just assistance is needed

Underwriting required credible development partners. Unlike insurance underwriting which expects some losses.

New Industry >> Risk aversion >> Credit enhancement

Fitch was wary of lack of national standards. But, any cash flow can be securitized. It’s easier with standards.

Need standards at each point in the value chain – EPCs.

2). Securitization typically doesn’t allow for 3rd party guarantees:

* Securitization only appropriate for small segment in near term of solar market
* Residential not long history and coming off mortgage asset bubble
* Rating agencies hesitant to add new asset class

3). Investor looking for “backup servicers” in the event of non-performance

* 50,000 units – 2000 calls / wee – 90% no problem
* 20 basis profit loss –estimate Per Kent W, check numbers
* Only loss is interruption loss
* Industry performance data on losses would be helpful (SAPC opportunity)
  + Per Mary, it depends on data – work with it
* Commercial segment – quality large, commercial will drive market and be bankable, take share
* Securitization is not a panacea
* Developer must get involved and be enlightened to invest
* Get it right in the first deals

**InterSolar Performance Symposium 7/8/13**

1. **Welcome Address and Introduction** – Marianne Walpert 09:00am

* **NREL Finance Securitization: Solar Access to Public Capital** - Michael Mendelson, NREL, Sr. Financial Analyst
  + NREL is not looking for early stage technology development for adoption
  + Expanding Capital through long term investment such as Pension-, Insurance-, Mutual Funds etc . Need to double tby 2020.
  + Lower the LCOE through public capital vehicles
  + Primary Effort in accessing untapped capital with goal of lowering cost of financing by access to public capital (ABS, REITs, MLPs etc.) by standardization documents and other project elements.
  + 3 Task Approach: Securitization Working Group, Analysis, and Dataset Development
  + Collaboration with over 70 SAPC Participants and Securitization experts, Database Developers, SunSpec etc.
  + Standardizing documents (Leases, PPAs, Roof easements etc).Best Practices (O&M, Installations, Design)Mock Filing – Simplified Structure such as Underwriter, Deal Lawyers, Data team that will give Rating Agencies more comfort.
  + Warehousing Assets to be Securitized – pool of Assets to be ready to bring them to market
  + Dissemination through Media Coverage, Webinars, Widespread Participation, Conferences, Papers & Blogs.
  + Near Term Timelines; Contracts, Data, Mock Filing
  + Credit Enhancements designed to reduce investment risk and sometimes uses public funds.
  + Website: financeRE.nrel.gov
* Q: Lose 5 years depreciation impact on ITC/SAPC? Will be discussed on Panel discussion

1. **Panel 1: Minimizing Risk -** Tim Keating (Mercatus), Joe Cunningham (CentroSolar), Matthew Lave (Sandia Labs), Willard MacDonald (Solmetric), Mani, Tamizhmani(TUV Rheinland PTL) – 9:50am

* Banks care about Bankability, while Underwriter cares only on Data – Tim Keating
  + Standards not hard enough, what standards are being followed?
* Mani (TUV) on Standards:
  + market moves very rapidly the last 5 years.
  + Targeting 6 - 10 cents/kwh LCOE, or 50 cents/Watt
  + Metrics using standard test condition (STC) data , and the new IEC61853
  + Lots of changes
* Matthew of Sandia:
  + No consistency on PV modeling, broken down into 9 different steps and looking where the differences are.
  + Looking at how systems performed over time under various conditions.
* Willard of Solmetric:
  + Cost of capital is driven by risk driven by uncertainties that happened on commissioning and O&M
  + Reducing the risk by reducing those uncertainties while enlarginbg the debt (available capital) to reduce the LCOE especially on commercial and utility scales.
  + Using Pyrometer to measure total energy produced.
  + Proposal using reference cell and angular response is on discussion.
* Joe (CentroSolar, US HQ):
  + Ensuring the income produces to measure metrics with consistent data on various systems for true comparison. Work with SolarTech on the performance committee.
  + System performances can be 10% difference on the IRR
  + Published white paper with SolarTech for standard setting guidelines. and recommend standards available is SolarTech website.
  + From modules perspective manufacturer test reliability for long term reliability of materials. review all BOM. It is costly but worthwhile to do.

Q: Is there Open Source platform for interaction for systems evaluation?

A: Mani of TUV: NREL, Sandia, IEC are working on this. IEAPVPS?? Focus on system standard performance and not just on module level.

Q: Multi questions on How the industry can reduce the risk on the international and local levels?

A: Tim: Get standard on this area first and cross country to lower cost

A: Joe: Many incentives are disappearing, the remaining net metering in Arizona could be the next standard.

Q: How can manufacturers warranty the systems for the Bank to minimize the rsik?

A: EPC is nervous if the performance guarantee is too tight form the Bank

A: Mani: Someone needs to warranty the risk

1. **Panel 2: It is all about Data –** Tom Tansy, Larry Chiavano, Dustin, Kahler, Bates Marshall - 10:10am

* Tom Tansy (SunSpec): Standardization
  + Q: what type of data are required?
  + Q: Are those collected data sufficient enough?
  + What does Transparency means is it important?
  + Standardization should focus on what?
  + What is the process require to get there?
* Larry Chiavano (First Associates):
  + No standard, issues are on securitization for Rating Agencies with limited data
  + Launching new platform to help rating Agencies
  + Compared to Loan FICO scores
  + Data are plenty but cannot get to a rating
  + SolarCity is the only one that disclose data
  + Compliance is another major issue that requires licenses for contract standardization.
* Dustin Kahler (Wells Fargo)
  + Level of granularity for residential may not require as much details compared to utility scales, date requirements are different.
  + Use more remote measurements for data collections.
  + Hoping that Rating Agencies can provide
  + Goes to different Assets classes and looking for home improvement data etc.
  + It will take a while for the financial community to come up with the rating.
  + Transparency is important to reduce uncertainties from investor perspective.
  + Transparency to the consumer are important as they need to know how their system are producing and provide customer satisfaction.
  + Industry moves the right direction.
* Bates Marshall (Medium Power, SMA)
  + Data shows quality and reliability
  + O&M needs as much data as possible
  + Geographic where remote location vs area with close to logistics make a different of what date are required
  + Credit risk covers by FICO, hardware risk covers by manufacturers ,vendor list and use analytics.
  + Solar monitoring centers are deployed to collect enough data, support for standardization.
  + Transparency si positive but not necessary
  + Standardization is not a technical challenge and it just needs cooperation from stakeholders.
  + Better data is important

Q: from Local Developer: Level of monitoring for commercial scake?

A: Dustin: no granularity from monitoring perspective, it could be expensive

A: Bates: Granularity of monitoring has direct correlation to cost

Q: Rating Agency

A: Dustin: Great for the industry

Q: 3rd Party verification

A: Being done routinely, some doing themselves to eliminate fraud from Installer.

1. **Address: An Outside View–**– 11:45am

* **Securitization Learning from Mortgage Industry** - Ron D’Vari of New Oak Capital
  + Data is not information, information is not knowledge
  + Knowledge is priceless
  + Platform that can provide data into asset classes
  + Extending credit to assets that will last 20-30 years is a challenge with changing condition.
  + cost of financing is not cheap and solar collateral is limited and questionable.
  + There is a lot more involved in the Cost of servicing
  + PPA vs. Lease vs. Loan are challenges facing financial industry. Banks are not long term investors but can syndicate them.
  + Strength of balance sheet of the operator is key .
  + Bottleneck for Solar Project Finances:
    - Variations in local regulations and systems efficiency
    - Shortage of tax equity investors
    - Panel price volatility
    - Uncertainties about technological advances and obsolesce.
    - Homeowners potential default
    - Lack of standard PPA, Leases, Insurance.
  + Standard is very important with well-defined rating criteria trusted by investors.

1. **Panel 3: Standards Contracts, Credit Issues and Opportunities for Standards –** Dirk Michaels, Paul Dietering, Edwin Feo, Seth Weissman – 1:30pm

* Dirk Michels:
  + Economies of scale & not reinventing the wheel
  + excessive due diligence can kill standardization
  + Creating document standards is just the first step, recognition by industry is the critical next step
* Ed Feo:
  + previous standardization efforts by SolarTech and others were a decent first step in lowering transaction costs.
* Seth Weissman:
  + Hertz and Avis don’t compete on the quality of their contracts. They provide much more value add to the rental customer.
  + Need to set high standards to compete for customers
* Paul Dietering:
  + Scaling needs lower transaction costs. The industry can make a little money on a few deals, or make a lot of money on lots of deals.
* Seth:
  + residential is far easier, no need to be different
  + commercial will more likely start with a standatd tem plate that will be customized per each deal.
  + Education in the market on both sides of the table is critical
* Paul:
  + Securitization is a good thing, but it shouldn’t be the driver for standardization. Standardization should stand on its own to enable speed and scale. Securitization should be considered a bonus.
* Ed:
  + SAPC has an opportunity to create a standard
  + But SAPC is missing a customer representative in the SAPC process
  + It is all about velocity of money – deal speed
* Dirk:
  + Banks flip paper – velocity of money
  + The sun generates a cash flow every day just as the homeowner creates a cash flow on the mortague
* Seth:
  + 1720 min score/ what do you default on first/ lower cost of operating home
  + most contract concerns are secondary to potential of asset
* Paul:
  + FICA in residential – credit quality of homeowner
  + Public debt is rated debt
  + no public debt – no rating
  + Credit enhancements are required to support credit where there is no credit rating
* Ed:
  + Residential defaults have proven low
  + animosity of rating agencies in commercial space, need credit support mechanism
  + First risk of loss on commercial side
* Dirk:
  + mixed funds:
    - only residential
    - only commercial
  + commercial is too customized
  + commercial PACE jumps the fence
* Seth:
  + not enough off-takers
  + must keep income flowing without tenant
  + consumer does not see/understand the backend of what they are signing up for
  + opportunity solar – multi-tenant

1. **Panel 4: Emerging Solar Market Finance –** John Joshi, Kristian Hanelt, Michael McGuire, Haresh Patel , Tim Buchner

– 2:15pm

* Tim Buchner
  + how well can investors leverage capital – friction
  + platforms
  + securitization isn’t the ultimate goal
  + credit enhancement policies – DOE
  + Need skin in game – No government safety number
* Kristian
  + How is investor community looking at platforms
    - white label solutions
    - organization services
    - underwriting:
      * credit metrics
      * title – home
      * installers – due diligence
      * project performance
    - servicing
      * billing
      * monitoring
      * servicing
* Michael McGuire
  + community banks
  + missed opportunity to match main street with wall street
  + community banks
    - platform processing
    - host centric in analysis match solar to usage
    - tariff modeling
    - analytics standards
* John:
  + need front end to back end
  + CNI Bond analytics
* Tim:
  + adding to many bodies
  + speed – get through bank faster
  + large independent power producers
  + IPP – medium bank
  + core metric – underwriting – pre syndication
  + stochastic modeling
  + only initial screening an d review, not credit like an insurance
* Michael
  + 100kW – 1MW
  + prototype projects
  + primary source/ secondary source
  + risk rating score
    - legal risks
    - contractor warranty risks
    - panel performance
    - counter-party Dodd Frank
* Kristian
  + processing
  + every homeowner saves money
  + verify title
  + component lists – investor choices
* Tim: equipment white list - Europe

1. **Panel 5: Rating Agencies –** Tim Keating, John Bohn, John C. Hitt Jr., Mary Rottman, Kent Williams – 3:30pm

* Tim:
  + market
  + will it work?
  + are they willing to pay for it?
* John:
  + Commercial
  + best of breed
  + underwriting each asset
  + more like a banking decision - no losses
* Kent
  + new asset class
  + we are not through a complete cycle
  + we are on heels of melt down
* Mary
  + Lots of reasons to be cautions
  + credit enhancements in previous markets
  + can’t buffer the investor
  + structural and industry challenges; sophistication and maturity
* John
  + any type of cash flow can be securitized
  + know investment grades & cash flows will match payments
  + how will pay out
  + intelligent standards
    - securitize any cash flow
    - standardization is easier
    - mixing means more work and becomes to expensive
* Mary
  + rating agencies are warming up
  + education is taking place
* Kent’s Data on leasing
  + 2010 – 2712 booked, 1.22% delinquent
  + 2011 – 6830 booked, 0.82 % delinquent
  + 2012 – 23408 booked, 2.25% delinquent
  + interruption loss is small, a few 100’ed in transition at any given moment
* Tim
  + why are we screwing around with residential
* John
  + Mary, you are a non-industry player
  + Mary, SAPC moch working group
  + real cash flow analysis, throw enough assets in the mix and you’ll have a cash flow
  + who wears the risk?
  + need organization around best practices across the value chain

**9:15: Morning Keynote: Michael Mendelsohn, NREL’s Securitization Activities**

Where does NREL finance activities sit?

How capital gets to market / projects

Looking at activities well formulated vs. early starters

Need a lot of capital to meet DoE objectives

Where does capital come from?

Growth goal major challenge

How do we meet goal? Need to go to public access but need tradable liquid product.

Public market mechanisms required to engage untapped retail and institutions

Problem: Most capital unavailable to the investment

Pension funds

Insurance funds

Impact in accessing public capital - can reduce LOCE by 18%

Primary Effort: Accessing Untapped Capital

* Expensive
* Limited in supply
* Time to access lengthy
* Develop standard contracts

Goal: Expand availability and lower the cost of financing by access to public capital

* Asset-backed Securities (ABS)
* Real Estate Investment Trusts (REITs)
* Master Limited Partnerships (MLPs)
* Other debt products

Approach: Standardize documents and other project elements to:

* Lower risk perception and due diligence requirements
* Pool projects across the market & enable scale economies

Task 1 – Lead and convent securitization working group – standardize documents and best practices and address other barriers

Solar Access to Public Capital (SAPC) working group

Task 2 – Analysis – access public capital applications to solar, and opportunities/constraints of existing proposed policies, and evolving market conditions.

Task 3 – Dataset Develop solar performance so new investors can understand investment risks

* SPARC (Open Solar Performance and Reliability Clearinghouse)

**Collaboration** – over 70 SAPC Participants

Additional Partners / Collaborators

Securitization Experts

Database Developers

TruSolar

Global Bonds Initiatives, WHEEL program

**SAPC Effort**:

* Standardized documents
  + Leases
  + PPAs
  + Easements (roof / site access)
* Standardizing best practices
  + O&M
  + Installation
  + Design
* Evaluation of performance and credit databases
* Developing warranty language
* Developing mock filing to rating agencies:
  + Comprehend risk perception
  + Improve data gathering, etc.
  + Participants take unique roles to role as stakeholders

**Mock Filing** – Simplified Structure

1). Underwriters (investment bank) – determine deal structure

2). Del Lawyers

3). Data Team (modelers, servicers, originators, IBs)

Warehousing Assets to be Securitized

Warehouse SPV

Originator / Issuer Assets >>> AAA/Aaa

Overcollateralized Asset >>> AA/Aa

>>> A Waterfall

>>> BBB/Baa

Asset Volume & MW Pooled – assuming $100, 75% of project capital stack securitized



**Dissemination:**

* Widespread participation
* Webinars
* Media coverage
* Conferences
* Papers & blogs

SAPC will be presenting at ABS-East in Miami in October 2013

Near Term Timeline / Preview

* Contracts – in process
* Data – available by end of 2013
* Mock filing – availability target within next couple of quarters

**Credit Enhancements**

Definition: An assurance to the investor (e.g. using collateral, insurance or a third party guarantee) that reduces debt and/or equity risk

Designed to reduce investment risk and thus, stimulate more, lower cost private investment

Sometimes uses public funds

Public entities can achieve great leverage by stimulating more private investment

Examples:

* Insurance
* Loan Guarantee
* First Loss Reserve
* Collateralization
* Co-Investment
* Foreign exchange insurance
* Credit derivatives
* Letter of credit

“First Loss” reduces risk exposure of other equity investors

In “Co-investment” public and private equity are equally ranked

Public “ Mezzanine” investment reduces required private equity

**REIT Market**

134 publically traded

Non-listed and private

84% of publically traded which are “equity investment”

**Solar REITS – NREL Report**

Three technical challenges specified:

* Solar PV **likely** to meet performance
* Solar PV **may** meet passivity
* Solar PV l**ikely** to meet integration into system
* However, complicating factor (e.g., loss of ITC, property tax exemption) **need to be explored further**

Integration with Connecticut Green Banks – collaborating but no formal press release

Standardizing documents – any activity on integrating EPC? Not at this time.

**9:58: Panel 1**

**Key issues around systems, standards and predictability:**

Open Sourced Platform – interaction soups to nuts? Will be hearing from other panelists that will have some elements addressing this question. IEA PVPS.

Acceptance standard – community believes one is needed. TUV working on this topic.

Political Risk - How can the industry reduce political risk?

Keating; AZ – international local versus, been seeing some IEC adoption in some US AHJs. Get standards developed and adopted then amolmigate.

Cunningham – incentives have given a big boom but as we move away from incentives uncertainty will go away. NEM being attacked by utility industry.

Keating – Spanish has changed, Egypt has changed.

In absence of standards thoughts on accepting performance guarantees? Banks don’t want to take technical risk but turn into a contract, e.g. EPC.

REC – TUV applied with standards application ANSE.

“Someone has to wear the risk”

**11:00: Panel 2**

Marshall, SMA - Two principal uses of data – quality & reliability / assets

Standards driving inoperability within data schemes

Operations & maintenance – key for those monitoring systems

What data is required, critical elements?

Kahler, Wells Fargo - Depends on who’s using data. Level of granularity for residential doesn’t need to be details whereas commercial should. Depends on structure, asset class.

What is the underlying differences for commercial?

Marshall, SMA – geographic location, remote management becomes important if operations is not local, and data is key.

Kahler – didn’t start paying attention until a couple of years ago. Think about more towards risk assessment and operations & maintenance.

Chaivaro, First Assoc. – developed 1st backup servicing program - launching. Hoping rating agencies will adopt. Industry shift – larger installers are moving towards own financing options.

Gaps in system – what’s happening in loan origination? What’s the state-of-art?

Chaivaro – shift from leasing to loan programs, loan programs additional underwriting requirements.

Kahler – gone through number of asset classes, there’s no single best corollary. Using different proxies, SolarCity, SunRun home mortgage & home improvement data.

Marshall – technology risk still a big question mark, wide spectrum of performance in field, using the right analytics will provide better data. Build product correctly, approved vendor list correctly.

Objective – lowering cost of borrowing. Is current data sufficient and can be manipulated in order to provide investors with a comfort level.

Chaivaro – any rating is not available within supply chain. Securitization on the table, once one is done will open up for others.

Kahler – financing rates will affect financing but not the data. Will take a couple of years as investment community hasn’t paid attention until last 2 years.

Marshall – EU monitoring provides a unique opportunity for a much more solar monitoring center (remote mgmt). Do systems communicate with each other? Current activities are moving towards this.

What about transparency? What does it mean? IS it important? How can we achieve it?

Chaivaro – not much public data expect with SolarCity. How can this be compared if other resources? NREL SAPC supports additional resource.

Kahler – standardization important particularly if providers no longer in industry. Investment moving towards receiving more data. Important to consumer to ensure system performance.

Marshall – necessary but not sufficient in preventing any melt down. But, does impact perception.

What are the top two areas in focusing on Standards?

Chaivaro – multiple platform providers but no major provider.

Marshall – agrees with Larry, takes will and industry cooperation.

If industry generates ideal data sets, platform in place, standardization will it move the needle?

Chairvaro – compliance SAA 16; 3rd party auditing firm audits contract compliance, CFPB will knock on doors to ensure compliance.

Kahler – there is enough data, industry continues to move in right direction, right providers needle will move. Establishing long term presence

Marshall – better data has a positive impact on debt service coverage ratio.

**Q&A**

Thoughts on level of monitoring of what is important?

Kahler – do not require a certain level. Most providers don’t go to a granular level due to cost point. Doesn’t mean not valuable only not feasible.

Marshall – granularity is driven by needs of operator. Streamline level monitoring does get to the level of importance.

3rd party verification of assets appear to be a gap?

Tansy – not an area of expertise, but, is a topic of concern.

Chaivaro - come up with a program to help prevent fraud either from the installer or lessor.

**11:45: Ron D’Vari**

Focused on transparency and activity

Financial industry has not built data as other industries have done.

Short time gratification and fear

“Data is not information, information is not knowledge, knowledge is not understanding, understanding is not wisdom”, Clifford Stoll.

Education is expensive, knowledge is priceless

**Outside of non-agency RMBS and manufactured housing all other securitizations have performed well even through credit crisis, examples**:

* Consumer ABS (Auto and Credit Card)
* Equipment ABS
* Collateralized Leverage Loans
* CMBS (to some extent)
* Corporate Receivables
* Esoterics (Insurance linked securities)

**RMBS securitized, failure had been mostly attributable to**:

* Rapid rise and fall of home prices due to system-wide speculative behavior and excessive liquidity
  + Hard to measure LTV when V moves so fast
* Over-levered borrowers
* Loose guideline specifications
* Direct correlations of the entire financial system with the product performance (“systematic risk”)

Ultimately this is insurance – how do we decouple from lending?

How do we contain crisis?

Employment at 7.6%

Data itself will benefit whereas translating data to identify liquidity, elimination of uncertainty

Need to keep in mind complexity of asset.

Cost of servicing – there’s a lot more involved

Technological lessons and specification contributes to verification

Need scalability and infrastructure in order for investors to come in

Supply Chain of services:

* Rating agencies
* Underwriters
* Service Providers

Consumer financial protection will find its way into the industry.

How ultimately bears the cost?

Deals that will lead:

Rating agencies have something to point to, e.g. Balance Sheet.

Aggregators – collect and ship

**Bottlenecks for solar project finance:**

* Shortage of tax equity investors
* Panel price volatility
* Wide variations in local regulations
* Variations in systems efficiency
* Electricity market variations
* Speculative rating of the operating servicers
  + Lack of nationwide large-scale back-up servicers
* Lack of standard Power Purchase Agreement (“PPA”), Leases, Insurance
* Uncertainties about technological advances and obsolesce
* Home owners potential default
  + Workout solutions
  + Recovery assumptions
* Long leases and relatively short period of data

If you don’t have enough warrantors, guarantors you won’t have enough to securitize. Underwriting is not enough.

Investors effectiveness – putting a $1.00 to work, don’t want to put $0.20 towards comfort level

Risk based lending

Individual risk too high for anyone to take on risk

Warehousing lending – juicy way to obtain capital

Standards are not rocket science

Chicken & Egg

**Q&A**

What are some potential solution to shorten the 20-30 year window?

**Panel 3:**

Michels, K&L Gates Issue for years – getting to a financial model that allows for easier financing.

Standards are only standard if the community (ALL) considers as standard.

Profits consumed due to transaction cost.

Feo, Coronal Renewables –

Weissman, SolarCity – passion to turn what is a consumer industry and make into something that you can look at the kitchen table and understand it. We can improve on the quality of installations and paperwork. Working with SAPC to find standard.

Detering, Tiago Energy - saw 3 yrs ago and took PPA and decided it needed to be standardized. Only way industry will get to scale is by standardized documents – important on residential projects but more important on commercial projects.

Standard contracts, credit issues – standard contract, admin cost $10k or less. Problem arose during finance stage. Lawyers and investors required more.

**Can you create a standardized document where the consumer will accept and what are the challenges?**

Weissman – residential far far easier, commercial will scale and standardized exactly where it standardizes. Residential should be the same every time. Challenge – lack of understanding by lawyers on deals they are working on. Educate the lawyers on process, pick the right counsel, educating the vast community.

Detering – agrees that residential is easier, documentation more uniformed. Commercial on the other hand, 4 – 5 years ago questions raised from both sides. Gotten better but not by much. Cost should not be driving securitization. Market growth should be the driving force. Need to get velocity up, securitization will then scale.

Feo – people signing contracts may not have know with all of what they are signing. On commercial side, SAPC has opportunity to drive standard. Customer and customer representatives are missing from equation, e.g. discussion. How quickly can you transact? Issue is speed.

Michels – SAPC working group of NREL, idea think about mortgage market and how quickly they are able to transact. Why? Standard programs (Fanny Mae, Fanny Mac) standard documents… securitizable.

Solar is the mortgage but there is more complexity, e.g. credit issues.

**What are the issues and challenges on credit issues?**

Weissman – first question asked is what about default? What about bankrupt? People are more likely to default on home loan vs. solar lease. PPA is reducing the cost to operate asset. Death or divorce where spouse has no credit.

**What about commercial – what are the differences?**

Detering – residential has the FICO score. People getting more sophisticated. Commercial doesn’t have FICO, but, public debt becomes the FICO perimeter. Challenge is no publically rated rating.

Feo – number of defaults low, issues are start-up issues, minor issues. Level of animosity between rating agencies off charts. Customer generators not paying bills. Commercial side, nugget is investment grade. But still challenge as investors may feel some uncertainty as to how well credit will remain high.

**Will we see securitization only on residential, commercial or mix**?

Weissman – see mixed, but issue will be how you will be able to turn the paper quickly.

Feo – may find standards easier to adopt with small commercial. But, still may have credit issue to deal with.

Weissman – Built SMB document (approx. 8 pgs) but problem is not enough off-takers.

Michels – are there other opportunities to create standards?

Feo – issue is coming up with a product

Weissman – standard on how you treat the customer, insuring the system, damage repair

Detering – taking care of the customer is less prevalent on commercial side.

**Q&A**

Are there ways around standardization / securitization on larger commercial multiple tenant properties?

Weissman – property commercial ownership – vacancies, once they look at solar as an asset source they can save money for the tenant, make money for the owner.

**2:15: Panel 4:**

Joshi

Hanelt, Clean Power Finance

McGuire, Wiser Capital – new platform launching next week for solar and host industry.

Buchner, Mercatus – developing tool that will be the first FICO like score.

Meetings this week to flush out rating issues.

**In terms of CPF what is the value prop to the community and how are you different?**

Building

Not a branding solutions ore while label

Services offered to investors:

Origination services

Underwriting homeowner and installer, project itself

Servicing – billing, monitoring, operations work

Be more flexible with a variety, diversity to drive more standards – Google, Stanley,

Seen cost of capital go down over few years – cost structure transparent to investors

Natural trend lease rates have gone down?

Getting variety of investors on asset gets cost of capital to go down.

Wiser Capital is new platform C&I, what is the value prop?

Main Street as opposed to Wall Street – missed opportunity

Community capital and Wall Street capital go together

Working on standardization on transaction costs

Banks understand platform process on transactions

Host centric on utilities – down load data to get best economics

Need good tariff modeling, standards and analytics

SAPC has a few analytics partners that monitor utilities data

**What is the value prop of Mercatus platform?**

Buchner – mot larger investors are dealing with utilities projects, distributed market coming to them quickly. Fundamentally looked at industries best practices that can develop FICO score that allows investors a better understanding of asset. Mirror image of what financial institute looks at – saves on acquisition cost – 30%. Enabling speed!

How do they get through process quickly, respond quickly? Mercatus platform allows for speed.

Large tax equiters, investor banking

**What is the core metrics you look at for measuring project?**

Buchner – looked at over 600 projects. Looking holistically at projects not just credit rating

Wrapping – financing, screening of initial due diligence, document management.

**How is Wiser’s platform able to work with community – process?**

Focus is smaller projects – 100kW to 100MW

Have to develop counter party - banker

PPA goes into lock-box

Banks looks at Wiser for certainty

Banks are pledges as collateral – new underwriting model helps banks understand obligation and risk.

Ability to underwrite:

* Host facility to make PPA pymt
* Legal risk – interconnection agreements flushed out, safety
* Contractors obligation – party to deal for 10 years
* Panel performance
* 3rd party servicing
* Takes 1st loss if there is a default

0 to 5% first loss

Does CPF underwrite or is it just FICO?

Use FICO and underwrite to it

Will make it right if there is a problem

Makes sure every homeowner is making money

Title verification

**Q&A**

How do you select component manufacturers?

Hanelt – allows investors to select with data provided to them

McGuire – allows EPC to select but ensures underwriting warranty

Buchner – use assess white list

Independent quality assessment, audit assessment?

McGuire – Wiser is looking at this

Hanelt – consumer default, regulatory loss / risk, back stopped with cash in-place

3rd party insurance

Wiser – first loss agreement

Hanelt – not really seeing in residential

Buchner – advisor to entities, fees are liability

What about PNC? IS homeowner allowed to add on?

Wiser – have seen but not the norm, if residential should be able to add

Hanelt – homeowner can add but liability can be expensive

Seen PPA used to take care of common area, e.g. HOA properties?

Joshi - not really happening due to legislation, commercial side a lot of banks will consent. Vermont may have.

Hawaii

Final wrap-up prognosis on platform

Hanelt – hash tag up to the right, net metering

McGuire – will to work with community on open score

Buchner - distributed solar here and big investor will soar with it

**3:30: Panel 5:**

**Underwriting similar to semiconductor industry – is it that simple? Assets stockpiling that your helping to manage is all we have to do?**

Bohn – have to underwrite each asset, process work best of the breed.

Williams – one issue is this is a brand new asset class coming on the heals of financial melt down. conundrum – haven’t been through full cycle.

Rottman – one thing missing in this industry is tools to help buffer investor, structural and industry challenge.

Simulated maturity

Hitt – able to securitize standard cash flow activities, home loans, car loan, credit cards, student loans. Challenge to provide confidence to investors on securitization.

What risk category do they fall into? Market immaturity thus adding to uncertainty.

Provider un-rated

If we have enough standards is true we can swamp out O&M?

Hitt –

Bohn – problem is not that you have a standard rather a repeatable standard.

William – calls are not rocket science, 2% , 2/3 is educating

5 separate groups working on national standard

Rottman – PR is warming up, becoming a little less skeptical. Education has been key.

William data slide – 90 plus days categories as of 3/31/13

Book Year Total Contracts Booked 90+ Days Past Due

2010 2713 1.22%

2011 6830 0.82%

2012 23408 2.25%

Typical 760 FICO score

Booked Year CAN PTP PCI PRB

2010 30.77% 15.38% 0.00% 53.85%

201160. 78% 17.65% 1.96% 19.61%

2012 73.62% 13.84% 5.50%

Most PRB accounts keep payment current

Some at risk PRB accounts will incur a loss

Loss on for pymt not made

Performance exceptional

Why are we still focusing on residential?

William – problem with data is data belongs to developers – only 2 have enough data

Chicken & Egg – want money for performance, need performance to get money

Rottman – what is Rottman Assoc doing? What RA is doing is what Rating agencies need.

SAPC going well, mock filing helpful

Data critical but challenge to obtain due to privacy issues, IP issues

Work being done it REITs will gravitate to industry.

Breaking the egg in consumer industrial – what can the industry do to move the needle?

Bohn – drive towards a standardization through the value chain.

Who in the value chain takes what risk?

EPC will never be re-written – do we have enough data, can we wrap?

Bohn – have enough data, alliances with key contractors / developers

Be available to the portion of industry that doesn’t have take-out

Migration to quality

Rottman – early issuers pay up a little bit to get out all the kinks.

You have to initial feel the pain to get the gain

**Q&A**

To Rottman - SAPC data being collected being presented to Congress to help the ITC?

Looking at the data, generalizing it and erase where it came from. Purpose is not to present to Congress, purpose is to provide the industry on how to work with the deal.

What is your take on new technologies coming into market?

Rottman – new technology tough – really need 3-5 years behind it.

Can panel speak to Solar Star? Recent rating by investors.

Rottman - more traditional asset to grants

Hitt – most model lines have gone into bankruptcy or receivership

**Key Take-Away Tweet**

Be careful of securitization – it’s not the end to be all. What’s more important is industry invests in best practices across value chain.

When standards are developed – step up and adopt.

If want Peace work for Justice

William – developers have to get involved on standards and enlightenment

Clarify and invest

Get right the first few deals

It all depends data and work with Mary, SAPC, oSPARC

**NOTES FROM 2014**

**Solar Finance and Asset Symposium IV**

***July 7, 2014****InterContinental Hotel –Laurel Hill Room*

SESSION A

Welcome –Tim Keating & Tom Tansy

**Introducing the SunSpec Alliance**

Standards drive up:

* Innovation
* Performance
* Value

Drive down: cost & risk

* Denmark has adopted SunSpec as new standards
* Latest partnership: UCSD
* oSPARC database in conjunction with NREL: benchmark plants for optimal investment

Strategic initiatives:

* SunSPec Inverter Control Program
* SunSpec Storage Program

**Keynote: Solar Finance Past, Present, and Future –Michael Eckhart**

*(Managing Director, Global Head of Environmental Finance, Corporate & Investment Banking, Citigroup Capital Markets, Inc)*

* “SunSpec is THE thing”

1. Perspective: the atmosphere is thin, our environment is fragile
2. How we got to where we are
   1. Invention of PV (1839-1959)
   2. 1973 –Oil Crisis and OECD Reply: Ford Foundation Study “Solar and efficiency” by David Freeman, foundation of Solarex, first conference by Wolfgang Palz
   3. 1974: IEA, FEA, EDA, oil industry investment in solar PV
   4. 1977-1979- US government action: foundation of the DOE, PURPA enacted
   5. 1979-1989 –The Lost Decade
   6. 1990-1996 –Rebirth of Renewables: SERI renamed NREL, EPA Act of 1992, Aachen Model, Germany, founding of Nth Power
   7. 1997-1999 –Kyoto and EU White Paper: Kyoto Protocol (1997), White Paper on RE by Wolfgang Palz, SolarBank Initiative in S Africa, in India, German 100k roofs program, CA AB 32 solar subsidy
   8. 2000-2001 –Stage Setting: German GIT for solar PV + KfW solar loan program by Hermann Scheer, EU publishes “take off for RE”, Net metering, 9/11
   9. 2003 -2005 –Policy for Financing: First REFF, foundation of New Energy Finance, foundation of SunEdison
   10. 2006-2007: China and CA –China enacts RE law, CA Solar Initiative, foundation of SolarCity, SunRun, Sungevity, sale-lease program
   11. 2008-2009 –Financial Crisis/Incentives: WIREC 2008, Financial crisis, ERRA with 20% ITC for 8 years, IRENA founded, ARRA, 20/20/20 by 2020
   12. 2010-2011 –Loan Guarantees: China dropping prices with its 523 PV manufacturing companies, Fukushima nuclear power accident
   13. 2012-2014 –Capital Markets: Japanese FIT, China PV installation program, First REIT
   14. In Summary: Phases of Innovation, 1970-2020
       1. Environmental Policy Innovation: Clean Air Act; Kyoto; EPA
       2. Technology Innovation: ERDA/USDOE. ARRA R&D Funding
       3. Market Structure Innovation: PURPA, EP Act 1992
       4. RE Policy Innovation: FIT, Net Metering, RPS, tax credits
       5. Financial Innovation: LG, CG, ITC, Interest Rates
3. Future
   1. Global Solar PV Global Installation: Japan and China are booming and will be 50% of the global market starting next year
   2. US Solar PV installation: utility-scale installations are decreasing, offset by Small-scale ones that are booming (2 markets going in different directions)
   3. Future of Solar Finance: Near term drivers
      1. Global markets driving down hardware costs
      2. Interconnection and permitting
      3. Grid and distribution system upgrades
      4. Storage
      5. Continued PV tech advancement and cost reduction
      6. Drivers trending away from solar: ITC and other direct supports, net metering & resolution of utility rates, interest rates
   4. Long Term Drivers
      1. Global Market pull on PV success
      2. Power economics with environmental and climate costs
      3. Public attitudes on climate and environment
      4. Public acceptance of solar
      5. Infusion of climate policy in utility decision making
      6. Drivers trending away from solar: none
   5. Continued innovation:
      1. Easy credit
      2. Credit backstop mechanisms
      3. Portfolio financing for substation level projects
      4. Risk mitigation and credit enhancement
   6. M&A and Consolidation
      1. Solar installation companies, solar financing companies
   7. Issuances to the capital markets: through solar securitization, green bonds and return of balance sheets, yield cos

**US Solar Market Outlook: The State and Future of US Solar –Shayle Kann**

*(VP Research, GTM Research)*

* In collaboration with oSPARC Plus (for more information about oSPARC, visit (http://www.sunspec.org/osparc/)
* Focus: where exactly are we today?

5 trends 🡪 Where financing is today and where is it headed?

1. Market is growing, but not everywhere, and not uniformly
   1. Absent seasonality, growth remains strong (2010-2014 US PV installations grew by 10x)
   2. The market hasn't really diversified all that much: each state should be a market, but it is not the case
      1. CA: 56% of residential market, NJ 5%, CO 4%, Hawaii, , AZ, other 17%
      2. Less true in non-residential: CA 27%, NJ 18%, AZ 13%, MA 7%, NY 5%, all other 30%
      3. Few potential emerging markets
   3. Each market segment is unique: a lot of the boom has been utility-scale over the past couple years (of 140k PV installations, most of them utility scale)
      1. Commercial had a head start on residential, yet residential now exceeds commercial for the first time in US PV installations
      2. Non-residential has been struggling the most
2. Residential: the rise of the loan?
   1. Residential 3rd party ownership still dominates (2/3 of residential market in 2013)
   2. The lease shouldn't necessarily remain dominant: probably because historically there hasn't been as good of a loan product as a lease product, but this might be changing
   3. Residential PV Finance landscape in 2013: 2 things have changed over the past year:
      1. Vertically integrated model and partner model: became semi-integrated
      2. More companies offering loan products and Lease/PPA products
   4. Projection: By the end of this year, every major company may offer loan-based products
   5. Third-party ownership market share is stagnant, or even falling
3. Non-Residential: Cracking the Code on Small Commercial
   1. We barely install any small commercial solar: 38% in 1MW, difficult to get to that segment because of the nature of the landscape, remains a problem to be solved
   2. Commercial will be growing more slowly that the other markets
4. Utility: making a comeback
   1. Prices for utilities have become so low that there has been a fair amount of procurement outside requirements: 3GW in 12 months (MN, GA)
   2. Solar winning under PURPA: if competitive with natural gas (UT, NC)
5. DG and Utilities: Predicting the Endgame
   1. Distributed Solar Installations in Context: distributed PV installations produced 0.04% of national electricity demand in 2013
   2. But in top 7 states, the portion of total electricity sales is much higher
   3. What about demand growth? (load growth, not total load) decreasing load growth (projected 1% annual demand growth in the next 30 years)
   4. Will the solar installation have an impact on loaf growth? 🡪 Yes: -47% in CA, -42% in NJ, etc. –Load growth could flatline
   5. We have not yet seen a major loss of solar industry anywhere, even in “unfriendly” states
   6. Massachusetts as the Model for the Future? 🡪 Potential to be replicated
      1. Net metering cap removed
      2. Virtual net metering compensation decreased
      3. SREC program replaced by declining-block, fixed price production incentive
      4. Introduction of a minimum bill
      5. Making 1,600MW target legally binding
6. How Much do Import Tariffs Matter?
   1. Chinese Module Suppliers Dominate the DG landscape
   2. Preliminary countervailing duty rates were higher than expected
      1. New trade case: big preliminary CVD Margins, at least 27% for China in 2014
   3. Chinese Tariff Strategies –No easy out this time: 0.82c/W, has the potential to raise prices
   4. Grading our predictions: in 2014
      1. At least one more utility affiliate will purchase a C&I project developer : 0/10
      2. No net metering repeal effort will be successful, but at least 2 states will introduce fixed charges or minimum bills: 5/10
      3. Every major residential TPO company will have a debt offering: 5/10
      4. >400MW of utility PPAs will be signed, all outside RPS requirements 10/10
   5. $131B in Project Capital Needed through 2018
      1. $38.9B to flow into residential
      2. $40.8B for nonresidential, $51.4B in Utility, $131.2B total

Q&A

* For Michael and Shayle
  + Prediction that hardware costs will decrease in the near future (M), 82c/W (S): are those near-term? Aka, where is pricing going?

🡪 M: cost and pricing are different: cost is going down independent of price, profit will be established by pricing behavior.

🡪 S: agrees, price will continue to go down in percentage –cost will probably not be able to decrease much more, will save a lot more on soft cost than on hardware cost

* For Michael: with respect to securitization, mostly residential scale, how are we going to crack the code for the commercial segment?

🡪 M: securitization is difficult to achieve, portfolio effect doesn't apply on the downside –somebody will step up and offer credit enhancement for a fee (wrap), most likely an insurance company

* How do we take the positives and negatives and (How huge is huge?)

🡪 M: 0 risk on 50% on returns

🡪 S: if the ITC drops the 10%, the states that are on the cusp of being markets will be lost

SESSION B

**Keynote: State of Solar Securitization –Stephen Viscovich**

*(Managing Director Securitized Products, Credit Suisse Securities LLC)*

* Portfolios seen today should perform better
* Securitization is nothing new: takes a lot of forms, rated capital market transactions are the driver for capitalization in the industry
* How does an originator access the securitization market, especially in the solar market?
  + Market is very much ready for solar securitization, but lots of potential issuers are not yet ready: lots of things that still need to be done even with a great portfolio
  + The sooner they are ready, the better the growth of the portfolio
  + How?
    - Processes needed (capital markets look at): Consistent underwriting, portfolio sizeable enough to access the market, consistent pipeline, reliable execution
  + What is the biggest hurdle to being able to access the capital market?
    - Getting through the rating agencies: investment grade level
    - Difficult process: evaluating the risk of a portfolio, rating agencies operate in the world of “what could happen, legally” –the lack of historical data makes it difficult evaluate/prove
    - Rating agencies look at: historical data –prove that their assets are performing, alternative assets (utility receivables); corporate infrastructure; human capital (is the operational risk low enough so that it can achieve investment grade rating)
  + What do we see as biggest concerns (rating agencies)?
    - Technological obsolescence: will there be something more appealing that the solar PV systems? In terms of value proposition
    - Credit risk: utility receivables, cash flow risk, FICO, mortgage payments
    - O&M: PV systems require capital
    - Regulatory risk: consistent questions with regards to net metering, property taxes, etc
    - What is the structure like? Leverage amount
  + What about investors?
    - Value proposition to customers
    - Solar is a portfolio diversification,
  + What kind of investors?
    - broad base purchases into this asset class - insurance companies, hedge funds, etc
    - Diversification + High credit quality
    - 🡪 market is ready, but are the issuers going to make themselves ready?
* What’s next in securitization?
  + How to incorporate securitization with tax equity: risk over capture
    - Consistency of income
    - Can there be a structure that works?
  + It’s about people challenging the status quo on both sides: deals must come out or the market will be in a back leverage scenario, which is more expensive

Q&A

* Warehousing, how is the tax equity problem to be solved?

🡪 Comes down to structure: requires collaboration between the 2 parties; as long as they are able to focus on what people are most concerned about, and collaboration

* + Recapture –solved
  + Income smoothness can be solved through Warehousing
  + Tax indemnification: small issue
  + Senior debt at securitized level

**Panel: Residential Solar Finance Roundtable and Business Model Trends –** *Ram Akella (Managing Director –Centrosolar America, Inc.), David Field (CEO- OneRoof Energy), Ken Schwarz (CFO – Sungevity)*

* New challenges in the industry:
  + Who is investing?
    - Very few investors 🡪 challenges for companies such as OneRoof Energy
    - New players in 2014: tax equity firms
    - Better rates, longer financing periods, more loans, structures available
* Is the industry is evolving in the lease and loan origination process?
  + Sungevity: selling projects
    - Residential industry close to having standardization, consistent products will drive down cost
    - Trend: More investors, more capital drive towards standardization 🡪 simplifies financing process
    - Tax equity: creates inefficiencies –byzantine structures
    - Storage integrated in financing future
* What do you see as a factor of growth beyond ITC?
  + Healthy mix between lease/PPA
  + Most successful financing projects integrate within leasing type platforms that already include standards
  + Different types of investors will come into the market place, non-traditional as well
  + Cost of delivery is cheaper in other countries such as Australia and EU, this may be replicated here in the US
  + Very few tax equity entrance: equities are very large 🡪 inefficiency
    - $4-7k for a house to acquire lease
    - These costs should come down
* O&M accurate enough?
  + Warranties on the equipment
* What efforts have your firms made to standardize
  + OneRoof: very limited amount of standardized kits, but an increase would increase customer peace of mind and decrease costs, risk, and monitoring

Q&A

* Simplifying the way tax business works/ What do you see beyond 2016
* What are your thoughts in storage systems?
  + D. Field: storage is veryactive in Hawaii, necessary due to grid saturation. This offers value to the customer

**Panel: Commercial and Industrial Solar Finance Developers and Investors Roundtable –**

*Tim Buchner (COO –Mercatus, Inc), Todd Michaels (VP Product Innovation –SunEdison), Kate Sherwood (Commercial Partner Sales Director –Solar City Corporation), Pablo Otin (US Country Manager –Gestamp Solar), Erik Stuebe (President –Ecoplexus, Inc)*

* Debate between developers and investors
* Framework
  + Commercial Solar: Swan or Ugly Duckling?
  + Growth predictions: “we predict commercial to drive up to 40% CAGR through 2016” –Goldman Sachs
  + What’s prevented the growth to date?
    - Difficult finding biggest risks or fatal flaws
    - Overloaded sifting through data
    - Policy instabilities
    - Lack of standards
    - Everything custom
  + The sad closure rate reality: 1.7% closure rate of commercial projects introduced to investors, little standard deviation between different investors
* Closure Rate: why is it so bleak?
  + Kate Sherwood: it cannot be assessed with spreadsheets –who has relationship, interest, is interconnection reasonable –interest is the no 1 driver
* Is there one issue in particular?
  + “You don’t know what you don’t know”: difficult to know the right questions to ask
  + Transparency and visibility: defining rules makes assets more valuable
* What has prevented that?
  + There hasn’t been an agreement/partnership strong enough
  + From the developer side (ES): fragmented market with thousands of companies, only a handful are stable/sophisticated enough
    - Structural barrier: significant demand charges, tariffs
    - “The glass is always overflowing”
  + Pablo Otin –There are 2 universes: developer/lender
    - No adjunction for these 2 sides to meet: lack of proper environment (=opportunity)
* Innovation hit the residential market in a big way, what do you think is pushing the envelope on the commercial market?
  + Todd Michaels: plenty of money, not enough projects –more and more liability because we are still in “developer mode”
    - Need to go from complex to simple: transparent offers to the consumer
    - Aggregation is a problem
  + Erik Stuebe: projected $30B in growth in the next few years
    - Don't see a solution to the problem of standardization in the market: small parts that add up to the whole

Q&A

* Financiers’ opinions on developers (rank)
  + Too protective of data
  + Too much sugar coating on reality (#1)
  + The expectations are too high on the projects they are developing
* K.S.: sugar coating can be an issue, but agree more with data sharing
  + Salespeople are trying to build trust with developers, but there is no common language today
  + We partner well with lead generation people, not with developers because have not defined expectation well
* P.O.: for a developer, sugar coating may be necessary to sell
  + From a developers point of view, “glass is always overflowing”
  + Quality of the industry overall has improved, therefore the quality of information has changed and dialogue is better
* T.B.: there needs to be a common language
* Question: about tariffs- what does the panel think about tariffs being restructured away from
  + K.S.: SolarCity partnered with Tesla: storage can address the problem of demand charges going up
  + ES: knowing where solar industry is going is a challenge
* Question: What most affects developer interest?
  + K.S.: realization of fortune 500 companies/ sudden interest in solar industry
    - In addition to green requirements, other
* Question: how is the closing rate progressing?
  + T.B.: going down from 3%
    - Requirements to get on the platform
* Question: lack of interest –DSNK (“Daily Solar Nut Kick”): who delivers that?
  + K.S.: power buyer- decides not to move forward
* If you could change one thing about power developers?
  + K.S.: communication
  + T.M.: “lets be friends”
  + P.O.: less lawyers
  + E.S.: less investors, too much language

Session C

**Keynote – The Solar Energy Technologies Office: Getting to Ubiquitous Solar –Minh Le**

*(Director -Solar Energy Technologies Office)*

* If we can get solar energy to be economically competitive, it will make sense to be adopted economically
* SunShot Initiative: Solar Grid Parity by 2020
* Goal: 5-6¢/kWh
* Industry has made great progress from when it was launched
  + 60% progress towards 2020 goal
* Continued decline in module prices
* World Record Cell Efficiencies: rate of innovation has gone up (3x in rate of world record efficiencies)
  + 10x growth rate from 2009
  + Jobs up 143,000 in 2013
  + SunShot incubator: $18 private for every $1 public
    - Risky ideas are important too: 25% of companies that were invested in do not exist anymore, but the ones that do remain are flourishing
* Increasing challenge: grid integration and soft costs
  + Manufacturing competitiveness
  + Erosion of Domestic PV cell and Module Manufacturing: 42% in 97 to 2% in 2013
  + “Abandoning today’s ‘commodity manufacturing’ can lock you out of tomorrow’s emerging industry”
* Despite growing demand, US shipments have fallen
  + In 2013, US PV inverter revenue was 2.4B, down 63% from 2010
  + Cell revenue down 77%
* China has been consuming more + rapid growth in Japanese market
* Systems integration R&D
  + Plant Performance and Reliability
  + Grid performance and Reliability
  + Dispatchability
  + Power Electronics
  + Communications
* Field Validation of PV Systems: have been there for 25-30 years, explain how things have been operating the way they do
* Putting installation on the field
  + Deficiency rate: 10-22%, overall building envelope protection with roof/wall penetrations, safety anchors
  + System/Equipment Grounding: 10-15% deficiency
  + 10-40%of residential installations have issues at installation
* Today’s Power System, 2 way power flow
  + Generation-transmission 🡪 Substation
* PV System Pathway to SunShot: 64% of installation is considered soft cost, hardware cost has been going down
* Red tape related to solar installation 🡪 drive costs and limit solar adoption
* Rooftop Solar Challenge: 22 teams cut red tape by 1 week, 600MW installed, 40k installations (40k weeks of red tape = 768 Years of red tape)
* Opportunities in the finance space:
  + Mosaic launches to residential installers with expansion of home solar loan program
  + Community Solar: Group Purchasing / Financial (Investment/Donation)
  + Shared solar: Offsite installation/ Onsite (Multi-Unit buildings

Q&A

* Working with the utilities- is there any way to improve tariff issues?

🡪 Incentives, one of them being net metering. The challenge is that even though some policies establish very good incentives, the market maturity can create challenges

Find ways to smooth it out

* how?

🡪 recognize that costs coming down create more certainty

**Keynote: Advanced Financing to Achieve SunShot: NREL Annual Operating Plan –Michael Mendelsohn**

*(SAPC Director and Senior Analyst, NREL)*

* Capital market participation requires
  + Asset and contractual consistency
  + Availability of due diligence tools
* Liquidity and Price transparency 🡪 consistency cash flows 🡪 tools to conduct due diligence 🡪 investor confidence in asset performance 🡪 feedback from rating agencies and investors
* NREL Securitization Activities: project history
  + NREL goal: expand availability of capital, lower cost of capital, reduce transaction cost, time to accessibility
  + 3-year DOE award:
    - Organize the industry around standard documents, best practices, robust datasets;
    - Conduct analysis to comprehend opportunities and barriers
    - Promote adoption by developers, financiers, law firms, etc
* SAPC: approximately 300 participant entities as of June 2014
  + Activities:
    - Standard contracts: residential lease (aggregated and disaggregated), commercial PPA, residential PPA near completion
    - Develop Best Practices: installation, O&M, Independent engineering
    - Build robust datasets: oSPARC makes performance data available
    - Develop mock filing to rating agencies:
    - Conduct analyses on RA risks concerns
    - Convert industry group to continue building
* Standard Contracts and Best Practices
  + Benefits of adoption
    - Facilitate cash flows to be pooled into securities to access capital market investment
    - Improve confidence among investors and regulators
    - Lower transaction costs
    - Speed deployment
    - Improve customer protection
    - Enable liquidity of project
* Task 3: Data Sets
  + oSPARC: will be the first major public database of system performance
  + First release will be at Intersolar: CA Solar Initiative crossed with weather data, thousands of others in development
  + Will be critical resource for DOE, NREL, PUCs, other labs, nonprofits, etc
  + oSPARC plus was launched with GTM in April, 2014
* Task 4: Banking on Solar
  + Designed to facilitate direct lending for solar deployment
  + Working group: 100+ members, building consensus on underwriting principles, developing education materials, etc
* Clarifying Legal issues: what is the priority of liens between the mortgage holder and solar lender in the case of a homeowner default? Banking on Solar working on draft template agreements 🡪 high levels of recovery for solar lenders
* SolarCity Securitizations: offer a lot of insight
  + 4.58% (in 2014) solar bond offering improving over time
  + 99% recovery upon reassignment in residential
* YieldCo Activity
  + Announced: NRG Yield, Nextera Yieldco, Abengoa, SunEdison (TerraForm Power)
  + Under consideration: SunPower
  + SAPC benefit: standard contracts and best practices
* SAPC Mock Securitization: SolarCo Waterfall
  + Mock securitizations will provide valuable legal documents and feedback from rating agencies to industry improving
* Next steps for Advanced Financing AOP
  + Expand pool of potential investors
  + Finalize best practices, next suite of standard contracts, oSPARC data acquisition
  + Develop mock securitization for commercial portfolio structures that can incorporate tax equity
  + Promote adoption of standard contracts, other assets
  + Engage banks and regulators on underwriting practices, data, and asset class performance

**Panel: Emerging Standards Impacting Solar Financing Over the Asset Lifecycle -**

|  |
| --- |
| *Tim Keating, Development Director, SunSpec Alliance Michael Mittleman, President, MJM Energy Consulting Kent Williams, COO, LeaseDimensions Michael Mendelsohn, Sr. Financial Analyst, National Renewable Energy*  *Laboratory* |
| *Trevor d'Olier-Lees, Infrastructure and Renewables Director,*  *Standard and Poor's Rating Services* |

Solar Plant Key Risk Categories

1. Completion Risk
2. Operation Risk
3. Revenue Risk –Volume
4. Revenue Risk –Price
5. Debt structure
6. Debt service

* Opening comments
* M.M.: solar loan product needs to catch up with the lease in terms of standards
* K.W.: produced quantified results
* Solar standards are in their early stage, but streamline the ability to rate
* Consistent contracts: lower startup costs for installers, increase customer confidence

Q&A: homeowners are interested in ways to make money off of solar.

* M.M.: types of homeowners (cash upfront), loaners

Question: usability of solar standards so far

* T.O-L: young industry trying to accelerate and have access to lending. Standardization helps assess how they build things
  + How to combine tax equity and securitization
* K.W.: easier for new entrants to use standards

Questions:

* A few credit unions and regional banks involved in solar lending
* Understand lending but don't understand solar: need to educate bankers, build standards
* Because lack of education and standardization, it is difficult to get commercial banks into commercial banking than it is for residential

Resi-Solar Performance Analysis –Kent Williams

* Issue: transfers
  + Overall performance remains strong
    - 99% pay 100% of cash flows
    - 0.005% loss from transfers
    - 0.2% problem accounts: lost payment
    - interruption loss: 0.052% projected loss for residential
* Cash collections are high: over 99%, >763 FICO
* Account transfer financial impact
* Solar delinquency model : 90+ day categories
  + CAN = Client Assistance Needed
  + PTP: Promise to Pay
  + PCI:
* The loss is only for missed payments

Question: the more datasets are available, the better decisions community bankers can make

* MM: how to acquire this data
* TK: concept of oSPARC stems from this need

Question: what are some other assumptions community bankers, for example, bring to the table?

* Bankers have very little domain knowledge: they need education, exposure, and experience
* They also need tools to evaluate opportunities for asset rating

Questions: any issues in system installations?

* Commissioning documents, standard maintenance

- In project financing, maintenance reserve is built to make replacements

- Warranties are not looked at by rating agencies

Q: how is an installer incentivized?

* TJK: lack of standards makes it difficult for the consumer to even enter the market
* TOL: rating agencies come up with their own assumptions

Q: why isn’t insurance brought up to speed/standards?

* There aren’t many insurance products
* Not trying to make a market but to facilitate them
* TJK: they suffer from the lack of data, they can sell at custom rates but have to underwrite

SESSION D

**Keynote: California Grid Outlook, a Cal ISO Perspective –Clyde Loutan**   
*(Renewable Energy Integration Senior Advisor, California Independent System Operator)*

* Unique challenges driven by the success of state initiatives and environmental policies:
  + Greenhouse gas reduction to 1990 levels by 2020
  + 33% of load served by renewable generation by 2020
  + Possibly 12,000 MW of distributed generation by 2020
  + Less predictable load patterns due to rooftop solar, electric vehicles and smart grid
  + Delta bay plan managing water flow affecting hydro availability
* Future grid operations to manage a more complex grid:
  + Increased requirements for regulation up and down
  + Increased intra-hour flexibility and multiple hour daily ramps
  + Increased instances of over-generation conditions
  + Compliance with a frequency response obligation following a disturbance (BAL-003-1)
  + Impact of DER resources on the BES is still not fully understood
* Renewable energy impact:
  + Wind/solar production is significantly reducing the need for conventional resources on peak summer days
  + The ISO has already begun to experience the need for flexible resources during non-summer months
  + Non-flexible resources create dispatch issues and potential over-generation conditions
  + Increase in real-time negative prices due to load and supply variability
* CAISO proposal: requiring Variable Energy Resources (VERs) to contribute to essential reliability services due to its unique operation challenges – 4 essential characteristics needed for stable and reliable bulk power system operations:
  + Capability to provide reactive power support
  + Capability to increase or reduce energy output automatically in response to system frequency
  + Ability to limit power production as needed for promotion of reliability
  + Capability to provide inertial/frequency response

**Industry Panel: THE ROAD AHEAD Business Model - Implications of New Technology, Market and Policy Signals: Netmetering, Curtailment, California Rule 21 and Storage**

*Tom Tansy (Chairman, SunSpec Alliance)   
Craig Lewis (Chairman, Clean Coalition)  
Girish Ghatikar (Deputy Lead Grid Integration, Lawrence Berkeley National Laboratory)*

*Dave Chiesa (Business Development Director, S&C Electric Company)  
Zvi Alon (Chairman and CEO, Tigo Energy)*

* Movement to distributed energy resources: local renewables and intelligent grid
* Juncture: we can reinvent the market structure that exists
* Physical layer: balancing power, voltage, and frequency
* Balancing frequency and voltage is much more complex
  + This is where curtailment is key
* Voltage: provisioning VARS close to load 🡪 huge opportunities
  + Speed-location is critical
  + Advanced inverter

Marketplace

* G.G.: focus on grid integration
* Challenge: better balance grid load and demand
  + Demand response automation
  + Microgrid: how to build more resilient infrastructure, expanding to small utilities
* Metering is important
* D.C.: Automated Demand Response: allows the consumer to change their behavior to take advantage of differences
* There is a market for energy storage: batteries 70-80% of storage systems
* Personalization is in the future
  + PV 2.0: every panel can communicate with the system
  + PV 2.0 is based upon SunSpec
* IEEE 1547 was revised to allow voltage support
* What are the biggest challenges?
  + Z.A.: Visibility is so low that financing cannot be made available to every project
  + D.C.: interfacing backwards is a challenge
* It’s not a lack of standards, it’s a lack of adoption that is an issue
* Remonetization of the electric system
  + Distribution system operator: concept minimizes transmission need
  + Utilities will need to evolve and be incentivized