Solar America Initiative
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Infrastructure Development Breakout Group C: National PV Rating Systems; System Finance and Insurance

Facilitators: Glenn Strahs and Tom Kimbis

Part 1: National PV Rating Systems

What is the best approach to insure systems perform and are reliable to at least minimum levels while not stifling innovation and improvements as competitive market drivers?

- Make sure calculation methodologies for rating systems are consistent (one should be able to do a side-by-side comparison of different PV products and know that their performance ratings were calculated using consistent methodologies).
- A system performance model is needed: System performance (as opposed to components) must be considered since there are no system performance models where a third party can get verification.
- Perhaps we should identify what we could and could not do with a rating system (e.g. we can't monitor if folks are washing their panels).
- If you can, measure how systems are actually performing in the field (sample)—some utilities are doing that now, e.g. the Long Island Power Authority. We should encourage the California Energy Commission to invest in doing this.
- There is high value potential for the Solar America Initiative to build off what all of the different programs and states are doing right now in terms of performance monitoring to ensure consistent guidelines/coordinated efforts.
    - The Electric Power Research Institute did that a long time ago with Sandia National Laboratories—they provided software to different groups that showed what and how you measure and monitor/parameters.
    - The International Energy Agency also has standards for monitoring.

What existing rating systems for comparable technologies could be instructive in this effort?

- The lessons learned from the Environmental Protection Agency and Energy Star are important—they very effectively engage the building and utility players. Look at historical development of Energy Star (PV could be one appliance in the grand scheme, although one participant cautioned against this approach). We may be able to ride on their experience. Following the Energy Star model is probably the best way to go.

- Look at the California Energy Commission rating system as potential model. The California Energy Commission is requiring a minimum level of efficiency in order to get quality funding. Gather lessons learned from the California Energy Commission on components (e.g. inverter) ratings.
- Also try to use a baseline Underwriters Laboratories rating—perhaps use Underwriters Laboratories as a baseline for minimum performance expectations of PV modules.
- Also look at the Florida Solar Energy Center as a starting point. The Solar Rating and Certification Corporation (based in Florida Solar Energy Center) has done a lot of work. Florida has used code inspectors.
- Involvement of other organizations: Take advantage of what's going on already. Most states are using what the California Energy Commission has developed. The California Energy Commission and International Energy Agency could likely be players— the protocols are already in place—let's add to that. There is also a lot of experience in Europe to learn from. Doing an inventory on who is doing what was suggested. There is a need to monitor all changes taking place with various rating systems, efforts, etc.
- The North American Board of Certified Energy Practitioners has a voluntary program for energy certified practitioners. They don't mandate a PV rating, but make it easier to point to resources/guidelines to follow.
- The Institute of Electrical and Electronics Engineers and Underwriters Laboratories relate to components more than performance and have not been updated recently—there are no specifications that directly apply. It was recommended that a requirement for compliance with rating systems requirements be instituted. Look at what the Institute of Electrical & Electronics Engineers and Underwriters Laboratories have done and update them appropriately to fit our needs, to set up standards on acceptable, not acceptable systems/components. Buildings have preexisting codes and standards, so PV standards need to comply with any preexisting standards. A national standard would be good, but it could be dangerous to rate/label systems as good or bad.

Is there any risk/concern about PV rating systems functioning as a restraint of trade in competitive market development?

- Suggestion: Work with the Federal Trade Commission to address claims issues and consumer protection.

What other attributes or standards beyond safety, performance, and reliability should be distinguished with a PV rating system?

- Look at demand value, storage, economic development values, and emissions offset value—consider calculators for that.
- Another issue that affects performance that is often overlooked is washing the panels (dust, pollen, birds, etc.). That could be a bigger issue than one might think in terms of performance.

- Look at system lifecycle considerations from a resource perspective (e.g. disposal or recycling methods and costs).
- Performance over time is key—that is what customers want to know. The rating system is one piece of this, in the end the customer wants to know what the performance will be over time. *Components-based rating systems are important, but a large component is the need to have publicly accessible information on how installed systems are performing (i.e. nameplate rating vs. installed performance)—be able to compare the two.*
- Also consider energy payback analysis of PV systems.

What are the approaches and implications for developing a national positive designation for superior PV products?

- There is a lot to learn from Energy Star, but this may need to be staged (e.g. systems performing less well but have lower costs, $/w)—so avoid giving a label to only the top 20% of PV performers right off the bat. You may eventually move to that. $/w is hard to translate to $/kWh (there are too many assumptions that go into that—e.g. life assumptions, etc.). State incentives are moving towards performance-based incentives (e.g. from $/w to $/kWh). That in itself can solve a lot of problems. Cents/kWh is the way to go.

How can the building and utility community be engaged by the Solar America Initiative?

- Energy Star is good at engaging both groups—learn from them.
- We need to better understand what utilities' needs are, e.g. peak shaving, etc.

What is the best organization or kind of organizations to develop and manage a PV rating system? What is the best role for the Department of Energy and the Solar America Initiative to play in its development?

- It would be great to have a third-party organization at the local level.
- There's a real opportunity for the U.S. to play a national role model in the international community.

Is rating system intended to be a compliance issue, or more of an educational issue?

- Hopefully a rating system would help manufacturers and not be a burden. This issue should be carefully considered.

Timeframe/relative phasing to develop PV rating system:

- The solar market today is not hampered by lack of a national standard, but the sooner you start the process the better.

    - A Department of Energy representative noted that lack of a PV rating system has not been an issue in their work with zero energy buildings, and he asked if others had the same experience.
    - Another participant noted that an older study found that 50% or more PV systems were not operating appropriately, although improvements have since been made.
- The development of a PV rating system needs to be done soon. It is critical from a consumer confidence perspective that this issue gets addressed early on.
- Component rating should be done immediately, perhaps along with a calculator, like expanding PVWatts. A system rating system is farther off.
- Utilities, buildings, and raters need to get involved early.
- Standards exist for components under test conditions (not as installed)—using a rating system that picks the top 25% as Energy Star does is a lower priority. Marketing the message that solar is good and can have similar benefits in terms of Energy Star rating should be the focus.
    - Energy Guide-type system is a good middle ground (not quite as aggressive as taking the top 25% of performers as Energy Star does).
    - Another interim step to the Energy Guide is Energy Star Homes example.
- To implement the goals of the Solar America Initiative quickly, then implementing this rating piece quickly is key.
- The biggest issue with rating/label is to reduce risk and improve reliability.

Part 2: System Finance and Insurance

Finance and Insurance Market Status:

- Energy-efficient mortgages are underutilized. The issue is not availability of financing. Consumers have access to bigger loans, but they generally use it towards purchasing a more expensive/larger home.
- The higher end ($1-3M homes) market is where PV is considered most today.
- The insurance community is in a tight financial market and is concerned about added costs/risk for any technology.

Low-interest loans/loan guarantees for solar/financing options:

- Is it up to financial institutions to introduce low-interest loans for solar? That's expensive; somebody has to pay for it. It's best to work within existing structures.
- Convince Freddie Mac and Fannie Mae to develop energy portfolios.
- In the residential sector, there is benefit in a Sallie Mae for solar. A lot of people don't want to refinance their house when they buy solar.
- The Department of Energy should look into loan guarantees in later years of the Solar America Initiative. Unsure if a presence of a loan guarantee or some sort of backing would strengthen the case, but it could be a valuable area of Federal involvement.

- The other piece missing, even at local level, is the tie-in of energy efficiency with solar. PV has a demand-side management impact, but the two are not tied together, and the financial market understands this connection even less.
- Make a distinction between financing larger projects and projects for homes. Keeping the financial community informed in terms of tax incentives would be a big help to drive the financial market to solar.
- The degree of standardization of interconnection rules has an impact on the market. Keep in mind the interconnection and permitting process and its impact on the financing of projects. Clarify confusion related to interconnection standards in the financial market.
- Regarding greentags and Renewable Energy Credits, what would be helpful for the Department of Energy to look at?
    - In New Jersey, the Renewable Energy Credit market is very strong, and it actually makes it possible for the utility to finance projects there. Look at what other states are doing in terms of Renewable Energy Credits. If you can promote Federal government using Renewable Energy Credits for its own agencies, it would be great.
    - Accurate performance rating tie-in to Renewable Energy Credits is key because Renewable Energy Credits are all over the board right now (no one knows how to rate them). Any Renewable Energy Credits need to be tied to a national rating standard.

Insurance involvement issues:

- Limited level of safety standards—there is room for work in this area.
    - Project owners oftentimes have no purview over security. Casualty insurance is not as much of an issue as liability insurance particularly in dealing with state and local governments/agencies putting solar systems on their buildings. There can be a liability issue in an injury case in which there is unauthorized access to the site.

Priority of financing and insurance activities:

- A consistent rating system will enable the financial market. You can't address solar outreach to consumers until you have a rating system/performance standards.
    - Involve the financial and insurance community in the development of the rating system.
- In terms of achieving the Solar America Initiative goals, it's important to address all issues and involve all players at the start.

With the California (and the general solar market) heating up, does the financial piece require significant Federal effort to address it? Is there a lot more to do than what's being done in California?

- Initial buy-down rebates are going away faster than anticipated.

- When technologies are bundled, it adds value/incentive to market (e.g. PV and energy efficiency).
- There is a Federal need to address the issues because of disparity between state incentives/regulations/standards. That complexity of disparate existing regulations/standards/incentives is a barrier.