



Finding Pennsylvania's Solar Future June 8, 2017 Stakeholder Meeting Summary

Operations & Systems Integration Workgroup

The operations & systems integration workgroup of the June 8, 2017 stakeholder meeting convened for two hours following the morning presentations. The working group was presented with a draft Purpose statement and Principles of Workgroup Interaction.

The facilitator of this workgroup was Jeffrey R. S. Brownson (Assoc. Prof. of Energy Engineering, EMS Energy Institute Solar Ecology Program, Penn State University). The scribe for the workgroup meeting was Evan Sheppard.

The draft Purpose Statement that was initially presented to the group read as follows:

Developing a dynamic process for stakeholder engagement and empowerment that will transform Pennsylvania's solar electric portfolio over the coming decades, such that the Commonwealth is poised to achieve a solar future with diverse job opportunities at all income levels, locally resilient communities, a robust energy industry and where both firms and families seek out Pennsylvania for the future. The group decided that the purpose statement could be addressed later online.

The group decided that the proposed Purpose statement should be reworded in a structure focusing on what-how-why. Team input for changes is as follows:

WHAT:

- Where all stakeholders are successful, in the most long-term cost-effective manner
- Process of reconciliation instead of compromise; where compromise is posed as a resolution where everybody loses something; while reconciliation is more of an upward gain for all stakeholders

HOW:

- Change "transform" to "increase" as the real goal
- Adoption vs. Generation
- Lowering barriers to integration

WHY:

- Safe and efficient operation of installations (complying with national best practices)
- Grid resiliency and reliability
- Interconnecting stakeholders to produce efficient installation and operation (control of soft costs)
- Grid and infrastructure improvements as a byproduct
- Preparing for future deployment of EV and battery systems, as well as microgrids

Revised DRAFT (requesting feedback):

- [WHAT] Developing a dynamic process for stakeholder engagement and empowerment that will lower barriers to solar electric systems integration across PA, whereby all stakeholders are benefitting in the most long-term, cost-effective manner;

- [HOW] In a way that increases PA's solar electric adoption over the coming decades, recognizes the diversity of power systems across the state, and supports PA workforce development, communities, and technology suppliers;
- [WHY] Such that the Commonwealth is poised for grid resiliency and reliability to produce efficient installation and operations (control of soft costs), overall planning and cost sharing for grid and infrastructure impacts are positive, safe, and compliant with national best practices—anticipating future development of technologies such as electric vehicles, battery systems, and microgrids).

The group did not have any recommended changes to the following Principles of Workgroup Interaction:

- Discovering, not telling
- Facilitators guiding the dynamic process, not driving the process
- Working with a question-based framework for engagement
- Embracing feedback from all stakeholders
- Allow the time and space for exploring potential

Defining Key Stakeholders

The team was called to expand a list of stakeholders (not prioritized). The list that was discussed is the following:

- | | |
|--|---|
| • Utilities | • Project Developers |
| • Residents of PA | • Community Service entities: fire and code officials |
| – Participants of the solar change as "owners" | • Equipment suppliers |
| – Non-participants, inclusive of low-income energy customers | • Policy makers (state level) |
| • EPC (Engineering-Procurement-Construction) / Installers | • Policy implementers (municipality level) |
| • Financial Institutions | • External parties |
| | • PJM (ISO/RTO) |
| | • Labor Unions |

Identifying Pivotal Factors

The stakeholder group then reviewed, edited, and defined pivotal factors.

- *Community Solar*: Should community solar be considered a scale? [example: distributed and utility scale, with community between?]
- *Workforce development*: (e.g. Millvale PA example of value in local jobs) What will the need be now vs. if solar increases by 50x? The solar industry productivity doubles approximately every two years. There would be about 5.5 doublings by 2030 (the time for a 50x increase in the scale of the industry).
- *Energy Prices Overall*: competitive environment of energy portfolio, rate payer's cost, utility's cost, and cost of grid defection (death spiral scenarios).

- *Fuel Switching*: Commercial switching is a definite potential—Large scale switching from coal to natural gas—Consider the invested value of natural gas pipelines—Value in future natural gas fuel cell systems
- *Physical Constraints on the System*: Storage capacity, dispatchable, LMP nodal pricing, grid resiliency, operations control - systems
- *Land Use / Zoning*
- *Technology*

Value and Risk

- Approaches
- Energy Costs
- Constraints
- Technology
- Systems size

TABLE A. Summary of Stakeholder Responses to Evaluating the Value and Risk of stakeholder groups for Solar through 2030 for Pennsylvania from June 8, 2017 Stakeholder Meeting.

Category	Actual Participant Responses	Value	Risk
Approaches Stakeholder			
	Equipment suppliers	8	2
	First Responders		10
	Code officials	Variable	Variable
	Utility Providers		
Energy Costs Stakeholder			
	Developers (locked costs)	6	3
	Utilities	0	9 "Death Spiral"
	Rate Payer	0	3
What-if: Decoupling the Utility from Rate Structure			
	Utilities	7	3
	Rate Payer	3	7
Fuel Switching Stakeholder			
	Commercial	8	5
	PJM	5	3
	Residential	4	5
	Installers/cross training	6	6
	Labor/Econ Develop	7	3
Physical Constraints/Fuel Switch Stakeholder			
	Utilities	10	6
	Rate Payer	4	4
	Low-Income	10	5
	Policy Makers	10	5
Technologies Stakeholder			
	Utilities (Tech Adv)	9	7

Utilities (Hacking)	1	9
Policy Enabling	9	3
First Responders	4	7