2009 DOE Solar Energy Technologies Program Peer Review Results
March 11, 2009

Executive Summary

The DOE Solar Energy Technologies Program convened a meeting of solar experts, DOE program staff and key laboratory staff on March 11, 2009 to review the Solar Energy Technologies Program and provide suggestions on current program issues, future challenges to the program and potential actions. Participants in the meeting and the format of the discussion are explained in Appendix A. The meeting immediately followed two days of project-level peer review. The timing was designed to maximize the insights and information the reviewers and staff developed from participating in the project-level review.

DOE program staff also presented information on the program's organization, goals and resources, followed by a presentation by review chairman Joseph Morabito, Director of the Integrated Robust Design and Compliance Engineering Center for Alcatel/Lucent. Morabito explained issues affecting the larger context of solar industry development. This presentation included an illustration that helped focus the discussion: a Senge diagram of the solar industry's value creation. In particular, the graphic highlighted the three leverage points of Systems Dynamic Modeling, Solar Energy Grid Integration Systems (SEGIS) and a Solar Industry Supply Chain Consortium. The illustration is show in Figure 1.

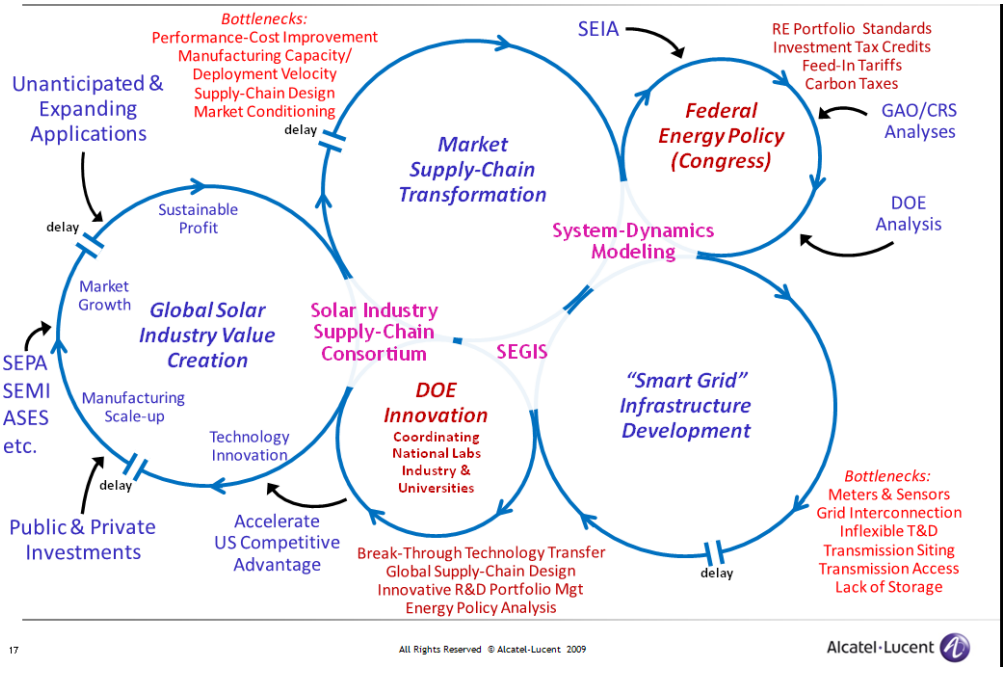

Figure 1: Senge Diagram of System-Focused Solar Industry Development

John Lushetsky, who had just moved from Program Manager for Solar to Acting Deputy Assistant Secretary for Energy Efficiency, led the program side of the discussion. Morabito led the discussion and input from outside reviewers.

Consistent with DOE/EERE's guidance and best practices for peer review, there was no requirement for the group to reach a consensus on recommendations. The following documentation includes all the major topics and discussion at the meeting. However, as the results show, there was actually a high degree of agreement on major observations and suggestions. Key recommendations are summarized in the first three bullets below, while some more specific recommendations are captured in the last.

- An industry consortium is necessary to work on standardization and collaborative research opportunities, starting with PV manufacturing equipment (especially in-line diagnostics and tools for maximizing yield). This is envisioned to be similar to Sematech's role in the semiconductor industry and its influence on that industry's supply chain.
- Enhanced collaboration combining DOE and industry with universities, other agencies, utilities and international researchers and companies is needed to better leverage knowledge and capabilities. The industry needs to "win" interdisciplinary support for the aggressive solar technology development and deployment that will be necessary to have an impact on global energy production and the environment. They should also continue to develop the solar industry's future workforce. This is particularly important in addressing systems integration issues that are likely to become a roadblock to solar development.
- Improved and expanded systems modeling is needed in several areas so that researchers, industry and top decision makers in key markets have detailed information on topics such as:
    - resource forecasting,
    - research investments and performance goals for emerging technologies,
    - benefits and barriers to large-scale solar deployment, and
    - up-to-date and credible metrics that highlight solar's advantages and make technology and environmental comparisons quantifiable.
- Additional comments and recommendations:
    - Much of the focus seems to be on module costs, with not enough work on balance of systems and other costs that are becoming increasingly important.
    - Demonstration and market transformation projects need better measures of success for public outreach, and for tracking progress as systems are installed.
    - Deployment capacity and workforce development will need more attention.
    - Stronger alliances with groups like EIA should be developed to disseminate results and give metrics greater independence and credibility. The quantitative definition of sustainability presented by Joe Morabito is an approach that

improves comparability between industries and technologies. Failure to have that comparison ability is the source of many challenges with metrics.

While the peer review is an essential part of SETP's evaluative process, the results are not considered the sole indicator of any particular project's success or failure, nor does the review alone determine whether a project will receive continued, additional or reduced funding. The review is a critical opportunity to gain insight from external peers and industry professionals and to open discussion about areas of continued and future focus for the program. It is not a solitary measure of progress, however, and this report is intended to be read with that in mind.