Solar Energy Technologies Program

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Program Review:
Systems Integration

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Systems Integration Sub-Program Goal

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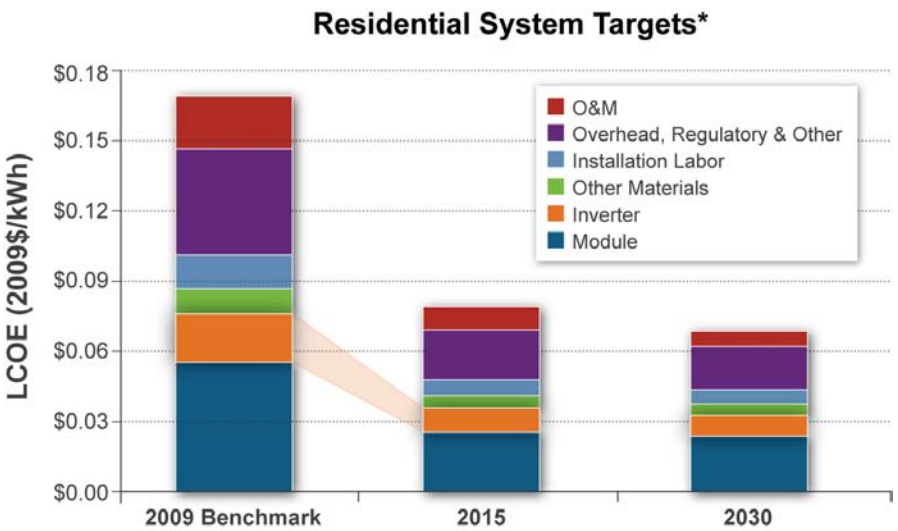
The goal of the Systems Integration sub-program is to address

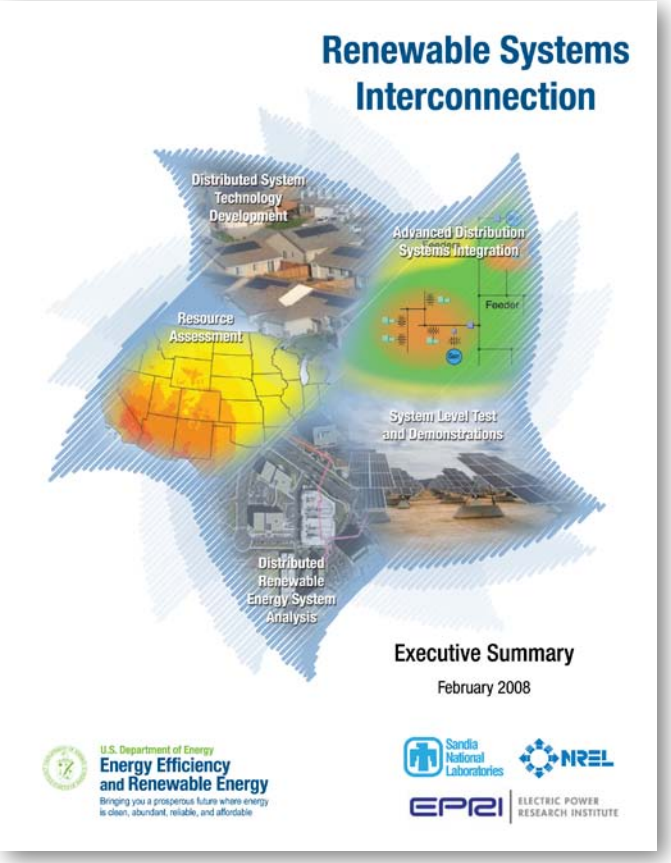
- inverter cost reduction
- other technical barriers to achieving 10-20% market penetration of solar technologies by 2030



SCE MW scale rooftop installation

25 MW PV System in Arcadia, FL

Systems Integration Planning

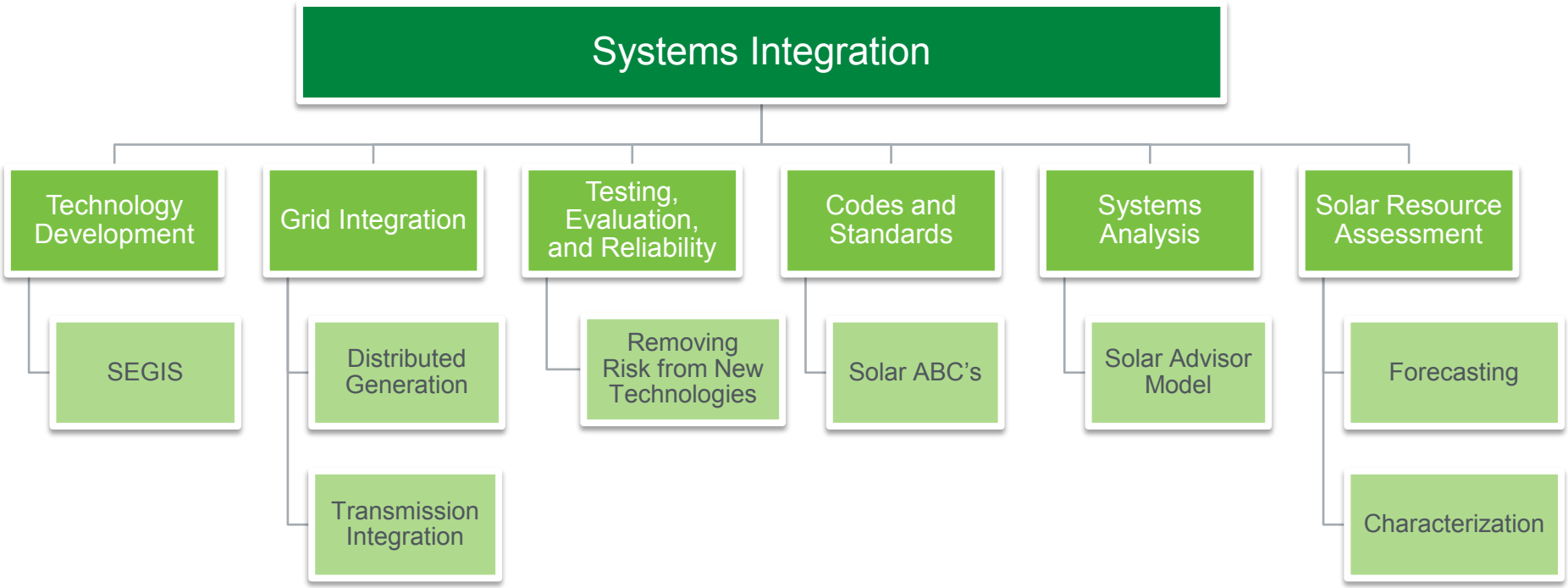


Significant findings from RSI Study

- PV systems poised for substantial increases in deployments
- Large-scale deployments could be limited due to technical concerns from utilities on integrating high penetration PV
- Advanced in systems and inverter technology are needed to address high PV penetrations
- New models and simulation techniques are needed to address high penetrations of distributed PV
- New solar forecasting techniques are needed
- Demonstration of high penetration PV installations are needed for validation

Developed multi-year program plan for Renewable Systems Integration based on RSI Study

Systems Integration



Technology Development: Solar Energy Grid Integration Systems (SEGIS)

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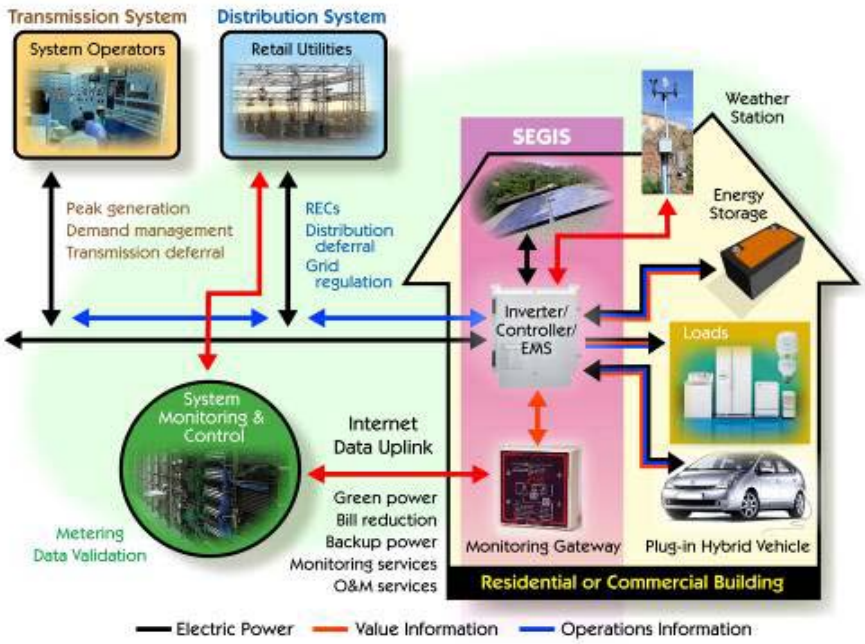
- **Program Scope:** Develop highly integrated, advanced inverters/controllers either with built-in energy management functions (including management of energy storage) or capable of interfacing with energy management and energy storage systems to achieve fully grid-interactive PV distribution systems.
- **Impact**: DOE involvement provides the necessary funding to create new technologies compatible with the Smart Grid.
- **Collaborations**: Industry, EPRI, NIST, OE, Universities
- **Research Category:** Advanced Component Development and Prototypes
- **TRL Level:** 6



Year	Budget
1) Scoping	$4.7M
2) Product Development	$21M
3) Deployment	TBD

High Penetration Solar Deployment

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Areas of Activity

- **Topic 1:** Improved Modeling Tools Development
- **Topic 2:** Field Verification of High-Penetration Levels of PV into the Distribution Grid
- **Topic 3:** Modular Power Architecture
- **Topic 4:** Demonstration of PV and Energy Storage for Smart Grids

Awardees

- Arizona Public Service Company
- Commonwealth Edison Company
- Florida State University
- National Renewable Energy Laboratory
- Sacramento Municipal Utility District
- University of California San Diego
- Virginia Polytechnic Institute and State University

Thank You

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