



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Solar Energy Technologies Program

PV Technology Incubator

Net Conference

June 16, 2009

We will begin at 9:40am MT to allow adequate participant login

For audio, please dial 1-888-324-9618

Conference #: 7918696

Participant Pass code: 5723650



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Solar Energy Technologies Program

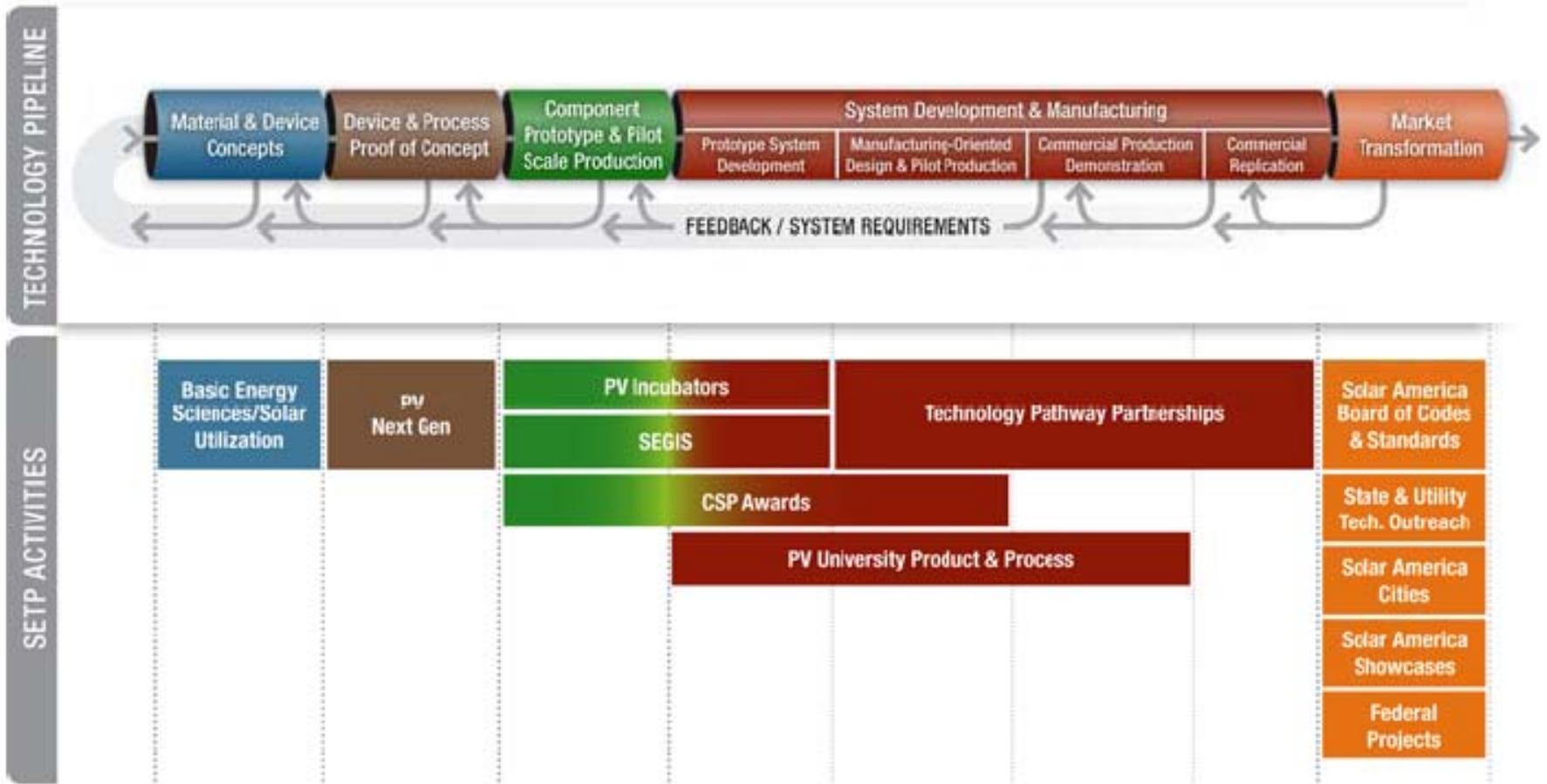
PV Technology Incubator

Basic Information for Net Conference

- 15 minute overview on the PV Technology Incubator Solicitation for LOIs
- Participants are in a “listen-only” mode, and participant’s questions must be typed and sent via the Net Conference Interface
- Please do not include personal/company identification in your question
- Please do not include proprietary data or business sensitive information in your question
- In order to provide the most accurate information possible, NREL may elect not to provide a response to a question during the net conference, but will respond to the question as part of an LOI amendment. All amendments will be posted at the following website: www.nrel.gov/business_opportunities/solicitations_rfps.html



DOE Funding Opportunities for Photovoltaics R&D





PV Technology Incubator

Goal: Begin with baseline prototype and scale-up to pilot production in 18-months

Cyclical Letter of Interest (LOI) Solicitations

- New LOI Solicitation planned every 12-months
- Awards to Small Business with University and Large Business lower-tiers
- Subcontracts up to \$3.0 million over an 18-month period of performance in two 9-month Phases
- Firm Fixed Price Awards with minimum 20% Price Participation

Awards Under Each Solicitation

- Entrance Criteria is successful small-scale PV cell or demonstrated lab process
- Demonstrated baseline and established benchmark metrics
- Deliverables are predominantly hardware with specific associated dollar amounts
- Anticipated successful exit position is up to 3MW production capability

Stage Gate Reviews

- Each subcontract is divided into two 9-month Phases
- Stage Gate Review after completion of Phase I (first 9-months)
- Successful Stage Gate Review results in authorization to proceed with Phase II



Topic Areas

Topic Areas include, but not limited to:

- Novel wafer-based silicon modules
- Polycrystalline thin films
- Film silicon on a foreign substrate
- High-efficiency cells, including multi-junction, and CPV module concepts
- Low-X concentration CPV systems with limited or 1-axis tracking module designs
- Organic PV, or other polymer-based solar cells
- Dye Sensitized Solar Cells
- NanoStructure-based concepts
- Rectenna-based designs
- Module/Cell/Wafer Components or Feedstock Manufacturing



Technical Improvement Opportunities

TIOs		Metrics			
TIER 1 TIOs	TIER 2 TIOs	Performance Efficiency	Cost	O&M	Reliability
Modules	Module				
	Absorber				
	Cells and Contacts				
	Interconnects				
	Packaging				
	Manufacturing				
Inverter & BOS	Inverter				
	Inverter Software				
	Inverter Components/Design				
	Inverter Packaging/Manufacturing				
	Inverter Integration				
	Other BOS				
Systems Engineering & Integration	System Engr. & Integration				
	System Manufacturing/Assembly				
	Installation & Maintenance				
Deployment Facilitation					

03798834

Responders will focus on Tier 2 (or lower) level TIOs for a single component of the MODULE Tier 1 TIO



Key Performance Parameters

Metric	Units	Comments
Levelized Cost of Energy (LCOE)	\$/kWh	Principle metric that measures degree of competitiveness with conventionally produced electricity
Annual manufacturing capacity	MW/yr	MW of annual subsystem and/or component manufacturing capacity in a given year at the target LCOE cost level. Like LCOE, this is a driving metric for SAI.
Direct manufacturing cost	\$/Wp	This is the direct manufacturing cost of a subsystem and/or component that includes materials, labor, equipment depreciation, facilities costs, etc.
PV component performance factor(s)	Unit To Be Determined by Responder	This performance factor(s) should be selected by the TPP to represent the driving contribution to system-level performance that will be provided by the subsystem and/or component they are improving. For example, a module development project might select the “nameplate” rated power output for the module ($W_{p_{dc}}$). This factor can be calculated on a daily or annual basis, but daily calculations must be averaged over an operating year. This metric is based on performance only, and does not take into account cost or lifetime issues.
Mean Time Between Failure (MTBF)	Time (hrs)	Expressed as the "average" time between failures for a subsystem and/or component – i.e. the reciprocal of the failure rate in the special case when failure rate is constant.



Qualitative Merit Criteria for Best Value Selection

- Quality and Relevance of the Proposed Technical Plan (50%)
- Technical Capability of the Responder/Team (20%)
- Quality and Relevance of the Proposed Business Strategy (30%)



LOI Response Requirements for Statement of Work

I. Background

Summary of the proposed project and how it relates and responds to the PV Technology Incubator solicitation's objectives

II. Objectives

Address the technology development pathway for the project over its 18-month duration, including KPP's, TIO's, and Stage Gate Metrics, with a focus on the 2012 commercialization-plan.

III. Scope of Work – Technical/Project Plan

Identify specific activities in this section that are clearly linked to their impact on the identified TIOs and KPPs.

IV. Project Plan

Schedule for each task and subtask activity, as well as a proposed reporting schedule, review schedule, key technical decision point milestones and deliverables.



Stage Gate Example

STAGE GATE REVIEW PLANNING SHEET

Incubator Company:					
PI:			Ph:	E-mail:	
Gate #	Planned Review Date	Criteria (Specific, Measurable, Achievable, Relevant, Timely)	Deliverable	Deliverable Date	How will achieving criteria be demonstrated?
1	9-months from subcontract execution	10%, 0.5 sq meter pre-production prototype modules	4 pre-production modules for test	8 months after subcontract execution	Test results from T&E team
		Manufacturing line design with equipment ordered	Design Report	6 months after subcontract execution	Report will document design and analysis of cost
		Module packaging design and prototype encapsulated pre-production models	4 pre-production encapsulated modules	5 months after subcontract execution	Damp heat test
		Report on direct manufacturing cost at scale-up with substantiating equipment acquisition cost and process step times	Report	8 months after subcontract execution	Report and substantiating documentation evaluated to assess direct mfg cost target achievement



Example of Task Plan and Milestone Schedule

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Task																			
Task 1	Δ.....	.....	...■.	.....	.....	.....	.....	.....	...■ ▼		
Task 2	Δ.....	.....	.....	.....	■	.....	.....	.....	...■	.....	.....	.....	...	.....	.....	.....	.....	.....	...▼
Task 3									Δ	.....	.....	.....	.....	■	.....	.....	.....	.....	...▼
Task 4									Δ	.....	.....	.....	.....	.....	.....	.....	.....	.....	...▼
Quarterly Technical Progress Report			▲			▲						▲			▲				
Stage Gate Review and Technical Progress Report									* ▲										
Draft/Final Technical Progress Reports																			▲▲
Final Review																			◆

- * 9-Month Stage Gate Review
- Decision Point Milestone
- ▲ Quarterly Review of Milestone and Deliverable Status



Example of Deliverable Schedule

<u>Deliverable</u>	<u>Due Date</u>	<u>% of Subcontract Price</u>
* Task 1, D-1	3rd Month	9% of subcontract
* Task 1, D-2	9th Month	12% of subcontract
* Task 2, D-3	5th Month	14% of subcontract
* Task 2, D-4	9th Month	10% of subcontract
* Task 2, D-5	18th Month	8% of subcontract
* Task 3, D-6	14th Month	11% of subcontract
* Task 3, D-7	18th Month	15% of subcontract
* Task 4, D-8	18th Month	12% of subcontract
** Quarterly Review	3rd Month	1% of subcontract
** Quarterly Review	6th Month	1% of subcontract
** Stage Gate Review	9th Month	3% of subcontract
** Quarterly Review	12th Month	1% of subcontract
** Quarterly Review	15th Month	1% of subcontract
** Final Review	18th Month	2% of subcontract

* Price allocated to % of work effort associated with this deliverable.

** Total price of these deliverables must not exceed 10% of the total subcontract price.



Schedule for Solicitation

- Solicitation Released: May 27, 2009
- Net Conference: June 16, 2009
- Technical Questions Due : June 23, 2009
- LOI/Responses Due: July 13, 2009
- LOI/Responses Reviewed: July 20 – Sept 15, 2009
- Selections Announced: October 2009