SERIUS is facilitating joint R&D and related activities on clean energy—by teams of scientists, technologists, and engineers from India and the United States—needed to deploy clean energy technologies rapidly with the greatest impact. The Indo-US Joint Clean Energy R&D Center (JCERDC) will support SERIUS’ multi-institutional network project costs using a public/private partnership funding model.

**Vision:** To create an environment for cooperation and innovation “without borders” to develop and ready emerging revolutionary solar electricity technologies toward the long-term success of India’s Jawaharlal Nehru Solar National Solar Energy Mission and the U.S. Department of Energy SunShot Initiative.

**Objectives:**
- Identify and quantify critical technical, economic, and policy issues for solar energy development/deployment in India
- Collaborative project structure and joint intellectual property management (teaming)
- Effective bi-national collaboration
- Collaborative culture and outreach
- Workforce development

**Budget:**
$25 million for 5 years (50% Indian side, 50% US side)
$25 million (minimum) matching funds

**SERIUS Research Strategy**
Each Activity in a Thrust comprises:
- **Consortium Projects** that are higher risk, pre-competitive disruptive or transformative R&D, and
- **Core Projects** that are led by core industry partners and focus on specific technical issues identified by industry. Core industry partners provide $300K in-kind or $100K cash matching funds.

**Research Thrusts**
- Sustainable Photovoltaics (PV)
- Multiscale Concentrated Solar Power (CSP)
- Solar Energy Integration (SEI)

**Activities**
- Earth-Abundant PV and Advanced Processing
- Advanced Manufacturing Technology
- Multiscale Modeling & Reliability
- High-T, High-P, Closed-Cycle CO₂ Brayton Cycle
- Low-T, Organic Rankine Cycle
- Thermal Storage & Hybridization
- Roadmapping & Assessment
- Solar Energy Integration & Storage Analysis

**Projects**
- Consortium Projects
- Core Projects

**The Leadership Team and Partners**

- **India**
  - Indian Institute of Science—Bangalore
    Dr. Kamarov Chattopadhyay
  - Indian Institute of Technology Bombay
  - Center for the Study of Science, Technology and Policy (CSTEP)

- **United States**
  - National Renewable Energy Laboratory
    Dr. Lawrence Kazmerski
  - Sandia National Laboratories
  - RAND Corporation
  - International Advanced Research Centre for Powder Metallurgy and New Materials
  - Solar Energy Center—UL

**University Partners**
- Arizona State University
- Carnegie Mellon University
- Colorado School of Mines
- Massachusetts Institute of Technology
- Purdue University
- Stanford University
- University of Central Florida
- University of South Florida
- Washington University in St. Louis
- Lawrence Berkeley National Laboratory
- California Institute of Technology
- Stanford University
- Massachusetts Institute of Technology

**Industry Partners**
- BHEL
- Clique Development Ltd.
- Hindustan Petroleum Corp.
- Moser Baer India Ltd.
- Thermax Ltd.
- TurboTech Precision Engineering Ltd.
- Wipro Ltd.
- Alpha/Cookson Electronics
- Convergent Technologies
- General Electric Company
- MEMC Corporation
- Solarmer Energy, Inc.

**Objectives of the Research Thrust Activities**

<table>
<thead>
<tr>
<th>Sustainable Photovoltaics</th>
<th>Advanced Process/ Manufacturing Technology</th>
<th>Multiscale Modeling &amp; Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth-Abundant PV &amp; Advanced Processing</td>
<td>Develop ink-based processes for PV elements based on new flexible substrates and printing techniques.</td>
<td>Couple materials to model with real-world reliability testing to provide direct feedback to the materials and process development tasks.</td>
</tr>
<tr>
<td>High-T, High-P, Closed-Cycle CO₂ Brayton Cycle</td>
<td>Develop organic Rankine cycle with efficiency &gt;50% at 1 MW.</td>
<td>Develop hybridized storage systems for the diverse temperature ranges of the Brayton and Rankine cycles as the first two tasks.</td>
</tr>
</tbody>
</table>

**Web Gateway**
www.SERIUS.org

- First entry with introduction to SERIUS
- General information and public awareness
- Portal to social media
- Publication and technical dissemination
- New partner entry
- Access to Partner Research & Interaction Hubs

**Remote Access Hub**
- Remote learning and training
- Secure intra-SERIUS communications
- On-line equipment, data acquisition
- Material and device design

**The SERIUS Web Gateway**
- The point of connection and communication for internal and external exchanges
- The entry for new partners
- Will be our innovative cyber infrastructure for transformative scientific discovery and interaction.