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Key Issues and Next Steps in the Development of Consortia for Photovoltaics: Lessons Learned from the CNSE - IBM Relationship

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CNSE – IBM Relationship

- State-of-the-Art 300mm Research Facility at CNSE of the University at Albany
  - Innovations in Lithography, Devices, Interconnects & Tooling to enable future scaling
- Joint Programs with technology equipment leaders (e.g., AMAT, TEL, ASML)
- 7/15/08 announcement – expansion of process facility to 15nm and addition of advanced packaging R&D center
- 8/18/08 announcement – IBM and joint development partners announced the world's smallest functional SRAM cell for the 22nm technology node.

J. G. Ryan and J. U. Lee, "Nanomaterials Innovation in Interconnect Technology,"
Common Platform Technology Forum 2008, San Jose, CA, 9/30/08.

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Key Issues

- Strengths of the CNSE – IBM model
  - An Intellectual Property (IP) model that enables partners to create and take away IP.
  - An approach to confidentiality issues that protects all parties but enables communication.
  - Outstanding infrastructure obtained through partnerships and strategic investment that supports IP generation.
  - Recognizes the interdependence of success. Entities cooperate in self-interest, sharing risk and reward.
  - Commitment to a long term strategic relationship.
  - A flexible model developed to be managed and evolve as opportunities present themselves.
  - The university (as neutral party) is critical for maintaining the trust of all parties (e.g. competitors, supplier-customer relationships).

- Key issues with high technology consortia
  - History of Burden Sharing?
    - Organizations like SEMATECH, IMEC, Albany et al work for the semiconductor industry because of their focus areas, portion of the timeline involved and experience of participants
  - Infrastructure
    - Must be industrially relevant, enabling IP generation and capture
    - Shared use by all partners minimizes business risk and maximizes financial leverage
    - Encourages presence of whole “food chain” (e.g. consumables, equipment and end user companies)
  - Focus of the work
    - R & D vs. Infrastructure vs. Design Tools vs. Manufacturing Science vs. Other
  - Partnership/Cost model?
    - “One size fits all” (e.g. SEMATECH, IMEC)
    - Tailored (CNSE-IBM)
    - Financial leverage offered?
    - How can high cost infrastructure be maintained?
    - How do partners gain confidence in a consortium as part of their “critical path”?

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Next Steps

- If the goal is to establish a new PV burden sharing group, then I suggest that a study group develop a proposal to articulate
  - What type of work
  - What part of the timeline
  - Model type
- Then a strategy should be developed that will
  - Optimize the use of existing relationships, partnerships and connections to identify the founding members
  - Choose host/site to optimize for financial leverage, nearby technical capabilities and political support
  - Establish additional university centers focused on training professionals and fundamental research to support future PV approaches
- Pursue funding as a group
  - Infrastructure incents cooperation by providing financial leverage
  - Enables industry and academia to collaborate on the same toolset