N85-32445

ADVANCED MODULE DEVELOPMENT OVERVIEW

JET PROPULSION LABORATORY

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Objective

Development of advanced module designs supporting achievement of DOE Five-Year Research Plan module cost and efficiency goals

DOE Milestones: Crystalline-Silicon Modules

Year	Module Parameters	For Energy Cost of
1985	12%, $100/m^2	21¢/kWh
1988	15%, $90/m^2	15¢/kWh

APPROACH

- **Perform module efficiency vs cost tradeoff based on energy cost criteria**
- **Choose specific silicon technology**
- **Prepare preliminary module design**
- **Award module contracts**
- **Conduct module reliability investigation**
- **Specify final module design**
- **Develop prototype module**

Efficiency-Cost Tradeoff: Initial Results

21 ¢/kWh goal more likely to be achieved by exceeding 12% module efficiency, based on:

- Sensitivity of efficiency/cost tradeoff
- Module efficiency predictions
- Module cost models:
  - Float-zone ingot
  - Dendritic-web ribbon

Completed Activities

- Decision made: focus on both float-zone and dendritic-web silicon
- Preliminary module packaging configuration selected: glass/EVA/plastic film
- Contract issued to Spire for high-efficiency modules
- Procurement plan initiated for dendritic-web modules

Spire Corp. Contract

- Deliverables:
  - 53-cm^2 float-zone cells for evaluation
  - 84-cell modules for evaluation
  - 12-cell modules for reliability investigation
- Module efficiency goals:
  - At 25°C: 12.6%
  - At NOCT: 11.5%
- Major problem:
  - Supply of float-zone wafers

FY85 Schedule

• Delivery of sample FZ 84-cell module	10/84
• Delivery of FZ 84-cell modules for qualification test	5/85
• Delivery of FZ 12-cell modules for reliability tests	6/85
• Initiate reliability tests on FZ modules	7/85
• Delivery of dendritic-web modules for reliability tests	8/85
• Initiate reliability tests on dendritic-web modules	9/85