

## **EE / CprE / SE 491 - sddec24-21**

### **CdSe Solar Cell**

#### **Week 7 Report**

Mar 13 – Mar 26

Client: Vikram Dalal

Faculty Advisor: Vikram Dalal

#### **Team Members:**

Payton Bills – Team Lead | Client Interaction

Anders Peterson – Client Interaction | Component design

Michael Thomas – Individual Component Design | Testing

Drew Jensen – Individual Component Design | Testing

Jacob Steffens – Simulation research | Research aid discovery and distribution

Jonathan Timm – Simulation research | Simulation testing

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#### **Past Week Accomplishments**

- Continued our areas of research
- We broke up our team into two main groups temporarily. One group focuses on economic analysis, and the other focuses on device physics and designing the solar cell stack. The device physics group consists of Payton, Anders, Michael, and Drew. The economic analysis group consists of Jacob and Jonathan.
  - We now have a general idea for the stack layout. We are looking more into the design principles concerning heterojunctions to design an effective electron transport layer (ETL) and hole transport layer (HTL) to support CdSe material properties. Additionally, our stack will take the form of either an N-i-P or P-i-N solar cell.

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## Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Payton Bills	Researched Device structure as a group and attended meetings.	5	38
Anders Peterson	Research into the device structure we plan to use. Read an old thesis that had several different device structures and the pros and cons of each.	3	44
Michael Thomas	Continued research into how temperature affects solar cell material properties. Additionally, began research in the design of the solar cell stack and, more specifically, on how to design heterojunctions.	6	40
Drew Jensen	Worked on understanding the stack for the solar cell and understanding the materials used in and the purpose of the different sections of a heterojunction solar cell. Read a bit about different manufacturing techniques as well.	5	29
Jacob Steffens	Met with Jonathan and worked on the planning of the economic analysis. We determined our main methodological approach.	3	26
Jonathan Timm	Met with Jake for our first meeting on our solar farm analysis. Spent some time on my own reading about power systems to have a better grasp on solar farm design/operation.	3	30

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## Plans for Coming Week

Next week we intend to continue researching device structures. We will utilize this research to come up with our first cell design, and if our advisor approves we will be able to move forward with writing a fabrication process. Additionally, we plan to continue to do economic analysis, with the goal of analyzing a handful of plant locations at various latitudes and hopefully end up with a baseline for general plant performance for comparative materials.