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# Introduction

Brief explanation of project and importance of sustainable energy.

## Photovoltaic generation

## Reaching maximum efficiency

Explain what a MIC is and why it is important. What partial shading and other aspects of our project are.

## Problem analysis

What is the overall goal of our project. Now, this section is a new chapter but maybe it would be better to turn it into another section since it really doesn’t differ that much from others.

## System requirements

More detailed info about what we are basing our system in. Power balance, PV chosen, requirements…

## Problem statement

Brief problem statement.

# State of the art

## State of the art

Research on previous solutions for PV generation. Exposition of possible power circuits to be implemented.

## Buck converter

## Boost converter

## Flyback and Buck-boost converters

## Non-inverting bidirectional converter

## Selection of topology.

# Non-inverting buck-boost converter design

Brief explanation on what the converter needs and what is the scope of this chapter.

## Circuit a nalysis

Explain diferente working modes, why there might be problems in transitions, what are the critical paths and other issues that we will face.

## Component sizing

Sizing of main components of the power side. Passive components, and also transistor limits.

## Open loop simulation

# Component selection and hardware implementation

Introudction to component selection, making a list of the components that are needed, maybe including components that wont be explained later like connectors.

## Passive components

## Switching circuitry

### Switch sizing

### Heat sink sizing

### Drivers and optocouplers

## Sensoring circuitry

### Input voltage sensor

### Ouput voltage sensor

## Hardware implementation

### PCB schematics

### Design considerations

### Power side

### Control side

# Maximum Power Point Tracking

Introudction explaining why it is important to implement a maximum power point tracker.

## Evaluation of MPPT techniques

### Constant voltage

### Perturb and observe

### Incremental conductance

## Selection of MPPT algorithm

## Perturb and observe implementation

## MPPT simulation

### PV model

### Simulation results

# Tests and validation

## PCB building

### Power Supplies

### Optocouplers

### Drivers

### Sensors

## MPPT validation

### RT-box

### PV simulator

### Load

### Integration

# Discussion

## Obtained results

This doesn’t have to be the final outline, maybe it is better to separate it differently but it is important to talk about good results and bad results in a very objective manner.

### Positive results

### Negative results

## Encountered problems

Brief description of the problems and then it could be a subsection for each one of the problems that we talk about.

It can be both solved problems and problems that are still there.

Things to improve can be another subsection of encountered problems or another separate section.

### Future work

# Conclusions

# References

# Appendixes