

# Generating Electricity by Direct Methanol Fuel Cells

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## Introduction

### Problem Statement:

To enhance the electrical efficiency, scalability, and practicality of Direct Methanol Fuel Cell (DMFC) Delivery Systems for practical use in resource-constrained environments or remote areas.

### Specifications:

- Output power  $\leq$  300 W
- Weight < 10 Kgs
- Operating temp. = 40 - 50 C

### Constraints:

- Fuel cell temp. < 70 C
- Unsteady voltage
- Corrosive tank material
- Fuel cell tank capacity < 2 L

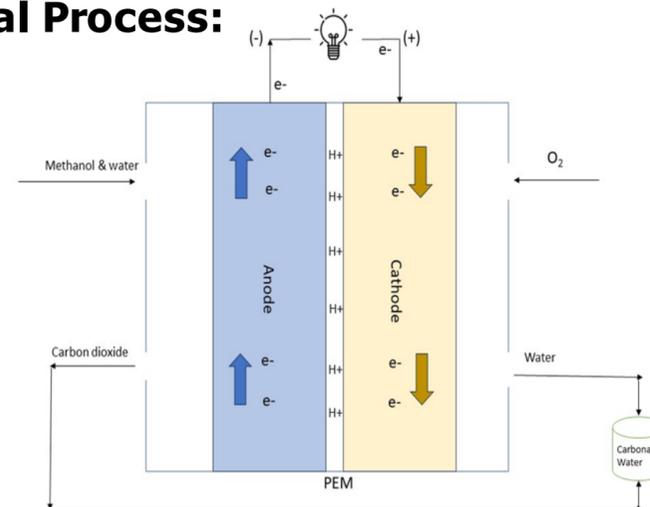
## Prototype Design



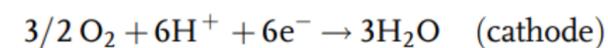
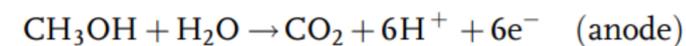
- Dimensions: 20cm x 40cm x 70cm
- Dry weight: 7.6 KG, Wet Weight ~9.6 KG

## Testing & Validation

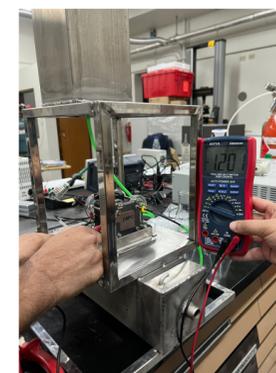
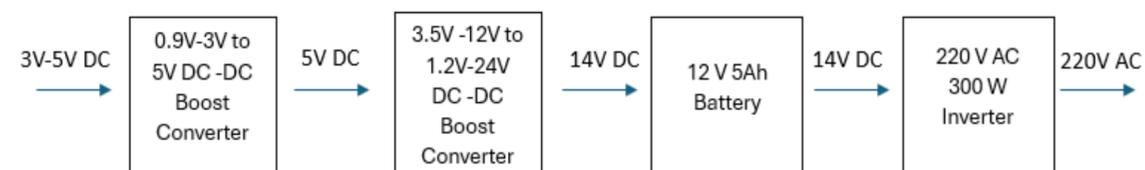
### Chemical Process:



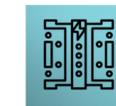
### Chemical reaction equations in DMFC:



### Electrical Diagram:



## Deliverables



Working Prototype  
Proof of Concept



Project Feasibility Study

## Conclusions

- The prototype demonstrates electrical efficiency improvements, particularly in the optimization of methanol, which contributes to increased fuel cell efficiency.
- DMFC operates within its optimal temperature range, thus maintaining efficiency and safety.
- The prototype's performance incorporates CO2 capture and water recycling, making it a sustainable energy source.

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