Stovetastics

THERMOELECTRIC MODULE BASED COOKSTOVE

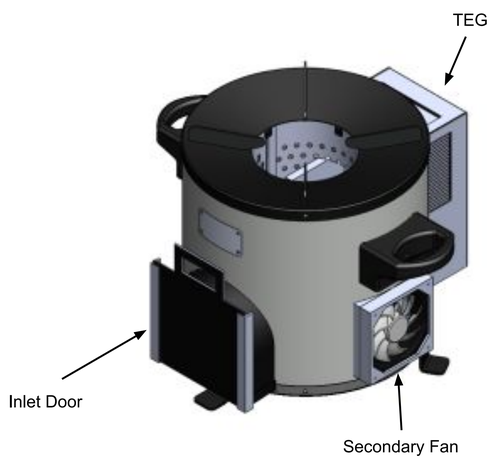
Sponsored by

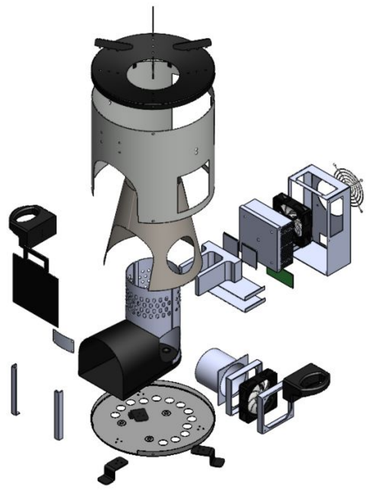
Hi-Z TECHNOLOGY, INC.

PROJECT OVERVIEW

This project was tasked to design and build a bio-fueled cook stove that incorporates Hi-Z's thermoelectric technology to power a fan and electrical outlet. The cookstove is to be deployed to third world countries to families that use biomass as their main source of fuel. The purpose is to reduce emissions, improve efficiency and create a source of electricity in areas that have limited access to power.

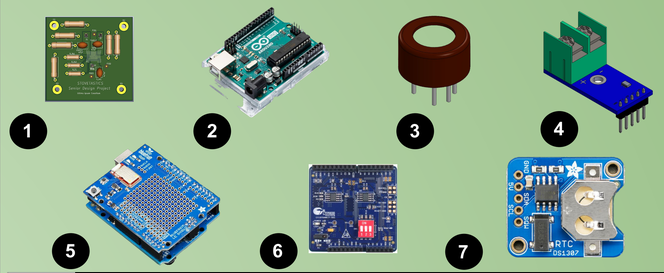
MODELS OF OVERALL SYSTEM





Exploded View

MAIN ELECTRONIC COMPONENTS



1	LTM8024	Voltage Regulator on our custom PCB board
2	Arduino Uno Rev3	Microcontroller
3	MQ-7	Data acquisition CO sensor
4	MAX6675	Data acquisition temperature sensor
5	Bluefruit LE Shield	Data storage
6	Cypress F-RAM	Data storage
7	DS1307 RTC	Data storage

THE ENGINEERING TEAM

Reve Zumarraga — *Lead Design Engineer*

Alexander Sprague — *Lead Design Engineer*

Sophia Nitkey — *Lead Quality Engineer*

Jason Schwartz — *Device Lead*

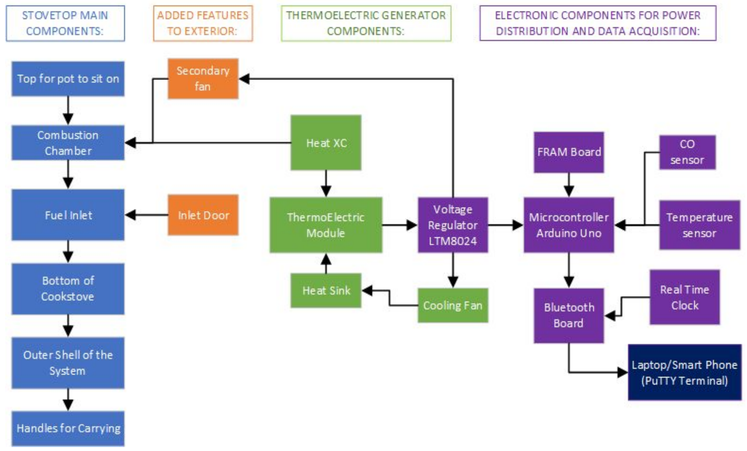
Josh Birkett — *RF Systems Lead*

Joel Edquiban — *Sensor Systems Lead*

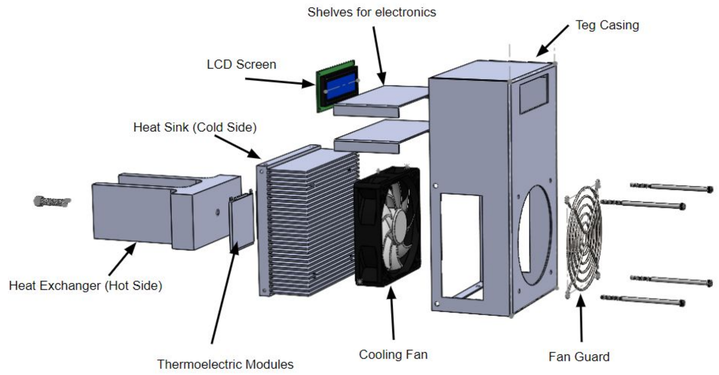
Agustin Cedeno-Rodriguez — *Electrical Power Systems Lead*

Alyaa Alkarji — *Quality & Reliability Lead*

SYSTEM LEVEL DIAGRAM



THERMOELECTRIC GENERATOR MODEL



Fabrication

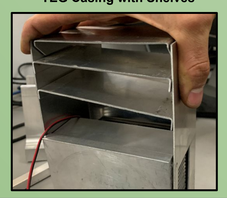
Bandsaw

Mill

Water Jet

Tapping/Threading

TEG Casing with Shelves



Finalized TEG Assembly

TESTING OVERVIEW

In testing, we find the overall performance of our system by using it to boil a pot of water. There are three main parameters of performance measurement.

Efficiency:

- Is found by measuring how much fuel (wood) is used to boil the 8,500 mL pot of water

CO Emissions:

- Is found from the CO sensor (MQ-7 sensor)

Fine Particulate Matter Emissions:

- Is found from the a filter that is weighed prior and after each test

SAN DIEGO STATE UNIVERSITY

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