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SCHOOL OF ENGINEERING

Approaching a High Efficiency Wood Stove

Advancing Sustainable Wood Energy in Maryland
October 30th

Taylor Myers



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Introduction

- Mechanical Engineering PhD Student
- Captain of the University of Maryland Wood Stove Team





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The Competition



- Alliance for Green Heat
- *Popular Mechanics* magazine





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My Team

- Very small
- Virtually no wood stove experience



The Wood Stove Problem





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If you can't beat them, join them

- How do rival technologies meet customer needs?
- Wood stoves can be adapted



Source: Bounce Energy



Control

- There is an optimal way to burn wood
- Sensors and feedback make for a better product





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Fixed Orientation





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Forced Air



Source: Wikipedia Commons



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Smart Controller



Source: Raspberry Pi



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Other Tactics

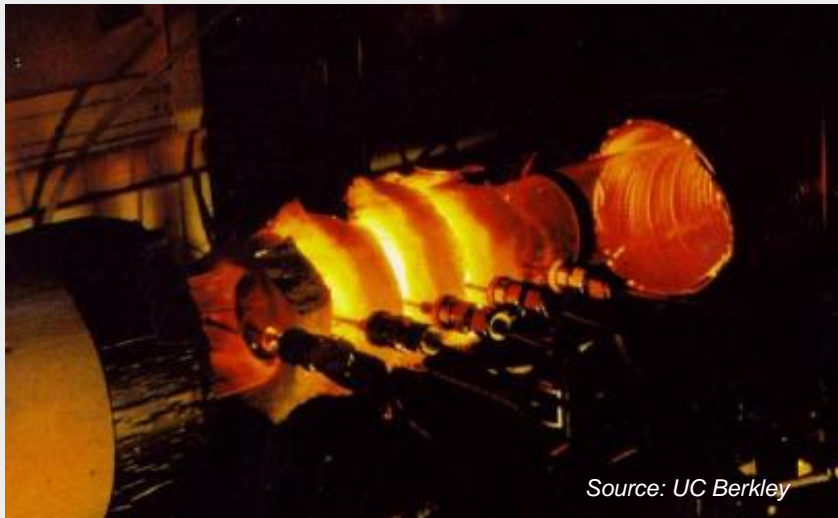
- Emissions
- Efficiency
- User Friendliness





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Emissions



Source: UC Berkley

Catalyst



Source: Dyson

Soot Trap

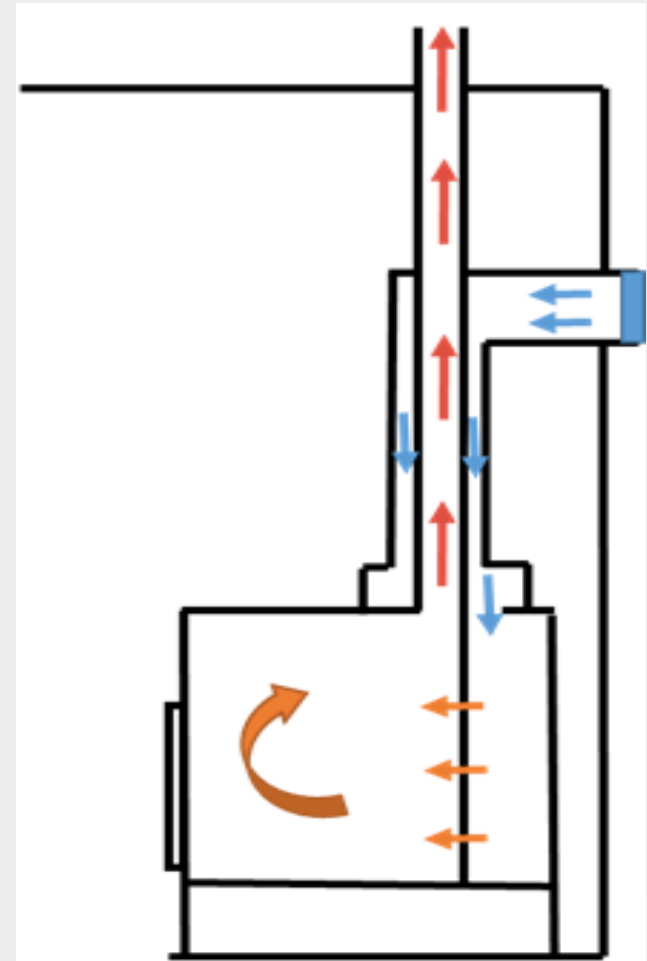


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Efficiency



Stack Heat
Exchanger





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User Friendliness

ClearStak[®]

Graph Data

Sign Out

Temperature Data

 Water Out	177.08 °F
 Stack	296.00 °F
 Catalyst	460.00 °F

System Data

 O ₂ Oxygen Level	14.80%
 Status	IDLE
 Run Time	21:7:32

Mobile
Interface



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Conclusions



Source: Poppins Chimney