

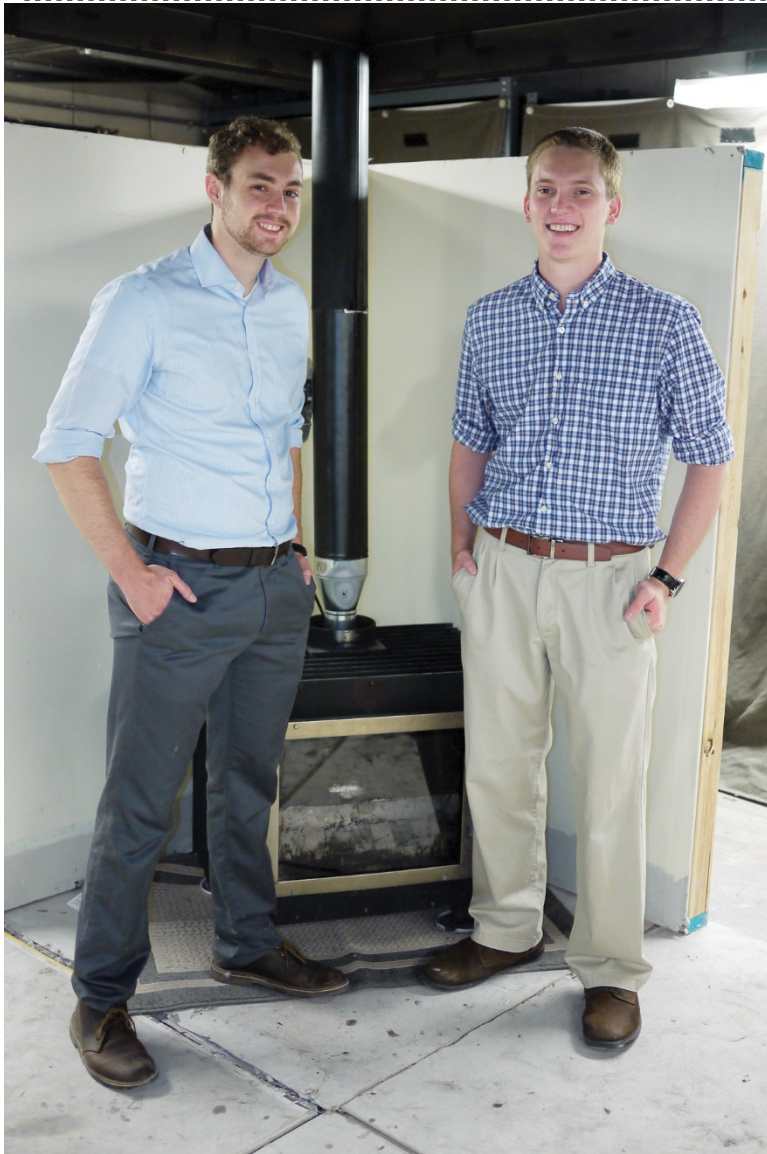
MFFIRE

Engineering the Perfect Burn

The Challenges of Bringing a  
New Automated Wood Stove to Market

# Who Are We?

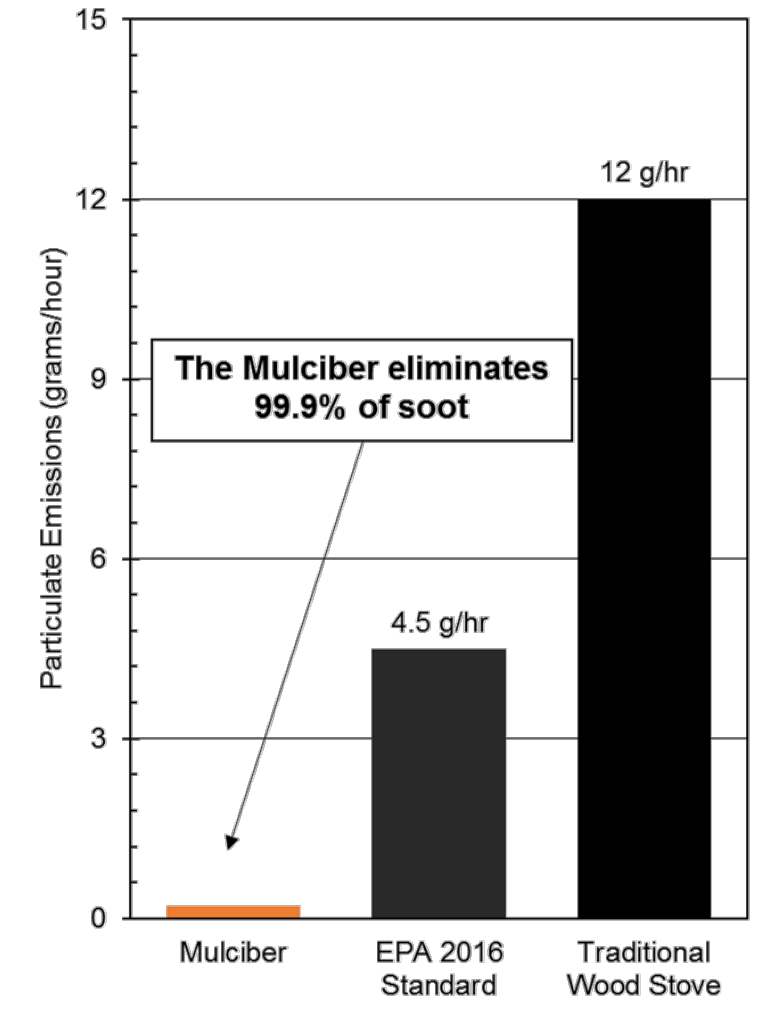
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Two fire protection engineers, from the University of Maryland, who accidentally built an automated wood stove

# The Mulciber

The **Mulciber** is a Smart Stove



# Positive Feedback

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*The New York Times*



We have received a tremendous amount of positive feedback.



Smithsonian Magazine

**Popular  
Mechanics**

Our Path So Far

# 2013 Wood Stove Design Challenge



2013 Low Emission Prize




# Getting the Business Started

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We received so much positive press, and so many excited phone calls, we decided there just might be a market for an automated wood stove.

**MIT Clean Energy Prize**  
 **Energy Efficiency Prize**  
**People's Choice Award**

# 2014 Wood Stove Design Challenge

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2014 Grand Prize

We came back the next year and won.



# Redesign and Beta-testing

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Over the next year,  
we refined our design  
and went through  
extensive testing.

# Path Forward

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We need to raise money

We need to regulatory test

We need to collect orders

We need to build units

**Barriers to making a new stove**

# Knowledge

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Industry Knowledge/  
Know-how

High-tech Know-how

# Cost

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EPA Estimate - \$328,000

To develop each of a line of four stoves  
(Not reasonable)

2 Mech. Eng. + Benefits for 2 yrs:	<u>\$400,000</u>
Elec. Eng. + Benefits, for 2 yrs:	<u>\$200,000</u>
Business Op. Employee for 2 yrs:	<u>\$200,000</u>
10 Prototype Units @\$5,000 each:	<u>\$50,000</u>
Lab Space 100 days at \$1,000/day:	<u>\$100,000</u>
Misc. Expenses:	<u>\$150,000</u>
<b>Total:</b>	<b><u>\$1,100,000</u></b>

# Regulations

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EPA regulations:

Improved

Complicated

How does the EPA test account for an automated cord wood stove?

# Conclusions

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Market

EPA Testing Protocol



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