Agenda Item 2

Featured Start-Up – MF Fire

UNIVERSITY SYSTEM of MARYLAND

BOARD OF REGENTS

SUMMARY OF ITEM FOR ACTION
INFORMATION OR DISCUSSION

TOPIC: Featured Start-Up: MF Fire, Paul LaPorte, CEO (information item)

COMMITTEE: Economic Development and Technology Commercialization

DATE OF COMMITTEE MEETING: November 9, 2017

SUMMARY: The featured start-up, MF Fire, is a fire technology company leveraging advanced combustion science to engineer superior fire products. The company licensed the first automated ultra-clean wood stove technology from the Maryland Fire and Rescue Institute at the University of Maryland, College Park.

MF Fire's wood stove uses a forced-air combustion system, a smart controller, and advanced combustion techniques to reduce emissions, boost efficiency, and simplify user experience. It is the most efficient wood stove on the market today that complies with revised federal emission standards. In addition, MF Fire is blending the best of the 18th century with the technology of the 21st by bringing to market a low-emission wood-burning stove that comes with a Bluetooth-enabled app to control the airflow and the temperature.

ALTERNATIVE(S): This item is for information purposes.

FISCAL IMPACT: This item is for information purposes.

CHANCELLOR'S RECOMMENDATION: This item is for information purposes.

COMMITTEE RECOMMENDATION: DATE:

BOARD ACTION: DATE:

SUBMITTED BY: Tom Sadowski (410) 576-5742 / Suresh Balakrishnan (301) 445-2783

MFFIRE

Creating smart wood burning technology and products that make wood heat clean, efficient, safe and easy-to-use

Beautiful, Clean, Efficient and Safe

Wood Burning Market

$7.5 BILLION	Wood stoves, fireplace inserts, and fireplace door market
$1 BILLION	Serviceable market in wood burning equipment
60 MILLION	Homes in U.S. that use fireplaces
50 MILLION	Wood stoves, worldwide
34%	Growth in wood burning market
250,000	Average number of U.S. wood stove unit sales per year — HPBA

Fires are **warm and cozy**, but have problems

The Consumer's Pain

1. Dirt and emissions
2. Fire safety
3. Fuel consumption
4. Need for control

Answer:

MF FIRE

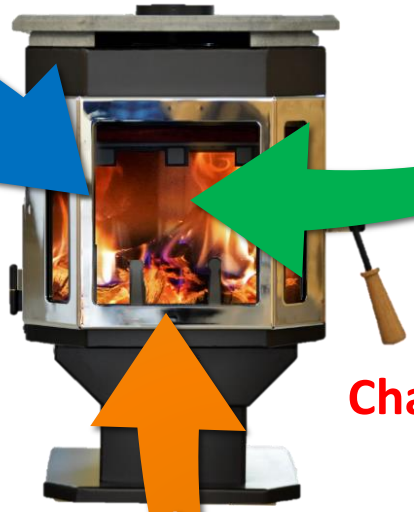
Why Now

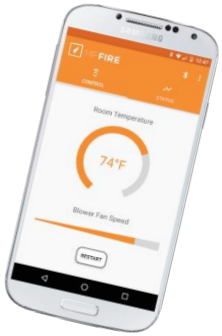
Major EPA Emissions Change

85% of stoves can't be sold

Most manufacturers will exit the market

Emissions limit cut by 56%





Amazon-like disruption hitting every industry

Mobile app and smart home collide

'Easy' user experiences are expected

Changing Consumers Behavior

Smart Technology matures

Real-time wood fire modeling becomes possible

Machine Learning + IoT enable rapid advancement

Fire Science + Enabling Technologies

Designed to be Different

MF Fire's *Catalyst*

The World's *First* Smart Stove

Clean

60 times cleaner than a traditional wood stove

Efficient

90% efficient

50% savings on wood fuel costs

Safe

The only wood stove to **actively prevent** the **22,000 chimney fires** each year

Modern and *Beautiful!*

Set a temperature, **Catalyst** controls your fire, and **machine learning** improves performance

Patents Pending Technology

Unfair Advantage: Smart Burning

Meets 2020 EPA Standards NOW

Our **smart controller** guarantees the **perfect burn, every time**.

Low Emissions

High Efficiency

Less Wood

MIT Clean Energy Prize
Energy Efficiency Prize

Woodstove Decathlon

2014 Grand Prize
2013 Low Emission Prize

Unfair Advantage: A Safe Fire

We have the **ONLY** stove technology that **prevents chimney and home fires**, and delivers safety alerts to users.

"Huge leaps forward in wood stove safety… MF Fire has raised expectations for fire safety."

Prof. James Milke
Past President of the Society of Fire Protection Engineers

Customer & Partner Feedback

I love the stove and want to become part of the "evangelistic program.“ We live 25 miles east of Eugene, Oregon, up the McKenzie River Valley. Lots of wood stove people up here.

--- Barbara Adler

I really look forward to getting this marvel of science installed and if you want any blog posts [or]endorsements once we have it up and running, I am more than happy to do so. Can't wait to see this marvel in action!

--- Graham Purkiss

It's going to be our coolest cabin yet and **you're stove will be the centerpiece in the living room**.

--- Eric Belanger
Harvest Energy Solutions
Log Cabin Builder

I had the WETT completed on the stove. **The inspector was very impressed!** The inspector sales stoves. I suggested that he contemplate a future as a salesperson for Catalyst.

--- Ed Shields

"A Cozy Fire That Doesn't Pollute"
– Fast Company

"This winter I tested the Catalyst, and I won't ever go back to another stove."
– Sam Billotti, beta customer

"a game changer"
– Smithsonian Magazine

"… unprecedented levels of control"
– Popular Mechanics

"A very-high performing stove, an innovative stove"
– John Ackerly, President of the Alliance for Green Heat

Management Team, Board & Advisers

Taylor Myer

Product Architect

Co-Founder, CTO

- Combustion expert
- Led development of Catalyst
- Ph.D. fire scientist - candidate
- University of Maryland
- 2014 Maryland Innovator of the Year

Ryan Fisher

Customer Champion

Co-Founder, COO

- Fire engineering, risk-assessment
- Customer & user experience
- M.S. in Fire Protection Engineering
- University of Maryland

Paul LaPorte

Business Leader & CEO

28-yrs, tech product & marketing

- Led venture backed startups
- High growth technology leadership
- Smart tech, IoT, RDBMS, Security
- B.S. in Engineering from MIT
- MBA from Georgetown

Jim Plazak, Adviser

38 years, leadership in hearth and home solutions

- General Manager, Fireside Hearth & Home (HHT)
- National Field Operations Manager, Fireside Hearth & Home
- Vice President, Hearth & Home Distributors

Wayne Newsome, Adviser

26 years, Chairman & CEO, Hearth & Home Distributors, Inc

- Built the largest distributor in the US
- Sold to HHT, the largest manufacturer

Matt Zuga, Director

24 years, venture partner and investment banker

- Partner, HighCape Partners
- Managing Director, Syngenta Ventures
- Partner, Red Abbey Venture Partners
- Managing Director, Legg Mason

John Schveibinz, Investor/Adviser

Advisor, 30+ yrs technology and business development

MF Fire & University of Maryland

FPE project

Invent smart combustion IP

Won international competitions

License the IP from UMD and start the company

Fast forward 3 years

MF Fire returns to UMD as Momentum Fund begins

MF Fire ready for commercial sales

Momentum Fund invests and helps find other investors

Our story continues …

Intellectual Property

Utility patent application – licensed from UMD

"High Efficiency Solid Fuel Stove with Optimized Burning Conditions and Low Emissions Level"

Serial No. 14/541,614

Patent application – new company IP

"APPARATUS AND METHOD FOR BURNING SOLID FUEL"

Serial No. 15/680,529

Product Roadmap

Catalyst Wood Stove – Available Now

Freestanding premium wood stove and our beachhead product

Tornado Fire Pit – Summer 2018

Fire science meets the backyard fire. Taps into high margin, high growth outdoor trends

Minimal Wood Stove – Fall 2018

Freestanding mid-tier wood stove and with optional smart package

Fireplace Insert – Fall 2019

A smart fireplace insert, expanding our form factor beyond freestanding wood stoves

Fireplace Door – Fall 2019

A low cost fireplace product with extreme efficiency improvements over existing fireplaces

Impact of the Technology

CO2

Replacing traditional wood stoves eliminates **1,170,000 metric tonnes of CO2 a year**

Replaces a similar BTU load of someone using fuel oil or natural gas, you would see a reduction in CO2 from wood burning of **1,620,000 metric tonnes of CO2 a year**

Over stove lifetime, replacing fossil fuel devices with a Catalyst wood burning stove will save **40,500,000 metric tonnes of CO2 from being emitted**

Particulate Matter (PM2.5)

Replacing all traditional stoves in the US will result in a **40% reduction in PM2.5**, the leading contributor to lung disease and respiratory illness

Sustainable, Renewable & Local

All wood fuel is renewable and sustainable compared to fossil fuels. Up to 70% of wood fuel comes from homeowners and more than half of wood fuel comes from naturally downed trees

Future Growth Plans

MF Fire Vision for In House Manufacturing Production and Local Economy Growth

Upon reaching critical growth (selling more 3,000 smart stoves annually), MF Fire will evaluate transitioning all manufacturing in house from our current configuration of manufacturing through a partner that does all fabrication, weldment and paint.

This would save manufacturer's margin, allowing us to reduce MSRP by $1300 while maintaining a target margin of 70%. The price reduction is estimated to trigger increased sales demand and grow revenue by 3-4X.

From a local economy perspective, this would create four positive economic impacts.

1) Initially - creates approximately 25 new skilled manufacturing jobs
2) Boost unit sales by 3-4x. **This in turn allows us to double or triple the work force noted above to approximately 75 new jobs:** 50 manufacturing jobs, plus an additional 25 people in marketing, support, and operations to support the increased volume.
3) The city and state benefit with a substantially enlarged tax base, both employee and corporate.
4) The company substantially impacts the mission of several entities that seek to improve the economic outlook of Baltimore and helps brings back a manufacturing base to the city.

To accomplish this requires key partners and financial support to establish the facilities, purchase/lease the equipment, and connect with work force development programs to ensure a steady supply of skilled trades professionals.


Catalyst
Beautiful, modern wood heat.