Business Plan

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Executive Summary

FireSense aims to provide accurate real-time data to help officials and landowners monitor their wildfire risk and have more secure prevention. The solution uses a network of advanced sensors deployed in the area of concern. These sensors will collect real-time data on critical environmental variables linked to wildfire risk, such as temperature, humidity, soil moisture, and vegetation. Once collected, the information is consolidated and presented to Wildfire officials via a user-friendly dashboard displaying real-time data, trends, and risk assessments. This UI enables officials to allocate resources more effectively and respond promptly to emerging threats.

Forest wildfires significantly threaten ecosystems, human lives, and properties. With climate change and rising temperatures across the globe, wildfires have been destroying twice as much acreage as 20 years in the past. The island of Maui recently faced destruction by an out-of-control wildfire, which decimated the local economy and biodiversity. Currently, the ability to monitor and predict wildfire risk in real-time is limited, especially in remote forested areas. Traditional methods rely on satellite imagery and ground reports, which result in inaccurate, delayed reporting. There is a critical need for an advanced, real-time monitoring system that can provide accurate and timely information to wildfire officials, enhancing their ability to prevent and respond to forest wildfires.

FireSense provides remote surveillance with additional precision to provide customers with real-time accurate risk gradients across their land.

Value Proposition

FireSense provides a granular and comprehensive analysis of land areas used to calculate a final risk score. FireSense delivers accurate and timely information to help officials take better precautions through more informed decision-making. Through the network of biodegradable sensors, clients can get a heatmap of risk profiles across their land, allowing for remote surveillance and targeted precautions. Current solutions use satellite imagery or ground reports, which do not provide targeted and specific information on where the risk may arise. FireSense, through its UI dashboard, allows users to gain the exact point of the risk profile at that location. In addition, FireSense's model is more accurate, with finer details of granularity through the measurement of soil moisture and temperature. This accuracy is novel in this space and will revolutionize the ability to provide risk information more precisely and allow users to deliver preventative measures to mitigate the issue.

We primarily focus on the US because it's the market we best understand. FireSense mainly applies to US Government Park Agencies and mass implementation across national parks and government. The government owns the majority of the land in the US and could feasibly implement FireSense with the scale of a network to have the most data available. However, government agencies are traditionally challenging to transition to consumers, so we will also focus on enterprise customers. We target agricultural farms and business clients at significant risk of wildfire. Wildfires can significantly harm

agricultural land with crop destruction and soil composition, making it unusable for future use. Our solution gives businesses more oversight over their land and better prevention.

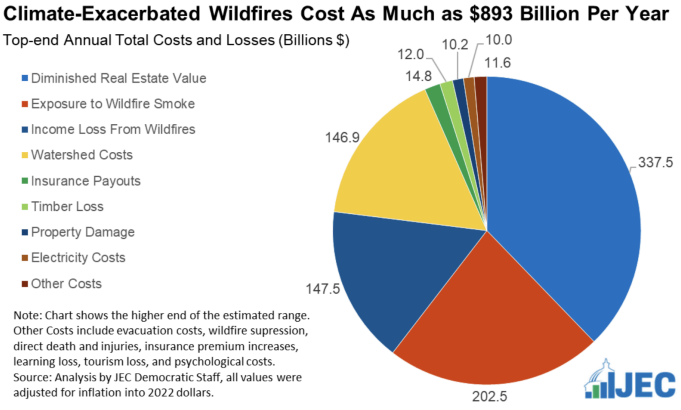
Through the network of sensors across the customer's area, we can collect more precise locational data from remote areas. Users can better survey their entire land area from a centralized place while monitoring remote regions. Through mesh networks and solar power, this remote monitoring allows clients to use less human resources to oversee these areas.

Stakeholders

1. *US Department of Forets*: This group is the main stakeholder in this project. They are able to have improved planning, response, and management of the forest grounds which would prevent a lot of destruction in the future.
2. *Environmental Organizations:* These groups would be interested in how this protects wildlife and local ecosystems. They would be concerned with its efficacy in more informed prevention of these disasters.
3. *Agricultural Businesses:* Agricultural Businesses will remain as one of our primary customers. They will be involved as they stand to mitigate their systematic risk and potentially lower insurance premiums with more security of their assets.
4. *Emergency Services:* Firefighters and other emergency response groups will benefit from our devices and be able to get precise information about potential and realized fire activity.
5. *Sensor Manufacturers:* The sensors will need to be mass produced for each customer and so the manufacturers for all of the sensor pieces like the Hygrometer and the Thermocouple. These will need to be mass produced to provide the product at scale.
6. *Insurance Companies:* FireSense will be able to better forecast the systematic risk of different regions which can allow for more accurate pricing and better diversification strategy through hedging across different investment classes with different risk profiles.

Market Research

The devastation of wildfires is both an environmental loss and an economic loss. Between 394 and 893 billion dollars are lost to wildfires yearly in the commercial, government, and individual sectors[1]. This destruction has led to many industries negatively impacted and FCF lost. The chart below describes the many sectors affected by wildfires across the US. All of these industries have a position to gain from reducing or having better prediction systems for systematic risk. Insurance companies have a significant portion to gain

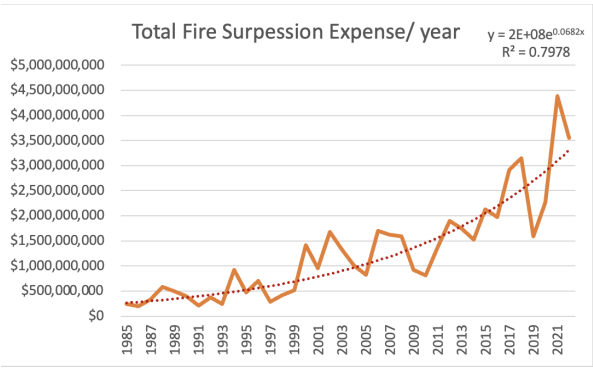


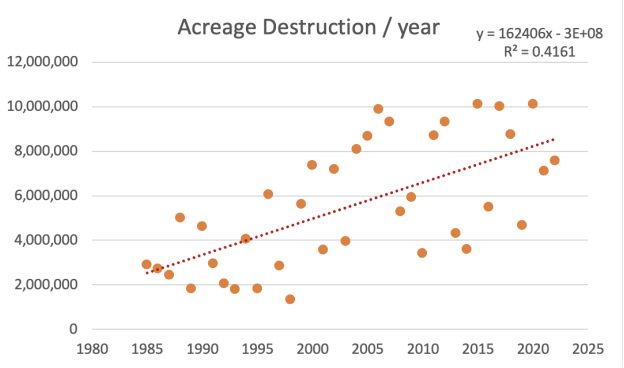
[1] https://www.jec.senate.gov/public/index.cfm/democrats/reports?id=E31AF93E-34C7-4C35-A416-533FF796369B#: [illegible]

from this technology as they can obtain more data, allowing them to make more informed decisions on their pricing and diversification strategy. The Wildfire insurance market is not directly valued; however, taking the value of the secondary peril bond market, we can see that these securities are value at 57.7 billion as of 2023[2].

Fire Expense Growth

The National Interagency Fire Center annually reports data on yearly fire destruction and its subsequent cost to US government agencies. Over the past forty years, the US government's annual cost burden has exponentially increased. Acreage destruction has also increased in the past 20 years, which is a separate cost. The costs to real estate due to acreage destruction are difficult to value; however, they are large in magnitude.





One of our primary customers is the Government, so we can model the market's growth based on their Fire Suppression expense and size based on the forested acreage. Last year, wildfires destroyed 7.57 million acres, and we can model our SAM based on this information. The estimated cost per sensor is $60, which brings our SAM to 454.2 million dollars to cover at-risk areas. So, our Government customer segment has a projected SAM of half a billion dollars. Government contracts are generally challenging to get on the first dollar, but once our solution proves effective, this seems like a reasonable market to service. In addition, this market focuses on the sensor revenues, which are only realized once in a customer sign-on and do not include the ARR generated due to the SAAS product or maintenance and installation pieces. There is continued revenue from the sensors, with the hardware depreciating over ten years.

Finally, growth will follow an S-curve with an explicit upper bound, the total amount of forested land in the US. With the number of locations to place the sensors constant for the government enterprise, we can only model the growth based on the current expense growth. As the fire suppression expenses increase, the demand for a new solution to mitigate these costs will also increase. Our exponential regression shows that the growth rate of suppression costs is 6.28% per year. So, the government sector has sizable growth, which is traditionally slow-moving. We can use this as a lower bound for other growth projections, like for enterprise, and estimate how that market will change.

[2] https://www.wsj.com/articles/wildfires-and-thunderstorms-are-throwing-insurance-market-into-turbulence-2c62ab7b

Competition & Differentiation

There are a number of competitors in the similar space, yet few who are focusing on our specific niche. The key competitors in the US are:

- *Technosylva:* This firm focuses on using predictive ML models and simulations to forecast how wildfires could spread across the first and how that risk affects the landscape as a whole.
- *Fire Scout AI:* This competitor uses CCTV to detect smoke in Forests. It serves more as a notification system to notify local regulators that a forest fire has formed. Their product focuses on prevention after spark which is different from the value proposition of our service.
- *Dryad:* This Berlin-Based firm employs a very similar solution to our own. However their sensors are placed on the trees themselves and in the free air. They measure for different metrics which are caused by combustion and not from prevention. Their prevention tool doesn't measure the granularity that our sensors detect at the soil level, which is generally a very strong indicator of wildfire risk.

The majority of the competition resides in Germany which provides our product a significant space for growth in the US markets. The US also has 26x as much forest land as Germany which will provide us the ability to gain a larger and stronger customer base and become more established before moving internationally. Many of these european based environment companies focus on government stipends for their revenue model which is unsustainable and administration dependent. FireSense's revenue model does not rely on government contracts, but rather our revenue sources are supplemented by contracts with large agricultural companies who can provide the capital to sustain growth and expand the business.

These companies mainly focus on reactive systems; their technology mainly detects the presence of fire or optimal response. It takes less than 30 seconds[3] for a wildfire to get out of control, so these technologies fail to prevent economic and environmental damage. FireSense offers a predictive and preventative solution to the problem which enables stakeholders to better understand real time conditions of their land and take measures to prevent a fire from starting.

Customer Segments

FireSense will focus on three key customer segments

- *Large Farms & Corporate Land:* WildFires pose a significant risk to lumber farms and other corporations who hold large amounts of land. A fire on farm land is devastating to current and future production. The large loss from this risk sends corporations to invest millions of dollars each year in irrigation facilities. These are redundant costs which can be replaced by our low cost network of sensors which enable them to have preventative maintenance of land. This

[3] https://www.scutumsoutheast.co.uk/help-advice/how-fast-does-a-fire-spread/

customer segment will be the initial and primary target of FireSense as it provides the most revenue potential.

- *Parks & Government environmental Agencies:* We will also target government agencies. National Parks serve as a landmark to US culture, so we seek to employ FireSense's technology to protect national land. Government contracts are difficult to attain, so this customer segment is secondary to corporate sponsors. However, government agencies often sign long term relationships with technology companies, so this customer segment would provide significant runway and stable growth.
- *Private Landowners:* Around 70% of land in the US is privately held[4], and these landowners pose the same concerns as corporate and government entities with regard to their fire maintenance. Smaller landowners however do not have the resources to enforce large scale prevention manners like corporate entities. FireSense provides a low cost and accessible solution for more intelligent land monitoring. This customer segment is difficult to reach, with many landowners being late adopters and the lack of online marketing attempts. This segment will be high cost with maintenance being distributed and decentralized customers. The margins will be slim, however FireSense can still fulfill the need and prevent land destruction=.

Cost

(Exhibit A, B) The direct costs associated with FireSense are the hardware and software costs. First the software costs are linear with AWS fees or other database management costs. Our product leverages many of AWS's core existing technologies through IoT core, Lambda, and DynamoDB. These costs can be accounted for by being around $0.5 per month per sensor as estimated through our tests. Hardware costs make up a larger portion of COGS. Each sensor must have the key components wired with the arduino, and each are purchased separately and assembled before delivery. These include the 3D printed waterproofing which will be done in house, the arduino motherboard, battery or solar cell, the hygrometer, and the thermocouple. These cogs will be linear and constant with the number of sensors produced. Its estimated that the waterproofing costs can be reduced in the future with technological improvements and materials science analysis.
SG&A as a fixed cost will be the largest deterioration of our profit margin. Maintenance costs, customer service fees, and talent salaries will be large in the preliminary days of the company. These costs are expected to rise linearly with revenues as the more sensors deployed maintenance costs will increase rapidly. It's unlikely that maintenance will be able to be pooled or the cost burden reduced due to the distribution of sensors and complexities of the network.

Revenue Model

(Exhibit A, B) FireSense will employ a "Razor and Blades" model, selling the hardware at a fixed costs with subscription based software on top of it. Sensor margins are fixed and lack scalability due to the

[4] https://www.ers.usda.gov/webdocs/publications/41882/30067_landownership.pdf

linear costs to revenues per unit. In addition the software costs increase with the number of sensors, so by employing a monthly software subscription model FireSense ensures recurring revenue and scalable growth to return to investors. Climate tech startups often have long exit horizons and difficulty scaling, however by merging climate tech with a SaaS model we ensure growth of our business model. In addition, when the sensor infrastructure is established customers must purchase the software subscription to get use out of the problem. The learning curve to setting up the sensors establishes high switching costs for customers. Disassembling the network will be a higher cost than retaining their subscription membership.

Exhibits

Exhibit A: Cost & Revenue Breakdown

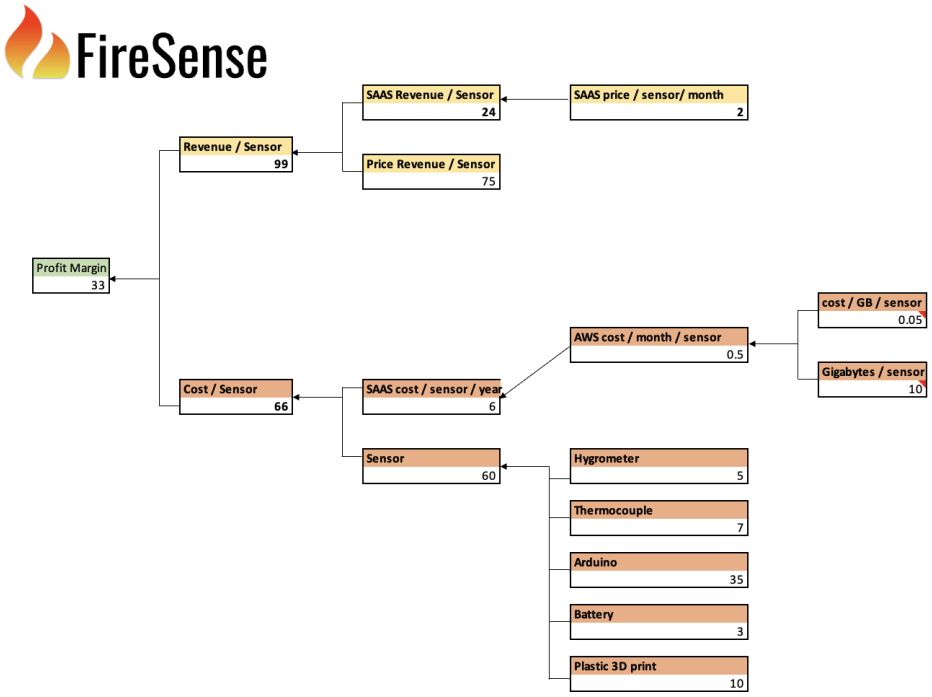


Exhibit B: Income Statement Projection

FireSense Government Sector IS Projections

Sensor Growth	6.820%

	2024A	2025E	2026E	2027E	2028E
Revenue/ Sensor	$ 99.00	$ 99.00	$ 99.00	$ 99.00	$ 99.00
Sensors	100,000.00	106,820.00	114,105.12	121,887.09	130,199.79
Total Revenue	$ 9,900,000.00	$ 10,575,180.00	$ 11,296,407.28	$ 12,066,822.25	$ 12,889,779.53
COGS / Sensor	$ 66.00	$ 66.00	$ 66.00	$ 66.00	$ 66.00
Sensors	100,000.00	106,820.00	114,105.12	121,887.09	130,199.79
Total COGS	$ 6,600,000.00	$ 7,050,120.00	$ 7,530,938.18	$ 8,044,548.17	$ 8,593,186.35
Gross Margin	$ 3,300,000.00	$ 3,525,060.00	$ 3,765,469.09	$ 4,022,274.08	$ 4,296,593.18
SG&A	$ 3,692,700.00	$ 3,944,542.14	$ 4,213,559.91	$ 4,500,924.70	$ 4,807,887.76
R&D	$ 693,000.00	$ 740,262.60	$ 790,748.51	$ 844,677.56	$ 902,284.57
OPEX	$ (1,085,700.00)	$ (1,159,744.74)	$ (1,238,839.33)	$ (1,323,328.17)	$ (1,413,579.16)
Interest Expense	$ -	$ -	$ -	$ -	$ -
Taxes (NOL)	$ -	$ -	$ -	$ -	$ -
Net Income	$ (1,085,700.00)	$ (1,159,744.74)	$ (1,238,839.33)	$ (1,323,328.17)	$ (1,413,579.16)