Project Introduction

Firewood™

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March, 2025

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1 Abstract

The aim of this document is to provide the reader with a rough overview of the business plan of Firewood™, alongside all technical and financial decisions that were made to maximise the business' chances of succeeding. The document aims to outline the current state of the target market and establish a USP for our product lineup whilst flaunting complex mathematics in hopes of persuading the reader into believing in our non-existent competence in the field.

2 Our Purpose

We at Firewood™ would really like you to think that our business is not just about grabbing cash from our customers, but rather that there is an overarching ideology and mission behind our existence. Our business aims to deliver high quality incendiary equipment manufactured from wood. This not only helps save the planet by reducing the amount of plastic waste, but also opens up the floodgates to artistic expression by permitting a wide range of sculpted styles for our products. What we sell are not merely lighters; they are artistic planet saviours.

3 Client Demographics

It is reasonable to assume that, due to the inherent nature of the products offered by Firewood™, its customers must exhibit one common trait, namely **the need for a mobile, localised source of heat energy**. This definition, despite not being necessarily flawed, ignores a very important parameter of the energy source — the (average) thermal power output. There is, after all, a vast difference between a cigarette lighter, and an acetylene torch.

3.1 Power Calculations

To narrow down our customer base, let's run some primitive calculations to determine the power range we're striving to operate within. Consider a typical lighter from a competing company, *BIC*. Said lighter is equipped with $4.5g$ of butane fuel. This amount of butane allows the device to maintain a (more or less) constant power output throughout the duration of $30min$. Upon combustion, one mole of the butane fuel releases a fixed amount of energy into the environment. This energy is defined by the *enthalpy of combustion* ...

$$\Delta H_{c(mol)} = -2.88 \cdot 10^3 \; kJ \cdot mol^{-1}$$

Thus, the device is capable of outputting an average amount of thermal power equal to ...

$$\begin{aligned} M &= 58.124 \; g \cdot mol^{-1} \\ n &= \frac{4.5 \; g}{58.124 \; g \cdot mol^{-1}} \\ &= 7.74 \cdot 10^{-2} \; mol \\ \Delta H_c &= \Delta H_{c(mol)} \cdot n \\ &= -2.23 \cdot 10^2 \; kJ \\ \bar{P} = \frac{E}{t} &= \frac{2.23 \cdot 10^2 \; kJ \cdot 10^3}{30min \cdot 60s} \\ &= \frac{2.23 \cdot 10^5}{1.7 \cdot 10^3} \\ &= \underline{\underline{123.8 \; W}} \end{aligned}$$

3.1.1 Continuous Form

Assuming that the fuel consuption is not constant, the formulæ for the instantaneous and average power outputs shall be expressed in a continuous form:

$$P(t) = \frac{dE}{dt}$$

$$\bar{P} = \frac{1}{T} \cdot \int_0^T P(t) \; dt$$

4 Market

At this point, it might be worth to take a closer look at the market that we're dealing with.

4.1 Competitive Landscape

- **BIC** — Undoubtedly, the company most often associated with modern disposable lighters. Whilst the production of disposable devices is not the main focus of Firewood™, it is their innovative wooden design that ultimately renders this outcome inevitable. The average price of a **BIC** sits at a unit price of around 1.50€. With an estimated production price of 0.25€ per unit, the lighters come at a sale margin of approximately 83% ($= \frac{1.5-0.25}{1.5} \cdot 100$) and come at a great turnover rate.
- **Zippo** — Unlike the former, **Zippo** focues on more premium market, with higher-quality products designed with longevity in mind. Fittingly, the price of the company's lighters aligns with the premium philosophy. With the lower-end prices at about 25€ and the high-end peaking at just below 500€, the company provides a very wide spectrum of products for various types of customers.

It is important to note that, due to the philosophical differences between the two companies, their businesses do not necessarily interfere with each other. Meanwhile, it would seem that Firewood™ falls right inbetween the two companies, putting itself in an unlikely spot to succeed.

4.2 Growth Trends

According to a study[1] by *Grand View Research*, the size of the market for pocket lighters was estimated at around *USD* $6,755.5$ *million* in 2024 and is projected to grow at a rate of 2.9% annually from 2025 to 2030.

4.3 Design Trends

According to the same study, there is an ongoing change in the behaviour of customers on the market:

> Modern consumers are increasingly gravitating towards multi-functional lighters that integrate features such as built-in LED lights, safety mechanisms, and ergonomic designs

Additionally, a separate finding cited in the study hints at the potential viability of Firewood™ on the lighter market:

> Moreover, the rise of lighter brands that emphasize eco-friendliness and sustainability is making a significant impact. [...] lighters made from biodegradable materials [...] are gaining traction. As consumers become more environmentally conscious, manufacturers are pivoting their efforts towards producing more sustainable alternatives, which reflects a broader societal shift towards greener products

[1] https://www.grandviewresearch.com/industry-analysis/pocket-lighter-market-report