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1. Competitor Analysis

Domestic Competitors:
There is currently only one competitor that distributes rocket stoves in the Fijian market: The Ministry of Women, Children and Poverty Alleviation. Their main goal is to provide rural, low-income women with the knowledge to produce their own rocket stoves, which can then become a sustainable source of generating income. The women of the rural villages are taught how to produce the rocket stoves in an intensive workshop run by the Ministry. The materials are provided by the Fijian government with the women selling their handmade stoves to make an income. The major strengths this competitor has in relation to Project Everest include their widespread reach, support from and ties within the local communities, and funding from the government.

However, this competitor poses only a low threat as the Ministry is currently not mass-producing nor attempting to retail the stoves. Hence, the threat that should be considered from this initiative is whether or not graduates of the program plan to build a business producing their own rocket stoves. Additionally, Project Everest's Buka Stove has the advantage of academic support and convenience to customers by retailing an already made product. It also comes with a one year warranty, which mitigates customer concerns over product quality. With the governmental rocket stove initiative, there is no way of ensuring quality control mechanisms are in place for women who go on to produce and sell their own stoves.

International Competitors:
Many of the major rocket stove manufacturers operate in Africa including: Potential Energy, Burn Stoves, African Clean Energy, EnviroFit, Inyenyeri, and Instove. Each of these companies have similar aims which include alleviating economic burdens, decreasing the health impacts of open fire pollution and deforestation, and reducing the burden of strenuous efforts to collect firewood by manufacturing a high-efficiency stove. The recurring pain point experienced by women in countries within Africa is pinpointed at the collection of firewood that takes hours and often leads to sexual assault. To mitigate this, women would often sell food rations in order to buy wood so they could cook what they had remaining.

Potential Energy - Berkeley-Darfur Stove:
Potential Energy has been operating since 2007 and has gained a competitive advantage by creating a product that has product-market fit, and achieving economies of scale by outsourcing major parts of production to India. The cost of manufacturing one stove is currently at USD $15, and the components manufactured in India are sent to the country of destination flat-packed and then locally assembled. Assembly is not labour-intensive and local training does not appear to be difficult, which reduces domestic labour costs and supports local job creation. Supporting local jobs can be an advantage in developing countries in building rapport with local communities. Outsourcing to one plant in India also allows for consistent quality control and product specifications. The company heavily incorporates the end-user when designing improvements and conducting tests, which is evident in the orange mesh safety feature of the stove. This has been deemed to have helped the company achieve a successful product-market fit. The stove was initially developed in UC Berkeley labs, and

has academic backing similar to Project Everest. The competitive advantage that Potential Energy possesses allows it to scale and expand into different markets.

African Clean Energy - ACE1:
African Clean Energy (ACE) offers a higher priced stove that is sold between USD $99 to $150 in Cambodia, Kenya, Lao People's Democratic Republic, Lesotho, Netherlands, South Africa, Uganda, and Zambia. Their value proposition includes providing a high-quality product that completely eliminates smoke as a waste-product, and is able make to make it accessible in developing countries using a micro-financing program (similar to what we the fuel team is offering in conjunction with the social consulting team's payment plans). Furthermore, the company's ability to expand to numerous markets is proof of scalability and, similar to Potential Energy, manufactures its major parts overseas and sends the necessary tools to finish assembly in the country of destination, hence savings on logistical costs. ACE also offers micro-lending to make the product more affordable and accessible to a larger share of the market i.e. via M-Paisa, Kiva, and Vodacom. Additionally, there are add-on features including: first, a DC connector and a USB port to turn the product into a power source; and second, consumers can purchase a small solar panel as another add-on feature that enables consumers to power other items such as a small fan or a USB device charger. ACE offers a one year warranty on the stoves and has amassed widespread media coverage from multiple major western news publishers, including Marie Claire, Forbes, Mashable, Wired, Readers Digest, and TEDx.

Inyenyeri
Inyenyeri aims to eliminate death and disease caused by household air pollution in Rwanda. The company provides a clean cooking solution for villages in the form of the mimi moto stove which is the most efficient clean cookstove with similar emissions to LPG (liquified petroleum gas). Inyenyeri intends to make money by selling biomass fuel pellets to customers and carbon emissions credits in the developed world. The current business model involves leasing of the mimi moto stoves to those who cannot afford an upfront payment of USD $50. Revenue is primarily generated through the sale of fuel pellets to urban villages while they are given to poorer rural villagers if they deliver sufficient feedstock for the creation of the pellets (i.e. the rural villagers deliver firewood to the pellet hubs, due to the efficiency of the fuel pellets the villagers do not have to collect as much firewood as they would have previously).

2. SWOT Analysis

INTERNAL FACTORS	
STRENGTHS (+)	**OUR COMPANY**

RESOURCES	• Access to first hand data
	• List of contracts and established relationships with local partners
	• Support from experts in the field
	  ○ Western Sydney
	  ○ Fiji National University (potential)
	• List of contracts and established relationships with local partners
	• Support from experts within the company (eg. Business Consultants)

THE PRODUCT	• Intuitive usage • Quickly produced (simple design) • Re-use of refrigerant tanks (environmentally friendly) • Preference over kerosene stoves (taste + cost) • Six month warranty of product
COMMUNITY, RELATIONSHIPS AND CONTACTS	• Well received in village: good product design • Good reputation in villages • Developed relationships with distribution partners • Developed relationships with manufacturers
OVERALL ADVANTAGES	• Good product design • Strong relationships and reputation • Access to resources (as outlined above)
WEAKNESSES (–)	**OUR COMPANY**
INCOMPETENCIES	• Lack of professional knowledge/experience (trekkers) • Team unaccustomed to lighting fires (unable to demonstrate proper usage) • Transition between project teams difficult
SOURCES OF REVENUE LOSS	• Increasing manufacturing cost of stoves with a decreased profit margin (from 42% to 34%) • Increased manufacturing costs resulted in increased product cost, which may hinder sales

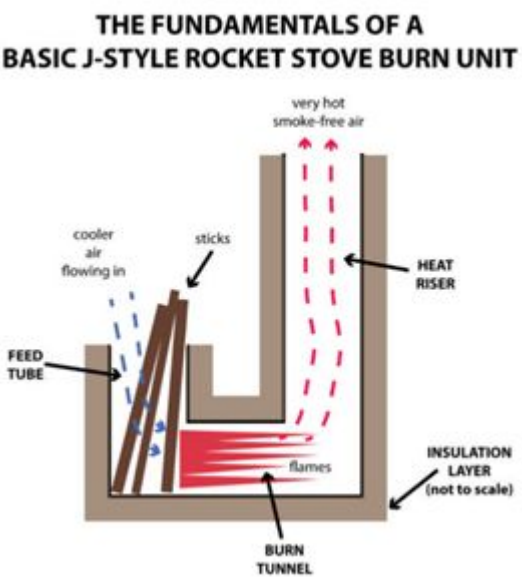
RESOURCE DEFICITS	• Budgetary constraints (prototyping, manufacturing, advertising)
	• Limited geographic access
	  ○ Shipping costs
	  ○ Import laws
	  ○ Time constraints
	• Lack of patent (legal concerns)

AREAS OF IMPROVEMENT	• Improved training for trekkers regarding demonstration of stoves • Improved method of communication between project teams • Acquirement of patent

EXTERNAL FACTORS	
OPPORTUNITIES (+)	**OUR COMPANY**
TECHNOLOGICAL ADVANCEMENTS	• Ability for stove to be built in other countries, for raw materials to be sourced from other countries, and for the stove to be distributed nation-wide
EVOLVING CUSTOMER NEEDS	• Demand for different sizes • Large target market
MARKET VOIDS	• One of two stoves in Fiji producing rocket stove • Expansion to other areas/villages
FAVORABLE TRENDS	• · Increase number of PEV students • · Interest of villagers producing stoves • · Growing interest in stoves
THREATS (–)	**OUR COMPANY**
OBSTACLES	· Weather conditions · Phasing out of refrigerator tanks (mitigated w. 5.0) · Unobtainable raw materials · Tensions between traditional Fijian villages/ Indo-Fijian community
ECONOMIC CLIMATE	· Rising prices of raw materials (commodity price changes if scaled sufficiently)
COMPETITORS	· Large scale competitors (potential energy) · Competitor – government program
AREAS OF VULNERABILITY	· Design copied by contacts (contracts drawn up) · Not unique idea (competitor's) · Expansion of electricity grid to villages

3. Theory behind Rocket Stove

The rocket stove, consisting of 4 sections, utilizes firewood of smaller dimensions to efficiently convert the wood into a heat source which is used for space and water heating as well as for cooking. This efficiency comes from the close to complete combustion of the wood which equates to very minimal smoke being produced by the fire. Initially the wood enters the feeding chamber making up the bottom part of a "J" bend of the design. This then burns in the burn tunnel which creates very hot air to rise out the stove top.



Through its insulating layer around the "J" bend, the heat lost through radiation out into the environment is minimised which allows most of the heat to exit through the outlet of the stove. This is especially useful when used for water heating or for cooking as all the heat is directed to the pot instead of being lost to the environment.

4. Cost Breakdown

Complete cost breakdown can be found in ***180208 Cost Analysis Buka Stove 01 LS***

Buka 5.0

Several material suppliers and labourers were sourced throughout Fiji, however, mainly focusing on the Suva and Sigatoka areas as they are the most likely areas of operation. From sourcing material pricings, the obtained costings were reasonable in order to have a lasting product. The prices in the table below are the cheapest available for the quality we saw as being most feasible based on the conditions of which the materials would be exposed to for extended periods of time.

NOTE: An alternative metal which has thinner gaps than the gothic mesh galvanised cut should be used as it was found to be more efficient when prototyping using 1 cm x 1 cm rectangular chicken wire, however, the wire itself was too thin and springy.

Company	Material	Cost (FJD)
Vinod Patel & Co.	- Pop Rivets (4x13 mm 70 pc)	$4.50 per 70 piece pack [11 Rivets Per Stove]
	- Gothic Mesh Galvanised Sheet [2400 x 1200 mm]	$51.95 per sheet [Makes 64 stove grates]
	- Galvanised Steel [2400 x 1200 mm] (0.9 mm thickness) (18G thickness)	$69.20 per sheet\ [Makes 6 stove exteriors]
Mechanical Services Limited	- Stainless Steel 304 [2400 mm x 1200 mm] (0.7 mm Thickness)	$256 per sheet [Makes 24 stove interiors]
	TOTAL COST OF MATERIALS PER STOVE:	$23.72

To see a more extensive list of all materials assessed for the interior and exterior stove and the cost of each from different suppliers, see **here**.

Lincoln Refrigeration Ltd has provided a rough quote of $65 to manufacture this stove including all materials. A quote of $35 for labour only was also given. This is by far the best quote given so far for the stove and they also have the best equipment available with likely higher quality control. It is of note that it would be greatly beneficial from a logistical standpoint to all manufacturing and materials in the same location. Another quote from Regent engineering was attained and estimated at over $500 which isn't feasible.

Buka 4.0

Lincoln Refrigeration Limited provide an estimated cost of $47 per Buka 4.0 for the stoves made including all materials whilst having access to better equipment than these other manufacturers. Lincoln Refrigeration Limited is also a supplier of the refrigerant tanks and has estimated they need to remove 100 of them per month which means a potential continuous supply of stoves could be manufactured from here without the need for interim transportation from tanks to labourers. For more information on this, see ***Lincoln Refrigeration Limited*** folder notes on our engagements and arrangements with them.

Buka Dragon

Mechanical Services Ltd. provide an estimated cost of $x per Buka Dragon. This price includes all material and manufacturing costs. Delivery to Sigatoka retailers is expected to cost an additional $y. Hence, the total cost per stove including delivery is $z.

Exploring options with imported materials and local manufacturer for Buka Dragon
Supply chain using local materials and local manufacturing for Buka Dragon
Exploring options for importing pre-cut sheet metal for local assembly of Buka Dragon