Developing a successful business plan for a sustainable energy company: a case study of FSE Oy

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Laurea University of Applied Sciences **Abstract**

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This thesis project investigates the current system of energy production in Finland and provides a more sustainable energy solution. The goal of this project is to study and give explanation about marketing plan, development plan, business plan, and business model for the case company FSE Oy.

Furthermore, the thesis report elaborates a hybrid system developed by FSE Oy. FSE Oy will provide a new hybrid system combining wind power and solar energy in one system. The company will provide those systems to individuals in their own homes and to small outdoor businesses such as restaurants and markets, the company also will provide a charging station for electric vehicles and farm owners.

In addition, a literature review was conducted that gives information about preparing a suitable business plan, marketing plan and business model for a company that provides sustainable energy.

The thesis include also interviews with homeowners and business owners. The interview aimed to figure out what households and businesses think about new sustainable energy and whether they are likely to be open to adapting it.

Keywords: Sustainable energy business plan, Solar energy, Wind energy, Hybrid system

Contents

1 Introduction

The thesis project examines sustainable energy and how it affects at present and in the future on obtaining clean energy taken from the environment without using oil and its derivatives, which the world is suffering from at the present time and the near future. The first research question is how to implement FSE Oy sustainable energy model in Finland. That includes the marketing plan, developing plan and business model for FSE Oy in Finnish market. Second research question is about the importance of introducing sustainable energy that is developed by FSE Oy for the future in Finland and abroad.

The thesis also describes developing of the current sustainable energy in Finland to more advanced way by combining new idea of wind energy with solar energy and providing a system called hybrid energy.

The author also will introduce a new case company idea in Finland called FSE Oy where it will provide Small "hybrid" electric systems that combine home solar & wind (photovoltaic, or PV) technologies that have various benefits over each other. Furthermore, the author will mention the marketing plan, developing plan and business model to give more advice for FSE Oy on bettering their process.

In Europe, particularly in the Nordic nations like Finland, where the sun shines the brightest and longest, the wind speeds are low during the summer. When there is less sunshine available in the winter, the wind is powerful. Hybrid systems can produce power when people need it because the peak operating periods for wind and solar systems happen at various times of the day and year.

1.1 Case company

In this part the author will introduce the new sustainable energy company in Finland called Future Sustainable Energy FSE Oy with new business idea called a hybrid system. See Figure 1 for Visual Picture of FSE hybrid system.

Figure 1 FSE Oy Hybrid system

The company was established in 2022 by CEO Ahmed Al-Khayyat in the capital area of Finland. Company will provide a new hybrid system Combined wind power and solar energy in one system. The company will provide those systems to individuals people to their own homes and small outdoor business-like restaurants and market, Electric stations for vehicles also will provide it to the farm owner and the cities in street to join the lights pole. This system will help a lot for the customers and benefit them because the small hybrid system doesn't require a large space for the installation and will let the owner to invest on the electricity sustainable energy. This also helps the government to reduce the purchase of electrical energy from abroad, because the systems installed by customers will participate in transferring surplus electric energy to the government. The company will provide its own brand system which is more unique, modern, and good quality because the company care more about the future modern style and the long period of their good quality products. System parts are designed in Finland but manufacturing them outside Finland. The first target market for the company is the Finnish market but the plan is that to provide those systems abroad and target them to the international market.

Figure 2 Transparent Solar Panel

Figure 3 Transparent solar panel on buildings

The company also developed the idea of regular solar panels in collaboration with Chinese solar panel industry developers by manufacturing and working with transparent solar panels that customers can install instead of standard home windows. This is because the new solar energy panels are transparent glass, and after that, there are colours that the customer may put as a window for the house or a facade for huge organizations. This will also improve the aesthetics of the installation, as it will be difficult to discern from the house's glass, unlike the panels mounted on the roofs. The new panels can be installed on the faces of the house

as regular glass, and they do not have any problems with cleaning or giving an inappropriate image to the house or some companies. In contrast to some current solar panel systems owned by homeowners in Finland and other Nordic countries, who find it challenging to clean in the winter due to the accumulation of snow on their surfaces.

Let's get to know more the hybrid power system, what it consists of, how it works, and what are its advantages and disadvantages for the system.

To obtain sustainable energy, we must act swiftly to stop using fossil fuels, which have a negative impact on the environment, and switch to sustainable energy sources, which can eliminate the demand for fossil fuels. Wind and solar energy are regarded as the most abundant and long-lasting sources of energy for acquiring sustainable and clean energy.

1.2 What is a hybrid system?

By definition, a hybrid source is one that draws its energy from two distinct categories of sources. When a system is referred to be hybrid, renewable energy is one way to produce electricity that combines the power of solar panels (photovoltaic) and wind turbines. (square, 2022)

1.3 Why create and construct such a system.

Every place experience period when the sun doesn't shine as much, or the wind doesn't blow. The two energy sources frequently don't produce at the same time, so pairing solar panels with a wind turbine makes perfect sense. Summertime wind speeds are low in Europe, especially in the Nordic countries like Finland where the sun shines the brightest and longest. The wind is strong in the winter when there is less sunlight. Since wind and solar power systems operate at different times throughout the day and year, hybrid systems can provide electricity when it is needed. (square, 2022)

1.4 How do hybrid solar-wind systems operate?

The system can generate electricity almost all year round because solar and wind energy work best together. Combining solar panels, which convert light into energy, and wind turbines, which capture wind energy, creates a hybrid solar wind turbine generator. A solar wind composite power inverter has inputs for both sources and incorporates the necessary AC to DC transformer to give charge to batteries from AC generators, eliminating the need for two inverters. (square, 2022)

As a result, before being stored in the battery bank, the energy produced by the solar and wind turbines is filtered. Most hybrid systems rely on batteries to supply power during the times when neither the wind turbines nor the solar panels are producing. Off grid was called

by this system. There is also another way the system can operate, known as the on-grid method, although in this stage, as the system fills up, excess power is sent to the active electricity provider. In this situation, the clients have the option of selling the additional energy that the system produced to the active electricity provider.

The requirement for fossil fuels will be very little soon thanks to the electrical companies' decision to minimize the import of a portion of the electricity from overseas. (mango, 2022)

1.5 Pros and cons of Installing A hybrid solar and wind system

Table 1 Pros and cons of installing a hybrid solar and wind system, Adapted from (square, 2022)

Pros	Cons
uninterrupted flow of power. The consumer will never run out of electricity thanks to the combination of two or more energy-generating technologies and energy storage technologies. When solar and wind energy are combined, they can both provide electricity during the day. Wind energy can also provide electricity at night, and if energy storage is available, there is always a steady stream of power.	-
Low life-cycle costs: In a hybrid system, renewable energy sources have low life-cycle costs due to the variability of supply to demand offered by diverse energy-generating systems. The costs of operation and maintenance are steadily declining in hybrid energy systems because of efficient load synchronization across different generators.	Even the price is little for the hybrid system, the initial investment is relatively significant.

Land acquisition for a hybrid system is simpler. The reason for this is that installing windmills and solar panels does not require separate plots of land. On a single plot of land, both can be built.	When there is no big place enough, when the light cannot reach the intended place, the system cannot function as it is planned to get the power. The same phenomenon may still occur if the wind is not blowing straight into the wind turbine.
Contrary to standalone energy systems, hybrid energy systems don't call for grid expansion. They produce energy at different periods and during different seasons, which explains why.	There are various types of wind turbines. The installation of these depends on the location. This disadvantage makes it impossible to deploy all types of wind turbines since local wind speeds vary.
Ecologically friendly: Renewable energy sources used in wind and solar hybrid system are more environmentally friendly than energy generators that burn fossil fuels. Due to effective generation from multiple renewable energy sources, properly managed load, and system dependability, the system becomes more carbon positive.	-
As there is less reliance on a single source to provide electricity, the battery size can be reduced.	-
	Not yet attained market maturity
a power generation system with increased dependability	-

2 Importance of Sustainable energy

FSE Oy implements a business which operates a hybrid energy system that is sustainable and impactful for the environment in a positive way. Understanding the current effects of the energy crisis on our world is crucial when thinking about sustainable energy and the future. Since the industrial revolution, the globe has become 1.5 degrees hotter because of human activity. This increase from pre-industrial revolution times has occurred in a startlingly short space of time. The combustion of fossil fuels for energy is one of several causes that have contributed to this rise. Carbon dioxide (CO2) is the most ubiquitous greenhouse gas and has significantly contributed to global warming. (Anon., 2022)

Sea levels are rising, glaciers are melting, and the frequency of hurricanes, heat waves, and floods is all increasing. Even though people have permanently altered the ecosystem, there is still hope for how we may preserve it and lessen the effects on subsequent generations. How we stop pumping carbon dioxide into our atmosphere and cut our emissions. So, our best hope to reverse the current trend and improve the quality of life on Earth is using renewable energy sources. Governments are considering employing renewable energy sources to produce electricity as a result all nations are increasingly using renewable energy to produce electricity. (Lakeh, 2022)

For instance, in 2020, 29% of the world's electricity have been produced by renewable energy. When compared to a 27% share of electricity generation in 2019, this is a success. According to (Lakeh, 2022), The importance of embracing renewable energy sources exceed the drawbacks overall. Although developing a network of renewable technologies could be more expensive initially, the costs will eventually be recovered. Considering the ripple effects of adopting renewable energy.(Lakeh, 2022)

According to (Conserve energy future, 2022), Sustainable energy is defined as the usage of any sort of energy that fits our demands without endangering the resources. Where sustainable energy sources are among the least destructive to the environment and provide long-term, clean, healthy, and self-renewing energy sources.

In terms of the environment, everything we use responsibly has a minor impact on the environment, but it can be reused or renewed easily and without causing considerable environmental damage. Waste of food, water, and energy resources is one of the sustainable decisions we make in our daily lives.

Since sustainable energy is widely accessible, cost-free, and has no negative effects on the environment, it must be promoted on a global scale. Ocean energy, hydroelectric energy, geothermal energy, wind energy, and solar energy are just a few of these constant, sustainable, and reliable sources of energy.

Since fossil fuels are scarce and pollute the environment greatly due to the gases they produce, which are always extremely hazardous, sustainable energy is not related to or one of the sources obtained from them. including coal, gas, and oil. Reducing the use of this damaging energy connected with fossil fuels and replacing it with sustainable energy, which is less harmful to the environment, is one of the most crucial actions that we must do. (Anon., 2022)

To reduce the reliance on fossil fuels, nations all over the world can adopt or use a variety of sustainable energy sources. Incorporating solar energy and obtaining it continuously from sunlight, as well as the continuous heat that can produce wind energy and temperatures that lead to the production of heat, as well as the continued motion of the earth, the sun, and the moon, all of which contribute to the production of tides.

Furthermore (Conserve energy future, 2022), one of the hydroelectric energy sources that can be obtained is the evaporation of water that falls as rain or snow, travels through rivers, and streams, and combines with the seas to provide this energy continually, safely, and sustainably. Sustainable energy usage is currently at 20% or higher globally and is expected to keep increasing in the foreseeable future.

2.1 Advantages to obtain sustainable energy.

Instead of using fossil fuels, there are various advantages that can be employed to obtain sustainable energy, including:

2.1.1 There is no limit to sustainable energy sources.

This means that we can employ sustainable energy sources indefinitely because there will never be a shortage. There is always access to wind, sunlight, hydro, and subsurface energy. This makes it clean energy, and unlike fossil fuels, its use is restricted. (Lakeh, 2022)

2.1.2 Sustainable energy is dependable and trustworthy.

Contrary to fossil fuels, which are constantly impacted by market fluctuations as well as by conflicts and wars, access to sustainable energy is simple, can be preserved, and is not connected to regional issues or market turbulence. to continue receiving energy This is what is happening right now since a war between Russia and Ukraine has cut off access to fossil fuels for most the European Union's member states, making it difficult for them to continue obtaining energy. (Lakeh, 2022)

2.1.3 One of the environmentally favourable sources is sustainable energy.

Sustainable energy production is thought of as a cutting-edge and organic method of creating clean energy, making it environmentally benign. It has no impact on environmental problems like global warming, climate change, or a drop in air quality, unlike the usage of fossil fuels for energy. (Lakeh, 2022)

2.1.4 Sustainable energy can also improve public health.

Scientists have put a lot of effort into making fossil fuels less harmful so that they can be used to generate energy without losing any of their effectiveness, but it has not been enough to compete with sustainable energy because it operates naturally without compromising the emissions that have an adverse impact on the environment. People who have access to sustainable energy benefit from having access to clean air and healthy soil, which improves their health and quality of life. Fossil fuels are unable to address this due to the significant impact they have on the climate, global warming, and other pollution. (Lakeh, 2022)

2.1.5 Low maintenance costs are associated with renewable energy.

Since they are made up of wind turbines and are always located on farms, sustainable power plants have substantially lower maintenance costs than fossil fuel-powered ones. Hydroelectric power plants likewise don't require many large parts or ongoing upkeep. Additionally, because solar energy systems do not have rotating components, they do not require constant maintenance, and the lifespan of the solar panels is always long. In contrast, fossil fuel-powered power plants require constant upkeep, expensive part replacements, and the use of environmentally harmful combustion engines. This is what makes using sustainable energy more affordable. (Lakeh, 2022)

2.1.6 Independent economic growth is promoted by sustainable energy.

And how does that work? By leveraging the local populace to generate energy from renewable sources, which in turn aids governments in lowering their reliance on imported electricity. Finland is now working on this and will continue to do so because it is one of the nations that lacks sufficient fossil fuel resources to meet its population's energy needs. (Lakeh, 2022)

2.1.7 Food waste can be converted into renewable energy.

Finland is aiming to limit the amount of waste that ends up in landfills by using food waste dumps to generate sustainable electricity. It is also regarded as a biomass because it can use organic materials as fuel. (Lakeh, 2022)

2.2 Negative aspects of sustainable energy

2.2.1 Sustainable Energy Is Expensive at First.

The initial cost of renewable technologies is costly and occasionally unaffordable given the amount of energy they can provide. As (Lakeh, 2022) mentioned, the production and installation costs of renewable energy equipment like PV panels are high. To support the development of these technologies, governments are allocating large expenditures, such as incentives for solar panels. (Lakeh, 2022)

2.2.2 The Space Needed for sustainable Energy Facilities is Huge.

According to (Lakeh, 2022), a big place is needed connect nature's influences. And that will cause for many place a problem that uses renewable energy. We need to use more land to build renewable energy farms than we do regular power plants. (Lakeh, 2022)

2.2.3 Recycling Is Necessary for sustainable Energy Devices.

Low quantities of pollutants are produced when power is produced using renewable energy sources. However, the manufacturing of renewable energy sources as well as the process of disposing of them could produce pollution, raising some issues. (Lakeh, 2022)

3 Methodology

In this chapter, there will be an explanation for the business plan, business model, Marketing plan and developing plan in general to draw a framework for the case company. The author gives suggestions and explanation for FSE Oy based on definitions.

The author has been researching other theses and different companies to get more knowledge and get more information about the idea of creating a business plan for FSE Oy. Furthermore, the author has used both qualitative and quantitative research methodology to assess, draw theories and solutions for the business plan of FSE Oy.

For the most theory parts, the author utilised qualitative research method. According to (studysmarter, 2023) “Qualitative research is about the collection and analysis of non-numerical data, like written or spoken words. It typically involves interviews and participant observation to examine people’s lived experiences.”

The general idea of the thesis for the marketing plan and business plan of FSE Oy were drawn from case studies, other companies and then modelled to the company's (FSE Oy) ideology by the author. The reason the author used qualitative research is to get the main theories from different types of studies and apply it to the business plan, additionally the quantitative research was mainly introduced to the thesis at the survey or interview section to determine the choice of the small business owners and homeowners the company is targeting.

3.1 literature review

In this thesis, the main idea and theory for the thesis and the business plan was driven from websites, journals, and another thesis. The author also conducted survey to the author has been interviewing these questions in this survey from 100 homeowners and 50 business owners. The interview was taken in various place and time, it was conducted from the start of July 2022 up until October 2022. During the process of the interview, the answers that was given from interviewee was different and only the questions which were answered are applied to the survey.

3.2 Findings

From the survey, that author learned that small business owners were more aware than the house owners about different types of sustainable energy. Furthermore, the interest or demand of introducing hybrid system to their home or business were high once they have knowledge of the sustainable energy system like solar and wind. The overall image of sustainable energy system for both homeowners and small business owners were positive, but when it comes to the idea of investing, the number of small owners were little, and the opposite can be said for the small business owners because they were more open to invest to the sustainable energy system.

Most people from the survey had the experience of the normal electricity from the electricity companies and when given a choice on the interview, most preferred the solar and wind (Hybrid system) to be there choice. For the hybrid energy system, many were sceptical since it's a new energy source idea that offer them all year around electricity power.

4 What is the business plan?

Business plan means in-depth descriptions of a company's aims and strategies for achieving to provide them. In terms of marketing, finances, and operations, a business plan outlines a

documented road map for the company. Business plans are used by both newly founded and established companies. (HAYES, 2022)

Designed for both internal and external audiences, a business plan is a crucial document. A business plan might be used, for instance, to entice investment before a company has built a solid track record. Getting financial organizations to lend to the company might also be beneficial. Every company requires a business plan, but smaller start-ups especially could gain a lot from having one. Idealistically, the plan should be evaluated and updated frequently to account for objectives that have changed or been reached. An established business that has made the decision to change its direction occasionally needs a new business plan. (HAYES, 2022)

Regardless of the industry the entrepreneur wishes to enter, a solid business plan is the cornerstone of any successful venture. The process of creating a business plan helps in deciding the course that the company should take and the steps necessary to get there. This is an important document for the company because it acts as both a status report for the owner and a plan for the company's operations. (HAYES, 2022)

It can be both exhilarating and stressful to decide to start a new business. Prior to taking the necessary steps to launch a new firm, the entrepreneur needs to concentrate because there are numerous tasks and challenges to overcome. A strong business plan can serve as a guide, aid in luring investors to the venture for the company and guarantee that the business keeps growing. (HAYES, 2022)

4.1 Why is it important to have a business plan:

Proving that the business proposition is viable.

By developing a business strategy, the entrepreneur can assess the possibility that his venture will be successful. Understanding market dynamics and rivals will help you determine whether a business idea is viable. All interested parties, including future customers, consumers, employees, partners, and shareholders, can see this in a solid company strategy. Financial projections for the owner's business plan must be made in this step. Owners that invest the time to investigate the viability of their concepts can establish objectives and strategies that will help their path to success. (Chase, 2022)

Determine meaningful goals.

As a business owner, managing everyday responsibilities will probably occupy most of the the owner's time. This means that after the company has launched, establishing goals and milestones may be difficult. Writing a business plan for the owners gives them the

opportunity to set significant goals for themselves three or even five years in the future. (Chase, 2022)

Making decisions on purchasing and allocating resources

A company plan outlines the assets and investments needed for each item. A strong business strategy can help determine whether expanding into a bigger store or workspace is financially viable. There will be a lot of investments to be made in the start of the company's lifetime in areas like new technology, hiring, operations, sales, and marketing, as well as the creation of products and services. The resource planning portion of the business plan is essential. It gives a ballpark figure for the owner's necessary resource outlay and ensures that his business will successfully manage those resources. (Chase, 2022)

Create a marketing plan.

A marketing plan explains how the business owner will connect with his target market and raise awareness of his brand. His business will be more successful if his brand positioning is understood by customers, partners, employees, and investors. The owner's firm goals are substantially more attainable if a thoughtful marketing strategy is incorporated into his business plan. (Chase, 2022)

According to (Chase, 2022), It is an important topic to think about as you develop your marketing strategy, Those are Who are the company's clients, how can the company keep customers and keep them interested in its marketing and products, what are the rules for the company brand, and what price the company will charge for its products and services? (Chase, 2022)

4.2 Business model in general

According to (Landry, 2020), company’s main goal and the role that the company's products or services will play in meeting those needs have all been described in the most basic form of a technique. And also (Landry, 2020) mentioned business model as a outlined document that a company give to its customers. (Landry, 2020),

In structure and substance, a business model is comparable to a business strategy. A business plan, on the other hand, describes all the elements required to demonstrate the feasibility of a new business, whereas a business model demonstrates the elements that enable an existing business to function successfully. Maintaining a focus on corporate goals, examining operational processes, and ensuring that the two are compatible are all advantages of business model documentation. (Landry, 2020)

4.3 Marketing Plan in general

According to (CHEN, 2022), he defines the company's advertising strategy for the products or services it offers to reach potential customers, in the sense of reaching the target market as a marketing plan. Where the marketing plan shows in detail the applicable advertising campaigns, which can be after months or a year. (CHEN, 2022)

The marketing plan usually includes some functions that help the company know the business and competitors: It gives an overview of the company's marketing and advertising goals. it also shows the current marketing position of the company, describes the target market and customer needs. Key Performance Indicators (KPIs) is also that the company will track and customizes messages targeting geographies and demographics. Furthermore, it also includes choosing platforms to promote products and services Like on advertising screens, social media, tv, Newspapers, and other characteristics that are part of the company's strategies. (CHEN, 2022)

4.4 What is the developing a Plan?

Developing plan means coming up with a practical application of the idea. Which would document the goals required to develop the skills, competencies, and goals that the company needs to achieve and support continuous improvement and development in the company's work. The development plan is drawn up by the company's manager, who works to define the goals, skills, and resources needed for the company's career plan. It also contributes to portraying and clarifying the idea of the project in terms of design, planning, and everything necessary for the company's work. The professional development plan is also centred on employees, and every employee must have a live development plan. Where development plans must be reviewed continuously throughout the year. (Resources, 2022)

5 Business model of FSE Oy and Marketing plan

Compare with the current energy system like how there is only individual energy like only wind or only solar photovoltaic (PV) systems, but the FSE have combined both.

Marketing plan- social media, newspaper, google ads, TV, email ads, YouTube ads.

5.1 Business model of FSE Oy

In this part, the author describes the business model of FSE. (For general explanation of business model see 4.2)

Key Partners- Suppliers and manufacturers will be in China and some of them will be in Germany. The suppliers in China will be responsible for supplying FSE Oy with the necessary equipment such as batteries, solar panels, wind turbines, as well as power inverter and wind turbine poles. As for German suppliers, they will supply cables and some controllers for solar and wind systems.

Key activities- FSE Oy focuses on manufacturing its own goods from the products that it will provide to its customers, and focuses on manufacturing modern systems, as well as powerful products. Since FSE Oy plans to provide their customers to achieve revenues from their residual energy, it is one of the company's goals to obtain good relations with its customers in the long term for the company's work.

Value proposition- FSE Oy focuses on offering its products to customers through the multiple of choice of single or hybrid systems. For example, only wind systems or solar energy systems are provided, or both together. Through the systems provided by the company, customers can obtain interest by selling the additional energy in the system and preserving the environment by using a system that generates clean electrical energy.

Customer relationship- FSE Oy aims to establish and maintain close relationships with its customers. After also installing the hybrid system for the customers, it will have constant checking and cleaning on the system that was installed.

FSE Oy has already established relationships with few business' owners and households' business, and its model contains a way for customer to earn back for their extra energy so the relationship between the company and customers is integrated with business model of FSE Oy.

Customer segment- FSE Oy are creating value for business places and households that are looking to go for sustainable energy. The customer segment of FSE Oy differentiates from others because it gives various choices for customers in its energy system products.

Key resource- FSE will have a warehouse to store the goods because FSE will provide its services to individuals customers and will be the dealer and supplier of goods within Finland and the European Union. It will also provide a special program for the devices for this, where customers can know the information, time, and charging percentage in their systems. The company also seeks to provide job opportunities for many employees.

Channels- FSE Oy developed a plan to reach its clients quickly through advertisements on social media, TV channels and local newspapers. Also participate in events organized by other companies and public events that aim to help preserve climate change.

Cost structure- The costs of FSE Oy systems are concentrated in developing and manufacturing the systems in cooperation with suppliers, and then importing them to provide them to their customers. About the cost of the customer, the customers buy the system once for a long period of time, which is tens of years, as well as some very simple annual costs for maintaining and cleaning the systems to keep them if possible.

Revenue stream- FSE will get its revenue from investors that has interest in the company and from selling direct the hybrid system and servicing like cleaning and maintenance of the systems. The amount of money spent by customers depends on how much power of energy the customers want to use.

5.2 FSE Oy Marketing plan

In every business, it is essential to have strategy or a plan on promoting and advertising the company so that they should find a way to spread the business to customers and potential partners. One of the ways to achieve attraction for a business is to have a marketing plan (For marketing plan definition, see 4.3), the author suggests and explains few methods and tools for FSE Oy to achieve success on marketing, the tools and methods are down as follows:

Website design and development.

The website occupies a large part of the FSE Oy company's work, as it helps in displaying and providing all the services and products that the company provides to its customers. When searching for the company via the Internet or interacting with ads, it will end up attracting customers to the company's website. Also, the website gives great credibility to customers to understand what they are looking for and helps them communicate easily with the company to get the service they are looking for.

SEO

FSE Oy would also be successful in marketing if it can utilize Search engine optimization. As mentioned by (Web fx,2022), since there are many companies with energy, SEO can be helpful to FSE as it can make sure search engines index websites and help the site appear in search results for relevant keywords.

Purchasing power.

Purchasing power can also be helpful tool for FSE Oy where ads use pay-per-click. The company targets the keywords of the renewable energy audience and pays when the user clicks on the keywords. For example, keywords such as sustainable energy, solar energy,

wind energy, and hybrid energy can be created. When the user searches for one of these words in the Google search engine, the company's website will appear to them.

Email marketing.

FSE Oy can also utilise email marketing as it is a good way to convert potential customers into its own company customers and stay at the forefront of existing customers' interests. Through marketing via the Internet, the company can communicate with customers easily and provide its services in an easy way, for example, by building a new system, maintaining, or cleaning the systems it installs for its customers, or sharing the company's services with new customers. Online shopping also helps to track the results of different tests and strategies.

Social media marketing.

At the present time, social media is one of the most important platforms for building awareness of the company's brand in the local area or the target area. FSE Oy is going to focuses on the social media platforms since publishing continuously and in a good way makes sharing useful information about renewable energy a matter of great importance to the target group in the company's work or the services it provides. Also, the use of social networking sites helps the company build trust and communicate with potential customers and build relationships by answering customer questions and encouraging interaction by asking and answering questions. As (Web Fx, 2022) mentioned, social media is a good way to get new customers by targeting the regions and the audience that the company is looking for to provide its services to them. Where ads always appear in users' news files, and this helps the emergence and knowledge of the company's brand for customers easily.

Display advertising.

FSE Oy focuses on providing its services by displaying advertisements, and this method is considered very effective now, due to its widespread in all public places such as malls, trains, and public streets. Its views are estimated at more than 5 million views per month, and this helps the company to provide its services and deliver them to the customer easily.

Marketing through newspapers.

For this time when we are hearing marketing through newspapers leaves doubts among some because of the widespread technology, but still, to this day, still many Finnish people read local newspapers in abundance, and this is one of the marketing methods that FSE Oy also should focuses on to provide its services to target a large audience of the population Analysts, especially homeowners and some small businesses and farms.

5.3 Important reasons to use digital marketing.

Internet popularity

It is recommended that FSE Oy should use this tool because it is one of the important methods that people use frequently at the present time to search for products and services, as this method paves the way for easy access to the field of renewable energy, in which the company seeks to deliver its products easily to its customers. As digital marketing provides the opportunity to display the benefits of renewable energy and provide users with a lot of information through the company's website. Once customers enter the website, they will learn about the company's work and the services it provides, and this gives the opportunity to obtain a new potential customer. (Web Fx, 2022)

Precise targeting

Internet marketing allows a higher percentage of traditional marketing to target renewable energy audiences and it should be valuable tool for FSE Oy usage. Where search engines help people search for renewable energy keywords specifically for FSE Oy. For example, solar energy, wind energy, hybrid energy, green energy, how to buy renewable energy or how to get it or where can I get renewable energy near me. we can easily find the company's website and view its services. Also pay-per-click ads or social media ads, help in targeting the right audience for the FSE Oy, for example, homeowners, small businesses, or electricity distribution companies. (Web Fx, 2022)

The ability to measure results.

FSE Oy can also use this through interactions with potential customers, this all happens through the Internet. The performance of campaigns for FSE Oy can be monitored through Google Analytics, for example, who visited the company’s website, how customers interact with the website. Who clicks on the ads and keywords on which the site or social media is ranked. (Web Fx, 2022)

The ability to adapt.

By monitoring marketing campaigns via the Internet, FSE Oy can utilise some aspects or words that work well will be noticed and given that they do not work and can be corrected in the future to provide the best results for the company and customers. Whereas, at the present time, digital marketing for renewable energy companies is highly adaptable, and this makes it easy to control the target market and customers and allows for improving the performance of the company's advertising campaigns. (Web Fx, 2022)

5.4 Marketing Mix

To evaluate the hypothetical of FSE Oy, the author chose to use a well-known marketing mix. The marketing mix is composed of the four Ps: product, price, place, and promotion.

A corporation can manage and use a marketing mix, which is a collection of tactical marketing tools, to elicit a certain response from its target market. It comprises any action a business can take to affect consumer demand for its goods. It can be used to plan and carry out marketing campaigns for FSE Oy. According to (Coursea, 2022), the explanations of the four-marketing mix are as follows:

Figure 4 Four Marketing Mix

Products of FSE Oy- Where the product consists of all parts of the system combined in one product, which is the entity that is sold to the customer. The product is the central component of the 4Ps because the other three are usually identified based on the product. The product can be standardized or differentiated, which means that it is sold with the same

standard features everywhere in the world. If it is differentiated, you can customize it to meet customer requirements. FSE Oy offers several products including solar panels, wind turbines, inverters, controllers, batteries, solar tiles, and transparent solar panels. But the main product of the company is the hybrid system that connects two energy systems to each other to give electrical energy through one system. FSE Oy products are characterized by high accuracy, long life, and durability for all types of weather. The company offers its own branded products and a warranty for systems ranging from 10 to 30 years and a lifetime of up to 60 years. The company has developed all its products to give a proportional size to all the small and large spaces on which its systems are installed.

Price- The price is defined as the ratio of exchange between the product and the money, as the price consists of the amount of money that the buying party needs to obtain the product. Price is also an important part of the basic business equation: profit = price - cost

FSE Oy systems are priced by system type and volume. The system prices range from 16,000 euros to 100,000 euros and up. The system is calculated according to the parts that included which they are Solar panels, wind turbine, battery, inverter, and the system controllers. Also, the company can sell its own products separately depending on the customers need that's priced also on the parts of the system which they start from 100€ to up.

Place- FSE Oy location is in the capital area of Finland, which will make it an office for it, as well as a warehouse for storing the goods. FSE Oy chose the location within the capital area, so that the means of transportation would be close after the arrival of the systems to the port of Helsinki, and the ease of delivery of the systems to customers, due to the presence of several transport companies with various services. FSE Oy will provide its services inside and outside the capital area, where the target market for the company will initially be all cities in Finland, but it seeks to expand the labour market in the near future outside Finland as well.

Promotion- FSE Oy will focus to promote its advertising campaigns on social media, for example, Facebook advertising, Instagram, Twitter, LinkedIn, YouTube, Google ads and newspapers, as well as via email and outdoor advertising display. However, the company seeks to provide products and services of high quality to customers, and this is a direct advertisement for the company's products, which helps the company in oral advertising among customers.

6 Developing plan for FSE Oy

Company's need to come up with practical applications that is suitable for them to manage and develop their success of the company, one of the ways to come up with the practical applications is through having plan of development, (See 4.4 for developing plan definition).

According to Ministry of Economic Affairs and Employment (2022), Finland is a global leader in the utilization of alternative energy sources, particularly bioenergy. Reducing greenhouse gas emissions and phasing out a fossil fuel-dependent energy system are the main goals of supporting renewable energy. Even though the current energy market fulfils that, the plan of FSE Oy is to advance one more level up. Employment, energy independence, and the creation of new technology are all aided by the usage of renewable energy and by creating more choices that can be aided to advance more.

The main renewable energy sources used in Finland include hydropower, wind power, ground heat, and bioenergy, particularly fuels made from forestry by products and other wood-based fuels. Naming all these energy sources above, there is still a lot more space to develop in the sector and FSE Oy is trying to fulfil that. in addition, biodegradable waste, agricultural and industrial leftovers, and municipal trash are all used to create bioenergy. Solar energy is becoming more and more crucial, especially in circumstances where on-site energy generation can be employed in place of grid energy. Solar heating is used to enhance the main heating system.

Around 40% of the total energy consumed in Finland comes from renewable sources. For renewable energy to account for more than 50% of all energy consumption by the end of the 2020s, more renewable energy must be used, according to the National Energy and Climate Strategy for 2030.

So, the developing idea for FSE Oy is to combine two of the sustainable energy methods into one system to get the hybrid system that gains the electrical energy from the solar energy and wind energy into the same system. As the current energy sector is developing, FSE Oy works on bettering the sector by implementing a hybrid system. The company will provide its own brand system, which is more unique, modern, and of good quality, because the company cares more about the future modern style and the long period of their good quality products.

6.1 Future global developing plan for FSE Oy

The company's development plan is to enter the global market by providing its products and services to countries outside Finland. The company's target market in the future is the European Union and the Middle East. As the CEO of the company has experience in entering the global market easily through experience in business management in the middle east and through his current project in Finland and his external relationship as well. As the countries of the European Union always have little sun, this is what will help them obtain the new system that the company offers to the European market, by providing a hybrid system of wind and solar energy through one system. As for the countries of the Middle East, they are in great need to develop the energy system that they are using at the present time, and they often have abundant sunlight, and this helps them to obtain the regular energy provided by

the company to obtain clean electrical energy. For example, at the present time, many countries in the Middle East have major problems with power outages for long periods of the day, and citizens often use fuel-powered generators to obtain electrical energy. This means by introducing the hybrid energy system, this is what will help many citizens to obtain clean and regular energy throughout the year.

6.2 Overall process of installing FSE Oy hybrid model

FSE Oy implements a hybrid system installation process. The hybrid power system is one of the solar & wind energy systems that combine two systems together to generate continuous electrical energy. For homeowners, small businesses, farms, and cities. The process of installing and installing the system is divided into two parts. First, solar panels are usually installed on roofs or large areas such as farms. The second system is wind turbines. The wind system is installed on an iron pole. It is installed at the top of the pole and connected to batteries, an inverter, and a controller. All parts of the system are also connected to on grid, which generates electricity from operating electricity companies. The system is connected through it to generate electric power. Where this system is considered one of the sources through which it provides customers with the use of solar energy, and they can also sell the additional energy to electric energy companies. Also, energy companies can buy energy from their customers instead of buying energy from abroad, and this helps them in saving the purchase and generation of electric energy in the future.

7 Renewable energy sources

As mentioned above, FSE Oy uses a hybrid system, which means it uses two of the four energy resources mentioned below. Two of the energies FSE Oy focuses are solar and wind energy. Information’s and definitions on the source of energies are written as follows:

According to (International Trade Administration,2022), The European Union's energy and climate legislation have various features, obligations, and policies related to sustainable energy that has an impact on Finland's sustainable energy and climate policies, which have an impact on market and employment possibilities. Finland is a pioneer in the use of Sustainable energy, the most significant of which is bioenergy. It seeks to advance Sustainable energy, lessen greenhouse gas emissions, and move away from fossil fuels. Sustainable energy accounts for 40% of total energy consumption now, with a goal of reaching 50% by 2030. Light clean energy power is becoming more and more important, particularly in situations where energy generated on-site can be used instead of grid energy. The primary heating system is supplemented by solar heating and all those sources rely on bioenergy among those sources are:

7.1 Hydro power

Hydropower. It is one of the most significant sustainable energy sources in Finland, which is known as the "country of 1000 lakes" and produces more than 22% of its electricity through hydropower. hydroelectric power is produced by hydroelectric power plants, with a total capacity of roughly 3100 MW. This is what motivates Finland to produce a significant amount of renewable energy and desire to enhance hydropower production in the upcoming years. (International Trade Administration,2022)

7.2 Heat energy from earth

As the name suggests it is a power derived from the earth. Wells or air-coupled heat pumps can be used to extract heat from geothermal sources. Finland uses this method to provide sustainable energy, whereas enhanced geothermal systems are used to describe adequately hot reservoirs that have been improved. Hydrothermal reservoir energy generating is a mature and dependable technology. In the coming years, Geo-Energy is anticipated to take up an even larger portion of the renewable energy market. (International Trade Administration,2022)

7.3 Solar energy.

Solar energy. Finland is regarded as one of the Nordic nations with the least amount of sunlight; in contrast to various European nations, most of the year sees only brief periods of sunshine, although the summer months get prolonged sunshine. As a result, Finland has been able to use solar energy more frequently recently to produce sustainable energy, and as of now, its proportion of solar energy has increased by double since 2020. (International Trade Administration,2022)

7.4 Wind power.

Wind power. In Finland, wind power now accounts for 10% of all electricity, up from less than 1% a decade ago. Finland should be able to get at least 27% of its electricity from wind by 2025. Finland started building wind farms later than many other European nations. However, in recent years, wind energy installation has accelerated, and national output and construction figures have consistently broken records. (International Trade Administration,2022)

7.5 Wood fuels.

In Finland, wood fuels constitute the primary source of renewable energy. The production of renewable energy heavily relies on bioenergy. Most wood fuels are made from by-products of the forestry sector, such as bark, sawdust, and other industrial wood residues, as well as black liquor made during the pulp-making process. Additionally, low-value biomass from harvesting and silvicultural operations, such as logging wastes, is used for energy production. (International Trade Administration,2022)

8 Implementation of sustainable energy in Finland

FSE Oy is a company with sustainable energy choice that is joining the Finnish market and according to a resolution adopted by the European Parliament, the EU should take the lead in achieving climate neutrality by aiming for almost net-zero greenhouse gas emissions by 2050. Finland developed a strategy to cut greenhouse gas emissions by 39% by 2030 and by 80–95% by 2050.

Since technological advancement is viewed as essential to reducing greenhouse gas emissions, technology-specific initiatives are required to meet climate-neutrality goals. The shift will present substantial potential for new firms and technical advancement; thus, this is an opportunity. (Paukku, 2021)

Annual cost-reduction targets are expected to be higher during the years leading up to 2050 because these climate neutrality goals are closely related to technological advancement. Because the socioeconomic cost of greenhouse gas emissions will be substantially greater, technological advancement must proceed quickly. (Paukku, 2021)

The social cost of carbon, or the social cost of greenhouse gas emissions, is the name given to this burden. The concept covers both adverse effects of global warming, such as harm to agriculture and damage from sea level rise, as well as beneficial effects, such as improved agricultural productivity. As a result, national and EU-level technological policies are crucial for achieving greenhouse-gas targets while also being cost-effective. (Paukku, 2021)

There are several models that can be used to estimate costs, but because they all have limitations, they can only be used as guidelines for policy. In Finland, new energy-efficient technologies, renewable energy technologies, and business models are being developed as a means of advancing the national economy and raising welfare levels across the board. The affordability of various renewable energy technology is closely related to economic initiatives to attain carbon neutrality. (Paukku, 2021)

In Finland, where a sustainable economy is defined as one that is socially, environmentally, and commercially viable, investments in climate technology and low-carbon manufacturing are seen as crucial. To do this, new technologies must be created, applied, and made commercially viable. So Onshore and offshore wind power are two environmentally friendly methods of generating electricity. Onshore wind power has lower investment costs than offshore wind power. primarily because, when compared to land-based wind power projects, offshore wind power facilities produce more electricity due to better wind conditions and, more importantly, since they don't negatively impact the local community or other interest groups as much. Two further key renewable energy technologies with promise in Finland are the production of solar and biomass energy. (Paukku, 2021)

According to (Paukku, 2021),Energy is a necessity for societies so that it can be provided to all and how we get it will be important for the future. Almost half of the world's population currently lacks access to modern energy sources, particularly in low- and middle-income countries. As a result, they continue to burn traditional biomass, which has detrimental effects on the environment and indoor air quality, such as firewood, charcoal, or animal dung. These nations must continue to industrialize and modernize, which will increase the expansion of sustainable energy. (Paukku, 2021)

8.1 Managing Supplemental Resources

(Harvard University, 2012) mentioned that when evaluating energy options, the three most important factors to consider are environmental effect, energy security, and economic competitiveness. Because many sustainable energy solutions are expensive, especially in areas with limited resources, economic competition unfortunately usually takes precedence. As we are aware, climate change affects us all. Therefore, in the future, we must find a sustainable energy source that can be used by both developing and developed nations.

Therefore, how can we fix this problem swiftly and economically so that everyone can make use of this energy?

According to (Harvard University, 2012), continuous technological advancement can help less competitions and makes lower problems. it can also result in applications that are adapted to local conditions. (Harvard University, 2012)

8.2 Local and International Solutions

On a global scale, numerous models are being put into practice at the national or local level to encourage the adoption of clean energy technologies. Changing few ways can lead to betterment of costs to having plans and developments of renewable energy. Customers who purchase energy from these companies pay them to find projects that will save energy use,

and they are subsequently compensated from the energy savings that result from the sponsored projects. The Energy Service Companies, or ESCOs, concept has been adopted by various developed nations with the help of the World Bank and has been successful there. Brazil, China, India, Thailand, Turkey, Uruguay, and Vietnam are just a few of the nations that have adopted this concept. (Harvard University, 2012)

For many developing countries to meet their own emission reduction targets set forth in the Kyoto Protocol, the international community has developed several finance channels to transfer money from wealthier countries to developing countries. The flaws prevent these programs from enabling the widespread adoption of truly sustainable energy production, while ongoing improvements to these programs might be able to address some of these issues. going forward. (Harvard University, 2012)

9 Conclusion

FSE Oy business model focuses on offering its products to customers through the multiple of choice of single or hybrid systems. For example, only wind systems or solar energy systems are provided, or both together.

The author introduces a new case company idea in Finland called FSE Oy where it will provide Small "hybrid" electric systems that combine home solar & wind (photovoltaic, or PV) technologies that have various benefits over each other. Furthermore, the author mentioned the marketing plan, developing plan and business model to give more advice for FSE Oy on bettering their process.

The first research question is how to implement FSE Oy sustainable energy model in Finland. That includes the marketing plan, developing plan and business model for FSE Oy in Finnish market. Second research question is about the importance of introducing sustainable energy that is developed by FSE Oy for the future in Finland and abroad.

Finland primarily uses hydropower, wind electricity, ground heat, and bioenergy, mainly fuels derived from by-products of forestry and other wood-based fuels. Despite all the energy sources mentioned above, there is still a great deal of room for growth in the industry, and FSE Oy is working to fill that gap. FSE Oy also manufactures its own goods from the products that it will provide to its customers, and focuses on manufacturing modern systems, as well as powerful products.

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Figures

Tables

Appendices

Appendix 1: survey questions

The author has been interviewing these questions in this survey from 100 homeowners and 50 business owners. Interview was first started with FSE Oy CEO close friends and relatives, then proceeded to current business partners and potential customers. The interview was taken in various place and time, it was conducted from the start of July 2022 up until October 2022. During the process of the interview, the answers that was given from interviewee was different and only the questions which were answered are applied to the survey.

FSE Oy had contacted few electricity company that specialize with green energy for partnership and some of the main companies are company X, Y, Z, and other companies where they are located outdoor like restaurant and shops that FSE Oy are going to offer in selling its hybrid system to them.

(P= People)

Numbers	Survey question	Homeowners	Yes	No	Business owners.	Yes	No
1	Do you prefer to own sustainable energy source in your home/business place?		55 P	20 P		26 P	12 P
2	Do you prefer to own sustainable hybrid energy source in your home/business place		63 P	12 P		32 P	13P
3	Do you think sustainable energy is beneficial to have in your own home?		63 P	12 P		32 P	13 P

4	Do you think sustainable energy is beneficial to have as future source of electricity to small businesses?		-	-		36 P	10 P
5	Do you think that sustainable energy is going to be the future source of electricity?		35 P	40 P		40 P	7 P
6	Do you think that sustainable energy is going to impact the climate change?		40 P	35 P		40 P	7 P
7	Do you think that sustainable energy is going to replace the fuel as a source of electricity in the future?		20 P	55 P		38 P	10 P
8	Do you own solar panel system in your home?		7 P	68 P		-	-
9	Do you own wind turbine system in your home?		0%	0%		-	-
10	Have you heard about hybrid sustainable energy system?		3 P	72 P		-	-
11	Would you trust to have sustainable energy sources in your home/ business place		45 P	3O P		32 P	14 P

12	Would you invest in hybrid sustainable energy system?		17 P	58 P		26 P	12 P

Appendix 2: Open survey questions

When conducting the interview, the open survey questions was also presented side by side with the normal survey questions. The interviewee came from different background and that resulted to have various answers to the open questions.

1. What source of electricity you prefer?

Solar panel system

Wind turbine system

Hybrid system (including both solar and wind power)

Gas

Oil

Fuel

2. What source of electricity do you have now?

Solar electricity system

Electricity company contract

Oil system

3. What you think about the idea of hybrid sustainable energy system?

It seems quite new, and the idea seems smart and beneficial for the future because it can provide the electricity around the year through all the seasons.