DEVELOPMENT PROCESS OF THE COMPANY MPELEITOR, S.L.

Mario Díaz González

MAY 17, 2017
RIGA TECHNICAL UNIVERSITY

INTRODUCTION

The main aim pursued by this project is the study of the economic and financial viability of a company, which will work on the production and commercialization of pellets, focusing primarily on the commercial side and marketing, making a deep environmental analysis.

We need the following tasks to analyze the viability of this company and achieve our aims:

- Define renewable energy and biomass.
- Define their sources, especially of biomass, as well as their applications.
- Current context of the timber sector in Spain and Europe.
- Forecast of the evolution of this sector.
- Legal framework to work with this product.
- Analysis of the market, including PESTEL and PORTER.
- SWOT analysis of my company.
- The process of manufacture, equipment and necessary technology for pellet mill production.
- Comparison to the other alternatives, such us Eolic or solar energy.
- Comparison to the main substitute products that are on the market.
- Investment needed for the activity, as well as income and associated costs.
- Simulating of different scenarios.
- Economic conclusion to decide if developing this company is profitable or not.

1 RENEWABLE ENERGY

Energy is a natural resource that can be used industrially through the application of technology and associated resources. The concept also let's name the ability to move or transform something.

Energy renewable, on the other hand, is that which can be renewed. The verb renew is linked to replace something, put back, transform or restore something that had been disrupted.

The notion of renewable energy makes mention of the type of energy that can be obtained from virtually inexhaustible natural sources, since they contain a huge amount of energy or they can regenerate naturally.

Wind energy, solar energy and geothermal energy are examples of non-polluting renewable energy (green energy), since its use implies a minimal environmental footprint. The energies obtained from biomass, on the other hand, are polluting renewable energy.

Non-renewable energies are those whose source cannot be regenerated. I.e., what is spent, not can recover. The fossil fuels, such as oil, coal or natural gas, are non-renewable energies.

Climate change is a problem on the planet. Many studies have been done, and all say that we must radically curb CO2 emissions into the atmosphere.

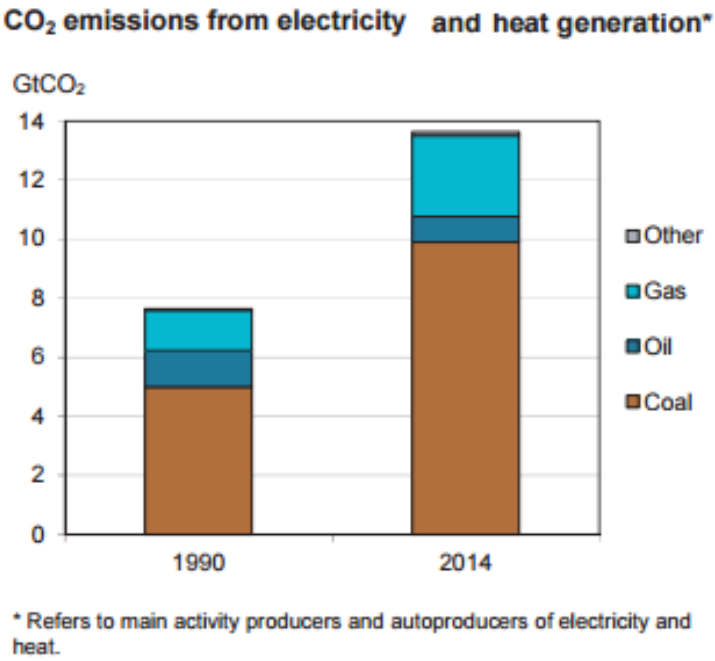


Figure 1.1 CO2 emissions from electricity and heat generation.

In recent years, great importance is taking place globally to renewable energy sources. It was at the end of the 1990s when it began to see the potential. In addition, fossil fuels are running out, and due to the growth of the population and energy demand, has encouraged more use of these sources.

Another very important aspect is the pollution and climate change. There are studies that claim that in the past 10 years have increased levels so that in the previous 200 years.

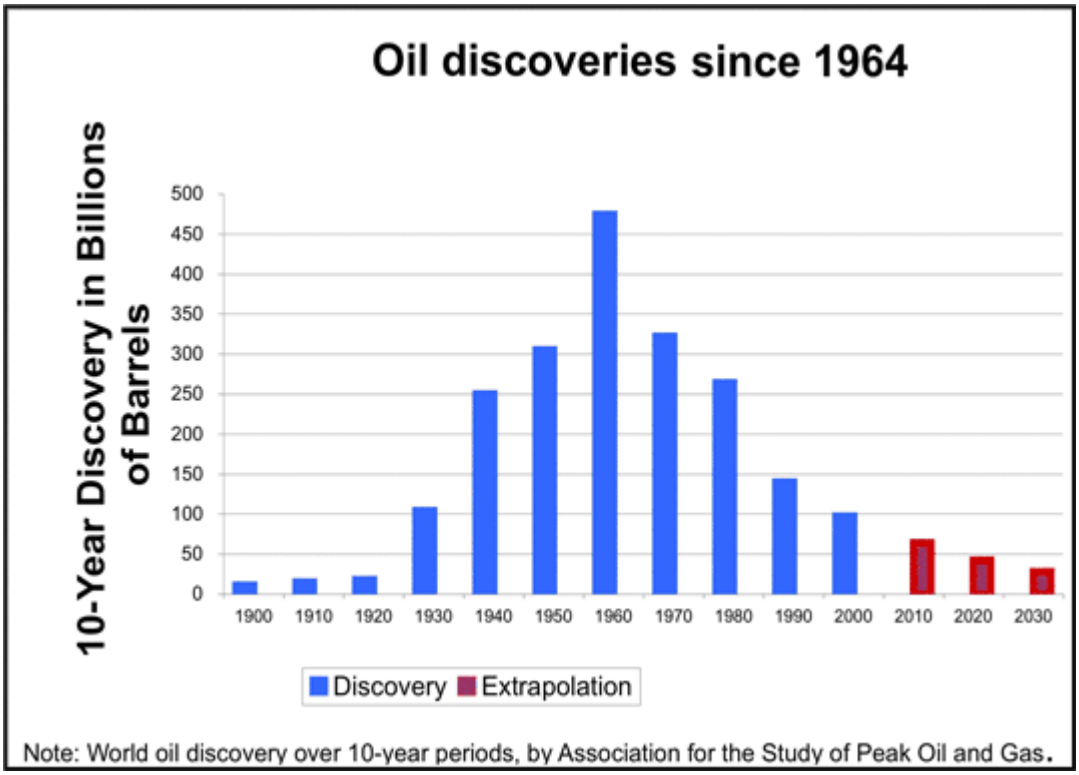


Figure 1.2 Oil discoveries.

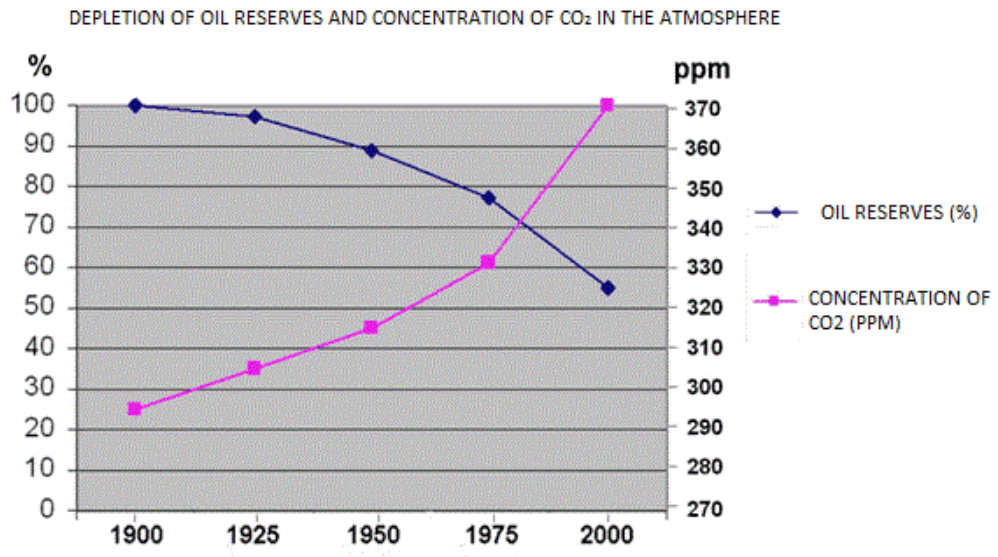


Figure 1.3 Oil reserves and CO2 concentration.

Another important factor is the price, since, due to the scarcity of fossil fuels with the passage of time, its price has increased.

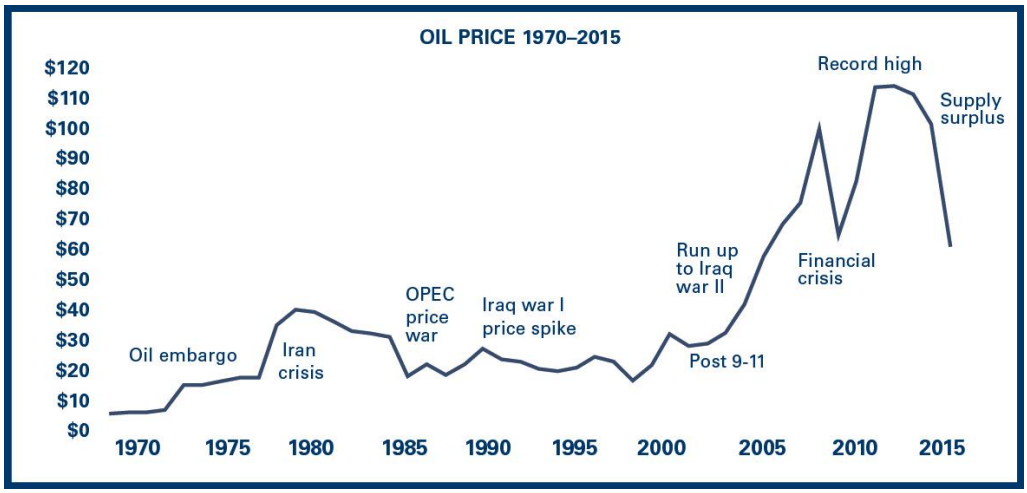


Figure 1.4 Oil price.

For all these reasons, many countries are implementing policies to encourage the use of renewable energies, including Spain, where we want to position our company.

By 2015 was signed the Agreement of Paris, which is trying to keep global average temperature increase below 2°C compared to pre-industrial levels. 195 countries negotiated this agreement, and establishes measures for the reduction of greenhouse gas emissions. Shall apply from 2020, that is when the Kyoto Protocol ends.

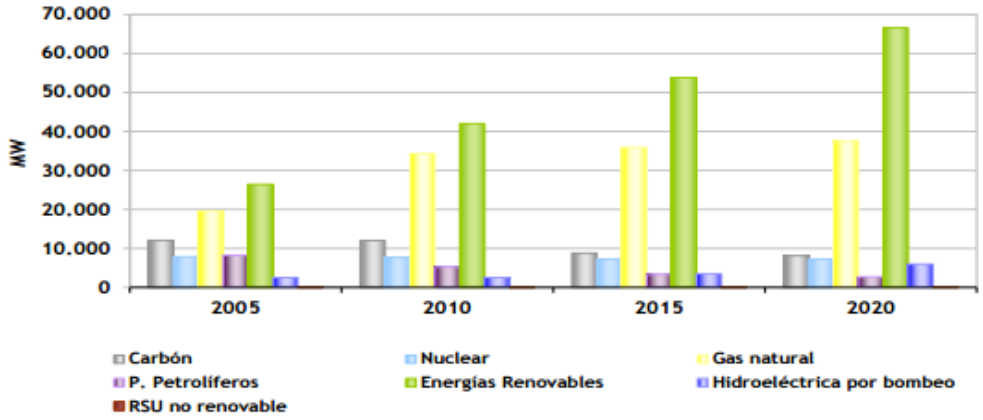
The European Environment Agency (EEA), which brings together 33 countries (EU 28 more Iceland, Liechtenstein, Norway, Switzerland and Turkey), stated in its latest report on the share of renewables in the European energy mix is growing. In 2014 (latest year available for the whole of the abovementioned countries), the share of renewables in gross final consumption of energy in the EU-28 was 16%, which represents 80% of the targets for 2020. (EEA, 2016).

1.1 REE IN SPAIN

The latest plan of renewable implemented by Spain (PER 2011-2020), aims to promote the use of renewable energy sources, and sets the following objectives:

- A 20% improvement in energy efficiency.
- A contribution of 20% of renewable energy.
- A reduction in GHG emissions (greenhouse gas) of 20%.

Figura 3.4: Escenario de Eficiencia Energética Adicional: Evolución de la capacidad eléctrica instalada según fuentes energéticas



Fuente: MITyC/IDAE

Figure 1.5 Evolution of electric capacity installed by sources.

According to the CIEMAT, the situation of renewables in Spain to date December 31, 2015, is a fulfillment of 17.43% of renewable energies in gross final energy. This makes us think that the goal set for 2020 will be met. (CIEMAT, 2016).

The PER 2011-2020 makes a series of economic, legal and technical proposals to grow the use of renewable energy. The proposals that I find most interesting to our company would be:

- For the production of renewable heat incentive programs.
- Public aid (EUR 180 million) to invest in thermal renewable energies, through agreements with the Autonomous Communities.
- Included in the energy certification of buildings thermal renewable energies.

Renewables are dependent on climate. When there is enough water in the swamp, wind and Sun, opens the "thermal gap", which in Spain is mainly covered with fossil fuels: gas or charcoal. The charcoal, when burned to produce electricity, generates up to 60% more CO2 emissions than gas.

In 2016, the thermal gap has been less and less coal has been burned. Gas has been almost used the same as last year. The Ministry of energy, also blamed the decline to the

"the oil price reduction experienced in the last two years". This fall, according to the Ministry, has made that "thermal power stations use petroleum as fuel (petroleum coke) in coal".

For the first time since 2003, Spain has imported more electricity than the exported. In 2016 generation has fallen by 1.9%, but demand has grown slightly, that imports have increased. France, despite the nuclear halt, has once again become the country sold more electricity to Spain. But Portugal - with a strong commitment to renewables - has been the most benefited by selling us more than what you purchased.

Renewables produced more electricity than coal, gas and nuclear power in 2016. The data appears in the Advance of the system electric Spanish 2016 report, released on electrical network of Spain. According to this progress, the main source of electricity in Spain has been, throughout this year 16, Iberian nature, i.e. the sun, wind, water and biomass that we have here (41.1%).

BALANCE ELÉCTRICO ANUAL (1)

	Sistema peninsular		Sistemas no peninsulares		Total nacional	
	GWh	% 16/15	GWh	% 16/15	GWh	% 16/15
Hidráulica	39.049	25,1	4	-1,7	39.053	25,1
Nuclear	55.546	1,4	-	-	55.546	1,4
Carbón	34.740	-31,8	2.298	23,2	37.038	-29,8
Fuel/gas (2)	-	-	6.748	3,9	6.748	3,9
Ciclo combinado (3)	26.186	3,6	3.601	-10,5	29.787	1,7
Hidroeólica	-	-	19	117,3	19	117,3
Eólica	48.507	1,7	420	4,6	48.927	1,7
Solar fotovoltaica	7.570	-3,5	409	2,6	7.979	-3,2
Solar térmica	5.102	0,3	-	-	5.102	0,3
Otras renovables (4)	3.440	8,4	11	4,8	3.451	8,4
Cogeneración	25.843	1,7	35	10,2	25.878	1,7
Residuos	3.049	2,1	275	-11,6	3.324	0,8
Generación	**249.031**	**-2,1**	**13.819**	**2,0**	**262.850**	**-1,9**
Consumos en bombeo	-4.846	7,2	-	-	-4.846	7,2
Enlace Península-Baleares (5)	-1.232	-7,8	1.232	-7,8	0	-
Saldo intercambios internacionales (6)	7.313	-	-	-	7.313	-
Demanda (b.c.)	**250.266**	**0,8**	**15.050**	**1,1**	**265.317**	**0,8**

(1) Asignación de unidades de producción según combustible principal. (2) En el sistema eléctrico de Baleares se incluye la generación con grupos auxiliares. (3) Incluye funcionamiento en ciclo abierto. En el sistema eléctrico de Canarias utiliza gasoil como combustible principal. (4) Incluye biogás, biomasa, hidráulica marina y geotérmica. (5) Valor positivo: entrada de energía en el sistema; valor negativo: salida de energía del sistema. (6) Valor positivo: saldo importador; valor negativo: saldo exportador. Los valores de incrementos no se calculan cuando los saldos de intercambios tienen distinto signo.

Figure 1.6 Annual electric Balance for 2016.

As we can see above, Biomass is included in “Other renewables”, and it´s an unpopular source at this moment. So, we still can develop it in Spain.

1.2 BIOMASS

Biomass is the use of organic matter as an energy source. By its broad definition, the biomass covers a wide range of organic matter that is characterized by its heterogeneity, both its origin and its nature.

In the energy context, biomass can be considered organic matter originated in a biological, spontaneous or provoked, usable process as a source of energy. These biomass resources can be grouped broadly in agricultural and forestry. Biomass is also considered organic matter in wastewater and sewage sludge, as well as the organic fraction of municipal solid waste (OFMSW), and other residues resulting from the industries.

The assessment of the biomass can be done through four basic processes by which can be transformed into heat and electricity: combustion, anaerobic digestion and gasification and pyrolysis.

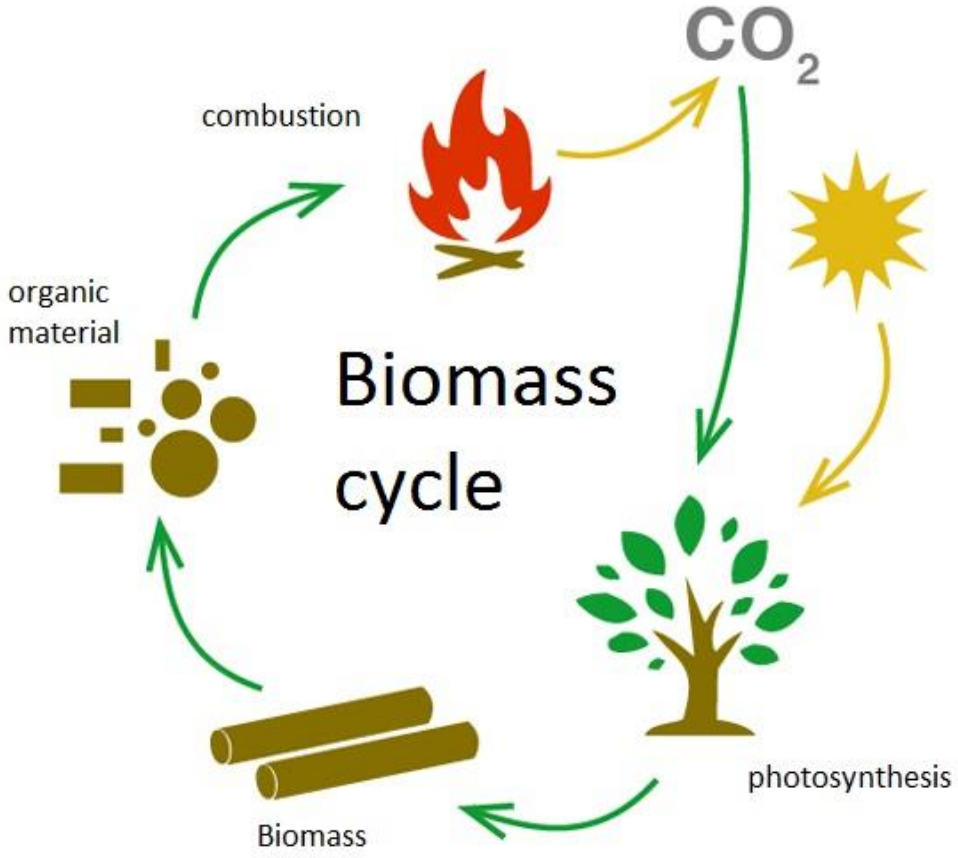


Figure 1.7 Biomass cycle.

Before fully entering the study of this type of building facilities is important to talk about its advantages and its disadvantages, the most important from an ecological point of view is its zero impact on emissions of carbon into the atmosphere, since CO2 is given off by combustion cannot be higher than the absorbed by the biomass in its phase of growth , on the other hand the economic aspect, here would have to be grouped together two parties involved in the process, on the one hand consumers who, given the high prices of fossil fuels see the biomass as a profitable in these times and on the other hand the agents involved in the production of this resource, i.e., local economies, which are the great beneficiaries of this market that directly will revive a market that in general is deficient.

The downside should emphasize the high cost of heat production equipment and its mechanical complexity against the conventional energy and the emission of benzopyrenes, a compound declared a carcinogen by who but that so far has not exceeded in any scientific study of maximum levels permitted by that organization.

General biomass has more benefits than harm. To facilitate its implementation, the work of the State Government is very important in his role as financier in the long run, which already are being seen in performances by the Institute for the diversification and energy saving (IDAE) with the PAREER program and supports regional and local governments are to promote the use of biomass.

Generically we can divide them into agricultural and forestry according to their origin. And according to their application, in biomass power and thermal.

- Thermal: we use it for industrial-process air conditioning of buildings, and district heating. This last try it more in detail in the ANNEX.
- Electrical: used for the generation of electric power.

Regarding the electrical use, the combustible material which is considered biomass, as established in the RD 661/2007 which regulates the activity of production of electrical energy in special regime, is:

- Energy crops, agricultural and forestry.
- Agricultural activities and gardening, and forestry residues and other operations sylvicultural forests and green spaces.
- Agricultural and forest residues and black liquor from the paper industry.
- With respect to the end-use heat in Spain are consumed more than 4 Mtoe for heat end-uses that the domestic industry uses almost half and the rest is found in industrial applications such as paper, wood, furniture, and food industries.

In recent years, as described above, targets both by Spain as the European Union and, in general, throughout the world, have increased the need for obtaining energy from renewable energy sources.

The regulatory framework of the biomass is composed of various laws which we should highlight the RD 661/2007, which regulates the production of electrical energy in special regime, and the law 43/2003 of Montes, which guarantees the conservation and protection of the Spanish mountains.

In addition to national laws, there are specific laws at the regional level that should be observed in each autonomous community.

In addition, we have experienced an increase in the price of fossil fuels, and an increase of the technological development that allows us to obtain biomass energy more efficiently.

Therefore, raises us a growth potential of this sector. It is also important to note that the population is increasingly more aware of that fossil fuels are running out, so it is needed a sharp change of course towards renewables.

To make sustainable use of biomass, it is accurate that the logging is done selectively and fulfilling vegetation cover recovery periods.

Through this selective logging and the creation of a discontinuous patchwork on the forest of the territory several targets would get as the obtaining of wood, the possible occupation of those areas with rural and sustainable recreational use with the environment, the protection of large forest fires, etc.

Combating deforestation are necessary research around two fundamental aspects:

- Studies of economic feasibility and optimization of resources, which provide alternatives economic and technical to take advantage of vegetable waste forest to minimize spending and, thus, achieve that more people add it to use biomass in a responsible manner.
- Learn how to enhance the plant remains that are found after a forest fire in a wooded area. In many ecosystems fires are something intrinsic and therefore will occur. Since this is a fact, it would be good to be able to give a value to those plant remains post-fire.

2 ALTERNATIVES

2.1 EOLIC ENERGY

Wind energy is renewable energy more mature and developed. It generates electricity through the force of the wind, using the kinetic energy produced by the effect of the air currents. It is a source of clean, inexhaustible energy that reduces greenhouse gas emissions and preserves the environment.

Wind energy has been used since ancient times to move boats powered by sails or run the mills machinery to move their blades. Since the beginning of the 20th century, produces power through wind turbines. Wind energy moves a propeller and, using a mechanical system, spins the rotor of a generator that produces electricity.

Wind turbines are often grouped into concentrations known as wind farms with the aim of making better use of energy, which reduces its environmental impact. The machines have a lifespan of twenty years.

With an increase in the capacity of 38 MW in 2016, wind power has been the second source of power generation in Spain in that year. Spain is the fifth country in the world for wind power installed, behind China, United States, Germany and India. The power installed at 31 December 2016 was 23.026 MW.

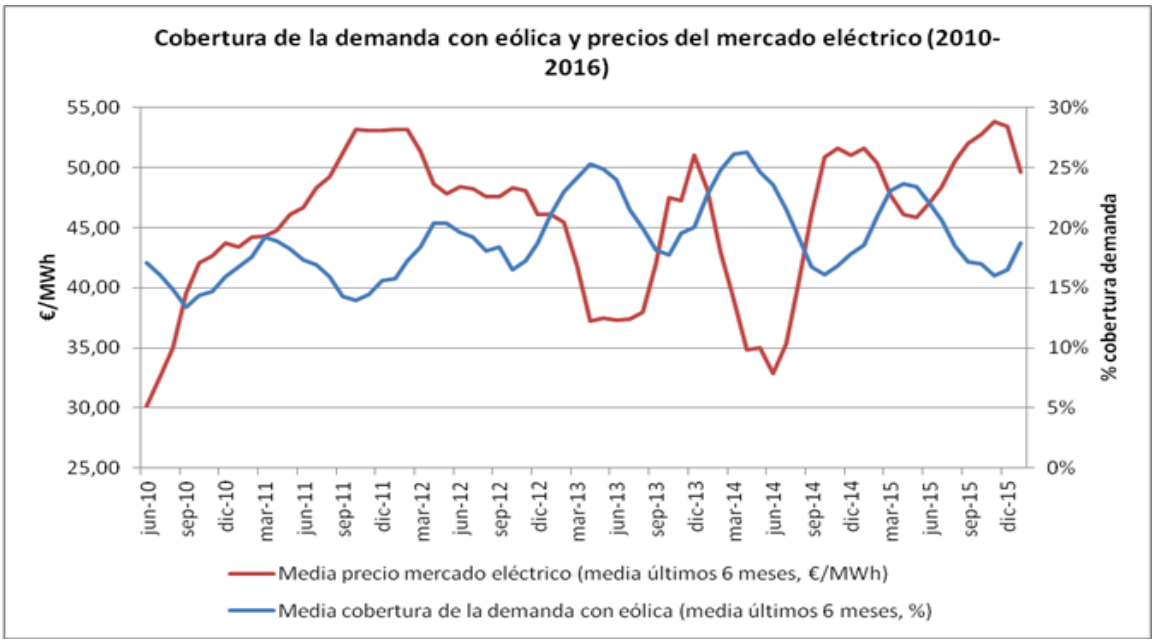


Figure 2.1 Prices of electricity and % of demand covered with Eolic energy

2.2 SOLAR ENERGY

Solar energy in Spain is a source of renewable electricity that is at an advanced stage of development, installation and use. It can be subdivided into two types, mainly: solar PV and solar thermal energy. Spain is one of the countries in Europe with more hours of sunshine, which joined the European commitments in installation of renewable energies, as well as convenience strategic reduce heavy dependence on foreign energy and to increase self-sufficiency in energy.

The photovoltaic solar energy is a source of energy that produces electricity from renewable sources, obtained directly from solar radiation through a semiconductor device called photovoltaic cell, or by means of a deposition of metals on a substrate called thin film solar cell.

The solar thermal or solar thermal energy consists in the use of energy from the Sun to produce heat that can be used to cook foods or to produce hot water for domestic water consumption, either hot water or heating.

We are going to study the latter, since it is which is related to the activity of our company, the objective being to generate heat in buildings through heating systems.

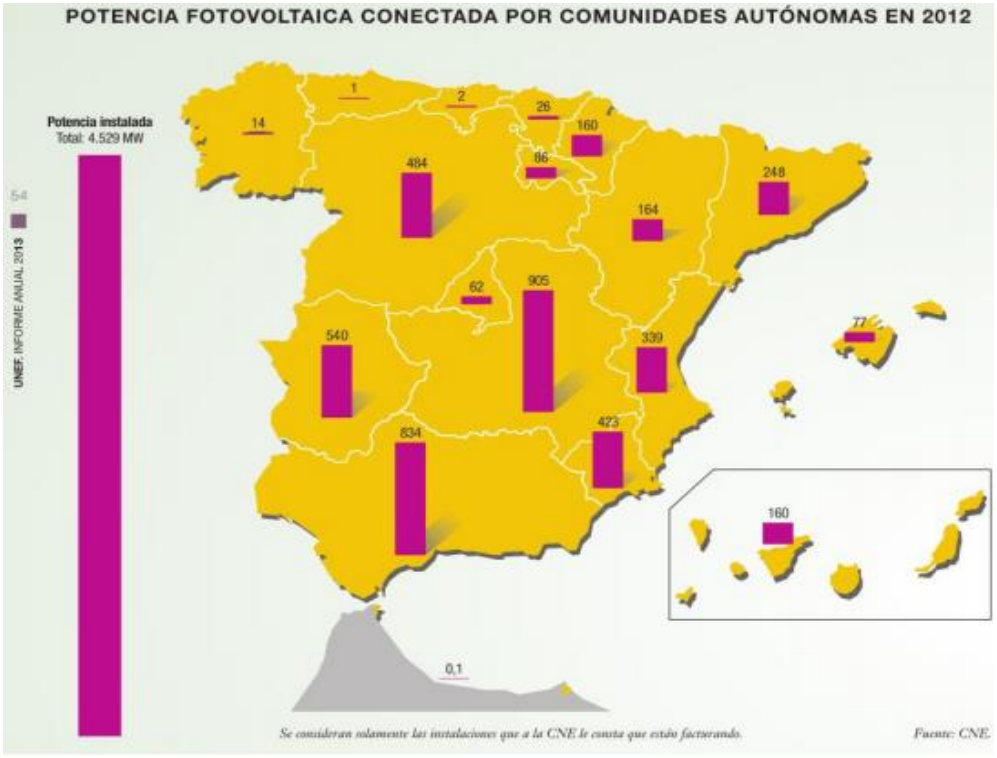


Figure 2.2 Photovoltaic power by regions

We can observe that in the North of Spain is very little developed, in relation to the South. This is due to the difference of climate that there is. Anyway, in the South it is also highly developed, in comparison to other European countries.

In addition, almost all plants are concentrated in large solar parks, but not in facilities for individuals.

You are attempting to encourage private investment to promote self-sufficiency, and thus contribute to climate change, but, as we can see, it is not getting.

Forty civil society organizations - consumers, environmentalists, entrepreneurs, trade unions, cooperatives - tabled on May 11 in Madrid NATO for self-consumption.

The Alliance does not want economic constraints or administrative "as those that currently exist for self-consumption" in Spain. This savings solution was regulated by Government of Rajoy, in October 2015, by means of the Royal Decree (RD) 900. That standard, which regulated and regulates "conditions administrative, technical and economic" self-consumption, known as tax includes the Sun (0.075 €/kWh). The Alliance calls for the withdrawal of this tax.

The reason that wields the Government to maintain this tax is as follows: If you generate with solar panels that you have installed on the roof of your house for example 30% of the electricity that you use, you will stop buying in the market that 30%; that is, that you will save 30% the kilowatt before you were consuming; you will also save those kW VAT and the tax that is associated with each kilowatt electricity. In addition, you save the toll those kW - leading partner to finance the maintenance of the networks, for example - also, which affects the sustainability of the system.

The cost of the installations of solar panels has dropped 80% in five years. Manufacture of modules and other basic components of PV systems companies have adopted economies of scale and technology has passed the period of learning and you can be considered mature.

However, the stagnation in the construction of new grid-connected photovoltaic projects is motivated in Spain by regulatory changes (reduction of premiums retroactive, elimination of aid for future plants...), what has caused the disappearance of many companies at different levels of the chain of value.

2.3 COMPARISON

In this section, we will compare these two energies analyzed, with diesel oil, which is the main fuel used in the systems of heating of buildings, and the Pellet, which is the option proposed by our company.

We will find the price of each source, and, in addition, the costs of installation media for each system.

2.3.1 Gasoil

To calculate the price per kWh, we first need to know the calorific value of the fuel. With the data of Petromercado*, assume the calorific value of the fuel as 10 kWh/l. (PETROMERCADO, 2016).

$$\frac{1}{\frac{10kWh}{l}} * \frac{1{,}13€}{l} * \frac{100c€}{€} = \frac{11{,}3\ c€}{kWh} \qquad \text{Equation 2.1}$$

2.3.2 Eolic energy

From this source of energy, we get electricity which we can use to heat water later. But it is not viable to install this system for individuals, the only way to use it is with many turbines in wind farms, so we will discard this alternative.

2.3.3 Solar energy

This could be the most interesting alternative. It has high fixed costs, and, as I said before, we should pay taxes for the energy we get, so it doesn´t look like to be better than the alternative I propose (Pellets).

The cost would be 7.5 c€ / kWh which is the tax you should pay in Spain.

2.3.4 Pellets

Today the pellet is between €0.26423 /kg and 0.22433 €/ kg, depending on the selling format. This is equivalent to 5.55 c€ / kWh and 4.71 c€ / kWh, respectively.

2.3.5 Conclusion

We will determine what the constructive conditions of our housing type. It is a detached, insulated, 100 square meters built on one floor occupied by three persons and with two bathrooms. The construction of the same has been scrupulously following the criteria indicated on the CTE.

All the energy that is consumed in the home, will be electric; lighting will make it with LED light points, the appliances will be classified as A ++ and the DHW production will meet the minimum indicated by the CTE in terms of its percentage of production by solar thermal panels and consumption (28 liters per person to 60 ° C by day and a minimum of production according to solar radiation).

To be heated and cooled, use a heat pump on the market with a 3.5 COP and as issuer under floor heating throughout the House.

We get different energy needs we will introduce here. Depending on the geographical location will be higher or lower.

	ENE	FEB	MAR	ABR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DIC	Total año
A	479	444	401	369	353	351	351	351	351	352	389	447	4638
B	464	430	396	376	359	351	351	351	351	359	404	445	4638
C	554	495	448	420	376	352	352	351	352	373	459	535	5066
D	614	569	514	463	407	358	353	353	367	416	531	606	5552
E	695	640	584	535	466	395	375	373	404	466	595	681	6209
α	351	351	351	351	351	351	351	351	351	351	351	351	4209

Figure 2.3Annual energetic consumption per house

Assuming an average of 5000 kWh per year, the price we get to solar and pellets is therefore the following:

- Solar: 5000 kWh/year * 0.075 €/kWh = 375 €/year.
- Pellet: 5000 kWh/year * 0.0555 €/kWh = 277.5 €/ year.

We will now analyze the costs of installation and maintenance:

- Solar: 10.000€ installation (approx.) and maintenance of 395 €/year (approx) price.
- Pellet: 3.720€ installation (approx.), to which must be added about 1.500€ in dwellings in which there are to replace the previous diesel oil boiler by new biomass. The maintenance price is 150€ per year.

Therefore, the choice of pellets is more attractive than solar panels (nowadays, and due to the obstacles in the legislation for solar energy in Spain).

15 years	GASOIL	EOLIC	SOLAR	PELLETS	ELECTRICITY
Price per kWh	0,11	X	0,075	0,0555	0,13
Installation	3720	X	10000	5220	X
Maintenance	150	X	395	150	131,2608
Price for average house	**13.470,00 €**	**X**	**19.575,00 €**	**10.882,50 €**	**11.062,61 €**

Installations of solar panels could be an alternative to get electricity, but not for use as a heating system.

If the law changed, we would have to recalculate all the costs, but nowadays we conclude that the best option to power an average home is to install a boiler that runs on biomass.

3 PRESENTATION OF THE PROJECT

3.1 SUMMARY OF THE PROJECT

We will place our company in Castilla y León (Spain) where will be our production activities. The promoters will be Mario Díaz and Agustín Pallares, two students of engineering in Industrial Organization.

The company is a limited company, because of the advantages offered by this type of company due to our business.

The objectives of this project are to meet existing national and European demand to the Pellet, which is growing more and more and that many countries are importing from other continents.

The market that we want to go, it is both the Spanish and European, and will offer products both individuals (smaller lots), and industries. Also, due to the growth of housing in recent years, and the price rises are expected oil, which prevents to continue using diesel as fuel, believe that the demand for Pellet stoves will grow much.

We chose this market because we have seen that there is a gap between production and consumption in Europe of pellets. Europe consumes 75% worldwide, but produces only 50%, USA and Canada being the main countries covering that gap. (AEBIOM, 2015).

Then shows the main consumers of pellets in recent years:

Main Pellet Consumers (1,000 MT)							
Calendar Year	**2010**	**2011**	**2012**	**2013**	**2014[e]**	**2015[e]**	**2016[e]**
UK	180	1,000	1,400	3,700	4,900	6,700	7,200
Italy	1,650	1,950	2,200	2,500	2,900	3,300	3,500
Denmark	1,600	1,600	2,100	2,400	2,100	2,100	2,150
Germany	1,200	1,400	1,700	2,000	1,800	1,850	2,025
Sweden	2,280	1,880	1,700	1,860	1,650	1,650	1,650
Belgium	920	1,200	1,700	1,500	900	1,250	1,250
France	400	400	550	690	880	950	1,080
Austria	660	720	790	880	950	1,000	1,000
Spain	175	200	250	380	700	700	700
Netherlands	910	1,000	1,250	1,200	500	300	600
Total	**11,400**	**12,500**	**15,000**	**18,300**	**18,800**	**20,500**	**21,500**

Source: AEBIOM and Member State sector organisations, e = estimate EU FAS Posts

Figure 3.3.1 Pellet consumers.

European countries having to import, because they do not produce as much as they need, more pellets are United Kingdom, Denmark and Italy. Therefore, these countries will be our main customers. At the same time, in most countries are being implemented sustainability measures, related to the energy certification of buildings, that open us the doors to a broad market of heating systems.

Main EU Importers of Wood Pellets

(1,000 MT)

	Total Imports[a]		Imports from U.S.	
Calendar Year	**2014**	**2015**	**2014**	**2015**
United Kingdom	4,715	6,519	2,895	3,528
Denmark	2,146	2,068	86	28
Italy	1,956	1,640	180	48
Belgium	657	989	423	629
Sweden	522	355	29	0
Germany	419	418	4	2
Austria	344	369	0	0
France	168	137	0	13
Netherlands	451	130	272	38
Total EU28	-	-	**3,890**	**4,287**

Source: GTIS (HS Code: 440131) (a) Includes EU intra-trade.

Figure 3.3.2 Main pellet importers.

On the other hand, in March 2017, FAO published a report highlighting that 7% of emissions caused by humans, are caused by producing and use charcoal and firewood. In addition, this report states that one-third of the world's population used firewood for cooking, as well as many small businesses. Finally, the report suggests Governments they introduce measures to encourage investment towards sustainable energies in this field (such as pellets), and proposes to improve the regulatory framework affecting these issues. (FAO, 2017).

With these data, we think that our products have a high chance of success if we work with them well. That is why we offer quality products that differ from the rest.

The difference of our pellet with the rest of Europe, is of the same quality. We will produce with the seal of quality in-A1, studying the techniques of production and production of pellets, the technology used, machinery, etc.

For the location of the company will look at several options: Valladolid, Burgos, Segovia, and Leon (all in Castilla y Leon).

The risks presented to us are that there is a need by the market, there are other many developers who see this need and believe companies to try to satisfy them. Why we see fundamental differentiation in quality, we believe that in this way our company will always be more attractive to customers and that will prefer our products.

3.2 EVOLUTION OF THE PROJECT: ORIGINS AND CURRENT

The idea of creating this company arose from a study we did on the oil fields, and on the use of the human being of this resource. We realized that it is untenable to continue exploiting the oil fields at this rate; and we saw that it was unfeasible in the short term.

This, combined with the increase in diesel oil prices, its fluctuations, and measures that all Governments are instituting allowed us to see that there was a business in the sector of the renewable opportunity.

Therefore, we considered any alternative that could replace oil in some aspect of day to day (cars, tools...).

Obviously, the major car brands have many years studying electric motors, so that field cannot tackle it with high expectations of success. On the other hand, not it is investigating both pellets and stoves functioning with pellets. Hence, we decided that our project would be on this topic.

The pellet industry began in the 1980s, due to the price of the 1970s-energy crisis. In general, he has worked at the residential level.

In Spain, previously was not used much this source of energy because it was not very efficient. The technologies for their production were not good enough, and pellets lacked a competitive calorific value in the market. This, added to that the population was not so concerned about climate change, was that the pellet is not particularly attractive.

In 1995, the Pellet Fuels Institute unveiled a standard for the industry. Two kinds of pellets have been created: standard and Premium. Specified aspects such as the diameter and the percentage of ash. As a few acceptable methods were not available to measure quality, many manufacturers simply tested its products once, and put their products on the market as a Premium.

In 2005, the Institute presented methods for checking the quality of the pellets. A roadmap is created for the establishment of an effective system of quality control, and from it, to standardize the methods.

The Deutsches Pelletinstitut GmbH (DEPI) created the system of quality certification ENPLUS, which serves for the heating of the wood pellet market in 2010. It is based on the international standard ISO 17225-2. The key objective of the European Pellet Quality Certification project is to create and implement an ambitious and uniform certification system for pellets in Europe, which will be used both by the heat and the power markets, for intra-European trade but also for imports.

Currently, ENPLUS trademark rights are in possession of the EPC (European Pellet Council), and in some countries, it gives rights to the respective national association. In the case of Spain, AVEBIOM is it that is responsible for coordinating requests and audits, both documentary and analytical. (web enplus-pellets, 2015).

Bioenergy International magazine, in 2010 there were 30.6 million tons of capacity in the world, which would amount to 144 million Mwh, which would be about 14 million m3 of oil. All this, in the 515 plants that were counted.

In Spain, in 2010, production capacity was 800.000 tons, but only 50.000 tons were produced. This can be due to that in 2010 the price of diesel as fuel in Spain was not very high, stoves pellet-powered were more expensive that now, had not developed much technology, and the population was less concerned about climate change.

In 2015, according to AVEBIOM, the production capacity amounted to 1.250.000 tons, but production remains sluggish and stands at 475.000 tons. (AVEBIOM, 2015).

3.3 MISSION, VISION AND VALUES.

3.3.1 Mission

Fully develop own project adapted to the current demands of a market that has evolved a lot in the last 5 years. We believe that it is an exceptional moment for the development of a company that give global and specialized service to companies, organizations and individuals that demand effective solutions provided by true professionals. We want to form a team with spirit of sacrifice and service to satisfy the exposed necessities.

3.3.2 Vision

MPeleitor vision is the technology to reach all customers, adjusting our products to the technological advances and taking care of our customers and at the same time the environment, pocket to produce fuels from biomass.

We want that heat reach all households at an affordable price for everyone, and, above all, sustainable for the planet.

3.3.3 Values

At MPeleitor we value people and employees, have priority in the care of the rights of the employees, their families, are looking for the best benefits of customers and we ensure the value of the planet, using products that do not produce damage in its use and manufacturing to the planet, seek mainly organic and real, consciousness using the technology for the benefit of society and the own planet.

3.4 VALUATION OF THE PROJECT

For as described above, and in short, MPeleitor is a company that is going to introduce in the market sustainably have stoves in house, and fuel for these stoves that do not produce pollution. In addition, we will also work with large industries such as electrical, which our pellets can be used to generate electricity. The most attractive in our project is the lack of competition that we, and the potential demand that exists, which makes very interesting proposal which we offer.

A key aspect is to ourselves we're going to take care of producing and commercializing products, offering in this way a total reliability to the client and an assured quality.

We believe that the project will succeed because we are going to meet an existing need, such as heating systems, the generation of electricity, etc., therefore we not run the risk of having to create a new need in the market, exposing ourselves it is not coulure. We offer the customer is to continue to enjoy all the same comforts that so far, but in a sustainable way for the planet and the human being at the time.

4 MARKET ANALYSIS

4.1 DEFINITION OF THE PRODUCT

As we have mentioned before, MPeleitor will produce and sell pellets and stoves that work with this type of fuel.

A pellet is a small portion of material agglomerate or compressed, from remains of pruning, such as shavings, sawdust and wood chips. Is a completely natural product, listed from solid biomass, which makes it interesting.

We can distinguish several uses of pellets, depending on the quality and the origin of these:

- **Industrial**: to generate heat and electricity, mainly.
- **Medium-sized facilities**: for heating and hot water in hospitals, etc.
- **Domestic**: heating systems, kitchens, ovens...
- **Others**: beds for animals like horses.

Depending on the raw material used, the pellets have different properties. We will work with forest waste, from which we can make our pellets. The features that we will obtain, therefore they will be:

- **100% natural pellet debarking pine wood.**
- **Size**: we will have a diameter of 6-8 mm for domestic (ENplus A1), and 10 mm for the industrialists. Gets a very dense product with low humidity, using lignin as an adhesive to crimp it. Long will be 2.5-3 mm.
- **Density**: get around 700 - 800 kg/m3.
- **Moisture**: this feature is important, since less moisture, get more calorific value. We will work with moisture content of between 4-5%.
- **Ash**: less than 0.6%.
- **Calorific value**: between 16-19 megajoules per kilogram (MJ/kg).

4.2 ENVIRONMENT ANALYSIS

4.2.1 GLOBAL AND EUROPEAN CONTEXT

Below is a graph of the distribution of the consumption of primary energy in the world shown by sources:

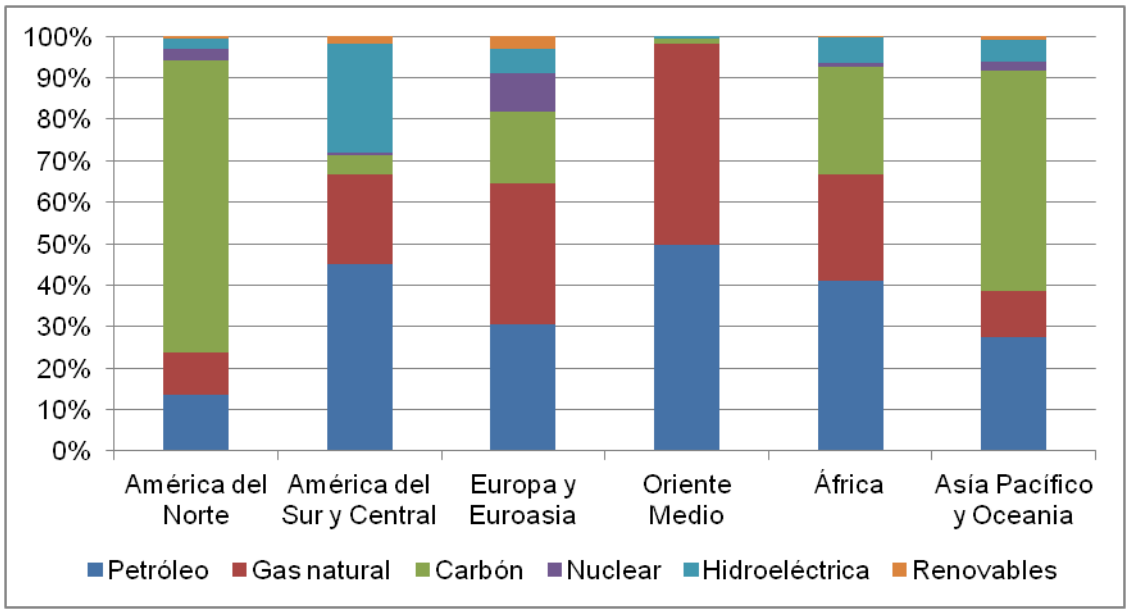


Figure 4.4.1 Consumption of primary energy by sources.

In the European Union, it is quite common to use pellets for heating and DHW. Since 2004 has increased the number of facilities of biomass boilers, although we still have much reliance on oil and natural gas.

Demand more and more bioenergy, driven by the objectives and policies for renewable energy in Europe, has led to a boom in the production of wood pellets, which has increased tenfold in the last decade. But the key factor is competitiveness with respect to fossil fuels. The Baltic countries (Estonia, Latvia and Lithuania), were the second largest producer and exporter of pellets around the world after the United States, by 2015. (FAO, 2015).

By 2015, the global pellet production amounted to 28 million tons. This represents an increase of 8 percent over the year earlier - 26 million tons-level, and an increase of 42 percent compared to the 20 million tons produced in 2012. (FAO, 2015).

The European Commission set that by 2020 consumption final energy by biomass will be 1,650 TWh, so it obtained primary energy will have to be between 1,850 and 3,400 TWh, depending on whether the biomass will be used to produce heat or electricity.

In Europe, the pellet, is mainly used to produce heat (61%), although it is also used to generate electricity (39%).

The European Climate Foundation did a study which concludes with that I will arrive at a range of 2,000 TWh per year of biomass produced in the European Union. To meet a demand of 2,300 TWh we will have to import 300 TWh per year. (ECF, 2016).

4.2.2 NATIONAL CONTEXT

According to the PER 2011 - 2020 in Spain will have to generate 4.850.000 tons of oil equivalent by 2020, using biomass as a source of energy. But, as Spain has much potential forestry and forest area, there are those who say that it could reach one million tons of oil equivalent by 2020.

According to Avebiom, figures for 2020 are 1.646.000 tons of capacity and 792,000 tons produced in Spain.

As previously mentioned in section 2.3.-, there are 66 plants certified ENplus in Spain. If we consider all the plants (big, small, etc.) we have a production capacity of 1.250.000 tons, but production was around 450.000 tons (38%). (AVEBIOM, 2016).

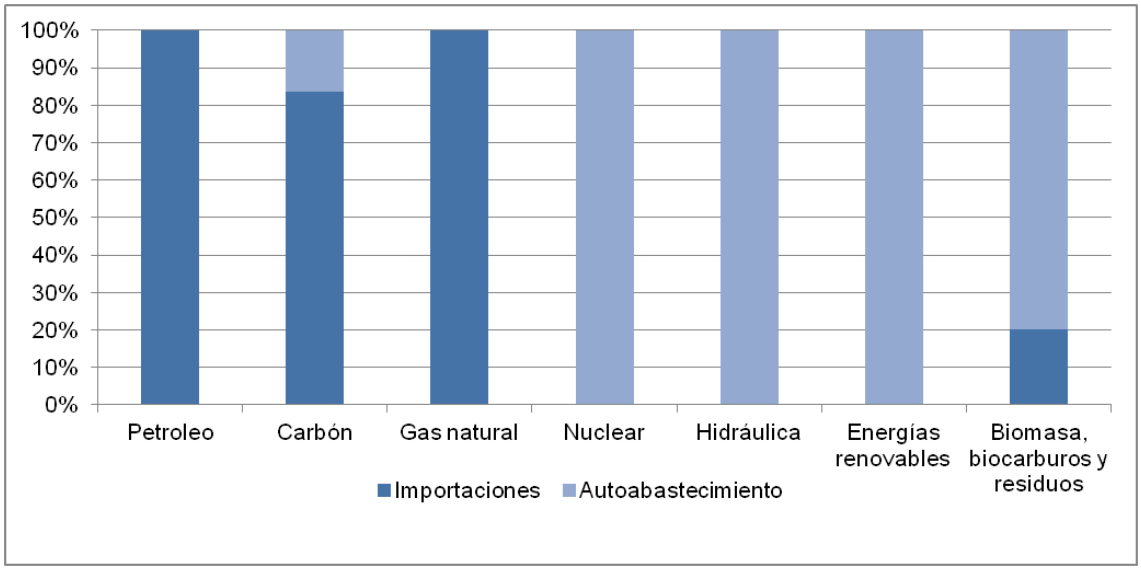


Figure 4.4.2 Imports and self-sufficiency.

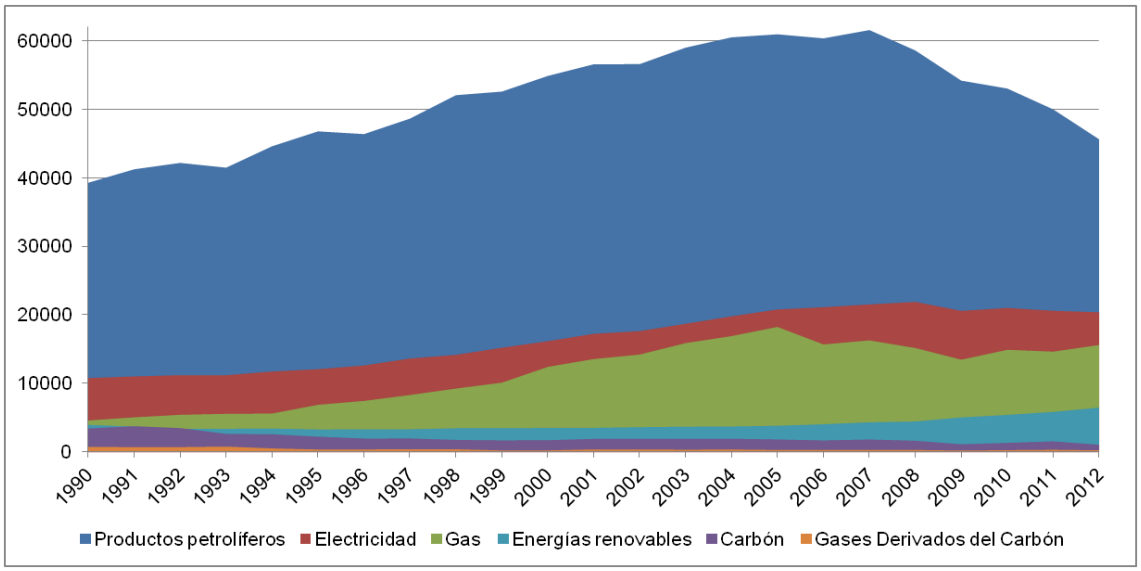


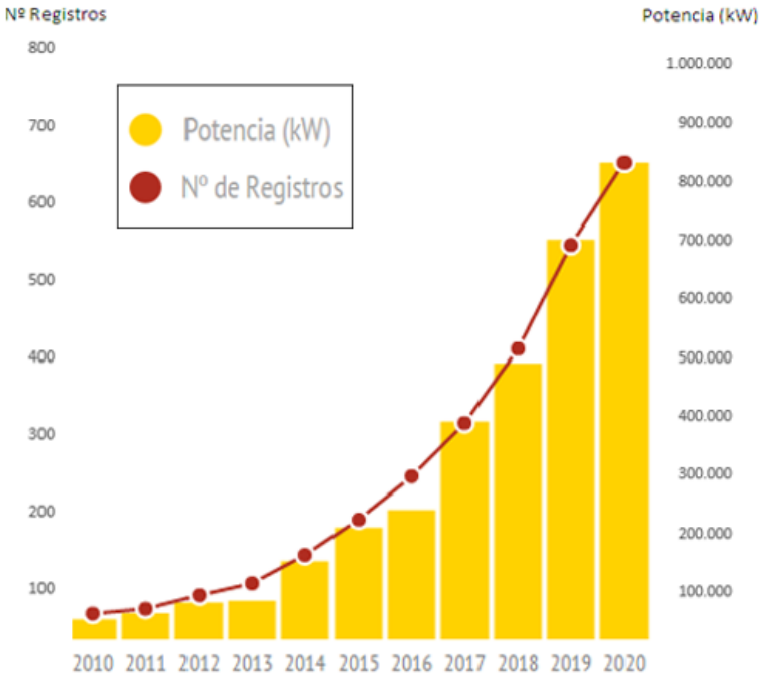
Figure 4.4.3 Energy obtained by different sources.

The official newsletter of the province of Barcelona May 6, 2017, published the call of subventions to local entities that install solar photovoltaic self-consumption and boilers and/or municipal networks of heat with biomass. The 750.000 € budgeted, 570.000 destined for the second match, where especially rewards the use of splinter in heat networks. This Barcelona strengthened its state leadership among the provinces with the largest number of biomass boilers.

In Castilla y León, which is where will carry out our activity of production and manufacture, there are 600 bioenergy installations that registered an output of 217,5 Mwt. It is the leading region at the national level, with 7 installed plants that produce more than 160.000 tons a year.

The Junta de Castilla y León is trying to promote the use of biomass. To do so, as well as the Plan of bioenergy, La Junta drives Forest Resources Mobilization Plan and the Plan for the implementation of biomass boilers in public buildings.

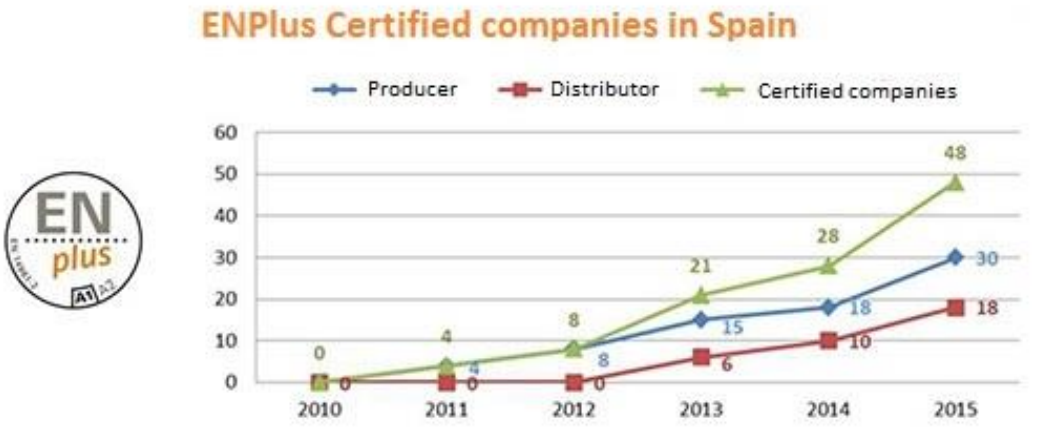
Board highlights the Plan of implementation of biomass boilers in public buildings, which aims to improve energy efficiency and savings between 20 and 30 per cent in fuel costs, implement renewable energy, "become an exemplary action for the development of the biomass for thermal purposes in the Community and promote the activity, create employment in the rural world and improve our forests". This performance, with 58 million euros of investment and over 200 performances, is the replacement of diesel oil boilers for boilers of biomass in public facilities, education, health and social services in rural areas. (BIOGRAMASA, 2016).



Año	Nº de Registros	Potencia (kW)
2010	34	33.351
2011	41	44.683
2012	60	64.023
2013	77	67.464
2014	117	139.274
2015	167	200.400
2016	227	232.675
2017	302	392.600
2018	406	497.350
2019	552	721.404
2020	667	860.434

Figure 4.4.4 Obtained power and records.

In this graph, we see records in Spain and obtained power, as well as an estimate of the next few years.



	2010	2011	2012	2013	2014	2015 (estimation)
Producers	0	4	8	15	18	30
Distributors	0	0	0	6	10	18
Certified companies	0	4	8	21	28	48

Figure 4.4.5 ENplus certified companies in Spain.

This graph shows that it had estimated 48 companies certified by 2015 in Spain, but the reality is that there are 66 companies by 2015. We see that the expectations are being overcome which indicates that it is increasing the use of stoves and pellet based heating systems.

From AVEBIOM we get a graph with biomass facilities installed in Spain 2010.

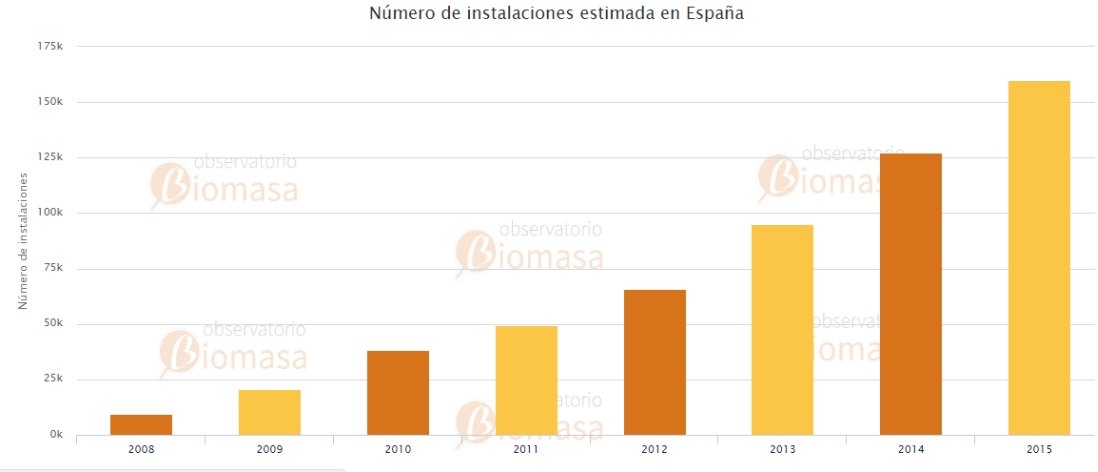


Figure 4.4.6 Biomass facilities installed.

As we see it has greatly increased in recent years.

We also find a very attractive gap in the market with the concept of district heating, where La Junta is preparing a big amount of money to finance those projects.

4.3 PESTEL ANALYSIS

4.3.1 POLITICAL AND LEGISLATIVE ENVIRONMENT

In Europe, on 10 January 2007, established a long-term strategy in the Union, proposed for 2020 that 20% of energy sources should be renewable. The European Commission reviewed the progress of Member States for the last time in 2013, concluding that most countries have fulfilled the intermediate objectives.

At the level of the European Union, the European Council adopted the framework on climate and energy in 2014 to 2030 with three binding targets: to) 40% reduction of CO2 emissions at the household level; (b) achieve 27% of renewable energies in energy consumption; and (c) achieve 27% improvement in energy efficiency.

The "roadmap to a low-carbon economy" proposes that by 2030 emissions of greenhouse gases are reduced a 40% compared to 1990 levels, by 60% in 2040, and 80% by 2050. (web europarl.europa.eu, 2016).

Also intends to encourage investment in green technologies, which makes it very interesting to the sector.

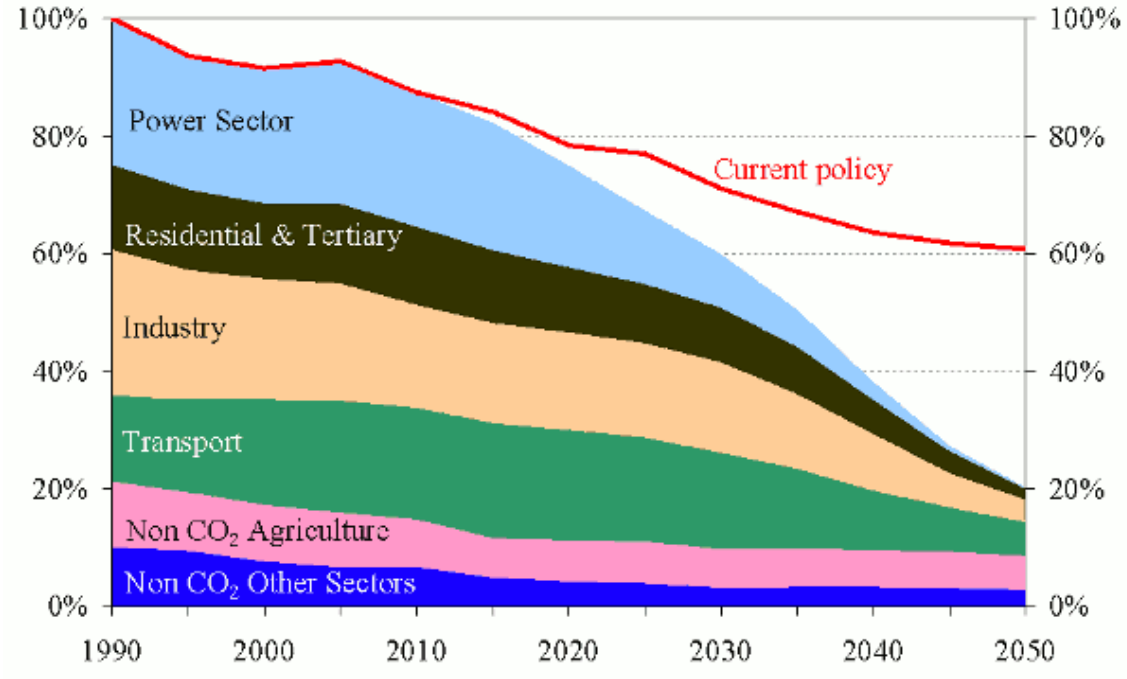


Figure 4.4.7 Emissions by sources.

All this detailed information can be found in "European Parliament resolution of 23 June 2016 on the renewable energy progress report (2016 / 2041 (INI))".

In Castilla y León, which is where we will open our plant, La Junta will donate more than 2 million euros of subsidies to power plants fueled by renewable energy in buildings. All this, co-financed by the European Fund of Regional development.

Also, the ministries of Agriculture and Livestock and Building and Environment of la Junta de Castilla y León, have prepared a joint plan to promote the use of forest biomass in the livestock sector. It's an investment of around 1.7 million euros, which aims to use biomass as fuel for heating of animals, burning by-products, etc.

4.3.2 ECONOMIC ENVIRONMENT

The current market is booming. Increasingly, because of all the environmental problems, such as climate change, is beginning to give importance to renewable energy

sources, and in this case, biomass (pellets) as a source of energy. Due to policies and measures that Governments are taking (mentioned above), the biomass happens to be a sustainable and cost-effective alternative.

Summarizing, in Europe the increase in consumption of pellets has evolved as follows:

4.3.2.1 EUROPE

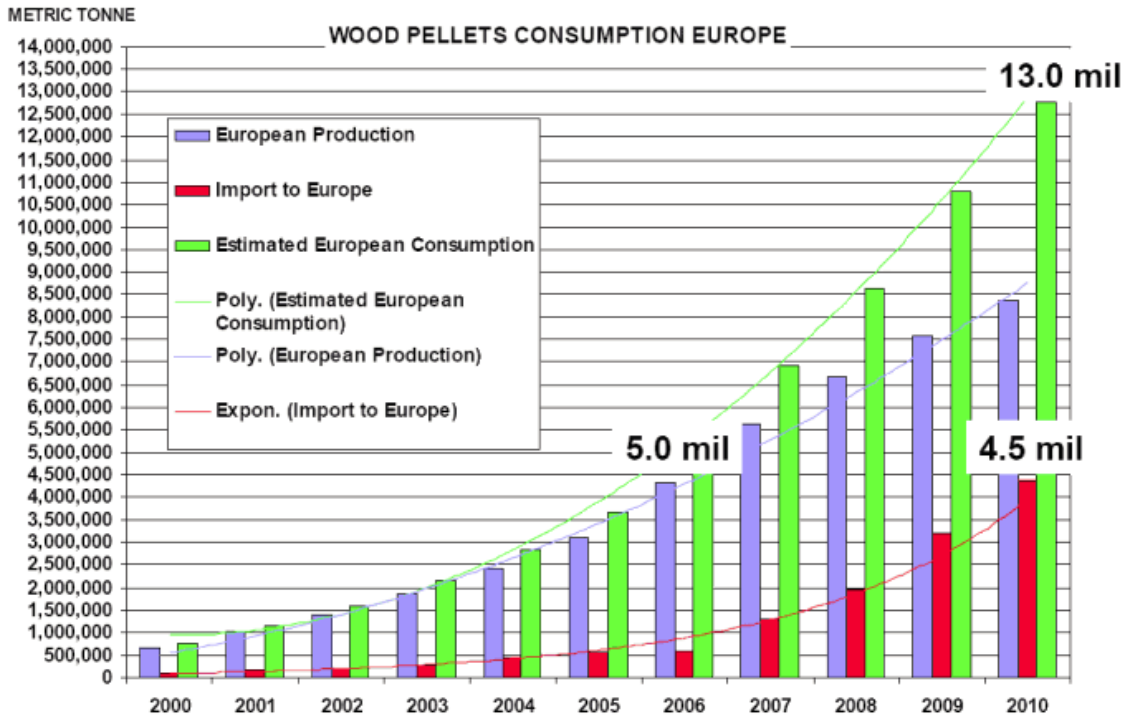


Figure 4.4.8 Pellet consumption in Europe.

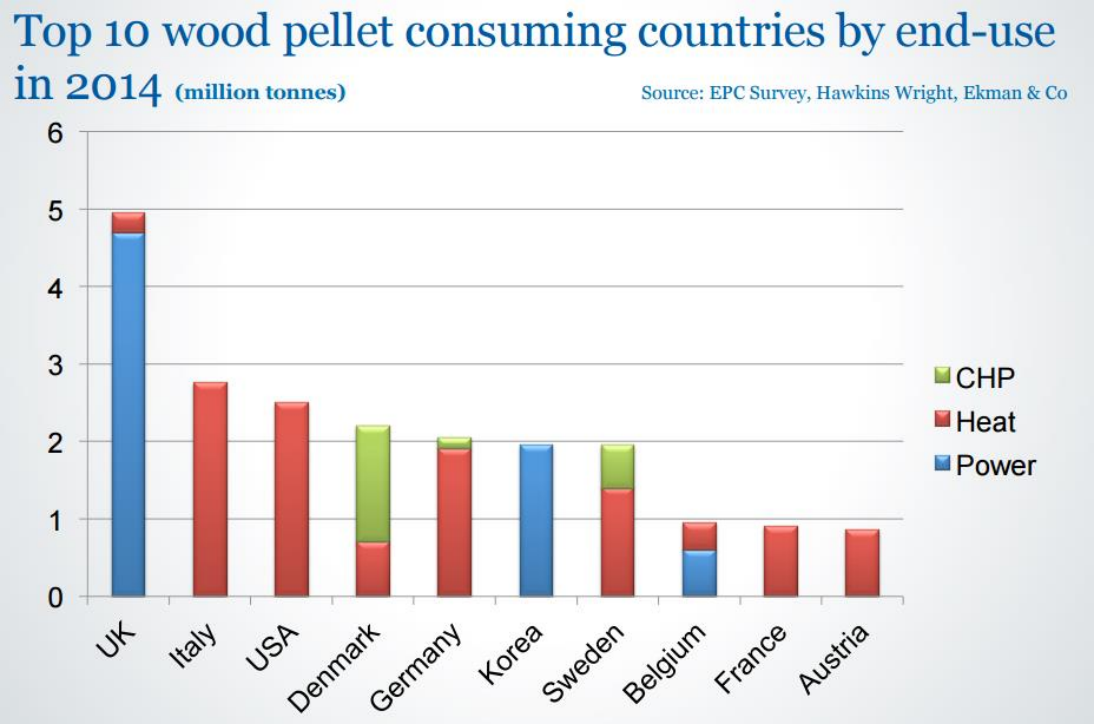


Figure 4.4.9 Pellet consuming countries.

Producing 13,5 million tons but consuming 18,8 million tons, the EU is the biggest pellet importer in the world. Imported pellets are mainly for industrial use (Power plants and CHPs). The imported pellets are mainly sourced from the USA and Canada.

4.3.2.2 SPAIN

November 2, 2016, on the day in AENOR on "ENplus: five years committed to the quality of the wood pellet", was released the following information:

Pellets in Spain 2012-2016 and estimation for 2020

	2012	2013	2014	2015	2016	Estimation 2020
available capacity	950.000	975.000	1.125.000	1.250.000	1.372.000	1.646.400
Number of companies	40	42	45	79	86	95
Production	250.000	350.000	410.000	475.000	550.000	792.000
Consumption	175.000	380.000	350.000	400.000	475.000	665.000

Figure 4.4.10 Pellet in Spain.

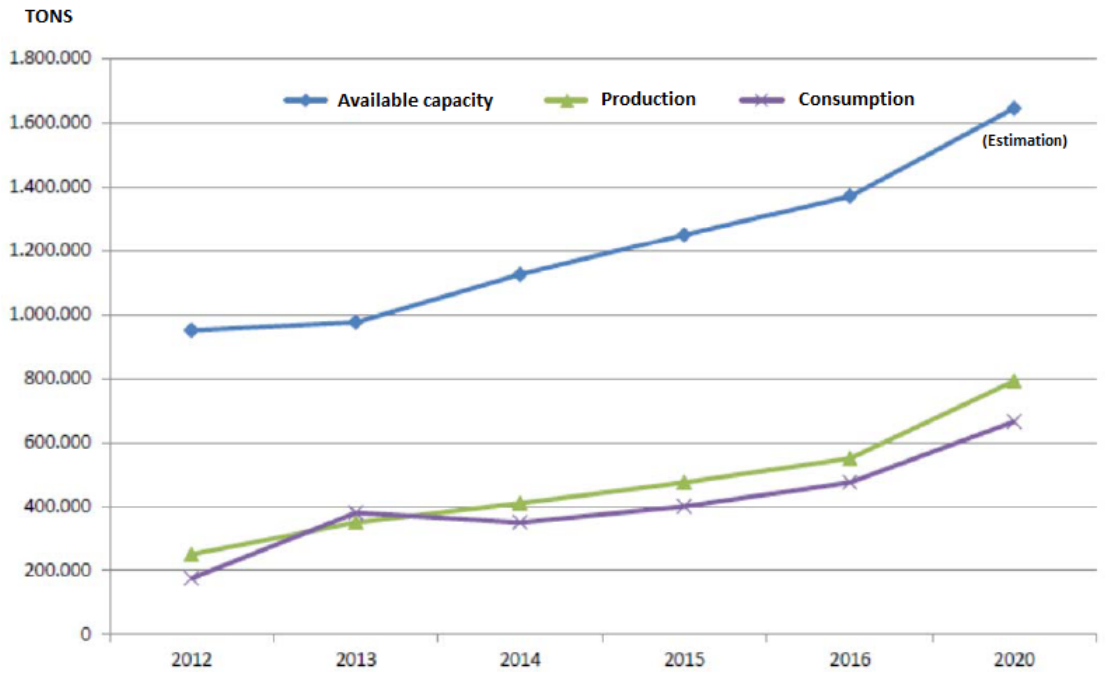


Figure 4.4.11 Pellets in Spain.

AVEBIOM, in addition, this report tells us that 85% of the production boasts ENplus A1 quality certification.

On the other hand, the consumption of pellets has increased 270%, the production by 120%, and the number of factories by 115%. The available capacity is now 1.37 million of MWt, which means an increase of 44,42%.

Concerning the prices of biomass (pellets) compared to diesel, we find quite attractive information for our company. As mentioned in a previous section, the price of diesel is exposed to fluctuations, and its price has increased markedly in recent years. This is not sustainable by pollution, make our sector very attractive.

IDAE published a bulletin of prices of biomass for thermal applications, broken down by quarters, corresponding to the year 2016 in February 2017:

AVERAGE PRICE VALUES FOR EACH PRODUCT				
Product	Price for 1T (euro/ton)	Price for 2T (euro/ton)	Price for 3T (euro/ton)	Price for 4T (euro/ton)
Firewood	126,35	115,16	136,77	135,70
Elaborated sliver	86,88	88,69	93,00	91,56
Bagged A1 pellet	183,62	182,69	181,99	186,12
Pellet A1 in bulk	169,21	167,62	166,16	170,25
Non certified pellet in bulk	171,37	166,94	171,77	173,02
Olive oil in bulk	89,94	81,59	82,59	83,03
Peels of fruit in bulk	56,21	61,35	61,71	59,16

Figure 4.4.12 Average prices.

Of the Agency Provincial of the energy of Burgos (AgenBur) we get the following information, which helps to compare the pellets with diesel oil, in terms of electrical energy:

Cost of diesel oil	€0.991 / l.	Cost of pellet	€0.2655 /kg
Calorific power	9500 Kcal/l	Calorific power	4500 Kcal/kg
Performance	90%	Performance	92%
Annual cost of electricity consumed	€40 / year	Annual cost of electricity consumed	€40 / year
Annual maintenance cost	€80 / year	Annual maintenance cost	€80 / l.
Annual cost increase	11%	Annual cost increase	3%
Cost (€ / kWh)	€0.0997 / kWh	Cost (€ / kWh)	€0.0552 / kWh

With this information, we see that there is a viable prospect of where our company is directed. The sector has grown considerably in recent years, and it seems that it will continue to grow at a good pace.

The price of our product is increased because supply and demand do not conform, and because there are few producers who dominate the raw material, the price is increased. However, for us that would mean a competitive advantage over our competitors.

We also see that the price of oil, to be increasingly scarce, and increasingly be more expensive to extract it, significantly increased its price, and it will continue to increase, so we offer a replacement product, we are favored.

4.3.3 SOCIAL ENVIRONMENT

In the social environment, we will highlight the reception that our products can have on the European and Spanish market.

As we have said, it is of solid biomass, it is a fuel that does not generate greenhouse gases. It is a non-fossil fuel, and not unbalanced the balance in the carbon cycle, because the CO2 that is emitted is absorbed from the atmosphere in the same cycle.

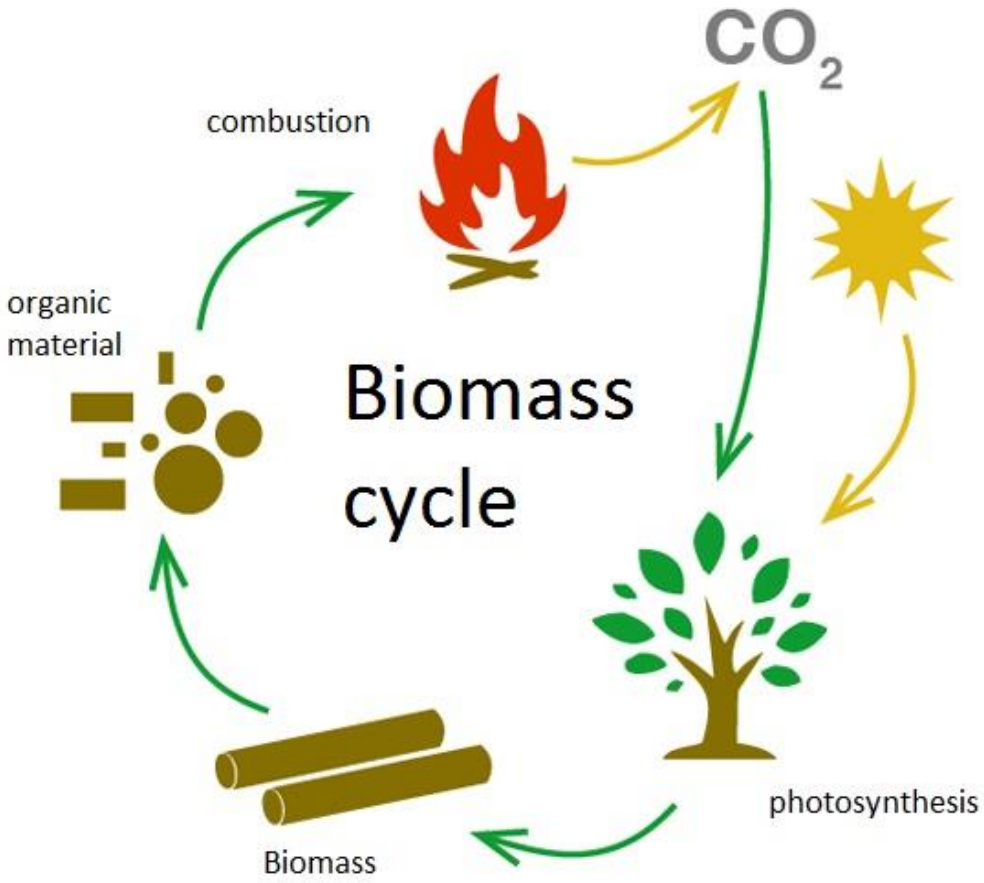


Figure 4.4.13 Biomass cycle.

Years ago, the technologies to produce energy from biomass were less efficient, so it was more expensive to produce pellets and had lower efficiency. But because of a

substantive improvement in the techniques of manufacturing and production, together with the increase in oil prices, European society has been approaching much renewable energy, in this case, pellets.

Countries like Finland are considering a 100% energy system for the country, including all sectors of energy consumption. The results show that the system is possible and viable. Sweden is the country with more share of renewable energy in the total energy consumption, followed by Latvia and Finland.

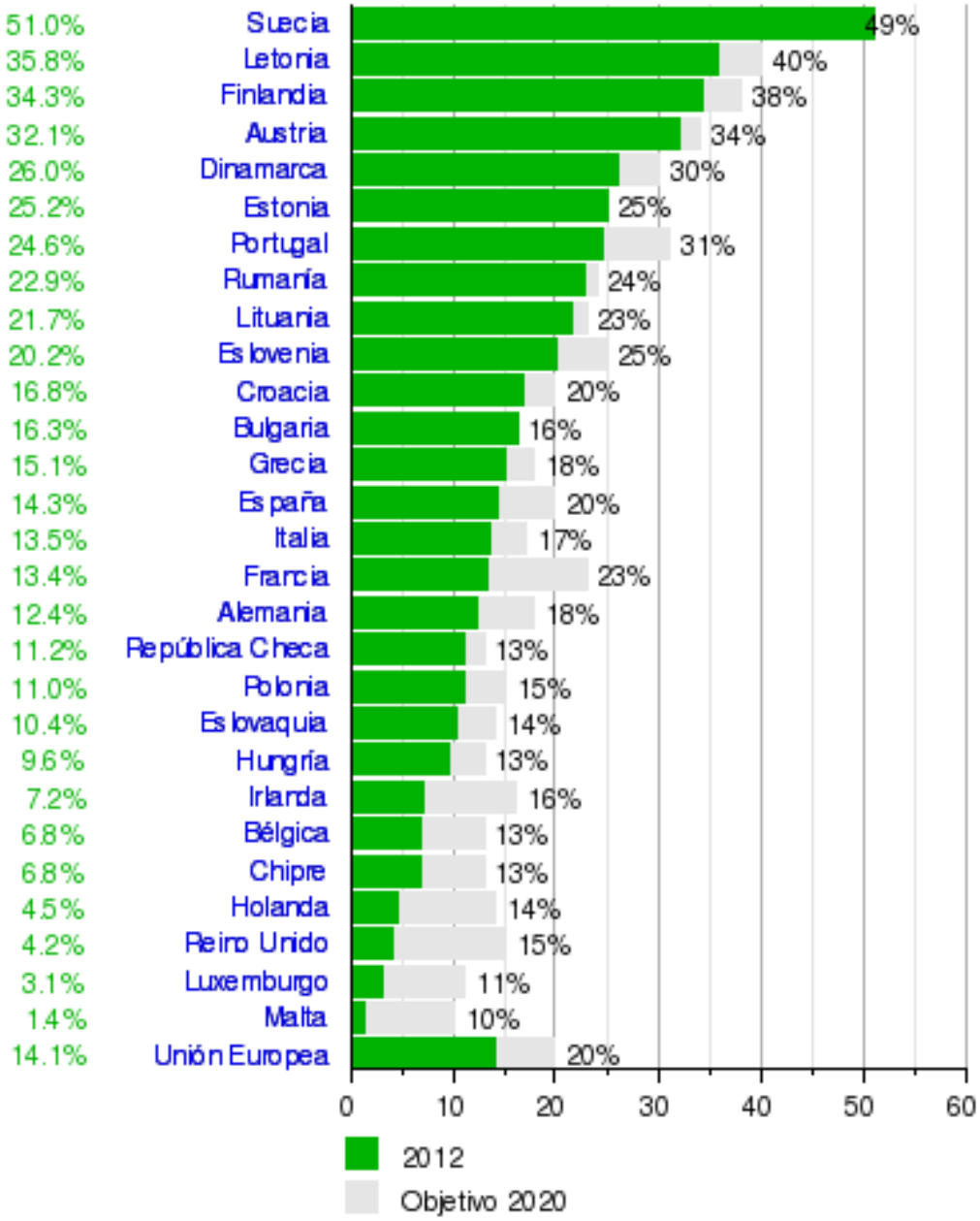


Figure 4.4.14 Share of renewable energy

In Spain, from the 2008 crisis, the construction stalled strongly, and as effect rebound, the installation of systems of heating and hot water fell. But now that structures begin to grow again, and that the biomass is an economically attractive alternative, is being conducted many installations that use pellets as fuel. Also influence the Government supports this type of facilities, in the form of grant, etc.

In the case of pellets, it is also interesting that weed from forests for energy purposes, you can take advantage not having so treat it as waste, and contributing to the prevention of fire.

In addition, campaigns are underway to raise awareness to society of the benefits of biomass, as the "Biomass in your home" program, sponsored by IDEA and AVEBIOM, in collaboration with partner companies and local authorities. Its objective is to inform the citizens the advantages of biomass as a source of energy for heating and hot water.

"It has seen through the distributors of equipment and fuel that after the exhibition 'Biomass in your home' for the different cities, has increased significantly the interest on the purchase of these products."

Results:

- 294.171 people have visited the exhibition and are knowledgeable in the use of biomass.
- 2.913.000 listeners of the radio campaign.
- 59.250 outreach magazines delivered during the exhibition.
- 17.839 different from web users.

4.3.4 TECHNOLOGICAL ENVIRONMENT

In this section, we will focus on machinery that we need to get our final product, and where we can find it.

Our priority is the quality of the final product, we will need that our teams have certain characteristics. We will divide the teams into several types:

- **Transformation or process**: crusher, dryer, mixed, Pelleting and a cooling system.
- **Storage**: hoppers, silos for storage of raw materials and final product.
- **Transport** (internal): conveyor belts, elevators, loading and unloading trucks.
- Also need support structures for previous teams, as well as lubricants, roller pressing, screens, teams of packaging for the final product, etc.

Figure 4.4.15 Process of pelleting.

There are many companies that could supply the necessary machinery, although most are foreigners. We must make sure that transformation teams have the specifications needed to achieve a final product with the quality we want. We could look for other equipment, such as loading and unloading, second hand to try to reduce costs.

With respect to boilers, is shown in the following image requirements to be taken from January 1, 2020:

Requisitos en el Reglamento 2015/1185 (aparatos de calefacción local)

Equipo	**Valores a cumplir** (1)				
	Eficiencia energética estacional (%)	Partículas (2) (mg/Nm^3)	OCG (3) (mg/Nm^3)	CO (mg/Nm^3)	NO_x (mg/Nm^3)
Abierto	≥ 40	≤ 50	≤ 120	≤ 2000	≤ 200 (≤ 300 para combustibles fósiles)
Cerrado (estufa)	≥ 65	≤ 40	≤ 120	≤ 1500	
Cerrado (estufa) con pellets	≥ 79	≤ 20	≤ 60	≤ 300	
Cocinas	≥ 65	40	≤ 120	≤ 1500	

(1) Todos los valores de emisiones están referidos a un contenido de oxígeno del 13% y a condiciones normales de presión y temperatura.
(2) Para partículas se fijan valores en 3 unidades distintas porque el Reglamento reconoce 3 métodos de medición de partículas. Solo es preciso cumplir con uno de ellos.
(3) Compuestos orgánicos gaseosos.

Figure 4.4.16 Requirements for local calefactions systems.

As we can see, there are strict rules for heating systems, based on energetic efficiency and other factors which benefit us.

4.4 ANALYSIS OF COMPETITION: PORTER.

4.4.1 BARGAINING POWER OF SUPPLIERS

This will be a key point in the development of our company. We need to have a good agreement with our supplier or suppliers, as this will depend on our production capacity and our benefits.

Our strategy will be to offer the supplier form part of our company, i.e. to be shareholder. It will give us the wood of the first year in Exchange for a percentage of our company's shares. In addition, we will sign with him a contract of exclusivity, of at least 5 years, in such a way that we'll make very much of our raw materials. As it will be shareholder of the company, will be very involved in our activity, and will participate as well as possible to get benefits.

We will have other suppliers, but as they represent one lower percentage of the raw material we need, they will not have much strength or much impact.

4.4.2 BARGAINING POWER OF CUSTOMERS

In the sector covering our company, clients do not have much bargaining power, since there are many companies that offer these products. At national level, in Spain, if there are enough supply products, so we will have to follow the right strategy to get customers nationwide.

Our main factor in favor will be the distance to the customer. A very high cost to our company will be the transportation of raw material and finished product, as being large quantities, we need quite expensive means of transport. But to locate our company in an area that the round we found no competition, we will achieve a competitive advantage with respect to them.

At European level, as there is greater demand offering, customers lose power negotiator. Our goal is to supplement the surplus of demand for European customers that is being covered by the United States and Canada. Because of lower transportation costs, we

can supply these countries without giving up our profits, since we will save much more than them in transportation.

Therefore, the price of the product, in principle, come marked by the manufacturers, although if we are exposed to possible wars between manufacturers with market shares, but leaving customers without bargaining power.

4.4.3 NEW COMPETITORS

The first thing that one must study to see if the number of new competitors can increase much, is if there are barriers to entry for the sector, and if the demand will increase, making the attractive market for manufacturers.

While we know that the market will increase enough, since we are in the heyday of "clean energy", and as we have explained, with the Government on these energies through aid, grants, etc., there are still barriers to entry for new manufacturers.

The biggest barrier to entry is get enough raw material required to run our central, and get enough finished product.

Although there is enough raw material in the region, this is limited. So, our strategy with suppliers is insert them in the shareholders, thus achieving exclusivity, and truly making it difficult for new competitors to get enough raw material to be competitive.

They could get raw material, of course, but not a lot, so it would have high fixed costs, without access to an attractive scale economy.

This is an indispensable important factor for us, we could say, to ensure the profitability of our business.

4.4.4 SUBSTITUTES

Product substitute we understand a product, that with the introduction of the market, can supplement another covering the same needs.

In our case, we have the replacement product that is growing in the market, and intends to make obsolete the use of oil, natural gas, etc.

We are still in a phase of growth in our industry, so technology and research, in the medium term, will focus on increasing the efficiency of our product, not to find a substitute product.

The use of other renewable energies could affect us as a replacement product that will encourage more, but that is not really a problem, because as we have seen, right now is

being promoted increased use of renewables in general. And, in addition, pellets presented a great efficiency, and not conditioned by external factors as they may be solar or wind energy.

Also, our boilers only supported as fuel pellets, so if a substitute product, were would have to consider that we should change the boilers, which present a high cost for customers, subtracting a lot profitability.

Theoretically, there is no alternative products for the time being, so that in the medium term our company should not worry.

4.4.5 RIVALRY BETWEEN COMPETITORS

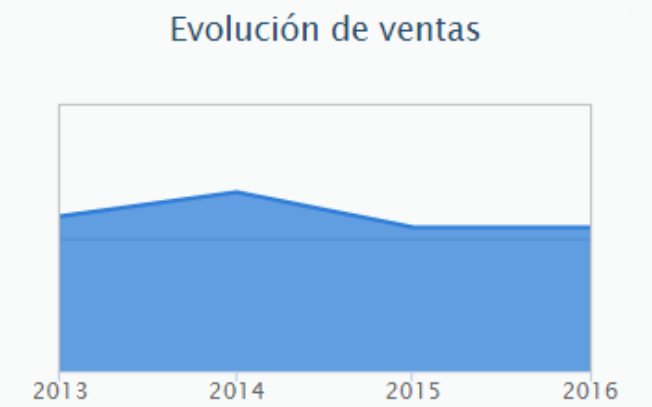
Obviously, the rivalry between competitors increases depending on the number of competitors, and to greater competition, lower profitability.

The rivalry between competitors is a summary of the 4 previous points. We can summarize it in that, to be competitive at the national level, we should offer good quality, since in Spain 85% of production contains ENplus quality seal. (AVEBIOM, 2016).

We want to offer this quality, at a good price, to meet European demand which is being covered by the United States and Canada.

We have 3 companies relatively close, that could be competition. They are Galpellet, in Ourense, and Pellets Asturias, at Tineo (Asturias).

Below, we show the evolution of sales of Pellets Asturias:



Año	Variación
2013	
2014	15,57 %
2015	-19,67 %
2016	%

Figure 4.4.17 Sales evolution of Pellets Asturias.

As we see it has decreased, so it will be easier to compete against it.

On the other hand, Galpellet has also decreased its sales volume:

Año	Variación
2013	
2014	54,97 %
2015	-29,37 %

Figure 4.4.18 Sales evolution of Galpellet.

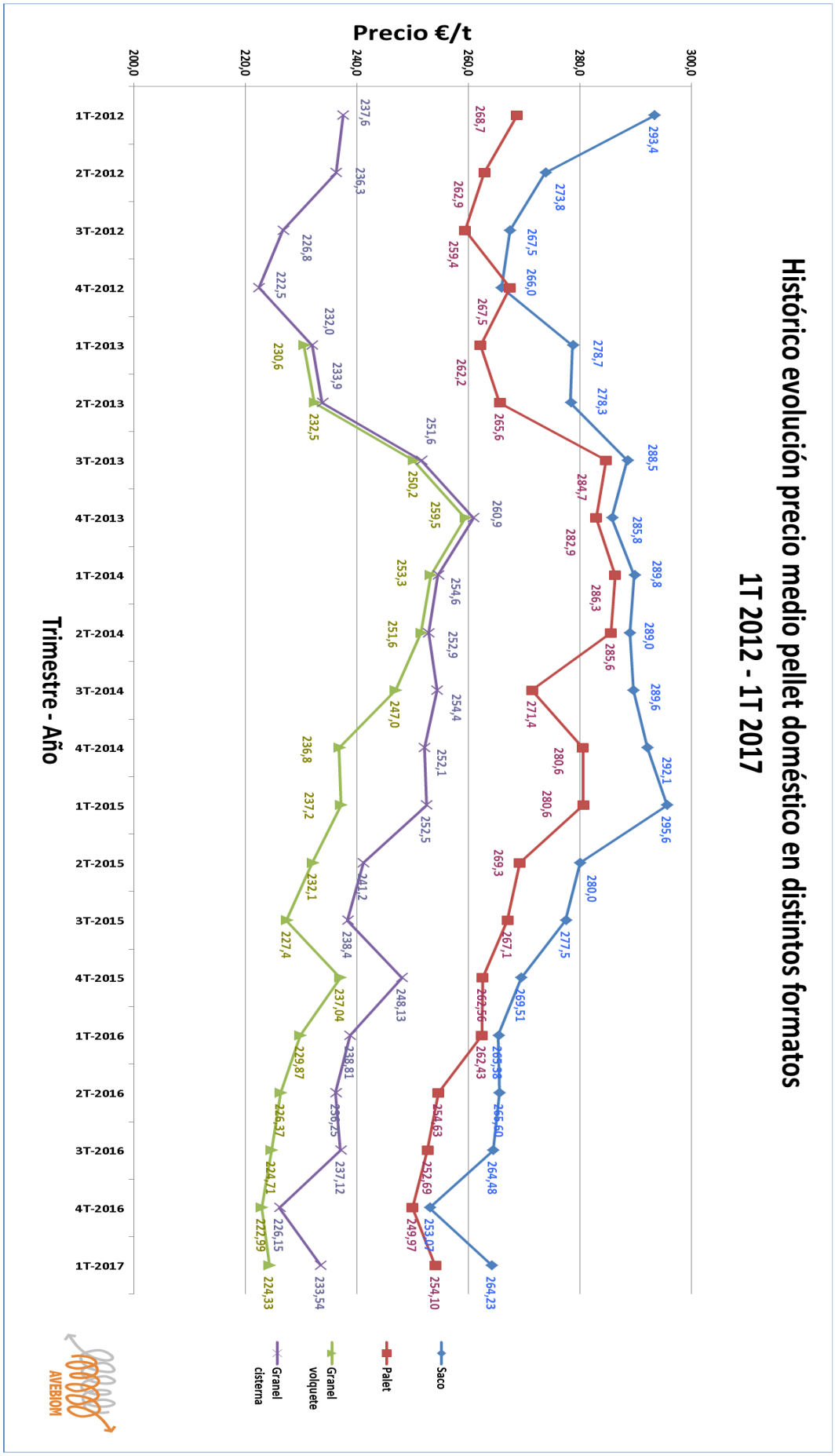
The rivalry between competitors is not high, because there are many companies that offer good products at good prices. We will try to make a difference, and make us strong in the market.

Regardless, the rivalry between competitors is not something that should concern us much, since if we can make a good product at a good price, we will have a guaranteed place.

4.5 POLICY PRICES AND SALES FORECAST

For pricing policy, we will consult the publications of AVEBIOM, which show the average price of the pellets. Data that we provide below have the following characteristics:

- They are calculated quarterly average end customer prices
- Data are obtained through survey of distributors and manufacturers with sales service consumer.
- The average end consumer prices include VAT and a delivery medium 200 km in format bulk pellet and bone and 100 km to splinter.
- Transport are calculated using coefficients published by the "Observatory of costs of the carriage of goods by road" published periodically by the Ministry of public works.
- They expressed in units [€/ t].
- For the mean values have been processed the data statistically to eliminating outliers that are far from the average more than 3 times the standard deviation.


Histórico evolución precio medio pellet doméstico en distintos formatos
1T 2012 - 1T 2017
Precio €/t
Trimestre - Año
Saco
Palet
Granel volquete
Granel cisterna
AVEBIOM

As we can see in the last figure, it´s shown the historic prices for the different formats of pellets in the market.

Therefore, today the pellet is between €0.26423 /kg and 0.22433 €/ kg, depending on the selling format.

This is equivalent to 5.55 c€ / kWh and 4.71 c€ / kWh, respectively.

From AVEBIOM we obtain this graph:

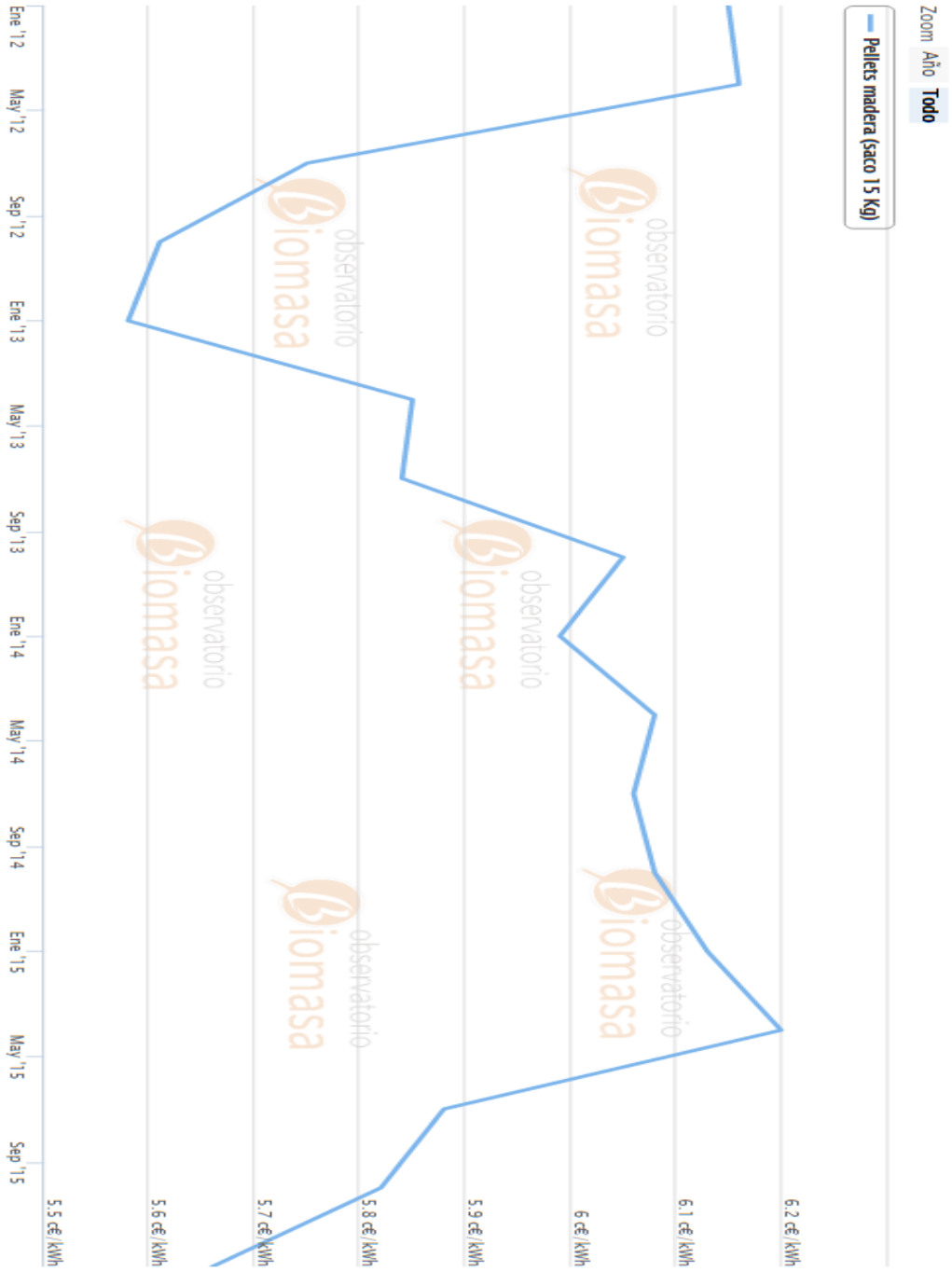


Figure 4.4.19 Evolution of the Price of 15 kg-bags of pellets.

It shows the evolution of the Price of 15kg-bags of pellets.

We are going to make a comparison with the price of the product we want to replace, who will be our greatest enemy the first quarters of activity, diesel:

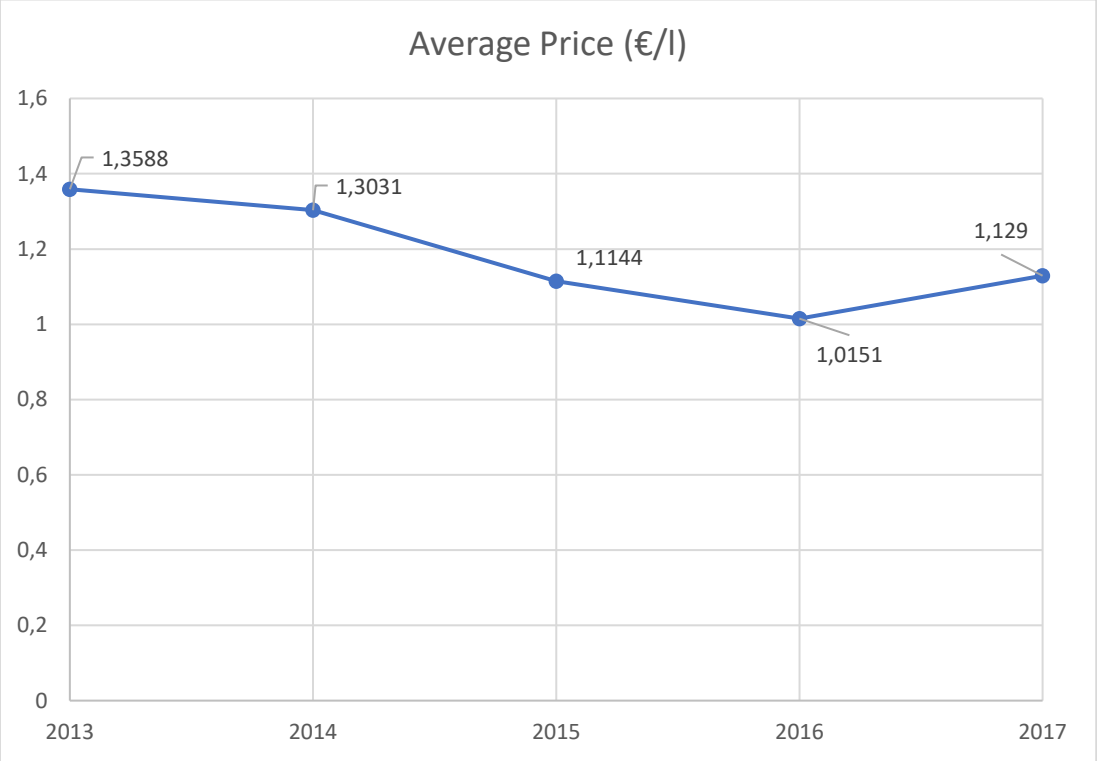


Figure 4.4.20 Average Price for diesel.

* Data taken from the Ministry of industry and the environment.

To calculate the price per kWh, we first need to know the calorific value of the fuel. With the data of Petromercado*, assume the calorific value of the fuel as 10 kWh/l. (PETROMERCADO, 2016).

$$\frac{1}{\frac{10kWh}{l}} * \frac{1{,}13€}{l} * \frac{100c€}{€} = \frac{11{,}3\ c€}{kWh}$$ Equation 4.1

Therefore, we see that the price of pellets is more attractive for the customer than the diesel.

As a strategy to be followed, we will choose the two first quarters sell our products a little cheaper (10%), to let us know in the market and retain customers. Starting from there,

we will work to market price, and, if after other two quarters they continue to increase sales at the rate that we expect, we will raise prices 5% above the average market share.

4.5.1 SALES FORECAST

We will set up different stages of production, since, if we start to produce 100% from the outset, we risk high do not attract sufficient customers from the first moment and we find much over at the factory. We have estimated a period of 12 months.

Therefore, our strategy will consist in gradually increase shifts by semesters, beginning with a shift of 8 hours a day the first semester, two shifts the second half, and 3 shifts from the third semester of activity.

4.5.1.1 First semester:

This semester will only have a shift of 8 hours a day. The average production is estimated between 2.8-3 tons of product per hour. To avoid scares, we will do the calculations from a pessimistic position, that is, with a production of 2.8 tons/hour.

4.5.1.2 Second semester:

We will have 2 shifts, from 8 h/day each.

4.5.1.3 Third semester and successive:

3 daily shifts, running at 100%, factory 24 hours a day.

Below is a table with the corresponding calculation and the results that we estimate to obtain:

	Daily production	**Total production**
First semester	2.8 t/h * 8 h/day = 22.4 T/day	22.4 t/day * 115 days = 2.576 T
Second semester	2.8 t/h * 16 h/day = 44.8 T/day	44.8 t/day * 115 days = 5.152 T
Third semester and on	2.8 t/h * 24 h/day = 67.2 T/day	67.2 t/day * 115 days = 7.728 T

5 MARKETING PLAN. MARKETING-MIX.

Includes the study of variable strategic factors or means of action of our project: product, price, distribution and communication.

5.1 PRODUCT

As already mentioned, the product that we manufacture, and, therefore, market, is the pellet. We are going to market in 3 different ways:

1. In 15 kg bags

It will be the format that we will more market. We estimate that 80% of our production will be destined to this format. It is the most common way for private clients, as dwellings, even small neighboring communities.

This format presents ease of storage, although it is more expensive than the rest.

Transport is easy, since it will go in the truck from our place of storage to the end customer.

The quality of this pellet will be A1 according to ENplus.

2. Big bag

This format will consist of a container of 1000 kg of pellets, in a single bag. It is a takeoff of large volume, which combines comfort, savings and versatility.

It is a convenient container that allows the customer to store it and use it according to your needs.

It is a very attractive option for communities of neighbors, and facilities that are not excessively large.

3. Bulk

The number chosen by the client, always exceeding 20 tons, will be provided and choosing larger amounts in steps of 5 tons. We will provide with our trucks.

This format is that the cheaper the customer apart from by asking many, because it saves the costs of packaging. But you need to have a big place to store them, since you download directly from the truck, through a pipe propelled, the deposit of the customer.

This option is intended for large installations, even industries.

5.2 PRICE

The price is already explained in the previous section, 4.5-Price policy.

5.3 DISTRIBUTION

For the distribution of the product, we will subcontract to a company that is responsible for this.

5.4 COMMUNICATION

To publicize our product on the market will use the systems of promotion and advertising in traditional radio, billboards, ads in newspapers and magazines, etc.

We will also participate in events that are related to the sector, such as ExpoBiomasa, which will help us a lot to get closer to customers and various companies that might want to work with us.

We will cooperate with AVEBIOM in initiatives like "Biomass in your home", which is particularly interesting, because in addition to know our product, at the same time encourage the use of biomass as fuel.

5.5 SWOT

5.5.1 OPPORTUNITIES

Being a booming market, our opportunities are focused on potential customers who are expected to be.

As we have explained before, the oil is a resource that is on the verge of exhaustion, so you must find a substitute.

Pollution has increased much from the industrial revolution, and countries are closing agreements to promote renewable energy sources, through grants, subsidies, even laws that prohibit the installation of diesel oil boilers, for example.

In this context, we want to get a foothold in the market with quality products, and be there in the future when demand is much larger.

Trade in broadcasting rights.

Rural development (creation of jobs).

5.5.2 THREATS

Our main competitors are companies which, although they have little time making pellets, carry much in the timber industry, so you are familiar with the market.

There could be some in the future regulatory change, which passed on the price of the tax we pay, and that would increase the cost of production.

Variation in the sale price, which in turn would affect the prospects for growth in the sector could also affect us much. If other renewables can increase your efficiency we could lose market share.

Ignorance of the society of the energy possibilities of these raw materials and biofuels.

5.5.3 WEAKNESSES

Our biggest weakness is dependence on raw. We must make sure the proper and sufficient wood supply to run our plant correctly.

Like any new business, at first not we are known, without experience in the market and experience.

Another weakness is that the product needs some special boilers, by which customer switching to this type of fuel is a high initial investment.

Very heterogeneous biomass.

High costs in the production and transportation of the product.

5.5.4 STRENGHTS

Product is beginning to be well known, demand is growing a lot and there are no many plants that produce with certificates of quality as our own, so we will go on the market with a product that will differentiate by their quality.

In addition, to being a source of renewable energy, it is very attractive for the customer and the environment.

It is the only renewable energy capable of directly replacing fossil fuels.

Versatility of energy applications.

6 PRODUCTION PLAN

6.1 MANUFACTURING PROCESS.

The process for manufacturing a pellet is long and complex. We will explain the different stages that has the process and machinery involved in each of them.

We can distinguish three large phases in the process, that would be the phase which takes place in the forest, which is carried out in the store and which is carried out on the ground. In the forest, what is done is to cut down the trees and processing the wood so that it is ready for further treatment, but this part of the process we will not handle us, so we will not dig deeper. (web plantaspeletizadoras.com, 2016).

In the store, we'll receive the already clean trunks, overhead them and crush them, turning them into sawdust and chips. After using a conveyor belt are sent to the store.

Once we have the sawdust and splinters in the warehouse, we carry out the following processes:

6.1.1 CRUSHING OR GRINDING PROCESS

The particles of the warehouse are a screen of 10-11 mm, the particles that exceed it, go directly to the drying process, and which are not, repeat this process.

6.1.2 DRYING PROCESS

After step I. particles of wood has between 25% and 50% of humidity, depending on previous storage time, that we must reduce it to continue working with her.

Occurs, therefore, a process of drying in a drum of drying, which reduces the moisture up to 10% approximately.

6.1.3 PELLETIZING PROCESS

After having dried wood, the particles have the same moisture. The pelletizing process consists of crushing the new particles, so that all have the same size, which will be 2 mm. Approximately, and is never more than 3 mm.

Once done, compress the particles with rollers, coming from an orifice of 6 mm. diameter, where with a knife cut and got solid pellets of 25-30 mm. length. In this process about 3% moisture is lost.

To achieve this, it is necessary to heat the product up to 80° - 90°, it is then necessary to cool down it.

6.1.4 COOLING PROCESS

It is the last process regarding production of pellets, and consists of cool product to make it compact and hard. We will use a fan with cold air for this stage.

6.1.5 PROCESS OF CLASSIFIED

This process would be quality control, and consists of a screening of the finished product, to ensure that products that do not have the desired quality of finished product warehouse.

Withdrawn products, are carried back to the press, but adding them a little water before for win moisture, because if not so dry product processing would be very aggressive and may cause damage.

6.1.6 PACKAGING PROCESS AND STORED

Pellets that we sell in bulk are transported to a storage silo directly while others need to be packed in bags of 15 kg, that is how we will market them. After packaging, they will be transported to another storage silo.

6.2 APPLIED TECHNOLOGY.

In this section, we will explain how works the machinery required for the production process, and where we can get it.

6.2.1 GRINDING OR CRUSHING EQUIPMENT

The machine is equipped with hammers and a sieve, so that the hammers hit strongly particles entering the machine continuously. When the particles are sufficiently small pass

the sieve, and fall into a tank, meanwhile, if they are still great, still being beaten to reduce its size.

The machine that we find most interesting for us is the "TYRON HAAS" mark HAAS. (web HAAS, 2017).

Figure 6.6.1 Tyron Haas.

Figure 6.6.2 Tyron Haas.

6.2.2 DRYING EQUIPMENT

These teams work with a heat flux getting product to become dehydrated. There are several types of machines, which work in one way or another depending on the size of the particles and of the flow of the current. In our case, we will choose the type of rotary kiln "drum". These dryers consist basically in a horizontal, cylindrical drum and rotary motion which enters both the product dry as thermal fluid of drying at a high temperature (300 - 800° C). Out of the drum there is a system of gas purification, which separates the particles from gases, avoiding emissions. (web apisa.info, 2017).

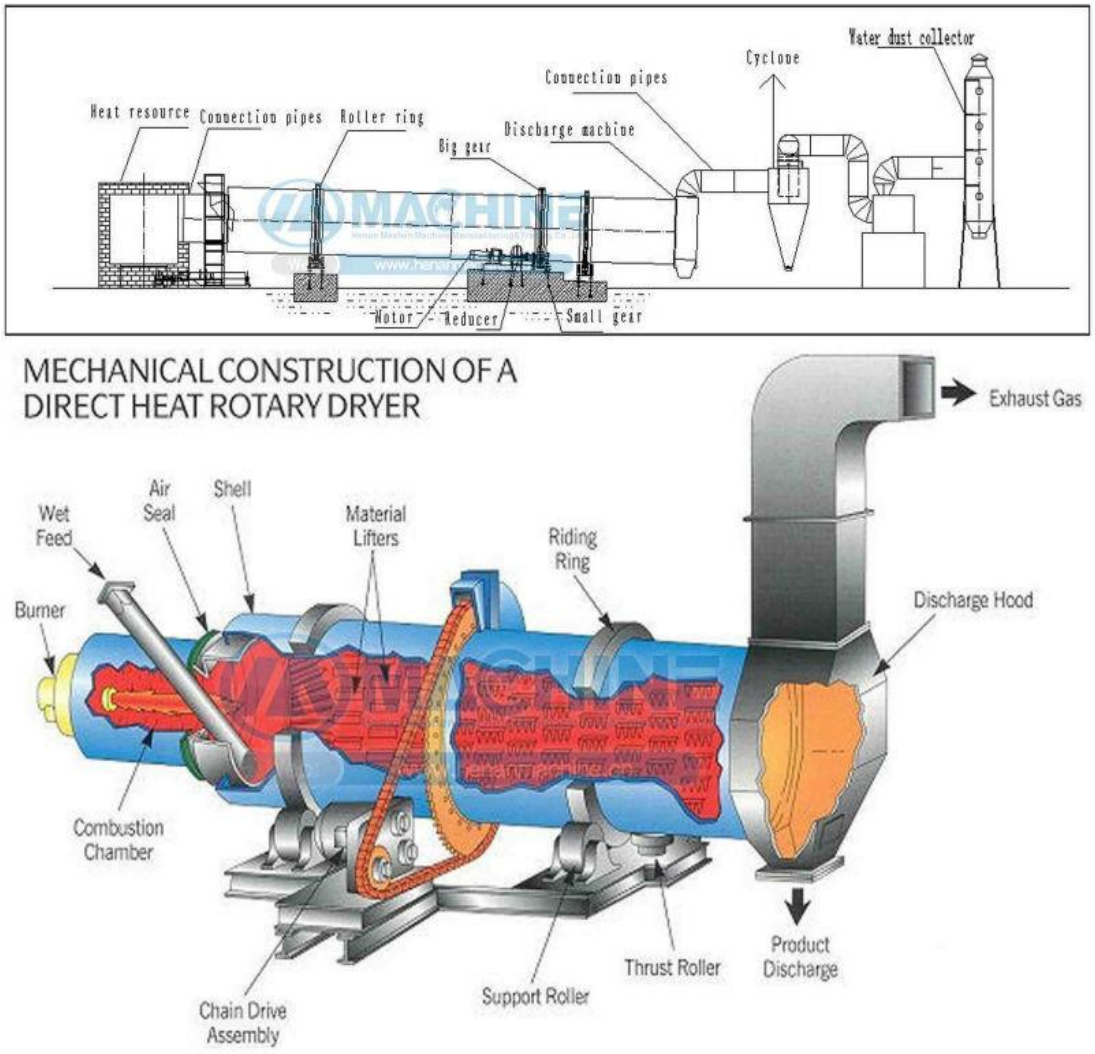


Figure 6.6.3 Drying process.

6.2.3 PELLETING EQUIPMENT

The company KAHL gives us different options in terms of machines for the pelleting. We are going to choose a dam flat die pelleting, being able to choose between 12 different sizes, and have the following characteristics:

- Matrix 175-1.250 mm diameter
- 3-400 kW drive motor
- 130-450 mm roll diameter
- Pellet 2-40 mm diameter

The drive occurs via a worm gear that is connected to a transmission by belts. (web KAHL, 2016).

6.2.4 COOLING EQUIPMENT

There are two options for refrigerated product, introduce air where the pellets are stored, or provide air to the pellets as they fall to its storage place. We're going to opt for the second option. Within this option, there are vertical and horizontal coolers. We are going to choose the vertical.

In the company SANTAGI BERGA found several models, ranging from 15 to 132 kW.

The cooler has 3 parts: the charging device (placed on top), cooling column, and (bottom) discharge device.

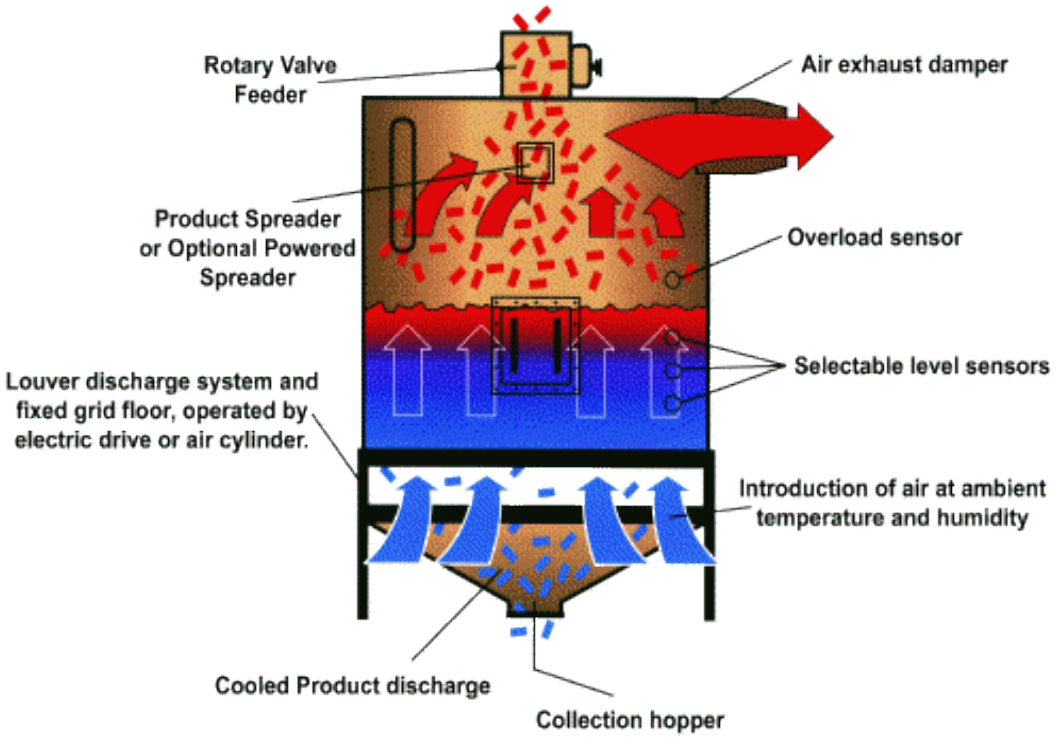


Figure 6.6.4 Cooling process.

6.2.5 STORAGE SILOS AND HOPPERS

Between processes and others, we will place a few small hoppers for storage, as a safety measure so that, in the event of failure of the machines, we don't have to stop

production. Does not need to be excessively large, will calculate having one large enough to feed 6-10 h of production.

When we have finished the process, and we have the final product, we took him to a storage silo or silo product. We will have two silos of product, one for pellets that we will market in bulk, and another for pellets that we trade in bags of 15 kg. Latter will pass through the machine before reaching the storage silo.

Figure 6.6.5 Silos.

6.3 PRODUCTION CAPACITY.

Our plant will be active continuously, with three shifts (8 h/day per shift) explained previously. Close a month for vacations, and because it is recommended for the equipment. We will choose the month of August, since it is the month that less demand will

be (because the temperature is highest). But if we leave active sales with product that is us in the store that we have not sold during the previous months.

At first, we considered the option open during all year, and the month of holiday hiring staff temporarily, but we discarded it, since the investment in training and the time it would take to begin to understand everything and work comfortable not seems profitable.

We will therefore work 52 weeks, 5 days per week. That is 260 days. Less holidays, it is 230 days. Production capacity have already analyzed it in the section 3.4.:

	Daily production	**Total production**
First semester	2.8 t/h * 8 h/day = 22.4 T/day	22.4 t/day * 115 days = 2.576 T
Second semester	2.8 t/h * 16 h/day = 44.8 T/day	44.8 t/day * 115 days = 5.152 T
Third semester and on	2.8 t/h * 24 h/day = 67.2 T/day	67.2 t/day * 115 days = 7.728 T

7 ORGANIZATION AND HUMAN RESOURCES

7.1 ORGANIZATION.

As we have seen in the chapter 4, the factory is composed mostly by machines, so it's a very automated process. We will need staff to be in contact with the machines to make sure that everything works correctly.

We will also need staff to be responsible for the accounts of the company, roles, plan production, attract customers, etc.

Due to the equipment installed in the plant, we will need at least two pawns which are responsible for the proper functioning of the machinery. They will be those who are in direct contact with the product.

We have chosen a set of rotating shifts (from the second semester). We will need:

7.1.1 EXTERNAL AGENCY

We discuss this point in paragraph 5.3.-external advisors.

7.1.2 ENGINEER

It is responsible for the continuous improvement of our plant, improve and optimize the work area and production processes, which has an impact on the company in the form of profits.

He is responsible, therefore, for planning production and product quality control.

7.1.3 COMMERCIAL

Responsible to promote our product, keep customers and build new. It will differ by their personal clients, since you will attend to their complaints and petitions.

Also, you plan sales, marketing campaigns, and then move on to the engineer based on the complaints and needs of customers.

7.1.4 PAWNS

They will gain second officers. We will distinguish two types, depending on its features:

- **Store**: you will be responsible for using the loader and forklift trucks, to move and place the raw materials and bags of pellets.
- **Factory**: you will be responsible for the line and the control room.

7.2 HUMAN RESOURCES.

This point aims to define the qualities we require staff, training that will need, and the organizational chart of the company.

We will not the pawn which we have defined as a "factory" to ask for specific training or specific studies, but we will give you training within the company itself.

We will require a wheelbarrow course, the pawn "in store" since it is necessary since it will have to work with this machine.

The commercial will need advanced administrative training, i.e. University studies as a Business management. What we want is a person with initiative, who can propose or undertake improvement actions before if required, making good decisions with own criterion. It is also very important to have social skills.

Finally, the engineer, who will be the head on the ground, you will also need a degree. The skills needed are:

- Work as a team, and you must be a team with the other personnel in pursuit of the common objectives.
- Be a leader, which is the maximum responsible, and therefore, responsible for leading the team to success.
- Having a complete, extensive and vision for the future, capable of integrating the individual objectives with the common, managing to set strategic targets that lead us to success.

7.3 EXTERNAL ADVISERS.

An important piece to our society will be the hiring of an external consultancy services, which help us in relation to "paperwork", and which can also help our commercial one of their tasks.

The main services that we seek in the Agency to hire are the realization of accounting books, records, and balance sheets, in such a way that faithfully express the image of the

financial situation of the company, as well as records and the necessary procedures for the recruitment and staff regulation.

It is very important for us that there is an absolute and scrupulous respect for the law, as well as agility and confidentiality services.

We have been in contact with the company GESLEY, S.A., which provides us with everything you need in terms of accounting and financial advice refers. It offers the following services:

- Permanent accounting advice.
- Analysis of the economic and financial information about our company.
- Analysis and interpretation of balance sheets.
- Preparation of annual accounts and deposit in the register.
- Supervision of accounting and closing of the fiscal year.

We can say that it assumes the function of Department of external accounting, that is, in addition, as a decision tool.

7.4 LEGAL FORM.

Our company is going to be a limited liability company, and we will be without type statutes.

"To start the processing of a limited company the notary will ask a series of data necessary to write the script and essential: the corporate name, the personal data of members will constitute society, the number of social capital and the participation of every Member in it, how it will bring this social capital" ", the chosen management system and who or who will occupy the post of administrators, as well as other data that must be included in the statutes, as the domicile or the purpose (activity that will devote the society)." (web notariado.org, 2016).

The rest of the process can make us, or order them to a notary. We decided to hire a notary so, providing us with the task considerably.

The society will be called MPeleitor, S.L., and will have an initial capital of €771.400.

It will be composed of several shareholders, part of the business will correspond to each one of them. They will be:

- **Mario Díaz González and Agustín Pallarés García**: we will be the two creators of the company, we will provide the project and a capital of € 200,000 between the two, in equal parts. We shall be responsible for 61% of MPeleitor S.L.
- **City Council of Bembibre**: City Hall will not provide capital, but we will give a ship of its property, 1.500 m 2, in a plot of 5000 m 2.

Currently, the industrial land in that area is priced at around 100€ / m2 and soil from the rest of the plot at 10€/m2.Therefore, is contributing € 185.000, corresponding, therefore, 16% of the company.

- **Sawmill**: it will provide us with 100% raw for the first year, i.e. 7.728 tons of wood. Pricing ton in €35, will be contributing €270.480. This will be 23% of society. From the second year, provides us 100% of the raw material, at a price agreed of 35 €/ ton.

7.5 LABOUR OBLIGATIONS.

The job duties are as follows:

- **High in the social security and quote account code**: as Mario and Agustin will be administrators and possess more than 25% of the company each, must quote as freelancers.
- **Opening of the Centre's work**: we need to notify previously, or until 30 days after the opening, and we accompany it with occupational risk prevention Plan and the project.
- **Affiliation of workers**: in the event that one was not given never high.
- **High worker**: have to be given at least 1 day before the activity.
- **Hiring the service of prevention of risks**: it can be own or others, in our case it will be outside.
- **Payment of social insurance**.
- **Payment of benefits**.

(web gie.es/obligaciones-laborales/, 2017).

7.6 PERMITS, LICENSES, CERTIFICATES.

All matters relating to permits and licenses will it take us the notary and the external agency that we will hire for these services.

With respect to the certificates, we will ask for certificates of energy efficiency in the ship, etc. But that everything is planned, since being the ship above City Hall, it has all current.

Certificates that we care most are the quality of the product. We will look for a quality certified system ENplus. This system has 3 kinds: ENplus-A1, ENplus-A2 and in-B, all based in the "Norm UNE - EN ISO 17225-2:2014 solid biofuels. " Specifications and kinds of fuels. Part 2: Classes of wood pellets".

The three types are for pellets with non-industrial uses.

7.6.1 ENplus-A1

For Virgin wood pellets, or waste wood that have not been chemically treated. They will have contained low ash, chlorine and nitrogen.

7.6.2 ENplus-A2

For pellets with some more ash, chlorine and nitrogen than the A1 type. Whole trees, bark, and waste from wood not chemically treated are allowed.

7.6.3 B

This class includes recycled wood and industrial waste, but not may have been chemically treated before. The wood from the demolition is not permitted.

Propiedad	Unidades	ENplus-A1	ENplus-A2	B	Metodología de análisis
Clase de diámetro (D)	mm.	6 (±1) o 8 (±1) [2]			EN 16127
Longitud (L)	mm.	3.15 ≤ L ≤ 40 [3]			EN 16127
Humedad (M)	a.r., Peso-% b.h. [1]	≤ 10			EN 14774-1 o 2
Ceniza (A)	Peso-% b.s. [1]	≤ 0.7	≤ 1.5	≤ 3.0	EN 14775 (550 °C)
Durabilidad mecánica (DU)	Peso-% a.r. [1]	≥ 97.5 [4]		≥ 96,5 [4]	EN 15210-1
Finos, F (< 3.15 mm)	Peso-% a.r. [1]	<1			EN 15210-1
Aditivos	Peso-% b.s. [1]	≤ 2 peso-% tipo y cantidad pendientes de fijar			ver 8.4 del manual
Poder calorífico neto (Q)	MJ/kg a.r. [1]	16.5 ≤ Q ≤ 19 [5]	16.3 ≤ Q ≤ 19 [5]	16.0 ≤ Q ≤ 19 [5]	EN 14918
Densidad (BD)	kg/m³	≥ 600			EN 15103
Nitrógeno (N)	Peso-% b.s. [1]	≤ 0.3	≤ 0.5	≤ 1.0	EN 15104
Azufre (S)	Peso-% b.s. [1]	≤ 0.03		≤ 0.04	EN 15289
Cloro (Cl)	Peso-% b.s. [1]	≤ 0.02		≤ 0.03	EN 15289
Arsénico (As)	Peso-% b.s. [1]	≤ 1			EN 15297
Cadmio (Cd)	Peso-% b. s [1]	≤ 0,5			EN 15297
Cromo (Cr)	Peso-% b.s. [1]	≤ 10			EN 15297
Cobre (Cu)	mg/kg [1)]	≤ 10			EN 15297
Plomo (Pb)	mg/kg [1)]	≤ 10			EN 15297
Mercurio (Hg)	mg/kg [1)]	≤ 0,1			EN 15297
Níquel (Ni)	mg/kg [1)]	≤ 10			EN 15297
Zinc (Zn)	mg/kg [1)]	≤ 100			EN 15297
Temperatura de fusión de las cenizas (DT) [4]	°C	≥ 1 200	≥ 1 100		EN 15370

[1] a.r.= *as received* (tal y como es recibido el material), b.h.: en base húmeda (determinaciones del combustible húmedo [max. 10 *w*-%]), b.s : en base seca (análisis del combustible sin humedad).

[2] Clase de diámetro (D06 o D08) debe ser indicado.

[3] Máximo 1% de los pelets más largos de 40 mm., máxima Longitud 45 mm.

[4] La temperatura de fusión de las cenizas es informativa (voluntaria) en la norma EN 14961-2. Para la certificación ENplus, el límite para la temperatura debe ser observado y detectado. Para este propósito, la ceniza debe ser producida a 815 °C

[5] Los pelets torrefactados no están incluidos en ENplus ni en EN 14961-2. Esto es limitado poniendo el límite al poder calorífico neto *as received* en 19 MJ/kg como máximo.

Figure 7.7.1 Requirements for certified pellets.

8 ECONOMIC-FINANCIAL AREA

The aim of this section is to express all the economic and financial aspects of the project, based on the information presented above. Informs us of the funds needed to develop the project, sources of funding, the financial structure of the company, its profitability, etc.

8.1 PLAN OF INITIAL INVESTMENTS.

We are going to define machines, licenses, permits, facilities, etc. necessary for the development of the activity.

It is import to define the following: there are no costs associated with civil works, since the City Council has been responsible for this, giving us the ship in perfect condition. But we should consider that machinery, in addition to its own costs, costs mount. This cost will be 25% of the price of machinery, according to STOLZ, S.A. We also should consider that trailers will be used for the transport of machines. (STOLZ, 2015).

The prices that we add here are approximate, although very close to the actual price:

PROCESS	Equipment	Price	Units	Total
I	GRINDER	55.000,00 €	1	55.000,00 €
II	DRYER	475.000,00 €	1	475.000,00 €
III	PRESSING	180.000,00 €	1	180.000,00 €
III	GRINDER	40.000,00 €	1	40.000,00 €
IV	COOLER	20.000,00 €	1	20.000,00 €
V	PACKAGING	85.000,00 €	1	85.000,00 €
VI	SILO SUBPRODUCT	15.000,00 €	2	30.000,00 €
VI	SILO BAGS	25.000,00 €	1	25.000,00 €
VI	SILO GRANEL	25.000,00 €	1	25.000,00 €
-	DISCHARGE	30.000,00 €	-	30.000,00 €
-	TRANSPORT	110.000,00 €	-	110.000,00 €
TOTAL				1.075.000,00 €

Apart from the teams that we had referred to in 4.-we've added download and transport, including dosing hoppers, threads, elevators, etc.

We will also add cats deriving from the installation, transport of machinery to our ship, engineering, etc.

AMBIT	PRICE	UNITS	TOTAL
TRANSPORT	1.800,00 €	3	5.400,00 €
INSTALATION	30% OF MACHINERY	-	322.500,00 €
ENGINEERY	3% OF MACHINERY	-	32.250,00 €
TOTAL			360.150,00 €

Us therefore is that the total budget that we will need to start the activity are **1.435.150 €.**

We studied the possibility of a second budget, in that we only had in mind a mill (the parts that still not exceeded the requirements were returned to the same mill), and with cheaper transport systems, as well as second hand items.

We opted for the first budget since the second, to the only have a mill, required more by-product stores, to prevent breaks or stops of machines. In addition, second hand machines, although they believed lower initial outlay, then presented fewer years of life, so we did not convince.

We opted for the first, it shows higher quality, to be the new machines, and better security.

8.2 PLAN OF FINANCING

To finance the project, in addition to the initial outlay of some partners, it will ask for a loan to the entity BBVA. The characteristics of the loan are as follows:

- Amount: €1.500.000.
- Duration: 66 months.
- Settlement: quarterly.
- Interest: 2.5%.
- Opening Commission: 0%.

Picture of depreciation are as follows:

DATE	LIVE BALANCE	SHARE	AMORTIZATION	INTERESTS
01/01/2018	1.500.000,00 €	37.500,00 €	0,00 €	37.500,00 €
02/04/2018	1.436.185,78 €	99.718,86 €	63.814,22 €	35.904,64 €
02/07/2018	1.371.972,72 €	98.512,38 €	64.213,06 €	34.299,32 €
01/10/2018	1.307.358,33 €	97.298,35 €	64.614,39 €	32.683,96 €
01/01/2019	1.242.340,10 €	96.076,73 €	65.018,23 €	31.058,50 €
01/04/2019	1.176.915,51 €	94.847,48 €	65.424,59 €	29.422,89 €
01/07/2019	1.111.082,01 €	93.610,55 €	65.833,50 €	27.777,05 €
01/10/2019	1.044.837,06 €	92.365,88 €	66.244,95 €	26.120,93 €
01/01/2020	978.178,07 €	91.113,44 €	66.658,99 €	24.454,45 €
01/04/2020	911.102,46 €	89.853,17 €	67.075,61 €	22.777,56 €
01/07/2020	843.607,63 €	88.585,02 €	67.494,83 €	21.090,19 €
01/10/2020	775.690,96 €	87.308,94 €	67.916,67 €	19.392,27 €
01/01/2021	707.349,81 €	86.024,90 €	68.341,15 €	17.683,75 €
01/04/2021	638.581,53 €	84.732,82 €	68.768,28 €	15.964,54 €
01/07/2021	569.383,44 €	83.432,68 €	69.198,09 €	14.234,59 €
01/10/2021	499.752,87 €	82.124,39 €	69.630,57 €	12.493,82 €
03/01/2022	429.687,11 €	80.807,94 €	70.065,76 €	10.742,18 €
01/04/2022	359.183,43 €	79.483,27 €	70.503,68 €	8.979,59 €
01/07/2022	288.239,11 €	78.150,30 €	70.944,32 €	7.205,98 €
03/10/2022	216.851,39 €	76.809,00 €	71.387,72 €	5.421,28 €
02/01/2023	145.017,49 €	75.459,34 €	71.833,90 €	3.625,44 €
03/04/2023	72.734,63 €	74.101,23 €	72.282,86 €	1.818,37 €
03/07/2023	0,01 €	72.734,62 €	72.734,62 €	0,00 €

The first month, as we can see, we only pay interests. We could consider it as an opening commission, because we pay that the first day we receive the money, and we don´t amortize anything.

8.3 COLLECTION AND PAYMENT SYSTEM

8.3.1 For payments and collections systems we will define the following:

Payments to customers shall be made within a period of 15 days.

Payments to suppliers shall be made within a period of 15 days.

Payments to creditors (maintenance, consumption, etc.) shall be made each month.

8.3.2 Let's also define measures that we take regarding the taxation of our company from the hand of the agency that leads us:

We here the VAT on a quarterly basis.

We here the Social security contributions each month.

As the first year is the sawmill which provides the raw material, this will begin to assess it from the second year.

We consider a CPI (consumer price index) 3%, both raw materials and the salaries of workers and sales.

We liquidate the (tax) IS the month of July of the following year, and it will be 25%.

8.4 INCOME AND EXPENSES.

In this section, we are going to develop the analysis of income and expenditure, and will break down these according to their sources.

We will have costs associated with staff, consumption, maintenance, etc.

8.4.1 STAFF

Pawns: they will have a salary of € 12/h gross. They will work 260 days per year, in shifts of 8 hours a day, so it will be 2,080 hours for each worker. This amounts to €24.960 per year for every pawn.

Commercial: charge €29,000 per year, more a plus by objectives. We will post €33,000 gross annual.

Engineer: salary of €48.000 gross per year the first year, and if all goes well, will increase his salary to €53.000 per year.

***** You should also consider the extra payments, which will be 2 for workers that are the whole year, and 1 for those starting in the second half. In June and December.

We'll also be wage increases to workers from six, i.e. for every 6 years that are in the company. These increases will be 5%.

8.4.2 CONSUMPTION

Electricity: we know that our factory consumes around 850 kW. We have contacted with Iberdrola and they offer us a 0.155 €/ kWh rate. Therefore, for every 8 hours of work shift will be US €1.054.

Water: costs of water, including the rate of City Hall, will be 30€ / month.

Phones: we estimate 90 €/ month.

Subject premium: the first year the sawmill supplies it us so it does not mean us spending, but starting in the second half, we must ensure what us agreeing a price €35 ton with the sawmill.

8.4.3 MAINTENANCE

Machines: according to STOLZ, it assumes a 1% annual expenditure on machinery, i.e. €10.750 for 100% performance.

Workers: they will have to pass medical examination, as well as prevention of risk and training courses. These costs are estimated at €8.000 per year.

8.4.4 OTHER

Loan: it is in the annex.

Furniture: €12.000, which is amortized using the straight-line method over 5 years.

Software: €2.000 per year, which is amortized using the straight-line method over 5 years.

Professional services: the cost of these services will be of €16.800 per year, that is, €1.400 per month. It is included external agency, transport and notary.

Insurance and alarms: contacted the company Allianz, which gives us an approximate budget of €6.000 per year.

Office: we calculate €200 per year.

Advertising: the first year will be €5.000, and starting from the second of €2.000.

Constitution costs: €1.000 records and taxes.

With respect to revenues, will have the income associated with the number of sales, which we already calculated previously in paragraph 3.4., though there we calculate it with the market price. According to our pricing policy, also explained above, we will sell the first

semester at a price 10% below the market price, the second semester at market price, and starting in the second half to 5% above.

Therefore, our revenues are:

- First half: with a single work shift, we obtain €566.338,75.
- Second half: with two shifts, we obtain €1.258.630,56.
- Third semester onwards: we have 3 shifts and get €1.982.185,632.

In this section, you must also consider depreciation of machinery. Our machinery is linearly amortized with a term of 20 years, which means €53.750 per year.

In the table below we can see revenues and expenditures, monthly detailed for the first semester, and every six months starting from there.

	January	February	March	April
INCOME	-	-	-	-
Sales	94.389,79 €	94.389,79 €	94.389,79 €	94.389,79 €
Total Income	**94.389,79 €**	**94.389,79 €**	**94.389,79 €**	**94.389,79 €**
EXPENSES	-	-	-	-
Pawns (x2)	3.565,71 €	3.565,71 €	3.565,71 €	3.565,71 €
Commercial	2.357,14 €	2.357,14 €	2.357,14 €	2.357,14 €
Engineer	3.428,57 €	3.428,57 €	3.428,57 €	3.428,57 €
Social Security (30%)	2.805,43 €	2.805,43 €	2.805,43 €	2.805,43 €
Electricity	23.188,00 €	21.080,00 €	23.188,00 €	23.188,00 €
Water	30,00 €	30,00 €	30,00 €	30,00 €
Phones	90,00 €	90,00 €	90,00 €	90,00 €
Raw material	0,00 €	0,00 €	0,00 €	0,00 €
Maintenance machines	298,61 €	298,61 €	298,61 €	298,61 €
Maintenance workers	666,66 €	666,66 €	666,66 €	666,66 €
Professional services	1.400,00 €	1.400,00 €	1.400,00 €	1.400,00 €
Furniture	12.000,00 €	0,00 €	0,00 €	0,00 €
Software	2.000,00 €	0,00 €	0,00 €	0,00 €
Insurance	500,00 €	500,00 €	500,00 €	500,00 €
Office supplies	16,66 €	16,66 €	16,66 €	16,66 €
Advertising	416,67 €	416,67 €	416,67 €	416,67 €
Constitution	1.000,00 €	-	-	-
Amortization	56.550,00 €	53.750,00 €	53.750,00 €	53.750,00 €
Total Expenses	**110.313,45 €**	**90.405,45 €**	**92.513,45 €**	**92.513,45 €**
TOTAL	**-15.923,66 €**	**3.984,34 €**	**1.876,34 €**	**1.876,34 €**

	May	June	2nd SEMESTER	3rd SEMESTER
INCOME	-	-	-	-
Sales	94.389,79 €	94.389,79 €	1.258.630,56 €	1.982.185,63 €
Total Income	**94.389,79 €**	**94.389,79 €**	**1.258.630,56 €**	**1.982.185,63 €**
EXPENSES	-	-	-	-
Pawns (x2)	3.565,71 €	7.131,42 €	49.919,94 €	74.879,91 €
Commercial	2.357,14 €	4.714,28 €	16.499,98 €	16.499,98 €
Engineer	3.428,57 €	6.857,14 €	23.999,99 €	26.500,00 €
Social Security (30%)	2.805,43 €	5.610,85 €	27.125,97 €	35.363,97 €
Electricity	23.188,00 €	23.188,00 €	228.366,67 €	411.060,00 €
Water	30,00 €	30,00 €	180,00 €	180,00 €
Phones	90,00 €	90,00 €	540,00 €	540,00 €
Raw material	0,00 €	0,00 €	0,00 €	270.480,00 €
Maintenance machines	298,61 €	298,61 €	3.583,33 €	5.375,00 €
Maintenance workers	666,66 €	666,66 €	4.000,00 €	4.000,00 €
Professional services	1.400,00 €	1.400,00 €	8.400,00 €	8.400,00 €
Furniture	0,00 €	0,00 €	0,00 €	0,00 €
Software	0,00 €	0,00 €	0,00 €	0,00 €
Insurance	500,00 €	500,00 €	3.000,00 €	3.000,00 €
Office supplies	16,66 €	16,66 €	100,00 €	100,00 €
Advertising	416,67 €	416,67 €	2.500,00 €	1.000,00 €
Constitution	-	-	-	-
Amortization	53.750,00 €	53.750,00 €	322.500,00 €	325.300,00 €
Total Expenses	**92.513,45 €**	**104.670,29 €**	**690.715,88 €**	**1.182.678,86 €**
TOTAL	**1.876,34 €**	**-10.280,50 €**	**567.914,68 €**	**799.506,78 €**

It is very interesting the first half comes out losses. This is because high fixed expenses we have, and the little production. However, in the second half and get a good result, and better still in the third semester and later.

Although the first half is not good, we are not concerned, since we consider that the period of acceptance and make ourselves known to the customers.

Also, we reaffirm in the idea of introducing to the sawmill in the shareholding, since we avoided a great expense of provisioning the first year, which, otherwise, we would be quite a few more losses and, therefore, would be more difficult to take the business forward

8.5 THE INCOME STATEMENT FORECAST.

In this section, we have considered the tax that is applied to the profits of the enterprise. This tax, according to the Spanish law of the IS, is 25%. We assumed two cases:

1. Consider sales of 100% of the capacity

In this case, we get benefits even the first year. From the second year these income rises enough, so we decided to share part of the benefits in the form of dividends, handing out € 100,000 each year.

A	1st Year	2nd Year	3rd Year	4th Year	5th Year
Sales	1.824.969,30 €	3.964.371,26 €	3.964.371,26 €	3.964.371,26 €	3.964.371,26 €
Provisioning	0,00 €	540.960,00 €	540.960,00 €	540.960,00 €	540.960,00 €
Staff expenditure	210.643,77 €	314.487,71 €	314.487,71 €	314.487,71 €	314.487,71 €
Other Expenses	415.201,64 €	1.408.270,00 €	1.408.270,00 €	1.408.270,00 €	1.408.270,00 €
EBITDAR	1.199.123,90 €	1.700.653,55 €	1.700.653,55 €	1.700.653,55 €	1.700.653,55 €
Rental	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
EBITDA	1.199.123,90 €	1.700.653,55 €	1.700.653,55 €	1.700.653,55 €	1.700.653,55 €
Amortizations	647.800,00 €	647.800,00 €	647.800,00 €	647.800,00 €	647.800,00 €
EBIT	551.323,90 €	1.052.853,55 €	1.052.853,55 €	1.052.853,55 €	1.052.853,55 €
Financial income	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial expenses	140.387,92 €	114.379,37 €	87.714,48 €	60.376,69 €	32.349,03 €
Return on ordinary activities	410.935,97 €	938.474,18 €	965.139,07 €	992.476,86 €	1.020.504,52 €
EBT	410.935,97 €	938.474,18 €	965.139,07 €	992.476,86 €	1.020.504,52 €
Corporation tax (25%)	102.733,99 €	234.618,55 €	241.284,77 €	248.119,21 €	255.126,13 €
Dividends	0,00 €	100.000,00 €	100.000,00 €	100.000,00 €	100.000,00 €
NET RESULT	308.201,98 €	603.855,64 €	623.854,30 €	644.357,64 €	665.378,39 €

2. Consider sales of 75%, and costs (except supply and personnel) 85%

This time, the first year we get a result positive but minimal, which might make us doubt our business. The rest of years increases the benefit, but not enough. This time we cannot distribute dividends.

B	1st Year	2nd Year	3rd Year	4th Year	5th Year
Sales	1.368.726,98 €	2.973.278,45 €	2.973.278,45 €	2.973.278,45 €	2.973.278,45 €
Provisioning	0,00 €	540.960,00 €	540.960,00 €	540.960,00 €	540.960,00 €
Staff expenditure	210.643,77 €	314.487,71 €	314.487,71 €	314.487,71 €	314.487,71 €
Other Expenses	352.921,39 €	1.197.029,50 €	1.197.029,50 €	1.197.029,50 €	1.197.029,50 €
EBITDAR	805.161,82 €	920.801,23 €	920.801,23 €	920.801,23 €	920.801,23 €
Rental	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
EBITDA	805.161,82 €	920.801,23 €	920.801,23 €	920.801,23 €	920.801,23 €
Amortizations	647.800,00 €	647.800,00 €	647.800,00 €	647.800,00 €	647.800,00 €
EBIT	157.361,82 €	273.001,23 €	273.001,23 €	273.001,23 €	273.001,23 €
Financial income	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial expenses	140.387,92 €	114.379,37 €	87.714,48 €	60.376,69 €	32.349,03 €
Return on ordinary activities	16.973,90 €	158.621,87 €	185.286,76 €	212.624,54 €	240.652,21 €
EBT	16.973,90 €	158.621,87 €	185.286,76 €	212.624,54 €	240.652,21 €
Corporation tax (25%)	4.243,47 €	39.655,47 €	46.321,69 €	53.156,14 €	60.163,05 €
Dividends	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
NET RESULT	**12.730,42 €**	**118.966,40 €**	**138.965,07 €**	**159.468,41 €**	**180.489,16 €**

For each of the previous two, have calculated the VAN and the shooting, to analyze the economic and financial viability of the project. In each case we assumed two different, 10% and 20% rates of interest. We obtain the following results from previous cash flows and knowing that the initial investment is €1.430.000.

8.5.1 Sales of 100%

Year	Investment	Cash Flow
0	1.430.000,00 €	-1.430.000,00 €
1	0,00 €	308.201,98 €
2	0,00 €	603.855,64 €
3	0,00 €	623.854,30 €
4	0,00 €	644.357,64 €
5	0,00 €	665.378,39 €

- Interest rate: 10%

We get a NPV of 610.183,10 € and an IRR of 25%. That means that we should go ahead with this project, since it will be quite interesting for us. The profitability of this scenario is high, so we would carry out the project.

- Interest rate: 20%

We get a NPV of 154.458,41 € and an IRR of 25%. The same as before, it is still interesting to carry out the project. In this case, the discount rate is 20% so we obtain less money, but it´s still profitable.

8.5.2 Sales of 75%

Year	Investment	Cash Flow
0	1.430.000,00 €	-1.430.000,00 €
1	0,00 €	12.730,42 €
2	0,00 €	118.966,40 €
3	0,00 €	138.965,07 €
4	0,00 €	159.468,41 €
5	0,00 €	180.489,16 €

- Interest rate: 10%

We get a NPV of -904.284,01 € and an IRR of -20%. In this case, we obtain very bad results, which means that we shouldn´t carry out the project. It´s because our sales are only 75% out of expected. In this case, we could study to increase our production.

- Interest rate: 20%.

We get a NPV of -922.431,24 € and an IRR of -20%. As before, we shouldn´t carry out our project with these results.

8.6 TREASURY BUDGET.

In this section, we have analyzed the Treasury of the company in the first 5 years, i.e., the money that we are going to have in the company.

To do this we have considered the payment of the VAT, as well as the amortization of the loan, the payment of dividends, etc.

We have the following table:

	1st Year	2nd Year	3rd Year	4th Year	5th Year
CHARGES	-	-	-	-	-
Sales	1.824.969,30 €	3.964.371,26 €	3.964.371,26 €	3.964.371,26 €	3.964.371,26 €
Capital	-	-	-	-	-
Financial debt	1.500.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €
TOTAL CHARGES	**3.324.969,30 €**	**3.964.371,26 €**	**3.964.371,26 €**	**3.964.371,26 €**	**3.964.371,26 €**
PAYMENTS	-	-	-	-	-
Inmobile purchase	1.435.150,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Constitution expenses	1.000,00 €	-	-	-	-
Supplies (material)	0,00 €	540.960,00 €	540.960,00 €	540.960,00 €	540.960,00 €
Payrolls	155.879,82 €	235.759,78 €	235.759,78 €	235.759,78 €	235.759,78 €
Training costs	8.000,00 €	8.000,00 €	8.000,00 €	8.000,00 €	8.000,00 €
SS payment (30%)	46.763,95 €	70.727,93 €	70.727,93 €	70.727,93 €	70.727,93 €
Supplies (consumption)	410.201,62 €	1.406.270,00 €	1.406.270,00 €	1.406.270,00 €	1.406.270,00 €
Professional services	16.800,00 €	16.800,00 €	16.800,00 €	16.800,00 €	16.800,00 €
Publicity	5.000,02 €	2.000,00 €	2.000,00 €	2.000,00 €	2.000,00 €
Financial expenses	140.387,92 €	114.379,37 €	87.714,48 €	60.376,69 €	32.349,03 €
VAT payment by IS	102.733,99 €	234.618,55 €	241.284,77 €	248.119,21 €	255.126,13 €
Taxation	294.620,82 €	536.820,87 €	536.820,87 €	536.820,87 €	536.820,87 €
Loan amortization	192.641,67 €	262.521,27 €	269.146,10 €	275.938,09 €	275.938,09 €
Dividend payment	0,00 €	100.000,00 €	100.000,00 €	100.000,00 €	100.000,00 €
TOTAL PAYMENTS	**2.809.179,81 €**	**3.528.857,76 €**	**3.515.483,93 €**	**3.501.772,58 €**	**3.480.751,83 €**

INITIAL BOX	0,00 €	515.789,49 €	951.303,00 €	1.400.190,33 €	1.862.789,02 €
VARIATION	515.789,49 €	435.513,50 €	448.887,34 €	462.598,69 €	483.619,44 €
FINAL BOX	**515.789,49 €**	**951.303,00 €**	**1.400.190,33 €**	**1.862.789,02 €**	**2.346.408,46 €**

We see that the activity of the company is profitable, since the box increases more and more. We could ask ourselves to distribute more dividends.

8.7 RISK AND SENSIBILITY ANALYSIS.

In view of previous studies, in this section we will analyze the risks and sensitivity to which we are exposed.

With respect to income, not we should worry too much, since our only source of income is direct sales to customers, and as the market predicts rapid growth, found no problems on it.

In relation to costs, we must look at several sections.

We have fixed quite high costs, such as the supply of raw materials and the cost of staff.

The raw material we have ensured by our contract with the sawmill, and at a price that find us it attractive, but that's only the 5 first years, so, if the price of wood lot, climbed from the fifth year would see increased our costs significantly, which could have an impact on the benefits.

On the other hand, the cost of personnel is high. We will study each semester to see if there is some inefficiency and if you can dispense personal, or, on the contrary, if we need more.

Other high cost that has our company is electricity. Since all machines of the plant require high power to operate, we incur very high costs of electricity. It is a fundamental aspect, therefore, have a close relationship with the power company, to try to get the best possible prices, affecting our company's profits.

Therefore, our company is sensitive to changes in the price of wood (from the fifth year), and light. These are the two factors that could most affect our accounts.

We are also very exposed to a change in the legislation about taxes for solar energy, which would make solar energy more competitive and people could decide to convert to that way.

9 CONCLUSION

Once analyzed the environment, described the different teams, explained the manufacturing process, defined the budget and determined the profitability of the plant, we have met our objectives of the project.

9.1 We have obtained the following conclusions:

9.1.1 Is unsustainable in the short term the use of non-renewable energy sources.

9.1.2 More people and more Governments are becoming aware of this.

9.1.3 Is starting to encourage the companies that work with renewable energy, as well as the consumption of energy from these sources is encreasing.

9.1.4 Changes in sales prediction greatly modifies final results.

9.1.5 The use of two mills does not significantly increase the initial investment, and gives us much security in the event of failure.

9.1.6 By-product storage places represent a significant expense, but assure us that we should not stop the line fault.

9.1.7 Continuous production (3 shifts) is more profitable than producing with 1 or 2 shifts.

9.1.8 In the case of fulfilling the expectations of sales, our project has both economic and financial profitability. But in the case of only meet 75% of sales, it wouldn't, so assume the risk when assembling the plant.

9.2 We consider the following alternatives for the future:

9.2.1 Focus on our future to the simple growth of household needs, regardless of other segments.

9.2.2 A possible line of growth would be to enter the sector of sawmills, which have suffered a lot in the time of the crisis, and that would allow us to get better prices for the wood we use, as well as to commercialize the scrap wood that we were.

9.2.3 If we had a sawmill, we could expand our plant production, and thus our production capacity. If it is market increase at the expected pace, that we would have more benefits.

10 ANNEX

10.1 DISTRICT HEATING

District Heating are networks of massive power using biomass generation. It is produce heat at a central and distribute it for the urban, the same network that is made with water, electricity, gas, etc.

These networks have a huge field to be developed in Spain. Heat networks are fundamental in Northern and Eastern Europe, in Spain there is still much travel ahead. In Germany, Austria, Bulgaria, Croatia, Hungary and Romania market share is between 10% and 40%, and in Iceland, Sweden, Latvia, Estonia, Lithuania, Finland, Denmark, Poland, Czech Republic and Slovakia share is higher.

In Stockholm and Paris, these networks represent a reduction of 123.000 and 62.000 tons of CO2 per year, respectively, and he is expected to grow much in the next few years. Continue Vienna, Helsinki and Amsterdam.

In Europe, these networks already have 64 million users, representing 10% of the population.

In Spain only emphasizes Barcelona, which reduces emissions by 11,000 tons of CO2, and is expected to be 25.000 more in the next decade.

In Spain sales of heat are around 120 TJ, while in Finland, Denmark and Sweden will reach 100,000 TJ.

By autonomous communities Catalonia stands out with nearly twice as many networks that communities that follow it (country Basque, Castilla-León and Madrid), and by type of network the most abundant is the only heat (35 networks of the 56), although the mixed (19) are also abundant. In terms of the weighting of the power networks of heat supply represents 67%, while networks of cold brings 33%.

The typology of customer's network users is divided into three segments: tertiary, housing and industry. Being the first major type accumulates with more than half of clients (52%). The other half of customers are distributed unevenly, with 35% in the segment housing and only the remaining 13% of customers in industry. Depending on the power of network, industrial customers have a higher percentage (19%), which reduces both in residential customers (31%) as in those of tertiary (50%).

It is estimated that the set of heating and cooling networks installed in Spain represent an average savings of 60% of emissions with respect to a conventional system, and to reduce the consumption of fossil fuels by half. This amounts to a total saving of 82.000 tons of CO2, equivalent to 4.100.000 planted trees and 41 million of urban displacements. Despite the still insufficient implementation of this technology in our country, the experience is enough to prove the savings reported, and its possibilities for development are extremely spacious, with other more mature renewable.

It is estimated that Spain can save up to 40.000 million euros with the full development of these networks.

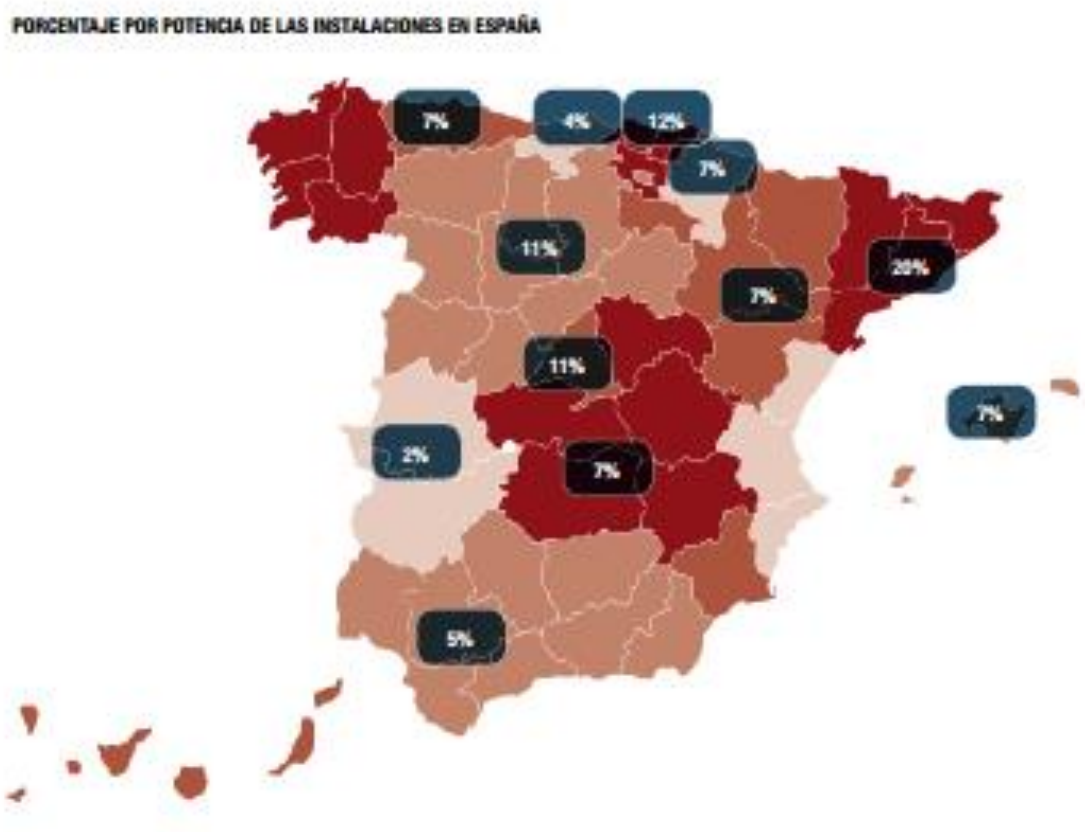


Figure 10.10.1 Percentage of power of installations in Spain

The expansion of networks of heat and cold has a favorable legal framework, if it is true that not enough by itself, given its growth retardation. This framework consists of three recent laws: new directive efficiency energy 2011/172; PER (2011-2020); and PAAEE (2011-2020), the three seek trade networks expansion so that they compete with other supplies, and are visible in the market.

The new energy efficiency policy 2011/172 highlights that heat networks are an essential alternative to energy efficiency, and says that States should develop plans for the

development of the DH & C. January 1, 2014. Update every 5 years. Such plans in local and regional development must be respected, and highlights the need for develop DH & C from renewables and waste treatments.

In addition, this new regulation sets criteria for measurement of energy efficiency for these networks, are catalogued as alternatives to any energy supply, and he is expected to be further connecting plants generating steam from waste heat networks.

And finally, the regulations are annex VII with the requirements of the Plan of development of this technology.

As for the P.E.R. (2011-2020), their support consists of that funding by private entities with support of the IDAE, and the inclusion of thermal renewables and networks of heating systems for energy certification of buildings, as well as the adaptation of the regulation of thermal installations in buildings (RITE) to renewable energy technologies. This helps advance the standardization and safety is given to consumers so that they see this as accessible as other option.

Finally, the PAAEE (2011-2020) comes to reinforce the entry into the market of heat networks, noting the air conditioning systems of the district as one of the key products in the energy efficiency of buildings. And it comes to clarify and support the role of energy service companies, which will be key in this market in the coming years, to achieve a remarkable improvement of the yields of the facilities by the introduction of cold and heat networks. (Lema, 2012)

10.2 CANVAS MODEL

We will summarize our project according to the canvas methodology to see if the conclusions are correct. Canvas model is as follows:

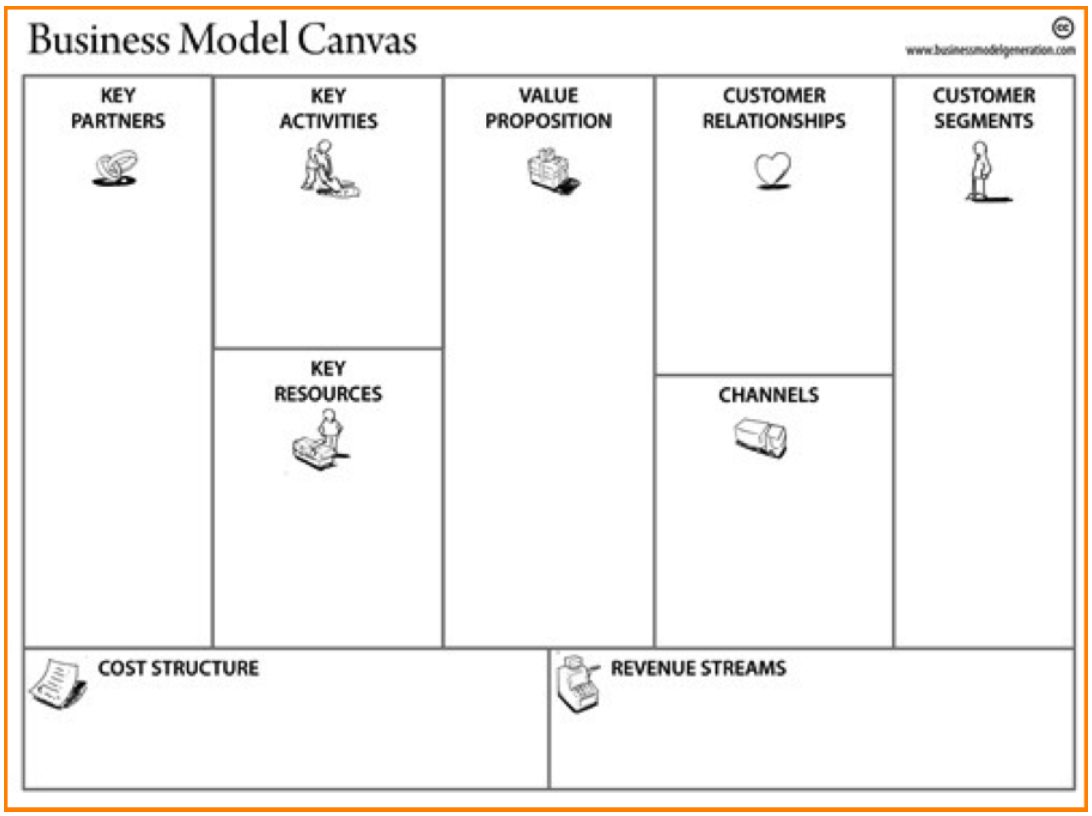


Figure 10.10.2 CANVAS model.

10.2.1 CUSTOMER SEGMENTS

Our customers will be all those people or groups of people who want to buy fuel for their biomass boilers.

Let's distinguish between individuals who want to buy it for their own homes, which bought us lower quantities, and groups such as communities of neighbors, industries, or District Heating, which we bought in bulk. For all of them we offer maximum quality and the best attention to the customer and after-sales services.

10.2.2 VALUE PROPOSITION

Our company offers customer the pellets with more quality in the market, since our manufacturing process is perfectly studied so that the final product is extraordinary. In

addition, we are working on a segment of renewable energy, which is very interesting to all people who want to warm their homes without polluting and damaging the environment.

We offer several purchase options, which gives us great versatility, adapting to the needs of each client. We treated are known for our quality, priced according to that quality, unparalleled customer, and superb accessibility, since we will work with orders by phone, internet, or physical.

10.2.3 CHANNELS

The channels by which we publicize will be both radios, newspapers, posters (at national level), as by our website, that will reach across Europe. In principle, we will not try to get out of Europe, since costs would be much higher transportation, as the barriers to entry in another continent.

Our presence at trade fairs of the sector, where we can show our customers our manufacturing process and our product will play an important role. In this way, we intend to go in hand with La Junta and institutions seeking to promote renewable energy sources, raising awareness to customers of the need to look for these sources that are sustainable for the planet.

10.2.4 CUSTOMERS RELATIONSHIP

Our relationship with clients will be unique. Using the methods of advertising we will keep you informed of our prices, offers, etc.

In addition, customers can access our plant to see for themselves the production process that we follow, and, also, we offer a good customer service, so that our relationship does not end when we collect our money.

10.2.5 REVENUE STREAMS

Sources of income, therefore, will come from our sales of final product. Advertising and pricing policy that we assume we will impact very positively throughout our business.

Our customers will be willing to pay the prices previously studied, since the main substitute product is diesel, and, as studied, offers less profitability. We will offer different prices depending on the volume of purchase, if it is for bags or in bulk, and, in principle, are

not willing to accept the price negotiations, although in special cases as agreements with a municipality to supply a District Heating could study it.

10.2.6 KEY PARTNERS

Our partners are, as we said, the City Council of Bembibre and sawmill. The sawmill, moreover, will be our main supplier. Our good relationship with them is vital, since they play a very important role in the formation of the company. While the Council supplies us with the ship, where we will install our pelletizing plant, sawmill provides us all the raw for the first year, and gives the corresponding to the following 4 years, with a price agreed in advance that find us interesting. Therefore, they are key partners, and we should maintain a good relationship with them.

10.2.7 KEY ACTIVITIES

Our company will carry out the transformation of raw material, through a process of complex pelletizing, into wood pellets which can be used as fuel. We are going to carry out a very careful production process, which will result in maximum quality pellet, certified with ENplus quality, which we will differentiate by quality.

Our source of income, will mainly be private clients (both industries and individuals), so it will carry out an exquisite service to the client, optimizing our relationship with them, promoting our business.

There are also a potential customer councils, due to the District Heating installations, above.

Customers can access us both by phone and through the internet, or even physically in the factory.

10.2.8 KEY RESOURCES

Key resources that we need to carry out our activity will be: the industrial land provided by the Town Hall, the raw material provided by the sawmill, as well as the credit that gives us the Bank, to finance all the necessary machinery and its installation. We will also need a qualified engineer with good ideas, a commercial with social skills, laborers willing to work and learn every day, and form a team together on everything, most importantly.

Therefore, our resources are both physical and economic, financial, and human.

10.2.9 COST STRUCTURE

Our biggest cost will come the electricity we consume to carry out the production process, both raw. The first year we have arranged the raw, so we save on costs.

Therefore, we have a high fixed, and not so high variable costs, so we want to work with 3 shifts and produce as much as possible (as already discussed above).

However, our business is based on value, i.e. we focus on our value proposition, not to offer our products at a lower price.

We also take advantage of our sawmill, which, being linked, we get economies of scale, obtaining raw material at good price. With respect to the economies of scope, we will focus on Spain, and we will export around Europe, but we will not leave the continent, since we do not see it feasible in the first instance.

11 BIBLIOGRAPHY

Agency, I. E. (2016). CO2 emissions from fuel combustion. *HIGHLIGHTS*.

AVEBIOM. (march, 2017). *Indice de precios del pellet doméstico en España.*

AVEBIOM. (November, 2016). *Jornada en AENOR sobre ENplus.*

España, G. d. (November, 2014). UNE-EN ISO 17225-2:2014. *Biocombustibles sólidos: especificaciones y clases de combustibles*.

IDAE. (February, 2015). *Boletín de precios de la Biomasa para usos térmicos.*

IDAE. (February, 2017). Exposición itinerante de Biomasa en tu Casa. *INFO DAE*.

IDAE. (November, 2016). *Programas grandes instalaciones térmicas GIT*.

Lema, M. P. (2012). Desarrollo de los District Heating en España. *energetica*.

UNESA. (2013). *Estimación de las emisiones de CO2 en la producción de electricidad.*

http://todobiomasa.es/blog/fabricas-de-pellets/

http://pelletsdelsur.com/projects/pellets-en-plus-a1/

http://todobiomasa.es/blog/que-es-mas-caro-el-pellet-o-la-lena/

https://www.youtube.com/watch?v=9CX3MavmiWg

https://www.biogramasa.es/pellet-en-castilla-y-leon/

http://granulas.lv/eng/

http://www.forest-monitor.com/es/la-produccion-de-pellets-en-espana-no-llega-al-40-de-la-capacidad-instalada/

http://www.biocastellana.com/cuanto-pellet-consumiremos-y-de-donde-llegara/

https://www.forest-monitor.com/es/mercado-pellets-madera-la-ue-datos-recientes/

http://www.forest-monitor.com/es/union-europea-pellets-mercado/

http://www.forest-monitor.com/es/union-europea-pellets-mercado INFO

http://www.propellets.at/very-low-fine-dust-emissions-caused-by-pellet-boilers/

http://www.depi.de/media/filebase/files/infothek/images/Brennstoffkosten-Deutschland.jpg Photo Germany

http://www.efidistrict.eu/nueva-red-calor/biomasa/ Facilities

http://www.un.org/sustainabledevelopment/es/2017/03/la-industria-maderera-tambien-puede-ayudar-a-combatir-el-cambio-climatico/

http://calorerbi.eu/que-es-el-pellet/ Description

http://ventadepellets.eu/historia-del-pellet/ History and law

http://www.energiza.org/eolica/20-biomasa/939-biomasa-en-la-uni%C3%B3n-europea INFO Europe

http://wp.cienciaycemento.com/peletizados-la-fabrica-de-pelets-clave-para-el-avance-de-la-biomasa/ Process

http://www.energiza.org/index.php/biomasa-2/806-la-biomasa-solida-se-consolida-como-la-fuente-de-energia-mas-competitiva-para-calefaccion Prices

https://www.endesaeduca.com/Endesa_educa/recursos-interactivos/el-sector-electrico/consumo-energia-mundo#distribucion2

http://www.okofen.es/es/pellematic_condens/#tab3 Boilers

https://www.hargassner.es/2015/10/23/avebiom-estima-que-espana-superara-los-800-000-kw-de-potencia-instalada-en-2020-2/

https://www.hargassner.es/2016/06/13/requisitos-de-diseno-ecologico-para-calderas-de-biomasa/

https://maquinariabiomasa.com/peletizadoras-para-fabricar-pellets-de-madera/

http://economipedia.com/definiciones/comparacion-entre-van-y-tir.html

https://www.theade.co.uk/resources/what-is-district-heating