SMART BIDIRECTIONAL ELECTRIC VEHICLES' CHARGER

BE-HOME

Aarón García Hernando

Íñigo Montesino Sarmiento

Guillermo Acevedo Perosanz

Covadonga Esponera Cienfuegos-Jovellanos

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EXECUTIVE SUMMARY

¿What is Be-Home?

Be-Home is a start-up that aims to address the increase in electricity prices in domestic markets. To do so, it proposes the use of electric car batteries as household power sources at times when electricity is more expensive, with a modern system of bi-directional chargers.

In addition, and in order to make a useful and efficient management, and to adapt to the consumer's behaviour, an application will be developed for which the user will pay a monthly fee that will allow him to reduce the monthly electricity tariff significantly.

Be home was born in the context of:

- High energy prices in a globalized market, affected by factors such as the inflation crisis, covid 19 and the war in Ukraine, where resources are scarce, and uncertainty prevails.
- Growth in electricity consumption. We are becoming more and more dependent on this resource due to technological facilities such as household appliances and electric cars.
- Development of domotics and self-management: we believe in the development and improvement of quality of life, where automation and progress are achieved by allowing people to work on things that add value.
- Battery market, with further development of these technologies, where they are increasingly necessary to meet universal zero-emission targets.

Our product:

The intelligent bidirectional charger will take advantage of the reduced rates existing during the night to recharge the batteries of the electric vehicle and bring them to their maximum recommended percentage, respecting the safety percentages indicated by the manufacturer so as not to negatively affect the performance of the batteries.

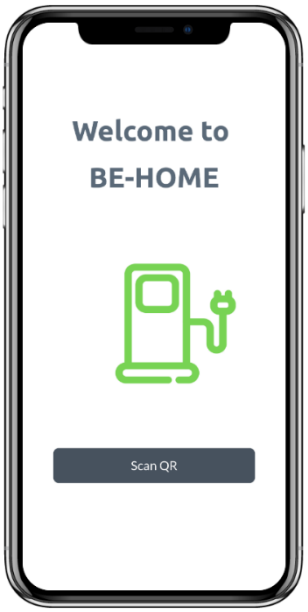
Once the vehicle has been charged, at the minimum possible power so that the charge percentage reaches its maximum moments before the occupants of the house where the charger is located wake up, the charger will switch to discharge mode of the vehicle, and from this moment on, the house will be able to use the electricity contained in the batteries.

Once the electricity tariff is more expensive, either because the price rises with the increase in demand, or because the contracted tariff ends with the super reduced tariff, the app will

indicate that we can use the battery charge and will recommend us to perform the most energy-intensive actions when the vehicle is in this mode. The charger needs some inputs that will be adjusted intelligently with the data captured by the charger which will indicate the average percentage of battery used for travel with the vehicle, so that the load necessary to make these displacements smoothly with a sufficient margin for possible variations in the trend will always be respected.

The average annual electricity consumption per household is 3,487 kWh, which implies an average monthly consumption of 291 kWh per household. According to the IDAE, an average of 10 kWh per day without counting the charge of the electric vehicle, so taking into account a battery of an average electric vehicle of 60 kWh, these batteries have enough capacity to power the house during the peak rate time in which it is connected, being able to be the whole day using only the vehicle battery without problems, in any case, the house will always be connected to the network so that the connections of powerful devices and other situations in which the battery can be stressed by a high power suddenly will be smoothed with the grid.

Our Service:



We offer a mobile application that allows our customers connect to their smart chargers via Wi-Fi connection using their smart phone, that allows them to control the charger remotely.

The mobile application offers the users various features that will help them save money in their electricity consumption bills. In order to use the mobile application, the users will pay a monthly fee, but it will be lower than the money they will save thanks to our product.

This service will allow the users control how and when their cars' battery gets charged, also they could consult their consumptions and savings. Moreover, the application will notify them with different tips.

Our Business Model:

From the customer acquisition, the company will start earning money first with the sale and installation of the electric charger. This product is something necessary for an electric car user, a market in expansion and where we will compete with a market price but with the difference of the added value that the application will bring.

The idea that we will make the customer understand is that by buying our product he will be able to charge his car battery when the electricity is at its lowest.

Once you have your car battery charged to the maximum at a minimum cost, you can then face the discharge as you wish. Generally, it will be to use the car battery needed for transportation that day and when you get home you can use the remaining battery to power your household needs.

In this way, the customer will be able to save a significant percentage on his monthly electricity bill and will have no inconvenience in paying for our application as a service.

Since it is a new service, we believe that the best way to make ourselves known will be through a great investment in marketing in order to sell our idea that "if you hire us, you will save money".

At the same time, we will have an operations department that will be mainly in charge of the relations with our suppliers since we will have the design but not the manufacturing. This department will also manage the installations and maintenance of each of our customers.

The company's human resources will be divided into 4 departments: commercial, technical, operations and financial, each of them will be led by one of the company's partners and composed of employees who will evolve according to the needs of the business.

After conducting a market study, we estimate that by the end of the second year of the project we will have more than 3,000 customers, who will pay the following prices:

Initial outlay: purchase of the bidirectional charger for a net amount of 750€.

Monthly payment: for maintenance, technical service and use of the intelligent application. Without it, the charger would only work as a normal electric car charger, and would not allow you to power your home or manage the charging of the vehicle when you want, only when you plug it in. The net amount is 10€ per month, always lower than the money the client will save.

What are our resources?

Capital contributed by the partners: 160k (40k each)

Crowdfunding launched as a start-up: 40k thanks to a strong marketing investment

Bank loan requested for 200k at 5% fixed interest rate over 5 years

Our numbers:

VAN: 56k (10%)

TIR: 12.94%

Payback: 3.82 Years

1. INTRODUCTION AND MARKET ANALYSIS

1.1. PROBLEM DEFINITION

In the energy context in which we find ourselves today, we can identify the price of electricity as a major concern, and the fact that there are periods in which prices are different, makes families worry about changing their consumption habits in order to mitigate the continuous price increases.

The Spanish electricity market sets its prices in relation to energy demand, which is why we can see that at night the price of electricity is cheaper than at some times of the day. Because of this, there are different fixed tariffs offered by the distribution companies that subsidize the consumption in these time slots with very reduced prices.

In parallel to this situation, we can see how the implementation of electric vehicles in our society is becoming more and more widespread.

It is here where we have identified a possible business opportunity in which by means of a bidirectional charger, we will be able to cushion the oscillations of the price of electricity using the battery of electric vehicles

We truly believe that with our device, not only would it dampen off-peak hours so that demand would not drop as much in these periods, but also that at times of high electricity demand by consumers, the networks would be less strained as users would be able to use their own electricity stored in the electric vehicles.

1.2. DISTRIBUTED GENERATION, SMART GRIDS AND SMART CITIES

To better understand how our business model could be successful, it is essential to explain distributed generation, smart grids, and smart cities.

Distributed generation consists of the generation of electrical energy by means of many small generation sources that are installed near points of consumption. Distributed generation is based on the cooperation between this microgeneration and the generation of conventional power plants. ([1])

Distributed generation is made possible by smart grids.

Smart grids are electricity grids that can intelligently and dynamically integrate the actions of all users connected to them – those who generate energy, the ones who consume it or those who do both – in order to supply electricity efficiently, sustainably, economically, and safely.

Smart grids incorporate digital technology into their traditional design to facilitate the bidirectional exchange of energy and information. They do so thanks to the internet, information and communication technologies, control systems and state-of-the-art IT and home automation applications.

Thus, the smart grid is able to respond to the electricity demand necessities of citizens and to potential incidents that may occur. The bidirectional nature of these grids allows the users to be both consumer and producer: they can produce energy and sell it to industrial or commercial users. ([2])

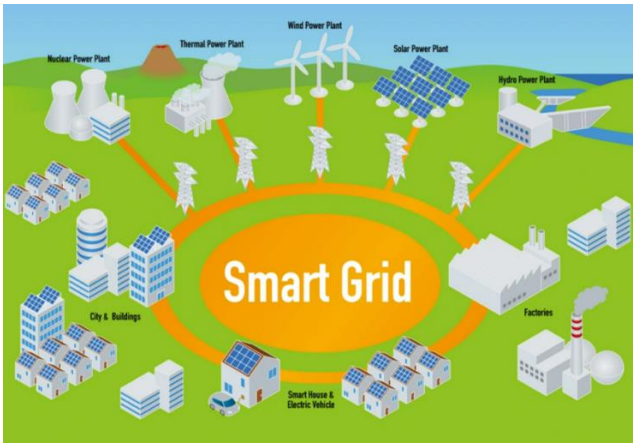


Figure 1: Distributed generation thanks to smart grid ([3])

Distributed generation and smart grids are two of the subsystems that will enable the implementation of smart cities. ([4])

Smart cities are born with the purpose of creating ([4]):

- Sustainable development
- An increase in the quality of life of citizens
- Greater efficiency of available resources

The ideal model of a smart city is mainly based on the following subsystems ([4]):

- Distributed generation
- Smart grids.
- Smart metering. Intelligent measurement of energy expenditure data of each user, through remote meters where readings are taken remotely and in real time.
- Smart buildings. Environmentally friendly, domotic buildings with integrated production systems.
- Smart sensors. Smart sensors have the function of gathering all necessary data to make the city in a smart city. They are an essential part of keeping the city connected and informed and making each subsystem fulfil its function.
- eMobility. Implementation of electric vehicle and the respective public and private points of charge.
- Information and communication technologies.

In conclusion, it is clear that the traditional electric model we know is changing and being replaced by distributed generation, playing a fundamental role in this transition to electric vehicles.

1.3. BATTERIES DEGRADATION

The first question that arises when our idea is raised is whether the car's batteries could be affected, whether their degradation would be greater, and their life would be shortened.

First and foremost, we will explain how lithium-ion batteries (LIBs), the most commonly used in electric vehicles.

A common LIB consists of lithium compound-based cathode, carbon-based anode, electrolyte, and separator. In general, the cathode materials are coated on an aluminium foil and the anode materials are coated on a copper foil, respectively. The aluminium and copper serve as the current collectors. A piece of porous polymer separator that is immersed in electrolyte and sandwiched between the anode and cathode prevents the shorting of the two electrodes (Figure 2). As shown in Figure 3, lithium ions go through the cycles of intercalation and deintercalation, and shuttle through the electrolyte as charge carriers in the internal circuit. With the intercalation and deintercalation of lithium ions, redox reactions occur at the electrodes, which generate electrons that move directionally through the external circuit to form the current. The migration of lithium ions in internal circuit and electrons in external circuit leads to the operation of LIBs. ([5])

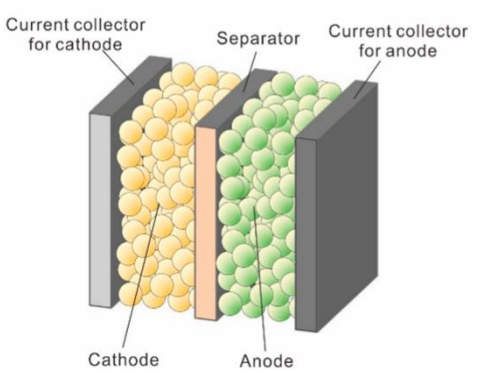


Figure 2: Scheme of a LIB ([5])

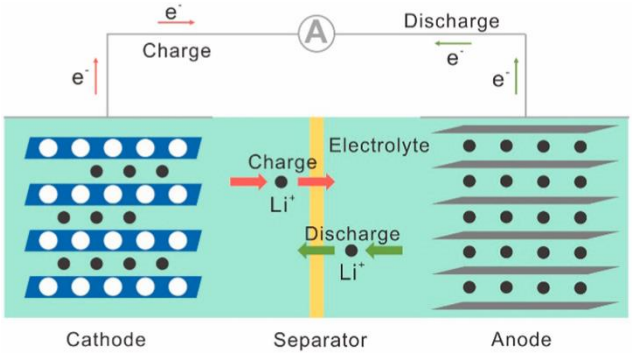


Figure 3: How a LIB works ([5])

The first question that arises when our idea is raised is whether the car's batteries could be affected, whether their degradation would be greater, and their life would be shortened.

It is therefore important to know what causes the degradation of batteries and what factors cause it to degrade faster.

Battery degradation is a natural process, due to the chemical reactions that take place in the LIB. This process constantly reduces the amount of energy a battery can store, or the amount of power it can provide. The batteries in EVs can generally deliver more power than the powertrain components can handle. As a result, power degradation is rarely observable in EVs and only the loss of the battery's ability to store energy matters. ([6])

An important indicator of the battery life is its state of health (SOH), that reflects the ability of a battery to deliver and receive energy and power ([7]). Over time, batteries deteriorate and their SOH decrease.

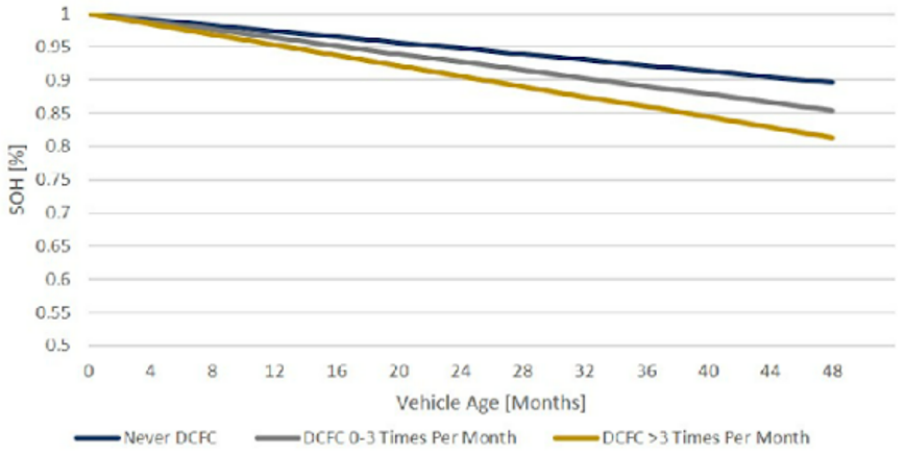
The most common factors impacting lithium-ion battery health are ([5]) ([6]) ([8]) ([9]):

1. Extreme climates. Some research showed that the optimal temperature range for LIBs is 15 °C–35 °C. Once the temperature is out of these comfortable regions, LIBs will degrade fast with increased risk of facing safety problems. In general, impacts from temperature can be divided into two categories: low temperature effects and high temperature effects:

- Low temperature effects. LIBs will show slow chemical-reaction activity and charge-transfer velocity, which leads to the decrease of ionic conductivity in the electrolytes and lithium-ion diffusivity within the electrodes. Such decrease will result in the reduction of energy and power capability, and sometimes even performance failure.
- High temperature effects. The high temperature effects will lead to the loss of capacity and power. Generally, the loss of lithium and the reduction of active materials under high temperature will result in the loss of the capacity, while the increase of internal resistance is responsible for the loss of power.

2. Operating at high and low state of charge. The state of charge (SOC) is the level of charge relative to its total capacity at any given moment. This term is directly related to depth of discharge (DOD) and battery life cycles. Battery´s DOD indicates the percentage of the battery that has been discharged relative to the overall capacity of the battery. Battery life cycles are the number of charge/discharge cycles a battery can sustain in its useful life and depend on how much of the battery's capacity you normally use. If you regularly discharge the batteries at a lower percentage amount, it will have more useful cycles than if you frequently drain the battery to its maximum DoD. So, Therefore, battery manufacturers recommend that the battery be kept between 20% and 80% of its charge.

3. High electric current (charge type). Some research has shown that rapidly charging a battery entails high currents resulting in high temperatures, both known to strain batteries. The following graph shows how a direct current fast charger (DCFC) can affect the state of health of the battery.



Graphic 1: Battery State of Health (SOH) vs Time: Varying DCFC Use ([6])

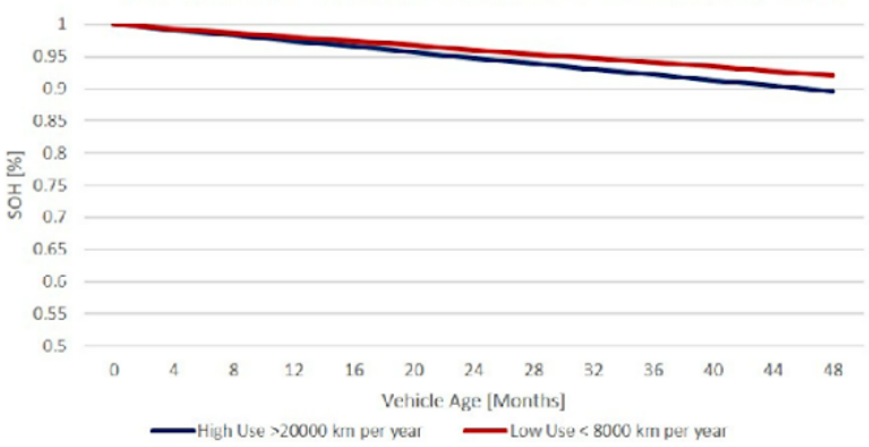
These three factors mentioned above are the ones that most affect the faster degradation of the batteries. Therefore, it is advisable to follow the following tips to avoid further degradation ([6]):

- Avoid keeping your battery car with a full or empty charge. Ideally, keep your SOC between 20%-80%.

- Minimize fast charging.

- Avoid subjecting the car to both low and high temperatures (try to park in air-conditioned areas).

It is also worth mentioning that the high use of electric cars, following the recently mentioned recommendations, did not show significantly higher battery degradation.



Graphic 2: Battery SOH vs Time: Varying use levels ([6])

Hence, the doubt that may arise for our future customers as to whether the increased use of their car battery could damage it, would be perfectly clarified with the information recently explained.

1.4. FLATTENING OF THE DEMAND CURVE

The efficiency of an electricity system is largely determined by the adequacy of the system operator's demand forecasts to the real market demand, but the total efficiency of the system would be achieved if we were able to reduce to the maximum the peaks of maximum demand that occur on a daily basis.

The ideal efficiency for a power system would be found when the same amount of energy is always demanded at any time of the day, so that there is absolute control over the energy production needed to meet that demand. The system operator would not have to give stop or start orders to the power plants, whatever their technology. It would be limited to making a weekly or monthly planning of energy production distribution.

That is certainly unrealistic today and may take many years to achieve. The curve shown below is that of April 30, but it could be that of any working day of the week. The yellow demand line (around 11 am) is very close to the green forecast line. Everything looks under control, but it could be much better.

Graphic 3: Forecast and demand curve

Electrical energy is an immediate and finite product. If it is not consumed at the moment, it is lost and has to be produced again. The only option to consume it later is to store it, but this entails costs that raise the price of energy considerably.

We know that the electric vehicle helps to reduce CO2 emissions and to reduce our energy dependence on the outside world, but we should also know that it can be a great opportunity to improve the overall efficiency of the electricity system. According to Red Eléctrica de España, the electric vehicle as a new consumer of electricity can become an ally for the efficient operation of the electricity system and for a greater integration of renewable energies, if recharging is carried out during the off-peak hours of the system, i.e. during the night when consumption is minimal. This will not only flatten the demand curve, but also optimize electrical infrastructures and take advantage of renewable energy, which is difficult to manage and is sometimes not produced due to insufficient demand.

However, for this to be effective, it will require the development of an intelligent recharging management system that is flexible enough to adapt to consumer preferences and, in line with the needs of the electricity system, encourages the recharging of vehicles outside peak electricity demand hours.

Smart meters and charging devices will be an essential tool here for vehicle communication with the grids, so that price signals are received that incentivize users to carry out off-peak charging. The electric vehicle can become a reversible storage system that can dump energy that has been stored overnight back into the grid at times of peak demand and this is what we are developing here.

In this way we will also achieve a flattening of the daytime demand curve and therefore greater efficiency of the electricity grid. REE is clear that the electric vehicle will be a fundamental part as an electric consumer in the coming years, and therefore has already prepared a recharge simulator in which we can see the effect of flattening the curve in off-peak hours. ([10]) ([11])

Graphic 4: Flattering of the demand curve

1.5. V2G AND V2H

Following the birth of the idea of distributed generation in which, as we have already mentioned, electric vehicles play a key role, together with the emergence of bidirectional charging, the terms V2G (vehicle to grid) and V2H (vehicle to home) were born.

V2G takes place when a bi-directional charger is used to supply power (electricity) from the vehicle battery to the utility grid via a DC to AC converter integrated into the vehicle charger. V2G technology can be used to balance and fix energy needs through smart charging. Vehicles are parked for most of the time, so with careful planning and the right infrastructure, parked and plugged-in electric vehicles could become a large energy bank that would stabilize power grids for the future. Electric vehicles would become huge batteries on wheels, helping to ensure that there is always enough power for everyone.

V2H occurs when a bi-directional charger is used to supply power (electricity) from the vehicle battery to the home via a DC to AC converter integrated into the vehicle charger. V2H, like V2G technology, helps to balance and fix energy needs. You can charge your electric vehicle at night when demand is lower and use that electricity during the day at home. In this way, you will help reduce peak hour consumption and relieve pressure on the grid. Thus, V2H technology allows us to have the energy we need at home when we need it most, reducing the load on the grid.

In our case, we are going to focus on the study of V2H. ([12])

1.6. TARIFFS

We have compared different electricity tariffs, specifically designed for charging electric vehicles, and examined which one could provide greater savings.

Shown below are the electricity tariffs studied:

1) Iberdrola, Plan Vehículo Eléctrico

		Up to 5 kW	5 - 10 kW	10 - 15 kW
Power price (€/kW year)	Off-peak hours	5,21	5,21	5,21
	Peak hours	30,57	30,57	30,57
Price of energy consumed (€/kWh)	Best price hours (1:00 - 7:00)	0,03	0,03	0,03
	Non-promotional hours	0,42427	0,42427	0,42927

2) Repsol, Tarifa Vehículo Eléctrico

Power price (€/kW year)	Off-peak hours (0:00 - 8:00, weekends and public holidays)	3,984705
	Peak hours (8:00 - 0:00)	35,505375
Price of energy consumed (€/kWh)	Off-peak hours (0:00 - 8:00 / weekends and public holidays)	0,259601
	Flat hours (8:00 - 10:00 / 14:00 - 18:00 / 22:00 - 0:00)	0,278604
	Peak hours (10:00 - 14:00 / 18:00 - 22:00)	0,328527

3) Endesa, Tarifa One Luz 3 Periodos

		<= 15 kW
Power price (€/kW year)	Off-peak hours (0:00 - 8:00, weekends and public holidays)	7,997304
	Peak hours (8:00 - 0:00)	33,861612
Price of energy consumed (€/kWh)	Off-peak hours (0:00 - 8:00 / weekends and public holidays)	0,190111
	Flat hours (8:00 - 10:00 / 14:00 - 18:00 / 22:00 - 0:00)	0,229623
	Peak hours (10:00 - 14:00 / 18:00 - 22:00)	0,287555

4) Naturgy, Tarifa Noche

		Up to 10 kW	Over 10 kW
Power price (€/kW year)	Off-peak hours (0:00 - 8:00, weekends and public holidays)	5,168124	5,168124
	Peak hours (8:00 - 0:00)	30,189048	30,189048
Price of energy consumed (€/kWh)	Off-peak hours (0:00 - 8:00 / weekends and public holidays)	0,190883	0,190883
	Flat hours (8:00 - 10:00 / 14:00 - 18:00 / 22:00 - 0:00)	0,24183	0,24183
	Peak hours (10:00 - 14:00 / 18:00 - 22:00)	0,298953	0,298953

With these four electricity tariffs, we verified which one could provide greater savings to our customers. We have considered that the power our customers will have contracted will not be more than 10 kW (the chargers are 7,4 kW). As the power prices are similar for all tariffs, we have estimated the savings per energy consumed:

	Savings per energy consumed
Iberdrola	0,39427
Repsol	0,068926
Endesa	0,097444
Naturgy	0,10807

With this study, we realised that the tariff offered by Iberdrola is the ideal one for our product. Consequently, as will be explained in more detail in another section, Iberdrola will be one of our partners.

1.7. SAVINGS

Once detected the best tariff, the study of the expected savings has been based on this tariff.

https://tarifasgasluz.com/faq/cuanto-cuesta-luz-mes

The reference data we have used to calculate the savings are as follows:

Off-peak hours	0,03 €/kWh
Peak hours	0,42 € /kWh
Price difference between off-peak and peak hours	0,39 €/kWh
Monthly single-family house energy consumed	317 kWh
Annual single-family house consumed	3.800 kWh
Monthly single-family house expenditure by energy consumed	134,35 €
Annual single-family house expenditure by energy consumed	1.612,23 €
Distance travelled daily	50 km
Average power consumed by appliances	5,5 kW
Monthly fee	10 €
Daily EV battery hours used for domestic consumption	6

Based on the above data and the energy present in the batteries of some of the electric car models currently on the market, the estimates that have been made are shown in the savings table 6 located in the appendix.

So, from the savings we conclude that it would be possible for our customers to obtain an annual economic saving of 46% of their electricity tariff.

1.8. EXPLANATION OF CHARGER OPERATION

The intelligent bidirectional charger will take advantage of the reduced rates existing during the night to recharge the batteries of the electric vehicle and bring them to their maximum recommended percentage, respecting the safety percentages indicated by the manufacturer so as not to negatively affect the performance of the batteries. Once the vehicle has been charged, at the minimum possible power so that the charge percentage reaches its maximum moments before the occupants of the house where the charger is located wake up, the charger will switch to discharge mode of the vehicle, and from this moment on, the house will be able to use the electricity contained in the batteries.

Once the electricity tariff is more expensive, either because the price rises with the increase in demand, or because the contracted tariff ends with the super reduced tariff, the app will indicate that we can use the battery charge and will recommend us to perform the most energy-intensive actions when the vehicle is in this mode. The charger needs some inputs that will be adjusted intelligently with the data captured by the charger which will indicate the average percentage of battery used for travel with the vehicle, so that the load necessary to make these displacements smoothly with a sufficient margin for possible variations in the trend will always be respected.

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1.9. MARKET ANALYSIS: ELECTRIFICATION PLANS

Not only are the governments the ones which want to promote battery electric vehicles, but the major manufacturers of cars also are interested in electrifying their fleets.

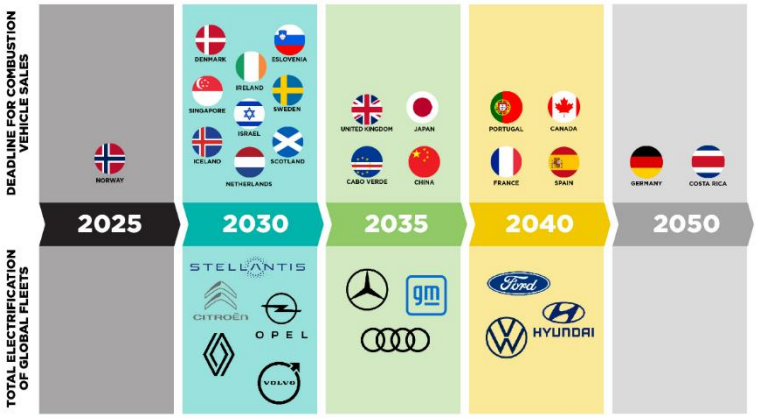


Figure 4: Governments and major manufacturers electrification plans ([13])

Some major players in the automotive sector have announced their intentions to sell only electric cars by 2030. Among these players we can find Renault, Volvo, and Stellantis Group.

Other brands such as Mercedes, Audi and General Motors have published that they are planning to electrify their fleets by 2035.

Finally, another companies, such as Ford, Volkswagen and Hyundai, have announced that they will achieve this target by 2040. ([13])

1.10. SWOT

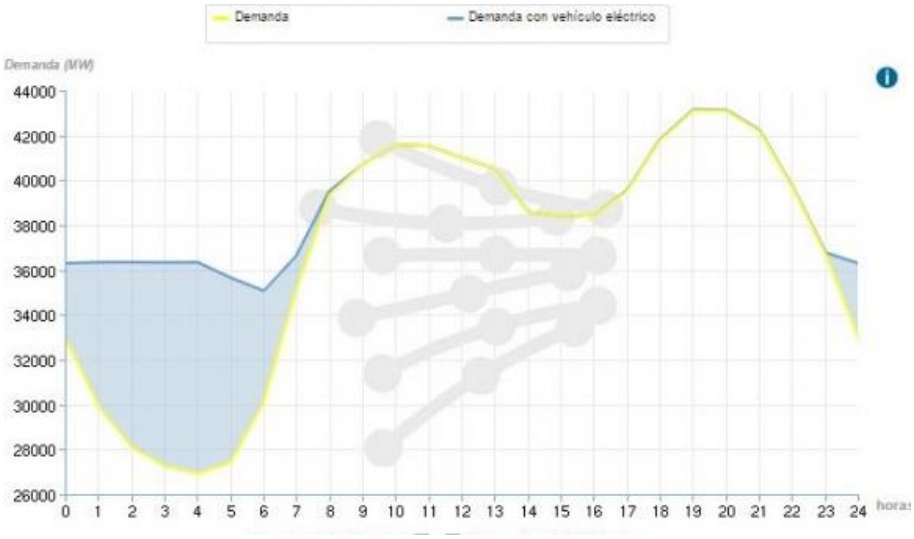
We have carried out a SWOT analysis to identify our strengths and weaknesses in order to know in which areas we can excel and in which areas we need to improve for the purpose of making a good value proposition.

Figure 5: SWOT analysis

1.11. CONSEQUENCES

The end customer is currently paying more than he is used to. We also have the problem that consumption is concentrated at peak tariff times, when each kwh consumed has a higher value, resulting in a high bill with reasonable consumption.

That is why we propose a system capable of managing energy and recharge the batteries of electric vehicles in the most favourable times and discharge this battery when the consumer demands energy and the price of this is very high.



Graphic 5: Low electricity price period

As can be seen in the graph above, the efficient use of electric vehicle loads would allow to dampen these large variations and reduce electricity production management problems.

2. VALIDATION PROCESS

2.1. DATA COLLECTION

To validate our idea, we have conducted research and different surveys and interviews that have provided us with enough information to believe that our product can be trusted.

In parallel to the development of the system, we have adapted the product approach based on this feedback we received from different sources. The survey was conducted with 200 people and interviews with 10 of them.

There is a gap for this product in the market, and we must bring a differential value to it, based on the information obtained about what the potential customer wants.

2.2. HIPOTHESIS, RESEARCH AND DATA COLLECTION, VALIDATION

When carrying out a business plan, it is vitally important to begin a process of validating the idea as scientifically as possible. In this way, a more transparent implementation of the business can be carried out in a more transparent way that will help the decision-making process.

Therefore, the team has a number of hypotheses that it must try to validate in different ways. These hypotheses focus on both quantitative and qualitative aspects. The hypotheses are as follows:

1- People are concerned about the electricity price: We were quite convinced that this was the case, but one of the things that struck us the most in the different interviews we conducted in our validation process was one of the concerns that immediately came up.
2- People try to adapt their electricity domestic consumption: We have observed that most of the interviewees try to adapt their consumption to times with lower prices.
3- People would like to have more accurate control over their consumption: The attempt to adapt consumption has led respondents to have to change their routines inefficiently, so facilitating management may be interesting.
4- People are interested in a smart device that allows them to control automatically their hourly consumption
5- People are planning to buy an electric vehicle in an early future: most of the interviewees have an electric car, and the people around them are thinking of doing the same, motivated by the good experience of these pioneers.
6- People with electric vehicle end up the day with more than a half of their vehicle battery: the people interviewed make journeys of 70 km per day on average, so with the autonomies of electric vehicles we can reach this conclusion
7- Car batteries may deteriorate with increased charge and discharge cycles. electric vehicle owners surveyed do not fully discharge the car to protect their batteries

Once we have the hypotheses defined, it is time to collect information and data to see which ones we can validate and which ones we cannot.

Therefore, we have obtained information from the following fields:

- Primary sources of documentation related to the subject: mainly books, scientific papers and newspaper articles.

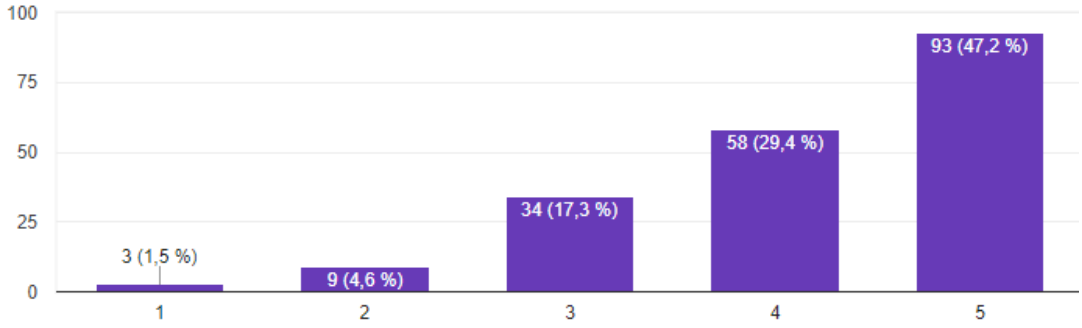
- Interviews with subject matter experts
- Data sources and official statistics (CIS, INE…)
- Personal interviews with potential customers
- Survey conducted on 200 people

This is the validation process for each of our hypothesis:

1- People are concerned about the electricity price:

The price of electricity is one of the issues that has risen the most in the CIS ranking of the issues that most concern Spaniards. If we go back 5 years ago, this was of concern to 0.3% of Spaniards, while today it is in ninth place in the ranking with a level of concern of 7.2%.

In our survey regarding the question: on a scale of 1 to 5, how concerned are you about the cost of your electricity bill?



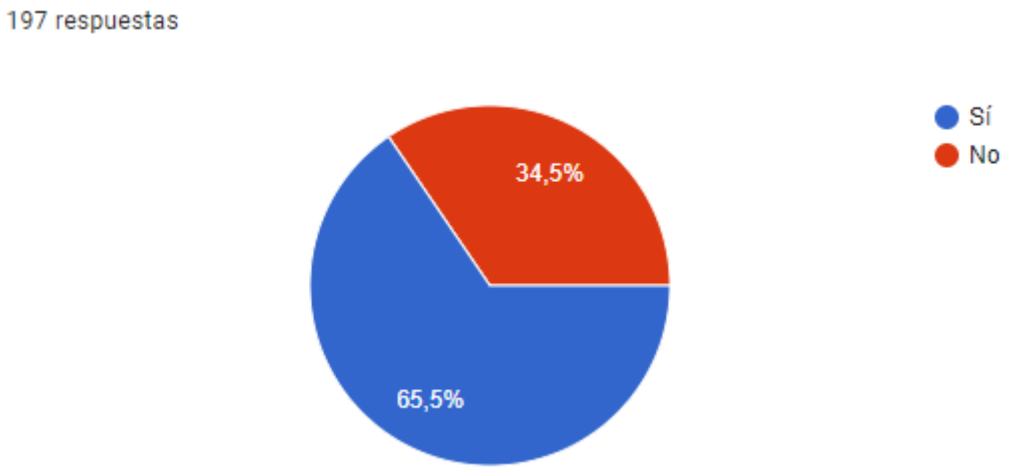
Graphic 6: How much concerned are people about the electricity price

approximately 70% of the people defined themselves as worried (4) or very worried (5).

2 - People try to adapt their electricity domestic consumption

According to the source "Cetelem Observatory", a company that conducts barometers and surveys on electricity consumption, published that in 2021, 87% of Spaniards declare to have adapted their consumption habits as a result of the new electricity bill.

Also, the results in this topic on our survey where that 65.5% of the people did it.

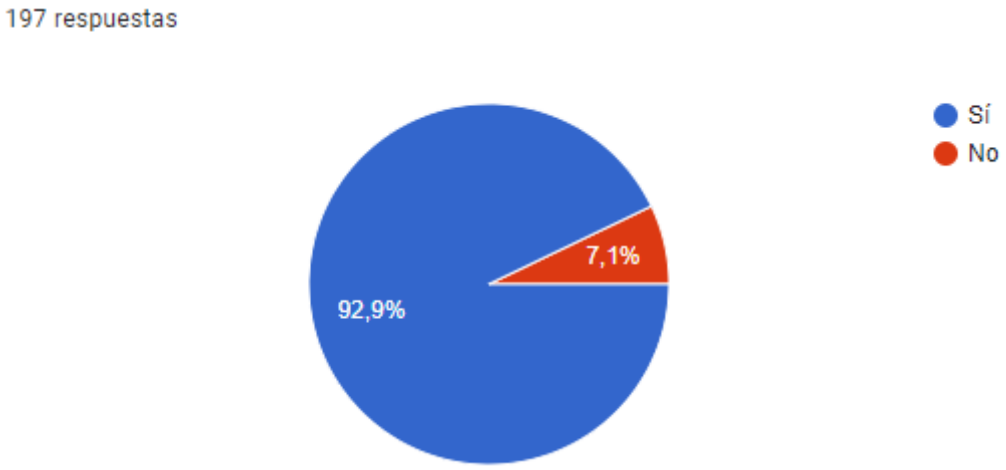


Graphic 7: People try to adapt their electricity domestic consumption

3 and 4 - People would like to have more accurate control over their consumption and People are interested in a smart device that allows them to control automatically their hourly consumption

This has been one of the most difficult hypotheses to validate since our survey could give biased answers. That's way, as we did not find any exact data about this, interviewed several people from different age and lifestyle. In these interviews, all of them said that they would like to have anything that could tell them in an easy way how much electricity they are consuming throughout the week, and would be willing to pay for a smart device.

After this, we also added this question to our survey, and this were the results:



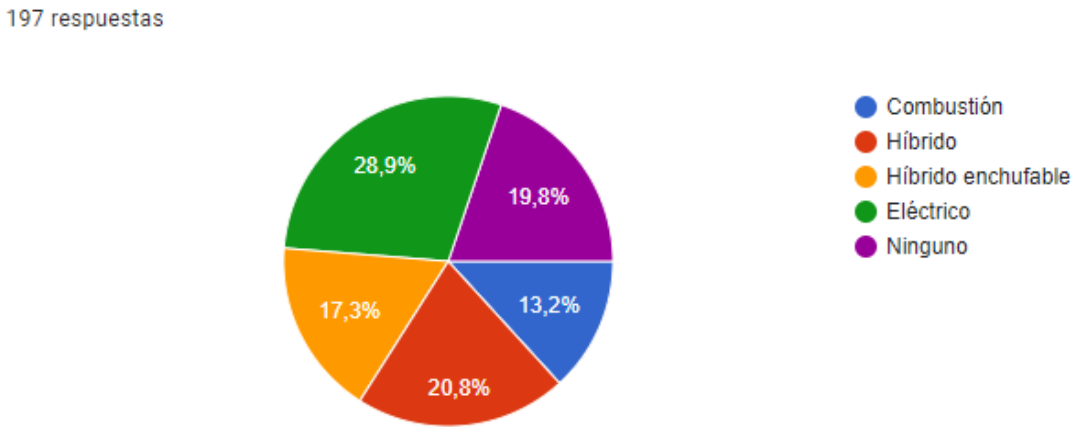
Graphic 8: Does people want an accurate control of their electric consumption?

The answer could be conditioned by the question, but the percentage of affirmative answers is still very high.

5– People are planning to buy an electric vehicle in an early future

This has been one of the most surprising results. Knowing that in 2030 there will be severe restrictions for the combustion car, most people are beginning to consider not owning a vehicle. So, the conclusion is that the forecast is that the number of electric cars sold will increase, but there will be fewer private cars.

The result of the survey showed up this result, where nearly 1 out of 5 people are not expecting to buy a car, when comparing to nowadays we have a car for every 2 people (the number of cars that are today in Spain is around 24.5M).



Graphic 9: Future car of the people

6 – People with electric vehicle end up the day with more than a half of their vehicle battery.

Although car batteries are not yet fully developed, most electric cars provide a minimum range of 150km. According to different mobility studies carried out in large Spanish cities, the average driver does not drive more than 30km per day in his private vehicle.

Also, to try and validate this idea we used a survey. The results asking the 27 people that answered in the survey that had electric cars were that only 12 of them had more than half of the battery remaining at the end of the day.

7 – Car batteries may deteriorate with increased charge and discharge cycles

This is one of the most relevant points of our business model. Any potential customer would mind about their battery lifetime and performance. After talking with different experts about this topic, we concluded that batteries will not be affected at all if we always work in a range where the battery is never under 10% and over 95%.

2.3. ANALYSIS AND CONCLUSIONS

After finishing the process of hypothesis validation, it is time to put in value all the results obtained as well as the conclusions that we can draw for the realization of the project.

Hipothesis	Result
1 - People are concerned about the electricity price	+
2 - People try to adapt their electricity domestic consumption	+
3 - People would like to have more accurate control over their consumption	+
4 - People are interested in a smart device that allows them to control automatically their hourly consumption	+
5 - People are planning to buy an electric vehicle in an early future	-
6 - People with electric vehicle end up the day with more than a half of their vehicle battery	~
7 - Car batteries may deteriorate with increased charge and discharge cycles	+

Table 1 Analysis and conclusions

Let's review hypotheses 5 and 6 to see how they may affect our work.

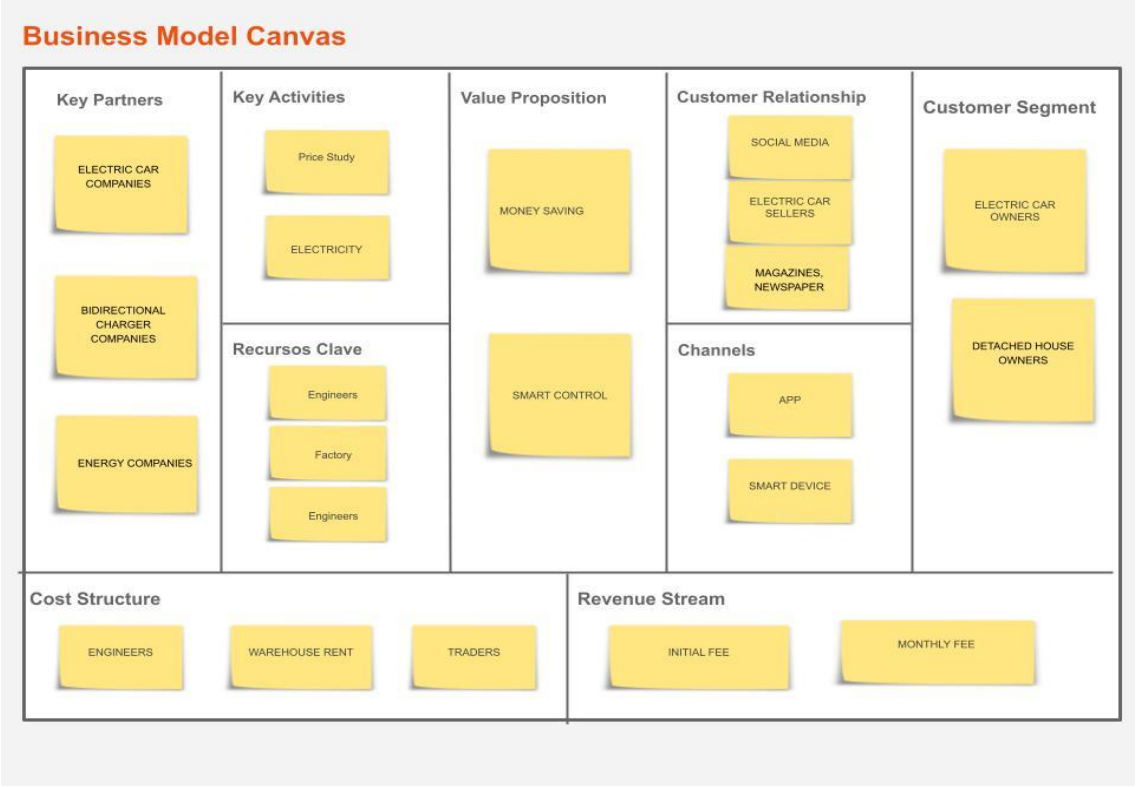
In case of number 5 hypothesis, this is not as real problem. it is likely that the mobile fleet has reached its peak in terms of cars, but the car industry will transform. This means that we can expect the fleet to decrease but still the percentage of electric cars will be much higher than today.

For the number 6 hypothesis, it is true that this fact is difficult to validate, but its also true that the car industry is developing fast and every year the autonomy of the electric vehicle is bigger.

In addition, by carrying out this validation process we have come to the conclusion of several things:

1- Our target audience is mainly people living in the surroundings of the main cities with electric cars and detached houses.
2- Our potential customers are concerned and worried about the electricity prices, and due to this they would like to not change their consumption habits
3- Our potential customers have the same tariff for charge their car and their electricity domestic consumption
4- We don’t exactly know the percentage of battery left of the car at the end of the day for our potential customers
5- Our business has to differentiate itself from the competitors with personalized management of electricity consumption
6- Our target audience will increase because more electric cars will be sold.

2.4. BUSINESS MODEL CANVAS



3. OPERATIONS

3.1. TIMELINE

We estimate that it will take us a whole year to get the final product, both the development of the mobile application and the manufacturing of the smart chargers.

1. During the first months we will work on the design of the electric bidirectional chargers, although the design and the charging technology won't be very disruptive. Mainly, we will work on the implementation of a smart chip that will allow the charger to have smart features and connect it to the mobile app in order to be able to control it remotely.

2. Contact with possible factories and providers that allow us to build the chargers with the conditions we request. These will be established factories that will make the electric bidirectional chargers and implant the chip into them in order to convert them into smart chargers.

3. Development of the mobile application, which will be one the most important parts of the process because we want it to be a differential point against our direct competitors. We'll test it many times with the physical chargers in order to check its perfect performance, giving importance to the connectivity and features as well as the user experience.

4. Web page development, as well as social media profiles, so the public could start knowing about our product and how we work first-hand. These will be the main platforms to get us known and selling points.

5. Participation at different motoring events, so potential customers start to know us, but most importantly to contact with possible selling points where our product could be commercialized, such us big shopping centres or car stores.

6. Once we get the final product, it will be launched to the market. We will keep working on improving the charger but mainly on keeping updated the mobile app, in order to improve it or even launching new features.

At the following Gantt diagram, we can see the different activities mentioned above:

Figure 6: Gantt diagram

3.2. BUSINESS OPERATIONS

At this point we are going to explain which will be the main business's tasks. Not only about the main activities but also about the secondary activities. Moreover, how the relationship with our main providers, partners and customers will be and how our main resources will be whether our own resources or external resources.

3.2.1. Main activities

The main activities we will be working on are: the development of the mobile application and its maintenance, selling our product on different selling points and keeping an excellent customer service.

The mobile application should be our flagship product, which will let us differentiate from our direct competitors giving the customers an outstanding service. A development team will work on the app, keeping it updated often in order to attend the customers' requests and implementing new features adding new services for the users. A more detailed explanation of the mobile application that will be developed, is on point 3) which explains all the services that will be included in it.

The business is divided into two main areas, the hardware and the software. Being the hardware the bidirectional chargers and the software the mobile application.

So the mobile application will be available for free on the main application stores and the chargers will be sold on different physical and online selling points. The main platform will be the web page where the customers could buy the charger directly from it. Although, we are conscious of how important it is for the customers to see the product physically and be able to try it, so the charger will be available at different stores such as big shopping centres and technological stores. Moreover, we will consider collaborating with some electric car brands to offer our chargers at the stores.

We are offering to the market a new product with many innovative features, so customer service is key. In order to help the customers with all the questions or problems they may have.

The web page will be a communication direct channel between the customers and the company. Some tutorials videos will be posted on it to facilitate the users their user experience with App. Moreover, there will be a live chat intended to solve all the questions the customers may have before and after buying the product.

On the other hand, there will be phone assistance as well, in case the answer given by the live chat is not good enough. The feedback given by the customers is considered very important and it will be considered for future improvements.

3.2.2. Secondary activities

We consider our secondary activities will be: the relationship with the providers and the factories that will be making our chargers, also the shipment and installation of the chargers at the customers' homes, that will be done by ourselves, a team of technicians in the company. Moreover, activities such as human resources, finance, …

Our smart bidirectional chargers will be made in third parties factories that are already established and manufacturing car chargers. This way we will only pay for the chargers we order to them, saving the huge initial amount of money a factory requires. We are looking for a charger with a good quality-price relation which allows us to connect an electronic chip to it, so it becomes a smart charger.

We are not looking for a cutting-edge technology charger that has the fastest charge speed, but we are looking for a charger that works well and we can implement the smart features we want to add. The pricing will be specified in the financial chapter.

Since our main sales will be online orders from our web page, we considered that we'll do the shipment by ourselves, so we can make sure the customer has a good experience and that it arrives at time, giving us full control of the process. A team of technicians will ship the charger to the customer's place, install the charger and give the customer some basic instructions about the app and how it works. Furthermore, there will be a lot of content on the web page to consult how to set up all the services available.

In order to keep updated all the financial terms, we will have a team to check and keep the records of the company's numbers. On the other hand, there will be a human resources department to work on all the human relations inside the company.

3.2.3. Resources

We can differentiate between our own resources and external resources.

Own resources

We consider our own resources those we own and we have the right to do with them whatever we consider.

The team working for the company which is made up of:

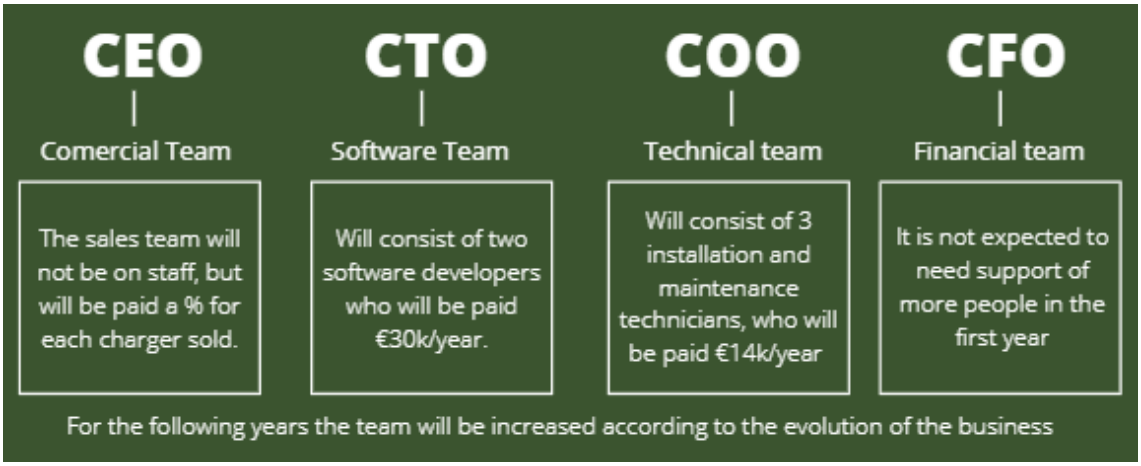


Figure 7: Main figures of the StartUp

As we can see in the picture, there will be four main figures which are the founders of the company: the CEO, the CTO, the COO and the CFO. Each of them will be in charge of a team of people regarding the different activities.

The CEO (Chief Executive Officer) will be in charge of the commercial team, although the commercials will not be on staff, they will receive a percentage of the sales they make. So they would be like ambassadors of our company. The CEO will be the one organizing commercial campaigns and contacting the different selling points and partners where we could offer our product.

The CTO (Chief Technology Officer) will be in charge of the development team. They will develop the mobile application for the chargers and the web site to sell our product. Once the product is launched, they will keep working on updates and attending the customer's needs to keep improving the product.

The COO (Chief Operating Officer) will be responsible for the technical team. The technicians in the team will be responsible of shipping the chargers to the clients home using the vans and installing the charger, we believe they will be able to install around 4 chargers per day. The COO will work on the design of the charger with another engineer, and it will be in charge of contacting the providers and the factories to make the smart chargers.

The CFO (Chief Financial Officer) will be in charge of the financial team. Although during the first year we do not expect to need more than one person to keep the counts updated, in the future there will probably be more people helping the CFO.

Once we buy the chargers from our suppliers once they are made in the factory, we will receive them and store them at the warehouse. We will keep them there until we sell them and ship the product to the clients.

The mobile application which will be the flagship of our company, could be considered as a digital asset. We will have the ownership of the app. We will be working on it continuously, in order to offer new updates to the users often.

External resources

We consider external resources those we do not own but we use them in order to carry out the business.

The warehouse we will be using as our offices for the employees to work there, also it will be used to keep the chargers we receive from the factory. This warehouse will be rented so do not have to assume a big investment at least during the first year. This way we can change to a bigger warehouse or change the location rapidly, in case the business grows or in case we have to move closer to where there are more new potential clients.

Furthermore, the chargers will be shipped to the customers house and installed, so it is fully ready to be used. The shipment and the installation will be done by the technicians of our company, the vans needed will be rented, mainly for the same reasons as the warehouse. This way the initial investment is not that big and in case the business grows suddenly we can rent more vans rapidly to cover the demand.

3.2.4. Relationships

For our business, we can identify three vital relations.

The first one, is the relationship we need to build with providers of bidirectional chargers. With them, it will be necessary to agree on the price they will charge for the chargers with the modifications we want to implement on them, as well as the way they will distribute the chargers to our warehouse. These are the two main aspects that we will have to agree with the suppliers.

The second relation to have into consideration is the one with our potential partners. In this group we include:

1. Electric companies that have electricity tariffs for electric cars with peak/off-peak price distinction, such as Iberdrola, Repsol, Naturgy, Endesa, among others. These companies can take advantage of our business because we will inform our customers about the tariff that could offer the greatest savings and advise them to change the one they have now for the one we are proposing to them. So, the electric companies could acquire new customers.
2. Electric car dealers. Through electric car stores will be able to promote and sell our product, so these establishments will take a percentage of the sales made.
3. Points of sale in different establishments. As in the case of electric car dealers, our product will be promoted and sold, but in this case, it will be our employees who will be doing this sales job.

And last but not least, the relationship with our clients. Customer service will be a priority in our business. We will provide our customers with both online and telephone service, as well as on-site service at the car dealerships where our product is available and at the different points of sale. In addition, for our first-time customers, there will be available an extensive number of explanatory videos on how to use the charger and the application. The customer comes first, we want to build customer loyalty and we want them to contract our services as long as possible.

3.2.5. Mobile App

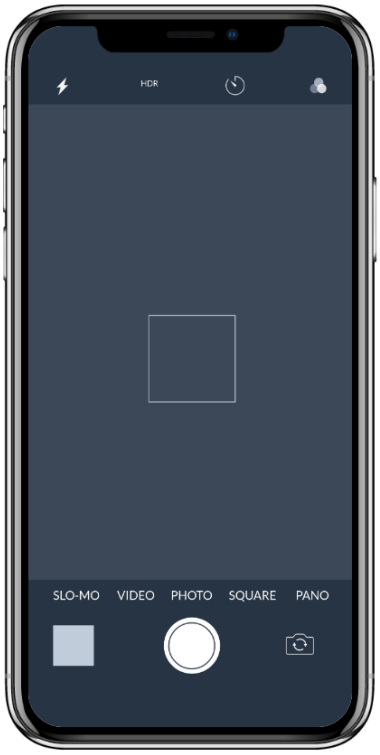
As we have said before, the mobile application is the most important asset of the company. It is what differentiates our product from other regular electric car chargers. The mobile app is going to let the user control the charger remotely, furthermore it will have some extra features to enhance the user experience. At this point we will describe how the app will be and what is going to include, also at the end you can check how the appearance will be.

Once a customer receives the charger, he/she will be able to create his own account in the app, signing up the charger or as many chargers he/she owns. In order to connect the charger with the mobile app, it should be connected to the Wi-Fi network, so it allows the user to control it remotely even if he/she is not at home. Once the customer scans the charger QR code in the app, it's ready to start using it.

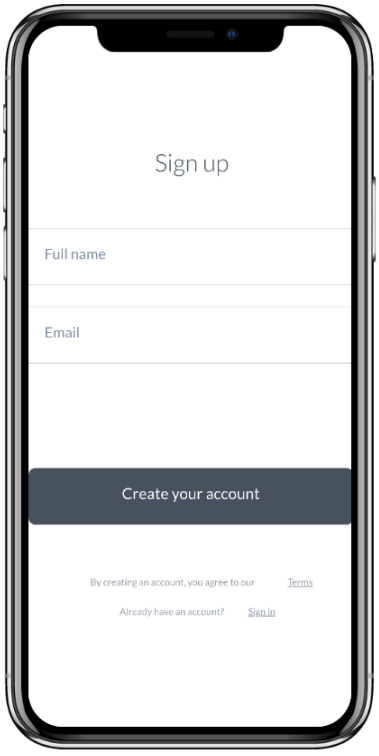
When the user picks which charger he/she wants to control, he/she can access all the features the app offers, these are:

1. There are different options to start charging the car's battery while the car is plugged to the charger (in any case it will respect the manufacturer's recommendations to keep a good battery health, around 20%-80%):
    1. Start charging immediately at the moment the user presses the app button which says "Charge now". With this option the battery will start charging right after the user presses the button. The battery will charge until it gets fully charged, moreover, you can set a timer or a maximum peak load you want to exceed.
    2. Program when you want the car to start charging. You could program from what time to what time you want it to get charged.
    3. Smart charging, which is the option we recommend, the car keeps plugged and it will be charged when the electricity costs at its cheapest. The charger will be connected to the app via Wi-Fi, so it will know the pricing per hour that the user has to pay, getting updates every day. What makes this option even more interesting, it is that you can set up a minimum battery percentage you want to have at a certain time. This way if a user only needs a 30% of the battery for the daily commuting, he/she could set up in the app to have at least 50% of the battery every day before he goes to work, to make sure he/she has the enough battery for that day. Furthermore, you could set up a different percentage for each day or for one day specifically. When the battery has more load than the one established it can be used for the home's consumption.
2. All the home's consumptions from the charger will be recorded in the app so the user can consult them. So, the user could see how much money he/she has saved thanks to this system and a history of consumptions.
3. When the car's battery is charged enough it will make the user some recommendations of what he could do using the electricity from the battery. Such as doing laundry or turning on the oven. It will always consider the battery health with respect to the charging peaks.

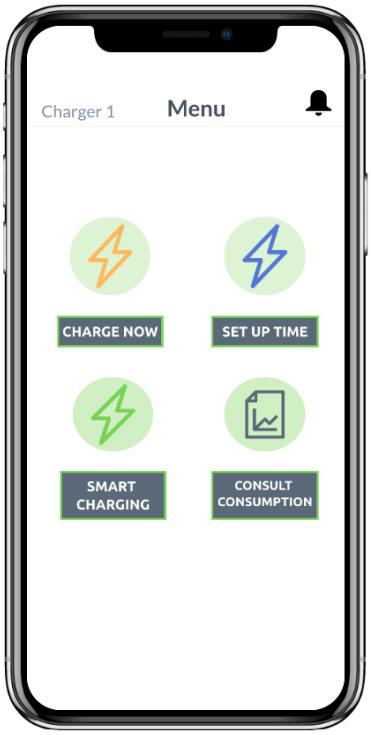
Bellow there are some screenshots of how it would look the mobile application:



On the left picture, we can see how the app would look once we open it for the first time. It will ask the user to scan the QR code that it's on the charger, once he/she has pressed the button "Scan QR" the camera will be open and scan the code.



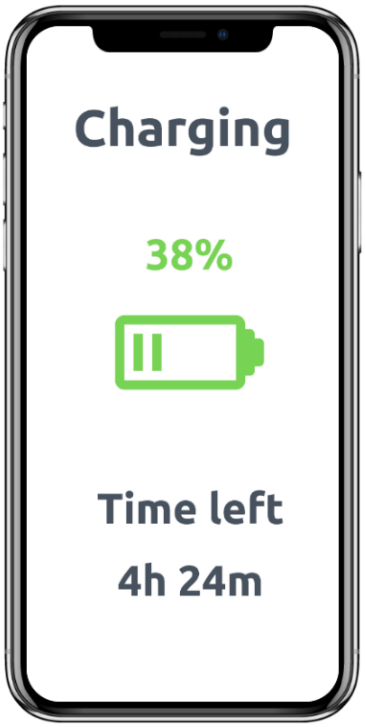
When the code is recognized, the user will have to make an account with an email account, where he/she would receive some notifications. A single user could have more than one charger and he/she would be able to control all of them with one single account.



Here we can see how the main menu would look once we have entered our user and selected a charger.

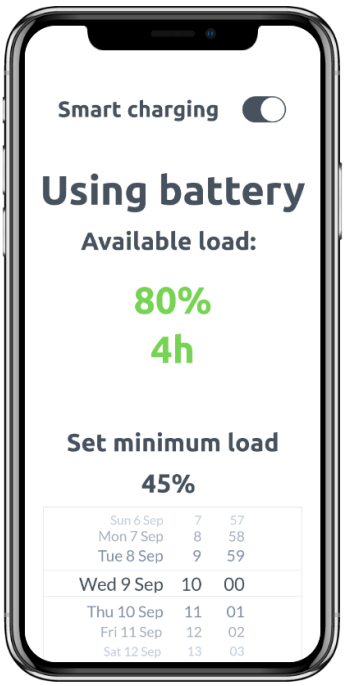
There are four different features, although there would be more in the early future with different updates.

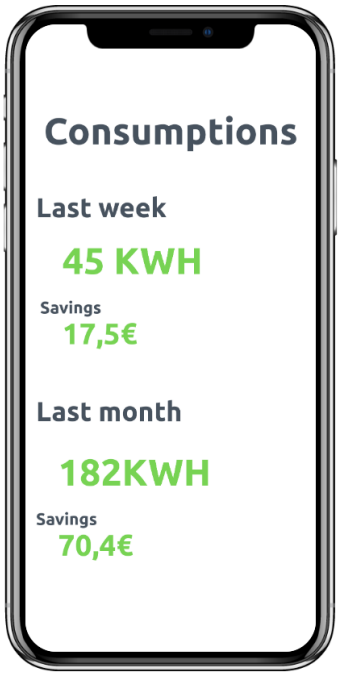
Also, in the top right corner we can see a bell, where we could see all the notifications.



If we select the “Charge Now” option, it will start charging and we could consult how the battery loading is going and how much time left there is until it charges to 80%. As we can see in the left picture.

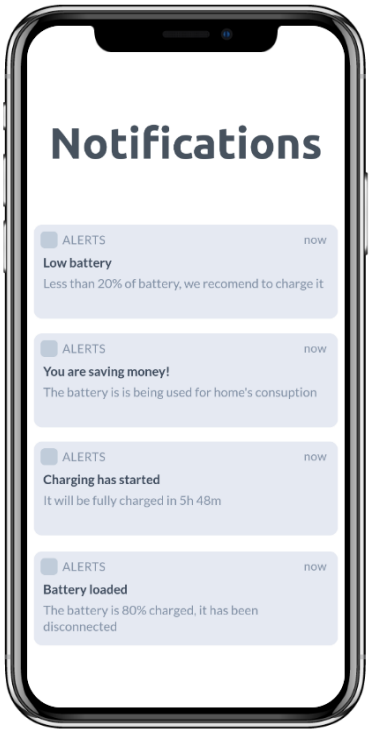
In the right picture, we can see what it would appear in case we press on the “Set up time” feature, we could set up a time when it will start charging the battery and check how much time it will take.





If we select the "Smart charging" option, a screen like the one in the left will appear. We could activate it and deactivate it at any time. Moreover, it will appear the battery load and an estimate of how much time the house consumes could be from the battery's load. Also, we could set a minimum battery's load we wish to have at a certain time, so the rest of the load could be used for the domestic consumes.

The fourth feature is "Consult consumption". Here we will see the amount of kWh (Kilowatt hour) that has been consumed from the car's battery and how much money was saved thanks to this service.



To consult the different notifications from the app, we have to press on the bell at the main menu. Here we can check them as we can see in the picture.

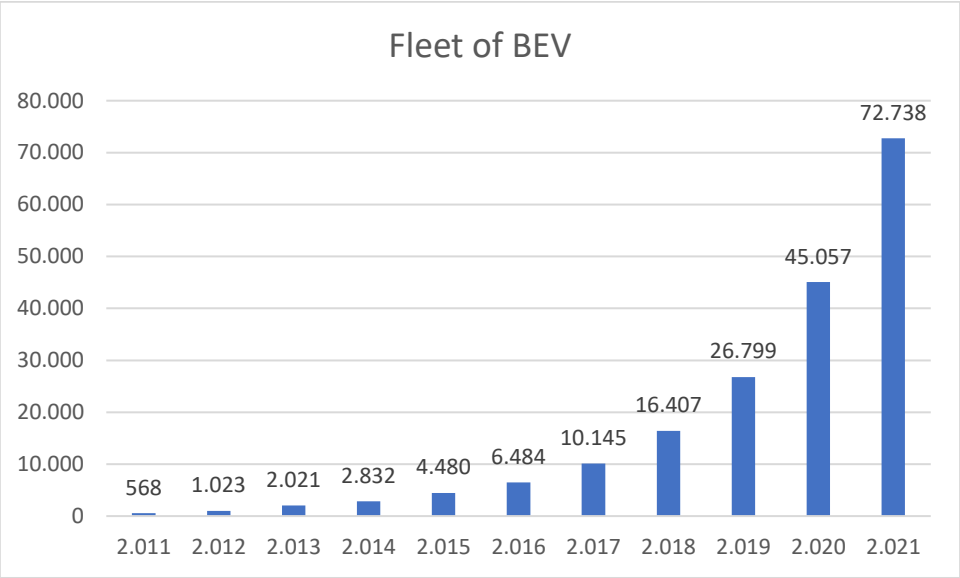
The app will notify us about the various changes the charger and the app makes.

4. MARKETING

4.1. CUSTOMER SEGMENTATION

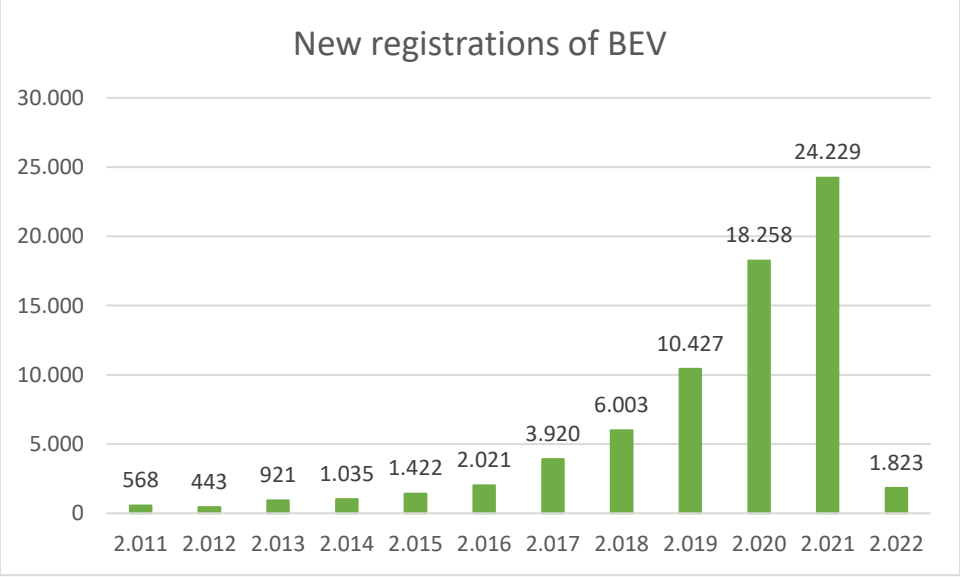
First of all, our main objective is to know the actual fleet of battery electric vehicles in Spain, to start having knowledge of the magnitude of our present possible customers.

During 2021, the Spain´s fleet of pure electric passenger vehicles was 72.738.



Graphic 10: Total number of battery electric vehicles passenger cars ([14])

It is also important to have into account that the number of registrations of fully electric passenger vehicles is increasing rapidly, how we can observe in the following graphic:



Graphic 11: Number of newly registered BEV passenger cars per year ([14])

The main reasons for this trend are the key aspects that are being carried out by the European and Spanish government, for achieving the target for 2030 of 5 million of electric vehicles in Spain, of which 3,5 million are passenger cars ([15]). These key aspects are ([15]):

- Reach the same price for electric and combustion vehicles
- Adequate and sufficient deployment of public charging infrastructure

These issues will be achieve implementing different mechanisms of action ([15]):

- Necessary public aids of 1.000 M€ until 2025
- Fiscal reform
- Regulatory measures to speed up the deployment of the recharging infrastructure and to encourage the penetration of electric vehicles in cities (parking management, bus-VAO lanes, access restrictions to the city centre, etc.).

Therefore, our potential customers are increasing so fast that it is vital for our business to not only be focused on current customers, but also the future ones.

The second key point for our customer segmentation is to be aware of how many Spanish people live in single-family houses, due to our first approach to the market we are going to focus the charger and the application on this range of population.

This is because, as will be shown in the following section, the population who live in single-family dwellings is more likely to own battery electric vehicle than those who lives in dwellings in a block of buildings. In addition, it is easier to control the consumption of a single-family house than that of a single house in a block of buildings, and the installation of the charger is also simpler.

According to the National Statistics Institute, there are **5.954.200** single-family houses in Spain.

4.2. DEFINITION OF TARGET PUBLIC

Once we have found our two main variables, we need to know how many of the people who live in single-family houses have electric vehicle. In this way, we will be able to define our target public.

In the following tables, there are three categories of housing in Spain as defined by Eurostat:

- Single dwelling buildings defined as having a private entrance at ground level. This type of house is the one we call single-family house.
- Two dwelling structures which may not have a private ground level entrance.
- Three and more dwelling buildings which include a mix of flats and attached houses.

It is important to note, as no surveys have been carried out in Spain to estimate the following data, international examples have been used and applied to our country.

	One-dwelling buildings	Two-dwelling buildings	Three-or-more-dwelling buildings
Percentage of dwellings	32%	5%	63%
Conventional passenger vehicle stock by dwelling type in 2019	40%	5%	55%
Electric passenger vehicle stock by dwelling type in 2019	60%	5%	35%
Electric passenger vehicle stock by dwelling type in 2030	44%	5%	51%

Table 2: Percentage of housing type and EV for general population in Spain ([16])

As can be seen in table 1, 60% of the Spain´s fleet of electric passenger vehicles is owned by people living in single-family houses. This percentage correspond to **43.643** electric passenger vehicles.

	EVs in one-dwelling buildings	EVs in two-dwelling buildings	EVs in three-or-more-dwelling buildings	Total
Home charging availability multiplier	92%	83%	48%	-
Percentage of total Spanish electric vehicle stock with home charging available in 2019	55%	4%	17%	76%
Percentage of total Spanish electric vehicle stock with home charging available in 2030	29%	23%	22%	69%

Table 3: Scenarios for electric vehicle owner housing type and access to home charging ([16])

As shown in table 2, the percentage of home charging availability in one dwelling buildings is higher than in the other two types of dwellings.

Although, the number of pure electric passenger vehicles in block of buildings is going to increase in the following years, home charging availability in single-family houses will continue to be the trend. So, as said before, in our first approach to the market, our target public is going to be people living in single-family houses and owning electric vehicles.

In addition to this, our target public is aware of rising electricity prices, therefore, they are motivated to achieve significant economic savings, as well as they are conscientious with climate change, so, they want to contribute to the implementation of distributed generation by flattening the demand curve and thereby reducing pollutant emissions and global warming.

4.3. POSITIONING STRATEGY

At this point, we must excel in the areas our competitors are weak, so we need to examine and study the weaknesses of our principal competitors. In this case, our main competitor is Wallbox, Catalan electric vehicle chargers' company that is beginning to sell bidirectional chargers and providing their customers control of their electrical consumption.

We examined the weaknesses the Wallbox´s app has, and we identified some improvements we could implement in our app to differentiate ourselves from Wallbox:

- Connection to the app via Wi-Fi
- Include in the app the possibility of starting charge and discharge immediately
- To be able to set a timer
- When plugging in the car, the app will estimate a charging time and set a countdown timer
- Tutorial videos on how the app works and how to program the charger
- Live statistics of how the price of electricity is changing

We also detected, among Wallbox´s customers, the discomfort with the customer services. For this reason, one of our value propositions is good customer service, with a quick response to our customers´ complaints.

In a nutshell, our positioning in the market is going to be based on:

- High quality customer service
- Intuitive and user-friendly design of the charger and mobile application
- Improving the charger and the app over our main competitor

4.4. PRODUCT DESCRIPTION

Our product idea is born, as mentioned before, from the situation we are currently experiencing:

- Electricity price has tripled since 2020
- 50% fluctuations in the price of electricity throughout the day
- Increase of electric vehicles in Spain

Analysing these circumstances, we concluded to develop an app which could efficiently use the battery available in our customers´ electric vehicles, by means of bidirectional chargers, for their electrical house consumption.

Using our devices, we offer our customers:

- Economic savings. Charging the battery of their electric vehicles in off-peak hours and then using the available battery (once the car will not be used for any more trips) in peak hours for domestic electric consumption, our customers can obtain significant savings on their electricity bills.
- Smart consumption. With the help of the chip integrated in the bidirectional charger and the application, smart appliances and devices can be added to the application and the application will monitor these consumptions. The app will also be configured to create alerts about the remaining available battery load and you can use all those devices that cannot be automated, such as the iron.

- Personalized management. Each customer is unique and each one has specific needs and characteristics; therefore, the management of domestic consumption control is customized for each client. Through the application you can configure each of the needs and these can be modified to suit the consumer.

4.5. MARKET PRICE

Market price is the price at which we want to charge for our product. This price has to be aligned with what our target audience would be willing to pay and the amount that will provide us with adequate revenue.

Once we have discovered the price at which we would buy the charger, the savings our product would provide to the customer and what the customer is willing to pay, we have stipulated to charge, at first, the price of the charger (750€) and then a monthly fee of 10 €.

4.6. MARKET DISTRIBUTION

Market distribution refers to the way our product will be sold.

Our main channel to sell the product will be through our web site. Once our clients have purchased the product, we will send it to them through a delivery company. This will be a direct channel.

Another important distribution channel would be electric vehicles car stores. As will be shown below, car dealerships would be one of our main partners and our customers will be able to purchase our product at car dealers where it is available.

The last distribution channel will be points of sale in different establishments. These points will have the same functions as electric vehicles car stores.

At the beginning, we will not have a physical store, so the stock will be stored in a warehouse, to be subsequently distributed either directly to customers or to car dealers or points of sale.

4.7. SALES PROMOTION

To promote our product and make the public aware of it, we have taken into consideration several possible channels:

1. Online:

   - Via social networks. In social media we will advertise our product and provide a link that leads directly to the web site where it will be available all the needed information about our product: the characteristics of our bidirectional charger, how to use the app, the key features of our app, etc.

   - Via SEO (Search Engine Optimization). This method consists of “improving your site to increase its visibility when people search for products or services related to your business in Google, Bing, and other search engines. The better visibility your pages have in search results, the more likely you are to garner attention and attract prospective and existing customers to your business.” ([17])

This strategy only needs an initial investment and some maintenance expenses.

There is another method called SEM (Search Engine Marketing). This strategy refers to the techniques that improve the positioning of our website through paid advertisements that appear in search engines for certain keywords. In our country, the most popular search engine advertising solution is Google Ads. But this method requires a higher investment than SEO. https://www.cyberclick.es/sem/sem-y-seo

In conclusion, at the beginning, we will only use SEO to advertise our business.

2. Physically:

- Via car stores. The same car stores will sell our product could inform our future customers about it.

- Via stands placed in different establishments, such as electronic stores (Media Markt), automobile shows, among others, to make our idea known. In these stands there will be employees who can promote and explain our product in detail.

5. FINANCIAL PLAN

The economic-financial plan is proposed for a medium-term period of 5 years. We will study the methods of financing the project and make detailed estimates of the main financial statements from the beginning of the project. Finally, we will present a series of investment indicators.

5.1. FINANCING

To establish the partnership, the four partners plan to form a limited partnership. This foundation is planned to be made with a contribution by each of the four partners of 40k. In addition, we estimate that since the share capital is 160k, it will be necessary to complement it with a short-term financial loan that we will detail later on and a social media crowdfunding.

Also, as a start-up, we will raise a crowdfunding with a 40k goal, that we think it will be a realistic objective as we will invest a lot of money in marketing.

The medium-term loan to be requested from the bank is expected to be 200k with an interest rate of 5%. Below we present in detail the forecast to be repaid in the next 5 years, together with the estimated financial costs:

Year	Fee	Interest	Loan repayment	Pending Debt	Long Term Debt	Short Term Debt
2023	45.291 €	9.180 €	36.111 €	163.889 €	125.930 €	37.959 €
2024	45.291 €	7.332 €	37.959 €	125.930 €	86.030 €	39.901 €
2025	45.291 €	5.390 €	39.901 €	86.030 €	44.088 €	41.942 €
2026	45.291 €	3.349 €	41.942 €	44.088 €	0 €	44.088 €
2027	45.291 €	1.203 €	44.088 €	- 0 €	0 €	- 0 €

Table 4: Forecast to be repaid in the next 5 years

As can be seen in the table above, the method of loan repayment is the French method, one of the most common methods in our country. A constant monthly instalment will be paid to the bank, where interest will be paid according to what remains to be repaid to the bank. Therefore, the first instalments will have a higher percentage of interest while the last ones will be only loan repayments.

Likewise, as this is a start-up, we present this complete project that can be carried out autonomously, but willing to look for private capital that wants to be part of the shareholding depending on the contribution it makes. If an external investor is found, it may not be necessary to ask for a bank loan.

5.2. ESTIMATED REVENUES AND SALES

Before proceeding to detail the investment numbers, it is important to note that all sales and income figures are presented net of taxes.

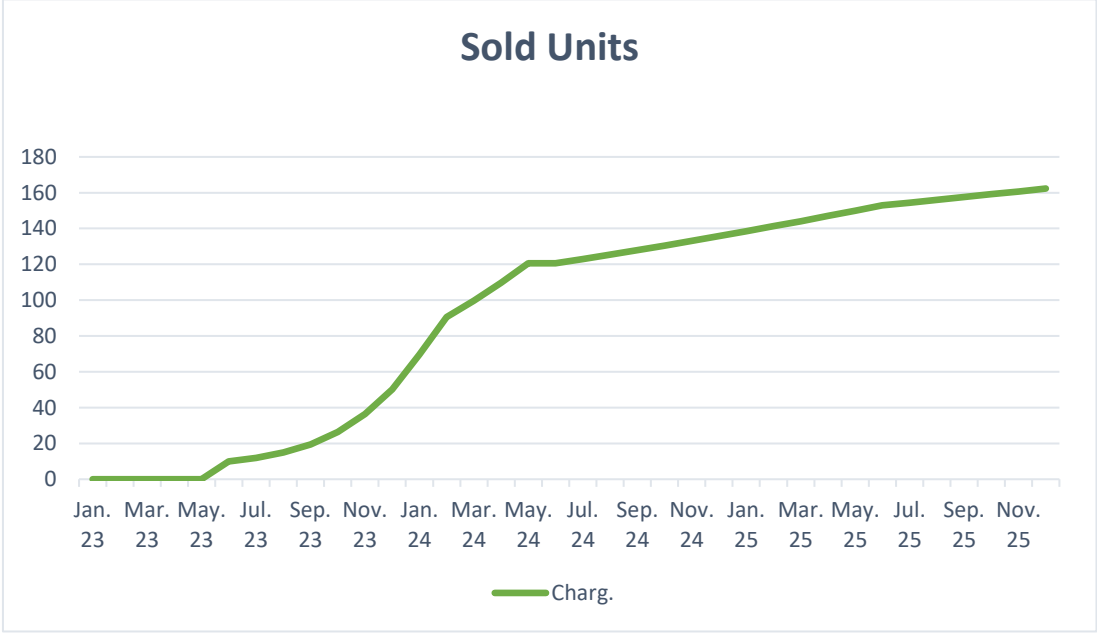
With the prices indicated by my partners, and with the idea of being able to meet the investment made from the first month, the estimated sales in a realistic scenario will not arrive until month 7, but the relevant volume is expected to begin in year 1.

Let's remember the prices for the two products for which we will earn money: the charger and the monthly plan, each one will cost €750 and the plan €10/month. With the idea of being

able to meet the investment made from the first month, the estimated sales in a realistic scenario will not arrive until month 7, because as my colleague from operations has detailed, we must prepare the technical development, but its relevant volume is expected to start from year 1.

For a realistic scenario, we estimate that sales will evolve as follows:

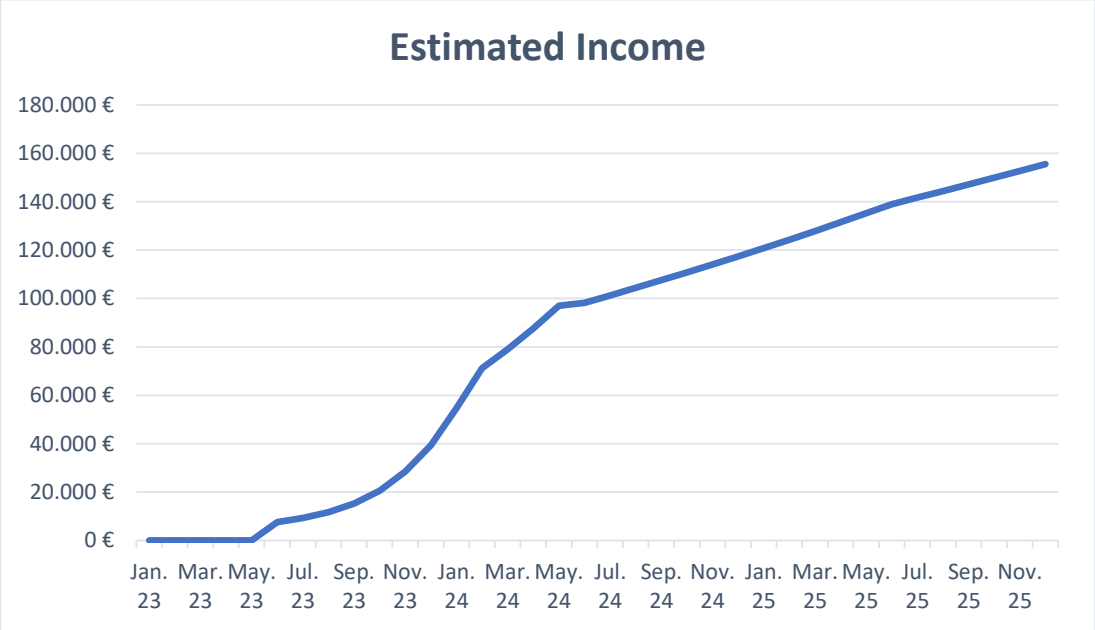
Until the first sales begin, the market until month 8 is not expected to start growing exponentially, reaching an estimated maturity period as of month 20. Thereafter, we believe the company will be able to reach peak sales at the end of year 3 of 162 units per month. On the other hand, it is foreseen that customers will pay the monthly plan every month, and it will be a way to accumulate and keep customers in the company. We do not plan for people to unsubscribe in such a short period of time, as the charger would then have no meaning and no added value.



Graphic 12: Number of solid chargers

Graphic 13: Plans per month sold

Once we have detailed the units expected to be sold of each of the products, it is time to quantify them in terms of how much money they will mean in terms of income for the company. At the price mentioned above, the net revenue curve is expected to be as follows in the first three years:



Graphic 14: Estimated income

Therefore, income at the end of year 3 is expected to be 2.7 million euros, of which 123k euros will be distributed in the first year, 1 million euros in year 2 and 1.5 million euros in year 3.

As we are not able to detail how the units sold will evolve for years 4 and 5, we will directly estimate revenues for year 4 3.4% higher than the previous year, and for year 5 3% higher, in line with a stable market.

5.3. P&L FORECAST

Next and according to the estimated sales revenue we will present our profit and loss statement.

P&L	Colsing 1st Year 2023	% over Sales	Colsing 2nd Year 2023	% over Sales	Colsing 3rd Year 2023	% over Sales	Colsing 4th Year 2023	% over Sales	Colsing 5th Year 2023	% over Sales
Sales (revenues)	**131.932,8**	**100,0%**	**1.143.152,7**	**100,0%**	**1.578.889,0**	**100,0%**	**1.632.299,2**	**100,0%**	**1.674.463,7**	**100,0%**
Electric Charger	126.965,1	96,2%	1.039.888,4	91,0%	1.276.714,8	80,9%	1.315.016,2	80,6%	1.341.316,6	80,1%
Monthly Plan	4.967,7	3,8%	103.264,3	9,0%	302.174,3	19,1%	317.283,0	19,4%	333.147,1	19,9%
COGS	**82.775,7**	**62,7%**	**681.090,7**	**59,6%**	**940.702,5**	**59,6%**	**972.524,3**	**59,6%**	**997.645,9**	**59,6%**
Gross Margin	**49.157,1**	**37,3%**	**462.062,1**	**40,4%**	**638.186,6**	**40,4%**	**659.774,9**	**40,4%**	**676.817,8**	**40,4%**
Salaries & Wages	148.000,0	112,2%	137.000,0	12,0%	167.800,0	10,6%	177.180,0	10,9%	197.725,0	11,8%
Social Charges	29.440,0	22,3%	25.920,0	2,3%	34.880,0	2,2%	36.000,0	2,2%	37.400,0	2,2%
Fees and taxes	200,0	0,2%	200,0	0,0%	206,0	0,0%	212,2	0,0%	218,5	0,0%
Supplies	3.000,0	2,3%	3.000,0	0,3%	3.090,0	0,2%	3.182,7	0,2%	3.278,2	0,2%
Managment consulting	600,0	0,5%	600,0	0,1%	618,0	0,0%	636,5	0,0%	655,6	0,0%
Office Supplies	1.200,0	0,9%	1.200,0	0,1%	1.236,0	0,1%	1.273,1	0,1%	1.311,3	0,1%
Martketing	102.638,7	77,8%	22.863,1	2,0%	23.548,9	1,5%	24.255,4	1,5%	24.983,1	1,5%
Insurance premiums	800,0	0,6%	800,0	0,1%	824,0	0,1%	848,7	0,1%	874,2	0,1%
Work done by other companies	600,0	0,5%	600,0	0,1%	618,0	0,0%	636,5	0,0%	655,6	0,0%
Repairs and mantainance	500,0	0,4%	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%
Rentals	12.000,0	9,1%	12.000,0	1,0%	12.360,0	0,8%	12.730,8	0,8%	13.112,7	0,8%
Transportation	12.000,0	9,1%	13.200,0	1,2%	14.520,0	0,9%	15.972,0	1,0%	17.569,2	1,0%
EBITDA	**-261.821,6**	**-198,5%**	**244.679,0**	**21,4%**	**378.485,6**	**24,0%**	**386.847,0**	**23,7%**	**379.034,3**	**22,6%**
Amortization Allowance	1.650,0	1,3%	1.650,0	0,1%	1.650,0	0,1%	1.650,0	0,1%	850,0	0,1%
Total operating expenses	**312.628,7**	**237,0%**	**219.033,1**	**19,2%**	**261.350,9**	**16,6%**	**274.578,0**	**16,8%**	**298.633,5**	**17,8%**
EBIT	**-263.471,6**	**-199,7%**	**243.029,0**	**21,3%**	**376.835,6**	**23,9%**	**385.197,0**	**23,6%**	**378.184,3**	**22,6%**
Financial expenses	9.179,9	7,0%	7.332,4	0,6%	5.390,4	0,3%	3.349,0	0,2%	1.203,1	0,1%
Financial result	**-9.179,9**	**-7,0%**	**-7.332,4**	**-0,6%**	**-5.390,4**	**-0,3%**	**-3.349,0**	**-0,2%**	**-1.203,1**	**-0,1%**
EBT	**-272.651,5**	**-206,7%**	**235.696,6**	**20,6%**	**371.445,2**	**23,5%**	**381.848,0**	**23,4%**	**376.981,2**	**22,5%**
Profit Tax	0,0	0,0%	58.924,1	5,2%	105.433,6	6,7%	108.554,4	6,7%	107.094,4	6,4%
Net Result	**-272.651,5**	**-206,7%**	**176.772,4**	**15,5%**	**266.011,7**	**16,8%**	**273.293,6**	**16,7%**	**269.886,8**	**16,1%**

Table 5: 5 Year P&L Forecast

We will detail the most relevant costs and budgets for each department over the years.

First, we are going to talk about one of the biggest costs that the company is going to have, and that is the COGS.

Since the charger will not be manufactured by us, the cost of manufacturing each unit including transportation to our offices will be €450. This therefore means that we will not have much margin left for the rest of the expenses, and it will only be sustainable for a high volume of sales. Also, we will have to take into account a 5% commission on charger sales that we will pay to the sales department, since it will not be included in the payroll.

The cost of personnel will evolve according to the needs of the business. Therefore, it is likely that we will need more staff in the first year, considering that the technology department will have to develop more things. From then on, the cost of personnel will work according to the expected sales since our major expense will be in technical installers and maintainers of chargers.

In addition, and as significant expenses, we will take into account the rent of the offices where we will develop our economic activity and store the stock, and the rent of the vans that the technicians will use to work.

With all these revenues and expenses, we can consider a very negative EBITDA in the first year, and from then on, we can start to grow. As a conservative scenario, we have not represented a higher EBITDA growth in line with revenue growth in years 4 and 5, but it is feasible to set COGS and overhead cost reduction targets in those periods, which will allow us to obtain better results.

5.4. BALANCE SHEET FORECAST

	Opening 1st Year		Closing 1st Year		Closing 2nd Year		Closing 3rd Year		Closing 4th Year		Closing 5th Year	
	Euros	%	Euros	%	Euros	%	Euros	%	Euros	%	Euros	%
Non-Current assets	**8.200,0**	**2,0%**	**6.550,0**	**4,7%**	**4.900,0**	**1,0%**	**3.250,0**	**0,4%**	**1.600,0**	**0,2%**	**750,0**	**0,1%**
Tangible assets	8.000,0	2,0%	8.000,0	5,7%	8.000,0	1,7%	8.000,0	1,0%	8.000,0	0,8%	8.000,0	0,6%
- Accum. Depreciation of tangible assets	0,0	0,0%	-1.600,0	-1,1%	-3.200,0	-0,7%	-4.800,0	-0,6%	-6.400,0	-0,6%	-7.250,0	-0,6%
Intangible fixed assets	200,0	0,0%	200,0	0,1%	200,0	0,0%	200,0	0,0%	200,0	0,0%	200,0	0,0%
Accum. Depreciation of intangible fixed assets	0,0	0,0%	-50,0	0,0%	-100,0	0,0%	-150,0	0,0%	-200,0	0,0%	-200,0	0,0%
Current Assets	**393.800,0**	**98,0%**	**133.695,3**	**95,3%**	**466.377,6**	**99,0%**	**809.374,0**	**99,6%**	**1.053.920,5**	**99,8%**	**1.285.759,8**	**99,9%**
Stocks	25.000,0	6,2%	25.000,0	17,8%	25.000,0	5,3%	34.529,3	4,2%	35.697,3	3,4%	36.619,4	2,8%
Reveivable (clients, debts...)	6.552,0	1,6%	19.662,1	14,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%
Treasury (available)	362.248,0	90,1%	89.033,1	63,5%	441.377,6	93,7%	774.844,8	95,4%	1.018.223,2	96,5%	1.249.140,4	97,1%
Total Assets	**402.000,0**	**100,0%**	**140.245,3**	**100,0%**	**471.277,6**	**100,0%**	**812.624,0**	**100,0%**	**1.055.520,5**	**100,0%**	**1.286.509,8**	**100,0%**
Shareholders Equity	**202.000,0**	**50,2%**	**-70.651,5**	**-50,4%**	**106.120,9**	**22,5%**	**372.132,6**	**45,8%**	**645.426,2**	**61,1%**	**915.313,0**	**71,1%**
Internal Capital	162.000,0	40,3%	162.000,0	115,5%	162.000,0	34,4%	162.000,0	19,9%	162.000,0	15,3%	162.000,0	12,6%
Capital (Equity Crowdf)	40.000,0	10,0%	40.000,0	28,5%	40.000,0	8,5%	40.000,0	4,9%	40.000,0	3,8%	40.000,0	3,1%
Reserves	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%
Results of previous years (Accum)	0,0	0,0%	0,0	0,0%	-272.651,5	-57,9%	-95.879,1	-11,8%	170.132,6	16,1%	443.426,2	34,5%
Result of last year	0,0	0,0%	-272.651,5	-194,4%	176.772,4	37,5%	266.011,7	32,7%	273.293,6	25,9%	269.886,8	21,0%
Non-Current Liabilities	**200.000,0**	**49,8%**	**125.930,4**	**89,8%**	**86.029,8**	**18,3%**	**44.087,8**	**5,4%**	**0,0**	**0,0%**	**0,0**	**0,0%**
Long term creditors	200.000,0	49,8%	125.930,4	89,8%	86.029,8	18,3%	44.087,8	5,4%	0,0	0,0%	0,0	0,0%
Current Liabilities	**0,0**	**0,0%**	**84.966,4**	**60,6%**	**279.126,9**	**59,2%**	**396.403,6**	**48,8%**	**410.094,3**	**38,9%**	**371.196,8**	**28,9%**
Short term creditors	0,0	0,0%	37.958,6	27,1%	39.300,6	8,5%	41.942,0	5,2%	44.087,8	4,2%	-0,0	0,0%
Short term financial creditors	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%	0,0	0,0%
Trade creditors	0,0	0,0%	47.007,8	33,5%	150.098,1	31,8%	207.311,2	25,5%	214.324,0	20,3%	219.860,3	17,1%
Public finance, taxes and social security	0,0	0,0%	0,0	0,0%	89.128,1	18,9%	147.150,4	18,1%	151.682,4	14,4%	151.336,5	11,8%
Total Shareholders Equity + Liabilities	**402.000,0**	**100,0%**	**140.245,3**	**100,0%**	**471.277,6**	**100,0%**	**812.624,0**	**100,0%**	**1.055.520,5**	**100,0%**	**1.286.509,8**	**100,0%**
Total Creditors	200.000,0	49,8%	163.888,9	116,9%	125.930,4	26,7%	86.029,8	10,6%	44.087,8	4,2%	0,0	0,0%
Total Own Resources	**402.000,0**	100,0%	**55.278,9**	39,4%	**192.150,7**	40,8%	**416.220,4**	51,2%	**645.426,2**	61,1%	**915.313,0**	71,1%
Total external resources	**200.000,0**	49,8%	**210.896,8**	150,4%	**365.156,7**	77,5%	**440.491,4**	54,2%	**410.094,3**	38,9%	**371.196,8**	28,9%

Table 6: 5 Year Balance Sheet Forecast

As can be seen in the table above, our company will not invest heavily in fixed assets, as it will tend to manage stock and cash flow, since customers will pay in cash. The tangible assets that have been accounted for will only be contributions from the partners at the time of the consolidation of the business, not being of a very relevant amount.

In line with the above, we can see that shareholders' equity will remain stable as expected, pending the acquisition of investors in our shareholding. The debt will be repaid as explained in the financing section, as well as the financial expenses derived therefrom.

For the scenarios of the last few years, we have an excess of cash that will be reviewed, because if the company maintains its growth, it will set higher targets for fixed asset investments or dividend distributions.

5.5. CASH FLOW FORECAST

Cash flow estimates help us to understand the company's needs and how it will be able to meet its payments. As this is such a detailed estimation, we only consider the first two years, since from then on, we do not foresee cash flow problems due to the increase in income.

To see the complete cash flow forecast, consult the tables 7 and 8 of first and second cash flow forecast in appendix.

One of the most important aspects of this section is that cash flow should never be negative, which would be a serious problem for the company.

In addition, all the expenses detailed monthly must coincide in their totality with the profit and loss account.

5.6. RATIOS AND INVESTMENT VALUES

Finally, and with the financial statements previously detailed, we present some important indicators about the investment:

Profit	1st yr. 2023	2nd yr. 2024	3rd yr. 2025	4th yr. 2026	5th yr. 2027
1. ROE (Return On Equity)	NS	166,58%	71,48%	42,34%	29,49%
2. ROI (Return On Investment)	NS	51,57%	46,37%	36,49%	29,40%
3. EBITDA over Sales	NS	21,40%	23,97%	23,70%	22,64%

Liquidity and solvency	1st yr. 2023	2nd yr. 2024	3rd yr. 2025	4th yr. 2026	5th yr. 2027
1. Solvency	0,66	1,29	1,84	2,57	3,47
2. Trasury (acid test)	1,28	1,58	1,95	2,48	3,37
Availability	1,05	1,58	1,95	2,48	3,37

Indebtedness and financial autonomy	1st yr. 2023	2nd yr. 2024	3rd yr. 2025	4th yr. 2026	5th yr. 2027
1. Indebtedness	150,38%	77,48%	54,21%	38,85%	28,85%
2. Debt quality	59,71%	23,56%	10,01%	0,00%	0,00%
3. Debt repayment capacity	NS	100,00%	100,00%	100,00%	100,00%
4. Interest Coverage	NS	33,14	69,91	115,02	314,33
5. Working Capital	48.728,89	187.250,74	412.970,43	643.826,21	914.563,05

Payback	3,82

VAN	56.086,19
	10,00%

TIR	12,94%

Collection and payment terms	-
1. Avarage collection days	1 day
2. Avarage payment (days)	56 days

6. DIFFERENCES WITH COMPETITORS

We have observed that many users complain because they cannot control the charger with the app when they are not close enough to the charger, because it connects to the phone via Bluetooth. This means whenever they want to interact with the charger, they have to go next to it.

Our charger will be connected to the homes' Wi-Fi so it could be controlled remotely even if the user is not at home, everything he/she needs is an internet connection.

Our competitor's app only allows to program when the users' wants to charge their car, but it does offer the user an option to start charging independently. So, we have included an option in our app to start charging immediately when the user presses the button.

When the cars' battery is charging, the owner will be able to see in the app a countdown to check how much time is left until the battery gets fully charged. Not only being able to see the charging percentage.

When the battery is enough charged for being used as the homes' electricity, the app will make the user some recommendations, such as using the washing machine or the dishwasher. Whereas other smart chargers apps do not have this feature.

We are concerned that we are offering a new product that many users may find difficult to use all the features we offer. So, we will make some video tutorials for the users to learn easily how to program and enjoy all of them. Instead of giving them an overwhelming users' guide.

BE-HOME	COMPETITORS
Conection via WiFi	Conection via Bluetooh
Charge or discharge instanly	✗
Estimates full charge time and check timer	✗
Personalized recomendations	✗
Video tutorials	✗

Figure 8: Main differences with competitors

7. NEXT STEPS

For further upgrades in our product, we will focus on the main idea that makes our product interesting for the customer, which is saving as much money as possible in a simple and easy way for the user.

So, we consider, the mobile app could connect with the home automation so the car's battery could synchronize perfectly with the home appliances. This way, once the battery is loaded enough, some housework could be done automatically without any human interaction and using the car's battery instead of having to pay the electricity bill.

Instead of making recommendations to the user of turning on the washing machine or the oven, it will do it by itself, if the user wants so and has programmed it to do so.

We also are considering adapting our product to use it in a flat where there is a shared garage. Although there is the possibility already to have your own charger station, we will study ways to take advantage of the residual battery's load for the home's consumption.

Moreover, there are also more use cases we have had to think of. Such as using our bidirectional charging stations at public places like shopping centres, where the electric car's owner could give some of its load to the shopping centre facilities and receive a discount at different stores.

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APPENDIX

Car model	Battery (kWh)	Autonomy (km)	Autonomy available at the end of the day (km)	% of autonomy available at the end of the day	Battery available (kWh)	Battery available (kWh) respecting a 20% charge	Battery available (h)	Actual hours used	Monthly savings	Monthly savings with fee	Annual savings	Annual savings with fee	Saving percentage	Saving percentage with fee
Bmw i3	42,5	345	295	86%	36,341	27,841	5,06	5,06	59,87 €	49,87 €	718,48 €	598,48 €	45%	37%
R.Zoe	50	390	340	87%	43,590	33,590	6,11	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
Audi Q4 e-tron	55	520	470	90%	49,712	38,712	7,04	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
MG 5	61	400	350	88%	53,375	41,175	7,49	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
Hyundai Kona EV	64	484	434	90%	57,388	44,588	8,11	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
Tesla	75	620	570	92%	68,952	53,952	9,81	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
Bmw IX	76,6	400	350	88%	67,025	51,705	9,40	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
VW id4	77	514	464	90%	69,510	54,110	9,84	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
Skoda Enyaq	77	510	460	90%	69,451	54,051	9,83	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
Mustang	99	610	560	92%	90,885	71,085	12,92	6,00	70,97 €	60,97 €	851,62 €	731,62 €	53%	45%
Average	67,71	479,3	429,3	89%	60,623	47,081	8,56	6,00	69,86 €	61,86 €	838,31 €	742,31 €	52%	46%

Table 7: Savings table

1st Year (2023)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Opening	**362.248,0**	**317.389,3**	**285.230,5**	**253.071,8**	**222.563,0**	**178.154,3**	**160.464,7**	**137.647,7**	**119.080,7**	**101.579,9**	**83.442,0**	**74.980,4**	
Sales revenues + VAT	0,0	0,0	0,0	0,0	0,0	8.591,0	10.430,2	13.152,7	17.200,2	23.299,5	32.212,0	44.511,3	**149.396,8**
IRPF	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	1.466,7	**17.600,0**
Total Inflows	**1.466,7**	**1.466,7**	**1.466,7**	**1.466,7**	**1.466,7**	**10.057,7**	**11.896,9**	**14.619,4**	**18.666,8**	**24.766,1**	**33.678,7**	**45.978,0**	**166.996,8**
Payment of COGS + VAT	0,0	0,0	0,0	0,0	0,0	0,0	2.429,8	5.347,9	8.187,7	10.341,7	13.589,1	18.419,7	**58.315,9**
Members' salaries and wages	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	**56.000,0**
Employee wages and salaries	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	7.666,7	**92.000,0**
Social Charges	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	2.453,3	**29.440,0**
Fees and taxes	100,0	0,0	0,0	0,0	0,0	0,0	100,0	0,0	0,0	0,0	0,0	0,0	**200,0**
Supplies	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	**3.000,0**
Managment consulting	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	**600,0**
Office Supplies	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	**1.200,0**
Martketing	20.000,0	10.000,0	10.000,0	5.000,0	20.000,0	5.142,0	5.172,4	5.217,4	5.284,3	5.385,1	5.532,4	5.735,7	**102.469,4**
Insurance premiums	500,0	0,0	0,0	0,0	150,0	0,0	0,0	0,0	0,0	0,0	150,0	0,0	**800,0**
Work done by other companies	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	**600,0**
Repairs and mantainance	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	50,0	100,0	150,0	200,0	**500,0**
Rentals	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	**12.000,0**
Transportation	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	**12.000,0**
Financial expenses	833,3	821,1	808,8	796,4	784,0	771,6	759,0	746,5	733,9	721,2	708,5	695,7	**9.179,9**
Repayment of loan capital	2.940,9	2.953,2	2.965,5	2.977,8	2.990,2	3.002,7	3.015,2	3.027,8	3.040,4	3.053,1	3.065,8	3.078,5	**36.111,1**
Operating expenses + input tax investments	4.714,5	2.614,5	2.614,5	1.564,5	4.714,5	1.594,3	1.600,7	1.610,2	1.634,7	1.666,4	1.707,8	1.761,0	**27.797,6**
Total Outflows	**46.325,4**	**33.625,4**	**33.625,4**	**27.575,4**	**45.875,4**	**27.747,2**	**30.313,8**	**33.186,4**	**36.167,6**	**38.504,1**	**42.140,2**	**47.127,4**	**442.213,8**
Quarterly VAT settlement				**-16.495,5**			**-24.002,4**			**-27.006,3**			
Liquidation IRPF				**4.400,0**			**4.400,0**			**4.400,0**			
Monthly Burn Rate	**-44.858,7**	**-32.158,7**	**-32.158,7**	**-30.508,7**	**-44.408,7**	**-17.689,6**	**-22.817,0**	**-18.567,0**	**-17.500,8**	**-18.138,0**	**-8.461,6**	**-1.149,4**	
CASH FLOW	**317.389,3**	**285.230,5**	**253.071,8**	**222.563,0**	**178.154,3**	**160.464,7**	**137.647,7**	**119.080,7**	**101.579,9**	**83.442,0**	**74.980,4**	**73.831,0**	

Table 8: 1st Year Cash Flow Forecast

2nd Year (2024)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Opening	**73.831,0**	**84.652,2**	**109.151,3**	**130.252,2**	**147.707,4**	**170.203,4**	**187.665,8**	**201.418,3**	**219.092,2**	**239.108,9**	**247.569,2**	**271.474,5**	
Sales revenues + VAT	61.915,0	80.718,2	89.597,0	99.363,7	110.107,1	111.566,1	115.096,8	118.698,1	122.371,5	126.118,3	129.940,1	133.838,3	**1.299.330,5**
IRPF	908,3	908,3	908,3	908,3	908,3	908,3	908,3	908,3	908,3	908,3	908,3	908,3	**10.900,0**
Total Inflows	**62.823,4**	**81.626,6**	**90.505,4**	**100.272,1**	**111.015,4**	**112.474,4**	**116.005,1**	**119.606,5**	**123.279,8**	**127.026,7**	**130.848,4**	**134.746,6**	**1.310.230,5**
Payment of COGS + VAT	25.327,5	35.076,7	47.176,1	57.668,2	65.730,9	72.344,3	76.689,3	79.122,2	80.379,3	82.051,9	83.757,9	85.498,0	**790.822,2**
Members' salaries and wages	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	4.666,7	**56.000,0**
Employee wages and salaries	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	6.750,0	
Social Charges	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	2.160,0	**25.920,0**
Fees and taxes	100,0	0,0	0,0	0,0	0,0	0,0	100,0	0,0	0,0	0,0	0,0	0,0	**200,0**
Supplies	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	250,0	**3.000,0**
Managment consulting	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	**600,0**
Office Supplies	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	**1.200,0**
Martketing	1.023,4	1.334,2	1.480,9	1.642,4	1.820,0	1.844,1	1.902,4	1.962,0	2.022,7	2.084,6	2.147,8	2.212,2	**21.476,5**
Insurance premiums	500,0	0,0	0,0	0,0	150,0	0,0	0,0	0,0	0,0	0,0	150,0	0,0	**800,0**
Work done by other companies	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	**600,0**
Repairs and mantainance	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	**0,0**
Rentals	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	1.000,0	**12.000,0**
Transportation	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	1.100,0	**13.200,0**
Financial expenses	682,9	670,0	657,1	644,1	631,0	617,9	604,8	591,6	578,3	565,0	551,6	538,2	**7.332,4**
Repayment of loan capital	3.091,4	3.104,3	3.117,2	3.130,2	3.143,2	3.156,3	3.169,5	3.182,7	3.195,9	3.209,3	3.222,6	3.236,1	**37.958,6**
Operating expenses + input tax investments	750,4	815,7	846,5	880,4	917,7	922,8	935,0	947,5	960,3	973,3	986,5	1.000,1	**10.936,1**
Total Outflows	**47.602,2**	**57.127,5**	**69.404,5**	**80.091,9**	**88.519,4**	**95.012,0**	**99.527,6**	**101.932,6**	**103.263,2**	**105.010,7**	**106.943,1**	**108.611,2**	**1.063.045,8**
Quarterly VAT settlement	**-27.492,7**			**-18.908,4**			**-5.528,6**			**10.830,7**			
Liquidation IRPF	**4.400,0**			**2.725,0**			**2.725,0**			**2.725,0**			
Monthly Burn Rate	**10.821,2**	**24.499,1**	**21.100,9**	**17.455,2**	**22.496,0**	**17.462,4**	**13.752,5**	**17.673,9**	**20.016,7**	**8.460,3**	**23.905,3**	**26.135,5**	
CASH FLOW	**84.652,2**	**109.151,3**	**130.252,2**	**147.707,4**	**170.203,4**	**187.665,8**	**201.418,3**	**219.092,2**	**239.108,9**	**247.569,2**	**271.474,5**	**297.610,0**	

Table 9: 2nd Year Cash Flow Forecast