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**BUSINESS MODELS IN THE PHOTOVOLTAIC SECTOR:
THE 4ENERGY CASE**

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ABSTRACT	5
INTRODUCTION	7
<u>1. CHAPTER: RENEWABLE ENERGIES AND PHOTOVOLTAIC TECHNOLOGY.</u>	<u>11</u>
1.1. PV PLANTS: FUNCTIONING AND TECHICAL CHARACTERISTICS	12
1.2. RENEWABLE ENERGY SECTOR	15
1.2.1. RENEWABLE ENERGIES IN THE CLIMATE CHANGE POLICIES: FROM A GLOBAL TO A NATIONAL PERSPECTIVE	15
1.2.2. SUSTAINABLE SOURCES: GLOBAL CONTEXT	18
1.2.3. SUSTAINABLE SOURCES: ITALIAN CONTEXT	21
1.2.4. PAST AND FUTURE INCENTIVE SYSTEM IN ITALY	27
<u>2. CHAPTER: BUSINESS MODELS</u>	<u>31</u>
2.1. ORIGIN AND DEVELOPMENT OF THE BUSINESS MODEL CONCEPT	31
2.2. ANALYSIS OF BUSINESS MODEL DEFINITIONS	36
2.3. WHAT IS NOT A BUSINESS MODEL	47
2.3.1. RESOURCE BASED VIEW	48
2.3.2. BUSINESS CONCEPT	48
2.3.3. REVENUE MODEL	49
2.3.4. ECONOMIC MODEL	49
2.3.5. BUSINESS PROCESS MODELLING.....	50
2.4. BUSINESS MODEL, STRATEGY AND DYNAMIC CAPABILITIES: A NECESSARY CLARIFICATION.	51
2.4.1. STRATEGY	51
2.4.2. DYNAMIC CAPABILITIES	53
2.5. BUSINESS MODEL COMPONENTS	55
2.5.1. ESSENTIAL COMPONENTS PRESENTED BY THE LITERATURE	57
2.5.2. MORRIS, SCHINDEHUTTE AND ALLEN “ENTREPRENEUR’S BUSINESS MODEL” ..	60
2.5.3. BUSINESS MODEL CANVAS	65
<u>3. CHAPTER: THE 4ENERGY CASE</u>	<u>73</u>
3.1. COMPANY OVERVIEW	74
3.2. METHODOLOGY	77
3.3. EXTERNAL VARIABLES: MARKET TRENDS AND REGULATION	79

3.3. ANALYSIS OF THE 4ENERGY BUSINESS MODEL	83
3.4. APPYING MORRIS ET AL. FRAMEWORK TO 4ENERGY	93
CONCLUSION	100
<u>REFERENCES</u>	<u>104</u>
APPENDIX	108

ABSTRACT

Il settore delle energie rinnovabili in Italia, e del fotovoltaico in particolare, è stato caratterizzato per anni da una forte incentivazione pubblica. La necessità di raggiungere gli obiettivi fissati dalle direttive Europee e gli alti costi che erano inizialmente necessari all'installazione di un impianto fotovoltaico hanno avuto un effetto dopante sul mercato contribuendo alla convinzione che non fosse economicamente sostenibile un modello di business che operasse esclusivamente in tale settore.

L'obiettivo di questa tesi è quindi quello di dimostrare che un tale modello di business non solo sia possibile ma sia anche in grado di generare profitti. A tale riguardo ci si serve di un caso pratico riguardante l'analisi del modello di business dell'azienda 4Energy S.r.l. Quest'ultima è una realtà aziendale che opera a livello locale (area Marche-Abruzzo) nell'offerta di servizi per l'installazione e la gestione di impianti fotovoltaici per privati ed azienda.

A tale scopo si sono in primo luogo indagate gli attuali trend globali, europei e quindi nazionali riguardanti la produzione di energia da fonti rinnovabili per poi giungere ad analizzare il contesto normativo attualmente in vigore in Italia. Si è osservato come la struttura normativa e gli obiettivi fissati dall'unione Europea nel contesto della lotta ai cambiamenti climatici siano favorevoli ad un ulteriore sviluppo del settore fotovoltaico.

Successivamente, con il fine di conoscere e poi utilizzare gli strumenti più adatti per una corretta analisi del modello si indaga sul concetto di “business model” presente in letteratura. Data la complessità del tema si è voluto dedicare una parte considerevole di questa tesi all’analisi della letteratura esistente che ha portato all’individuazione di due modelli ritenuti adatti all’analisi empirica svolta successivamente. I due modelli individuati sono il cosiddetto “Business Model Canvas” elaborato da Osterwalder e Pigneur (2010) e il framework proposto da Morris et al. (2005).

L’analisi empirica ha mostrato che, nonostante chiare limitazioni, entrambi i modelli riescono a descrivere efficacemente il modello di business di 4Energy. In particolare, il secondo modello permette un discreto livello di approfondimento fornendo inoltre una proiezione dello stesso in un prossimo futuro. Si ritiene quindi che il modello adottato da 4Energy sia coerente con le condizioni offerte dal mercato e sia quindi adatto a sfruttare le future opportunità che quest’ultimo, tramite evoluzioni della regolamentazione potrà offrire.

Si spera infine che, ulteriori studi nell’ambito dei modelli di business, nonché l’applicazione dei modelli utilizzati in contesti aziendali simili possano portare ad un’evoluzione degli stessi e permettere una comparazione che gioverebbe senz’altro alla ricerca empirica qui svolta.

INTRODUCTION

The present thesis is the result of a personal interest in environmental issues, seen from an economic perspective, that, due to the support and collaboration established with the firm objective of the case study has been realized. To this purpose we wanted to use a tool, the business model, that continues to be of difficult definitions for academic and practitioners, requiring a preparatory literature review.

The birth of this company, especially in terms of vision and mission is to be found in a global context that is progressively characterized by a focus on environmental and economic sustainability issues.

It is increasingly growing worldwide a push and attention towards those that are considered the megatrends¹ (Retief, Bond, Pope, Morrison-Saunders, & King, 2016) that will influence the future. We refer in particular to concepts such as climate change, with all that that entails, and the depletion of natural resources, that have the potential to bring considerable changes not only at a social level but especially at economic level. By now these issues are constantly in the spotlight of governments and international agencies discussion requiring actions and solutions as organic and coherent as possible. We are therefore witnessing socio-economic changes of global significance that will deeply affect several business sectors. In this context, one of the most discussed issues refers to the production of energy

¹ Megatrend is defined by the Oxford English Dictionary as: “an important shift in the progress of a society or of any other particular field or activity”.

from renewable energy sources. Even though the available technologies are no longer considered as totally innovative nor brand new, they still have wide room from improvement in terms of performances and can still be considered in the early stages of their product life cycle. This is particularly true regarding the photovoltaic technology, that represent one of the most used and effective green energy sources. Having these technologies, at least in the early phases of their development, costs significantly higher than the conventional energy sources have received incentives to the installations for years. While recently, the high investments in R&D made in the past started to result in remarkable cost decrease that in turn has diminished the direct incentivization in favor of tax benefits. The first part of the paper will therefore analyze the state of the art of the photovoltaic sector in Italy in order to provide a consistent basis enabling the reader to understand the specific history and dynamics of this market and hence have all the means to contextualize the company reality that will be the object of the empirical study.

To this purpose the dissertation will use the business model literature and tools to determine the functioning of a small firm operating in the services related to the installation and management of PV systems, 4Energy.

In order to do so an extensive literature review on business models and related concepts will be conducted in the second chapter. Indeed, even though the term business model is present in the literature from more than sixty years has often been misused by practitioners and academics (DaSilva & Trkman , 2014). In the last two

decades several are the authors that investigated the issue in order to clarify and deepening and thus giving significance to the term. These contributions focus on different perspective and properties of business model thus, making it difficult to reach a universally acceptable definition. Probably this is due to the fact that business model can be understood by several perspectives as economic, strategic and organizational (Magretta , 2002).

Notwithstanding the lack of a clear definition several academics call for the use of this tool. New technologies, changes in the socio-economic conditions and globalization have changed profoundly the way business is conducted requiring the adoption of well-developed business models allowing companies to deliver and capture value from innovations (Teece D. J., 2010). In its more general definition a business model can be seen as an “architecture for how a firm creates and delivers value to customers” (Teece D. J., 2018) but the literature review will contribute to broaden and deepen the definition of the concept.

Furthermore, two business model frameworks will be object of a more careful analysis with the aim of laying the foundation for the empirical study. the first business model, called business model Canvas (Osterwalder & Pigneur, 2010), it is widely accepted and recognized useful in the description of almost every type of firm and will serve as introduction to the successively analysis carried through the use of the framework proposed by Morris et al. (2005). The latter seems to allow a deeper level of study but, the fact that were not found other practical applications,

except for the case considered in the article, do represent a challenge the work will face. The appropriateness and the accuracy of such a model will be evaluated at the end of the dissertation. The first two parts of the work are therefore preliminary to the third chapter in which it will be build first and analyzed later the business model of the firm.

Considering the initial premises concerning the global attention on environmental matters and the peculiar conditions of the renewable energy market the goal of the paper is dual. On one hand we want to verify whether it is possible or not to apply a business model used for the description of a large multinational company, operating in a totally different contest (i.d. the framework proposed by Morris et al. 2005), to describe a reality with completely different features. Secondly, we want to verify the consistency and economic sustainability of such a model that is operating in a market that for years has been deemed unprofitable without the substantial sustain of public incentives.

1. CHAPTER: RENEWABLE ENERGIES AND PHOTOVOLTAIC TECHNOLOGY.

The first chapter of the thesis will be devoted to an environmental analysis of the photovoltaic (PV hereinafter) sector that will provide the necessary foundations to understand a complex and articulated issue, that, especially in Italy experienced several major changes. As a matter of fact the PV sector during the years has been at the centre of multiple legislative interventions aimed at regulating the management of incentives but also to adjust the electricity market. Furthermore, being the PV technology one of the most used renewable energy source has also been the focus of number of actions and directives from the European Union that the Italian government have subsequently transposed and turned into regulations. It is therefore necessary to understand how the PV sector is included in a more general area, renewable energy sources, that represent one of the main and key aspects in most of the global leaders' agendas.

To address all these topics the chapter will firstly introduce the photovoltaic technology by describing how it works, in order to provide a general explanation of the argument. Thereafter, starting from a global perspective, the dissertation will gradually narrow the focus on the Italian situation, the policies applied in the past and the direction at which the current policy is aiming.

1.1. PV PLANTS: FUNCTIONING AND TECHNICAL CHARACTERISTICS

The present section is aimed at providing a short explanation on the functioning of a solar PV system. Even though the main argument of the whole dissertation is not strictly related with the functioning of a PV plant, nor with its technical characteristics it is however worthwhile to dedicate an introductory paragraph to this topic in order to provide, the reader with all the elements necessary to a full comprehension of the work.

The information and explanations contained below are the outcome of an interview conducted with the technical staff of 4Energy, its aim is purely informative, every possible error is to ascribe to the author.

The photovoltaic technology allows the direct conversion of solar energy into electricity through the photovoltaic effect, i.e. the property of some semiconductor materials to generate electricity if struck by light radiation. Silicon, a widespread element in nature, is the basic material for a photovoltaic cell, elementary device able to produce about 1.5 Watts of direct current², normally insufficient for common uses. A module, the basic component commercially available, is composed by several cells electrically connected and encapsulated. More modules, connected in series and in parallel form the section of a system, whose power can

² Direct current is the unidirectional flow of an electric charge. A classic example is a battery.

reach thousands of kW. Downstream of the photovoltaic modules is the inverter which transforms the direct current generated by the cells into alternating current directly usable by users or reversible in the network. Modules can be oriented towards the sun on fixed structures or on structures able to follow its movement in order to increase the solar collection (tracking system). Each installed kWp³ requires a net space of approximately 8-10 square meters for crystalline silicon modules coplanar with building covers; instead, more space is needed for modules arranged in multiple rows on flat surfaces to reduce shading. In Italy the optimal exposure for fixed modules is towards south with an inclination of about 30-35 degree: a photovoltaic system, optimally oriented and inclined can produce, on average, 1000 kWh per kWp for a system installed in Northern Italy and 1500 kWh per kWp for a system in Southern Italy. A photovoltaic system has an expected life of about 20 to 25 years, with little need of maintenance and a good resistance to atmospheric agents, naturally, a more frequent maintenance will help the system to keep its original production level that, otherwise is going to decrease over time. The main application of PV plants are for:

- Systems for users connected to low voltage network;
- Electricity production plants connected to medium or high voltage network;
- Plants with storage systems for utilities isolated form the network.

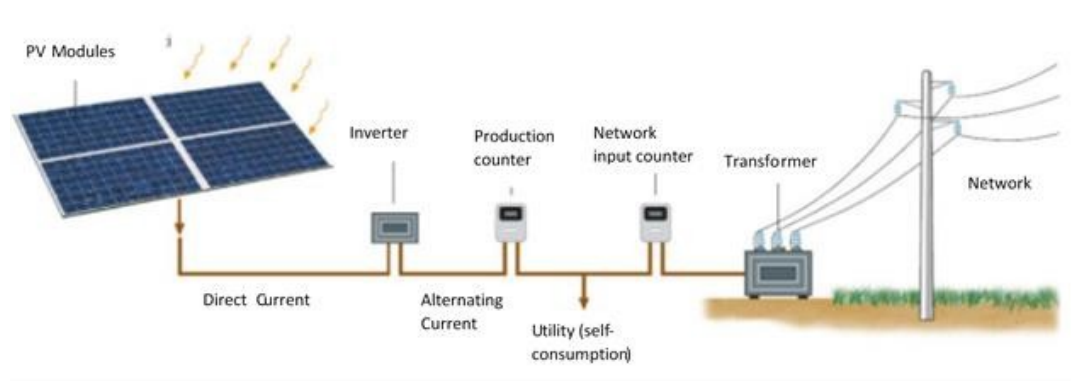
³ kWp is a unit of measure of the maximum potential power producible by an electric generator.

Lastly, a few lines will be devoted to the main technologies, i.e. the modules and panels typologies present on the market.

The most common typology are the crystalline silicon panels (monocrystalline and polycrystalline). Polycrystalline cells are particularly efficient in terms of conversion of incident radiation into electric energy. Then there are the thin film panels with amorphous silicon or other materials, such as diselenium of indium and copper (CIS) and cadmium telluride (CdTe). Panels realized with this technique are characterized by lower performances with respect to crystalline silicon but have more convenient prices and greater versatility of use.

Nonetheless it should not be forgotten that solar energy production, as all renewable sources, is strictly bounded to atmospheric conditions and production levels can greatly vary from year to year, or even from season to season.

Figure I.1: Photovoltaic System Functioning Framework



Source: Our elaboration on material provided by 4Energy

1.2. RENEWABLE ENERGY SECTOR

In order to better understand the trends and current policies concerning the PV sector the latter should be considered as part of a more general topic that is, the renewable energy technologies and the fight against climate change. As a matter of fact PV represent one of the most used green sources of energy both at national and global level.

1.2.1. Renewable energies in the climate change policies: from a global to a national perspective

Already in the nineties the issue of climate change became evident and the need for an alternative and sustainable development model rose. It is in this context that the UNFCCC⁴ (United Nations Framework Convention on Climate Change) was created in 1992 as the first global convention to specifically address the greenhouse emission problem. The result, some years later, was the well-known Kyoto Protocol⁵ that defined the targets for emission reduction and prepared the ground for a decarbonisation policy that Europe almost immediately adopted. The path continued until 2015 when, at the Conference of the Parties⁶ (COP21) held in Paris

⁴ The UNFCCC is an international treaty adopted in 1992 with the aim of “stabilize greenhouse gas” (United Nations Framework Convention on Climate Change, 1992). It was the first step towards the adoption of environmentally sustainable policies. It lay the groundwork for the subsequent Kyoto Agreement.

⁵ The Kyoto Protocol is an international treaty adopted in 1997 and entered into force in 2005. The Protocol it has been ratified by 192 parties.

⁶ The Paris Agreement reached the threshold establish by art. 21 on October 5th, 2016 and entered into force on November 4th, 2016.

195 countries signed the first universal and legally binding agreement on global climate. This latter expressly decide on the target the parties should pursue, in particular Article 2 (COP21, 2015) establish that:

- a. Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;
- b. Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and
- c. Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Moreover, each state has the duty of presenting the national action plan for the climate, that, for Italy, is the Strategia Energetica Nazionale 2017 (SEN) that will be lately discussed.

In this context the EU had already established ambitious and binding targets with the Roadmap2050 defined by the European council in 2009 that establish an 80% reduction of greenhouse emission, a 55% of energy production from renewable energies and a 40% level of energy saving. Given the long-term orientation of the Roadmap2050 also short and mid-term objectives have been set. With the

renewable energy directive (2009/28/EC), also known as RED I or 2020 Package it was establish:

- a. 20% cut in greenhouse gas emissions (from 1990 levels);
- b. 20% of EU energy from renewables;
- c. 20% improvement in energy efficiency.

Successively, with the RED II, as part of the Clean Energy Package new binding targets were set for 2030, specifically, concerning the renewable energies the level was raised at 32% on the total energy. It should be noted that the 32% level refers to the aggregate EU energy and does not refers to every single member state, in this regard it has been introduced the concept of *burden sharing*. This methodology aims at establishing a different binding share per state according to the rules dictated by the Governance Regulation. With respect to the 2030 target the quota has been calculated taking into account the 2020 target, the GDP, the level of electric interconnections, the national potential (Primes) and in addition a fixed identical share per each state. Translated into numbers this corresponds, for Italy to a 29,7% target share to be reached before the end of 2030. For 2020 the Italian target is 17%. Moreover, according to the scenarios developed by the EU Commission Italy, in the best possible case will reach a renewable energy share of 27%, that is almost 3 points below the target (scenario EUCO30). In this context the SEN foresees a

sectorial differentiation⁷ of the target that primarily relies on a relevant development of electric sources, mainly provided by wind and solar energy.

The European directives were received by the Italian government that formulated its national strategy with the SEN 2017 in which the overall national strategy has been depicted and it is going forward in the adoption of the necessary legislation, in particular, with regard to renewable energy, the last decree to be approved on July 4th, 2019 was the “FER decree” on the regulation of the energy market.

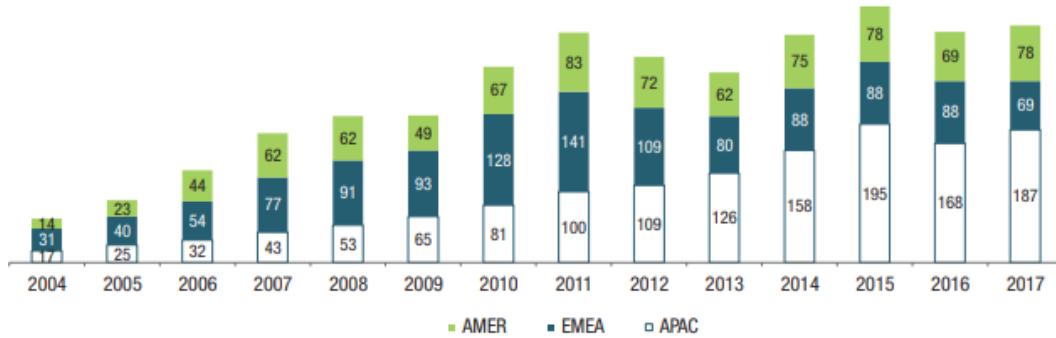
1.2.2. Sustainable sources: global context

As it has been showed several actions were taken in order to fight and prevent climate change, in the practice most of the initiatives for enhancing the use of green sources relates to tax benefits and incentives to ease the development and diffusion of green technologies.

From a geographical perspective, until 2011 the vast majority of the investments were mainly concentrated in the EMEA area (Europe, Middle East and Africa) under the lead of the EU. The EMEA region peaked in 2011 with \$141 billion to be then overtaken by APAC (Asia-Pacific) countries lead by Chinese investments. The graph below (Table I1) shows the global investment trend divided by regions, interesting to notice, starting from 2011, the increasing relevance of Asian investments and the simultaneously decrease of European investment.

⁷ The target is divided by the commission into three key sectors (Heating&Cooling, Electric and Transport).

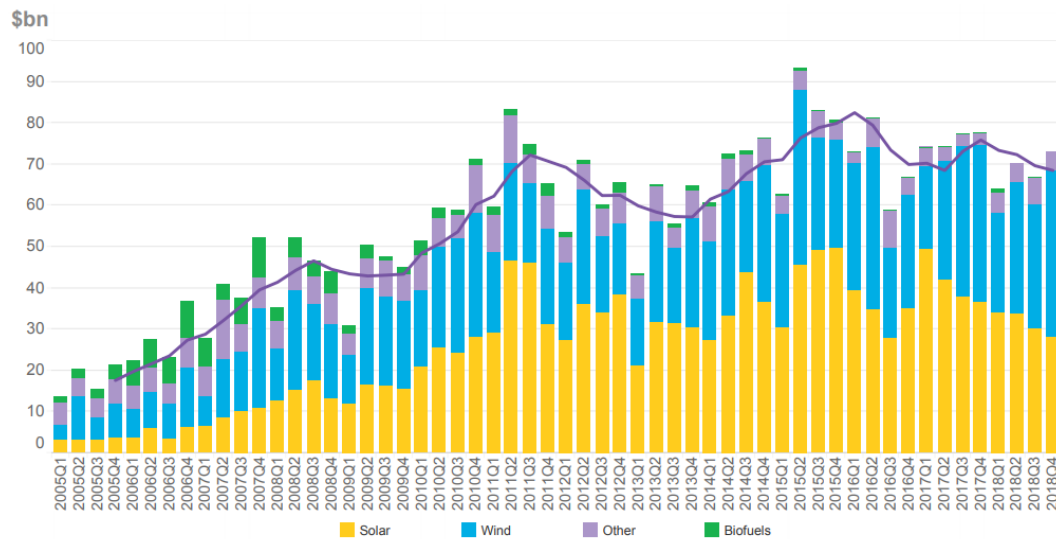
Table I.1: Global Investment in Renewable Resources per Geographical Area, \$bn



Source: Bloomberg, 2017

Beyond that, it is equally important to look at where these investments are placed, once again 2011 seems to be the break year in which investments in solar energy started to consistently overpass investments in wind energy (Table I.2).

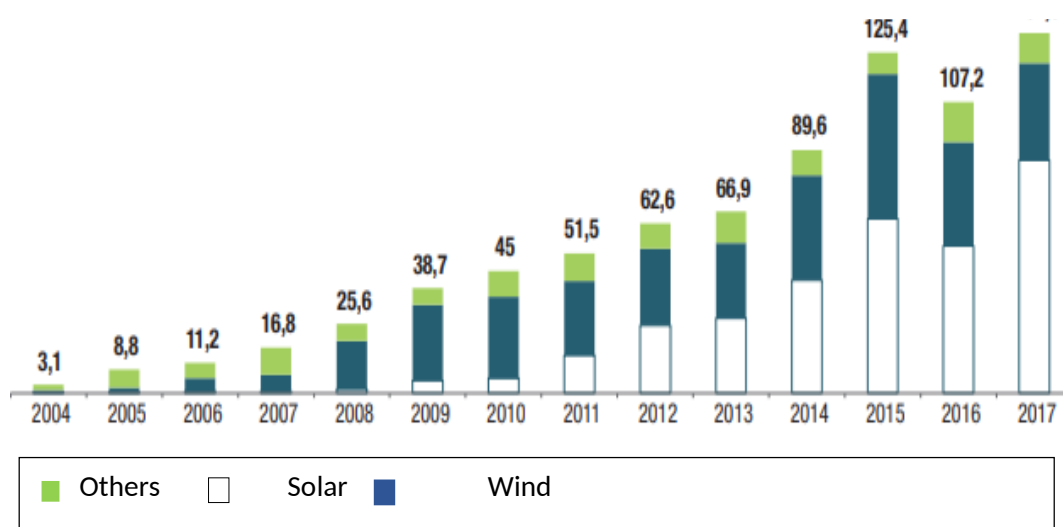
Table I.2: Global New Investment in Clean Energy by Sector, Q1 2005-Q4 2018



Source: Bloomberg, 2018.

The reason of this change in the investments direction is probably to be found in the increasing investment coming from China, in particular the Chinese funds were directed on the solar technology, see Table I .3. Emblematic the case of the tech multinational Huawei that has become one of the main producers of solar inverter.

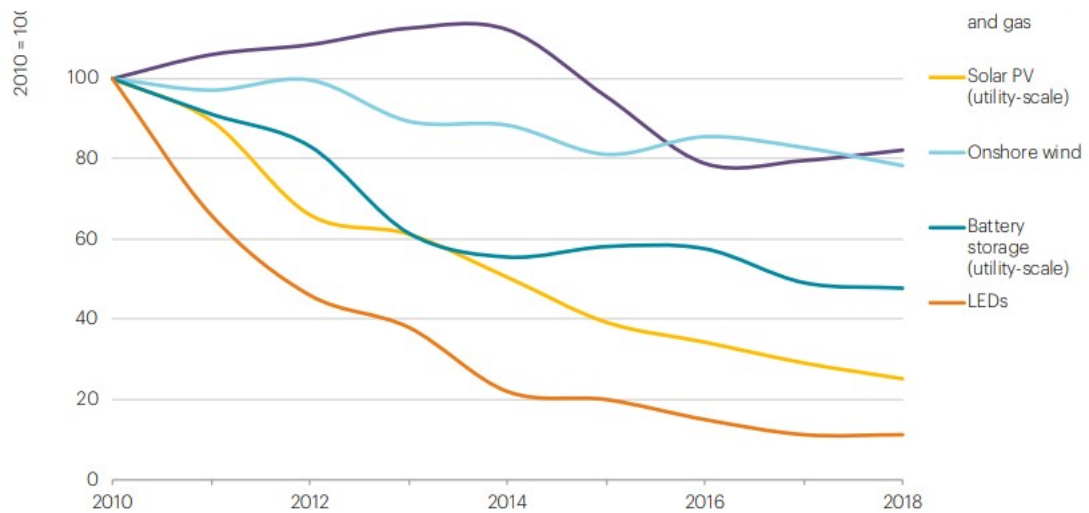
Table I.3: Investment in Clean Energy China, by Sector.



Source: Bloomberg, 2018

Lastly, at the end of a global overlook of clean energy technologies it should be considered the cost of such sources. The evolution of the technology sustained by the investment made by governments and privates have drastically decreased the cost of the majority of the green energy sources. Coherently with what it has been

Table I.4: Capital Cost in Selected Energy-related Sector



Source: World Energy Investment 2019, International Energy Agency

seen before, starting from 2011 also the solar PV experienced a more than significant decrease in its capital cost. Moreover, among other technologies only the LED technology performed better (Table I.4).

1.2.3. Sustainable sources: Italian context

Narrowing now the perspective the study will take into more consideration the specificity of the Italian clean energy market, that is, the market in which 4Energy operate. It is therefore vital to understand the current situation as well as to carefully look at the possible trends foreseen for the future, with specific focus on the period 2020-2030.

Italy has already achieved the target set by the Package 20-20-20, as a matter of fact Italy was supposed to reach the 17% goal by 2020 but such value has been outdid

in 2015 when the share of final gross consumption (FGC) of energy covered by renewable energy sources (RES) registered a more than satisfying 17.5% and then continued to increase up to the current 18% marked in 2018 (Table I.5). The objective has been reached also due to an increasing importance of the electric sector that rose from 8.9 Mtep⁸ up to 9.7, sector that particularly benefitted from the increasing number of PV installations.

Table I.5 Final Gross Consumption (FGC) of Energy in Italy (Mtep).

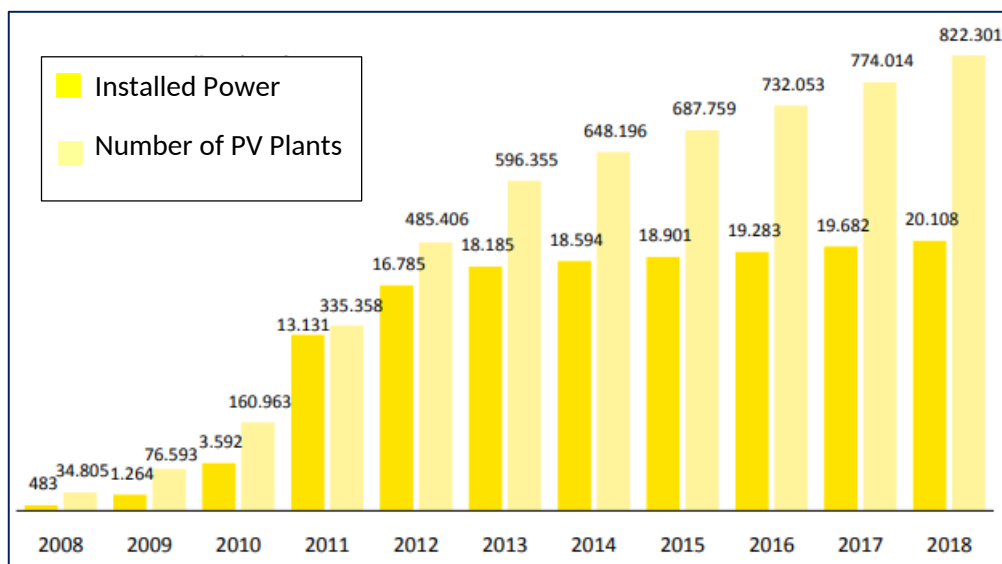
<i>Source</i>	2013	2014	2015	2016	2017	2018
<i>FGC RES - Electric Sector</i>	8.9	9.2	9.4	9.5	9.7	9.7
<i>FGC RES - Heating Sector</i>	10.6	9.9	10.7	10.5	11.2	10.9
<i>FGC RES - Transport Sector</i>	1.3	1.1	1.2	1	1.1	1.2
<i>Final Gross Energy Consumption from RES</i>	20.8	20.2	21.3	21.0	22.0	21.8
<i>Gross Final Consumption of Energy (GFC)</i>	123.9	118.5	121.5	121.1	120.4	120.8
<i>GFC Share Covered by RES</i>	16.8%	17.0%	17.5%	17.3%	18.3%	18.0%

Source: Our elaboration on data provided by GSE.

⁸ Mtep is the abbreviation of Million-Ton Equivalent of Petroleum and is a unit of measurement of the energy.

According to the data provided by the Italian Agency for electric services (GSE) solar PV is the main source in terms of installed capacity (20.1 GW in 2018), strictly followed by the hydroelectric and more outdistanced the wind. Moreover also the number of PV plants is increasing (Table 1.6I.6). The little difference in the installed power in spite of a substantial increase of the PV plants it is due to the dimension of the new plants. Indeed, a decrease in the dimension, hence in the power, of the new plants has been recorded. From huge PV park, mainly built with investment purposes by private agency, we are witnessing to a shift to small and medium plants for domestic use. Suffice it to say that if in 2011 the medium size of a plant were of 54.7 kW in 2018 the size decreased to 8.8 kW.

Table 1.6: Evolution of the installed power and number of PV plants in Italy



Source: *Statistic Report on Solar Photovoltaic 2018*, GSE

To conclude the digression on the current Italian situation it is worthwhile to mention just a few numbers on the amount of public incentives going to RES. The solar PV is by far the one that benefitted the more from the public support, the latest data available, indicate that PV received €6.7 bn for an incentivized power of 19.6 GW. With these number solar energy is largely the most supported technology, biogas received financial aids for €1.5 bn while wind energy received €1.46 bn, almost the same as biogas. Considering the average cost of the incentive per unit of energy produced PV is the one obtaining the most, that is the most convenient on which invest in, the incentive is for the PV 294 €/MWh, for biogas 208 €/MWh, for hydroelectric 109 €/MWh and for wind 98 €/MWh. Further considerations and in-depth analysis will find room in the paragraph to come.

As seen above Italy has already reached the 2020 target for electric RES but, according to GSE, in the coming years they will arrive at the end of the useful life for incentives, numerous plants powered by renewable sources, for an estimated power of 8 GW, corresponding to 20.574 GWh. According to these estimates, it is therefore evident that, to date, the balance between the energy that will be soon in operation (7.934 GWh) and the expiring one (20.574) is negative (12.640 GWh).

At best, without the intervention of new policy measures, it is estimated that many of the plants in operation could continue to produce electricity even without incentives but would be subject to high management costs. In some cases

revamping⁹ or repowering¹⁰ would be vital to keep the plant alive and avoid disposal, but it may not be implemented in the “business as usual” scenario. To avoid this possible scenario in 2019 the Italian government has approved the FER decree in which establish a new set of incentives. In line with EU directives the new decree puts the accent on the incentivisation of self-consumption plant and the promotion of the so-called “energy communities”. Moreover , a simplification of the administrative processes has been proposed in order to facilitate the access to incentives to families and small and medium enterprises. On the other side, waiting to be received by the Italian legislation, there are the Electricity Directive (2009/72/EC) and the Electricity Regulation (EC/714/2009). These new rules, approved in May 2019 and entered into force in the summer 2019 have the aim of redesign and modernize the current EU electricity market. Since the electricity produced by renewable energies is expected to grow from 25% to more than 50% in 2030 rules need to be updated in order to facilitate the integration of renewables into the grid. Norms must also meet the needs of renewable energies, as for example integrate into the grid energy storage system, to allow more and more subjects to adopt RES systems. Furthermore, the directives indicate the need of the market to provide the right incentives for consumer to become more active and sustain the

⁹ Revamping refers to a series of interventions intended to give back to the plant its original configuration and therefore its original productive capacity

¹⁰ Repowering refers to a series of interventions intended to improve the production capacity of the PV plant.

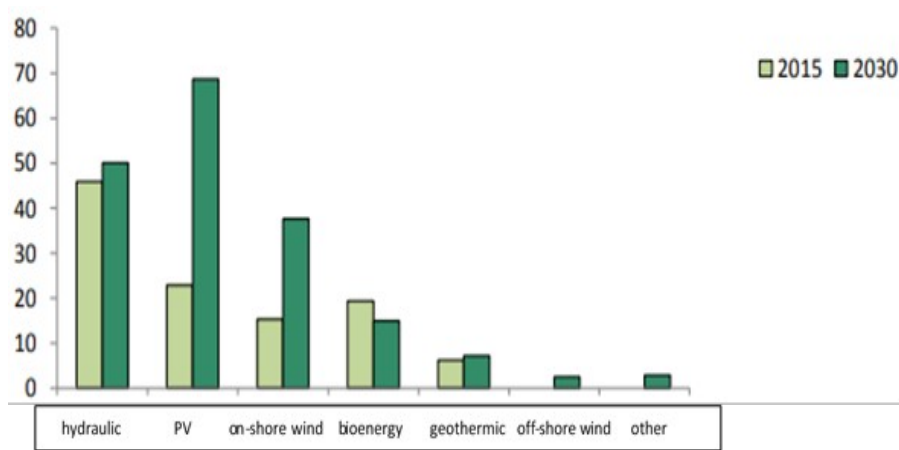
growth of clean energies, the more consumers will participate the more the electricity system will be stable.

The EU directives perfectly match the expected situation foreseen by the Italian energetic strategy (SEN). The target, concerning electric renewables, is to reach by 2030 a level of 55% of total electric demand covered by green energies. An objective superior even compared to what required by European parameters. In order to reach this goal the SEN reaffirm the will to sustain this growth through public support policies that necessarily have to be revised. The current incentive system will be gradually transformed in enabling mechanisms for the integration of renewables into the market, so that they acquire independence in contributing to environmental objectives.

In this context, the solar energy plays a crucial role, highlighted also in the SEN, the decreasing costs and the residual potential, that is the highest among the renewable energy technologies, make of the PV the technology that is likely to experience the greater development, Table I.7. The expected rise of PV systems is not only in terms of produced power but also in terms of future investments for new installations, by looking at Table I.8 is possible to observe how PV (the one circled in red) is by far the technology that will receive more investments.

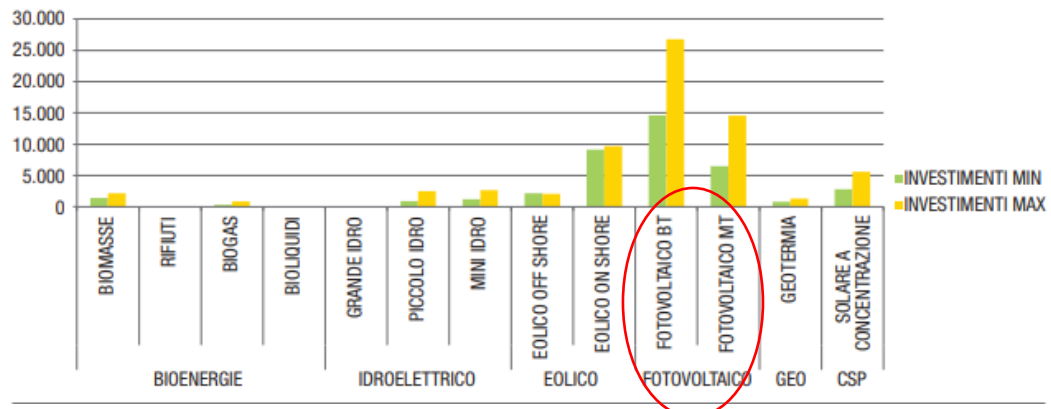
To enhance such a development will also contribute the increasing development, in terms of capacity, of storage energy systems, benefitting too from increasing investments in the recent years.

Table I.7: Expected Increase in Renewable Production 2015-203, by Sector



Source: Strategia Energetica Nazionale, 2017

Table I.8: Expected Investment for the installation of new RES, by Technology 2018-2030 (Mln€).



Source: Libro Bianco per uno sviluppo sostenibile, Confindustria

1.2.4. Past and future incentive system in Italy¹¹

The intent of this paragraph, as for the whole chapter, is to provide an exhaustive presentation of all the PV related topics in order to have a complete understanding

¹¹ Most of the information and data contained in this paragraph are retrieved from: <https://www.gse.it/>

of the argument. After all that has been said it is therefore helpful to conclude the chapter by analyzing the past and future incentive system that sustained and will sustain the growth of photovoltaic systems. Moreover, incentives and fiscal benefits have represented a great boost for such a technology, and billions of euros have already been allocated to the development of such a technology.

Starting from the origins, the first consistent and decisive incentive for the growth of renewable sources, and hence of the photovoltaic, has been the so called “Conto Energia” a feed-in scheme used to allocate incentives.

This feed-in scheme has been introduced in Italy with the Community Directive 2001/77/CE but became operational only in 2006 with the 28/07/2005 and 60/02/2006 Interministerial Decrees that established the financing system for electricity production (I Conto Energia). Practically, incentives are granted to private subjects, companies and public administrations that would install a photovoltaic solar plant connected to the electricity grid. The amount of the incentive is proportionated to the electricity produced.

Afterwards, during the years, several are the legislative changes occurred. The II Conto Energia was approved in 2007 and introduced new novelties such as the application of the incentive tariff on the whole energy produced, the simplification of the administrative rules to access the tariff and the differentiation of the tariff based on the typology of architectural integration and the size of the plant. Furthermore, a bonus has been provided for PV systems combined with efficient

use of energy. Again in 2010, with Ministerial Decree the third Conto Energia entered into force with rules applicable only to systems in operation from the first of January 2011 to May 31st 2011. Specific tariffs for photovoltaic systems integrated with innovative characteristics and for concentrating photovoltaic systems¹² were introduced. For plants installed after May 31st, 2011 a new Conto Energia (the fourth) was published in 2011 with the objective to align the level of the tariff to the photovoltaic technology evolution and introduced a cumulative annual cost limit for incentives set at €6 billion. With the approaching of the mentioned limit the fifth and last Conto Energia were announced. Further to partially confirm the regulations of the previous, extended the annual cost limit to €6.7 billion.

Besides incentives to the production, within the aids to the photovoltaic systems it is possible to include also the cost coverage tariffs provided by the GSE for storage systems. This latter are a set of devices, equipment and management and control logics, functional for absorbing and releasing electricity. These devices are designed to operate continuously in parallel with the network, with the obligation of connecting third parties or capable of altering the exchange profiles with the electricity network (input and / or withdrawal). For storage systems associated with

¹² Systems in which the light is concentrated from 500 to 1000 times by a lens system to illuminate high-efficiency and low-size PV cells. (Source: <http://www2.rse-web.it/temi/sottotema/10?objId=4>)

PV plants the tariff consists of a fixed fee of € 50 and a variable fee of € 2 for each kW of power up to 20 kW and equal to € 1 for each kW of power exceeding the first 20 kW.

Currently, there are several systems still financed by the previously mentioned Conto Energia, for those systems installed after 2013 there were no direct incentives until August 2019 when, with the approval of the FER 1 Decree a new incentives system has been reintroduced. However, there was and still is a series of tax deduction and benefits regarding the tax treatment the asset receives that allows private subjects and companies to reach considerable levels of savings. The nature of such deductions is so wide and involves a great number of variables (size, power, surface on which the system is installed etc.) that would be difficult to deal with in the current discussion, moreover for the purpose of the thesis it would not be so relevant.

2. CHAPTER: BUSINESS MODELS

2.1. ORIGIN AND DEVELOPMENT OF THE BUSINESS MODEL CONCEPT

Although the term business model is frequently used and seems to be widely spread in the scientific-economic literature its meaning has been often discussed and challenged. In order to gain an extensive and deep understanding of its significance is therefore necessary to start from the origin.

The term was first used by Jones (1960) in one of his articles' title but then, no mention of the business model concept was made through the whole study, pointing out a general lack of knowledge on the theme.

Despite being cited from time to time by scholars and researchers the term got rid of its operative activity looking, to gain significance only with the advancement and development of technological innovations and electronic businesses (Wirtz, Pistoia , Ullrich, & Gottel, 2016). At that time, from the early nineties, the business model started to be seen as an effective instrument able to provide a clear picture of the company as a whole, enabling executives to acquire useful perspectives on the business itself. This concept was even more applicable to the new economy enterprises were business models tried to translate potentially profitable technological innovations into business terms (DaSilva & Trkman , 2014). As a matter of fact, the complexity of the argument and the changes generated by the

development of new technologies, especially in the sector known as “information and communications technology” (ICT) had a disruptive impact on the markets, creating the need for a different way to describe the companies operating with these innovations.

Consequently, starting from the end of the past century, in conjunction with the booming of the dot-com era, the term business model was widely used in several researchers and practitioners works even though a certain degree of confusion on the issue still remained. As a matter of fact several were the researchers that adopted the term to the purpose of their studies creating substantial differences that led to severe obstacles to the progress on the theme (Zott, Amit , & Massa , 2011).

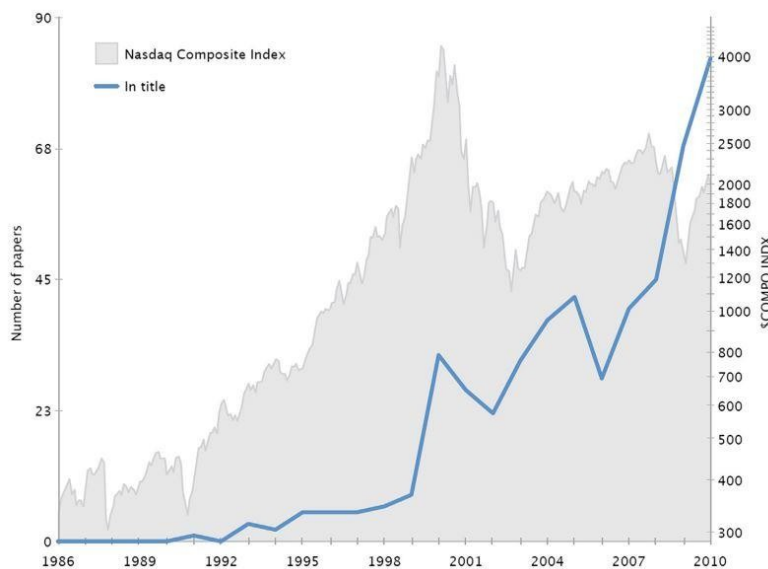
The relatively novelty represented by the term, together with the uncertainty associated with it, did not fail to attract criticism. Among all, the most authoritative was surely the observation coming from M. Porter: “The definition of a business model is murky at best. Most often, it seems to refer to a loose conception of how a company does business and generates revenue. Yet simply having a business model is an exceedingly low bar set for building a company. [...] The business model approach to management becomes an invitation for faulty thinking and self-delusion” (Porter, 2001).

Apart from the scepticism around the term, it is in the aforementioned period that a great diffusion of academic articles on the theme was recorded. An interesting consideration with this regard is made by DaSilva and Trkman (2014) that observed

how, starting from the early nineties, the number of citations of “business model” in academic journals has a trend similar to the NASDAQ index ¹³. See **Error! Reference source not found.** II.1.

Business models were perceived as useful framework on which evaluate the emerging technology-based companies, since they did not have previous frameworks on which investors could look for, speculations were made on the future perspective offered by those companies (Thornton & Marche , 2003). Consequently huge investment, in the order of millions of dollars, were placed to fund several business models that in most of the cases turned out be flawed and poorly designed (Shafer, Smith , & Linder, 2005).

Table II.1: Number of papers on business model vs. Nasdaq index



Source 1: DaSilva & Trkman (2014).

¹³ NASDAQ: it is defined as the first electronic stock market listing 5000 companies. Retrieved from: <https://www.nasdaq.com/investing/glossary/n/nasdaq-stock-market>

The unclarity among the definition of the term business model and the lack of clear and recognizable boundaries led to a fallacious representation of the reality that, in turn, justified erroneous investments. As reported by Garfield (2011) several dot-com companies used their business model, thought reliable, as a justification of the funds received.

Further to these considerations from the year 2000 several attempts were made in the literature with the aim of clarify the concept of business model and separate it from other notions such as business planning, organization theory or strategy. Even if the endeavours oriented to deeply and extensively define the term are an extremely positive sign, they are, at the same time, symptomatic of the lack of a univocal perspective on the topic, and of the fragmented literature available at that time. In this context it is not surprising to find authors affirming that different basic perspective existed, bringing the term to be used synonymously with three different meaning (Zott, Amit , & Massa , 2011). In addition to the above mentioned ITC-oriented business model articles, dominant in the early stage of the term's diffusion, also strategy-oriented works have been published after 2002. Organization-oriented articles were published too but are of marginal importance compared to the other two school of thought.

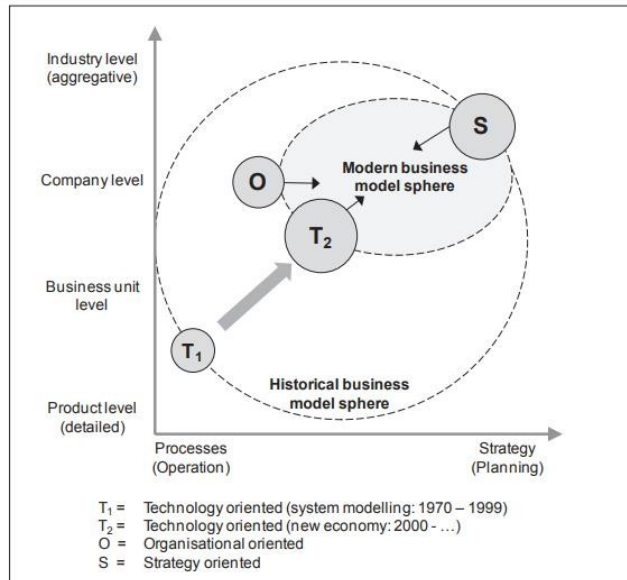
In recent years the diverse perspectives and understandings seems to be increasingly converging into a more uniform and shared vision. Considering the level of abstraction of the business model utilized, it is possible to note how the authors

have evolved their focus from a detailed product level (technological orientation), typical of the early phases to a more abstract level depicting the company's competitive environment (Hamel , 2000). However, the evolution of the model's view has been constantly updating up to include both a competitive and an internal view of the company (Osterwalder & Pigneur, 2010).

Progresses have been made also regarding the purpose attributed to the business model, both in the terms of describing new form of businesses and in integrating already existing business concepts. Moreover, the increasing involvement of strategy-oriented authors rose critical questions on the difference between business model and strategy. The answer is not taken for granted and will be further analysed in the paragraphs to come, for the moment the solution proposed by (Casadesus-Masanell & Ricart (2010) is sufficiently explicative: "...strategy and business model, though related, are different concepts: a business model is the direct result of strategy but is not, itself, strategy."

To summarise this introductory part on the origin and evolution of the business model concept, will be used the graph proposed by (Wirtz, Pistoia , Ullrich, & Gottel, 2016) in their article, see **Error! Reference source not found.** It clearly shows how the concept has converged up to a company level view with strategy (or planning) role rather than an operational instrument.

Table II.2: Development of the three basic theories into the direction of a converging business model view



Source 2: (Wirtz, Pistoia, Ullrich, & Gottel, 2016)

2.2.ANALYSIS OF BUSINESS MODEL DEFINITIONS

After having introduced the history of business model the paper will try to go deeper in the analysis and, through the use of several literature works on the matter, different definitions of business model will be provided. Firstly should be remembered that, in spite of the widespread use of the term, the literature on the theme is extensively fragmented, discordant definitions and construct boundaries have confounded and expanded the field of research creating several and severe problem to the researchers work (George & Bock, 2009).

Since the literature is full of definitions, only a few will be reported. Specifically, the aim of the paragraph is double, on one hand an exhaustive and explicative list

of experienced scholars should be provided, while, on the other hand it is necessary to highlight the definitions that have the best chances to effectively support the empirical work that will be conducted in Chapter 3.

The most intuitively definition of business model is probably the one defining it as “how a firm organizes itself to create and distribute value in a profitable manner” (Baden-Fuller & Morgan, 2010). This statement implicitly shows how, consciously or not, every firm has at least one business model (Casadesus-Masanell & Ricart, 2010).

However, several are the definitions provided and another one which is surely interesting to look at is the one provided by (Magretta , 2002) in which the author defines a business model as “stories that explain how enterprises work”. By following the well-known questions posed by Peter Drucker “Who is the customer?” and “What does your customer value?” Magretta explains how the business model story is the one enabling the company to respond to those questions. According to the author, all new business models, at some level, are variations of already existing frameworks or, at least, are variations of the same value chain underlying all business: creating, designing and inventing a new product/service and selling it to the final customer. In this perspective the business model provides the plot by means of which the company connect the two rings of the chain. In line with this vision there is the observation provided by (Linder & Cantrell, 2000) that focus the attention on the explicative role played by the business model, that is to

depict all the relevant activities performed by a firm and, where possible to provide useful explanation for the financial success of the company.

Similarly to this vision is the one that depicts a business model as a system enabling the company to identify the customer, engage with him and then the delivery of a certain value that must be monetised (Baden-Fuller & Haefliger, 2013).

A different point of view is the one that look at the business model as a process perspective, focusing the attention on the creation of value and depicting the model as a way to synthetize complex and multi-layered interaction in a concise yet effective manner (Eriksson & Penker, 2000). A similar thought is found in the work of Cavalcante et al. (2011) that first elaborate links between business model dynamics and innovation and then by emphasizing the importance of the actors involved in those dynamics deliver a process-oriented perspective of the business model .

Besides differences in the meanings offered by multiple authors, the definition's core point seems to be in understanding the methods used by companies to deliver values to their customers. At a first distracted glance this could sound quite similar to the definition of strategy but, according to Casadesus-Masanell & Ricart (2010) business models “refers to the logic of the firm, the way it operates and how it creates value for its stakeholders” while strategy “refers to the choice of business model through which the firm will compete in the marketplace”.

What it emerges from these views is that the business model also performs a key role in explaining the ongoing processes within a company, and in organising in a logical way the components of the company itself. With regard to this a comprehensive and exhaustive definition is provided by (Teece D. J., 2010):

“...a business model describes the design or architecture of the value creation, delivery, and capture mechanisms [a firm] employs. The essence of a business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit.”

In those few lines several concepts are expressed. First it refers to the value creation, thus what is the product/service the firm is creating, producing or offering that meet the customers' needs, attention is required in specifying by what means this value will be furnished. In other words, it is necessary to specify the technologies, the innovations and the organization the company will use to address the customer need. Moreover, it should describe the activities by which the organization deliver the value to the customer and, last but not least how the value will be captured. In fact, it should be remembered that the final goal of each company is to generate money.

To reinforce the definition presented by Teece (2010), it is necessary to point out that the business model components must be internally aligned, coherently placed within the overall management company and in line with the vision offered by the

latter (Birkinshaw & Ansari, 2015). Practically, the ordinary capabilities and the dynamic capabilities of a firm must be able to work together toward the final goal of deliver the expected value.

An addition relevant aspect to take into account is the one concerning which segment is targeted by the business model, if on one hand it is true that well designed business models are able, with appropriate adjustments, to reach simultaneously multiple targets is also true that a profound understanding of the dynamics and characteristics of the target to firstly pursue is essential.

Following the same line of reasoning it becomes critical to evaluate in which ways a company's business model will differ from the competitors. It should be noticed that having an innovative business model is not always synonyms of competitive advantage since rival companies could easily replicate the same if not well protected with patents, or by the difficulty raised by implementing the model itself. Afuah and Tucci (2001) in defining the business model focus their attention on its role in explaining the firm's competitive advantages and performances stressing the relevance of building and using the right resources in order "to offer a better value to the customer and to make money doing so".

Continuing the literature scanning process it emerges another definition that is worthy of attention. In their article "Business Models: Origin, Development and Future Research Perspectives" (Wirtz, Pistoia, Ullrich, & Gottel, 2016) further to

provide the reader with an extensive list of business model definitions provide also their personal point of view, stating that:

“A business model is a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by means of a company's value-added component. In addition to the architecture of value creation, strategic as well as customer and market components are taken into consideration, in order to achieve the superordinate goal of generating, or rather, securing the competitive advantage. [...] A current business model should always be critically regarded from a dynamic perspective, thus within the consciousness that there may be the need for business model evolution or business model innovation, due to internal or external changes over time.”

While having the first part of the definition very similar to one provided by Teece (2010) the latter adds relevant points that should be critically analysed.

First it highlights the importance of considering the strategy, the customer and the market environment as integrating section of the model because is also through them that a company will secure its competitive advantage. Secondly, it also emerges the dynamic nature of the model. As a matter of fact, a business model, while providing a static picture of the company needs also to be regarded as an active tool that changes at the variations incurring in the environment in which operates. Or, additionally that vary at the emergence of evolutions happening within

the firm, which might be caused by internal re-organization or the results of a newly innovation in the product/service. These new clarifications add value and clarify what a business model is, marking recognizable borders and tailoring for the business model a much more specific role among the management instruments than originally hypothesized.

A more practical definition is the one provided by (Osterwalder & Pigneur, 2010) that with the aim of simplifying the concept propose a model composed of nine components that have the goal of describing how a firm creates, delivers and captures value. What they propose is a model known as “Business Model Canvas”, despite being relatively simple, thus incurring the risk of leaving behind core aspects of a company, it has been widely used by several entities and it will be further analysed in order to understand whether its use will add value to the empirical work that will be run successively.

Prior to the elaboration of the Canvas model, also Timmers (1998) had already presented a holistic view of the business model, that is, an instrument that describes all business actors and their role, the potential benefits associated to these actors and, last but not least, a description of the sources of revenues.

At this point an example could be of some help in understanding the topic and in translating the theory into practice. In the recent years, with the innovation brought by the internet and the proliferation of mobile apps, a model that has known a certain degree of success is the so-called “freemium model”. The term draws its

origins from the combination of the words “free” and “premium”. It basically consists in offering the basic version of a product/service for free but with some limitation in terms of features while offering connecting packages under payment of fees. The value proposition of the firm will be the same, but it will be offered to the target customers in two different ways. The system enables companies to have access to a large customer base, the free user, with the final scope of converting a portion of this base into premium user. The passage from a free user to a premium user represents for the firm the step in which the created value is captured and monetized. Several are the possible examples, among the most famous is possible to cite: Adobe Acrobat Reader that offers a basic version for the reading of pdf files and a Pro (premium) version for the editing; Skype known for the possibilities that offers in connecting people through audio or video calls; Spotify that offers music streaming for free and an off-line ad-free service for a monthly fee.

In the table below, a recapitulatory table is provided in order to summarise what has been written in the paragraphs. The table is the result of the review of different articles, naturally, far from including all the existing definitions its goal is to create a quick and easy overview on the topic.

Table II.3: Business Model Definitions

Author(s), Years	Definition
Baden-Fuller & Morgan, 2010.	“How a firm organizes itself to create and distribute value in a profitable manner.”
Magretta, 2002	Business models are “stories that explain how enterprises work. A good business model answers Peter Drucker’s age old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?”.
Osterwalder & Pigneur, 2010	“A business model describes the rationale of how an organization creates, delivers, and captures value.”
Wirtz, Pistoia, Ullrich, & Gottel, 2016	“A business model is a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by means of a company's value-added component.”
Teece, 2010	“A business model describes the design or architecture of the value creation, delivery, and capture mechanisms [a firm] employs. The essence of a business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit.”
Casadesus-Masanell & Ricart, 2010	“A business model is . . . a reflection of the firm’s realized strategy”

Chesbrough & Rosenbloom, 2002	The business model is “the heuristic logic that connects technical potential with the realization of economic value” (p. 529).
Amit & Zott, 2001	“The business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities.”
Timmers, 1998	“The business model is “an architecture of the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenues.”
Afuah & Tucci, 2001	“...is the method by which a firm builds and uses its resources to offer its customer better value and to make money in doing so.”

Source: Our elaboration on existing literature.

As it is possible to note the literature is plenty of definitions and offers several view-point on the theme, different currents exist, and the complexity of the matter makes it difficult to synthesize a univocal and universally acceptable truth.

Furthermore, another aspect that should be considered, given its importance in the literature, is the area of “business model innovation”. If, in fact, it is true that having a valuable business model is vital it is likewise true that, innovating and changing the currently used business model can mark the difference between disappear from the market or maintaining, or even expanding, the current position. The firm’s ability to develop, refine and recombining business models’ elements is a core micro-

foundation of dynamic capabilities (Teece D. , 2007). Business model innovation were initially seen as an independent and differentiated concept in the literature (Wirtz et al., 2016). According to Jonhson et al. (2008) the innovation brought into the business model is perceived as “...new or game-changing to your industry or market”. The model is so modified or even re-created that the results is a brand new business model as opposed to only revising specific parts (Voelpel , Leibold , & Teckie , 2004). To emerge are thus, two possibility. On one hand, the new business model, especially if related to the rise of a new technology (i.d. ICT) could potentially lead to the development of new companies or even new industries (Wirtz et al., 2016). On the other hand, the innovation can alternatively be related to existing organizations that through it can reinvent themselves or their business model (Voelpel S. , Leibold , Tekie , & Von Krogh, 2005). In this case “business model innovation occurs when a firm adopts a novel approach to commercializing its underlying assets (Gambardella & McGahan, 2010). Historically business model innovation is often bound to the emergence of new technological possibilities. Voelpel (2004) affirm “In today's rapidly changing business landscape, new sources of sustainable competitive advantage can often only be attained from business model reinvention that is based on disruptive innovation and not on incremental change or continuous improvement.” To corroborate this, Teece (2018) forecasts a “new wave of business model innovations” caused by the development of the “internet of things” (IOT). This will likely create new opportunities to understand

how a product is used due to the great amount of data currently available. Summing up, the approach and implications linked to business model innovation results completer and more radical than the long-term evolution of a business model (Wirtz et al., 2016.)

2.3. WHAT IS NOT A BUSINESS MODEL

When defining a concept, especially if the issue is rather confused and fragmented as the one under consideration, it could result useful a definition of the same stating what a business model is not. Building on the paper “Business Model: What Is and What It Is Not” by DaSilva and Trkman (2014) clarifications on the differences between business model and other concepts typical from the business management literature. Albeit being more than twenty years from the starting of structured and extensive research on its nature the term has often been confused with other concepts, that is why the two authors have deeply examined the cause of this confusion. With the belief that such a work is extremely useful to gain a better picture of the issue here the main key point of the cited paper are reported. Moreover, far from establishing which vision is the more appropriate the aim of the paper is the present a concise yet exhaustive review of the existent literature in order to provide the reader with the appropriate theoretical background.

2.3.1. Resource Based View

Albeit almost all the existing definitions of business model refers to the resources a firm possess, the term's definition should not be confused with the older concept of the Resource Based View (RBV) that can be defined as the bundle of resources and capabilities owned by an enterprise (Barney, 1991). It is also true that every model, directly or indirectly, must refer to the competencies or resources underpinning its competitive advantages (Morris, Schindehutte, & Allen, 2005). Despite its importance it is then relevant to highlight how resources alone are not able to entirely depict a complex and articulated environment as the one described by a business model. That is why McIvor (2009) stress the significance of linking the RBV together with the transaction cost economics (TCE) theories that are understood as modes of organizing transactions that minimize transaction costs (Williamson, 1979). What it emerges is that business model is the combination of capabilities and transactions that together lead the firm to generate value.

2.3.2. Business Concept

Probably this term is the one that has been the greatest source of confusion. The lack of clarity and rigor has allowed the establishment of similarities between "business model" and "business concept" since early authors have often used the terms as synonyms (see, Hamel, 2000; and Voelpel et al., 2005). DaSilva and Trkman (2014) in an attempt to clarify the issue affirm that "that the business

concept is any conceptualization of business reality, such as the business itself along with a company's strategy and business model." substantially the term "business concept" ranks on a higher level of abstraction compared to the business model that is more focused on firm's specific description.

2.3.3. Revenue Model

When talking about revenue model in the context of business model it is not so rare to see the term being confused with the model itself (George & Bock, 2009). Rather the revenue model is a descriptive tool used only to define in which mode a business model generates revenues, thus, the revenue sources, their volume and how they are distributed (Zott & Amitt, 2008). As a matter of fact in the business model framework proposed by Osterwalder and Pigneur (2010) the revenue model can be identified in the "revenue stream" block. As per the resources of a firm, the revenue model solely is not enough to describe the entire processes in which a firm is involved. It plays an important role in defining how the value is captured by the firm, but it requires to be integrated in a bigger model in which through the linkages and transactions with the other components it can fully conduct its functions.

2.3.4. Economic Model

The "economic model" was defined by Cicchetti et al. (1973) well before the business model started to spread out. They referred to it as " a mathematical description of both the determinants of behaviour and the jointly observed outcomes

of this behaviour at a given point in time”. This is thus actualised by means of a tool to study any type of behaviour and its outcomes in economic terms and using different kinds of mathematical or economic modelling (DaSilva & Trkman , 2014). To this extent it is understandable how the generic nature of the definition leave space to several fields of application, from pure economics to management sciences. According to DaSilva and Trkman (2014) from an historical point of view economists have often interchangeably used the term economic model to describe what is nowadays considered a “business model”. See, in this regard Hansen and Wernerfelt (1989) that described firms’ performance by means of economic models. Summarizing, economic models offer an economic and mathematical rationale specifically addressed to a firm, an industry or to an economy as a whole while business model offer a complete logic of a firm’s functioning within a given industry (Casadesus-Masanell & Zhu, 2010).

2.3.5. Business Process Modelling

The two terms “business modelling” and “business model” could appear as the same thing, and, at least until the early 2000s were used interchangeably by several authors (Akkermans, 1995). But nowadays, even though some misuses still exist, the management literature has evolved, and the terms are rarely overlapped. The distinction between the two lies in the role played by business modelling. It enables a detailed identification of how transactions are performed within an existing

business model. In addition, business modelling “is an approach to describing how businesses conduct their operations” (Recker, Indulska, Rosemann, & Green , 2009). It usually includes the use of charts to graphically depict the activities and events happening within the firm.

2.4. BUSINESS MODEL, STRATEGY AND DYNAMIC CAPABILITIES: A NECESSARY CLARIFICATION.

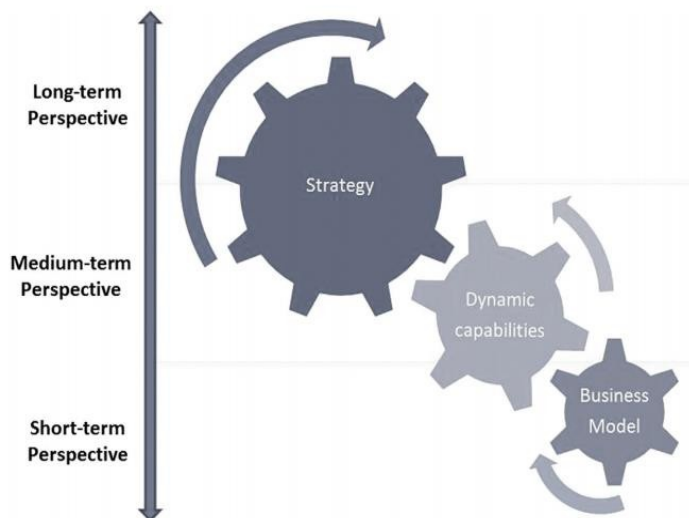
When dealing with complex topics, especially when the discussion has not yet reached a conclusion, but it is instead subject of ongoing revisions and changes the risk of confusing different concepts is concrete. As seen before, the business model argument has already been object of criticism for its nature, indeed the borders between business model and strategy are thin and blurred, leaving space for misunderstandings and distorted interpretations. For this reason the current writing is willing to furnish needed clarification.

2.4.1. Strategy

While at the beginning the term business model has been regarded by most as a buzzword, foreign to the business literature, the word strategy has almost always been at the heart of the managerial literature. Porter’s (2001) interpretation of strategy consists of “how all the elements of what a company does fit together”. Since it could sound quite similar to the previously cited business model definition coming Casadesus-Masanell & Ricart (2010), it is necessary to specify and clarify

the existing differences. As a matter of fact, strategy could be best described as the general and long-term oriented vision of the company that, by setting up dynamic capabilities fix the boundaries in which the chosen business model will be implemented (DaSilva & Trkman , 2014). In other words business models are the results of the designed strategy and are bounded by the dynamic capabilities a firm possess.

Table II.4: DaSilva and Trkman Strategy Framework



Source 3: (DaSilva & Trkman, 2014)

Table II.4 is the representation of the above-mentioned definitions proposed by DaSilva and Trkman (2014) in which the strategy, long-term oriented, determines the actual business model influenced by the firm’s dynamic capabilities. Substantially, the perspective offered by this framework entails a vision of the strategy as what a firm aims to become and thus the business model as what a firm is in the present time. To this extent becomes even more understandable the reason

why Casadesus-Masanell and Ricart (2010) affirmed that “every organization has some business model”, conscious or not, but “not every organization has a strategy”. Designing a business strategy becomes then critical to the success of a firm’s business model, an accurate coupling of strategy analysis with business model could guarantee the safeguard of the competitive advantages a newly designed and implemented business model could offer (Teece D. J., 2010).

Alternatively, strategy is also viewed by Ambrosini and Bowman (2009), as the act of building dynamic capabilities that will enable the company to adequately respond to existing and future issues. Being their work primarily focused on the analysis of the dynamic capabilities concept it is interesting to note how the term business model is completely excluded by the definition of strategy.

Furthermore, strategy can be defined as a “set of analyses, concepts, policies, arguments, and actions that respond to a high-takes challenge” (Rumelt, 2011).

Through this strategic analysis the company will gain the necessary information useful to select the appropriate market segment, a go-to market approach and consequently the most suitable business model.

2.4.2. Dynamic Capabilities

The term “dynamic capability” has been utilized several times in the literature what describing what is and what is not a strategy or a business model. The current paper

is not an exception and in the previous sub-paragraph several times the term has been named.

The first to defines and theorise dynamic capabilities were Teece et al. (1997), that in their paper “Dynamic Capabilities and Strategic Management” developed an innovative approach to understand how firms achieve and sustain competitive advantage. They define dynamic capabilities as “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments”. In a rapidly changing business environment the authors focused their endeavours to build an approach useful to explain firms’ successes and failures.

Following Teece et all. (1997) many other authors and academics have contributed to the definition of what a dynamic capability is. Here some of their contributions are offered:

- (Eisenhardt & Martin, 2000): they focus the attention on the process nature of dynamic capabilities defining them as “the firm’s processes that use resources — specifically the processes to integrate, reconfigure, gain and release resources — to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die.”

- (Wang & Ahmed, 2007): in addition to the previous definition in their work the authors specify how, according to them, dynamic capabilities are more than processes rather, they are embedded into processes. They are thus described as “a firm’s behavioural orientation to constantly integrate, reconfigure, renew and recreate its resources and capabilities, and most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage”.
- (Zollo & Winter, 2002): in their definition the persistent, thus “dynamic”, nature of those capabilities is stressed by the words “stable patterns” and “systematically” highlighting their importance in a constantly changing market. According to the two academics “a dynamic capability is a learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness.”

Notwithstanding some natural difference between the hereby proposed definition, in contrast with the difficulty encountered in defining the business mode term, are all very similar, showing the general consensus of the literature on the issue.

2.5. BUSINESS MODEL COMPONENTS

Once having gained a discrete familiarity with the topic it is time for the paper to approach directly the matter by looking at how different authors have practically

depicted the business model framework. Thanks to the literature review already ran it has been possible to acknowledge the different perspective existing on the theme, moreover, the vastness of different context in which the business model approach is applicable have left space to the proliferation of models each of them with diverse components. To avoid useless waists of time and energy, as well as to narrow the field of research only a few, important authors will be object of a deeper examination. With the following work, further to simply describe some of the existing frameworks in the literature, the aim is to provide the basis for the empirical work that will be carried on in the third chapter. If the definitions and perspectives of the term “business model” have been extensively discussed in the previous sections, reaching a certain degree of clarity on the matter, little or no attention was dedicated to the content of the concept. Thus, considering that in the literature the content (i.e. components) is as important as the definition of the same, the intent here is to outline the major components scholars have identified as the basis for a consistent business model. Practically, after having introduced the most frequent component encountered in the literature, two frameworks ¹⁴, will be presented and discussed in order to facilitate the empirical work that will follow.

¹⁴ (Osterwalder & Pigneur, 2010) and (Morris, Schindehutte, & Allen, 2005)

2.5.1. Essential components presented by the literature

Building on the experience of Wirtz et al. (2016), where, further to examine the origin and development of business model, they offer a general overview of the components proposed by several practitioners, the section will briefly present what are seen as the fundamental elements that stand at the basis of the business model concept. In doing so the use of the table constructed by the authors, , will provide a useful device to support the dissertation. On the bottom of the table, the identified components are listed while, on the left it is possible to find the examined authors.

In spite of the previously outlined differences between strategy and business model the former had without every doubt influenced the latter and have therefore its room in the current discussion. Several are the authors that refer at strategy as a

Table II.5: Overview of business model components

Component Author	Strategy	Resources	Network	Customers	Market offering (value proposition)	Revenues	Service provision	Procurement	Finances	Spectrum of the Components
Hamel (2000)	Core Strategy, Strategic Resources		Value Network	Customer interface						●
Mahadevan (2000)			Logistic Stream		Value Stream	Revenue Stream				●
Wirtz (2000)	Combination of production factors for strategy implementation	Core competencies & Core assets		Market & customer segmentation	Service offer & Value proposition	Systematization of revenue forms	Combination & transformation of goods & services	Production factors & Suppliers	Financing & Refinancing	●
Hedman/Kalling (2002)	Managerial and organizational, logistical process component	Resources		Customers	Competitors, Offering		Activities & Organization	Factor & Production Input Suppliers		●
Bouwman (2003)		Technical architecture		Customer Value of Service					Financial arrangements	●
Afuah (2004)	Positions	Resources			Industry Factors		Activities		Costs	●
Mahadevan (2004)				Target Customers	Value Proposition	Revenue Model	Value Delivery			●
Voelpe/Liebold/Tekie (2004)		Leadership capabilities	Value Network (Re)Configuration for the Value Creation		Customer Value Proposition					●
Yip (2004)	Scope, Differentiation	Organization		Nature of Customers, Channels	Value Proposition, Nature of Outputs		How to transform inputs (including technology)	Nature of inputs		●
Lehmann-Ortega/Schoetti (2005)					Value Proposition, Value Architecture	Revenue Model				●
Osterwalder/Pigneur/Tucci (2005)		Core Competency	Partner Network	Target Customer, Distribution Channel, Relationship	Value Proposition	Revenue Model	Value Configuration		Cost Structure	●
Tikkanen et al. (2005)	Strategy & Structure		Network				Operations		Finance & Accounting	●
Al-Debei/EI-Haddadeh/Avision (2008a)			Value Network		Value Proposition, Value Architecture				Value Finance	●
Demili/Lecocq (2010)		Resources & Competences, Organization			Value Proposition	Volume & Structure of Revenue Streams			Volume & Structure of Revenue costs	●
Johnson (2010)		Key Resources			Customer Value Proposition	Profit Formula	Key Processes			●
Osterwalder/Pigneur (2010)		Key Resources	Key Partners	Customer Relationships, Channels, Customers Segments	Value Proposition	Revenue Streams	Key Activities		Cost Structure	●
Intensity of use	●	●	●	●	●	●	●	●	●	

○ Very low ● Low ● Moderate ● High ● Very High

Source 4: (Wirtz, Pistoia, Ullrich & Gottel, 2016)

component of the business model, or at least that recognize the implications that the strategy, by delineating vision and mission, have in the development of a model of business.

Hamel (2000), in his work presents the “Core Strategy” as a main element of a business model, but many others have included strategy in their models.

As per the strategy also the resource model is one on the most frequently cited in the literature. In this model, material and immaterial resources, core competencies and core assets are specified in order to give a full picture of the company’s set of input factors.

Networks and partnerships are also usually considered as part of the model (Hamel, 2000; Voelpel et al., 2004) since could possibly affect the value creation of a company and thus, should be taken into consideration when building up the business model.

Moreover, the role played by the customers is frequently acknowledged by many authors. In this view all the relevant offers (products, services etc.) are portrayed. The design of customers’ interfaces are included.

Next to the customers it is possible to find the most used component in the literature: the market offering model. The term here as a broad meaning varying from the focus on the value creation and thus the benefits offered to the customers, to including the competitive environment in which a company operates (Afuah, 2004). In addition to the market offering model the revenue model is usually mentioned.

It has already been specified that the revenue model is not itself the business model, this refers to the different forms in which a firm can generate revenues, considering

that the final goal of every enterprise is to achieve profits the understanding of a company revenue structure is of primary importance.

With the term service provision the authors defines the parameters and activities depicting “how goods of lower level are converted to goods of higher order by internal company processes” (Wirtz, Pistoia , Ullrich, & Gottel, 2016).

One of the less cited components is the “procurement”, it refers to the acquisition of a company of all the inputs necessary to the creation of value. The need to be cost-effective lead procurement management to carefully consider all options in the light of the possibilities or threats offered by globalization, decreasing production cycles and fast changing markets.

Lastly there is the financial model, as a matter of fact the success or failure is usually determined by the financial management of a firm. The correct and accurate activity of control and financial planning is therefore usually included in the business frameworks analysed in the article.

2.5.2. Morris, Schindehutte and Allen “Entrepreneur’s Business Model”

In the article “ The entrepreneur’s business model: toward a unified perspective” (Morris, Schindehutte, & Allen, 2005) the three scholars, after a process of review of the existing literature, suggest their own integrative framework. Here the model is proposed in order to present a practical example of how the components of a model could fit together.

The authors tried to elaborate a framework that could match the need of having a “reasonably simple, logical, measurable, comprehensive and operationally simple” model, thus rather general, with the willingness of providing a frame able to serve the need of the individual entrepreneur.

To this extent the suggested model consists of three areas of decision making, of increasing importance. Namely, “foundation”, “proprietary” and “rules”. At each level six questions are raised. This structure has been designed to permit an increasingly level of knowledge of the business. The foundation level is designed to be rather general, the questions address the basic decisions every firm must answer and serves as an introductory step to delineate universal models. On the next step, proprietary level, the goal is to combine and develop decision variables enabling the firm to achieve an advantage in the marketplace. At this stage the model starts to narrow its perspective to become more customizable depending on the vision an entrepreneur has on its company. Finally, at the rules level specific guiding principles are set in order to enable the correct functioning of the business, and to have clear lines to follow in the decision making processes.

The six decision areas delineated by the model are the result of the commonalities found in the literature review previously carried on. Based on this theoretical foundation four elements have been highlighted: the value proposition, the customer, internal processes and competencies, and how a firm makes money. Moreover, other two elements have been added, one concerning the competitive

strategy used to gain a pre-determined place in the market and the other one concerning personal or investors contingencies and requirements. Listed here are the six questions:

1. How will the firm create value?

The key aspect here is to define the nature of the product/service offered and what is the role played by the firm in the production of the offer. Often this area is found under the name of value proposition.

2. For whom will the firm create value ?

Once fixed the value proposition the next logical step is to define who will be the customer, its characteristics, the geographical dispersion, and how he will interact with the firm. The establishment of these parameters significantly affect the internal organization of resources and capabilities.

3. What is the firm's internal source of advantage ?

Here the question is clearly aimed at identifying the best source a firm possess in terms of possibility to take advantage of it. Practically this can be seen as the "dynamic capability" described by Teece et al. (1997) or as the "core competency", that is the capability or skill a firm perform better than other, described by Hamel (2000).

4. How will the firm position itself in the marketplace ?

According to the authors is critical to delineate how the firm will acquire its space into the market. This implies the understanding of the differences existing between

the firm and the competitors, the competitive advantages and how can be maintained.

5. How will the firm make money?

Inspired by the economic model proposed by Linder and Cantrell (2000), the question address the way in which earnings are made. In the model four subcomponents are depicted: operating leverage; volumes; margins; and revenue model.

6. What are the entrepreneur’s time, scope, and size ambitions ?

Despite being rather underestimate it represent an aspect of a certain relevance, an integrated business model should in fact consider what are the long term goal of the entrepreneur/investors because they can affect the strategy pursued by the firm. It is also called the “investment model”.

Table II.6: Morris et al. Business Model

<p>Component 1: How do we create value?</p>	<ul style="list-style-type: none"> • Offering: primarily products/primarily services/heavy mix • Offering: standardized/ some customization / high customization • Offering: broad line / medium breadth / shallow lines • Offering: access to products / product itself / product bundled with other firm’s product • Offering: internal manufacturing or service delivery / outsourcing/ licensing / reselling / value added reselling • Offering: direct distribution / indirect distribution
<p>Component 2: Who do we create value for?</p>	<ul style="list-style-type: none"> • Type of organization: B2B / B2C / both • Local / Regional / National / International • Where customer is in value chain: upstream supplier / downstream supplier / government / institutional / wholesaler / retailer / service provider / final consumer • Broad or general market / multiple segment / niche market

	<ul style="list-style-type: none"> • Transactional / Relational
Component 3: What is our source of competence?	<ul style="list-style-type: none"> • Production / Operating systems • Selling / Marketing • Information management / mining / packaging • Technology/ R&D/ creative or innovative capability/ intellectual • Financial transactions / arbitrage • Supply chain management • Networking/ resource leveraging
Component 4: How do we competitively position ourselves?	<ul style="list-style-type: none"> • Image of operational excellence/ consistency/ dependability/ speed • Product or service quality/ selection/ features/ availability • Innovation leadership • Low cost/ efficiency • Intimate customer relationship/ experience
Component 5: How we make money ?	<ul style="list-style-type: none"> • Pricing and revenue sources: fixed/ mixed/ flexible • Operating leverage: high/ medium/ low • Volumes: high/ medium/ low • Margins: high/ medium/ low
Component 6: What are our time, scope and size ambitions?	<ul style="list-style-type: none"> • Subsistence model • Income model • Growth model • Speculative model

Source: Retrieved from: Morris et al., 2005

In the table above all components with the respective elements are summarized. For what it may concern the components one, two and five the firm is supposed to select only one options for each set listed, while for the others it is possible to select more than one option. To this extent it is worthwhile to see how the framework has been applied to the case of Southwest Airlines, the company considered as the inventor of the low-cost flight and therefore as the first to use and innovative business model in the sector. Building from the foundations level the authors identify from time to time the components considered to be characteristic and then analyse them in depth in the next level. Finally, by studying the behaviour of the firm they emphasize

those that are the fundamental rules established by the company in order to achieve an effective use of the model. The table below summarize the results of this work.

Table II.7: Characterizing the business model of Southwest Airlines

	Foundation level	Proprietary level	Rules
Component 1: Factors related to offering	Sell services only Standardized offering Narrow breadth Shallow lines Sell the service by itself Internal service delivery Direct distribution	Short haul, low-fare, high-frequency, point-to-point service Deliver fun Serve only drinks/snacks Assign no seats/no first class Do not use travel agents/intermediaries Fully refundable fares, no advance purchase requirement	Maximum one-way fare should not exceed US\$____ Maximum food cost per person should be less than US\$____
Component 2: Market factors	B2C and B2B (sell to individual travelers and corporate travel departments) National Retail Broad market Transactional	Managed evolution from regional airline to servicing to 59 airports in 30 states Careful selection of cities based on fit with underlying operating model	Specific guidelines for selecting cities to be serviced 85% penetration of local markets
Component 3: Internal capability factors	Production/operating systems	Highly selective hiring of employees that fit profile; intense focus on frontline employees Do not operate a hub and-spoke route system. Fly into uncongested airports of small cities, less congested airports of large cities Innovative ground operations approach Independent baggage handling system Use of Boeing 737 aircraft No code sharing with other airlines	At least 20 departures per day from airport Maximum flight distance should be less than ____ miles Maximum flight time should be less than ____ minutes Turnaround of flights should be 20 minutes or fewer
Component 4: Competitive strategy factors	Image of operational excellence/ consistency/dependability	Differentiation is achieved by stressing on-time arrival, low fares, passengers having a good time (spirit of fun) Airline that love built	Achieve best on-time record in industry
Component 5: Economic factors	Fixed revenue source High operating leverage High volumes Low margins	Short-haul routes and high frequency of flights combined with consistently low prices and internal efficiencies result in annual profitability regardless of industry trends	Maintain cost per passenger mile below US\$____
Component 6: Growth/exit factors	Growth model	Emphasis on growth opportunities that are consistent with business model	Managed rate of growth

Source: (Morris, Schindehutte, & Allen, 2005).

2.5.3. Business Model Canvas

The “Business Model Canvas” has been drawn up by A. Osterwalder and Y. Pigneur with their book “Business Model Generation (2010). It represent a descriptive instrument to understand the functioning of a business and all the actors, resources and networks involved in it. The Canvas consists of nine building block that, through key questions, help the management to validate the model and

implement strategic decisions. The nine building blocks are rounded into four main categories: offer, customer, infrastructure and financial viability. The efficacy of the model is greater the more detailed are the blocks and the more the nine blocks are effectively integrated among themselves and not acting as individual segment. The offer is described in the “Value Proposition”, and refers to the product/service the firm produce. The customer area is represented by “Customer Segments”, “Channels” and “Customer Relationship” and covers all the issues related with the management of the clientele. “Key Resources”, “Key Activities” and “Key Partners” are the basis of the infrastructure. The financial viability is verified through the “Revenue Model” and the “Cost Structure”.

Here a description of each of the nine building block is presented:

1. **Customer Segment:** it “defines the different groups of people or organizations an enterprise aims to reach and serve” (Osterwalder & Pigneur, 2010). The customer segment to serve must be carefully selected since the decision will deeply affect the product/service design and the relationship that will be build. A firm needs to be conscious about which segment to serve and which to ignore. Efforts are to be made also in segmenting the customers in order to better understand the needs and requirement of each group and reaching them with different offers and channels. There are different types of Customer Segments:
 - **Mass Market:** clients have similar desires and characteristics, segmentation of the offer is usually not justified nor needed.

- **Niche Market:** the value proposition is specifically designed to meet the needs of a particular customer segment. Usually everything from the distribution channels to the type of customer relationship is tailored upon that segment.
 - **Segmented:** it happens when the firm directs its offer to different groups of customers with slightly different needs. The other building block must be organized to meet each segment, implying, almost certainly, the necessity to have more than one channel distribution or marketing approach.
 - **Diversified:** here the customer segments have significant differences in their requirements. This means having a totally different approach for every diverse segment.
 - **Multi-sided platforms:** is the case of companies serving two independent segments through the use of the same platform. A classic example is the one of Spotify, or similar applications, that need a large user-base in order to attract advertisers and thus being able to offer a free version of the service to customers.
2. **Value Proposition:** it “describes the bundle of products and services that create value for a specific Customer Segment” (Osterwalder & Pigneur, 2010). The value of an offer can be measured in so far as solve a customer problem or satisfy a customer desire. The offer can have different forms and features, among all:

- **Newness:** is an offer that satisfy a completely new need the customer did not even perceive since no similar products/services were available.
 - **Performance:** an offer that improve the performances of already existing product/service.
 - **Customization:** products and services are tailored to satisfy the need of a specific Customer Segment.
 - **“Getting the job done”:** the value is created by supporting and helping the client to accomplish a goal.
 - **Brand/Status:** the value stands in the perception a customer has of a product/service.
 - **Price:** offering similar products at a low price in order to meet the needs of price sensitive customers.
3. **Channels:** it “describes how a company communicates with and reaches its Customer Segments to deliver a Value Proposition” (Osterwalder & Pigneur, 2010). Channels represent a touch-point between the company and its customer and are important since through them the relationship is established.
4. **Customer Relationship:** it “describes the types of relationships a company establishes with specific Customer Segments” (Osterwalder & Pigneur, 2010). The choice of the relationship to establish can vary based on different motivation as: customer acquisition; customer retention; and boosting sales. It is possible to distinguish between several relations:

- **Personal assistance:** the relationship is based on human interactions.
 - **Dedicated personal assistance:** it is an evolution of the personal assistance and implies the presence of company representative dedicated only to one or more clients. Usually is found in correspondence of a customized “Value Proposition”.
 - **Self-service:** the company has no direct contact with the customer but rather provide the necessary infrastructure to enable the user to serve himself.
 - **Communities:** thanks to constantly improving ICT, many companies started to use online communities to facilitate the connection with their customers.
 - **Co-creation:** it is a relatively new form of interaction in which customers become central in the process of value creation and contribute with their ideas, reviews and suggestion to the development of product and services.
5. **Revenue Stream:** it “represents the cash a company generates from each Customer Segment” (Osterwalder & Pigneur, 2010). This section explain how part of the value is captured by the firm, it responds to the question: for what value is each customer willing to pay? There are different pricing mechanisms, but they can generally be divided into:
- **Transaction revenues:** they come from a single, non-recurring customer payment.

- **Recurring revenues:** they are the results of a long lasting relationship between the firm and the client, either because the customer is constantly replicating the purchase or because the purchase involve a series of post-purchase support options.
6. **Key Resources:** it “describes the most important assets required to make a business model work” (Osterwalder & Pigneur, 2010). These assets are what the firm needs to create value, resources can be of different type:
- **Physical:** are included the physical assets a firm owns, for example: factories, machines, vehicle etc.
 - **Human:** human resources are meant to be the people involved in the business model, their creativity, expertise and knowledge can be a great resource for the company.
 - **Intellectual:** under this category it is possible to find brand, proprietary knowledge, patents and copyrights. Initially difficult to be created, if successful can represent a great competitive advantage since are hardly replicable.
 - **Financial:** being able to financially sustain the model or having access to credit lines or investment are another key resource a company should possess.
7. **Key Activities:** it “describes the most important things a company must do to make its business model work” (Osterwalder & Pigneur, 2010). In order to

create value every company must perform a series of actions, in this section they are described:

- **Production:** it refers to the design, making and delivering of a product, usually can involve high volumes of quantities or lower quantities but of higher quality.
- **Problem Solving:** it refers to the activity of providing services of different types.
- **Platform/Networks:** it relates to the activity of managing platforms and networks customers use for their needs. It relates to platform management, service provisioning and platform promotion.

8. **Key Partnership:** it “describes the network of suppliers and partners that make the business model work” (Osterwalder & Pigneur, 2010). Every company is constantly exposed to interactions with other actors that can play a crucial role in its business model, it is therefore necessary to distinguish the different type of partnership that can be found:

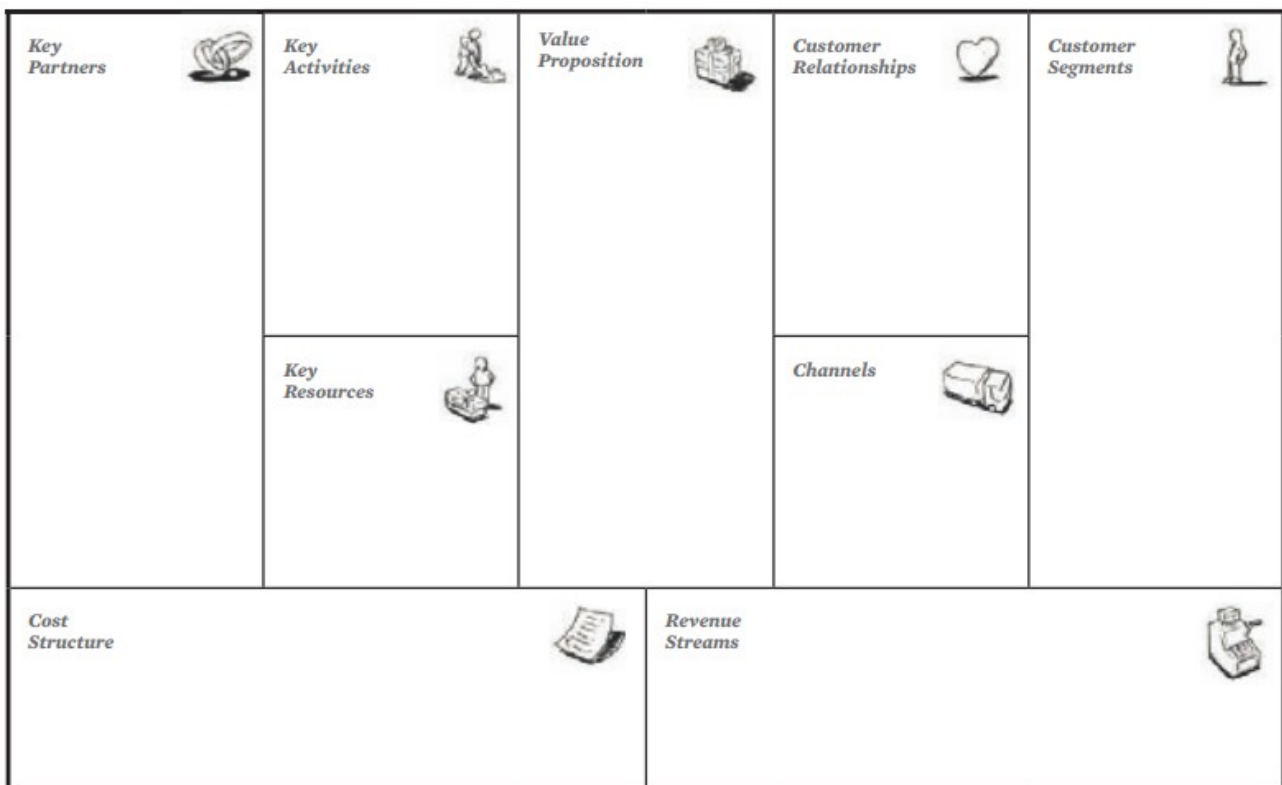
- Strategic alliances between non-competitors
- 2. Coopetition: strategic partnerships between competitors
- Joint ventures to develop new businesses
- Buyer-supplier relationships to assure reliable supplies

9. **Cost Structure:** it “describes all costs incurred to operate a business model” (Osterwalder & Pigneur, 2010). Here are highlighted the most important cost a

firm must sustain while running a business model. Coherently with the value proposition each firm will select the most suitable structure. On a general level it is possible to distinguish between:

- **Cost driven:** they focus the attention on minimizing the costs where possible.
- **Value driven:** the focus is on the quality of the offer, cost are usually higher.

Figure 2 Business Model Canvas



Source: Osterwalder & Pigneur, 2010

3. CHAPTER: THE 4ENERGY CASE

In this chapter an empirical application of the previously reviewed theory will be provide in order to test whether or not is it possible to use frameworks usually applied to medium and big companies also to small enterprises. Moreover, it should be remembered that the peculiarities of the energy market, and specifically of the energy coming from renewable sources in Italy, have strongly influenced the strategies and the choices taken by 4Energy.

With regards to the structure of the chapter, the first section will be devoted at describing the company, its history and a brief description of the context in which it operates. Then, after an explanation about the methodology used a paragraph will be devoted to exploring external variables that, by definition, are not included in any business model but, in this context are extremely relevant for the purpose of adequately assessing whether or not the current model is effective. Subsequently, with the help of the empirical data provided by the firm and collected through the use of interviews occurred in different stages of the study, a descriptive analysis of the 4Energy's business model will be provided. This latter will start with the use of the business model Canvas (Osterwalder & Pigneur, 2010), in order to create a solid basis for fixing the main characteristics of the company. Subsequently, following the logic line of the previous chapter, 4Energy will be analysed through the framework proposed by Morris et al. (2005). While for the business model Canvas the literature is plenty of examples of practical applications it is not the same for

what it concerns the other model, that is, the difficulties associated with the process of business modelling will be greater. The analysis

3.1. COMPANY OVERVIEW

4Energy is an Italian company operating in the energy sector, they project, install and carry out the maintained for photovoltaic plants for families and small and medium enterprises. Specifically the area in which they are focused is the so-called self-consumed energy, that is, the plant does not use governmental or regional incentives to the production. 4Energy is the evolution of two precedent companies operating within the same business area but with different logics. The 4Energy parents were KIS srl. (2009) and MAD srl. (2011) whose activity was PV plant project management. Being and that time the market strongly influenced by direct incentives to the production, (the “Conto Energia 20052 and followings), the installation of a plant was viewed more as a speculative investment than a solution to the reduction of the cost of energy.

The 6th of July 2013, the fifth and last Conto Energia was dismissed and the incentives were substituted by tax benefits deeply changing the market dynamics.

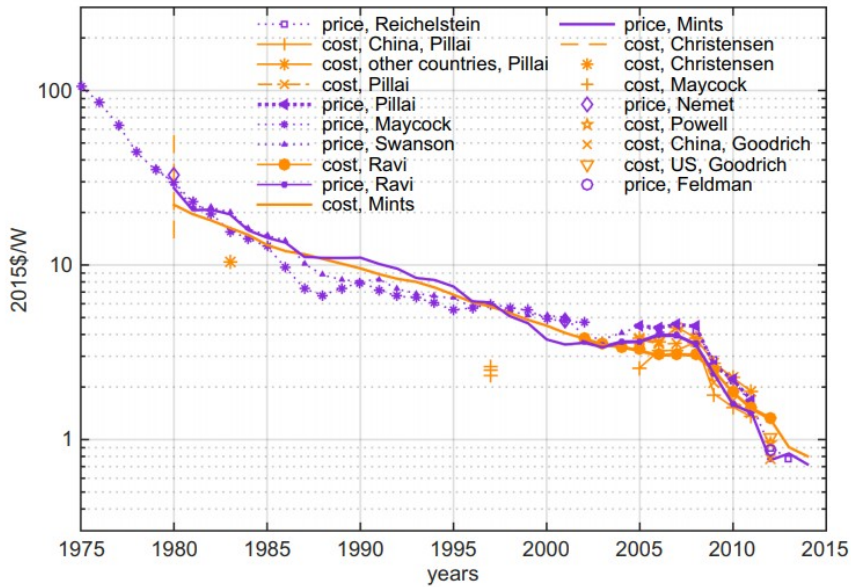
For this reason the previously cited company were discarded and 4Energy was founded. The aim of this newly formed company was not to operate in the

incentivized market but to realize grid-parity¹⁵ PV plants. This required a new company configuration and the integration of new competencies able to deal with the problems related to the management of different conditions. In the light of what has been already mentioned about business model, the changes here described can also be seen an innovation in the business model determined by altered external factors.

According to the company's CEO Andrea Silveti the firm has known its biggest growth especially in the last two years, 2017 and 2018, where, due to favourable market conditions, the increasing cost of the conventional energy together with the decreasing cost of PV plant components and the tax benefit granted by the legislation have created the basis for a sustained development of the business.

¹⁵ Grid-parity: the term refers to the situation where the energy produced from renewable energies has the same price of the energy coming from conventional sources.

Table III.1: PV Modules Costs and Prices



Source: Kavlak, McNerney, & Trancik (2018).

To corroborate what has been said, is interesting to look at Table III.1. The table, elaborated by the MIT researchers Kavlak, McNerney, & Trancik (2018) highlights how the costs and prices of PV modules has significantly decreased during the last forty years. According to the authors the causes of this rapid decline are to be found partially in the increased efficiency of the modules and mostly in the governmental and private fund to R&D, and scale economies.

4Energy is located in Grottammare, (Italy) a city placed at the border between the Marche and Abruzzo regions, central Italy. The geographical collocation is useful to understand the environment in which the firm operates. As a matter of fact these two regions are characterized by the presence of several small and medium

enterprises rather than few big companies, mostly manufacturing and agricultural companies. Moreover, the company has selected only the southern provinces of the Marche region and the norther region of Abruzzo as target market. The choice has been driven by the will of being grounded in the territory which they belong, both for ethical and social reason but also to ensure the client a fast and effective service that would be otherwise difficult to offer.

The regions are similar both from the point of view of the economic conditions and of the number of solar rays they receive. This factor is obviously of fundamental importance since the profitability of a plant is strongly dependent on the solar radiation it receives.

3.2. METHODOLOGY

Given the initial presuppositions, and the research questions the paper is supposed to answer it has been chosen to use an illustrative case study with the belief that is the most appropriate tool. The nature of the study that will be conducted in the following pages is both deductive and exploratory. As a matter of fact, a substantial part of the work is of theoretical nature and provided all the instruments, both at practical level and at conceptual level, that will serve to translate the scientific knowledge into a concrete and verifiable case. With this regards the two model considered most suitable for the observed reality have been chosen. Concerning the exploratory aspect of the research it comes from the several open questions to which

the study requires an answer. Moreover, the work should be considered as a qualitative research deemed more appropriate for the current case. Firstly because allows a simpler approach and secondly because it better suits the deductive and exploratory characteristics mentioned above.

The whole process would not have been possible without the help and the collaboration of 4Energy that, through the CEO Andrea Silveti represented the linking ring between the two involved subjects. All the information regarding the firm were provided by the CEO during three semi-structured interviews or by written communications¹⁶. The structured of the interview, as suggested by Saunders et al. (2012), has been selected in order to cover all the needed field of research while the same time having clear borders to avoid focusing only on succesful aspect of the business rather than on the whole picture. Furthermore, thanks to the mediation of the company it was possible to attend some technical conferences of the matter that facilitated the understanding of the market. It should be noted that, the contents of the following paragraph, as far as possible, were always shared with Mr. Silveti in order to avoid any possible misunderstanding and biases that may have occurred during the meetings.

¹⁶ Find the questions asked during the interviews in the Appendix.

3.3. EXTERNAL VARIABLES: MARKET TRENDS AND REGULATION

It was previously observed that the business model is mainly a tool to capture the internal organization of a company. Several authors described the business model as a rationale (Osterwalder & Pigneur, 2010), a representation (Wirtz, Pistoia, Ullrich, & Gottel, 2016) or a description (Teece D. J., 2010) of how the firm's activities are structured in order to create and deliver value. In the vast majority of the cases, these models are thus instrument to internally analyse and study the company's nature and where the external market conditions take the back seat. Suffice is to say that in

Table II., where several business model definitions were summarized, none of these mentioned external market condition and/or particular relevant regulation as variables to be considered.

On the other hand, the current case study has already demonstrated to be strictly correlated with technological and regulation aspects. For the former it is no longer possible to define the photovoltaic as a technological innovation but it is still possible to observe how the progresses in the technology are guaranteeing better performance at a gradually decreasing price. All this contributes therefore to a general improvement in the demand, as the graphs in the first paragraph have already depicted, cannot be ignored when assessing the correct use of a given business model and its possibility of success or failure.

Concerning the regulation aspects, it is even more relevant and important for the company itself. Due to the overview conducted in the first chapter it has been

possible to observe the trajectory followed by the PV incentives within the Italian policies on renewable energy sources. Furthermore, it has been studied the direction on which the current European directives, and consequently the Italian policies too, are focused on the development and enhancement of green energy sources, PV included. In the next decade the European Union is expected to remarkably increase the share of energy coming from renewable energy sources, thus every country will likely implement strategies and actions going in this direction. Again it is worthwhile to highlight the fact that the photovoltaic technology is part of a greater phenomenon, the green energy sources in the context of the fight of climate change that is by now recognized as a megatrend. This represent a key aspect, as a matter of fact, megatrends are those phenomena that have the potential to deeply affect market conditions by relevant changes in the socio-economic contest. The issue is well addressed by Retief et al. (2016) in their research on key global megatrends for the implications they have on environmental assessment practices.

Therefore the global environment seems to be decisively oriented towards the progressive use of renewable sources, several are the action that international agencies and governments are taking to enhance such development.

Specifically, in the context of the European directives¹⁷, the objectives and the policies are well defined and the analysed business model could have the potential

¹⁷ Please refer to Chapter 1, paragraph 1.2.2.

to exploit the possibilities opened up by the European and Italian regulation. It has been said that, after years of important incentives spent on, in the majority of the cases, medium and large PV systems there is now the tendency to sustain the diffusion of photovoltaic among private citizens rather than investment companies. It is in this sense that must be read the recent adjustments brought by the already mentioned FER decree. Together with remarkable improvements of the technology these interventions are leading the market towards the so called “grid parity”. The terms refers to the situation when the cost of installing a PV system, but also the price of its management and maintenance is similar and, therefore, competitive on the market with respect to other energy sources, such as electricity, allowing the use of renewable sources because are more convenient than traditional sources or, at least, their cost is equivalent.

The increasing convenience in this technology will likely enhance and push more subjects to consider it as an economically advantageous investment choice. It must indeed be considered also the still existing incentives granted by the newly approved FER 1 Decree. The latter provides an all-inclusive tariff dedicated to small and medium size ranging from 20 to 100 kW/h paying €105 per MWh produced, subject to registration in the appropriate register and fulfilment of the requirements. While for larger plants it has been designed a system that provides the registration in a registry for plants from 100 to 1000 kW/h and the participation to public auctions for systems above 1000 kW/h. Specifically, the registry system,

as per the smaller systems, requires the fulfilment of legal requirements while large plants are subject to the participation to a unique bid auctions system until the funds provided have run out.

Moreover, in line with European directives, it is now considered possible to directly sell, for systems owners, the produced energy to small entities called energy community¹⁸, the provision

Taking into account what has just been highlighted, we can therefore outline a general framework that envisages a strong development of the sector with considerable opportunities for growth. It is therefore clear that these favourable economic conditions must be considered in carrying out a business model analysis that is as accurate as possible.

Lastly, in the context of external variables it required a focus on the external competitions the firm is currently facing or will face in the future. To this regard, the following observations are the result of the interview and reflect the company experience during their years of existence. Given the local nature of the company¹⁹ have been identified two different typologies of competitors. Small and medium enterprises, or professionals operating at a local level, and providing similar services or large companies operating at national level. It must be remembered that,

¹⁸ By Energy Community we mean a community of users located in a specific reference area where end users and market players actively cooperate to develop high levels of "smart" energy supply, facilitating the optimization of the use of renewable sources and technological innovation. For further detail see Art. 2 (16) and Art. 2 (11) of the Clean Energy Package.

¹⁹ To this extent the following paragraph 3.3 will provide further information.

the service offered by the company is the result of a work involving different competencies the firm owns or is able to reach through its network. It would therefore be possible for a client to singularly come into contact with the various professionals involved. It is this particular type of competition 4Energy is more likely to experience since companies capable of providing an integrated service have not been identified.

On the other hand, 4Energy is facing the threat represented by the services offered by two big companies operating in the energy sector, E.ON Energia Spa²⁰ and Enel X Italia Spa²¹. To this regard, if it is true that given their dimension and therefore ability to exploit considerable advantages for economies of scale their size represent at the same time an obstacle in the relationship with the customer that is one of the key success factor for 4Energy.

3.3. ANALYSIS OF THE 4ENERGY BUSINESS MODEL

The first part of the descriptive analysis of the 4Energy Business Model will be carried out through the use of the Business Model Canvas (Osterwalder & Pigneur, 2010). As a matter of fact this model allows a simple and yet effective description of the main components of a business and the interrelations among the same. Every

²⁰ E.ON is one of the largest energy operators in Italy. Among its branches they have a business unit operating in PV systems services. <https://www.eon-energia.com/>

²¹ Enel X is a multinational company operating in the energy sector. <https://www.enelx.com/it/it>

“block” of the canvas will be first individually studied and then through the empirical observation the research will try to link in a logical way the components. Please note that the following study has been conducted with the help of 4Energy’s CEO Andrea Silveti interviewed by the author.

Customer Segment

The nature of the service offered by 4Energy allows the company to segment the market into two different segments each of them with marked differences with regards to needs and financial capacity.

Each of the targeted segments will be here analysed:

Residential: this segment is represented by private individuals or families whose need is to reduce the cost of the consumed energy through a reduction in the cost of the energy bill and to be energetically independent. In other words the offer is focused in the sale of savings. Being the matter complex and relatively unknown to the laypersons the value this segment is looking for is in the reliability and availability that the company can offer. According to the interviewed customers have

- A high and middle income, that are often able to afford the investment without the need of a bank loan or other financial instruments;
- A high and medium level of culture, have interest in the care for the environment and the leverage represented by ecological values plays a critical role;

- An age ranging from 35 to 55 years;

Customers are located preferably in Marche and Abruzzo regions, and only in rare cases in other locations (Puglia among others). The key factors 4Energy considers important are the confidence in the brand and word-of-mouth. Moreover it should be considered that the installation of a PV plant involves several actors, some of which have the potential to become indirect customers. Architects, surveyors, engineers are all involved at some stage of the project and can turn out to be source of useful contacts to transform in customers.

Also electric car dealers and sustainable and eco-building constructor could be seen as indirect customer since their customers have possibly the same characteristics of the 4Energy residential customer segment.

Enterprises: this segment is composed by small and medium enterprises, specifically manufacturing companies, typical of the entrepreneurial structure of the two regions, and agricultural businesses. Enterprises have different needs and focus their attention and aspects that are not even considered by private citizen. In particular for companies the PV plant is seen as an investment, thus the re-entry the investment is one aspect to be carefully considered, not to be confused with the return on the investment that is nevertheless taken into account. Furthermore, additional services are required by a firm, such as the support in finding the best and financially

affordable solution. This implies that 4Energy should deliver to the customer a complete business plan in which a detailed plan of action is exposed. In this context the experience and the expertise of 4Energy professionals in dealing with regional, national or European calls for funding play a critical role. These services can be summarized by the term facilitated finance, a key aspect of the offer. Additionally, another key aspect of the offer could be represented by operating lease, a solution allowing the company to exploit the benefits of the plant without owing it in exchange of a rental fee.

Also in this segment there are some that could be called indirect customers, namely actors involved in the project that have to potential to act as additional source of customers. These are: construction companies specialized in the remaking of roofs, accountants and facilitated financial companies.

Table III:1: 4Energy Customer Segmentation

	Residential	Enterprises
Target characteristics	Private citizens with medium and high income	SMEs and Agricultural Businesses
Geographical position	Marche and Abruzzo regions	Marche and Abruzzo regions
Key services	Bill savings and energy independence	Facilitated finance and operational leas

Key factors	Brand reputation, word-of-mouth	Investment re-entry and financial/tax benefit
Indirect clients	Architects, surveyors, engineers, electric car dealers, eco-building constructors	Construction companies, accountants, facilitated finance companies

Source 5: Our elaboration based on the company's CEO interview

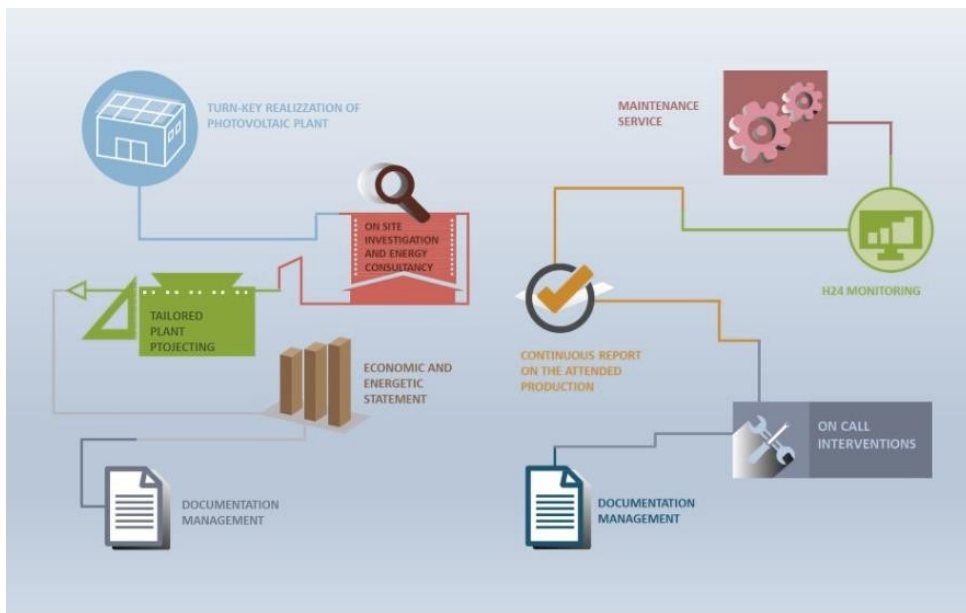
Value Proposition

The value proposition of a company describes products or services that create value, i.e. that solve a customer problem or satisfy a customer need. By keeping this in mind it is possible to illustrate 4Energy value proposition. As said before the firm offer services for the planning and management of brand new plant and the management of already existing plant made by third parties. Moreover it also helps plants' owners to solve possible problem of administrative nature with the GSE (the Italian managing authority of the energy services). All these services are embedded into an offer whose key point is the ecological goal of reducing CO2 emissions. It could be therefore possible to describe the value proposition as the emissions reduction and the improvement of environmental condition through the use of the PV technology to allow customer to reduce their bill expenses and reach energy independence.

Moreover, the value proposition describes the reason why a customer should choose a company instead of another. In this regard the strength of 4Energy stands in the high quality of the service they offer. Each client has a differentiated offer and its

plant is constantly monitored by 4Energy professionals in order to assure the efficiency of the investment. It is therefore possible to talk about customized value proposition where the customer needs determine the construction of the offer. Not only, for what it may concern the enterprises customer segment the service delivered by 4Energy could be ascribed as what is defined by Osterwalder et al. (2010) as a “Getting the job done” value proposition. As a matter of fact, most of the firms are totally foreign to this context and prefer to have a professional service that does all the job for them rather than address internal resources on the issue.

Figure III.1: 4Energy value proposition representation



Source: Provided by 4Energy Srl.

In the figure above it is possible to look at the two main services, thus value proposition, 4Energy offers to its customers. In the picture, provide by the company

itself, it is possible to notice, on the left side how the “realization of a plant offer” is articulated while on the right side there is the description of a typical maintenance offer.

Channels

The third component of the Canvas, according to the company, is realized into two different ways, coherently with the segmentation of the customers. In any case, it is also true that in some cases the channels used by 4Energy can be useful for both the segments. Firstly, it should be specified that, being a small-medium company, 4Energy does not rely on an external sales network but have internalized all the activities related to the acquisition of customers. Moreover, given the particular nature of the service, and the fact that requires the establishment, for a variable period of time, of a relation between the company and the customers, the reputation of the firm is a critical key aspect to achieve the success. For this reason the firm has chosen to use the so-called “content marketing”²² to provide customers valuable information about the service, the products and the environmental impact of choosing renewable sources of energy. The contents are then shared on the official web site of the company and on the company profile on LinkedIn.

²² As defined by (Ahmad, Musa, & Harun, 2015) content marketing “is sharing the information regarding the products and brands to attract others to participate in purchasing activities that create the engagement relationship between consumers and the companies.” Not only, according to the author content marketing can lead to good brand health, i.e. good reputation.

For what it may concern the enterprises sector, the company believe necessary, to reach its customers, the use of indirect channels. Indeed the mostly devote their efforts on the creation and organization of conferences and events specifically designed for specialists' associations (architects, accountants, etc.) with the aim of showing the 4Energy brand to those actors able to ensure a significative pool of potential customers.

Customer relationship

In the light of what has already been said it is clear that 4Energy, in the relationships with its customers, is focused on the customer retention. The nature of the service is such that is profitable for the company to have durable relationships over the time. Each PV plant has the need of periodical maintenance services that could also be provided by other firms not involved in the installation, thus for 4Energy is critical to create a solid relation with the customer in order to offer its additional maintenance services.

To do this, the company has focused its effort in providing customers with personal assistance. On-site visits, continuous exchange of information and tailored service are the means through which the customer could perceive the value proposition and therefore being able to come to a decision.

Revenue Streams

The section depicts the streams by which the company generates cash. The first distinction to make is that since the customer segments are two there will be two

different revenue streams. Similar for what it may concern the structure of the stream but different in term of the price applied. Normally the energetic request of an enterprise is much greater than the request of a family thus implying remarkable differences also on the size of the installed plant.

The value for what customers are paying is, as aforesaid, the advisory service of 4Energy consultants. The services are divided between plant projecting and post sales services (maintenance). The price paid is then related to the amount of time spent on the project and on the features requested by the project. As a matter of fact the price of the components, that can significantly vary depending on the quality of the material is not charged by the company. All the materials used in the project are purchased by for the customers by 4Energy that play only the role of intermediary, with the supplier.

Key Resources

The key resources are the particular assets a firm owns and that create the value proposition, making the business model working. The analysed case is a perfect example of business model in which the key resources are represent by the category named by Osterwalder & Pigneur (2010) as “Human”. According to the CEO people are the real key assets of the company. The offered services require skilled people able to provide customers with quick and precise answers and assist them in all the stages of the relationship.

Key Activities

The key activities performed in 4Energy belong to the “Problem Solving” category. The key resource, i.e. the human capital, of for energy should be able to follow the customers and its needs from the beginning and offer them, each time, the best solution possible.

Key Partnerships

The present block is of critical importance for the success of the company. During the interview with the CEO has emerged the primary role played by the partners that, each time, are involved in the projecting and installation of a PV plant. It is important to highlight that this articulated net of partnership, created by 4Energy’s professional is what can determine the success or the failure in closing a contract.

Since the strategy of the company is not focused on having physical assets or on the production of material and development of new technologies the suppliers are chosen in order to exploit their economies of scale and reducing the costs.

Moreover this strategy has been designed to not hold a warehouse which would mean to deal with additional cost and with the risk and uncertainty of not selling the materials already purchased. 4Energy, by choice, prefers to order the materials needed by each project only when a deal with the customer has been reached and everything is ready. Following the same strategic reasoning also the installers are external and are involved in the project by 4Energy on behalf of the customer.

Summarizing, the company relies on the help of a few installer, strategically chosen to cover all the territory on which 4Energy operates, and a set of suppliers providing

them all the components needed by a PV plant, namely, solar panel and inverter.

The suppliers are chosen in order to guarantee a certain level of reliability and quality of the components in line with the company's philosophy.

In addition to these so-called "technical partners" it is possible to find a network of finance consultant, tax advisors, banks and public administration officers (for what it may concern regional funds).

Cost Structure

As above mentioned, the company's strategy aims at not having warehouse's cost neither at having production plant thus the main cost centres are represented by the professionals figure within the company and the structure cost associated with the company's headquarter. Additional and variable cost are sustained for marketing campaigns or for the organization of events and conferences. Or, again, for consultant advice on specific matters on which the company may not possess the right knowledge.

The company, coherently with the value proposition has chosen to be value-driven thus implying are less concerned about the cost associated with their professional because are focused on the high value they want to offer to the customers.

3.4. APPYING MORRIS ET AL. FRAMEWORK TO 4ENERGY

Building on the experience of the Business Model Canvas the following paragraph tries to extend the 4Energy's business model analysis using the framework

proposed by Morris et al. (2005)²³. In the second chapter the framework has already been described as a tool allowing the progressive study of an enterprise from a general overview to a deep examination of the rules underlying its business model. Before to start is necessary to highlight the empirical nature of the present work, what is going to be presented is the result of the theory underlying the framework matched with the evidences from the company interview and the evidences collected by studying that specific reality. Moreover, the literature review conducted in the previous chapter has not found other practical cases in which the model has been applied but the one regarding Southwest Airlines, already reviewed. The great difference both in terms of size and business between 4Energy and Southwest lays evident issues since it is not possible to advance comparisons between such different realities. Naturally, the lack of other empirical application of the model represent a serious limitation to the work because precludes the possibility of having a realistic and reliable comparison. Nevertheless, the one and only empirical application will also be used as a reference to guide the building of the 4Energy framework.

Furthermore the model, according to the authors, has been specifically designed to serve as a “framework that is applicable to firms in general but which serves the needs of the individual entrepreneur”. Such a description perfectly fit the 4Energy

²³ (Morris, Schindehutte, & Allen, 2005)

case, thus, the challenge is to verify whether or not the model could fit the needs of a small enterprise as 4Energy is as well as it fits the Southwest business.

4Energy business model allowed the company a rapid growth that led the company from an initial turnover of €55.000 in 2014 (the company started operating only in the middle) to €327.000 recorded the next year, to the €532.000 recorded for 2018 marking therefore a remarkable growth in a relatively small time span. They have been through different regulation and legislative changes (see Chapter 1) but kept growing by adapting their capacities and updating their knowledge.

In the table below the model is described. Firstly it has been analysed the foundation level, that, obviously, shares with the business model Canvas some characteristics and variables. At this level only the basic aspects of the business are approached and the information are nothing but the answer to the questions highlighted in table II.6. Next, at the proprietary level the analysis goes deeper and the key aspect of the model are depicted. Here one can find the firm's core competencies and elements of the strategy used by 4Energy to reach and acquire customers. Specifically, the high level of human capital represent the basis on which the service is offered to clients, that, alongside relational aspect of the business contribute to the firm success. Finally, the model help the enterprise, thus the entrepreneur to define the rules that count forward the maintenance of a stable and profitable business. Prior to the empirical analysis the theoretical study had highlighted a concern about the possibility to obtain codified and operationally applicable rules in a reality very

distant from that studied in the literature. On the contrary the focus of the proposed business model on the rules level offered the opportunity to earn not only a more than exhaustive set of well-established rules but also to obtain a level of analysis that otherwise would have been difficult to obtain . It is interesting to notice how the rules reflect the previous choices made at the foundation and proprietary levels. Furthermore, the rules are consistent with each other, and with a clear strategic view. Regarding the private segment the choice is to focus the efforts on independent building unit ensuring the possibility in install systems of at least 3 kW/h having the possibility to consume most of the produced energy. Moreover, preference is given to the clients with the possibility to finance the investment without recurring to credit institutions, thus avoiding the cost of the loan and following payable interests. In doing so, it is possible reduce administrative complications and ensuring higher profits for both the parties, moreover the possibility for the customer to fully finance the investment is a sign of a good level of liquidity ensuring the possibility of selecting medium and high quality components for the system. Concerning the other segment preference is given to small and medium enterprises, generally able to guarantee a faster decision-making process, that consume most of the energy produced. Here, the key factor identified by the company strategy is represented by the subsidized finance services 4Energy can offer. The design of a business plan able to include all the possible form of incentives and tax benefits is equally important too. In addition the above mention

choices are in line with the typology of close relationship the firm wants to establish with its customers, it would be far more difficult to establish such a relation with big companies or investment funds and the purely local vocation of the firm would disappear.

Table III.1: Representation of 4Energy' business model thought Morris. et al. framework.

	Foundation level	Proprietary level	Rules
Component 1: Factors relating to offering	<ul style="list-style-type: none"> • Sell only services • Customizable offer • Shallow line • Service bundled with other firm's products • Internal service delivery • Direct distribution 	<ul style="list-style-type: none"> • After sales services, as remote monitoring, management assistance • Provide repowering and revamping services • Personalized and dedicated assistance 	<ul style="list-style-type: none"> • Private: systems not less than 3 kW/h. • Enterprises: small/medium companies.
Component 2: Market factors	<ul style="list-style-type: none"> • B2B and B2C • Local • Final consumer • Segmented • Relational 	<ul style="list-style-type: none"> • Be present in local events and conferences to acquire customers • Aiming at the segmented customers 	<ul style="list-style-type: none"> • Private: preference to independent building unit • Enterprises: select small/medium companies. Avoid large systems made for investment purposes.
Component 3: Internal capability factors	<ul style="list-style-type: none"> • Networking • Selling • Information provider 	<ul style="list-style-type: none"> • Constant update on regulations, incentive systems and available technology 	<ul style="list-style-type: none"> • Ensure high standards regarding customer care, commercial and designing aspects
Component 4: Competitive strategy factors	<ul style="list-style-type: none"> • Image of operational excellence • Service quality • Intimate customer relationship 	<ul style="list-style-type: none"> • Differentiation is achieved by ensuring the customer a personalization of the offer and a close relationship with the service provider 	<ul style="list-style-type: none"> • Maintain a high level of customer loyalty. • Improve brand recognition through

		<ul style="list-style-type: none"> • Strategic partnership with experienced accountants and other experts. • Close relationship with components provider 	marketing activity.
Component 5: Economic factors	<ul style="list-style-type: none"> • Pricing: flexible • Volumes: low • Margins: Variable depending on the segment 	<ul style="list-style-type: none"> • Profits are the results of ex-novo installations and after sales services. With relation to this the long term nature of the product is a guarantee for future source of income. 	<ul style="list-style-type: none"> • Maintain the current mark-up on costs. • Standard price list for privates
Component 6: Growth/exit factors	<ul style="list-style-type: none"> • Growth model 	<ul style="list-style-type: none"> • Focused on developing new business opportunity. 	<ul style="list-style-type: none"> • Developing a business unit for the energy production

Source: Our elaboration base on empirical observation

Once built the model it should be verified its consistency, both internally and externally. The first chapter of this thesis has highlighted the several changes the business had and is currently having, consistently with this, the framework already possesses elements that ensure the needed level of knowledge to keep the pace with the governmental legislative action. As per the technology, the close relationships established with components providers allows the firm to always have a clear and exhaustive understanding of innovations and novelties in the business. Looking now at the internal fit, as described by Morris et al. (2015), it is given by “both consistency and reinforcement within and between the six subcomponents”. Here the model is consistent, the strategy factors are coherent with the market factors, the long term oriented growth model allows customers relationship to grow and

economic factors can benefit from it. The strategic choice to outsource operational activities finds its reason in the desire to avoid expenses for the maintenance of a warehouse and to allocate those resources to activities with higher added value. Finally it is necessary to devote further study to the framework's last component regarding the growth of the firm. As always sustained the peculiar nature of the PV, deeply influence the strategy of a firm operating in the sector, in this case the long-term objectives set up by the EU and the Italian Government²⁴ offer broad prospects for business development and even an expansion of the same. 4Energy, supported by the evident growing trends in the market, chose the growth model enabling the firm to continue the development shown in the recent years and, as highlighted by the proprietary and rules level, in addition, opened up for a new business opportunity. The recent development in the existing legislation have opened to the possibility, for small and medium systems, to provide, and selling energy to the so-called energy community. Even though the legislative change is very recent, the architecture and structure of 4Energy's business model is allowing them to consider the regulation innovation as a possibility for future business development.

²⁴ See Chapter 1, paragraph 1.2.

CONCLUSION

In this section we want to draw a general conclusion on the work that has been done. It is therefore worthwhile to remember the premises made at the beginning of the research. The overall goal was to verify, in the first instance the ability of the business model proposed by Morris et al. (2005) to effectively describe 4Energy and, subsequently to verify the consistency and accuracy of the latter. To this purpose a preparatory work was necessary in order to collect, analyze and elaborate all the information needed.

The first step has been the analysis of the photovoltaic market, this implied a work that, from global trends was able to narrow the field up to national policies. Being the Italian regulation of PV systems under research this in turn entailed the study of EU directives of the theme. It has been ascertained that, what are considered as global trends, i.d. the growing attention towards climate change and sustainability, found a respective correspondence in the European directives which are then implemented by national legislations. It has been noted how the current legislative systems is formed both by direct incentives and tax benefit that made the installation of a PV systems economically convenient. Moreover, the goal, in terms of green energy production, for the future leave space for a consistent growth of the sector with potential positive effects for operators. Again, it is important to highlight that, even though the growth observed in the last decade has been heavily financed through financial aids and that, this will probably last in the future there is a

progressive approach towards the grid parity threshold partially sustained by the decreasing cost of such technologies.

The second part of the thesis served to firstly define the concept of business model.

Despite the numerous researches in the academic literature it has been observed how different approaches and definitions still make it difficult to come to a univocal solution. The paper therefore has investigated the literature to highlight the most complete examples of business model definitions and frameworks. From the work done two models emerged that were considered suitable for the empirical research, the business model Canvas and the framework suggested by Morris et al. With regard to the former it is possible to conclude that the model was functional for its purpose, i.e. an introduction of the company. As a matter of fact, despite covering all areas of the business, that level of in-depth analysis necessary for the full coverage of a complex company is missing. The statement confirms the initial hypothesis and stresses the need for an additional level of analysis to be carried out with a more suitable instrument. The former, as mentioned above was identified in the model proposed by Morris et al. (2005). Here we want to recall the purpose that this model aims at: “To be useful, such a framework must be reasonably simple, logical, measurable, comprehensive, and operationally meaningful” (Morris, Schindehutte, & Allen, 2005). Furthermore it must be recalled the limits the analysis faced. The only practical application of such a model was carried in a totally different business, i.d. the airlines sector and Southwest Airlines, and no

other examples were found in the literature. Despite this, the study has been more effective than the expectations and has allowed a good knowledge of the 4Energy structure.

To conclude, the company model has proved to be suitable for market conditions and able to incorporate the consistent and conditions-changing stimuli coming from external variables, i.e. regulations and technological innovation, proof of this is the significant growth that the company has recorded since its origin. On the other hand the lack of a comparable case study has limited the efficacy of the research and represent an important limitation to the paper. Furthermore, the static nature of a business model has made it difficult to trace possible future developments and therefore predict the potential of 4Energy but, to partially offset this lack is deemed useful the last component identified by Morris. et al., the choice to devote a part of the framework to the understanding the scope, size and time ambitions of a firm open up to the possibility of comprehending the potential development of the same.

We hope that future research regarding the business model concept could improve the accuracy of the existing frameworks and therefore allow a development of better analysis. Furthermore, additional case studies applying the same frameworks here used could open up to comparisons able to verify the correct use of the same and to even widening the field of research.

Finally, we deem of special interests any research regarding the business model application in the renewable energy sector that could contribute to the discussion here presented.

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APPENDIX

Appendix 1. Semi-structured interview

Customer segment

- What are the services the company offers?
- In which way are you segmenting the customers? What are the characteristics of each segment?
- This segmentation determines a different approach?
- What characteristics you believe important in order to obtain an effective customers selection?
- Are there any other segment you might be able to indirectly attract?

Value proposition

- Through your services what customers' need are you going to satisfy?
- How is the offer differentiated between the two segments?
- Based on the customer segmentation, in which way is the offer differentiated? What are the key factor in meeting the customers' needs?

Channels

- What are the channels used by the firm to reach the customers?
- Do you use the same channels for the two segments? Are the channels different?

Customer relationship

- What type of relationship do you wish to establish with your customers?
Is there any difference in the approach to the segments?
- Why do you prefer a relational approach?

Key resources

- What are the key resources the firms owns?
- How these resources are embedded in the whole business model?
- It is possible to consider your human resources as the dynamic capability of the firm?

Key activities

- What are the key activities performed by 4Energy's personnel?

Key partnership

- What are the partners you consider key to your business?
- What are the benefits deriving from these partnerships?

Cost structure

- What are the main costs incurred by the company? Are these costs sustainable by the structure of the firm?
- The firm is currently totally self-financed, in which way do you think this fact is going to affect your cost structure?

Revenue streams

- How are your profits divided between the two segments? And between the two services you offer?
- What is the mark-up you apply on your services?
- Could you please describe the revenue structure of the company

Rules level

- Considering the framework proposed by Morris et al. (2005), do you think it is possible to apply it to your reality?
- For each segment of the model can you please described the rules implemented by the company?
- What is the degree of flexibility in applying these rules?

Future perspective

- What are the scope and size ambitions for 4Energy? What is the time span?
- Do you think the current business model is appropriate to support such ambitions?
- What are the areas in which you think the business model needs to be improved?
- Your business model seems to be easily imitable. What do you think your rivals will not be able to replicate?

- The market presents positive trends for the future, do you think the firm will be able to intercept those trends?

Nature of the market

- Given the peculiar nature of the market, what are the variables you believe are fundamental for the success of the company?
- In which way the technology innovation affects the market and therefore your business model?