



**Current and future challenges of the ceramic tile  
firms**

**CASE STUDY: PAMESA - AZULIBER**

**Author: Luis Ruiz Climent**

**Tutor: Francesc Xavier Molina Morales**

**DEGREE IN BUSINESS ADMINISTRATION**

**AE1049 - FINAL DEGREE WORK**

**ACADEMIC YEAR 2021-2022**

## **TABLE INDEX**

### Content

<b>TABLE 1: EVOLUTION OF EMISSION ALLOWANCE PRICES</b>	<b>32</b>
<b>TABLE 2: EVOLUTION OF GAS PRICES</b>	<b>33</b>
<b>TABLE 3: ELECTRICITY PRICE EVOLUTION</b>	<b>34</b>
<b>TABLE 4: DEVELOPMENT OF SALES, not aggregated, of the AZULIBER GROUP</b>	<b>47</b>
<b>TABLE 5: EVOLUTION OF AZULIBER GROUP'S NET PROFITS</b>	<b>48</b>
<b>TABLE 8: PAMESA GROUP NET PROFIT EVOLUTION</b>	<b>51</b>
<b>TABLE 9: LABOUR GROWTH of the PAMESA GROUP</b>	<b>51</b>

## **FIGURE INDEX**

### Content

<b>FIGURE 1: THEORETICAL IMAGE OF A CLUSTER</b>	<b>6</b>
<b>FIGURE 2: CLASSIFICATION WITH EXAMPLES OF THE DIFFERENT TYPES OF CLUSTERS</b>	<b>9</b>
<b>FIGURE 3: IMAGE OF THE VALUE CHAIN OF A CLUSTER</b>	<b>12</b>
<b>FIGURE 4: MAIN BENEFITS OF A CLUSTER IN THE CERAMIC SECTOR</b>	<b>13</b>
<b>FIGURE 5: CLUSTER IN SILICON VALLEY</b>	<b>15</b>
<b>FIGURE 6: LONDON TECH CITY CLUSTER</b>	<b>16</b>
<b>FIGURE 7: CLUSTER IN PARIS-SACLAY</b>	<b>17</b>
<b>FIGURE 8: MAIN M&amp;A OPERATIONS IN THE CERAMICS SECTOR 2019-2021</b>	<b>30</b>
<b>FIGURE 9: STAGE IN WHICH THE CERAMIC CLUSTER IS LOCATED AT THE MOMENT</b>	<b>38</b>
<b>FIGURE 10: MAIN OBSTACLES IN THE CERAMIC CLUSTER</b>	<b>43</b>

# **INDEX**

## Content

<b>1. INTRODUCTION</b>	<b>4</b>
1.1 Introductory framework	4
<b>2. CLUSTERS</b>	<b>5</b>
2.1 Definition	5
2.2 Type of clusters	6
2.3 Benefits of a cluster	9
2.4 Most historically noteworthy	13
<b>3. THE TILE CLUSTER IN CASTELLÓN</b>	<b>19</b>
3.1 Main characteristics	19
3.2 Evolution	20
<b>4. CURRENT CHALLENGES</b>	<b>31</b>
4.1 Environmental challenges	31
4.1.0 Main current threats to the ceramics sector.	31
4.2 Commodity crisis and its consequences	34
4.3 The Russia-Ukraine conflict	35
<b>5. THE CLUSTER CONCENTRATION PROCESS</b>	<b>36</b>
5.1 How it works?	36
5.2 Potential problems	38
5.3 Future situations	43
<b>6. THE CASE OF PAMESA-AZULIBER</b>	<b>45</b>
6.1 History and previous collaborations	45
6.2 Company developments	49
6.3 Current status	49
<b>7. CONCLUSION</b>	<b>53</b>
<b>8. BIBLIOGRAPHY AND WEBGRAPHY REFERENCES</b>	<b>55</b>

# **1. INTRODUCTION**

## **1.1 Introductory framework**

The main objective of this work is to know the case of the merger between Pamesa-Azuliber within the Spanish ceramic cluster, which is mainly focused on the province of Castellón, for this we will be placed in previous background to the merger Pamesa-Azuliber telling the history of mergers and / or acquisitions within the Castellón ceramic cluster.

First of all, we will explain what the term cluster means, what are the different types of clusters that have appeared and what are the benefits they bring and as a turning point we will comment on the most important clusters worldwide.

Subsequently we will connect directly to develop what is the process of emergence of a cluster, which will help us to understand how the Castellón cluster developed, in turn we will comment on the possible problems that may arise in its formation and comment on future problems which could be faced.

To give a background to the main case of the paper, which is the recent merger between Pamesa and Azuliber, we will review the historical connections that have been formed throughout history in the ceramic cluster, focusing mainly on Spain (Castellón), and we will develop the main causes of these connections, the approach taken by the company and the result of carrying them out.

As the main point of the work we will develop the business merger between the Pamesa Group and the Azuliber Group, all this point will be developed from the point of view of the Azuliber group, as we have the contributions of the manager of the Azuliber group Virgilio Ruiz Moreno, this will help us to understand what are the motivations that led to this merger within the cluster and how it has been its subsequent development.

To finish we will develop how the current changes in the world are affecting the Castellón ceramic cluster, from the crisis of raw materials to the energy crisis and the measures taken by governments to control ceramics, we would also like to mention how the Russia-Ukraine war has directly affected companies in the province and what solutions have been adopted.

## **2. CLUSTERS**

### **2.1 Definition**

Cluster refers to *"a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by common and complementary characteristics, including final product or service firms, suppliers, financial institutions and firms in related industries"* (Porter, 1990).

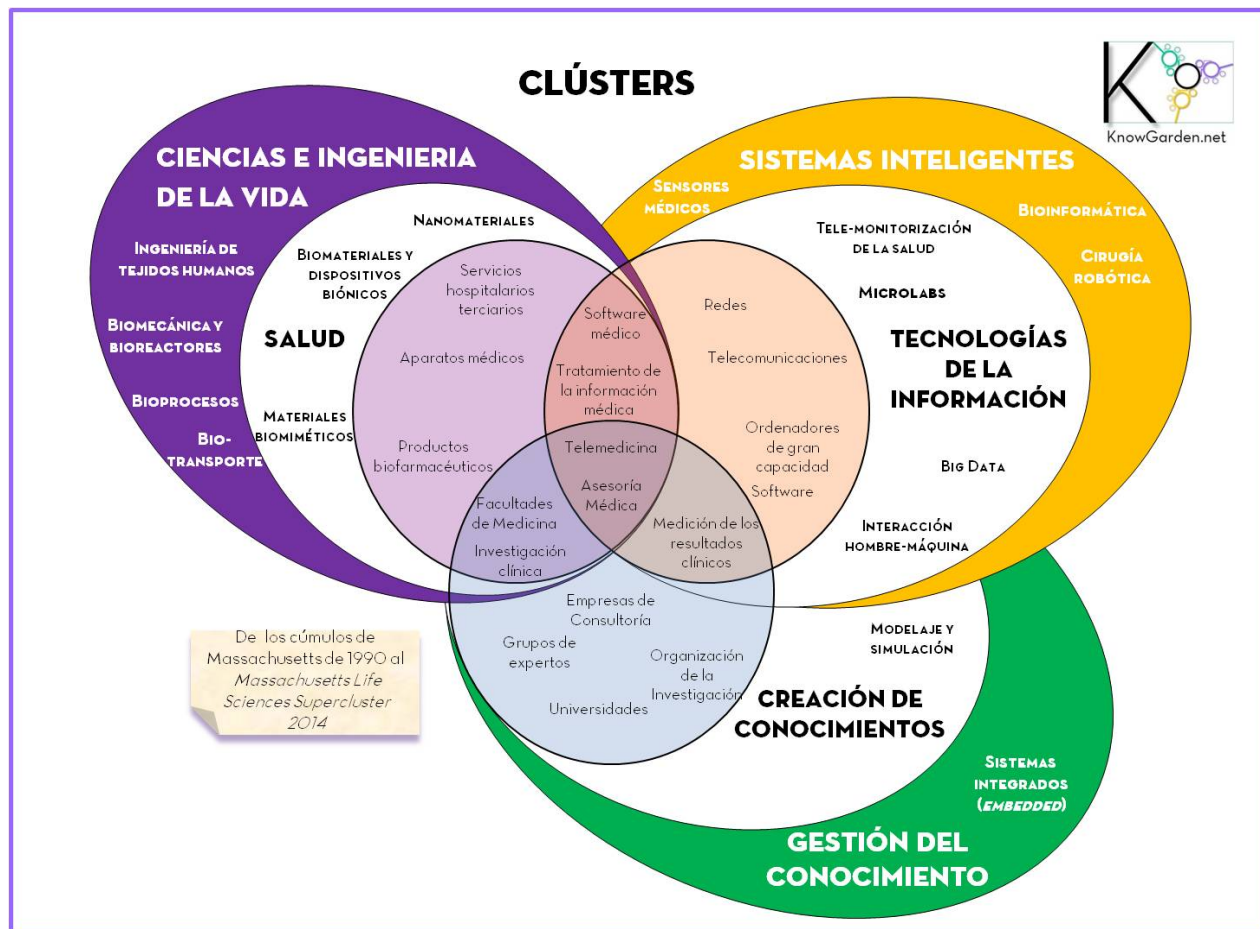
This definition of Cluster is popularized and explained in the book *The Competitive Advantage of Nations*.

We can say that this definition has been modified under small touches over the years, but has always kept its main message, Cluster is an association or set of interrelated companies, delimited in a geographical area close to each other.

To conclude we could highlight the most appropriate definition for the ceramic sector that we find *"Cluster is an association of groupings of industrial companies and public and private institutions, geographically located in a limited area, belonging to a sector of activities within common markets with their demanders, suppliers and advisory agents in knowledge, technologies and/or financing, in order to promote communication between its components to increase their knowledge and competitiveness"* (Manene, 2010).

Attached is an explanatory image of how the different connections work within the sectors promoting the inter-company connection.

FIGURE 1: THEORETICAL IMAGE OF A CLUSTER



Source: KNOWGARDEN, 2014.

## 2.2 Type of clusters

We found two ways of dividing clusters into types, the first relates to the type of connections that firms have with each other, and the second would focus more on the sector to which the firms are associated.

Firstly, depending on who the different companies or industries that make up the cluster are associated with, there are two types of clusters:<sup>1</sup>

- **Vertical integration cluster.** - This integration appears when different industries or companies are connected to each other through the supply chain. It would be companies that produce different stages along a production, specializing in connecting between different companies to promote their growth against different competitors.

<sup>1</sup> Classification of types extracted from the author's theory (L.M.Manene, 2014, Cluster types).

- **Horizontal integration cluster.** - This integration occurs when different industries or companies are connected to each other through their own resources, i.e. when they share a common knowledge base, as they may have a similar market for products or the use of their technologies during production, they may also use similar raw materials in the production system.

Secondly, depending on the sector to which the different companies or industries are associated, there are four types of clusters:

- **Industrial cluster** - This is the most basic cluster that we can find today. The definition that Michael Porter used at the time to define a cluster is currently the most accurate description for this type. This type refers to the concentration of companies and institutions connected to each other in a particular field. A wide variety of clusters can be found throughout the different industries of the world such as automotive, aerospace, social networks, tourism, mining, logistics, etc.

In turn, within the industrial cluster we can find a series of subtypes based on the geographical distribution of the different companies or industries that compose it:

→ **Industrial district cluster.** In which the companies themselves have a closeness incomparable to that of the other two types, thus producing an exchange of both production resources and constant information, thus enhancing cooperation between the various members of the cluster.

→ **Regional cluster.** In which companies occupy a number of individual strategic territories within the same region, in order to facilitate collaboration between the different cluster members.

→ **National cluster.** In which companies are geographically spread across the country. This usually occurs with companies that connect different types of raw materials with each other.

---

<sup>2</sup> Classification of types extracted from the author's theory (L.M.Manene, 2014, Cluster types).

- <sup>3</sup>**Value chain cluster.** - It is the most used within the business sector. Within the value chain several companies maintain an active buying and selling both in products and services between them. One of the biggest incentives for the existence of this type of cluster is the physical proximity that they have which greatly favors the management of costs, thus allowing better options when adapting prices with respect to supply and demand between the different companies that make up the cluster.
- **Clusters of "factorial endowment":** It is a type of cluster that is generated due to the existence of specific advantages within an area, this appears for example in the California wine cluster where both wineries and growers, service providers, and wine-related institutions are interconnected with each other. This occurs to exponentially enhance a characteristic of the region, which is only found in a specific part of the country, forming a collaboration between companies and institutions.
- **Technological cluster.** - It is the most specialized cluster in information and knowledge exchange, it is organized through groupings which share fields of study or training. A clear example could be found in the different universities that share research and work with research centers within the campus itself, through which they maintain an active relationship which favors the development of both parties involved.

Next, we will show a conceptual map in which we will place the ceramic cluster within the different types explained above based on the current situation of the sector and not on its evolution:

---

<sup>3</sup> Classification of types extracted from the author's theory (L.M.Manene, 2014, Cluster types).



**FIGURE 2: CLASSIFICATION WITH EXAMPLES OF THE DIFFERENT TYPES OF CLUSTERS**

TIPOS DE CLÚSTER					
TIPO DE INTEGRACIÓN	TIPO DE SECTOR	INDUSTRIAL	CADENA DE VALOR	"ENDOWMENT FACTORIAL"	TECNOLOGICÓ
	VERTICAL	Clúster Automoción (Galicia)	Madrid Network (Madrid)	CLÚSTER CERAMICO (CASTELLÓN)	Paris-Saclay (Francia)
HORIZONTAL	Clúster Río Perla (China)	Beauty Clúster (Barcelona)	Clúster Vitivinícola (California)	Silicon Valley (San Francisco)	

Source: Own elaboration

We will place the ceramic cluster within *the type of vertical integration* since it is a clear example of connections between companies within the supply chain, that is to say, a business network has been generated that starts from the extraction of the paste, red or white, in the mines, passing through the different production processes, to the distributors and marketers of the sector, which have been located in proximity to the warehouses to facilitate both the management and the control of the different orders.

At the same time we place it in *"factorial endowment"* since the whole ceramic sector in Castellón is favored by the quantity of raw materials and the ease of their extraction and treatment in the geographical conditions of the province. From these conditions, the business fabric that we have today was generated.

### **2.3 Benefits of a cluster**

As mentioned earlier in the original definition of the cluster, ***"the efficiency of a cluster is greater than that of each company in isolation because of the interrelationships that each company generates for the others"*** (Porter, 1990).

Within the formation of a cluster we can find a number of benefits which should be highlighted above others as they are the main reasons why today is still developing this formation between companies. The benefits or strategic advantages to highlight are the following:

- The concentration of companies in the same geographic area boosts **the emergence of new customers**, expanding the market for all the companies involved, much more than it would if each one operated in isolation.
- The increase in competitiveness due to this massive concentration of firms generates growth in both specialization and division of labor, resulting in **higher productivity**.
- The constant interaction between producers, suppliers and customers is reflected in a **greater knowledge** of production, technology and marketing.
- Continuous dealings and negotiations of an economic nature with the same economic agents generate greater confidence and security, which leads to **greater possibilities for negotiation and reduction of cost overruns**.
- The creation of the cluster as a group formed by different companies facilitates the collective action of all of them to achieve **common objectives** (internationalisation, training, technological monitoring and development centers, quality standards campaigns, etc.).<sup>4</sup>

The main benefits that we will highlight within the cluster structure are found both for the companies in particular and for the economy of the sector in general:

- **The development of skills and competencies that complement each other**, thus enabling greater competitiveness against their direct competitors and increasing opportunities in highly complex markets that they could not enter if they were isolated companies.
- Development through **integrated learning**, by means of which we achieve an increase in available knowledge through inter-company connections, thus facilitating both individual and group progress.
- The **emergence of greater economies of scale**, since each company in the cluster can specialize in one part of the process, from production to marketing and sales.
- Social and cultural rapprochement between different companies, **generating new ideas and new businesses**, giving rise to a shared and committed vision among all members.
- **Optimization of communication flows** improving inter-company understanding and allowing the use of best practices for those involved.

---

<sup>4</sup> Classification of benefits extracted from the author's theory (L.M.Manene, 2014, Cluster benefits).

- Generating an **infrastructure of specialized services** in all possible areas, from accounting to legal, from production to marketing.
- It provides a guarantee of security in ongoing relations with banks, insurance companies and other types of **economic-financial support** institutions such as those specializing in investment funds.

Clusters **directly increase competitiveness against competition in the** following five ways:<sup>5</sup>

1. Productivity growth of the different companies that make up the cluster.
2. Encourages the growth and development of new innovative ideas.
3. It enables the emergence of new companies to cover the growing needs within the cluster.
4. It reduces the possibility of uncooperative behaviour within the value chain.
5. It increases inter-company coordination and, in turn, promotes coordination within the company itself.

Below is a **representation of the value chain in a cluster** with a PowerPoint slide, where suppliers, manufacturers, distributors and customers belonging to a cluster are helped by support activities that encourage companies' efforts in research, technological development and innovation via numerous external interrelationships between entities and institutions in the geographical area concerned.

---

<sup>5</sup> Classification of benefits extracted from the author's theory (L. M. Manene, 2014, Cluster benefits).

FIGURE 3: IMAGE OF THE VALUE CHAIN OF A CLUSTER



Source: L.M. Manene Cerragería, 2014.

The main protagonists of the competitiveness of an economy are the companies, they are the ones in charge of adopting the appropriate strategies for each situation they face, being part of productive sectors that interrelate with each other, and promote a physical, social, economic and political environment that conditions their business implications. Economies can be structured in different clusters of companies interconnected vertically or horizontally and conditioned to relationships according to certain competitive advantages that increase the effectiveness of the individual company.

In this way, the competitiveness of a country's companies is conditioned by a wide range of factors, from the company's own strategies and resources, through the configuration of the global value chain from raw materials to the end user, to more indirect factors such as infrastructure, the sophistication of demand or even social attitudes and culture.

Next, we will show a visual idea of the main benefits that the cluster has generated within the ceramic sector, we will choose for them the most outstanding within the different types explained based on the main characteristics that we can observe:

**FIGURE 4: MAIN BENEFITS OF A CLUSTER IN THE CERAMIC SECTOR**



**Source: Own elaboration**

These benefits are the main ones to highlight since they are the ones that have generated the current power of the Castellón cluster compared to its competitors. To begin with, we highlight the communication flows, it is more than obvious that the ease of communication between mines, factories and distributors, as well as suppliers, is something really positive when it comes to the growth of each of the companies that make up the business fabric within the cluster. The economies of scale appear due to the proximity and ease of both the acquisition of raw materials and the sale of the finished product by the wide network of marketing companies that appear; which connects directly with the next benefit, the emergence of new businesses, thus segmenting the load of a company in different stages, highlighting in the last period the emergence of companies dedicated to R & D in environment and marketing and sales development. At the same time, one of the greatest benefits is the ease of receiving monetary support from both private and governmental entities, since the cluster has developed a business network around it that generates confidence for any type of external investment.

## **2.4 Most historically noteworthy**

In this section we would like to highlight the most outstanding clusters at a global and historical level, thus exemplifying in a visual way the definitions and explanations previously given.

We consider this necessary to be able to maintain a correct mental image of how the different clusters have behaved at a global level, the places where they have originated and the evolution they have been developing.

Next, we will show the different clusters grouped by country:

### **USA**

It is a world power both technologically and competitively and within this country we can highlight a specific cluster:

#### **Silicon Valley**

Located in the San Francisco Bay Area, it is considered the most powerful entrepreneurial ecosystem in the world, consisting of an abrupt amount of investment funds, incubators and accelerators, as well as large companies that try to generate synergies between them. The creation of this cluster is directly related to the large number of innovative companies and silicon chip manufacturers located in the area. Among the companies to be highlighted we can find Adobe Systems, Apple Inc. or Google, as well as Microchip Technology Inc. or National Semiconductor. Today this place is considered the cradle of technological development.

We will place Silicon Valley within the quadrants of technological type, since it is considered the most important technological cluster in the world despite being in continuous growth, while, on the other quadrant we place it within the type of horizontal integration since the business network that they have focuses on the various connections generated between companies thanks to the continuous exchange of information thus enhancing each company within the sector individually in their different sectors of action and to promote the growth of different companies within the cluster favors the emergence of investors and outside capital.

**FIGURE 5: CLUSTER IN SILICON VALLEY**



Source: Hosteltur, 2018.

### England

Considered one of the most competitive countries in the world, it is one of the countries with one of the most historically consolidated markets.

### London

London's Tech City, London's tech cluster is considered the most important in Europe in 2018 by the American firm CBRE, they claim that it stands out against the rest of European cities due to the constant waves of new young talent that flock there to evolve at an entrepreneurial level. It is a place where you can continuously find large companies and small startups in the process of expansion.

The main objective in early 2010 was to create a cluster capable of competing with Silicon Valley, so there was a large investment and participation by both local and national governments, thus getting companies like Facebook, Google and Microsoft to invest in the area, thus achieving to consolidate as one of the most important clusters worldwide.

In this cluster there is a business fabric made up of technology companies, educational institutions, financial and professional service providers and public sector organisations; in turn the ease of accommodation for students and families and the good connections to the rest of the city through a solid transport network has favoured the rapid growth of the cluster.

Since 2010 London-based technology companies have collectively raised over €10 billion in venture capital funding. There are currently more than 140 companies involved in technology and finance.

**FIGURE 6: LONDON TECH CITY CLUSTER**



Source: Hmong, 2018.

## **France**

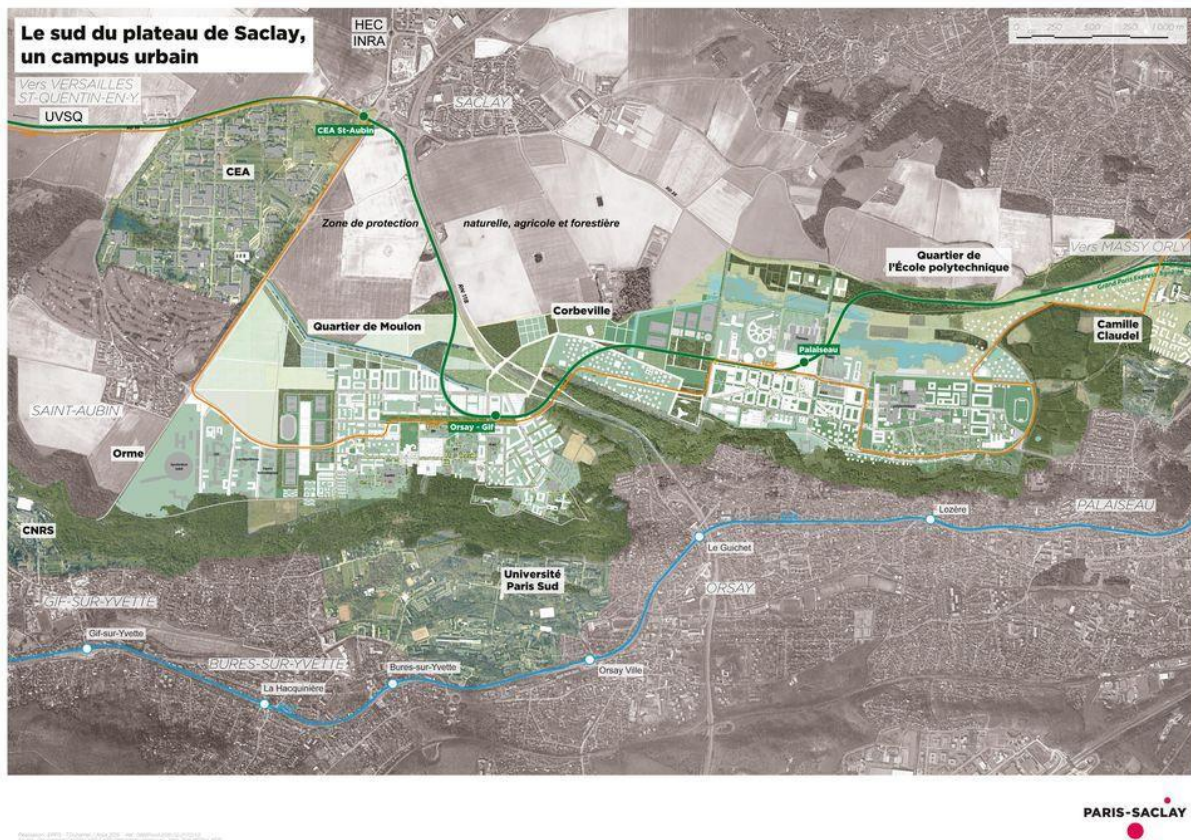
One of the main European powers, which has always stood out for its academic knowledge applied to business.

### **Paris-Saclay**

It begins its construction in 2013, with government funding of approximately 6 million euros, it is a concentration of technology companies along with universities specializing in engineering. The most notable company is Siemens.



**FIGURE 7: CLUSTER IN PARIS-SACLAY**



**Source: Paris-Saclay, 2020.**

This cluster is based on the emergence of three distinct components; firstly a scientific component, following the establishment of the University of Paris-Saclay, 14 establishments dedicated to higher education, several research organizations and 280 laboratories, grouping these to achieve to be among the top 20 research universities in the world, in turn, has the Polytechnic Institute of Paris, and a grouping of different centers dedicated to technological research. Another component is economic, based on the emergence of R&D centres for large companies, the creation of a favourable ecosystem for entrepreneurial SMEs and the commercial development of the different scientific and technological advances; finally, the regional development component, focused on the creation of an urban campus, which mixes residential accommodation and the different living spaces, services and public spaces.

The concentration of large groups and innovative SMEs associated with a world-class university hub makes the Paris-Saclay cluster one of the 8 most important innovation hubs in the world. Paris-Saclay brings together 15% of French public and private research.

The project is organized around large Zones of Concerted Development (ZAC), which allows for a combination of programs between higher education and research, housing for families and students, economic development and various services.

Two zones have already been created around the cluster, the Moulon zone and the Quartier de Polytechnique.

### **3. THE TILE CLUSTER IN CASTELLÓN**

#### **3.1 Main characteristics**

In 1860 in the Faience Factory in the Cartuja of Seville, industrialization began to take place by Carlos Pickman, the tile cluster in Castellón has its origin in Onda in the mid-nineteenth century. In 1857 there were already 34 kilns occupied by thirty factories and in 1916 the first training centre related to the ceramic sector appeared. In 1929 we find this situation in Castellón: 41 companies, 143 kilns and 71% of the national production.

In 1965, the first great crisis appeared in the face of the appearance of a competing cluster, in this case, the entry of Italian tiles, which had the capacity for investment and manpower, but were still behind in terms of technological innovations at that time.

In this way, in 1969, Castellón is located with these data: 138 companies, 5600 employees and 25 million m<sup>2</sup> of production per year.

In 2018 Spain is ranked as the second largest tile exporting country in the world, with a market share of 14% and an excellent positioning in reference to quality-price that allows it to differentiate itself from Italy and China. The Spanish ceramic market is considerably fragmented with around 150 companies in the Castellón ceramic cluster.

At present, in the province of Castellón, mainly in the areas of Alcora and Onda, the Castellón tile cluster is considered one of the main clusters worldwide in the tile sector as it offers 93% of the national production, more than 60,000 direct jobs annually and maintains a relationship with more than 300 companies.

The tile cluster covers all the stages involved in getting ceramic tiles into the hands of the end consumer. With this we include all the agents that work from the manufacturers to the commercial ones.

The sector is in a stage of great growth on a global scale and this in turn leads to producing countries that want to start competing. At the same time, there has been strong progress in innovation in the sector in recent years, both in terms of technology and products.

With regard to marketing, Spain has a great fragmentation with respect to the rest of the competing countries, except for Italy, which has a very similar performance.

The Castellón tile cluster has very few barriers to entry, not to say that mainly only the initial capital necessary to start up is needed, since it has an environment which favours the creation of companies as it provides the necessary technology, support and services.

The absence of know-how limits the emergence of new companies related to the sector in places where there is no cluster or where clusters are in the process of initial development, which greatly improves the situation in which the Castellón cluster finds itself compared to the rest of its competitors.

### **3.2 Evolution**

In the following point we will explain how the different connections between the main ceramic companies have evolved throughout history from 2016 to 2021. We will be able to observe the evolution of the companies and highlight the improvements that have been appearing after the connections between them. At the same time, we will distinguish within each connection the differences between the mergers and takeovers that have occurred in the sector, since in some of these connections only the key points that would strengthen the two business groups will have been taken into account:

#### **Year 2016**

##### **Pamesa Group and TAU Cerámica**

In mid-May 2016 the Pamesa group, after tough negotiations with the company Sherpa Capital, got the reins of TAU Cerámica, thus receiving the production unit of Taulell passing it into the hands of Portovan SL, a company of the Pamesa group.

This acquisition occurs to solve the creditors' contest that TAU Cerámica was facing since June 2015.

Pamesa Group, advocated maintaining all jobs, despite a high possibility of reduction or relocation of employees on a temporary basis, along with an investment of 15 million euros in R & D, in turn, assume the total mortgage debt of TAU Ceramics valued at about 18 million euros approximately.

In the future, the Pamesa group proposed to reactivate the four kilns available, compared to the two that TAU Cerámica was maintaining, increase the workforce available at the time of purchase, modernize the production plant and adapt the current production to the new formats and needs of the group.

Taulell was renamed Tau Porcelánico and achieved sales valued at 32,735,000 million euros, a workforce of 78 employees and a net profit of 879,000 euros.

The Taulell company would begin to increase its numbers until closing the year 2020 with sales valued at 170,222,000 million euros, a workforce of 439 employees and a net profit of 8,466,000 million euros.

## Year 2017

### Grespania Ceramic and Atomizer NPC

At the beginning of January 2017, the company that owns Grespania, , Participación e Impulso SL, buys the atomizer Nuevos Productos Cerámicos (NPC).

NPC was considered the largest atomizer of white clay in the Spanish ceramic sector. It is a company specialized in the production of atomized earth for the manufacture of white tiles and the acquisition of this company was considered one of the largest operations within the ceramic industry due to the size of both companies within their respective sectors.

Participación e Impulso SL owned 25% of the shares of NPC, the rest of the company was owned by Keraben, Cercasa and Azteca, three large companies in the sector. After the transaction the company has acquired the remaining 75%.

Despite the purchase, NPC did not make any strategic changes in its work after the transaction. NPC closed the 2015 financial year with 104.6 million euros in turnover, on the other hand, Participación e Impulso raised its turnover to 95.3 million euros in the same year.

The acquisition of NPC only demonstrates the company's drive to increase its participation in the ceramic sector, expanding both in the production of tiles and in the provision of services to other companies linked to the ceramic sector.

### Lone Star Funds and Esmalglass-itaca

At the beginning of July 2017 the American investment fund Lone Star buys Esmalglass for a value of 606 million euros from the investment fund Investcorp.

The Lone Star fund based in Dallas (Texas) focuses its main actions in real estate and financial investments. The purchase of Esmalglass, joins the purchase of many other acquisitions by the fund over the last few years around Europe.

The company Esmalglass, managed to consolidate itself as one of the most efficient companies in both international and domestic markets, in turn, had a wide range of products. It had a turnover of around 400 million euros in the last financial year. It has a portfolio of approximately 1,200 customers and 21 sales offices around the world. The company had about 1400 employees at the time of the purchase.

At the time of the purchase, the investment fund said it planned to keep most of its employees and its current CEO.

### **Victoria PLC and Keraben**

In mid-November 2017, the British company Victoria bought the Spanish tile manufacturer Keraben for 274 million euros.

The company considered the British 'king' of the carpet, since it maintains leading positions in carpets and other floor covering materials, despite having acquired the Italian company Ceramiche, opted to further enhance its growth at European level.

This operation was financed thanks to a capital increase proposed by the company on the London Stock Exchange, which would have raised approximately 200 million euros.

Deep-rooted connections with merchant banks such as Cantor Fitzgerald and Berenber boosted the value of the company's shares, which increased in value by 7% to a market value of £800 million. It is worth noting that the company achieved a turnover of 330 million pounds in the year prior to the purchase.

Keraben, despite earning revenues of 118 million euros in 2016 and a gross profit of 36.4 million euros, passed into the hands of the British giant. Keraben's owners were currently divided between Tensile, with 77.3% since 2014, and the founding family, the Benavents with 22.7%.

The company retained the entire workforce, from management team to warehouse employees, for at least the next 3 years of management. They felt strongly that this purchase will enable the group to derive over 50% of its revenue streams from outside the UK.

### **Ferro and Endeka**

At the beginning of November 2017, the multinational company Ferro acquired the Endeka Group for 64 million euros.

The multinational Ferro is in a process of expansion and the acquisition of Endeka will strengthen its position in the market as they are complementary companies. Endeka was a multinational in the ceramic raw material sector, specifically focused on the sale of frits, glazes, colours and inks, which will favour the production of a wide range of ceramic products. This will strengthen Ferro's position within the raw materials market.

With this move, Ferro will reinforce its current strategy and continue its dynamic growth and innovation process. As these are complementary markets, both companies will reinforce their market position and will achieve a constant growth by mutually expanding their product offerings.

This merger will generate more value for the customers of both companies, specializing the products and improving the current services thanks to the combination of both companies, in turn, the company Endeka has advanced functional facilities at the time of purchase. Therefore, by achieving a combination of both technical and commercial expertise, the expectations of both companies are on the rise both in terms of customers and profits.

Ferro is a world leader in function coatings and colour solutions, distributed in a wide range of sectors such as construction, automotive, electronics, etc. Headquartered in Ohio (USA), the company has at the time of purchase a total of 5300 employees and its last financial year ended with a turnover of 1150 million in 2016.

Endeka, at the time of the acquisition, had a workforce of 340 employees and had a turnover forecast of 75 million in 2018.

### **AZULEV**

At the end of November 2017 the directors took control of Azulev's shares, this happened when the private equity firm GED Iberian Private sold its package of shares to the directors and workers.

In June, GED's departure from the board of directors was announced and subsequently, on 30 October, the partial spin-off was approved and the consequent transfer and en bloc transfer of part of the assets, referring to the tile distribution business and the sale of materials.

With this sale the 46% owned by the firm passes into the hands of the current management of the company chaired by Salvador Huerta. With this, the company would be majority owned by the board of directors and minority owned by MCH and Sibec.

Azulev achieved revenues of approximately EUR 34,000,000 million in 2016 and maintained a workforce of more than 200 active employees during the year.

### **Year 2018**

#### **Victoria PLC and SALONI**

At the beginning of August 2018 the British company Victoria bought Ceramica Saloni for 96.7 million euros.

Victoria raised much of the deal's supply by offering shares on the London Stock Exchange.

The Spanish Cerámica Saloni is dedicated to the manufacture of ceramic floor and wall tiles, has a significant manufacturing capacity and has one of the most experienced managers in the sector.

In the last financial year Saloni recorded a net profit of approximately 107 million euros and a gross operating profit of 15.6 million euros.

This purchase is motivated by the attempt to strengthen the synergies between Saloni and another company in the sector, Keraben, which has been part of the group since 2017.

### **Ferro and QuimiCer**

At the beginning of July 2018, the multinational company Ferro bought Quimicer, thus completing its second purchase in less than a year.

Both companies kept their own production lines, but after this operation Ferro consolidated its privileged position in the ceramic glazes and colours sector, a sector which was on the rise and in which the acquired company was a specialist.

Through this agreement the production plants, the customer portfolio and the sales offices located around the world were taken over by Ferro.

It was decided that despite being a healthy company, economically speaking, and with a great future ahead, due to personal reasons within the owners caused the sale.

Ferro guaranteed the employment of the 100 workers and did not propose any short-term changes in production.

### **Falcon Private Holdings and Grupo Halcón Cerámicas**

In early September 2018 Falcon Private Holdings acquired the firm of Halcon Ceramics.

The current owners will retain a minority stake and will continue to be actively involved in its management.

Halcón Cerámicas specialises in the design, production and distribution of ceramic tiles. In 2017 it closed global sales of approximately 150 million euros.

The acquisition of Halcón Cerámicas is the product of an investment strategy taking advantage of the operative capacities to facilitate the development of future business in similar companies in the long term. Halcón has a privileged position within the ceramics sector which is exponentially favoured by active collaboration together with capital with long-term and flexible capabilities.



Falcón Private Holdings felt that the Halcón Group had a similar strategic vision to them and that with their support they could exploit their sales and marketing capabilities,

A large number of companies related to the ceramic sector have actively participated in this acquisition, both investment funds and legal advisors and financial institutions.

### **Avenue Capital and Rocersa**

At the beginning of June 2018, the investment fund Avenue Capital acquired the tile company Rocersa for more than 180 million euros.

The tile company Rocersa, after seven years weighed down by the crisis and accumulating a debt of more than 120 million euros, decided to give in to the American investment group.

The firm, specializing in real estate, accepted the proposal to maintain the largest number of workers of the current staff including management. This is because the company, despite being in a moment of constant debt, had high expectations of growth and a considerable increase in sales, so the new investments announced by Avenue Capital modernize the facilities and hope to achieve the objectives set after the purchase.

### **Miura Partners and Equipe**

In early June 2018 Miura Partners acquires a majority stake in Equipe Cerámicas.

Equipe is considered the national leader in small format ceramic wall and floor tiles and offers a wide variety of high quality collections in specific markets. At the time of the purchase, the company dedicated 90% of its production to exports, doubling its turnover to over 30 million euros.

Miura's objective is to boost the organic and inorganic growth of Equipe, starting from the idea of doubling the production capacity with the investment made and aiming to become a world leader in its sector.

Miura plans to keep the current management team as he believes they are doing a great job specializing in the niche within their sector and focusing all current investments on achieving global leadership.

### **Glass and Ceramic Colours**

At the beginning of February 2018, the Vidres group acquired the company Colores Cerámicos, for 6 million euros, thus including the fifth company within the group.

The purchase of Colores Cerámicos led to the growth of Vidres throughout 2018, increasing its turnover by 23%. In turn, it has allowed the group to make a leap in the domestic market growing up to 50%; in the international market also highlights its growth this year, but to a lesser extent.

## **Year 2019**

### **Esmalglass-Frita and Ferro**

In mid-December 2019, Pigments Spain, the company that owns Esmalglass and Frita, acquired Ferro's ceramics division for 412 million euros.

After years of crisis the Spanish ceramic sector remains booming and demonstrates its strength in international markets so the U.S. fund Lone Star, which already owned Esmalglass-Itaca-Fritta, has acquired one of its direct competitors between what the glaziers are concerned having in mind to grow and diversify market within the ceramic sector.

Ferro had revenues of 457 million euros in its last 12 months ending in September, considering that Esmalglass had a turnover of 470 million euros, it is almost double its size and potential.

Companies will continue to innovate and drive growth as they believe that their greatest business strength is innovation and customer service, which has allowed them to maintain higher gross margins.

### **Pamesa Cerámica and Keramex**

At the beginning of August 2019 Pamesa buys Keramex, thus trying to achieve leadership within the ceramic sector at European level.

With the closing of the new acquisition, Pamesa is now the largest tile producer in Europe by m<sup>2</sup> and is considered the seventh largest in the world. At the same time, it continues to directly affect the growth of the Castellón cluster, with 90% of its production located in the province.

Keramex was a company specialized in a niche of small formats of 20x20 tiles; Pamesa does not expect to increase exponentially its sales with this purchase, since the turnover of Keramex did not exceed 14 million euros per year, but it allows it to obtain a new factory close to its current production and logistics centres, adding around 80 workers.

Pamesa is currently focused on economies of scale, the reduction of production costs and expansion within the cluster, thus directly combating the last remnants of the crisis.

The group achieved a turnover of 643 million euros in 2018, mainly as a result of ceramic sales exceeding the figure of more than 75 million meters sold. With the purchase of Keramex, the group will be increasingly closer to the ceramic leader, Porcelanosa, which has a turnover valued at 806 million euros.

### **Realza Capital and Tencer**

At the end of August 2019 Realza Capital acquired a majority stake in the company Tendencias Cerámicas with the objective of investing in its growth

Tencer is a tile company specializing in special small format pieces. The company has focused on designing and producing tiles and ceramic projects adapted to the needs of customers. The company currently has 200 employees and intends to increase its workforce in the coming years.

Tencer's goal after the strong investment of Realza Capital begins by doubling the business in five years, boosting its international activity and the growth of its own brands, in turn, plans to close the next financial year with sales of 29 million euros.

### **Investindustrial and Neolith Group**

In early September 2019 Investindustrial acquired 75% of Neolith Group for approximately EUR 250 million.

This purchase and sale was carried out in order to continue the expansion process of International Design Surfaces Investments, the parent company created in March 2019, which already groups together more than 16 companies around the world.

This purchase is due to the constant growth of the ceramic sector, which is beginning to attract the attention of large business groups willing to invest in innovation and production.

### **Year 2020**

#### **Colorker and Saniceramic**

At the beginning of January 2020 the merger between the Colorker Group and the trading company Saniceramic Group takes place.

This merger is carried out to enhance the image of both companies in the international market, taking advantage of the synergies in common, making it possible to face the big business groups.

The resulting entity has more than 360 employees and an annual turnover of approximately 80 million euros.

Colorker continues to focus on improving its efficiency in team co-ordination, corporate image and company positioning.

Saniceramic as a trading company has a clear objective which is to improve its international image and its activity within the international markets.

This agreement entailed an integration backed by a shareholder exchange, which resulted in the creation of a single board of directors where the representation of all shareholders of both companies will be maintained.

### **Rocersa and Azulev**

At the beginning of February 2020 Rocersa bought Azulev, this purchase was made by the US fund manager Avenue Capital.

This purchase demonstrates Avenue Capital's continued expansion since its emergence two years earlier with the purchase of Rocersa.

After the purchase, the new group has a turnover of close to 80 million euros and a workforce of around 300 employees. Both companies are currently healthy, as Rocersa's growth after the takeover has enabled it to achieve a turnover of 47 million euros in the last year and a gross operating profit of 5.5 million euros.

### **Pamesa Cerámica, Argenta and Cifre**

At the end of October, the Pamesa Group acquires half of Argenta and Cifre, thus reinforcing its expansion in the sector.

Argenta and Cifre invoiced in the previous year around 280 million euros, which has encouraged the Pamesa group to invest in the project by buying half of them.

This purchase has taken place in order to optimize synergies, improve its productivity and profitability and be able to meet the expected future purchase volumes, thus continuing with Pamesa's project of betting on economies of scale by offering a better and greater supply of ceramic material and a clear commitment to the best service for customers.

### **Azuliber and MYR Ceramics**

In February 2020 Azuliber buys MYR Cerámica joining the wave of ceramic growth and the competition to gain size without pause within the Spanish ceramic sector.

MYR Cerámica has the most appropriate facilities for the production needs of the Azuliber group in the short, medium and long term.

It should be noted that Grupo Azuliber is in the process of research and expansion within the sector and has not yet defined the actions to be taken into account in MYR due to the amount of synergies and potential found between the two companies.

Azuliber is on the rise in the sector as it has been awarded a Gold Alpha in the same year that it has achieved a production of more than 1.2 million tons of atomized red clays.

### **Year 2021**

#### **Pamesa Group and Polished La Plana**

At the beginning of March 2021 Pamesa Group acquired Pulidos La Plana, thus acquiring a new plant of more than 7000 m2.

This acquisition will increase polishing capacity by 360,000 m2 per month, which represents a 27% increase in the polishing segment, where it is currently the market leader.

Grupo Pamesa will keep the entire workforce of Pulidos La Plana, 45 workers.

This makes the Pamesa Group one of the 5 largest in the world, with a turnover of 780 million euros and a workforce of 2,500 employees.

It should be noted that the Pamesa group during the pandemic did not present any ERTE, but also hired more than 350 workers.

#### **Italcer and Equipe**

At the beginning of March 2021 Italcer buys Equipe creating a tile group of approximately 220 million euros.

Italcer finds remarkable synergies with Equipe company which considers that it can favor its current growth and in which they plan to invest the new funds raised through the fund Mandarin Capital Partners.

### **Lamosa and Roca Group**

In early September 2021 Grupo Lamosa bought the flat ceramic division of Roca Group valued at \$260 million.

This acquisition includes two factories in Brazil and Cerámicas Belcaire with a total production of 23.4 million m<sup>2</sup> in the previous year.

Its exports are mainly focused on the USA, with commercial subsidiaries in Brazil and Spain.

This purchase is considered to strengthen the group's presence in the Americas.

### **Pamesa Group and Azuliber**

This event will be developed in the following point from Azuliber's point of view.

This event included the purchase of several mines, two atomizers and six ceramic plants; thus placing the Pamesa group as an unattainable leader for the rest of its direct competitors.

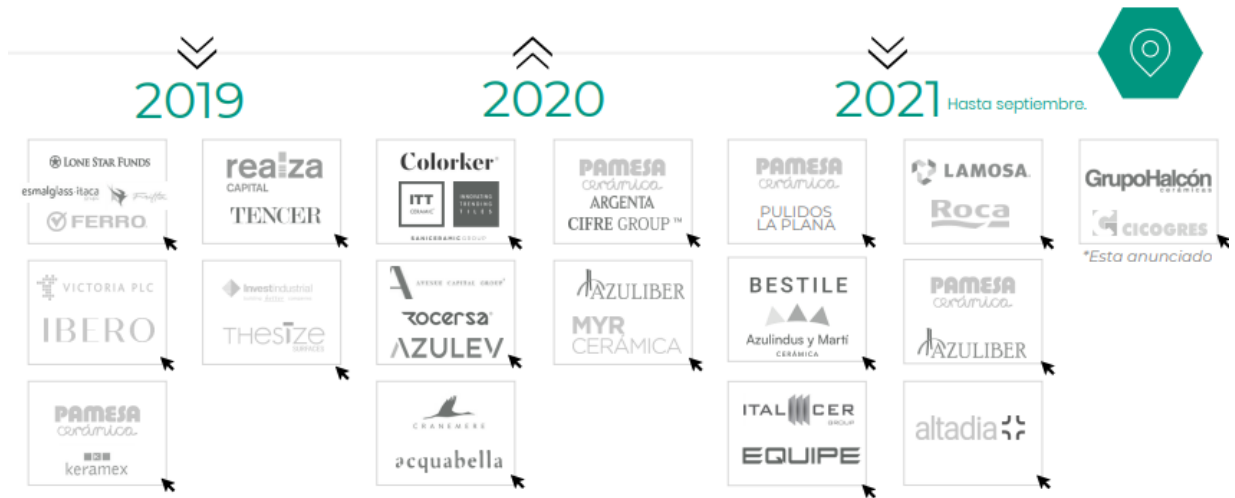
### **Altadia**

At the end of February 2021, we witnessed the birth of Altadia, a new business giant following the merger of Esmalglass-Itaca-Fritta and the ceramic division of Ferro.

It thus becomes a world leader in the sector with a turnover of approximately 800 million euros; it will have 32 production plants in 19 countries, 19 distribution and after-sales service centres, as well as a workforce of approximately 3,600 employees worldwide.

This union reinforces the different characteristics of each brand, together with the high knowledge and strength of our technical assistance teams, as well as the joint work of the R+D+i departments will allow them to offer better products and services to customers.

**FIGURE 8: MAIN M&A OPERATIONS IN THE CERAMICS SECTOR 2019-2021**



Source: VIGILANCER, 2021.

## **4. CURRENT CHALLENGES**

### **4.1 Environmental challenges**

The main threats that we find within the ceramic sector are currently segmented into three:

#### **4.1.1 Environmental threats:**

We found a serious problem with the reduction of emissions that the sector can make both in fluorine gases, sulphur, etc., as well as in heavy materials and crystalline silica. Although these problems are important, they can be solved through investments and technology as long as they are made in a specific reasonable time so that they can be undertaken without producing economic imbalances for the companies themselves.

#### **4.1.2 Environmental risks included in the 2020-2050 agenda:**

Currently, being political risks and variable according to the state of mind of the populations or institutions, it is very difficult to adapt to them, therefore they create a great uncertainty for companies, since they only pose the problems to be solved and do not offer possible solutions and their implications for the companies or sectors affected.

#### **4.1.3 Emission rights.<sup>6</sup>**

They can reach in a very short time to relocate the ceramic sector in Spain and in the rest of Europe; The obligation to deliver an emission right for each of the 8 tons of clay production and the delivery of a right for the production of 315 square meters of ceramics so this produces an overcost hardly assumable; These emission rights have become a clearly speculative financial product as the industry is forced to use them and every year their existing volume is reduced until reaching zero in 2050; So its price can get to get the European ceramic production is economically unviable and the necessary ceramic production will be produced in countries without such restrictions as Turkey, China, India, etc.. Clearly much more polluting and unconcerned about the environment; The evolution of the prices of emission rights in recent years has been as follows:

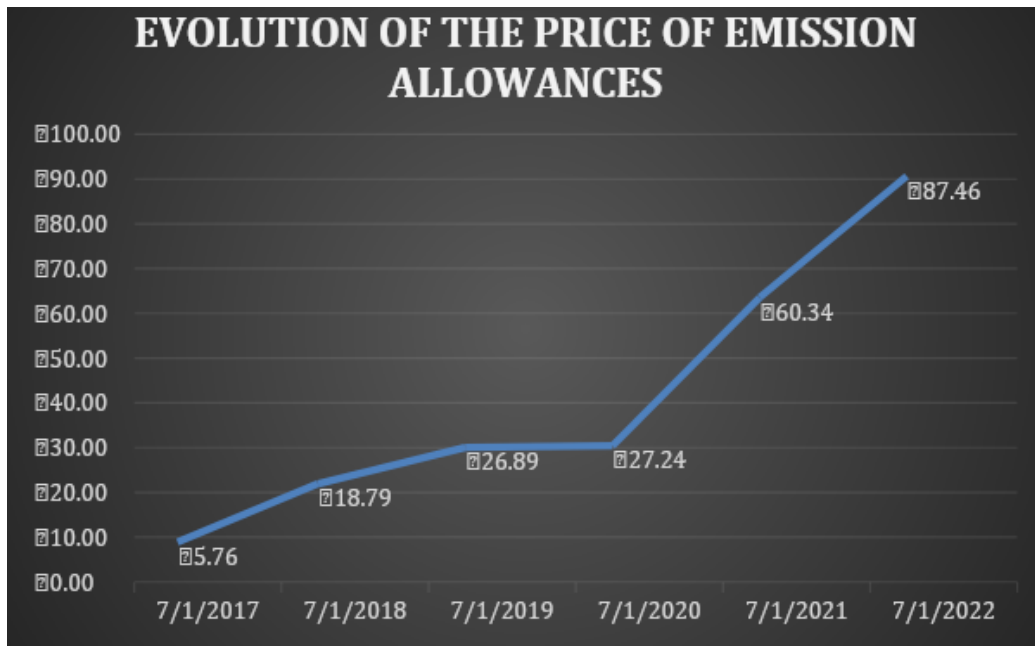
- 1 July 2017 - 05.76 € per emission allowance
- 1 July 2018 - 18.79 € per emission allowance
- July 1, 2019 - 26.89 € per emission allowance
- July 1, 2020 - 27.24 € per emission allowance
- July 1, 2021 - 60.34 € per emission allowance
- May 1, 2022 - 87.46 € per emission allowance

---

<sup>6</sup> The following data has been extracted from the economic website *investing.com*.



**TABLE 1: EVOLUTION OF EMISSION ALLOWANCE PRICES**



Source: Own elaboration

#### 4.1.4 Gas<sup>7</sup>

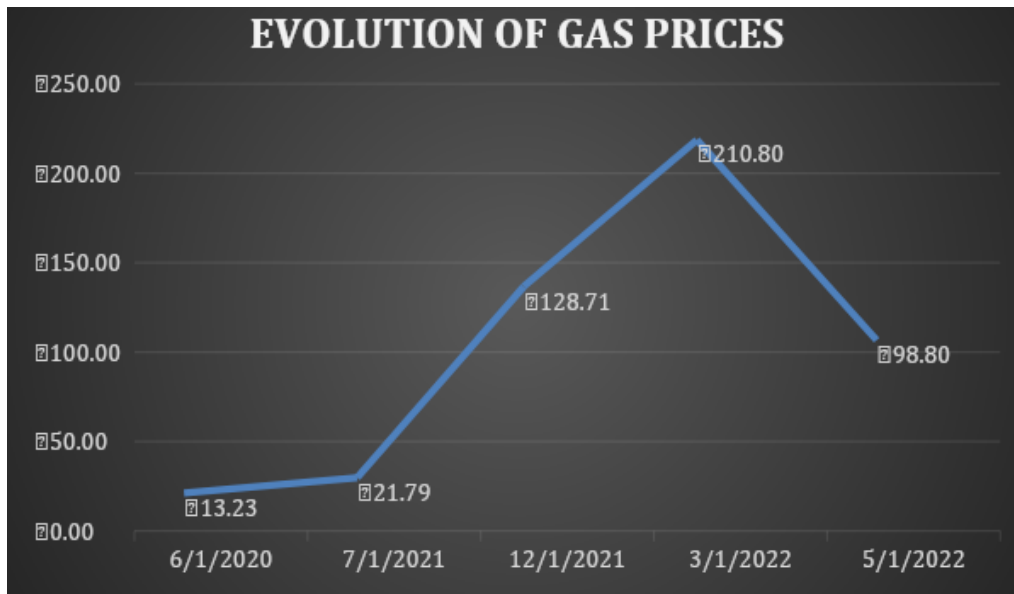
To manufacture ceramics it is necessary to reach temperatures of around 1200 degrees centigrade, these temperatures with existing technologies can only be reached by furnaces that use gas as fuel; This type of energy does not exist and can not be produced in Europe, so we are supplied mainly from Arab countries or Russia.

The price of this energy has remained relatively stable in recent years, but has recently increased significantly, the evolution has been as follows:

- June 2020 - 13.23 euros per MW
- July 2021 - 21.79 euros per MW
- December 2021 - 128.71 euros per MW
- March 2022 - 210.80 euros per MW
- May 2022 - 98.80 euros per MW

<sup>7</sup> The following data has been extracted from the economic website *investing.com*.

**TABLE 2: EVOLUTION OF GAS PRICES**



**Source: Own elaboration**

Europe with the implementation of the 2020-2050 agenda that involves the elimination of fossil fuels, since investments in the natural gas industry are being cancelled, along with the recent sanctions against Russia which cause the trend towards the elimination of gas to accelerate; In turn, not having a substitute fuel, since the possible future substitute would be hydrogen is currently in a very primary phase of testing and development. All these events put together could lead to the closure of the ceramic production industry in Europe.

#### 4.1.5 Electricity<sup>8</sup>

Electricity is essential for ceramic manufacturing and has a significant impact on costs.

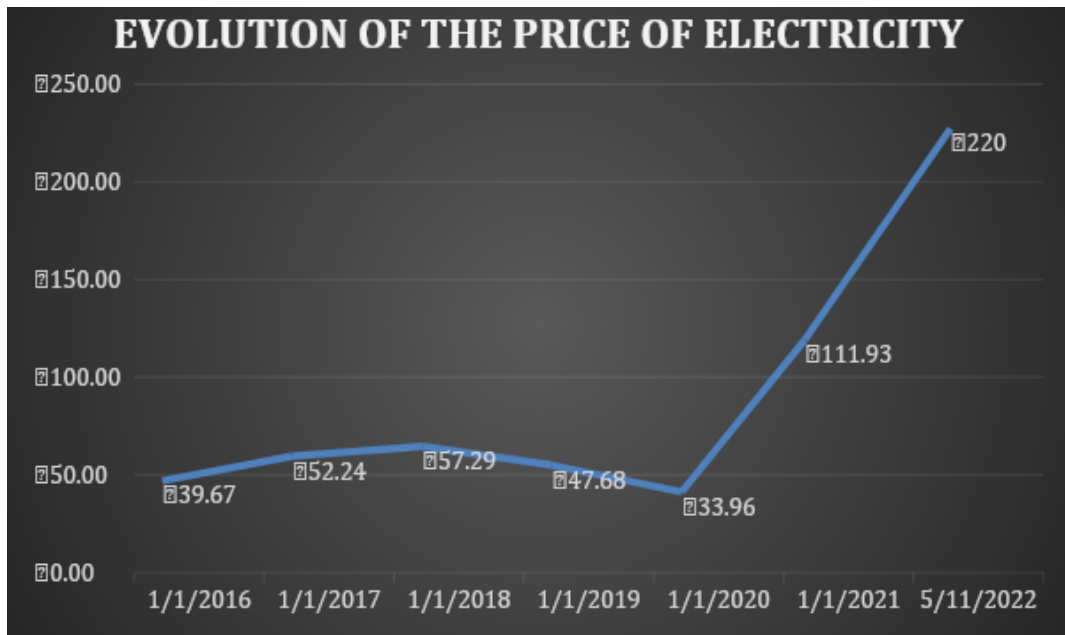
Although it is not likely to be out of supply, it is possible that due to the constant increase of its price together with other cost increases may affect the ceramic sector.

The evolution of prices is as follows:

- In 2016 - 39.67 euros per MW/h
- In 2017 - 52.24 euros per MW/h
- In 2018 - 57.29 euros per MW/h
- In 2019 - 47.68 euros per MW/h
- In 2020 - 33.96 euros per MW/h
- In the year 2021 - 111.93 euros per MW/h
- As of 11 May 2022 - 220 euros per MW/h

<sup>8</sup> The following data has been extracted from the economic website *investing.com*.

**TABLE 3: ELECTRICITY PRICE EVOLUTION**



Source: Own elaboration

## **4.2 Commodity crisis and its consequences**

In this point we will explain by sections how the lack of raw materials is affecting the ceramic sector in the last years, to explain it we have divided it in two sections:

- National raw materials:

The administrative problems for the concession of research, openings and maintenance of the clay and aggregate mines lead in the medium term to a shortage of the raw material necessary for the red body ceramic industry.

- International raw materials:

The competition with other producing countries in Europe and the rest of the world, the increase in freight rates and geopolitical problems (war in Russia) directly affect the supply of the materials necessary for the white body ceramic industry.

### **4.3 The Russia-Ukraine conflict**

The Russian-Ukrainian war conflict directly affects the ceramics sector in two directions:

1. Worldwide shortage of the main clay used for the production of porcelain and white porous ceramics, as well as of other raw materials that are very necessary for ceramics or glazes, such as kaolin.
2. The economic sanctions against Russia and the state of war in Ukraine mean that two of the main markets for finished products that are difficult to replace in the short term are disappearing.

In turn, the government has promoted a series of measures to remedy the way in which this will affect companies, some of the measures that directly affect companies are:

- Lower energy prices for companies.
- Strengthen price stability.
- Supporting the most affected sectors and businesses
- Securing supplies.
- Boosting energy efficiency.

These measures are beginning to be implemented, but they are still not enough to alleviate the economic and energy problems that the ceramic sector is facing, which could lead to the loss of more than 50% of employment in the sector.

## **5. THE CLUSTER CONCENTRATION PROCESS**

### **5.1 How it works?**

The emergence of economic clusters within specific regions does not occur by mere business chance, but rather is the result of a number of interconnected processes that follow a life cycle. This process occurs continuously throughout history in different places around the world, and in most of them follows a common process summarized in 4 stages.

Next, we will develop the 4 stages that occur during the process of creating a cluster:<sup>9</sup>

1. **Gestation stage (Cluster in gestation).** During this stage different companies and industries appear independently and completely unrelated to each other, but which in turn maintain an indirect relationship since they are part of the process of the same economic activity in a given region. During this stage we find what is defined as "the seed of the cluster", this is enhanced by a number of factors that directly affect the formation of the cluster, the factors that favor the seed can be from natural advantages (climate, biodiversity, raw materials) or economic advantages such as the emergence of a booming economic activity, or by the demand within the region for a product or service in specific which may be favored by the formation of the cluster.
2. **Emergence Stage (Emerging Cluster).** In this stage, in the given region, a concentration of companies, industries and institutions specialized in the booming economic activity begins to be seen, giving a start to the relationships between companies in the cluster, where a beginning is observed when sharing and transmitting the common elements for its correct development and it is observed how the companies begin to complement each other. During this stage, special care must be taken in conducting the gestation, since the cluster is in a delicate process as the relationships between the companies are very early in the process. During this stage it is necessary that the agents involved have a constant presence and commitment for the complete formation of the cluster, which will result in many other agents wanting to access the cluster, thus forming a much more robust cluster against the various competitors. The contribution of new actors will encourage entrepreneurship in other action initiatives and in this way the cluster will be able to continue to the

---

<sup>9</sup> Classification of stages extracted from the author's theory (Leonel Guerra, 2010, Ciclo de vida)

next stage of its life cycle. Some emerging clusters "take off and grow", others will not thrive and will eventually disappear; the main key is in the success of the businesses they undertake and the competitiveness of the economic infrastructure available.<sup>10</sup>

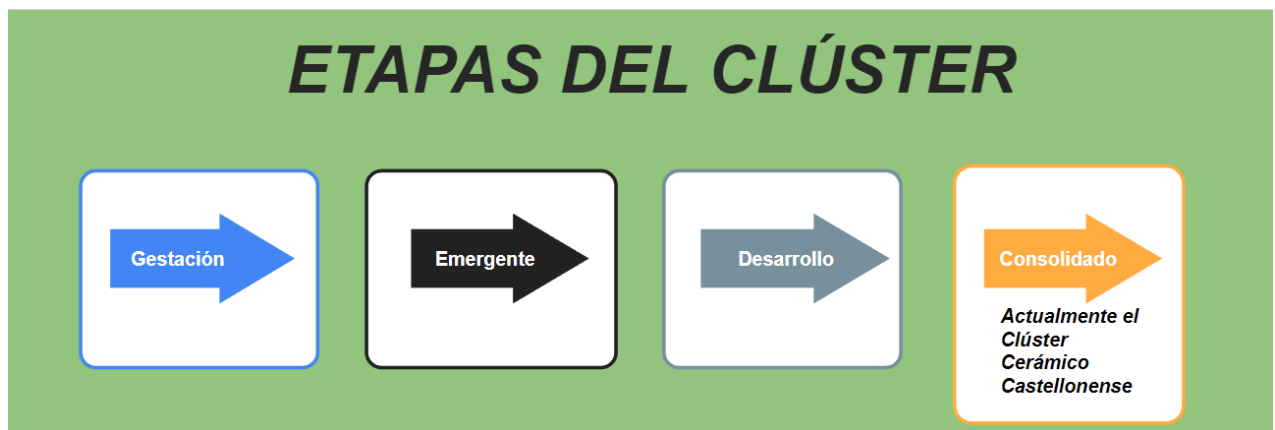
3. **Expansion stage (Cluster in development).** At this stage the relationships between companies, industries and institutions are already beginning to be strongly rooted, thus beginning to see the first fruits of competitive advantages, both those of the particular economic activity with which they are related, as well as those of their products and services. After reaching this stage it is considered that the cluster has managed to clear, although it is still in a process of constant growth, where what is most valued is the sharing of objectives and common benefits among the different members of the cluster. During this stage the cluster organizations focus especially on the development and strengthening of their competitive economic infrastructure favoring their future business, so strong links appear with key suppliers, including universities, research and development centers, banking and financial institutions and government agencies. At the same time, external links may appear with other companies and/or clusters located in the cluster ecosystem, mainly given to be suppliers of inputs and specialized support services.
  
4. **Maturing stage (Consolidated cluster).** This stage is considered the stage of maturation of the cluster, where certain strategies begin to appreciate which begin to take prominence, to emphasize those that maintain constant relations between the different companies, industries and institutions favoring constant innovation within the cluster. This is the reason why a new life cycle can begin based on the incorporation of new technologies and the creation of totally innovative products compared to the current ones. It is an established fact that if the companies within the cluster do not continue their development once they have reached this point, promoting innovation or increasing their network of connections, a constant decline will appear which will lead to the disappearance of the cluster and of the most fragile companies within it. Therefore, during this stage it is necessary to strengthen and consolidate all types of links or relationships that exist between suppliers of economic infrastructure, inputs and specialized support services, in order to have a firm foundation on which to continue the development of the new life cycle.
  
- 5.

---

<sup>10</sup> Classification of stages extracted from the author's theory (Leonel Guerra, 2010, Ciclo de vida)

<sup>11</sup>Next, we will show an image in which we will situate the ceramic cluster within one of the stages explained above, based on the current situation of the sector, in turn we will comment which would be the situations that would cause the continuation to the next stage of the cluster:

**FIGURE 9: STAGE IN WHICH THE CERAMIC CLUSTER IS LOCATED AT THE MOMENT**



**Source: Own elaboration**

We consider that the cluster is in its maturity or consolidation stage, since the bases of the business fabric have already been consolidated, that is to say, there is already a conglomerate of companies and institutions that connect with each other within the sector, and that have maintained productive relations for years, thus promoting the survival of the sector in the face of the different crises that have occurred. At the same time, we believe that the cluster is now facing a series of business strategies, mergers, takeovers, investments in R&D and new technologies that favour the restart of the cycle, promoting the development of the cluster towards new frontiers. We can see this in the Pamesa business group, which has begun its business expansion into sectors other than the ceramics cluster, but maintaining steady growth.

## **5.2 Potential problems**

In all business strategies there tend to be a series of failures which are unpredictable and clusters are no different. It is very common to only know the successful cases of clustering, which produces a false sense of security when forming them, but nothing could be further from the truth. To start a clustering process it is necessary to go through a series of steps that we have already commented previously and in any of these steps an unforeseen event

---

<sup>11</sup> Classification of stages extracted from the author's theory (Leonel Guerra, 2010, Ciclo de vida)

could occur, which could destroy the whole operation. That is why in this point we are going to comment the main problems that can occur during the different phases in the creation process and the future problems that can appear. To begin with, we group the main obstacles that can appear in the formation of a cluster into three groups and we will briefly explain each of them:

### 1. **Structural obstacles:**

As they are obstacles that require a long term process for their correction, they are more considered constraints than obstacles since they will condition the actions and strategies of the action plans of each cluster member.

- Pre-Clusters: In many cases of cluster creation situations occur in which not enough elements are found to run the complete start-up of a well-structured cluster.
- Unbalanced clusters: This occurs when some companies within the cluster have a more transnational character while the suppliers are of a local character, which can lead to a mutual maintenance obstacle.
- Major limitations in infrastructure: Mainly in the aspects of R&D, training of human resources and quality of communications.
- Concentration of economic power: It is common for the majority of local capital to be concentrated in a limited number of families and groups.<sup>12</sup>

### 2. **Functional obstacles:**

It refers to the obstacles that are within the reach of all participants during the clustering process, since, being changes possible in a shorter period of time, it only requires agreements between the different agents.

- Centralism: It often happens that a company or government entity wants to have the upper hand during the entire decision-making process and during the allocation of resources, this should be solved from the beginning to remedy possible disputes in the long term.
- Sectorial approach: There must be a clear definition by all members of how the cluster will be managed, that is, not only focus on their sector but act as if

---

<sup>12</sup> Classification of obstacles extracted from the author's theory (Leonel Guerra, 2010, Ciclo de vida)



it were a whole, it is very important to define public and private policies for proper development and economic growth.

- Limited information: This should be as wide-ranging and up-to-date as possible, as well as being from reliable sources and suited to the current needs of the entire cluster.
- Lack of coordination mechanisms: It may be the case that some of the cluster companies do not focus part of their human resources on coordination and management with the other cluster members, which can lead to a total break in the management chain.
- Attitude of dependence: The productive sector should never depend directly on government entities since they are still independent companies. At the same time, the companies within the cluster themselves should focus part of their resources on their individual growth, as this will benefit the group as a whole.

### **3. Emotional obstacles:**

- Leadership: All cluster members are obliged to take responsibility for individual and group decision making.
- Communication: Transparent, fluid and constant communication channels must be maintained so that all cluster functions can develop their full potential.
- Continuity: Mainly for two reasons, to overcome resistance to change among all cluster agents and to stay together until results are obtained.
- Individualism: To be aware of the usefulness that each company contributes to the cluster and which ones are only integrated to benefit themselves individually.
- Short-term vision: Companies that after the formation want to obtain immediate results and benefits instead of focusing their resources on strengthening and improving the cluster against the rest of the competitors in order to increase their possibilities in the long term.<sup>13</sup>
- Lack of trust: When this happens, the company involved must solve or leave the cluster because it can generate a chain of distrust among all cluster members and lead to the rest of the obstacles. It is very important to maintain a constant commitment to the common goal and for this you must trust the rest of the members.

---

<sup>13</sup> Classification of obstacles extracted from the author's theory (Leonel Guerra, 2010, Ciclo de vida)

- Politicization: Special attention should be paid to governmental actors as they may have other interests in supporting the formation and consolidation of the cluster.

Therefore, we should have an objective and proactive vision in order to overcome the obstacles and thus strengthen our chances of success. Since most of the obstacles that we have presented could be solved if all cluster members were prepared for them.

Finally, we will highlight the four major obstacles and explain how to deal with them, i.e. how to manage and address each of them in the most efficient way possible:

### **Leadership**

The most crowded problem within all clusters in formation is the issue of leadership. It may sound very obvious, but there are very few companies that fall into this until it comes to making important decisions. Being a leader is not just about making important decisions, it is about maintaining authentic and effective leadership, i.e. there must be total commitment from those chosen within the cluster. If a responsible leader is not found, it is very likely that the rest of the cluster members tend to be demotivated and to the need for absolute pressure environments. To solve this a leader has to maintain a constant communication process and not only with the members of his own team but also with all the agents that participate in the economic development of the cluster.<sup>14</sup>

### **Organization**

Connecting directly with the leadership appears the organization. It is absolutely necessary an organization that supports and facilitates both the approach and the implementation of each decision taken. Within a cluster this is divided into two levels: the cluster organisation and the company organisation. On the one hand, there is the challenge of forming a cluster itself, where the coordination and collaboration of all the members involved has to work, while allowing them to manage the responsibilities of their own workplaces. Each company has its own rules, policies and goals, so an organisation is needed that facilitates the joint management of the whole, not just the running of the cluster.

Let us remember that the organisation must be accepted by the cluster members, as well as facilitating their integration in it. The different capacities, dimensions and interests of each cluster agent must be taken into account and the budget needed and the minimum structure for it to be operational must be explained from the beginning. Therefore we will find a position within the cluster called "cluster manager" which will be responsible for the

---

14

management of this same and decision-making thus becoming a crucial factor to take into account.

At the same time, for the correct functioning of the cluster, an external support structure is needed to facilitate the correlation between the different agents of the cluster, both technically and economically.

### **Approach**

The approach presents challenges and problems at both ends of its appearance. On the one hand, if it depends too much on it and little use is made of the act itself, it can lead to cases of paralysis by analysis, resulting in frustration and group discomfort. On the other hand, a hasty start can lead to the appearance of decision making without prior knowledge of the situation in which it is found, as well as discussions arising from the lack of clear common objectives by all members of the cluster.

The main problems to avoid from the early stages include a lack of accuracy in defining the cluster leading to a blurring of objectives, with reference to the regions and sectors involved as well as the target markets.

It should also be clear that there are clusters that will have less presence and/or potential for the chosen region or time.

### **Environment**

The environment in which we place the cluster must be premeditated well in advance so as not to make mistakes from the beginning, since choosing an environment full of uncertainty and anxiety can lead to excessively difficult challenges that cannot be faced in situations. However, it is true that a cluster can solve these difficulties in some situations.

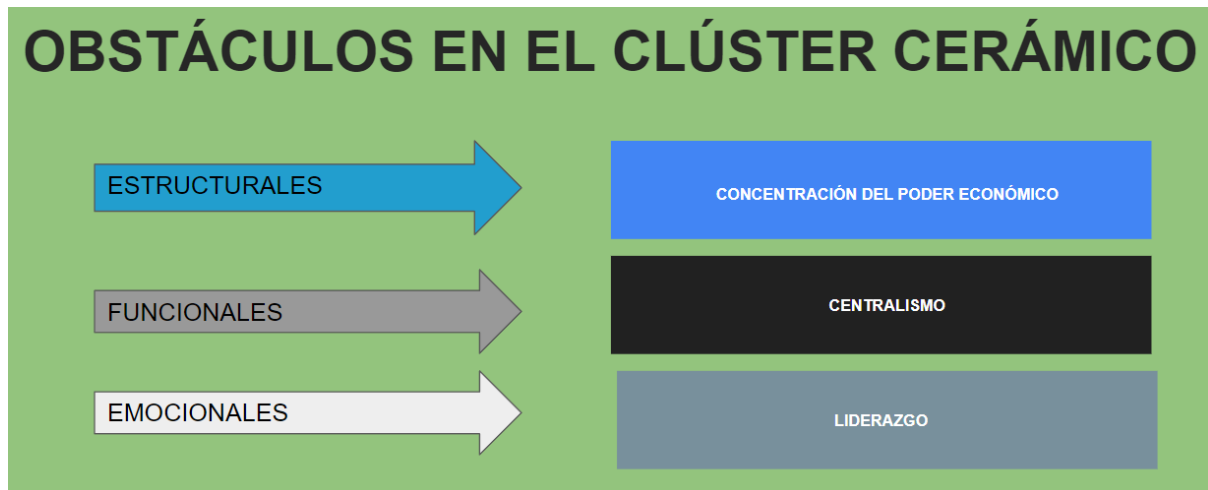
Therefore, we can conclude that the environment can be one of the most difficult challenges when forming a cluster, as well as one of the most important when forming relationships between all the cluster agents.<sup>15</sup>

Next, we will show a conceptual map in which we will place the main obstacles that have affected the ceramic cluster within the different types explained based on the main characteristics that we can observe and how we consider that they have solved these obstacles:

---

<sup>15</sup> Classification of obstacles extracted from the author's theory (Leonel Guerra, 2010, Ciclo de vida)

FIGURE 10: MAIN OBSTACLES IN THE CERAMIC CLUSTER



Source: Own elaboration

The main obstacle within the structural ones is found in the concentration of economic power, as this occurs when within the same cluster there are a number of business groups or investment funds that manage a large part of the supply of the sector in total, so that the economic power in R & D and improvement of technologies within the cluster depends mainly on these business groups. In turn, we connect directly with the most outstanding functional obstacle, centralism, which we find in the sector with the Pamesa group, which maintains an image of dominant leader of the supply of the sector for different economic and productive reasons, which allows it to take the reins and decisions when it comes to the distribution of resources and business and technological development. Finally, we find the obstacle of leadership, there are many companies committed to sponsorship and/or commercial agreements with the leader of the sector, which favours growth and coordination within the cluster, but at the same time, it often disables the individual decision making of some companies in the cluster for fear of internal dissonance.

### **5.3 Future situations**

The clusters are not impassive to the passage of time and like all business measures tend to adapt over time to improve their efficiency and management against other emerging competitors.

It is true that a cluster, as we have already explained, has very well formed bases over time and specific characteristics for its correct functioning, but we have not mentioned the future situations it faces.

Mainly clusters tend to internal dependence, i.e. they rely excessively on the relationships formed with the other agents of the cluster, but what would happen if other external agents appeared and tried to replace them. Well, this is what will happen in the coming years if they do not begin to update their organizations and measures against competitors.

Nowadays, an endless number of possibilities have opened up with the increase in communications, internet relations and e-commerce, which is why new types of competitors have appeared. From suppliers to promotions and marketing to R & D are directly affected by new technologies and if one of the agents within the cluster fails to adapt to these new changes could directly affect the rest of the agents.

Therefore we foresee a clear update of the methods of efficiency and management within the cluster methodology relying on external models and allowing relationships with agents that exist outside their region, it is true that this is difficult to understand today as one of the greatest strengths within the clusters is the ease of communication due to the proximity but with new technologies it is very likely that companies more dedicated to marketing, promotion and sales within the cluster begin to find competitors from points never seen before.

Later on we will explain future situations of a more specific character within the ceramic sector and we will indicate how these affected especially this sector since the explanations previously given have a more general character within the term cluster.

## **6.THE CASE OF PAMESA-AZULIBER**

In this section we will develop the main point of the work, that is, the Pamesa-Azuliber merger, mainly from the point of view of Azuliber S.L. since it is the absorbed company.

We have subdivided the basis of the point into three different types of sections in order to give a background to the merger that took place in September 2021.

We believe that this merger marks a before and after in the ceramic sector, as well as greatly enhances the possibilities for growth and expansion of the Castellón cluster.

### **6.1 History and previous collaborations**

To begin with, we will make a brief summary of the history of the Azuliber group until its acquisition by the Pamesa group.

Azuliber is constituted and starts its activity in 1972 as a producer and supplier of ceramic biscuit for different companies of the cluster; the foundation comes propitiated by the beginning of a collaboration between three ceramic companies that were consumers of this product, which were Undefa S.L., Alcor S.L. and Rocas del Masmut S.L.

The bisque is the fired but unglazed ceramic support; with this bisque the finished product factories glazed it and fired it again in another kiln, producing ceramic wall and floor tiles by means of the double firing system; Later, the single firing ceramic process became popular, which was more energy efficient as the finished product underwent a single firing, so Azuliber transformed its bisque manufacturing activity to the production of atomized red body clay in 1988.

In 1991 a relevant event took place with the introduction of electrical cogeneration by means of the incorporation of turbines in the production process; the turbines burn gas in their operation, just like the old burners, generating the heat energy necessary for the evaporation of the water from the slurry (clay mounted with water) and producing the atomized clay; In turn, the turbine generates electricity, this electricity is exported to the network enabling its subsequent sale to electric companies, thus reducing production costs by balancing the cost of gas with the income produced by the sale of electricity.

For approximately two decades Azuliber grew in parallel with the ceramic sector, developing innovative clay formulas, boosting the production of red clays, innovating in the use of white porcelain clays, researching new formulas for white porous clays and clays for engobes.

During this period the facilities were improved, going from 3 atomizers to 10, from 1 to 4 turbines, acquiring mills; also a great part of the funds were invested in the environmental culture of the company with improvements in the filtering systems, reuse of sludge and ceramic rejects, enclosure of the threshing floors where the clays are stored and formulated, solving the problems with respect to the dust in suspension.

During this period, the company also became aware of the need to ensure the supply of raw materials, so it invested in the purchase of shares in mining companies, in the research and application for mining rights in the main supply provinces of Castellón, Valencia, Teruel and Cuenca, thus strengthening a vital part of the business such as raw materials;

Once the economic crisis of 2007-2014 was over, and maintaining an active workforce of 158 workers, Azuliber changed its focus and began an expansionary policy with the acquisition of a competitor company, Atomizadas de Alcora, in 2015 to strengthen its presence in the atomized red pulp sector.

In 2016, with a staff of 171 workers plus 41 workers belonging to Amisalsa, the marketing activity of the finished ceramic product is boosted, with the creation of three marketing companies, Valentia Ceramica, Click Ceramica and Goetan Cerámica; each of them designed for a different segment. At the same time, the production of finished product is increased to supply the marketing companies with the acquisition of several ceramic manufacturing companies, Ceramicas Myr, Azulejera Alcorense and taking a majority stake in the company Jose Oset; the company also expands its own facilities in Azuliber, Valentia and Azulejos Plaza.

The approach to the Pamesa group began to take place throughout 2018, with a relationship as a client supplier, where Azuliber became a supplier of atomized clays on an occasional basis to meet the needs of the Pamesa group; it also began to collaborate with respect to common customers and even in sponsorship projects and sponsorship of Villarreal CF.

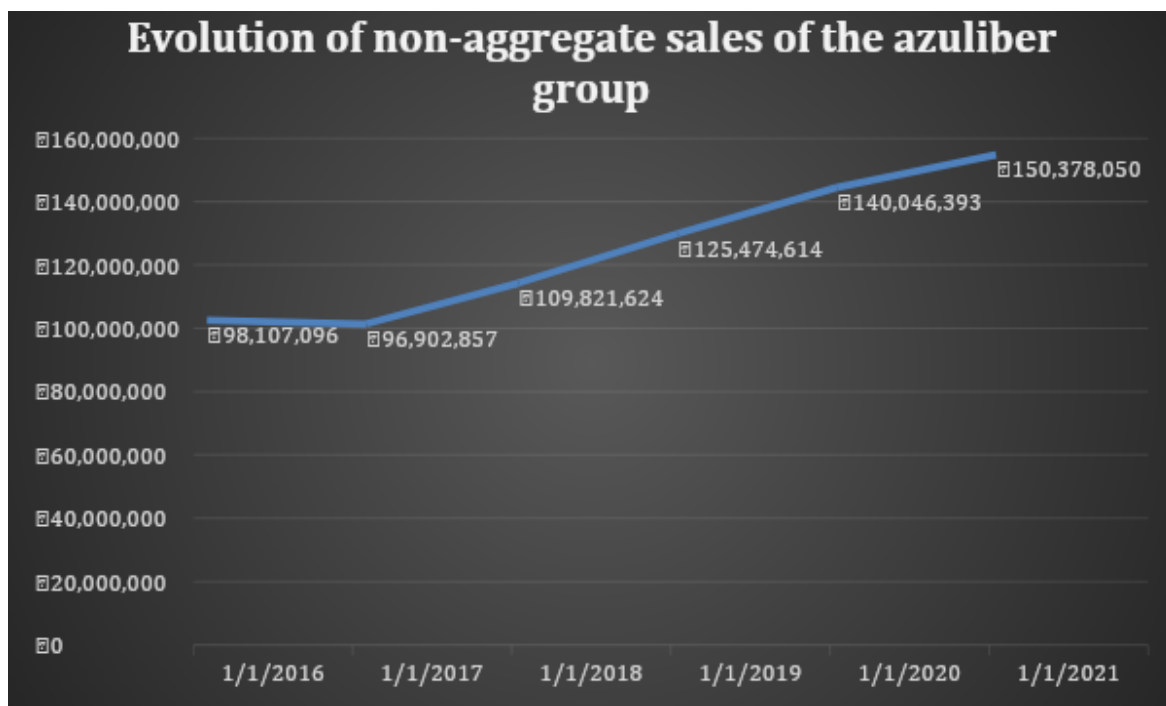
In 2019 Azuliber had an active workforce of around 273 employees, which through the evolution of the firm and the constant growth thanks to the investments and collaborations produced became approximately 400 employees in 2021.

In the summer of 2021, the Pamesa group considers that the companies are complementary and that they can contribute positive elements to the growth of its group by making a purchase offer, worth 70 million euros plus the group's current debt, to the owners of the Azuliber group (Azulejos Alcor, Undefa and Rocas del Masmut); this offer is accepted and the acquisition is implemented in September 2021.

After the purchase, the Pamesa group undertook to keep as many workers as possible, only eliminating those positions that were clearly redundant and where there was no possibility of relocation.

Next, we will attach some graphs to discern a more detailed visual image of the growth of the Azuliber Group over the years, with this we can see how the business group grew exponentially within the Castellón cluster and it was later this growth one of the main reasons for its merger with the Pamesa Group:

**TABLE 4: DEVELOPMENT OF SALES, not aggregated, of the AZULIBER GROUP**

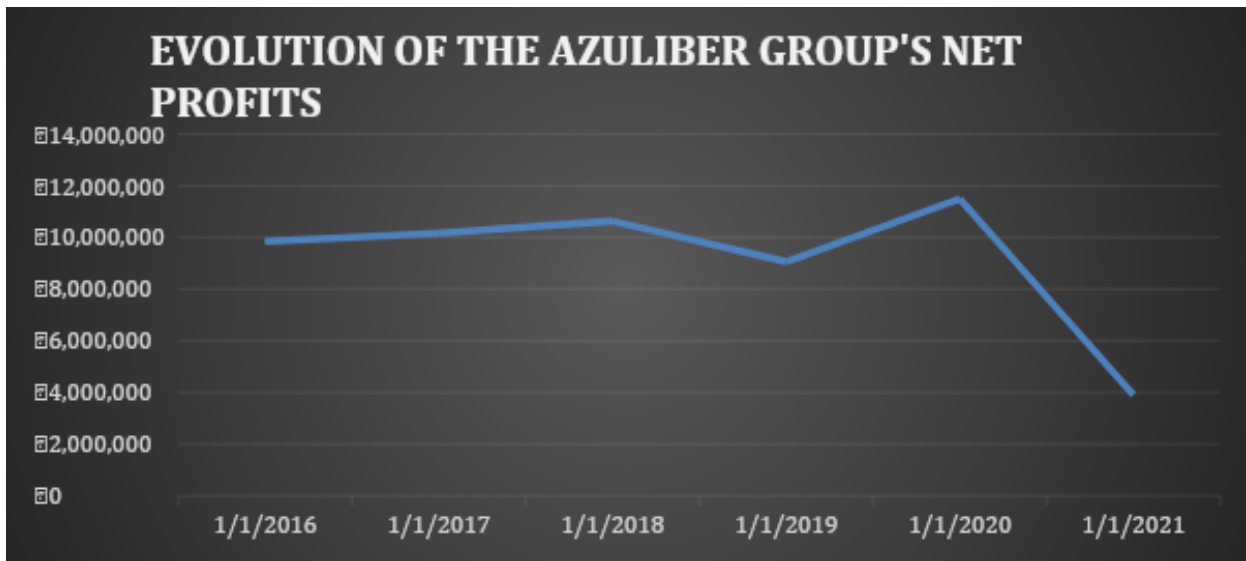


**Source: Own elaboration, data extracted from the commercial register, 2022.**

We can observe a clear growth in sales over the years; it should be noted that these values do not exclude sales made between the companies that made up the group, so there may be a slight difference in net sales.



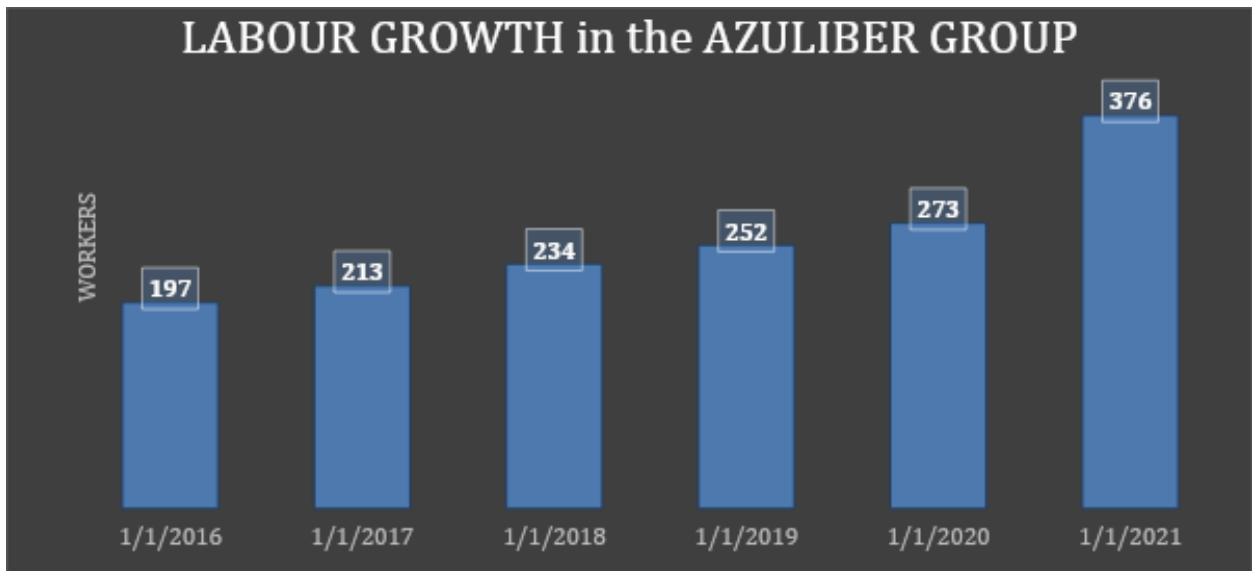
**TABLE 5: EVOLUTION OF AZULIBER GROUP'S NET PROFITS**



Source: Own elaboration, data extracted from the commercial register, 2022.

We note how the group has managed to increase almost steadily the profits generated since the crisis of 2015, seeing this reflected in its continued expansion within the Castellón cluster, to mention that at the end of 2018 they incurred a drop in profits on a par with the rest of the companies in the cluster.

**TABLE 6: LABOUR GROWTH of GRUPO AZULIBER**



Source: Own elaboration, data extracted from the commercial register, 2022.

The group's workforce has been increasing since the beginning of its expansion within the cluster, maintaining as far as possible the majority of the employees working in the companies merged/absorbed by the group at the time of its expansion.

## **6.2 Company developments**

As previously mentioned between the two groups there were great synergies, both the Pamesa group and the Azuliber group are owners of mines, with this merger this position is exponentially enhanced since, by adding the red and white clay mines of the Pamesa group, mainly in Teruel, together with the Azuliber group mines, which are located in Valencia, Castellón and Cuenca.

With regard to the atomizing plants, they clearly give it a leading position, mainly in the atomization of red paste with Ondagen of the Pamesa group joining this Azuliber, Arcillas Atomizadas de Alcora and Atomizadora and being a reference in atomization of white paste with Pamesa, TAU, Arcillas Atomizadas joining these Azuliber white paste, in turn, we can highlight the recent acquisition of Tierra Atomizada.

The ceramic production plants of Pamesa, Compacglass, TAU Cerámico, Gotocer and Keramex are joined by those of Azuliber, Valentia, Click and Jose Oset, thus providing an additional production of 80,000 m<sup>2</sup> per day, which brings the daily production of the Pamesa group to 500,000 m<sup>2</sup>.

With regard to the Azuliber sales companies, they disappear as a brand to become part of the Pamesa group's sales companies.

## **6.3 Current status**

Despite continuing to be the undisputed leader of the ceramic sector at national level and maintaining its sixth position worldwide, the Pamesa Group has received a remarkable increase after the merger; therefore, in this point we will analyze the closing of the last financial year of the Pamesa Group.

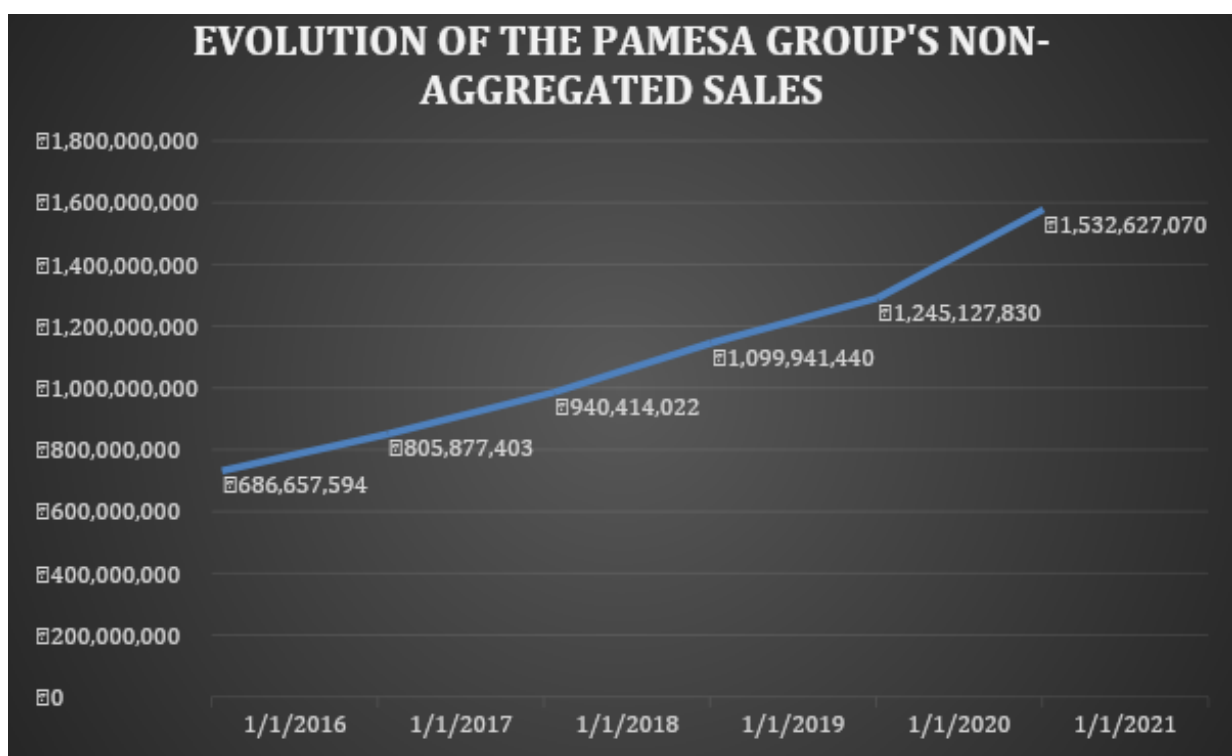
In 2020, the Pamesa Group's sales amounted to 782 million euros, with organic growth plus acquisitions, the Pamesa Group expected to close the year with sales of over 1250 million euros.

In 2021 Pamesa Group, after the merger, had a workforce of more than 2000 direct employees.

Following the growth demonstrated after the merger, the Pamesa group is predisposed to continue increasing its activity both organically and inorganically, with expectations of reaching 1500 million euros in turnover by 2022.

Next, we will attach some graphs to compare the different evolutions of the companies before the merger, with this we will be able to observe how the business group grew on a par with the rest of the companies within the Castellón cluster and it was later this growth one of the main reasons for its merger with the Azuliber Group:

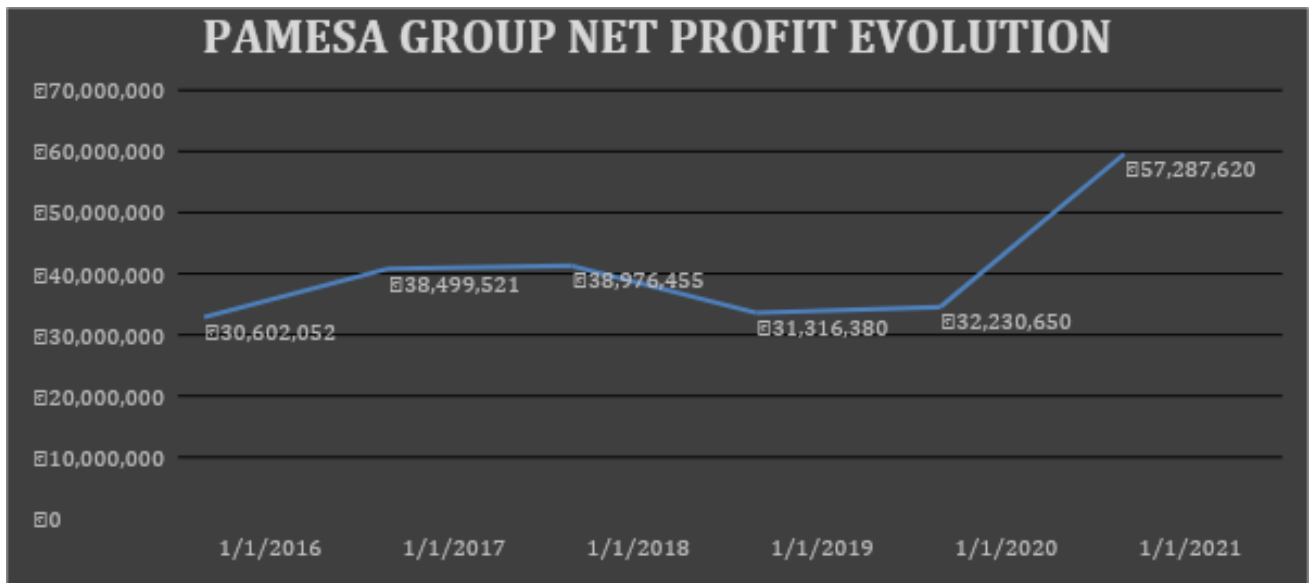
**TABLE 7: EVOLUTION OF SALES, not aggregated, of GRUPO PAMESA**



**Source: Own elaboration, data extracted from the commercial register, 2022.**

We can observe the same type of growth in sales over the years; it should be noted that these values do not exclude sales made between the companies that made up the group, so there may be a slight difference in net sales, as in the Azuliber Group.

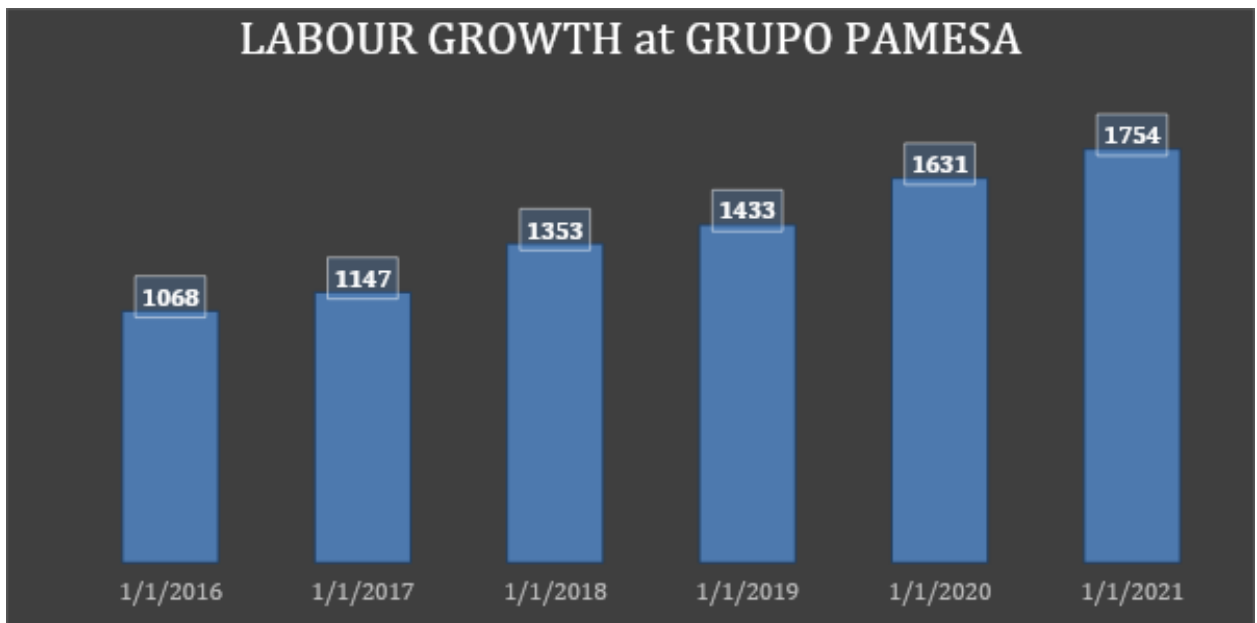
**TABLE 8: PAMESA GROUP NET PROFIT EVOLUTION**



Source: Own elaboration, data extracted from the commercial register, 2022.

We note how the group had also excelled in increasing profits almost constantly profits generated since the crisis of 2015, seeing this reflected in its continued expansion within the Castellon cluster, to mention that as the Azuliber Group also at the end of 2018 incurred a drop in profits, there was a smaller rebound in 2019 than compared to the rest but a much greater increase compared to any company in the cluster in 2020.

**TABLE 9: LABOUR GROWTH of the PAMESA GROUP**



Source: Own elaboration, data extracted from the commercial register, 2022.

The staff of the group has followed the same constant leadership since the beginning of its expansion within the cluster trying to adapt most of the workers of the absorbed companies, to emphasize, that having centralized the administrative functions in the main one of the group, most of the jobs that are maintained tend to focus on the factories and atomizers; thus maintaining as far as possible most of the employees working in the companies merged/absorbed by the group at the time of expansion.

## **7. CONCLUSION**

Throughout this work we have been investigating everything related to the term cluster, from its definition to its types, in turn, we have been able to learn more about their main characteristics, how they act, how they survive over the years, what are their greatest weaknesses, etc.; this has served as a thread for the main point of the work, the Pamesa-Azuliber merger in the context of the Castellón ceramic cluster.

We have classified the Castellón cluster throughout the different parts of the work, thus giving us an idea of what type of cluster we have in the province and what are the main benefits received by the companies that make it up, and that, therefore, maintain over the years the relationships formed within this business network.

As main conclusions we can explain the current situation of the ceramic cluster, based on the most important merger in recent years, such as Pamesa-Azuliber, from the point of view of the smaller group as in this case Azuliber group; the situation of the cluster is in a critical state in which companies are beginning to depend directly on being part of large business groups as is the case of Pamesa group and that group of similar sizes, although smaller in comparison, as was the case of Azuliber group have taken the decision to merge despite the facilities available within the Castellón cluster, a cluster, as we have already mentioned above, very consolidated, deeply rooted in the business fabric of the country, indicates the difficulties that companies in the ceramic sector and the Castellón cluster more specifically began to face.

As we have been able to observe in the evolution graphs of the two business groups, both started from a very advantageous situation compared to the rest of the participants in the cluster, as well as, they had a great power in the decision making of the sector and when negotiating agreements with the different links within the cluster and in spite of all this they were forced to merge between them to be able to maintain their constant growth against external competitors, mainly from outside the country, being able to equalize both their production power and their current level of sales.

To sum up, this brings us to a critical point within the Castellón cluster in which there is a very bad situation for SMEs, such as distributors, retailers, maintenance companies, etc.; thus forcing any company that wants to integrate into the cluster to be part of a larger group from the beginning, thus forcing the new members of the cluster to the decisions taken by the consolidated companies within it, which completely disadvantages the next stage of the cluster, which would be to evolve towards new business horizons, since if a company starts

to have a monopoly in the decision making that affects the rest of the links of the cluster it could trigger an internal instability and subsequently a disappearance of the rest of the companies and institutions within the cluster due to the lack of individual leadership added to a clear lack of ambition on the part of the majority of medium sized groups for fear of the dominant groups currently formed.

For my part I consider that there would be a great series of measures to take to favour the continuous growth of the cluster and to solve the problems that are arising to the current members of the cluster; as we have mentioned before the price increases in the main needs of the tile companies should begin to be regulated by the government or at least to subsidize the companies that are trying to adapt their technologies to the new needs, as well as, it should try to superimpose the companies in growth opposite to the dependence of a set of groups already consolidated inside the sector.

## **8.BIBLIOGRAPHY AND WEBGRAPHY REFERENCES**

**A.C.A Valencia** (2019). *Pamesa buys Keramex in its race for size*. Website:

<https://www.expansion.com/empresas/2019/08/13/5d51c9d6468aebd1278b46c2.html>

**Bolland, E.** (2021). *Pamesa buys Azuliber and moves to increase production by 3 million square meters*. Website:

<https://www.lavanguardia.com/local/valencia/20210904/7697882/pamesa-compra-azuliber-umentar-produccion-3-millones-metros-cuadrados.html>

**Báez, Á.** (2018). *US fund Avenue Capital buys the tile company Rocersa, weighed down by debt*. Website:

<https://valenciaplaza.com/el-fondo-norteamericano-avenue-capital-adquiere-la-totalidad-de-rocersa-lastrada-por-la-deuda>

**Báez, Á.** (2020). *Cranemere fund buys Acquabella and becomes world's leading shower tray manufacturer*. Website:

<https://castellonplaza.com/el-fondo-cranemere-compra-acquabella-y-pasa-a-ser-lider-mundial-en-fabricacion-de-platos-de-ducha>

**Brines, J.** (2021). *Italcer buys Equipe and creates a 220 million tile group*. Website:

<https://www.expansion.com/valencia/2021/03/04/603fd702468aeba30b8b461d.html>

**City A.M.** (2018). *London's tech cluster, the most important in Europe*. Website:

<https://www.icex.es/icex/es/navegacion-principal/todos-nuestros-servicios/informacion-de-mercados/paises/navegacion-principal/noticias/NEW2018797416.html?idPais=GB>

**Casado, R.** (2017). *Victoria buys Spanish tile maker Keraben for 274 million*. Website:

<https://www.expansion.com/valencia/2017/11/16/5a0d974a22601d5b2c8b463c.html>

**Cinco Días** (2017). *British Victoria buys Cerámica Saloni for 97 million*. Website:

[https://cincodias.elpais.com/cincodias/2018/08/06/companias/1533571981\\_186835.html](https://cincodias.elpais.com/cincodias/2018/08/06/companias/1533571981_186835.html)

**Cabrerizo, J.** (2021). *The 6 major operations in the Spanish ceramic cluster in 2021*. Website:

<https://www.elperiodicodelazulejo.es/industria/las-6-grandes-operaciones-en-el-cluster-ceramico-espanol-en-2021-CM69531>

**Dolz, L.** (2021). *The ceramic cluster and its value chain*. Website:

<https://www.diariodelpuerto.com/logistica/el-cluster-ceramico-y-su-cadena-de-valor-MBGD16236585346138360>

**Euronews** (2021). *The benefits of a cluster for companies*. Website:

<https://es.euronews.com/next/2021/03/12/los-beneficios-que-representa-un-cluster-para-las-empresas>



- Europa Press.** (2018). *Falcon Private Holdings acquires the firm Halcon Ceramics.* Website:  
<https://www.europapress.es/economia/noticia-falcon-private-holdings-adquiere-firma-halcon-ceramicas-20180904165309.html>
- El Mundo** (2021). *Altadia is born, a new business giant after the merger of Esmalglass-Itaca-Fritta and Ferro's ceramic division.* Website:  
<https://www.elmundo.es/comunidad-valenciana/castellon/2021/02/26/6038acf8fc6c83b6088b45a8.html>
- Europa Press.** (2021). *Grupo Halcón announces the acquisition of the industrial assets of Cicogres.* Website:  
[papress.es/economia/noticia-grupo-halcon-anuncia-adquisicion-activos-industriales-cicogres-20210702124910.html](https://www.europapress.es/economia/noticia-grupo-halcon-anuncia-adquisicion-activos-industriales-cicogres-20210702124910.html)
- El Periódico del azulejo** (2021). *Lamosa buys the Roca Group ceramics division, including Cerámicas Belcaire.* Website:  
<https://www.elperiodicodelazulejo.es/actualidad/lamosa-compra-la-division-ceramica-roca-grupo-incluida-ceramicas-belcaire-HH56161>
- E.M.** (2019). *Esmalglass buys Ferro for 412 million to position itself as a global ceramic market leader.* Website:  
<https://www.elmundo.es/comunidad-valenciana/castellon/2019/12/16/5df7be26fdddf2fb98b461c.html>
- Guerra, L.** (2010). *Life cycle of a cluster.* Website:  
<https://clusterizando.com/2010/09/05/ciclo-de-vida-de-un-cluster/>
- Gallego, N.** (2020). *Five clusters elaborate six key axes to reactivate the economy.* Website:  
<https://www.diariodeleon.es/articulo/castillayleon/clusters-elaboran-ejes-clave-reactivar-economia/202006230332242024317.html>
- Hernández, B.** (2014). *Most important clusters in the world.* Website:  
[MOST IMPORTANT CLUSTERS IN THE WORLD by Brahian Hernandez \(prezi.com\)](https://www.prezi.com/brhianhernandez/most-important-clusters-in-the-world/)
- Hervás Oliver, J. L.** (2021). *Ceramic Sector Report.* Website:  
[https://www.itc.uji.es/wp-content/uploads/2021/12/i4.0-Sector-Ceramico\\_Informe-2021\\_ITC-UPV.pdf](https://www.itc.uji.es/wp-content/uploads/2021/12/i4.0-Sector-Ceramico_Informe-2021_ITC-UPV.pdf)
- Idepa** (2018). *What is a cluster?* Website:  
<https://www.idepa.es/innovacion/clusteres/que-es-un-cluster>

- Llorens Castello, D.** (2017). *Managers take shareholder control azulev*. Website:  
<https://www.levante-emv.com/castello/2017/11/26/directivos-toman-control-accionarial-azulev-12117638.html>
- Manene Cerragería, L.M.** (2014). *Cluster: definition, objective, benefits and developments*. Website:  
<https://actualidadempresa.com/cluster-definicion-objetivo-beneficios-y-desarrollo/>
- Martí, S.** (2021). *Ceramic sector in danger of possible stoppages and cost overruns*. Web site:  
<https://economia3.com/2021/12/20/467829-sector-ceramico-en-peligro-posibles-parones-y-sobrecostes/>
- Mestre, J.** (2016). *Pamesa buys Tau and raises its weight in global tile*. Website:  
<https://www.levante-emv.com/economia/2016/05/13/pamesa-compra-tau-eleva-peso-12411142.html>
- Miura Partners** (2018). *Miura invests in Equipe Ceramicas to create the world leader in small format ceramics*. Website:  
<https://miura.partners/noticias/miura-invierte-en-equipe-ceramicas-para-crear-el-lider-mundial-de-pequeno-formato-ceramico/>
- de Nalda, M. L.** (2015). *Organizational reproduction and capability formation in the Castellón ceramics cluster: Genesis, Spinoffs and capability formation*. Website:  
<https://riunet.upv.es/bitstream/handle/10251/49560/LLEO%20-%20Reproducci%F3n%20organizativa%20y%20formaci%F3n%20de%20capacidades%20en%20el%20cluster%20de%20la%20cer%20mica%20de%20Caste....pdf?sequence=1>
- Olivares, R.** (2018). *Vidres shoots up its sales by 23% and triples its profits after taking over Colores Cerámicos*. Website:  
<https://castellonplaza.com/vidres-dispara-sus-ventas-un-23-y-triplica-sus-beneficios-tras-hacerse-con-colores-ceramicos>
- Olivares, R.** (2020). *Pamesa materializes the purchase of half of Argenta and Cifre after receiving the endorsement of Competition*. Website:  
<https://castellonplaza.com/pamesa-materializa-la-compra-de-la-mitad-de-argenta-y-cifre-tras-reecibir-el-aval-de-competencia>
- Olivares, R.** (2021). *Pamesa signs the purchase of the Azuliber group and adds 36 million m2 of tiles per year*. Web site:  
<https://castellonplaza.com/pamesa-firma-la-compra-del-grupo-azuliber-y-suma-36-millones-de-m2-anuales-de-azulejo>
- Olivares, R.** (2021). *The ceramic cluster*. Website:

<https://castellonplaza.com/el-cluster-ceramico-5500-millones-de-facturacion-el-8-de-la-produccion-industrial-de-la-comunitat>

**Olivares, R.** (2022). *The tile facing a new challenge changes formulas and buscaminas to replace the Ukrainian clay.* Website:

<https://castellonplaza.com/el-azulejo-ante-un-nuevo-reto-cambia-formulas-y-busca-minas-para-sustituir-la-arcilla-ucraniana>

**Planelles Aragó, J.** (2021). *The raw materials crisis impacted globally and on the ceramic industry.* Website:

<https://www.elperiodicodelazulejo.es/industria/la-crisis-de-las-materias-primas-impacto-global-y-sobre-la-industria-ceramica-CB102411>

**Prego, C.** (2020). *Paris-Saclay: France's race to create its own MIT and Silicon Valley in the heart of Europe.* Website:

<https://www.xataka.com/xataka/paris-saclay-carrera-francia-crear-su-propio-mit-silicon-valley-corazon-europa>

**Romero, V.** (2021). *The ceramic cluster does not see hydrogen as competitive until 2050 and asks the EU for a fiscal margin.* Website:

[The ceramic cluster does not see hydrogen competitive until 2050 and asks for fiscal margin to the EU \(elconfidencial.com\)](https://www.elconfidencial.com/tecnologia/energia/2021-09-15/cluster-ceramica-hidrogeno-2050-eu-margen-fiscal_102411)

**Romero, M.** (2020). *SWOT analysis of the ceramic sector after the COVID 19 crisis.* Website:

<https://www.observatoriomercado.es/analisis-dafo-del-sector-ceramico-tras-crisis-de-la-covid-19/>

**Ribes, B.** (2021). *Pamesa buys Azuliber and provides its ceramic leadership.* Website:

<https://www.elmundo.es/comunidad-valenciana/castellon/2021/09/01/612f4ac2e4d4d83e748b458e.html>

**Ramos, A.** (2011). *Problems and disappointments in clustering.* Web site:

<https://clusterizando.com/2011/10/16/problemas-y-decepciones-en-la-clusterizacion/>

**Ramos, A.** (2010). *Obstacles to clustering.* Web site:

<https://clusterizando.com/2010/08/08/obstaculos-a-la-clusterizacion/>

**Ribés, B.** (2017). *Multinational Ferro buys Endeka Group for 64 million euros.* Website:

<https://www.elmundo.es/comunidad-valenciana/castellon/2017/11/13/5a095a0ae2704edf318b462c.html>

**Romero, V.** (2017). *Lone Star breaks into the ceramics sector with 606 million purchase of Esmalglass.* Website:

[https://www.elconfidencial.com/espana/comunidad-valenciana/2017-07-13/lone-star-compra-esmalglass-irrumpe-sector-ceramico-en-espana\\_1414461/](https://www.elconfidencial.com/espana/comunidad-valenciana/2017-07-13/lone-star-compra-esmalglass-irrumpe-sector-ceramico-en-espana_1414461/)

**Ribes, B.** (2017). *The company that owns Grespania buys the atomizer NPC*. Website:

<https://www.elmundo.es/comunidad-valenciana/castellon/2017/01/03/586b6ddcca474114738b45e5.html>

**Ribés, B.** (2020). *Azuliber buys MYR Cerámica to gain competitiveness*. Website:

<https://www.elmundo.es/comunidad-valenciana/castellon/2020/02/07/5e3d222d21efa02a358b465d.html>

**Redacción E3** (2021). *Pamesa Group buys PLP and increases its polishing capacity by 27%*.

Website:

<https://economia3.com/2021/03/03/331725-grupo-pamesa-compra-plp-y-aumenta-su-capacidad-de-pulido-en-un-27/>

**Sanfeliu, A. R.** (2021). *Cluster*. Web site:

<https://www.elmundo.es/comunidad-valenciana/castellon/2021/11/18/6196d087fc6c83ed338b4571.html>

**UJI** (2013). *The ceramic sector shows that clusters favour commercial and technological exchange*.

Website:

<https://www.agenciasinc.es/Noticias/El-sector-ceramico-demuestra-como-los-clusters-favorecen-el-intercambio-comercial-y-tecnologico>

**Vigilancer** (2021). *Acquisitions and business concentration in the ceramic cluster*. Website:

[Acquisitions and business concentration in the ceramic cluster: Retrospective analysis of the evolution experienced in the sector - Vigilancer](#)

**Vigilancer** (2021). *Major M&A transactions in the ceramic sector*. Website:

<https://www.vigilancer.es/wp-content/uploads/2021/09/Principales-operaciones-MA-del-sector-ceramico.pdf>

**X. Prera** (2018). *Ferro takes over Quimicer and completes its second acquisition in less than a year*.

Website:

<https://www.elperiodicomediterraneo.com/empresa/2018/07/29/ferro-quimicer-completa-segunda-compra-41286879.html>

