

# VILA NOVA DE CERVEIRA

# VILA NOVA DE CERVEIRA

Plano de Ação para a Sustentabilidade Energética

*executive summary*

## PREAMBLE

The human presence in the territory that currently makes up the county of Vila Nova de Cerveira dates back to prehistoric times - it is possible to find, in the county, several and diverse vestiges that confirm this occupation. Its castle and fortress, initially build for defensive purposes, are now part of Vila Nova de Cerveira's historical heritage, alongside with its pillory and parish church. Manor houses attest Vila Nova de Cerveira's importance and economic status over the centuries and enrich the idyllic natural environment of the county.

Commonly known as the "Village of the Arts", Vila Nova de Cerveira is also famous for its international biennial of art which attracts entrepreneurs, renowned artists and creators as well as several visitors, both national and international.

Despite its recent industrial development, Vila Nova de Cerveira remains predominantly rural.

Its beautiful landscapes and its cultural, human and gastronomic heritage make Vila Nova de Cerveira unique both in the Iberian and European context.

The sensitivity for the "environmental" cause and the willingness to promote a simultaneously sustained and sustainable development are notorious and have driven the activities of the local authorities. Aware of the role it plays and its responsibility towards the people of Vila Nova de Cerveira, either as actor or as a model-entity and motivator, the municipality of Vila Nova de Cerveira decided to accept the challenge launched by the European Commission and, at its February 25<sup>th</sup> 2011 meeting, decided to endorse the Covenant of Mayors, committing itself to:

- go beyond the objectives set by the EU for 2020, reducing the CO<sub>2</sub> emissions in our respective territories by at least 20%;
- submit a Sustainable Energy Action Plan including a baseline emission inventory which outlines how the objectives will be reached;
- submit an implementation report at least every second year following the submission of the Action Plan for evaluation, monitoring and verification purposes;
- organise Energy Days or City Covenant Days, in co-operation with the European Commission and with other stakeholders, allowing citizens to benefit directly from the opportunities and advantages offered by a more intelligent use of energy, and to regularly inform the local media on developments concerning the action plan;
- attend the annual European Union Conference of Mayors, giving its contribution.

Accordingly, Vila Nova de Cerveira has promoted a series of actions that have culminated in the drafting and approval of this document - entitled "Plano de Ação para a Sustentabilidade Energética de Vila Nova de Cerveira". In terms of content, this action plan makes a brief description of the county of Vila Nova de Cerveira, characterizes its energy consumption and production and indicates a set of actions/measures whose implementation will lead to the progressive CO<sub>2</sub> emissions reduction and, subsequently, to the improvement of Vila Nova de Cerveira's energy and environmental performance.

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## Overall strategy

### Plan content and structure

The “Plano de Ação para a Sustentabilidade Energética de Vila Nova de Cerveira” (hereinafter referred to by PASE\_VNC) is a strategic document that shows how Vila Nova de Cerveira will honour the commitment of reducing its CO<sub>2</sub> emissions assumed by the municipality upon accession to the European initiative 'Covenant of Mayors ', in 25<sup>th</sup> of February 2011.

With a geographic scope of action of 108.5 km<sup>2</sup> and having the year 2008 as reference, the PASE\_VNC is an instrument of the outmost importance for improving the energy and environmental performance of Vila Nova de Cerveira. Being based on a thorough research and data treatment - that culminated in the drafting of the "Inventário de Referência das Emissões de Vila Nova de Cerveira" (hereinafter referred to by IRE\_VNC) - the PASE\_VNC gathers and systematizes a set of measures and actions whose implementation will result in 2020, a reduction in CO<sub>2</sub> emissions of around 20%. Because it is a plan for the whole territory, the PASE\_VNC includes:

- measures that rely entirely on the internal responsibility of the City Hall of Vila Nova de Cerveira (from now on referred to by MVNC) or that can be implemented by entities participated by the MVNC;
- measures in whose implementation the MVNC has no intervention on, despite their contribution to the objectives set.

The structure of this document is as described in Table 1.

Table 1 - Structure of the document and a brief description of its contents.

Chapter	Subchapter	Contents
Territorial framework	-	Brief characterization of the county of Vila Nova de Cerveira both geographical and statistical.
Covenant of Mayors _ context and opportunity	Current context and vision for the future	Presentation of the vision for the county of Vila Nova de Cerveira in 2020 and of the reasons for the accession to the initiative 'Covenant of Mayors'.
	Organisational aspects	Description of the methodology adopted for the preparation of both the IRE_VNC and the PASE_VNC. Particular emphasis is given to the structure and 'modus operandi' of the technical team and to the procedures adopted in order to assure the involvement of both stakeholders and citizens.
Current context and vision for the future	Synthesis of the diagnosis	Specification of: the provenance of the data used; the assumptions made and the calculation methods used for the preparation of the IRE_VNC. Moreover, characterization of both energy consumption and associated CO <sub>2</sub> emissions referring to 2008 (baseline year selected) and to Vila Nova de Cerveira.
	Towards 2020	Portray of both macro and local framework of the PASE_VNC. Description of the strategy that will enable the county of Vila Nova de Cerveira to meet the desired targets of CO <sub>2</sub> emissions (among other information, it is specified: which measures and actions need implementing; who are those responsible for their implementation; which sources of funding are available for planned investments and how Vila Nova de Cerveira will monitor and evaluate the implementation of the PASE_VNC).
Conclusions	-	Brief summary of the main conclusions of the PASE_VNC and of the IRE_VNC.
References and sources of information	-	List of the sources of information consulted in the preparation of both the IRE_VNC and the PASE_VNC.

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Still regarding IRE\_VNC and PASE\_VNC contents it is important to refer that, on their preparation, sources of CO<sub>2</sub> emissions other than those solely and exclusively related with the use and/or processing of energy, weren't taken into account, neither was considered the potential contribution of sinks of CO<sub>2</sub> or of other greenhouse gases (GHG).

A further comment to refer that, in the drafting of the IRE\_VNC and of the PASE\_VNC, it was taken into account the content of the various supporting documents to the implementation of the initiative 'Covenant of Mayors' by the signatories, produced by the Secretariat of the Covenant of Mayors, in particular the information necessary to fill in the "SEAP template". Accordingly it should be noted that the PASE\_VNC has the year 2020 as time horizon and was structured taking into account the following sectors and subsectors:

- BUILDINGS, EQUIPMENTS / FACILITIES & INDUSTRIES  
*"Municipal buildings, equipment/facilities"; "Tertiary (non municipal) buildings, equipment/facilities"; "Industry"; "Residential buildings"; "Municipal public lighting"*
- TRANSPORT  
*"Municipal fleet"; "Private and commercial transport"*
- LAND USE PLANNING  
*"Strategic urban planning"; "Transport/mobility planning"; "Standards for refurbishment and new development"*
- PUBLIC PROCUREMENT OF PRODUCTS AND SERVICES  
*"Energy efficiency requirements/standards"*
- WORKING WITH CITIZENS AND LOCAL ACTORS  
*"Advisory services"; "Awareness raising and local networking"; "Training and Education".*

### Objective(s) and Targets

As previously mentioned, through the implementation of the PASE\_VNC, Vila Nova de Cerveira aims to reduce its CO<sub>2</sub> emissions to 20% below the 2008 level, by the year 2020.

### Current framework and vision for the future

Environment has been regarded, for quite some time, as a priority by the municipality of Vila Nova de Cerveira. In Vila Nova de Cerveira, it is noticeable a well-organized and a long term effort on behalf of both the recovery and preservation of the territory's natural heritage and the improvement of municipal networks - from sewerage, to water supply and to footpaths, for example. Continuing its strategic work and aspiring to do more and to improve the quality of the service provided, on December 15<sup>th</sup> 2006, the Municipality of Vila Nova de Cerveira subscribed the so-called Aalborg Commitments – beginning the process of drafting the county's "Agenda Local 21".

Regarding Energy and despite the fact that, for obvious reasons, energy consumption is, and has been for quite some time, a major concern of the municipality, only now was it possible to define an integrated and concerted action strategy, guided by an accurate diagnosis, which deals solely and exclusively with energy issues and aims to reduce the county's energy consumption (with the subsequent effects on climate change).

Being aware of its role in mitigating the effects on the climate change, the municipality of Vila Nova de Cerveira decided, at its February 25<sup>th</sup> 2011 meeting, to accept the European challenge and to sign the Covenant of Mayors. As a corollary of this act, Vila Nova de Cerveira committed itself, like its European counterparts, to:

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- go beyond the objectives set by the EU for 2020, reducing the CO<sub>2</sub> emissions in its respective territory by at least 20%;
- submit a Sustainable Energy Action Plan including a baseline emission inventory which outlines how the objectives will be reached, within one year of the adhesion date;
- submit an implementation report at least every second year following the submission of the Action Plan for evaluation, monitoring and verification purposes;
- organise Energy Days or City Covenant Days, in co-operation with the European Commission and with other stakeholders, allowing citizens to benefit directly from the opportunities and advantages offered by a more intelligent use of energy, and to regularly inform the local media on developments concerning the action plan;
- attend and contribute to the annual EU Conference of Mayors for a Sustainable Energy Europe.

Promoting energy efficiency and the use of renewable energy resources thus became understood as fundamental, aiming Vila Nova de Cerveira at *“being, in 2020, a model county in terms of energy, where the sustainable use of energy resources guide the performance, drive innovation, quality, attractiveness and competitiveness of both territory and entities there based, and enhance the quality of life of all those resident”*.

## Organizational and financial aspects

### Coordination and organisational structures created/assigned

Given its profile and experience, the municipality of Vila Nova de Cerveira took over the coordination of the initiative 'Covenant of Mayors' and carried out all the necessary procedures in order to obtain information on energy consumption and production, as well as to involve different sectors of activity in the development of both the IRE\_VNC and the PASE\_VNC.

### Staff capacity allocated

Aiming to ensure: all technical support; the production of all documentation and the organization of all necessary activities, and thus, ensure compliance with the targets set by Vila Nova de Cerveira upon the adhesion to the Covenant of Mayors' initiative a technical and multidisciplinary team was formed. It comprised the following institutions and elements:

- Municipality of Vila Nova de Cerveira – were allocated to the initiative 'Covenant of Mayors' three elements, one of which the municipality's vice-president;
- Agência Regional de Energia e Ambiente do Alto Minho (AREA Alto Minho) – two elements of this energy agency collaborated with the Municipality of Vila Nova de Cerveira.

This technical team met as often as necessary in order to: define a joint action strategy; allocate responsibilities at each stage of the process; set targets and timings for implementation, assess obtained results and introduce adjustments whenever needed.

Furthermore, there was an involvement of the municipality of Vila Nova de Cerveira at three distinct stages of the process, namely: adhesion to the Covenant of Mayors (on February 25<sup>th</sup>, 2011); consolidation of the action plan and formal approval of the PASE\_VNC (on August 8<sup>th</sup>, 2012).

### Involvement of stakeholders and citizens

During the first year of adhesion, in addition to the municipality's employees, citizens and stakeholders <sup>1</sup> were involved.

In order to inform, both citizens and stakeholders, about the commitments made by Vila Nova de Cerveira in the ambit of the Covenant of Mayors a set of information was produced and made available. Information and awareness sessions were also organized aiming to: present this European initiative; explain the Covenant of Mayors' implications and to collect contributions from the stakeholders and citizens present

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<sup>1</sup> For PAES\_VNC purposes, stakeholders are an array of local and regional actors considered by the municipality to be “strategically important”.

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for the IRE\_VNC and the PASE\_VNC. Subsequently, it was established a direct and individualized contact with some strategic stakeholders, aiming to gather more detailed information for the elaboration of the action plan. Thus, the PASE\_VNC was the result of fairly participated consultation process enriched by the contributions given by various entities among which: restaurants; commercial establishments; hotels; Manufacturers of textiles; Manufacturers of food products; Manufacturers of fabricated metal products, except machinery and equipment; Manufacturers of motor vehicles, trailers and semi-trailers; Repairers and installers of machinery and equipment; Parish Councils; local mass media, among others.

Additionally, in order to mobilize citizens and institutions and to encourage the implementation of “environmentally friendly” solutions, several and diverse initiatives were promoted. For their contribution to the objectives of the PASE\_VNC, emphasis should be given to: the placement of information alluding to the Covenant of Mayors on the municipality’s official website; the publication of several news both on the municipality’s official website <sup>2</sup> and on local press and organization of awareness raising activities (namely those encouraging pedestrianism and cycling).

### Foreseen financing sources for the investments within your action plan

Considering the measures within the PASE\_VNC and given the specific financial instruments presently available, it can be foreseen that the annual public funding sources will be the Energy Efficiency Fund (FEE) and the funds to be allocated through the National Strategic Reference Framework (QREN). As far as private investment is concerned, the annual sources of funding may arise from incentives systems and from the Plan for Promoting Efficiency in Consumption (PPEC).

On the other hand, the JESSICA initiative (Joint European Support for Sustainable Investment in City Areas) and the ELENA Program (European Energy Local Assistance) could also support the implementation of some of the actions recommended in the PASE\_VNC.

Finally and although not being, in itself, a source of funding, it must be pointed out the contribution that is to be expected from energy service companies (ESCOs) for the implementation of the PASE\_VNC. At present, following the publication of the Council of Ministers Resolution No. 2 / 2011 of 01.12.2011, it is possible to hire energy service companies (ESCOs) to implement measures that lead to the improvement of energy efficiency in public buildings and equipments allocated to the provision of public services. Therefore, given the current Portuguese economic and financial situation, it is likely that such contracts may be celebrated in order to finance some of the investments within the PASE\_VNC.

### Planned measures for monitoring and follow-up

As previously mentioned (see the content of the item “Staff capacity allocated”), some resources were allocated to the preparation of the IRE\_VNC and of the PASE\_VNC, by the municipality of Vila Nova de Cerveira and by AREA Alto Minho. Among other tasks, these entities collected, processed and systematized a great set of information on the consumption of various energy vectors and its consumers as well as on energy production and its producers. Furthermore, these entities: promoted and participated in information and awareness sessions; produced and disseminated information concerning the initiative Covenant of Mayors; compiled and systematized the various contributions, from various sectors, for the PASE\_VNC. They are, therefore, motivated and familiar with the requirements of the Covenant of Mayors and with the commitments made. Therefore, it is expected that these same resources become involved in the tracking, monitoring and evaluation of the implementation of the PASE\_VNC.

From an operational standpoint, the implementation of the PASE\_VNC will be monitored and an implementation report will be submitted, at least every second year following the submission of the Action Plan, for evaluation, monitoring and verification purposes. To achieve this, a network of information exchange will be established and a “Centre for energy and environmental sustainability of the county of Vila Nova de Cerveira” will be created.

Since the implementation of PASE\_VNC is essentially an interactive and joint process, it is expected that the reports and conclusions arising from its monitoring will be disclosed and discussed with all partners from

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<sup>2</sup> [http://www.cm-vncerveira.pt/portal/page/vilanovadecerveira/portal\\_municipal/noticias](http://www.cm-vncerveira.pt/portal/page/vilanovadecerveira/portal_municipal/noticias), for example.

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different sectors and with the Vila Nova de Cerveira's citizens, thus becoming a means to assess the degree of compliance, to promote discussion and to improve the PASE\_VNC's execution. The municipality of Vila Nova de Cerveira through its website and other communication tools at its disposal will assure the compilation and dissemination of obtained results.

Regarding municipal energy consumption and production – i.e. those associated with the “Municipal buildings, equipment/facilities” and “Municipal Fleet” - the monitoring of the measures/actions within the PASE\_VNC will be carried out by some of the elements of Vila Nova de Cerveira's covenant of mayors' technical team. In order to meet all the necessary requirements, to the standards and procedures already implemented in the municipality of Vila Nova de Cerveira adjustments will be introduced and issues related to the monitoring and implementation of the PASE\_VNC will be incorporated.

Finally, it should be noted that the PASE\_VNC:

- is a medium-long term plan;
- involves a broad number and a wide variety of players;
- is based on a set of assumptions that are likely to change from now until 2020,

therefore, it may be necessary to make some alterations to its content in order to adjust it to the different realities that might arise during the course of its implementation. The opportunity to apply corrective actions should be systematic and always aim to improve and not just be an expression for the correction of deviations or errors, may they be motivated by a lack of information or the natural changes that occur in the society, whose nature may be technological, structural or economic.



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## Baseline Emission Inventory

According to the SEAP template instructions, statistical data was gathered, processed and then allocated to the following categories and subcategories:

- “Buildings, equipment/facilities and industries”: “Municipal buildings and equipment/facilities”; “Tertiary (non municipal) buildings, equipment/facilities”; “Residential buildings”; “Industry”; “Municipal public lighting”;
- Transport: “Municipal fleet”; “Public transport”; “Private and commercial transport”.

## Synthesis of the Diagnosis

The IRE\_VNC is a prerequisite to the development of PASE\_VNC. In this document and according to the content of the supporting documents produced by the Secretariat of the Covenant of Mayors, both energy production and consumption should be characterized for a given baseline year. However, due to lack of complete, official and reliable statistical information which allow to determine and characterize Vila Nova de Cerveira 2008<sup>th</sup> “energy production” it was only possible to incorporate on the IRE\_VNC the information alluding to “energy consumption”.

Because it integrates a large set of quantitative information, alluding both to the energy consumption and to its associated CO<sub>2</sub> emissions, specified by energy carrier and by category of consumption, the IRE\_VNC allows, on one hand to identify the nature of the issuers of CO<sub>2</sub> and, on the other, to adjust to Vila Nova de Cerveira a strategic plan which aims to improve this territory’s energy and environmental performance. In the future, IRE\_VNC will be an instrument of paramount importance assessing both the implementation of the PASE\_VNC as well as the effectiveness of measures adopted.

## Methodology

In order to maximize the reliability of the IRE\_VNC, official statistical information, published by DGEG, was used whenever possible. In the case of the municipal energy consumption – i.e. that associated with “Municipal buildings, equipment/facilities” and “Municipal fleet” - were considered those concerning the operation of the local authority itself and the consumption values were obtained through interpretation of the various invoices related to the energy consumption incurred in the year 2008<sup>3</sup>. Thus, it was processed the information listed in Table 2.

Table 2 – List of the information processed and its origin.

Designation	Indicator used	Period	Source of the information
Electricity	Electricity consumption (kWh) by type	2008	DGEG
	Electricity consumption (kWh) by business sector	1994-2008	DGEG
	-	2008	MVNC (EDP invoices)
Fossil Fuel	Fuel Consumption (tonnes)	1990-2008	DGEG
	Sales of liquid and gaseous fuels (tonnes) by location and type of fuel	1990-2008	INE
	Sales of Petroleum Products in the Internal Market by Sector and Economic Activity County in 2008 (t)	2008	MVNC (suppliers invoices)
	-	2008	MVNC (suppliers invoices)

The data was processed for each energy carrier and four types of analysis were promoted, namely:

- evolutionary analysis of the consumption in the county of Vila Nova de Cerveira for the time series of available data;

<sup>3</sup> 2008 was the chosen baseline year for the inventory, being this the closest year to 1990 for which the most comprehensive and reliable data could be collected.

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- percentage distribution of the consumption in 2008 in the county of Vila Nova de Cerveira by sector of economic activity;
- percentage distribution of the consumption in 2008 in the county of Vila Nova de Cerveira by category;
- disaggregation of energy consumption registered and of its associated CO<sub>2</sub> emissions, for 2008 in the county of Vila Nova de Cerveira, by category.

It's important to state that:

- for the conversion of the various units of measure available to MWh, were used the conversion factors and net calorific values available on the website of DGEG;
- for calculating CO<sub>2</sub> emissions, it was used, whenever possible, emission factors contained in the "Technical Annex to the SEAP template instructions document: the emission factors" - when unavailable, were used those contained in Order No. 17313/2008 of June 26.

Concerning the activity sectors considered on the preparation of the IRE\_MNC and, subsequently, the PASE\_VNC, and given the freedom which is given to the Covenant of Mayors' signatories to include or exclude "Industry", Vila Nova de Cerveira chose to include it. It should however be referred that the criteria used to select which sectors of activity correspond to the category "Industry" was, in essence, the one used by INE in preparing the "Contas Nacionais" (namely the "E.6.2 Contas da Energia" of the "E.6 Contas Satélite do Ambiente"). Thus, the statistical sections / divisions processed are those listed in Table 3.

Table 3 - List of sectors included in the analysis of the IRE\_VNC and the PASE\_VNC

Section	Designation	Section /division relationship
A	Agriculture, forestry and fishing	01+02+03
B	Mining and quarrying	08
C	Manufacturing	10+13+14+16+20+22+23+24+25+27+28+29+30+31+32
D	Electricity, gas, steam and air conditioning supply	35
E	Water supply; sewerage, waste management and remediation activities	36+38
F	Construction	41+42+43
G	Wholesale and retail trade, repair of motor vehicles and motorcycles	45+46+47
H	Transportation and storage	49+50+52
I	Accommodation and food service activities	55+56
J	Information and communication	58+59+60+61+62
K	Financial and insurance activities	64+65+66
L	Real estate activities	68
N	Administrative and support service activities	81+82
O	Public administration and defence; compulsory social security	84
P	Education	85
Q	Human health and social work activities	86+87+88
R	Arts, entertainment and recreation	90+91+93
S	Other service activities	94+96
T	Activities of households as employers; undifferentiated goods – and services – producing activities of households for own use	98
U	Activities of extraterritorial organizations and bodies	99

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Thus:

- on the analysis carried out and wherever possible, in addition to being considered the total consumption was considered the partial consumption (resulting on the deduction of the “Industry” consumption);
- on the disaggregated consumption analysis - either by sector or by category - was processed the total consumption (i.e. data related to “Industry” was included).

### Consumption and Emissions

#### Electricity

The graph in Figure 1 reflects the evolution of the electricity consumption registered in the county of Vila Nova de Cerveira.

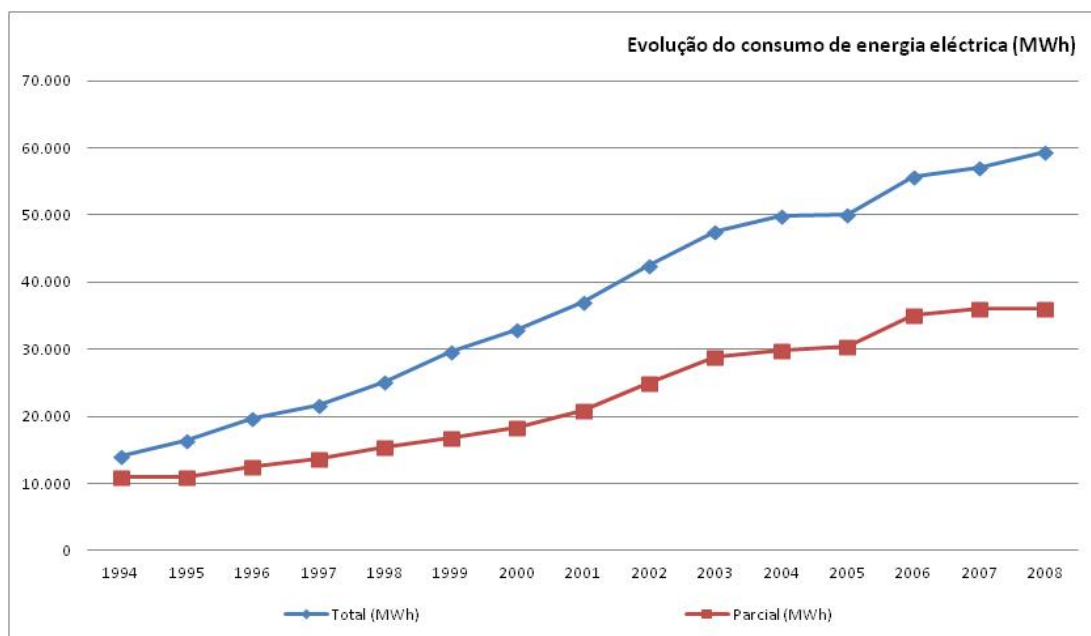


Figure 1 - Evolution of electricity consumption in Vila Nova de Cerveira (total and partial).

(Source: <http://www.dgeg.pt>)

Through analysis of the graph in Figure 1 it can be concluded that the total electricity consumption in the county of Vila Nova de Cerveira steadily increased until 2008 - year which registered the highest consumption level of this energy carrier. Moreover, comparing total and partial values one can perceive that the evolutionary trend is analogous.

Once split the total consumption of electricity by sector of activity, the graph in Figure 2 is obtained.

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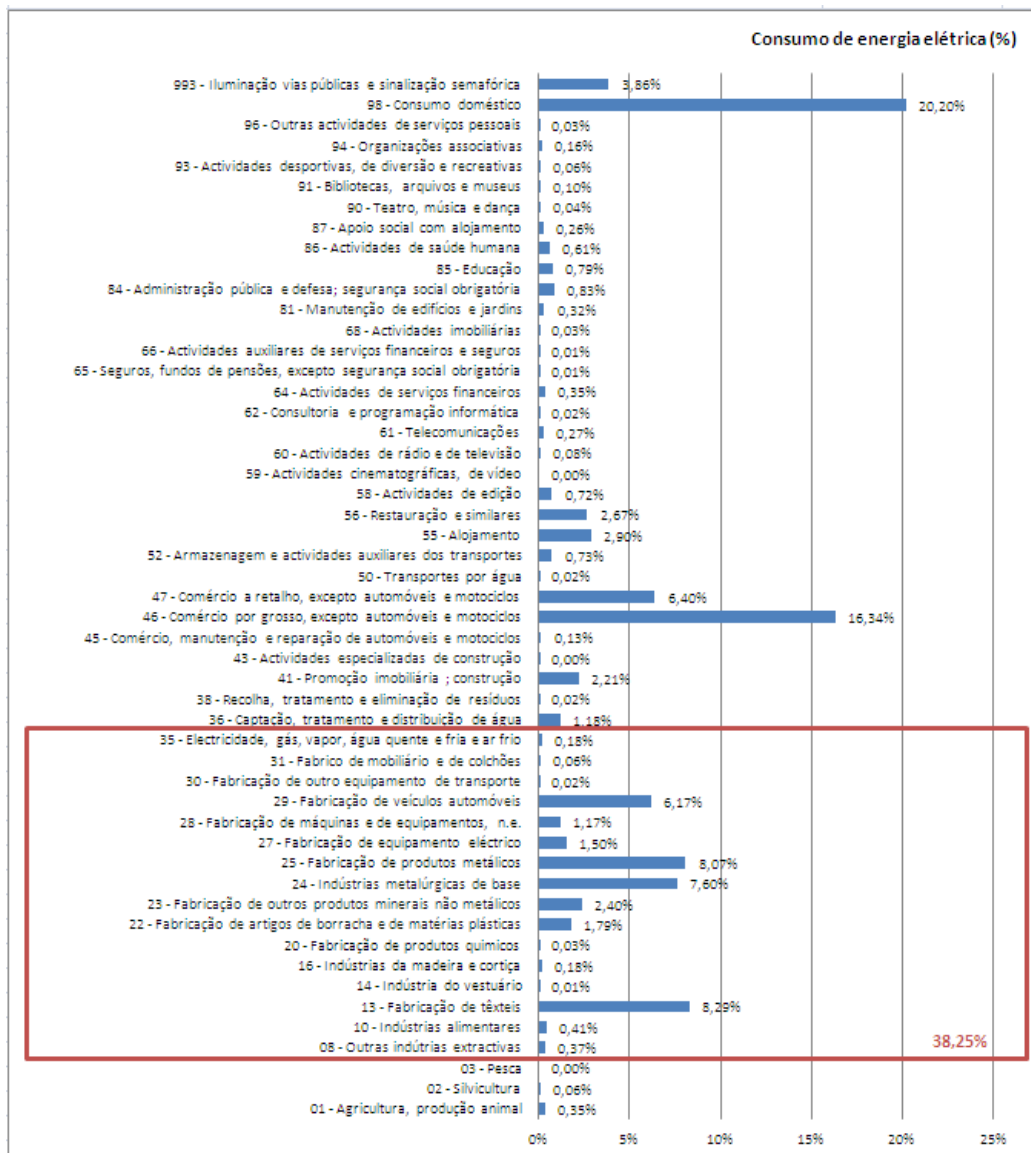


Figure 2 - Distribution of electricity consumption percentage by sector of economic activity.

Comparing each sector's energy consumption, it is possible to perceive that in Vila Nova de Cerveira in 2008 the sector which registered the highest values was "98 - Undifferentiated goods- and services-producing activities of private households for own use"; followed by "46 - Wholesale trade, except of motor vehicles and motorcycles" and then by "13 - Manufacture of textiles" - with percentages of 20.20, 16.34 and 8.29%, respectively.

Splitting the consumption values for the energy carrier in question and for the year 2008 by category yields the following percentage distribution (see graph in Figure 3).

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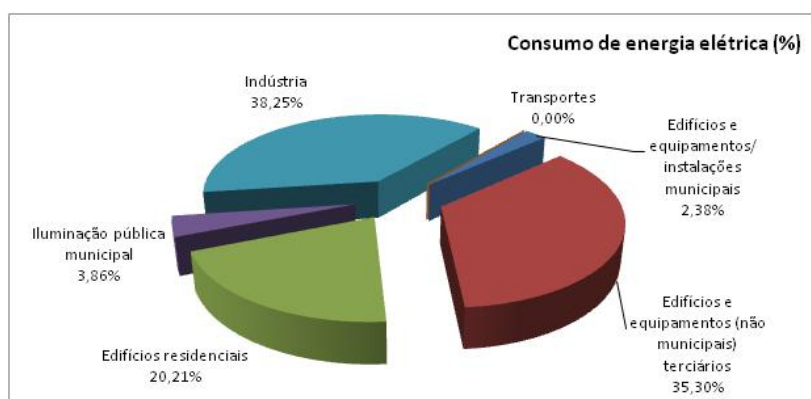


Figure 3 - Disaggregation of electricity consumption, registered in 2008 and in Vila Nova de Cerveira, by category.

As expected, 38.25% of the electricity consumption registered in the county of Vila Nova de Cerveira in 2008 corresponds to the category “Industry”. It should be stated that the percentage of the category “Municipal public lighting” is greater than that concerning the “Municipal buildings, equipment/facilities” – 3.86 and 2.38% respectively.

Table 4 summarizes the disaggregation, by category, of the registered electricity consumption and its associated CO<sub>2</sub> emissions.

Table 4 - Final energy consumption and its associated CO<sub>2</sub> emissions, for the energy carrier 'electricity', disaggregated by category.

Category	Final Energy Consumption (MWh)	CO <sub>2</sub> Emissions (t)
Municipal buildings and equipment/facilities	1415.46	522.30
Tertiary (non municipal) buildings, equipment/facilities	21004.54	7750.68
Residential buildings	12025.91	4437.56
Municipal public lighting	2298.71	848.22
Industry	22758.54	8397.90
Transport	0.00	0.00

A further comment to reference that, in determining the CO<sub>2</sub> emissions associated with energy carrier 'electricity', the emission factor used was 0.369 t CO<sub>2</sub>/MWh.

#### Natural Gas

In 2008 there was no natural gas consumption in the county of Vila Nova de Cerveira, therefore, for the year in question and for this county, the CO<sub>2</sub> emissions associated with the use of this energy carrier are non-existent.

#### Fossil fuels

In the particular case of fossil fuels, it should be noted that once crossed the information available on the websites of DGEG and of INE, the values for the indicators “Fuel Consumption by Municipality (tonnes)” and “Sales of liquid and gas (tonnes) of the companies by location and type of fuel” are equal, so it can be inferred that those institutions have considered, for statistics purposes, that:

- all the fuel acquired in Vila Nova de Cerveira was consumed in Vila Nova de Cerveira;
- all the fuel consumed in Vila Nova de Cerveira was acquired in Vila Nova de Cerveira.

Although this does not reflect necessarily the reality of Vila Nova de Cerveira, in the absence of other reliable information - which allowed a more rigorous way to measure the real consumption of this energy

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carrier and allocate it to the various sectors - in order to prepare the IRE\_VNC was used the data corresponding to "Fuel Consumption by Municipality - 2008", from DGEG.

The graph in Figure 4 reflects the evolution of fuel consumption, total and disaggregated by fuel, registered in the county of Vila Nova de Cerveira in the period 1990-2008.

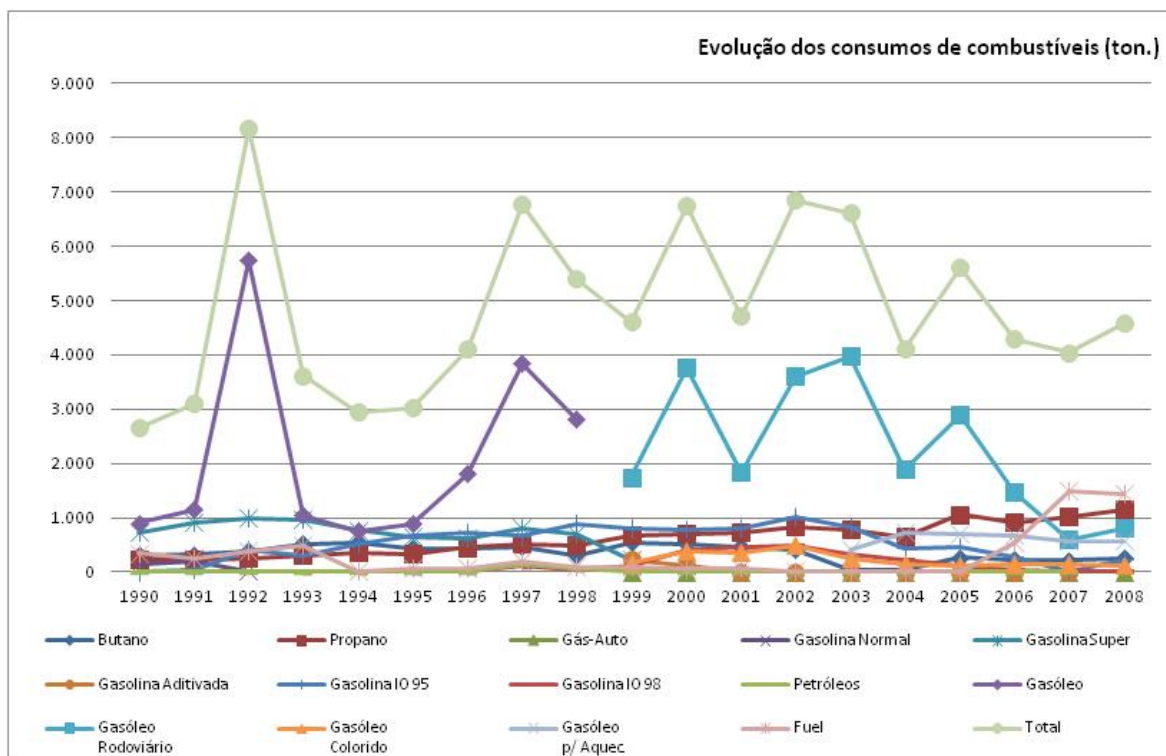


Figure 4 - Evolution of fossil fuels consumption registered in the county of Vila Nova de Cerveira (total and disaggregated by type of fuel.)

(Source: <http://www.dgeg.pt>)

The analysis of the information in the graph in Figure 4 shows that:

- there is a significant variation in the consumption of petroleum products during the period 1990-2008;
- the year which registered the highest consumption of fossil fuels (liquid and solid) was 1992, followed by 2002 and after 1997;
- with the exception of the years 2007 and 2008, the most consumed fuel in Vila Nova de Cerveira was "diesel";
- the oscillation registered on the total fossil fuel consumption was mainly driven by the variations which occurred in the consumption of diesel fuel - maximum and minimum peaks corresponding, respectively, to the years 1992 and 1994;
- an exponential increase in sales of "thick fuel oil" during the period 2005-2007;
- in the years 2007 and 2008, the most consumed fuel in Vila Nova de Cerveira was "thick fuel oil".

Proceeding to the percentage breakdown of the amount of fossil fuels sold in Vila Nova de Cerveira in 2008 it is noticeable, as would be expected, the predominance of "thick fuel oil" sales, followed by "propane" and "diesel", with percentages of, respectively, 29.41; 27.18 and 17.55% (as confirmed by Figure 5).

# VILA NOVA DE CERVEIRA

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*executive summary*

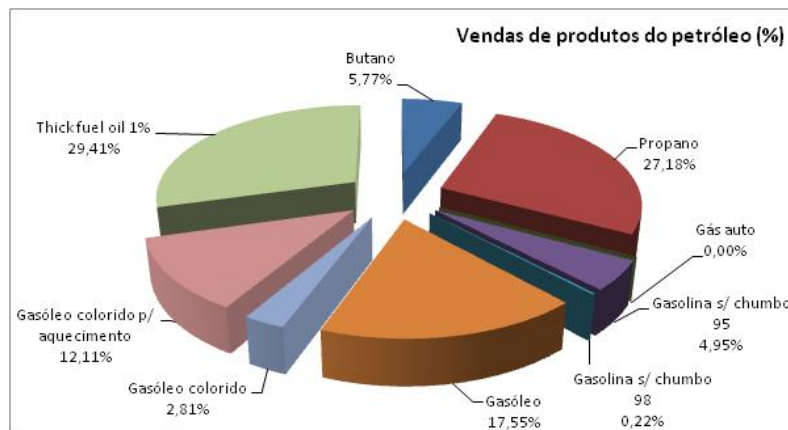


Figure 5 – Disaggregation of fossil fuels sales, registered in 2008 and in Vila Nova de Cerveira, by product.

As for the disaggregation of the sales of petroleum products in the domestic market by sector of economic activity, the information is available only for the year 2008 - hence it is not possible to carry out an evolutionary analysis by sector of economic activity. For the same reason it is also impossible to quantify, with accuracy, which energy consumption is associated to which economic sector of activity for the county and the reference year in question.

After processing the information related to fossil fuel sales in Vila Nova de Cerveira in 2008, with and without “Industry” (total and partial, respectively), it is possible to obtain the graph in Figure 6.

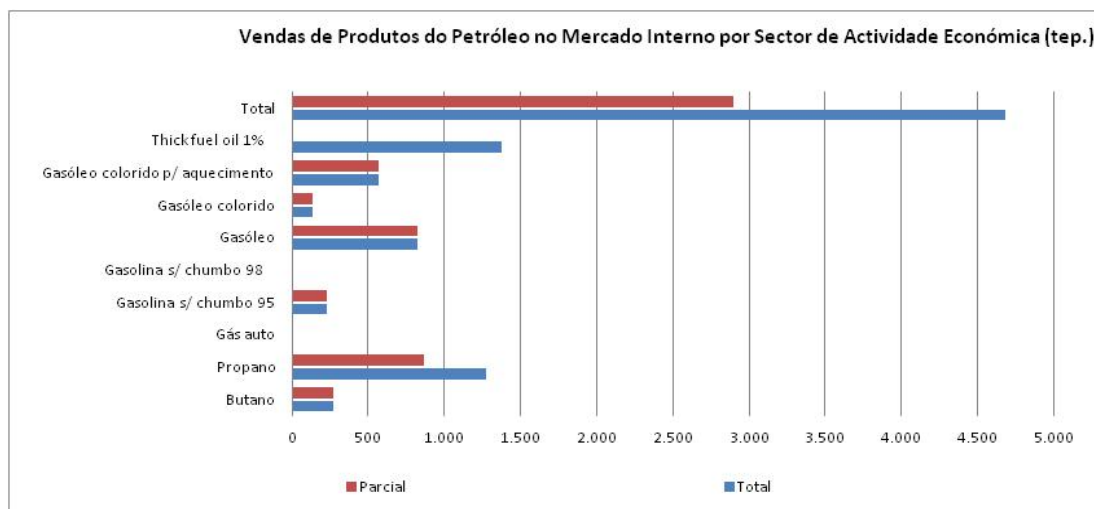


Figure 6 - Fossil fuels consumption in 2008 on the county of Vila Nova de Cerveira (total and partial).

(Source: <http://www.dgeg.pt>)

Through interpretation of the information expressed in Figure 9 it is clear that the contribution of “Industry” is significant – being particularly relevant in fuels such as “thick fuel oil” and “propane”.

Once split the total petroleum products sales for the year 2008 in Vila Nova de Cerveira by economic sector of activity, the graph in Figure 7 is obtained.

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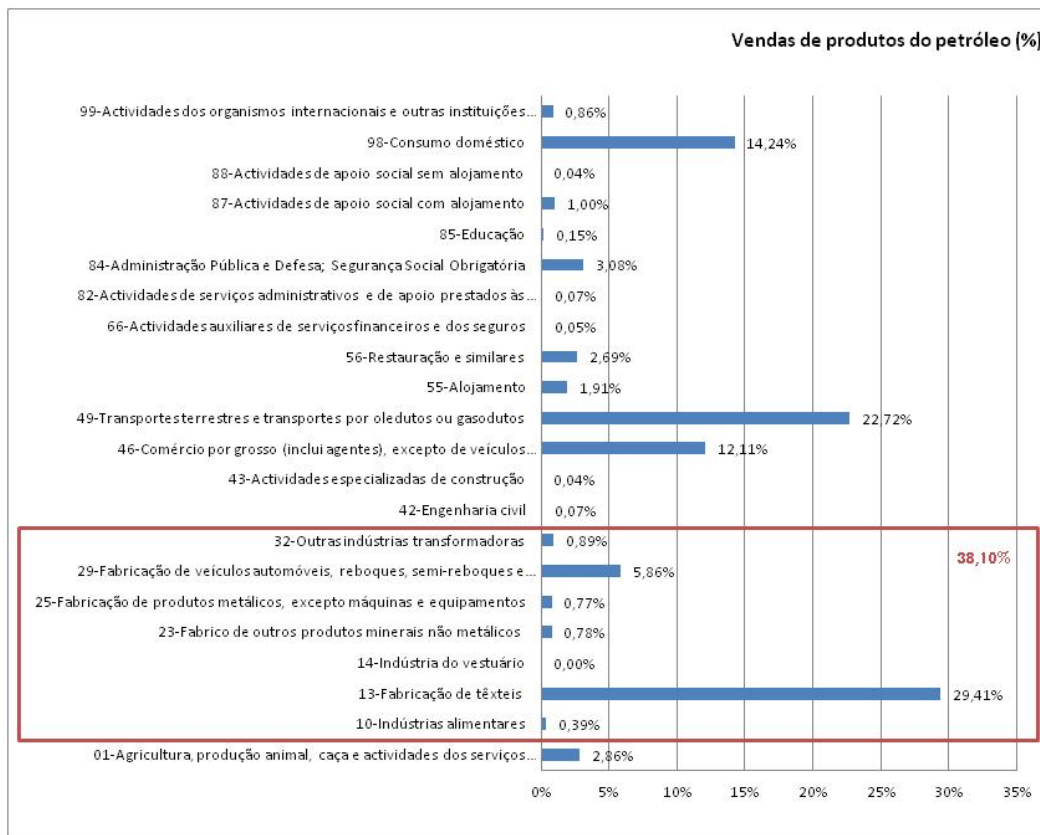


Figure 7 - Distribution of the percentage of fossil fuel sales per economic sector of activity.

By analysing the information contained in Figure 10, it can be seen that fossil fuel sales in Vila Nova de Cerveira can be allocated, mainly, to four sectors of activity, namely, in descending order of importance: “13 - Manufacture of textiles”, “49 - Land transport and transport via pipelines”, “98 - Undifferentiated goods- and services-producing activities of private households for own use” and “46 - Wholesale trade, except of motor vehicles and motorcycles”.

It should be stated that the amounts corresponding to “98 - Undifferentiated goods- and services-producing activities of private households for own use” only aggregate information regarding the gases “propane” and “butane” - in other words, it does not include fuel used by families to travel in motor vehicles (which are allocated, for statistical purposes, to “49 - Land transport and transport via pipelines”).

By disaggregating the values of fossil fuel consumption in 2008 by category the following percentage distribution is obtained (see Figure 8).



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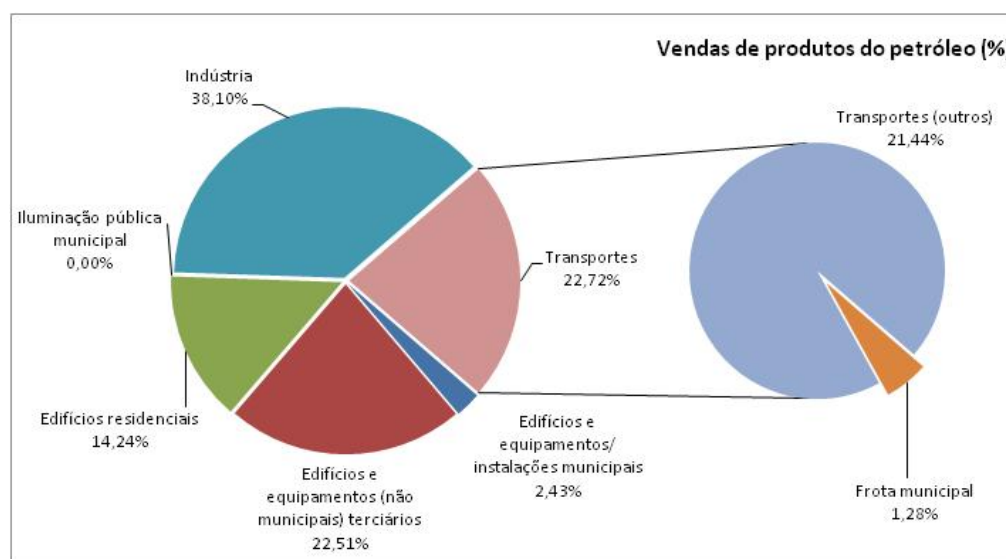


Figure 8 – Disaggregation of fossil fuel consumption, registered in 2008 and in Vila Nova de Cerveira, by category.

As expected approximately 38.10% of fossil fuels consumption correspond to the component “Industry”, followed by those relating to “Transport” and “Tertiary (non municipal) buildings, equipment/facilities”, with percentages of 22.72 e 22.51%, respectively.

Table 5 summarizes the disaggregation by category of “fossil fuels” consumption, in the county of Vila Nova de Cerveira in the year 2008, and its associated CO<sub>2</sub> emissions.

Table 5 - Final energy consumption and its associated CO<sub>2</sub> emissions for the energy carrier 'fossil fuels', disaggregated by category.

Category	Final Energy Consumption (MWh)	CO <sub>2</sub> Emissions (t)
Municipal buildings and equipment/facilities	1323.17	301.75
Tertiary (non municipal) buildings, equipment/facilities	12265.89	3107.19
Residential buildings	7758.09	1759.86
Municipal public lighting	0.00	0.00
Industry	20760.34	5545.21
Transport	12381.31	3255.01

An additional comment to refer that, in determining the CO<sub>2</sub> emissions associated with energy carrier “fossil fuels”, the emission factors used were:

- Liquefied gas - 0.227 t CO<sub>2</sub>/MWh;
- Heating oil - 0.267 t CO<sub>2</sub>/MWh;
- Diesel - 0.267 t CO<sub>2</sub>/MWh;
- Gasoline - 0.249 t CO<sub>2</sub>/MWh;
- Other fuels - 0,279 t CO<sub>2</sub>/MWh.

### *Renewable energy*

Until 2008, from a statistical point of view, there are no records of renewable energy consumption and, in 2008, there are only those related to sales of biodiesel. By analysing the statistical data provided by DGEG it is possible to conclude that in 2008 and in Vila Nova de Cerveira there are no records of biodiesel sales hence the CO<sub>2</sub> emissions associated with the use of this energy vector are non-existent.

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## Overall Balance

Table 6 consists of a summary of the IRE\_VNC and Figure 9 shows the distribution of the percentage of the final energy consumption, in the county of Vila Nova de Cerveira and in 2008, disaggregated by energy carrier.

Table 6 - Final energy consumption and its associated CO<sub>2</sub> emissions, referring to the totality of energy carriers, disaggregated by category.

Category	Final Energy Consumption (MWh)	CO <sub>2</sub> Emissions (t)
Municipal buildings, equipment/facilities	2738.63	824.05
Tertiary (non municipal) buildings, equipment/facilities	33270.44	10857.87
Residential buildings	19784.00	6197.42
Municipal public lighting	2298.71	848.22
Industry	43518.88	13943.11
<b>Sub-total</b>	<b>101610.66</b>	<b>32670.67</b>
Municipal fleet	696.67	185.12
Public Transport		
Private and commercial transport		
<b>Sub-total</b>	<b>12381.31</b>	<b>3255.01</b>
<b>Total</b>	<b>113991.96</b>	<b>35925.68</b>

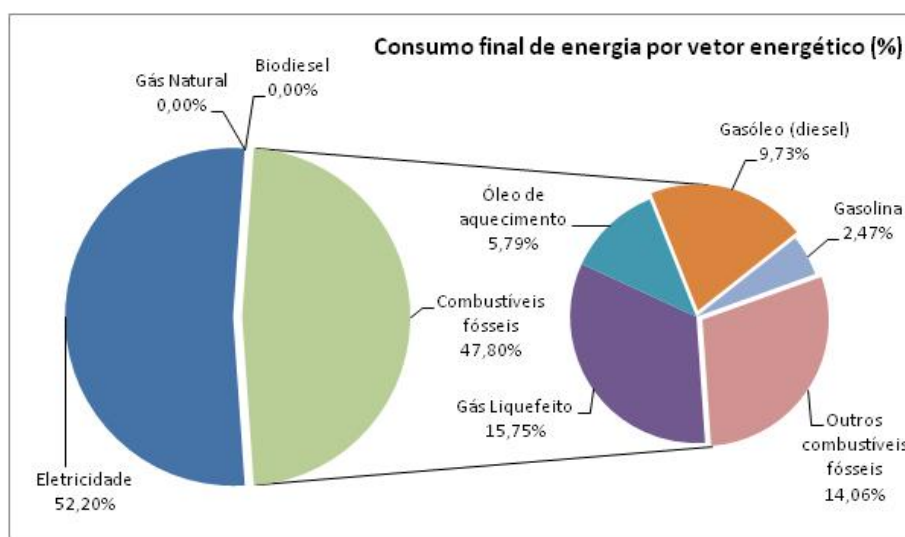


Figure 9 - Disaggregation of final energy consumption, in 2008 and in Vila Nova de Cerveira, by energy carrier.

By interpreting the figures in Table 6 it is possible to perceive that, in terms of components, the component “Buildings, equipment and facilities” is more energy consuming than “Transport”. Regarding the categories themselves the category which registered the highest energy consumption and, subsequently, led to greater CO<sub>2</sub> emissions was 'Industry'.

The analysis of Figure 9 shows that the most consumed energy carrier in the county of Vila Nova de Cerveira in 2008 corresponds to “electricity”. As far as “fossil fuels” are concerned, it is important to highlight the consumption recorded by “liquefied gas” and “other fossil fuels” – with percentages of around 15.75 and 14.06%, respectively.

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### Planned actions and measures for the full duration of the plan

#### Towards 2020

In order to implement an action plan and aiming to enhance the success of its implementation, it is necessary to establish and detail the measures that need undertaking, translate them into indicators, which should then be defined accordingly to the resources available and be implemented within an adequate timeframe. Moreover, to each measure should be assigned a person responsible for its implementation as well as set a realistic budget.

Embodying, too, a strategy of action, this time aiming to improve the energy and environmental performance of the county of Vila Nova de Cerveira, the PASE\_VNC could not elope from these guidelines. Therefore, in accordance with the content of the document “INSTRUCTIONS: How to fill in the Sustainable Energy Action Plan template?”, were listed and grouped by fields of action (such as “Municipal buildings, equipment/facilities”; “Residential buildings”; “Municipal public lighting”; “Public transport”; “Training and education”, among others) a set of measures/actions whose implementation will lead to the reduction, by 20% in 2020 and in the territory of Vila Nova de Cerveira, of the CO<sub>2</sub> emissions. Furthermore, for each measure/action: was allocated, at least, one entity responsible; was defined a timing for implementation and was quantified energy savings and production and respective CO<sub>2</sub> emissions reduction.

Regarding the “municipal component” despite the final energy consumption and the CO<sub>2</sub> emissions corresponding to the categories “Municipal buildings, equipment/facilities” and “Municipal Fleet” being small, it was considered important to include, in the PASE\_VNC, a set of actions of the responsibility of the MVNC.

#### Foreseen actions

The strategy of action to be undertaken in Vila Nova de Cerveira in order to reduce CO<sub>2</sub> emissions by 20% in 2020 is as described in Tables 7, 8, 9, 10 and 11.

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Table 7 - Measures to be adopted for the sector 'Buildings, equipment/facilities & industries'.

Fields of action	Designation	Description	Responsible department/entity	Implementation period	Energy saving (MWh)	Energy production (MWh)	Reduction of CO <sub>2</sub> emissions (ton)
Municipal buildings, equipment / facilities	Sports facilities energy performance upgrade	Implementation of energy efficiency measures in municipal sports facilities.	Municipality of Vila Nova de Cerveira	2013-2020	381.97	-	91.23
	Rehabilitation of large municipal buildings	Implementation of energy efficiency measures in large municipal buildings, except sports facilities.	Municipality of Vila Nova de Cerveira	2013-2020	0.83	-	0.31
	Certified municipal buildings	Energy certification of municipal buildings.	Municipality of Vila Nova de Cerveira	2013-2020	-	-	-
	Efficient schools	Realization of energy diagnosis and implementation of the proposed measures.	Municipality of Vila Nova de Cerveira	2009-2020	4.08	-	1.43
	Renovation of office equipment	Gradual replacement of office equipment by others more efficient.	Municipality of Vila Nova de Cerveira	2012-2020	9.76	-	3.60
	Standby e off-mode consumption elimination	Behavioural change of the use of office equipment by the workers in the municipal buildings/equipment and facilities.	Municipality of Vila Nova de Cerveira	2012-2020	0.65	-	0.24
	Efficient interior lighting	Gradual replacement of incandescent light bulbs with others more efficient.	Municipality of Vila Nova de Cerveira	2012-2020	147.49	-	54.42
	Management and monitoring of energy	Implementation and operation of an energy monitoring and management system in municipal buildings.	Municipality of Vila Nova de Cerveira	2013-2020	32.59	-	12.03
	Efficient water supply	Implementation of a set of measures addressing the water supply system of the county of Vila Nova de Cerveira aiming to: improve service provided; minimize losses and promote energy efficiency.	Municipality of Vila Nova de Cerveira	2013-2020	44.13	-	16.29

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Tertiary (non municipal) buildings, equipment/facilities	Building rehabilitation	Implementation of energy efficiency measures in buildings aiming to improve their energy and environmental performance	Private	2009-2020	351.55	-	102.71
	Office equipment renovation	Gradual replacement of office equipment by others more efficient.	Private	2009-2020	26.33	-	9.71
	Renewal of electrical equipment in hotels	Replacement of inefficient appliances by others more efficient (Class A or higher).	Private	2009-2020	116.37	-	42.94
	Renewal of electrical equipment in restaurants and coffee shops	Replacement of inefficient appliances by others more efficient (Class A or higher).	Private	2009-2020	95.24	-	35.14
	Phase-out of incandescent lamps	Gradual replacement of incandescent light bulbs with others more efficient.	Private	2009-2015	969.15	-	357.62
	Eco-AP implementation	Promotion of a set of energy efficiency measures that will allow the public administration buildings to reduce their energy consumption by 20%.	Public	2009-2020	133.60	-	49.30
	Efficient heating/cooling systems	Implementation of a set of measures aiming to improve the energy performance of heating/cooling systems.	Private	2009-2020	555.27	-	185.03
	Solar DHW	Installation of solar thermal collectors in the tertiary sector.	Private	2009-2020	99.21	-	32.02
	Management and monitoring energy systems	Implementation and operation of an energy monitoring and management system in the tertiary sector.	Private	2012-2020	315.48	-	116.41

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Residential buildings	Home renewal	Adoption of energy efficiency measures in housing, including interventions in glazed openings and insulation (walls, floors and ceilings).	Private	2009-2020	195.85	-	61.36
	Certified buildings	Residential buildings energy certification	Private	2009-2020	-	-	-
	Replacement of inefficient equipments	Replacement of inefficient appliances by others more efficient (Class A or higher).	Private	2009-2020	378.79	-	139.77
	Phase-out of incandescent lamps	Gradual replacement of incandescent light bulbs with others more efficient.	Private	2009-2020	888.96	-	328.02
	Intelligent lighting	Implementation of a set of measures aiming to improve the energy performance of residential interior lighting (except incandescent light bulb replacement).	Private	2009-2020	21.65	-	7.99
	Solar DHW	Installation of solar thermal collectors in the residential sector.	Private	2009-2020	650.86	-	203.92
	Efficient heating/cooling systems	Implementation of a set of measures aiming to improve the energy performance of residential heating/cooling systems.	Private	2015-2020	152.33	-	47.73
	Monitor and manage energy consumption	Replacement of the existing electricity counters by intelligent ones. Introduction of equipment that enables the optimization of electricity consumption in the residential sector.	Private	2013-2020	174.36	-	64.34
Industry	Motion control systems	Installation of motion control systems aiming to maximize equipment's energy efficiency	FUNDILUSA; TINTEX; privado	2011-2015	131.19	-	32.52
	Efficient lighting	Implementation of a set of measures aiming to improve the energy performance of lighting in industrial plants (	BRUNSWICK; TINTEX; privado	2010-2015	242.62	-	83.04
	Efficient use of thermal energy	Installation of boilers and heat recovery systems; heat losses minimization by good insulation.	TINTEX; privado	2009-2014	1486.08	-	346.99
	Energy source replacement	Energy carrier replacement (from thick fuel oil, diesel and liquid gas to natural gas); cogeneration	TINTEX; privado	2010-2020	7698.01	-	1353.16
	Equipment maintenance and consumption management	Equipment maintenance, refurbishment and retuning to counter natural efficiency degradation and to reflect shifts in process parameters. Energy consumption monitoring and management.	BRUNSWICK; FUNDILUSA; TINTEX; privado	2009-2020	934,95	-	198.97

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<b>Municipal public lighting</b>	Optimized set time	Adjustments in the operating hours of municipal public lighting.	Municipality of Vila Nova de Cerveira / EDP Distribuição	2010-2011	413.77	-	152.68
	Efficient public lighting	Implementation of a set of energy efficiency measures in municipal public lighting (ex. installation of dimmers; electronic ballasts; LED lighting, etc.).	Municipality of Vila Nova de Cerveira / CIM Alto Minho	2012-2014	464.54	-	218.33
	Geo-referencing municipal public lighting network	Survey and geo-referencing of all the components that integrate Vila Nova de Cerveira's municipal public lighting network.	Municipality of Vila Nova de Cerveira / CIM Alto Minho and AREA Alto Minho	2013	-	-	-

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Table 8 - Measures to be adopted for the sector 'Transport'.

Fields of action	Designation	Description	Responsible department/entity	Implementation period	Energy saving (MWh)	Energy production (MWh)	Reduction of CO <sub>2</sub> emissions (ton)
Municipal fleet	Municipal fleet renewal	Gradual replacement of the municipal fleet by more energy efficient vehicles, hybrid or electric.	Municipality of Vila Nova de Cerveira	2009-2020	33.37	-	8.87
	Biofuel incorporation	Incorporation of biofuel (B20) in the municipal fleet.	Municipality of Vila Nova de Cerveira	2012-2020	-2.78	-	4.95
	Right tire	Use of tires with low rolling resistance in the municipal fleet, verification and, if necessary, pressure correction.	Municipality of Vila Nova de Cerveira	2012-2020	20.02	-	5.32
	Travel planning and coordination	Adopting measures in order to promote car sharing among municipality's employees (ex. municipal fleet management)	Municipality of Vila Nova de Cerveira	2011-2020	0.33	-	0.09
	Incorporation of monitoring systems	Incorporation into the municipal fleet of monitoring systems (on-board computer, cruise control, GPS, etc.).	Municipality of Vila Nova de Cerveira	2012-2020	25.03	-	6.65
Private and commercial transport	Improvement of mobility and transport systems and networks	Restructure public transport network and enhance the use of public transports	Private	2012-2020	371.44	-	97.65
	Vehicle replacement	Renewal of the fleet through the purchase of more efficient and less polluting vehicles.	Private	2009-2020	1084.28	-	284.97
	Right tire	Use of tires with low rolling resistance, verification and, if necessary, pressure correction.	Private	2009-2020	337.33	-	88.66
	Driving efficiently	Incorporation of monitoring systems (on-board computer, cruise control, GPS, etc.).	Private	2009-2020	632.50	-	166.23
	Biofuel incorporation	Incorporation of biofuel (B20).	Private	2013-2020	-13.88	-	24.70
	Cycling routes and footpaths	Building infrastructures which enhance sustainable mobility (such as cycling routes and footpaths).	Municipality of Vila Nova de Cerveira	2012-2020	18.07	-	4.75
	On-line services	Making available on-line services, using new information and communication technologies (NICT), thus decreasing the number of 'mandatory' travels needed.	Public Administration	2009-2020	60.23	-	15.83



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Table 9 - Measures to be adopted for the sector 'Land use planning'.

Fields of action	Designation	Description	Responsible department/entity	Implementation period	Energy saving (MWh)	Energy production (MWh)	Reduction of CO <sub>2</sub> emissions (ton)
Strategic urban planning	Incorporation of energy related issues in strategic urban plans (namely Vila Nova de Cerveira's PDM)	Incorporation, in the revised PDM, of solutions that potentiate a reduction of the energy consumption and associated CO <sub>2</sub> emissions (like: limitation, to the minimum, of the expansion of urban areas; promotion of a greater mixture of uses and proximity of services at consolidated urban zones; definition of new green corridors, cycling routes and footpaths; etc.).	Municipality of Vila Nova de Cerveira	2009-2020	-	-	-
Transport/mobility planning	Transport and mobility planning	Definition of solutions aiming to improve mobility and increase the accessibility provided by the county's public transportation system, ensuring the economic sustainability of all agents involved.	Municipality of Vila Nova de Cerveira / CIM Alto Minho	2011-2013	-	-	-
Standards for refurbishment and new development	Pro-energy efficiency standards	Revision of the existing municipal regulations in order to incorporate issues related with energy efficiency in buildings and in public lighting (urban regeneration and new developments).	Municipality of Vila Nova de Cerveira	2011-2013	-	-	-

Table 10 - Measures to be adopted for the sector 'Public procurement of products and services'.

Fields of action	Designation	Description	Responsible department/entity	Implementation period	Energy saving (MWh)	Energy production (MWh)	Reduction of CO <sub>2</sub> emissions (ton)
Energy efficiency requirements/standards	Enhancing municipal green procurement	Implementing public procurement laws in the municipality of Vila Nova de Cerveira.	Municipality of Vila Nova de Cerveira	2013-2020	0.30	-	0.10
	Enhancing green procurement	Implementing public procurement laws in the municipality of Vila Nova de Cerveira's public administration buildings.	Public Administration	2008-2020	0.04	-	0.01

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Table 11 - Measures to be adopted for the sector 'Working with the citizens and stakeholders'.

Fields of action	Designation	Description	Responsible department/entity	Implementation period	Energy saving (MWh)	Energy production (MWh)	Reduction of CO <sub>2</sub> emissions (ton)
Advisory services	Advice on energy issues addressing the municipality	Advise in order to promote both energy efficiency and use of renewable energy sources.	Municipality of Vila Nova de Cerveira / AREA Alto Minho	2012-2020	274.97	-	82.83
	Raising awareness towards energy related issues in schools	Promotion of energy and environmental awareness actions addressing Vila Nova de Cerveira's schools (production and distribution of informative material; organization of contests of ideas, among other events).	Municipality of Vila Nova de Cerveira / AREA Alto Minho	2012-2020	26.31	-	8.88
Awareness raising and local networking	Raising residents awareness towards energy related issues	Promotion of energy and environmental awareness actions addressing Vila Nova de Cerveira's citizens (ex. production and distribution of informative material).	Municipality of Vila Nova de Cerveira / AREA Alto Minho	2013-2020	741.90	-	232.45
	Awareness raising on energy related issues within the tertiary sector	Promotion of energy and environmental awareness actions addressing Vila Nova de Cerveira's tertiary sector (production and distribution of informative material; award organization; among other events).	Municipality of Vila Nova de Cerveira / AREA Alto Minho / Private	2013-2020	1101.90	-	363.41
	Awareness raising on energy related issues within industries	Promotion of energy and environmental awareness actions addressing Vila Nova de Cerveira's industries (production and distribution of informative material; award organization; among other events).	Municipality of Vila Nova de Cerveira / AREA Alto Minho / Private	2013-2020	3916.70	-	1254.95
	Training on Eco Driving	Implementation of eco-driving awareness actions addressed to Vila Nova de Cerveira's citizens.	Municipality of Vila Nova de Cerveira / Private	2012-2020	520.01	-	136.71
	Training on Eco Driving addressed to municipality's employees	Implementation of training on issues related to eco-driving, for municipal vehicle users.	Municipality of Vila Nova de Cerveira	2013-2020	69.67	-	18.51
Training and education	"Greener" driving schools	Incorporation of educational content on the topic of eco-driving at driving schools.	Private	2008-2015	123.81	-	32.55