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# Applying the Sustainable Development Orientations in a Municipality Programme in South-West of France

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## Abstract

This paper discusses how a sustainable development programme could be applied to a village in respecting to the, European, French and Regional regulations. Léguevin is a small village in the South-West of France near Toulouse. The environment problems are one of the major concerns of the community as well as to the politicians. For the new municipality council elected in 2008, a proposed environmental and sustainable development programme taken part in their new municipality engagement. A Plan Communal Environment has been adopted and taken into consideration of the orientations to preserve the environment. Several axes have been chosen and some of these are to reduce the communal buildings power consumption, transportation and water consumption, preserve water resources, eco purchase, population information and environmental education. Several measures have been taken such as significant reduction of power and water consumption, and increased the use of renewable resources. Also, encouraging eco purchase grouping, utilizing recycling papers, E-mail and others means. It could be concluded that even for a small village with a limited financial resources, the application of the sustainable development orientation could be achieved at local level.

**Keywords:** Sustainable development, Energy policy, Environment, Léguevin.

## I. INTRODUCTION

### 1.1 Léguevin

Léguevin is a small village or municipality in the South-West of France, at the West of a Major aeronautical town Toulouse by 19 km, with population of about 8054 (estimation 2011) inhabitants. It belongs to the Haute Garonne department and Midi – Pyrénées Region. It takes part in a bigger structure called ‘Communauté des communes’ or Committee of municipalities, forming about 33000 inhabitants. By this way, it does not belong to Toulouse Agglomeration and it has the authority to take some decisions especially in the Development Durable issues. It is bordered from North to West by the Bouconne Forest and from South to West by four sides Highway. It has a mixture of population with most of them working in the Airbus industry. More than 53% of its lands is dedicated or reserved for the agricultural with a small number of industrial sites [1]. It is located beside the administration buildings (two sports halls, one theatre, two primary schools, two preprimary schools and three nurseries) and regional railway station at a distance of about 6 km at the nearest city Brax.



Figure 1 Léguevin location

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This paper based on my personal experience as a member of Léguevin municipality council and also member in the administration council of ‘The Joint Association for the Study and Protection of the Environment of the Haute Garonne Dept. (SEMPE)-France’ from 2008-2012.

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### 1.2 European and French regulation in environmental issue

Under the provisions of Directive 2009/28/EU of 23 April 2009 (the Renewable Energy Directive), by 2020 23% of France's final energy consumption must be generated from Renewable Energy resources. Specialists estimate that at least 10% of renewable energy in final consumption will be in the field of transportation [2-3]. Law No. 2000-108, dated 10 February 2000 and its implementing decrees (the Electricity Law), introduced an incentive regime that is one of France's main drives for the development of renewable energy. The Electricity Law set out the regulatory framework that opened up the electricity market to competition and privatized part of the activities of the utility company, the French National Electrical Company "Electricité de France EDF". The Electricity Law established, among other things: creation of the company Regional Transmission Electric Company (RTE) to manage the transmission grid; creation of the energy regulation commission; introduction of the obligation to purchase renewable energy produced at a fixed tariff or through tender procedures; and rules of access and management of the utility grid.

By an environmental forum called the "Grenelle de l'Environnement", which was officially launched on 6 July 2007, the French government brought together state players and stakeholders from interested sectors in order to define a comprehensive plan for sustainable development in France. Following a consultation phase, the following framework was established:

Grenelle 1: the law known as Grenelle 1 was passed by the Parliament on 23 July 2009 and became effective on 3 August 2009 (the Grenelle 1 Law). The Grenelle 1 Law lays down overarching environmental principles for France and sets the policy for the country to protect the environment and reduce consumption of energy, water and natural resources.

Grenelle 2: the law known as Grenelle 2 was voted on by the Parliament on 29 June 2010 and entered into law on 12 July 2010 (the Grenelle 2 Law). The Grenelle 2 Law spelled out detailed action plans that reflect to the general objectives approved by the Grenelle 1 Law. Also based on three established Thermal Regulation (RT) in 2005, 2008 and 2012, the last one applied since 1<sup>st</sup> January 2013, limiting the consumption of a new building or partially new to no more than 50 kWh /m<sup>2</sup>/year, using Bioclimatic architecture and establishing a reference temperature inside building. The future RT 2020 is for building a positive energy objective [4].

### 1.3 Municipality roles in the sustainable development programme

By their decisions to choose the town, department and regions planning, local authorities (town council, department council, region council) play a primordial role in the reduction of the Greenhouse Gas Effect (GHS). Their choice in equipment's (trucks and other construction vehicles) used in the local development town planning and in transportation could affect the national plan in GHS reduction. They manage public buildings, public illumination (road and towns) and also other activities such as: local transportation, water and waste treatment, urban heating. The later contribute to more than 12% of the national GHS emission that is about sixty million equal ton of CO<sub>2</sub> per year [5-6]. These local authorities performs their objectives to control and reduce the CO<sub>2</sub> emission through several axes by: establishing an energy policy to regulate the villager building energy consumption which is about 75% of the total village consumed energy, arranging their public purchases, enhancing electricity from renewable origin, used fleet of clean vehicles (natural gas or electric), utilization of low consumption public illumination, adopting a sustainable town planning taken into consideration the densification of the habitat which contribute to the reduction of the utilization of personal means of transportation, favoring the use of public transportation, diminishing the waste and water rejection and managing the green public areas by using a friendly fertilizer types and diminishing the water consumption.

Since 2007, one year before the election, a working team has been established to make the major town environmental orientation. A Plan Communal Environment (P.C.E.) resulted out from this work which gives axes of decisions and applications that must be taken into consideration as shown in Figure 2. Discussion with community has taken place and one major part of the election programme 2008-2014 was dedicated for the sustainable development [7].

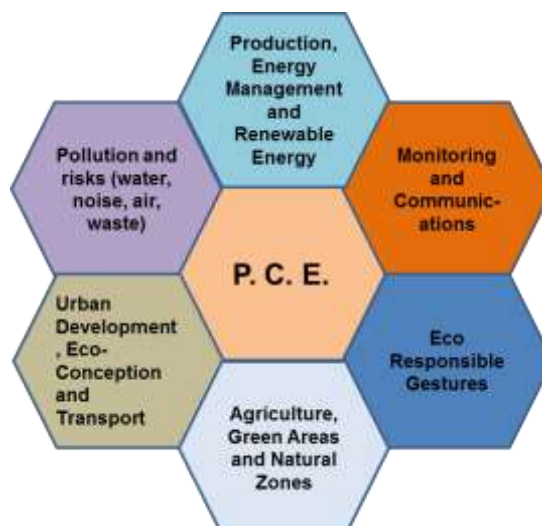


Figure 2 P.C.E. major axes [7].

## 2. PLAN COMMUNAL ENVIRONNEMENT (P.C.E) OR LE PLAN ENVIRONNEMENT COMMUNAL (P.E.C)

The major axes of this plan are:

### 2.1 First Axe- Energy Management and Renewable Energy Production

P.E.C. state actions to be taken in this axe as follows:

- a. In order to control the town total energy consumption, an energy diagnosis of buildings must be applied to optimize the energy performances of the communal buildings. This energy diagnosis could lead to ; ameliorate the actual hot water tanks park boiler apparatuses, the recovery of wood lost by the Bouconne forest during the last storm and used it as energy sources, detailed study of energy consumption by these buildings in order to define means and resolutions to reduce thermal loss .To reduce energy consumption of public roads (illumination, by using low consumption lamps) and by the installation of LED lamps (Luminescent Electrical Diodes) allows using ten times less energy than the normal ones.
- b. Ameliorate the insulation of the polyvalent sport hall by taking into account the study made in 2006 and progressively allocated an annual 50 000-€ budget for this purpose.
- c. Continue to encourage the construction of new building linked to renewable energy sources (in individuals in the field of thermal solar energy).

### 2.2 Second Axe- Pollution and natural risks (water, noise, air and waste)

P.E.C. states certain actions need to be taken into account as follows:

- a. Completion of the renovation of potable water supply networks (replacement lead pipes on the rest of the village) thus reduces lead contamination and water leakage.
- b. Installation a means of recovery of pluvial waters for the municipality buildings to assure of sprinkling, thus allowing economizing drinking water. Encouraging in the same time the individuals to do the same thing and aiding them in the installations of these water recovery tanks and participating in its purchase.
- c. Protecting the groundwater of the village territory which provides 50% of its domestic waters. Improvement of this ground water by protecting the gathering zones so that guaranteed a better water quality for a better public health. Re-establishment of the consumer's trust in the tape water and encouraged them to use less bottled water, therefore less plastic materials used and less energy consumed. To continue to lead actions in this objective, by ameliorate of the selective waste sorting and also to generalize the implementation of composters.

### 2.3 Third Axe - Urban Development, Eco conception and Transport

The objective is to make general use and improve this type of Eco conception buildings or constructing a environmentally respecting buildings. By incorporate the environmental concepts when choosing of building based on in its location, choose of more environmental construction and isolation materials and the introduction renewable energy sources, these buildings assure the reduction of water and energy consumption. Further actions to construct autonomous buildings in energy consumption or positive energy building could be done.

P.E.C. state actions to be considered in this axe as follows:

- a. Add to the construction licenses an environmental clause when it is possible.
- b. Assure that the construction sites have an environmental quality: management of water, reduction of risks of pollution, management of the different categories of waste.
- c. Make available to the community the High Environmental Quality (HQE) GUIDE for the applicants of new construction licenses.
- d. Support the construction of building that has the awareness to the environment and in this objective construction of wooden environmental housing estate buildings.
- e. Elaborate a plan to achieve the ownership of the thrifty accommodation of energy.
- f. Get involved in 2012 that more than 50% of the local fleet vehicles to be green and to replace progressively the old vehicles for better ones with a higher environmental quality. Nowadays, the municipality has seventeen equipment's in the fleet. Therefore, we will be able to replace two vehicles per year for an expense about 30 000€ / year.
- g. Enhance the use of the solar heating in the social accommodation.
- h. Continue the policy of cycles tracks.
- i. Create a system of bus transporting towards the railway station of LEGUVIN-BRAX to assure the flow of people from Léguevin towards BRAX.
- j. Continue the negotiation with Toulouse Agglomeration Bus Transport Company (SEIT) in order to extend the bus line no 32 until Léguevin with an approximate cost of 60 000€ per year.

### 2.4 Fourth Axe - Agriculture, Green Areas and Natural Zones

The Urban planning documents has the authority to define the village development areas and evolution of the landscapes. Thus the protected areas, green ways, restriction of soil by waterproofing and maintaining natural areas could be defined. By favoring modes that have more respectful treatment of biodiversity as human health; adopting on a given territory of a charter of protection of the biodiversity, encouraging farmers to turn to an agrarian production, participating in the protection of sensitive natural areas.

These following activities stated by the PEC to:

- a. Develop green zones, green areas and plantations of manifold kinds to adapt to our microclimate.
- b. Recommend the use of pure vegetable oils for jobs of gardening, chain saws and for other machines, limit the impact of oils accidental losses.
- c. Involve in the progress of the highway, offer a plan of development of the green corridor for animal species presents in the village by giving them up a free movement towards the forest of Bouconne.
- d. reduce pollutions of underground waters procreated by the use of pesticides and other chemicals products recommended to the farmers to find an alternative solution, and to our municipality service, to use alternative methods for the maintenance of the green areas, gardens and the agrarian earth. The objective is to reduce the rate of Nitrate present in these waters nowadays.
- e. Encourage non-conventional weeding as thermal weeding and other means to arrive at zero pesticides level.
- f. Elaborate a plan of inventory of living species with the aid of Youth Municipality Council (CMJ) and schools.

### *2.5 Fifth Axe - Eco responsible Gestures*

By elaborating an environmental education programme in which participate the community, Scholl children, municipality personal and other, an advance in the comprehension, application and sensitization of the environmental problems could be achieved. This programme could be made through environmental exhibitions, other activities in which the community could made initiatives.

The P.E.C. states the following activities to be done:

- a. Spread the use of recycled papers to all municipality administrations and replace papers when it is possible by electronic means (E-mail).
- b. Enhance the concept of Eco purchases to take into account the environmental issue in the followings in: the choice of building materials, painting and using Eco label wood, choose all products of bio quality. When dealing with tenders all the materials purchased must respect these criteria's, it could be includes wood, painting, maintenance and hygiene products, paper and envelopes, public illumination, etc. For the building sector, numerous plans to applied the concept of High Environmental Quality (HQE ®). One of the purposes of this concept is the improvement of air quality inside of the municipality buildings by using healthier products. By this way the environmental and social issues will be introduced into the villager life.
- c. training the municipality personals on the Eco purchases
- d. searching substitution products with a lesser impact on the environment
- e. Augmenting the frequency of bio meals in the canteen (nowadays once a month) on the condition of finding purveyors.
- f. sensitization of the municipality officers with these new criteria of consumption with a possible of reduction of public expenditures
- g. Sensitize the inhabitants on the impact of their daily activity on environment and their health as well as on gestures to reduce these impacts.
- h. Reinforce environment activities by visits, lectures, cleaning of riversides and creation of the circuits of pedagogic discovery.
- i. under the aegis of Youth Municipality council (CMJ) set up at the level of primary schools and secondary school, a campaign of recovery of piles and paper.

### *2.6 Sixth Axe - Monitoring and Communications*

Establishment of a monitoring committee was as a first step of the installation of this plan. Opened to all publics and partners of the school, this monitoring committee is called to regroup notably all people in the village in order to establish the required actions in the sustainable development programme.

Actions cited by the P.C.E. to be considered are to:

- a. Set up of a monitoring and a valuation of the actions of P.E.C.
- b. Use the new methods of communication and social media in favor of the environment.
- c. The municipality environmental service becomes a focal point of resource for these new technologies in the field of environment, where the population could find information, orientations, allowing them to implement their environmental thoughts. This will be done in partnership with national institutions.
- d. Twinning with an exemplary city in this domain and exchanging the experiences in this field.
- e. Follow plans in other domains such as social, culture and economic development by bringing the concept of environmental to these plans. Examples: the day nursery, industrial / commercial zones and the theatre.

## **3. RESULTS AND DISCUSSION**

Just after the election of the new municipality council in 2008, a post of deputy-mayor for the sustainable development has been created and his responsibilities have been defined. Any municipality actions must take into consideration of the environmental orientations; it must be accepted first from the sustainable development point of view before the council approval. The sustainable development team work which will be represented in each municipality commission. This action applied to all new tenders, by introducing a clause condition that each participated company must adopt the sustainable development principles in the treatment of their waste and in purchasing their raw materials. Also a selected condition added to the tender choice if the company or not applied the sustainable development in their previous work and politics.

Another action is to write these orientations in 'Le Plan Local d'Urbanisme' (PLU) or local Town Planning so that each new construction must perform what the RT 2008 demand.

The other actions were:

- a. Establishing of a 'Sustainable Development Day' in conjunction with the European Sustainable Development week, in which information, exposition and several actions in favour of the environment will be implemented. With the aid of the CMJ, a day of cleaning in the village riversides was established each year with the participation of families, pupils and communities as shown in Figure 3.



Figure 3 Examples of the actions for the sustainable development day activities.

- b. In order to evaluate the impact of the municipality activity on the emission of CO<sub>2</sub> and with the help of the Departmental Agency for Energy Management (ADME), a specialized company is hired to study these effects by a method named 'Bilan carbone'. The 'Bilan Carbone ®' is primarily a process in order to assess and reduce GHS emissions. Out of this study shown in Figure 4, a state of art of in which municipality service that rejected more CO<sub>2</sub> and a proposed solutions to reduce these emissions has been made [8].

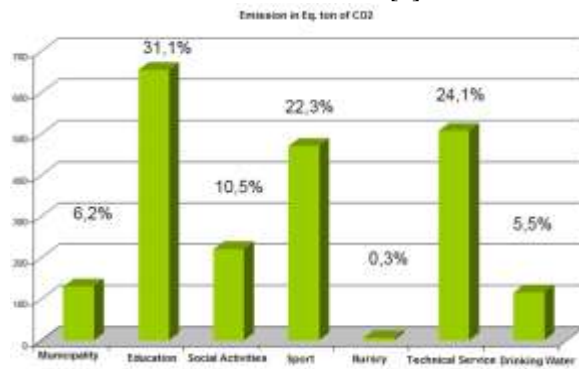


Figure 4 Some of results of the preliminary 'Bilan Carbone' study [8].

- c. Participation with another programme named Agenda 21 adopted in the summit of Rio 20 years ago. Agenda 21 is a comprehensive and concrete method, whose objective is to implement progressive and lasting sustainable development in a territory-wide. It is supported by the community and carried out in consultation with all stakeholders: elected officials and staff, residents, associations, companies, decentralized structures of the state in education and research. This programme with a study period of two years with the intention to develop a preliminary diagnosis with giving a good knowledge of the territory on the economic, social, environmental and organizational features. It defines a strategy outlining the objectives in the short, medium and long terms, define methods, means, proposed action, partners involved as well as evaluation criteria, implement a programme of cross-cutting actions, concrete and demonstrative and evaluate a systematic and ongoing policies and actions undertaken in a spirit of continuous improvement.
- d. Inauguration of the municipal theatre 'TEMPO' in which part of its energy produced by photovoltaic cells on the roof of about 500m<sup>2</sup> as shown in Figure 5. All of this energy produced was sold by the French National Electrical Company (EDF) because of the high guaranteed purchase price.



Figure 5 The municipal theatre 'TEMPO' with its roof covered with PV panels.

- e. Establishing the new extension of the 3<sup>rd</sup> aged homestay (Maison de retraites) with vegetal roofing, reducing the amount of heating that must be supplied. The use of the thermal wedding in replacing the conventional one and at the same time replacing all flowers and plants which a new ones which consume less quantity of water.
- f. Participation of the action of the intercommunity by the distribution of vegetal waste collector or composter for the village (by a rate of 60% of collector price). This has given a significant reduction in the amount of vegetal waste collected by the intercommunity.
- g. Using the LED illumination for the city center as well as replacing all old lamps by a new one and programming the flux illumination in function of daylight and nighttime. It reduced from 20-30% the amount of the municipality electrical bill.
- h. Creating more cycle's paths thus reducing the flow of cars transporting pupils to schools and encouraging people to do sports.
- i. Distribution of drinking water economizer for all community through the water taps to reduce the waste amount of drinking water.

#### 4. CONCLUSION

Actions have been taken in respecting first the P.E.C. engagement as well as the 'Bilan carbone' results. These concerned the reduction in the electricity consumed, enhanced the renewable energy part in the total consumed energy, reduction of water consumption, purchase of regional products, used of recycled papers, purchase the two new cars one on NGV and the other electric, reduction of the green waste and optimized the selective sorting of family waste by distributing several containers for each type of waste, replacing most of the drinking water network by PVC pipes so that a significant reduction in the waste of this water estimated from 20-30% and the rehabilitation of the water tower.

To enhance the environment preservation and the life style, a green paths as well as a cyclist path has been created and application of thermal wedding. The reorganization of the city centre with less parking and more planted trees, and changing of the car flow directions reduces the quantity of cars traversing the village and thus a significant reduction in pollution, noise and accidents. By choosing the purchase from local producers, a reduction in the 'Bilan carbone' is noted. Informing the children and school aged about the eco gestures in their homes and schools will reduce the amount of water waste and involve them in the environmental actions. Managing the number of inhabitants and trying to have a bus service from the nearest big town in order to reduce the car utilization and in the same way, by offering a bus will at a very low ticket price to transport people from the village to the nearest railway station (about 6km). Planning to implant an eco-neighborhood buildings with the application of the most HQE regulations as well the inauguration of the third Eco nursery are example of the application of the sustainable development principles.

Certainly, these effort need financial allocations because they are more expensive than the conventional ones and with the promise of the non-increasing of the local citizen taxes, a new financial organization in the communal budget and the search of the equilibrium with the subventions from national and European institutions.

It could be concluded that even for a small village with a limited financial resources, the application of the sustainable development orientation, preserving the environment and the natural resources could be achieved at local level. By conjugating the effect of all other municipality, a huge advance could be made at national and international levels.

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