

SUSTAINABILITY AND SOLID URBAN WASTE. A COMPARATIVE ANALYSIS OF DIFFERENT TREATMENT PROCEDURES IN GUIPÚZCOA (AUNTONOMOUS BASQUE COMMUNITY)

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Sustainability has become the focus of discussion in the management of waste and it has become the basic principle on which the new EU model for the treatment of waste is founded.

Recent years have been marked by an increasing preoccupation within the historic territory of Guipúzcoa (THG), Autonomous Community of the Basque Country (CAPV), with respect to the complex and controversial topics of waste collection, treatment and models of management, etc. Already, in the last century, at the end of the seventies, municipalities were forming consortiums in order to deal in a united way and in an economy of scale with general common problems and services. Each municipal consortium planned and administered waste treatment in its own specific way. In 2002, however, the Guipúzcoan Provincial Council (DFG) set about drawing up an integrated plan (PIGRUG) to deal with waste collection and treatment at the level of the whole province. In spite of this, however, due to modifications in the laws governing waste disposal and also due to failures of foresight in the original plan, the DFG, in 2008, saw itself forced to draw up a new plan (DdP-PIGRUG). In 2012, following a change in government, the political parties which were opposed to incineration, the solution adopted in the previous plans, yet another plan was devised (EDDdP), this time much more in line with the postulates of the EU, a plan which abandoned incineration and which upheld, against all opposition, the separate collection of different categories of waste.

The enormous quantity of written documents dealing with the treatment of waste in Guipúzcoa, all claiming to be sustainable, together with widely differing political, social and media viewpoints, have given rise to an inflamed social debate in which highly questionable

claims are very often voiced and myths are upheld which cannot withstand a disciplined, rigorous, and objective analysis. This article provides a succinct report of the results of an analysis carried out by an interdisciplinary team of researchers, whose general aim was to shed light on and carry out an exhaustive and rigorous analysis of the different methods, treatments and plans which exist in Guipúzcoa today regarding urban waste.

Our final and fundamental goal was to carry out a comparative analysis of the degree of sustainability to be found in the two major proposals being mooted in Guipúzcoa for the treatment of solid waste: one, which proposes a final disposal with a very large quantity of waste being destined for incineration and another, or others, which favour much stricter methods of collection and which oppose, in all cases, the installation of an incineration plant as a method of final disposal.

The following summarizes the operational and secondary or methodological aims of this research:

To compile, in as exhaustive a manner as possible, all the information regarding the two opposed methods.

To carry out an analysis by sectors of the two methods proposed, taking into account the following vectors: technical, environmental, health, socio-economic and juridical-administrative repercussions.

To draw up an outline of the results and conclusions in which the pros and contras of each of the methods proposed and analysed would be featured briefly and generally.

To provide a critical analysis of the information entering the public sphere from different sources (politicians, the media, social and technical) with regard to the two options (a much more developed and selective collection process with no incineration contrasted with a much less selective collection with incineration)

To carry out a detailed analysis regarding methods, initiatives, technical proposals and citizen involvement relating to the question of waste management in leading developments in areas which are relatively close, especially within the EU.

In order to achieve these objectives, we now outline the most important methodological steps necessary to bring this study to a successful completion:

- Compilation of the documents required:
 - a. Compilation of all planning documents drawn up in Guipúzcoa.
 - b. Compilation of relevant technical information regarding the two methods of waste management and treatment.
 - c. Compilation of all necessary technical, juridical, environmental, health and socio-economic information that is available regarding these methods in other nearby territories (Europe).
- Analysis of the information compiled in the previous phase. Analysis by sectors of the following: technical aspects and economic efficiency; analysis of environmental and health aspects; socio-economic analysis; juridical-administrative analysis.
- Sectorial diagnosis of each of the above areas.

Taking into account the complex and controversial reality we have here described, it was our aim, working from the Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV-EHU) and conscious of the role that the university should play in relation to the society in which it is inserted, to provide useful, rational and critical reflexion, ethical perspective and scientific, technical and social argument that would be independent and impartial, and that would shed light on the two methods at the centre of the controversy regarding waste management.

We based our comparison on a Life Cycle Analysis methodology, in the belief that this is the type of methodology best suited to a comparative analysis of complex realities. The EU also considers this the best methodology with which to approach the planning and organization of waste management (European Commission, 2011). ACV is structured as a methodological instrument for measuring the environmental impact of any product, process or system throughout its life cycle (from the initial raw materials to the end of its life). It is based on the compilation and analysis of the inputs and outputs of a system so as to obtain results which will show its potential environmental impact, with a view to determining the strategies that should be adopted.

Life Cycle Analysis methodology (ACV) is regulated by the norms UNE-EN ISO 14040 y 14044 and is a fundamental instrument which allows us to carry out an adequate ecological and economic analysis of a system through the examination of the matter-energy flows within the system itself.

Once we had applied this methodology and analysed each one of the variables involved, environmental, health, economics, energy efficiency, juridical repercussions, etc., the following major conclusions were arrived at:

The EU, given the extreme shortage of its native supply of most of the raw materials it consumes, has been progressively implementing multiple instruments to promote a circular economy: boosts to prevention (The Ecodesign Directive, extended responsibility of producers-RAP); boosts to recycling and re-utilization (administrative regulation; minimum objectives to be reached by member states), boosts through economic instruments (charges in accordance with the volume of waste generated; taxes on incineration and dumping which take into account health and environmental impacts; grants for recycling and re-utilization).

The implementation of this policy explains the high degree of recycling and reutilization (70-80%) which characterises six member states: Germany, Holland, Belgium (with differentiated policies in the Flemish and Walloon regions), Austria, Sweden and Denmark. To reach these levels, their policies have been based on certain measures: reduction of the total volume of waste production, taxes and/or prohibitions in relation with the dumping and incineration of waste, payments for waste generation, fiscal policies, regulatory policies, campaigns to raise awareness, education and others.

As a result of a comparative analysis focussed on life cycle methodology, it was seen that the behaviour of the differing alternatives (without incineration as the final disposal treatment) is highly sensitive to the percentage of selective collection of the waste generated as well as to the total volume of waste generated. If the waste management and treatment, on the one hand eliminates incineration as the final treatment, and on the other establishes ambitious methods for the selective collection of recoverable materials and organic matter, then it can clearly give rise to situations in which the reduction in absolute terms of the

waste generated is both higher and more effective. In the same way, the differing alternatives produce a more favourable economic balance and a lower rate of greenhouse gas emissions.

We are led to conclude that it seems perfectly feasible for the territory of Guipúzcoa to reach a situation in which waste management and treatment can eliminate incineration as a final treatment while, at the same time, achieving a global balance in the economic, material, energy and environmental sectors which would be more favourable than what could be achieved with the design proposed in the DdP-PIGRUG (2008).

As of today and in view of the principal environmental and health repercussions which may derive from incineration, as outlined in Rowat (2000), it seems blatantly ill-advisable to install new incinerators and becomes absolutely necessary to gradually phase out those already functioning. At the same time the totality of regulations existing today with regard to waste management must be implemented and emphasis placed on questions of reduction, selective collection, composting, biomethanization, re-utilization and recycling. All of this will undoubtedly have a beneficial effect on the environment and on people's health.

Very often, plans relating to waste disposal, as for example PIGRUG and DdP-PIGRUG, which make proposals in favour of the installation of an incinerator, affirm that the technology used will be the most up-to-date available, that it will comply with current legislation and that the most demanding filters and security measures will be put in place. However, as is demonstrated in this study and in the abundant and contrasted bibliography, there have been clear cases of negative incidence in the environment and on human health during the evolution of the technology used in incineration. Multiple contingencies, accidents and problems have also arisen in which it was demonstrated that the emissions being produced were above regulatory levels (Beçanson, Valdemingomez, Cumbria, Palma de Mallorca, etc.).

Incinerators generate principally solid and gaseous waste which enter into contact with the environment and become a source of contamination and the generation of illnesses which affect human health and have serious consequences for the environment.

The illnesses developed from the materials emitted by incinerators may be produced through the digestion of the latter along a complex chain which is generated through the contamination of cattle and crops, They can also be a source of a deceleration in agrarian economy since they reduce productivity and quality.

Incineration demands a growing and permanent supply of waste, which interferes negatively with the drive to recycle and converts it ultimately into an unsustainable solution, in spite of the fact that it generates energy. In the same way it generates numerous waste products which are highly toxic and dangerous for human health, and which, in turn, must themselves be eliminated

All analyses of methods of waste disposal, whether this be domestic, biosanitary, or industrial should be based on an exhaustive examination of all the dimensions of reality which are or can be affected, the quality of human life, alterations in territorial systems, negative impact on the environment, together with any social or cultural consequences.