

# The Acerra's Waste-to-Energy Plant and the Difficult Balance between Environmental Impact and Right to Health

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**Abstract:** Italian waste management legislation had a strong development through the transposition of the guidelines disposed by EU principles in matter of environmental protection (i.e., polluters pays, prevention and precaution principles).

Legal sources taking action on this matter are numerous as well as the involved institutional actors; nevertheless, despite such significant regulation, the southern part of Italy has experienced a real waste crisis in the last decades due both to local authorities' inactivity and to organized crime's interests in waste management business.

All of this has led to severe consequences not just on the environment and local populations' health, but also on the image of the area. Videos of waste piles dumped on cities' streets have been shown by national and international media for a long while, which did not involve the prompt adoption of any kind of long-term measures by the competent institutions.

Currently, the institutional solutions adopted to improve the management of waste cycle treatment are several, although they pursue the same purpose: obligation for separate waste collection, awareness campaigns on recycling importance, restoration of dangerous landfill sites and, finally, building of waste-to-energy plants equipped with the most advanced technologies for health protection with low environmental impact.

The present work, indeed, also analyses the case of Acerra's waste-to-energy plant, subject of heavy disputes by local population.

**Key words:** waste management, environmental impact, right to health, waste-to-energy plants, Acerra

## 1. Italian Legislation and EU Principles

Management and recycling of waste is still an unsolved problem for today's consumer society, notwithstanding the attempts of the Legislator to regulate it in order to protect environment and citizens' health from potentially dangerous impact due to negligence or inappropriate management.

According to the Italian legislation, the waste management is subject to the specific sector regulations, strongly influenced by the EU principles for the Environment. Indeed, the implementation of such European Principles for the Environment as the

principle of prevention and precaution together with the polluter-pays principle plays an important role at different stages of waste cycle management: from the prevention of waste packaging formation to the disposal and pollution related responsibility.

At EU level, the legislative framework on this matter refers to Directive 2008/98/CE of the European Parliament and of the Council of 19 November 2008 on waste. This Directive sets not only basic concepts and definitions related to waste management, but also establishes the measures for its proper treatment and disposal, seeking to ensure the right to a healthy environment.

In addition to this Directive, among other sources of EU legislation and case law an important role plays Regulation (CE) No. 2150/2002 of the European

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Parliament and of the Council of 25 November 2002 on waste statistics. This Regulation has enhanced the importance of proper communication regarding the transmission of qualitative and quantitative data on waste, which in its turn has allowed a uniformity of action by all European countries, conforming the decisions of investors and governments called to implement environmental rehabilitation.

In addition to the mentioned above Directive and Regulation, the European Union has also adopted specific directives for particular categories of waste and for specific waste management operations, such as for instance disposal.

The Italian environmental law governing waste is enshrined in the Part IV of the Environmental Code (Legislative Decree 152 of 3 April 2006, Articles 177-238) as amended by Legislative Decree 205 of 3 December 2010. The rules incorporated in the consolidated text appear also as a framework for the regional legislation, which shall be implemented to regulate certain areas of the subject in matter, highlighting the features and peculiarities of individual situations.

However, in order to achieve the objectives of the environmental and human health protection in the field of waste management, in addition to the mentioned legislation, the synergistic action of institutions is required. It may be recalled the action of control and organization entrusted to the Minister of Environment, the Minister of Economic Development, Local authorities and Local Health Units, Law Enforcement and in general all institutional stakeholders involved in environmental protection and in the proper environmental impact assessment of waste management. Finally, the role of NGOs is also crucial, as they are responsible for the balance of public and private interests in environmental issues and can take part in administrative processes provided by the Environmental Code, invoking the legislative initiatives and proposals to give voice to public opinion.

Historically the Legislative Decree No 152/2006 was preceded by a waste legislation that since 1982 has increasingly conformed to EU directive criteria. This is confirmed by numerous infringement proceedings initiated by the European Commission against Italy for failure or incorrect transposition of EU legislation, in general or on specific issues related to waste management.

The provisions set down in the Environmental Code can be relatively divided into two parts: a general part and a special part dedicated to certain categories of wastes. In order to define a right field of application of the associated provisions, the definition of waste is determined as the by-product and end of waste.

The definition of waste is fixed in point (a) of the first subparagraph of the Article 183 of the Legislative Decree No 152/2006 as “any substance or object which the holder discards or intends or is required to discard”.

Whereas the notion of “by-product” is defined in accordance with the Article 184a of the abovementioned consolidated text, which refers to “any substance or object created by way of a specific production process’ ancillary activity and reused, without any other different treatment but the normal industrial practice, during the same or other production process”.

Besides the definition of by-product, Article 184c of the abovementioned environmental code defines the notion of end of waste, which refers to the final stage of waste recovery, including recycling or re-use, without causing any negative effects on the environment or human health.

Notwithstanding the mentioned above Decree is quite exhaustive in the provisions dedicated to the waste management, multiple instruments of different legislative ranking on this matter are often implemented as well. Indeed, it is worth pointing out that over the past few years due to the exceptional circumstances of the problematic issues related to waste management and disposal that were arising from time to time, the non-standard legal instruments were

implemented, such as, for example, emergency orders. Such decisions were often the subject of the high attention for the various levels of governance.

## **2. Waste Crisis in Campania: Institutional and “Non-Institutional” Actors**

In this regard, the situation that occurred in the South of Italy was typical. It referred to a waste crisis, an emergency concentrated in particular in the south part of the Country, caused by the inertia of the State Institutions and local authorities responsible for the waste management and environmental protection and for the infiltration of organized crime in the “business” of waste management.

Indeed, it cannot be denied that a state of emergency declared in Campania from 1994 until 2008 due to the dire situation was caused by the non-disposal of regional landfills and waste storage sites. Given that the landfills in Campania were completely saturated, the Local Authorities were no longer able to manage the disposal of waste. Campania is a highly-populated region that per se makes it the third region in Italy in terms of waste production per capita.

In order to overcome the emergency, a Special Commissioner for the waste emergency was appointed in 1994 in order to implement the specific dedicated measures aimed to end the crisis that risked jeopardising not only of the due conditions of places, but also of the health conditions of citizens.

To be honest the emergency state was not cause just by the by the inertia of the State institutions and local authorities, but also by the numerous illegal behaviours in the waste management related to the Camorra infiltrations.

Since the early 80s, the Camorra clan of “Casalesi” having the support of some politicians and corrupted administrators together with the local entrepreneurs has created a flourishing business traffic on waste disposal, carrying on site and illegally burying in the ground toxic industrial wastes coming from the northern Italy.

The illegal market of waste management provides

the conditions for the establishment by organized crime of so-called apparently “clean” companies that deal with the entire management waste cycle. The mentioned companies are usually involved in illegal traffic but in fact, they should operate on the legal market, which is possible due to the mafia infiltration in corporate administrations and local authorities.

The business of waste is very lucrative for those who get profit from it; however, it has a very high cost in terms of the impact on environment and health of contaminated places’ inhabitants. Campania’s territories have been poisoned by urban and industrial waste for more than twenty years. In effect, the State registers severely contaminated soil, groundwater, atmosphere and even landscape, compromised by the eco-balls’ scam.

According to the numerous epidemiological investigations carried out on the territory of Campania, it follows that the Province of Caserta is the most devastated area as it is morphologically equipped with numerous quarries filled with waste. In addition, the investigations register that also the Neapolitan hinterland is battered with the problem of waste: between the cities of Acerra, Nola and Marigliano the highest concentration of diseases related to the massive presence of toxic substances in the soil and air is registered.

For these specific reasons, Campania has been nominated as the “Land of Fires” by national and international media because of the high number of cases of illegal waste fire burnings. Being more precise, the exact area that has been affected by the higher number of illegal fires that created columns of toxic inhalation is situated between Giugliano, Qualiano and Villaricca.

According to the investigations conducted by the National Research Council and World Health Organization, the conditions mentioned in the previous paragraphs could result in the higher incidence of cancer, respiratory diseases, genetic malformations and infant mortality. This public health hazard is also

caused by the presence of illegal dumps and heaps of illegal toxic waste often buried underground, which in turn caused fires and perennial noxious fumes, called "fumaroles". The highest incidence of the abovementioned diseases was registered both in the Province of Caserta and in the so-called "Triangle of Death" or "Triangle of Poison", located between Acerra, Nola and Marigliano. Due to the massive presence of dioxin in the soil on those territories, the risks of cardiac diseases, diabetes and leukaemia became even higher.

Unfortunately, the agricultural and animal husbandry activities were still carried out on those territories and often the potentially harmful products ended up on the markets, which imposed bigger risks for the health conditions. The dramatic emergency waste besetting the Campania had a strong media response that brought the whole world's attention to a negative image of the region. The most popular were the images of Naples' streets invaded by waste, in particular in 2004, when they captured the attention of the national and international media. Unfortunately, some pictures captured also people in revolt on the streets, protesting against the measures taken by the government and against the deaths that were afflicting their territories of origin.

Before the scandal occurred, the population had never been properly informed about the corrupted system of the waste cycle management and the illegal underground disposal conducted by organized crime groups as well as about the health risks that could be caused.

### **3. The Incinerator "Solution" and the Case of Acerra**

Unfortunately, the institutional measures adopted at the beginning were not adequate to resolve the issues, as they referred to the short-term measures, did not cover the whole gravity of the issue and could not completely resolve the problem.

Between 2001 and 2002 and until 2007, when the

institutional attempts to establish a complex program on waste recycling failed, the use of the old landfills significantly increased and the abusive creation of the new ones took place.

Such governmental decisions together with the decision to create several incinerators right on those territories already compromised from the unlawful spilling of waste, increased public discontent. The conflict with the resident population, that felt being excluded from the decision-making processes concerning their territories of origin, was constantly growing up.

The local communities, initially gathered for disorganized protests, had created many problems for public order: it is worth mentioning protests against the construction of the Acerra incinerator, the protests against the constant waste spill in the Pianura dump and the protests against the irresponsible use of Lo Uttaro landfill in the province of Caserta.

The protests were so violent that the systematic repression by the law enforcement were transmitted by the mainstream media as a symbol of the people imposition to governmental decisions that were not shared.

The emergency state lasted until 2008, until the moment, when the streets of the provinces of Naples and Caserta were literally flooded with waste of all types. In May 2008, the national government adopted the Decree No 90 as a response to the crisis. The Decree provided the construction of the ten new landfills and four incinerators in the Region. It entrusted the wide powers of management and decision-making to Guido Bertolaso, the head of the Civil Protection, whose main task was to ensure that all the provisions of the Decree were fulfilled, in particular those regarding the completion of construction of the Acerra incinerator.

Unfortunately, there was no innovation in the waste management system which remained anchored to the old logic Lobbyists and corporate interests. Once again, the Government failed ending the corruption that

existed in the management of the waste cycle.

Due to the high voltage that caused the measures adopted by the head of the Civil Protection, as well as the numerous clashes that characterized the construction of the incinerator in Acerra city (known as the "Impregilo affair"), the waste disposal and storage sites identified in Decree n. 90/2008 were declared areas of national strategic interest and thus were militarized.

Later on in 2009, few months after the incinerator of Acerra was put into service, the Government adopted a new Legislative Decree, which effectively ended the state of emergency, notwithstanding the construction of all the planned incinerators was not completed, the policies on waste recycling were not implemented, nor the remedies were established for the continuous accumulation of the eco-balls formed in disregard to the technical regulations. Indeed, these were the main reasons of the Acerra incinerator malfunctioning. The plant was burning materials which were not in line with the standards set and, therefore, the polluting emissions far exceeded the threshold provided and authorized for that type of plant.

However, despite the declared end of the waste emergency in Campania, EU Institutions were still concerned about the waste situation in Italy as well as they were not satisfied with the response to the problem provided by internal Institutions.

Nowadays, by virtue of EU practice on environmental management principles implementation (in particular those related to the waste management), the key objective of the Legislator and institutional entities involved is no longer the waste management, but the prevention of its formation.

The recycling has become the mechanism aimed to achieve closed-loop economy, able to enhance a "good" waste and underline the utilities.

The existing hierarchy between the methods of waste management gives the priority to the prevention, followed by reuse, recycling and then recovery. The institutional and private actors that operate in the field

of waste management are called to fulfil specific preventive measures; otherwise, the European Community shall sanction such failure. It should be ensured citizens' access to clear and transparent information, so that they can understand how to implement the preventive measures in waste treatment. For instance, the waste separate collection should be promoted and encouraged in order to reach the higher implementation percentage year by year, as well as reuse of materials from household waste should. The citizens are sensitized not only by the recovery and recycling of waste, but also by the possibility to avoid their production, according to the well-known slogan "the best waste is the one not produced".

This shall minimize the environmental impact of consumer goods' production and in its turn protect the health and environment.

The precautionary and the "polluter pays" principles are also commonly used in waste management current regulation: this is the underlying rationale of waste tax predicting, as well as the more virtuous business incentives towards eco-friendly goods production (because such goods are both durable and recyclable).

Within the institutional framework for cooperation, Regions and local Authorities shall ensure they are aligned with local realities and needs of the community. The role of civil society is crucial for the creation of recycling society, for the implementation of principles in compliance with international environmental law standards (e.g., Stockholm Declaration on the Human Environment of 1972, World Charter for Nature of 1982, European Charter on Environment and Health of 1989, Rio Declaration on Environment and Development of 1992).

Among the remedies valid in the long-term prospective is the rehabilitation of the storage at risk, which was adopted to foster an appropriate waste management in order to implement the programs of decontamination of polluted soil and enhance the healthy microclimate.

The abovementioned principle is based on the choice

(from both technical and legislative prospective) to construct the waste-to-energy plants, which are equipped with efficient and advanced technologies able to reduce the waste disposal impact on environment to the minimum.

The legislation on the incinerators establishment and management, because of the central role they play in governmental strategies related to waste management, has a predominantly technical nature and refers to precise scientific parameters. In particular:

- Emissions in the atmosphere;
- Management of the waste accepted in landfills and products from incinerators;
- Water withdrawals and discharges;
- Contamination of soil and subsoil;
- Water intended for human consumption;
- Noise input.

Before its recent repealing by the Decree No 46/2014 (Decree on Industrial Emissions), the internal subject of the sector was covered by the Decree No 133/2005, transposing the Directive 2000/76/CE on the incineration of waste. The abovementioned Legislative Decree regulates all the waste incineration process' stages, from receipt of the plant to disposal of residual substances, dictating specific provisions concerning:

- Criteria and general technical standards for the construction and functional characteristics of the plants;
- Limits and operating conditions of the plants, with reference to the needs of the protection of the environment from emissions produced by incineration;
- Emission limit values of the installations;
- Sampling methods, analysis and evaluation of the pollutants from such plants;
- Time adjustment criteria for the adaptation of the equipment according to already existing standards.

According to the mentioned above Decree, each provider shall hand over an annual mandatory report on operation system and compliance with the prescribed emission limits that shall be sent to the relevant competent Authority (Province).

In March 2014, the Legislator intervened to modify the regulation on waste incineration, repealing the aforementioned Legislative Decree. N. 133/2005 and transferring some parts into the Title 3a of the Legislative Decree No 152/2006, with subsequent amendments and integrations.

The "new" regulation "*defines the measures and procedures aimed to prevent or, whether not possible, to limit the negative effects of waste incineration and co-incineration activities, in particular, the emissions caused by such activities in the air, in soil, surface water and groundwater, in order to achieve a high level of environmental protection and the protection of human health*".

In addition, it introduces the definition of incineration and co-incineration plant, provides the treatment that is subject to periodic renewals (called as the Integrated Environmental Authorization IEA) for authorization to operate both on newly established and already existing plants. To this end, it establishes additional specific regulations on the treatment of wastewater from the cleaning of waste gases outside the incineration or co-incineration plants.

The incinerator of Acerra is the first waste-to-energy plant constructed in Campania and represents one of the most technologically advanced plant in its sector. According to the data provided by the Civil Protection, the plant at full capacity can transform urban waste quantity equal to 1950 tonnes per day (a total of 600,000 tonnes per year) into electricity and/or heat. The ash and slag produced by combustion are then collected and cooled in tanks filled with water in order to be furtherly treated in part (and reused) and disposed in part in special dumps (at the moment outside the Region). The fumes are released into a purification circuit created to slaughter the gaseous macro pollutants, powders, micro pollutants and oxides of nitrogen and then are furtherly released into the atmosphere through a 110 meters high three-vented chimney.

The best available technologies aimed to ensure the

lowest environmental impact caused by air emissions, liquid discharges, solid waste, noise and traffic of vehicles have been adopted for the Acerra plant. According to the Civil Protection, the limits on emissions guaranteed by the plant are much lower than those set by EU legislation. In addition, specific control systems automatically block the operation of the plant

in case of exceeding the established limits. Finally, in order to provide the public with a clear and transparent information about the plant operation and its emission monitoring the Environmental Observatory of the Acerra incinerator was established, which has also made such data available on its website.



**Fig. 1** Termovalorizzatore di Acerra, emblema di uno Stato che prevarica, promette e non mantiene, by Emiliano Stella, <http://www.lultimaribattuta.it>, 2014.



**Fig. 2** INCENERITORE ACERRA/La battaglia si sposta al Tar: presidio con le donne del 29 agosto, by Lucio Righetti, <http://www.identitainsorgenti.com>, 2015.



Fig. 3 Caivano: Zona ASI, Marciscono Trecentomila Ecoballe. Discarica a cielo aperto che non interessa Più a nessuno, by Francesco Celiento, <http://caivanoweb.blogspot.it>, 2011.



Fig. 4 Acerra, lavoratori minacciano di lanciarsi dal termovalorizzatore, by Francesca Saveria Cimmino, <http://www.campaniasuweb.it>, 2013.



Fig. 5 Dopo Scanzano continua la lotta per la salute. Acerra resiste!, by Giovanni Savino and Jacopo Renda, <http://www.marxismo.net>, 2004.



#### 4. Critical Insights and Future Perspectives

Although the Acerra incinerator represents a cutting-edge facility and is equipped with the best available technologies, some important clarifications should be observed. In the first place, it is worth pointing out that the concentration of polluting emissions provided by the abovementioned sector regulations are expressed in cubic meter of flue gas and not in total release: in other words, such limits refer only to the quality of the emissions but not to its quantity. That means that the current rules are not set as a function of the total emissions of pollutants and their effects on health and environment, but rather as a function of the values that can be technically achieved with the adoption of the best available technologies.

Thus, it becomes paradoxically possible to stay within the emission criteria established by current legislation while burning more wastes and consequently polluting more our environment.

Secondly, the incineration of municipal solid waste emerges contrary to the logic of the recovery of material-reuse-recycling, which is the basis of the separate collection and waste management hierarchy. Indeed, the abovementioned Decree on Environment, transposing subparagraph 1 of Article 179 of the Framework Directive 2008/98/CE, establishes a clear hierarchy in waste management process, where the waste-to-energy (e.g., the energy recovery through incineration) takes penultimate position after the prevention, preparation for reuse and recycling, but precedes the disposal, *extrema ratio* in waste management.

Consequently, it follows that both national and EU legislation tend to favour the material recovery over energy recovery, in particular due to the growing scarcity of raw materials. The Sixth Environment Action Programme of the European Union targets 20% of waste production cut for 2020 and 50% cut for 2050 compared to 2000. The Programme also sets the

replacement of all the incinerators in Europe should be completed by 2020.

On the basis of this guidance, it follows that many EU countries (such as Denmark) have initiated a gradual incineration exit strategy, while in the USA and in Germany the incinerators are not realized anymore and have been replaced by separate collection and bio-mechanical waste treatment plants.

Given the mentioned above analysis it becomes clear that incinerators are old-world instruments that remain promoted just in developing countries and are often uneconomical, if not for incentives and public funding they receive.

In the light of the above considerations, it becomes evident that the regional policy (and, if possible, also national) of the entire cycle of production and waste management needs to be reviewed. The “non-solution” incineration characterized by a negative and uneconomical energy yield and by strong environmental and health repercussions should be also progressively avoided. In conclusion, the definition of the future operating trends should be based on the 3R strategy: reducing, reusing and recycling.

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