

#ZeroWasteCities

The Story of Calatafimi Segesta



The Sicilian municipality of Calatafimi Segesta may be small, but it provides one of Europe's leading examples of how an island municipality can implement an effective zero waste strategy whilst also focusing on improving the lives of the local community.

Despite receiving high-levels of tourism each year and having a dense, historic area in its centre, Calatafimi Segesta still achieved 85% separate collection rate and generated just 88kgs residual waste per person in 2022.

The municipality achieved these impressive results through a process of implementing a zero waste strategy at its core, with a focus on door-to-door collection of materials and the prioritisation of capturing organics, with supplementary incentives offered to residents who home composted.

CALATAFIMI SEGESTA

Calatafimi Segesta is a municipality of just over 6000 inhabitants within the region of Trapani. The local economy is based mostly around agriculture, whilst its rich history dating back

to former Arabic, Elymians (ancient people of Western Sicily) and Roman times provides a source of regular, high-volume tourism each year, particularly in the summer.

HISTORY

In 2011 the municipal administration of **Calatafimi Segesta** passed a **municipal resolution outlining its 'Zero Waste Protocol'**, beginning a path of sustainability in waste management. Trapani's Zero Waste Association made contact with the councillor for the environment, and after a series of meetings and even a trip to Capannori, the first Zero Waste Municipality in Italy, the administration wanted to take this path.

Unfortunately, the territory over the years has been a centre of interest

for entrepreneurs of the thermal waste treatment industry.

There have been several long standing push backs against such initiatives led by citizens and environmentalist movements. For example in 2014, when the first gasification project was proposed to be built in an area equal to 120 hectares located in the municipality of Calatafimi Segesta. After about four years, thanks to a collection of signatures and citizen mobilisation, the project was blocked.



Picture 1: Demonstration against incinerator

CONTEXT

In 2003, the then governor of Sicily proposed a plan to build four incinerators on the island, with the idea that this would solve the municipal solid waste problem arising on the island.

However, **the incinerator project encountered strong opposition from citizens associations, environmental activists and other organisations.** The main concerns raised by opponents included the potential negative impacts on human health and the environment that increased incineration would have. Furthermore, citizens highlighted the fact that the plan would prevent good practices emerging to reduce waste generation, which back then were focused predominantly on increasing recycling and composting according to European Union directives. In addition, there were concerns about the transparency and efficiency of the procurement process for the construction of the plants.

Due to the strong protests and controversy surrounding the project, **the four proposed incinerators were never built.** The decision not to build incinerators in Sicily was a victory for all environmental activists and a demonstration of the importance of active participation in the formulation of environmental policies.

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never built. The decision not to build incinerators in Sicily was a victory for all environmental activists and also a demonstration of the importance of active participation in the formulation of environmental policies.

However, the issue of high waste generation in Sicily remained a major challenge in the years that followed, with various alternative solutions and attempts promoted to address the problem. In fact, the threat of further incineration or other thermal treatment plant projects in Sicily has seen no respite over the years. For example, the current governor has expressed to the Italian government a willingness to obtain special powers to build such plants.

Notably, **several municipalities in Sicily have shown that adopting good practices in waste management can lead to positive results,** showcasing that there are more sustainable alternatives for addressing waste other than simply burning it. One of the most positive examples that can be found across the entire Southern European region is the Sicilian municipality of Calatafimi Segesta.

Their success story shows that with sustained efforts by local governments, waste collection companies, and most importantly, local citizens, it is possible to achieve significant results in terms of separate waste collection, sustainable waste management, and the creation of jobs.

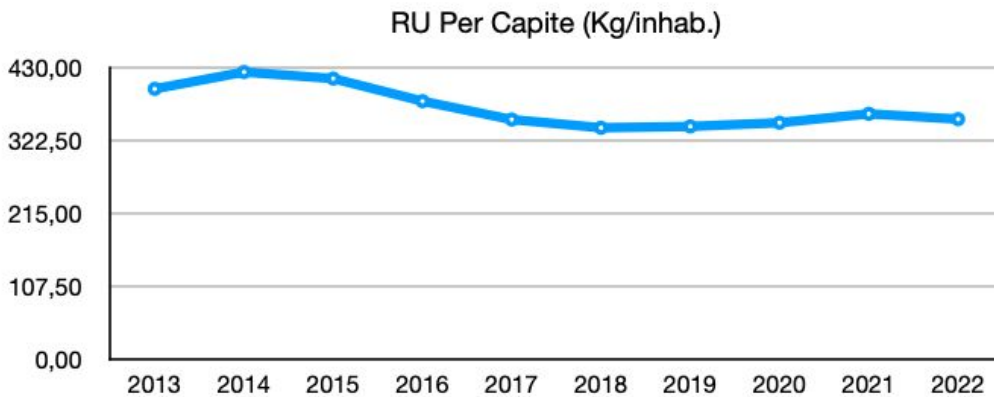
PERFORMANCE

The waste collection and transportation service has been assigned to the company AGESP.



Trends in municipal waste production, municipality of Calatafimi-Segesta, years 2013-2022

In 2022, a total municipal waste (separated and unsorted) of 2163,447 tons was collected. As shown in the graph, the total waste generation over the period under consideration, from the years 2013 to 2022, has shown a decrease in recent years. This could indicate improved waste management practices and increased environmental awareness in the local community.



Trends in per capita municipal waste production, years 2013-2022

The per capita total municipal waste production figures show a decrease over the years, with a slight rise from the year 2020 to the year 2021, from 347.84 kg per inhabitant to 360.95 kg, registering an increase of 3.8 percent. In 2022, there is a slight decrease to 353,1 kg per inhabitant.

In the municipality of Calatafimi-Segesta, a door-to-door collection service is available for all households and commercial users within the main urban centre. Users outside the centre are partly reached by the door-to-door service, the remaining part uses the service of the ecological island (about a hundred users altogether).

The waste that is sorted includes different categories, such as organic waste, paper, glass, plastics, nappies and diapers, tires, end-of-life vehicles, clothing, WEEE (electrical and electronic equipment waste), oils and fats, medicines, batteries and accumulators, wood, metals, pruning clippings, and bulky items. The municipality also offers an on-call collection system, where locals can request a specific collection of large, bulky items, WEEE or garden trimmings (leaves, grass etc) when needed, without extra charges.

Data on separate collection from the years 2013 to 2023*

Year	Population	Separate collection (Tonnes)	Separate Collection (% of total MSW)	Separate collection (Kg/inhab.)
2013	6.808	1.157,86	42,77	170,07
2014	6.792	1.273,71	44,4	187,53
2015	6.712	1.224,71	44,2	182,46
2016	6.616	1.274,67	50,76	192,66
2017	6.537	1.296,27	56,26	198,3
2018	6.471	1.482,17	67,29	229,05
2019	6.376	1.448,34	66,34	227,15
2020	6.288	1.506,56	68,88	239,59
2021	6.196	1.667,61	74,69	269,14
2022	6.133	-	75,00	-
2023*	6.146	-	85,74	-

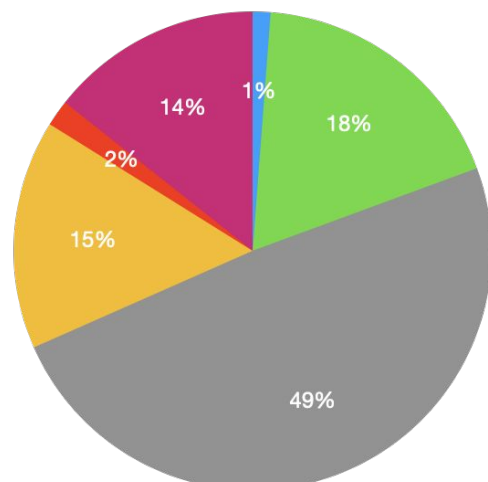
*first half of 2023

Separate collection of the main commodity fractions, 2013-2023 (in kilograms)

Year	Mixed bulky waste	Packaging Paper and Cardboard	Organic fraction (kitchens , canteens and green waste)	Wood	Metal	Plastic Packaging	WEEE	Textiles	Glass
2013	-	86.500	1.058.380	2.750	160	-	-	4.980	-
2014	-	206.070	864.570	5.370	200	74.190	-	6.840	11.270
2015	-	257.790	735.610	5.160	-	93.410	610	480	11.990
2016	8.790	226.980	796.060	12.540	1920	92.410	-	2.780	131.030
2017	7.680	240.360	752.620	6.880	1.930	110.630	13.045	13.550	148700
2018	11.110	285.990	805.270	12.160	1.800	168.010	8.470	8.960	179.300
2019	10.750	299.260	689.410	12.230	2.780	207.110	22.690	-	203.030
2020	10.390	283.420	785.100	9.860	3.530	206.000	25.740	1.400	179.600
2021	13.970	300.300	853.530	11.060	3.330	233.040	27.190	21.555	201.720
2022	18.290	275.820	742.920	16.110	4.803	234.900	26.920	24.300	217.660
2023	13.840	143.920	383.680	3.830	-	123.020	12.500	23.140	110.780

● Mixed Bulky waste ● Paper&Cardboard ● Organic fraction ● Plastic
● WEEE ● Glass

Separate collection % by material fraction, 2022 (Split by weight)



Organic waste in the municipality comes from kitchens and canteens, garden and park maintenance, open markets, and biodegradable waste destined for home composting. Home composting is a practice followed by a few dozen users since 2020. Thanks to a municipal statute it is possible to have a 20€ deduction per person for a maximum total of 60€ per family.

Home composting totals:

- 2020: 8219 kg
- 2021: 14160 kg
- 2022: 14000 kg
- 2023 (first 6 months): 7080 kg

Data on home composting is calculated from the users who are officially signed up for the programme, a total of 63 households. The calculation is based on an estimate of how much the standard organic production is for a local household. Then a calculation is made of the material that is not delivered to the composting centre based on the number of households participating in the programme.

Garden waste has been collected separately from the rest of the organic waste since 2020, with 28 tonnes collected in 2021 and 11 tonnes collected during the first 6 months of 2023.



Picture 2: Centro di raccolta municipale

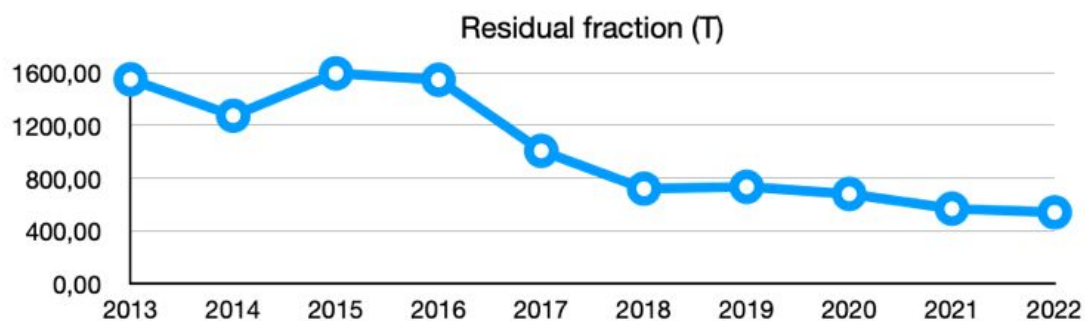
The development of a composting centre is in its final stages and now awaits public funding for its implementation. The model developed is for an aerobic treatment plant, capable of treating 36000 tonnes of organic waste to produce high quality compost. The municipality is also seeking further funds to add an anaerobic function to the plant, which if added would increase overall capacity to 90,000 tonnes and be able to produce biogas from the treatment of organics. With the composting centre about 10 people will be employed, whilst a further 10-12 people would work in the anaerobic digestion plant.

Residual waste

The system used by Calatafimi Segesta has proven over recent years to be a pioneering example of getting the foundations right in order to reduce waste generation. By rejecting extra incineration capacity, the municipality has been able to focus on supporting citizens to sort and recycle their waste properly.

This has led to a dramatically impressive decrease in residual waste generation, down over a 1000 tonnes per year since 2013, approximately two-thirds less.

Year	Total residual waste generated (t)	Per capita (kg/inhabitant)
2013	1549,54	226
2014	1273,71	187
2015	1595,26	234
2016	1546,08	230
2017	1007,87	152
2018	720,53	110
2019	734,76	113
2020	680,64	106
2021	565,34	90
2022	541,06	88



Local data indicates a significant increase in the separate collection of textile waste, from 1.4 tonnes in 2020 to 21.55 tonnes in 2021, a percentage increase of 1439.64%. Whilst its commendable to be collecting more textiles, the issue still remains that most textiles cannot be recycled. The municipality has noted some specific actions will be needed to properly manage this type of waste, such as

the enhancement of reuse programmes or the involvement of charities. With the new creation of the Reuse Centre (started in July 2023) specialised in textiles, it is believed that there can be a considerable improvement in reusing textiles.



Costs of the system

The municipality's total costs for the waste collection system for 2022 was €1,421,767 as per PEF (Economic and Financial Plan) 2022 - 2025. The calculation of the TARI (waste tax) is based on several factors, such as the square footage of the property, the number of household members, the waste collection service used, and other variables defined by the municipality. For example, an average family of 3 people with a household of 100 sq. m. pays approximately € 400.00 per year. To compare with other Sicilian municipalities for the same family and households size:

- Messina (236k pop.): €476
- Catania (313k pop.): €475
- Siracusa (122k pop.): €472
- Agrigento (59k pop.): €471
- Trapani (68k pop.): €457

Currently, the tax system does not accommodate a Pay-As-You-Throw approach for the municipality. Due to the closure of the local landfill, which has affected the whole of Sicily, the tax on waste sent to landfill on the island has increased from 220€ to about 290€ currently per ton. Yet despite this, due to the high performance of the system in the municipality, Calatafimi Segesta have not had to pay any increase in their waste tax (TARI).

The municipality has been able to avoid this precisely because we have decreased to only two monthly pick-ups of residual waste.. Otherwise, we would have had to intervene, as has happened in neighbouring municipalities, which were forced to revise the current year's business plan. We have managed to go from about 70% annually to the current rate 85% for separate collection of municipal waste. Since the municipality exceeds 65%, they will be fully eligible for reimbursement in the privilege bracket and receive an economic return from regional authorities for the increased charges placed on landfilling waste.

Extra initiatives within the municipality's zero waste strategy

The CCR - Municipal Collection Centre

A new municipal site for the collection of reusable and recyclable materials will open at the end of 2023, built thanks to funding from the National Ministry of Environment. At the CCR, waste can be disposed of and sorted according to a wider range of different types and done so even more accurately. All citizens will be able to use the CCR, both those who live outside the city centre and those inside.

It will be possible to deposit various types of waste, including bulky waste and large electronic items, without making a reservation. The municipality believes that when the centre is up and running, it will help the community achieve a separate collection rate of near to or above 90%.



Picture 3: Municipal collection centre

The water house

Over the years, the municipality has taken steps to prevent materials from becoming waste or being recycled. With the establishment of the 'Water House' (a water dispenser), it wanted to send a message on the importance of water as an asset for all, on issues of environmental sustainability and public benefit. The savings in the consumption of plastic bottles translates not only into an environmental benefit but also into tangible savings for the public administration in terms of reduced costs for the disposal of plastic waste.



Picture 4: Water house

The plastic-eating machine

Thanks to winning a tender from the Italian Ministry of Ecological Transition, a 'Plastic Eating Machine', an eco collector and compactor for PET bottles for recycling, was installed and is located in the adjacent space of the Reuse Centre. Citizens can register and drop-off PET bottles via a QR code. The machine works with a scoring system, which is currently being defined. The idea is to involve businesses that allow the purchase of goods through this scoring system.



Picture 5: Plastic-eating machine

The zero waste and social cohesion

The municipality has been promoting collaboration between citizens and municipality for a number of years. The main objective is to promote local economic and social development, helping bring together the community and increase social cohesion. For example, citizen assemblies are organised regularly with operators from CeSVoP (Volunteer Service Center of Sicily).

Collaboration between citizens and administration is at the heart of the policies of the Municipality of Calatafimi Segesta for the enhancement of common goods and represents a unique opportunity to promote local development and collective well-being.

For example, in 2021, the municipality created a tender for the purchase of 58 homes at the symbolic cost of €1. The goal was to cope with the phenomenon of depopulation - by recovering the ability for people to live again in the municipality's historic centre, by redeveloping the area from an urban planning point of view and by encouraging more tourist friendly institutions (e.g. hotels, shops, crafting workshops) to reopen in the city centre once more.

For Calatafimi Segesta, becoming a zero waste city is more than just reducing its waste. It provides an opportunity to engage with the community and improve the lives of both local residents and the guests that come to visit each year.



Picture 6: Training

Reuse Centre and eco-island for clothing and small WEEE

The building and operationalisation of a new local Reuse Centre' was implemented within the project "RE-NÉ - Re-lancer une Nouvelle Économie" funded by the European Union within the Italy-Tunisia international cooperation program. One of the objectives of the project is to improve waste management at the institutional level, with the establishment of reuse & recycling points and to create an international platform for the exchange of information and expertise in the waste sector.

The two-year project, which will end on December 15 2023, involves three Sicilian municipalities (Balestrate, Favignana island, Calatafimi Segesta), with the IRIB-CNR Institute and two Tunisian municipalities (Maamoura and Zarat) and UTSS - the Tunisian Social Solidarity Union.

The municipality of Calatafimi Segesta, among the activities envisaged in the project, has built the Reuse Centre, with an area of 240 square metres. With funding from the RE-NÉ project, it was possible not only to renovate the premises but also to purchase the necessary equipment in order to get the centre in working order.

The reuse centre is currently being run by a local cooperative of volunteers that was established in August 2023. For now it is in a start-up phase, with their focus on both selling quality second-hand items and also turning garments they receive that cannot be sold in their existing form, into new models of packaging or styling items.



Picture 7: Reuse centre

In the area adjacent to the Reuse Centre, an eco-island has been placed for the collection of used clothing, small WEEE items, small toys and other objects suitable for reuse, so that users will be able to drop off objects that have suitable characteristics to be reused (small electronic items only) or recycled independently.

Through a public tender, the municipality identified the right personnel to carry out training to approximately 20 people on both the importance of reuse. At the end of the training, five people created a cooperative named "Fa-Ma.P" which was designated with the responsibility of operating and managing the reuse centre on a daily basis. A further e-commerce site for the online sale of the products made from textile waste and discarded clothing is also being developed in the coming months.

The cooperative has officially been in operation since 17 July and to date, approximately 40 tonnes of textile waste has been sorted and prepared for reuse. Even when the centre is closed people are able to drop off their clothes and textiles in the special receptacles outside the centre. Thanks to an electronic chip people can use their health insurance card to open the automatic doors and deposit the garments. The team of volunteers then sort these garments into first and second choice quality, identifying which fabrics can be regenerated and made into new products. The team also donates reusable clothing to people in need locally.



Picture 8: Eco-island

Interview with Ms. Maria Pascale, Fa-Ma.P Cooperative President

How did the Fa-Ma.P cooperative come into being?

The cooperative was formed by five people who met each other during the training course provided by the municipality in preparation of the opening of the reuse centre. We are very different people but with a common interest. Each of us has different jobs and come from different backgrounds. At the moment we are volunteers and we have made an investment to become a self-funded business. Each of us has a primary work activity outside of this volunteering, but we are working towards making the Reuse Centre our fully-fledged activity. Our idea is to provide work. I take care of the administrative part but there are different figures, the artist Luigi Senia who is in charge of designing the models of the clothes and creating the art objects with textile waste; there is Caterina Bruccoleri who is an expert in embroidery. There are also two seamstresses, sisters Angela and Paola Gucciardi who process the fabrics.

How has the impact of the Reuse Centre been among the citizens?

Initially the citizens looked at us with some mistrust, as we were a novelty for the town. Of course one has to get used to the new reality that clothing and textiles can be reused. In 2025 it will be compulsory to sort textiles as well, so already in a way the Reuse Centre is getting citizens used to that. We are very enthusiastic and we have a lot of hope. I think it is something great that has come into being; it is the first centre of its kind in Sicily. There is great potential to grow and create more jobs.

Are the products you create for sale?

Yes, we are slowly selling the items we create; we have first-rate items on the online market thanks to the platform created with funds from the RE-NÉ project, but we also sell to the local market. We have an area of the workshop that we use for display and sale.

People start coming, looking and buying. What is important for us is through the product we create to convey the sense of recovery. The message is that you should not throw anything away but recover and revive a piece of clothing, for example, that may not fit one person but does another.

Projects in the near future?

We want to organise meetings to make schools aware of recovery and reuse. We have already made contact and are happy to make our circular fashion project known, of course.



Picture 9-10-11: Reuse centre

Interview with Calatafimi Segesta Mayor, Mr. Francesco Gruppuso

“Calatafimi Segesta in 2011, thanks to the door-to-door service, had already reached 65 percent of separate waste collection. By adhering to the Zero Waste strategy we were the first municipality in the Province of Trapani and the third in all of Sicily, after the municipalities of Marineo and Collesano (province of Palermo). To date, all the planned objectives have been achieved: almost 90% separate waste collection with door-to-door, the composting centre and the reuse centre thanks to the “RE-NÉ” project.

All good practices have been implemented and with determination we have succeeded. The motivations are due to a great desire to protect our territory. I felt that the zero waste model could tie together multiple aspects of environmental and economic sustainability. It is not just about setting good waste management in motion and achieving high percentages. Zero waste is a wide-ranging action, and the benefits are on multiple levels: in agriculture with compost, in the recovery of materials linked to the whole aspect of raw material scarcity, in the possibility of creating new jobs with the reuse centre, and in the non-landfilling of still usable resources.

In 2011, the then Rifiuti Zero Trapani association, when I was an environmental councillor, contacted me and I was very interested in the project. Later I went to visit the good practices put in place in Capannori. I visited the Zero Waste Research Center, the “Daccapo” Reuse Center. I also attended many educational conferences that were organised by Zero Waste Italy. Our endorsement of the zero waste strategy by the city council in 2011 was unanimous.

Whenever the administration has made choices, even very challenging ones, citizens have responded positively and from the very beginning have joined in the various good practice initiatives such as the ‘Water House’, the plastic eating machine and recently the reuse centre.”

INGREDIENTS FOR SUCCESS

Keys to Calatafimi Segesta's success appear to include:

Citizen Involvement:

Citizen enthusiasm and their awareness about the issue of waste have been crucial in achieving high waste collection rates. Active community participation is essential to the success of any waste management program.

Collaboration among stakeholders:

Cooperation between the municipal government, the waste collection company, and the local community have been critical to success. This collaboration has created an environment where everyone works together to address waste management challenges.

Strong leadership:

The mayor's commitment and his previous experience as an environmental councillor have played a key role in steering the municipality towards more sustainable waste management.

European and international projects:

Participation in European projects such as the Italy-Tunisia cross-border project called "RE-NÉ, has contributed to the municipality's openness to new ideas and approaches in waste management. These kinds of initiatives can lead to an exchange of knowledge and experience that benefits all partners involved.



Picture 12-13: Celebration partnership Italy-Tunisia

CONCLUSIONS

For Calatafimi Segesta and its citizens, it is highly encouraging of course to see that efforts to improve waste management over the past decade are being backed up by hard data showing these efforts are having a positive impact. This can be seen clearly in the decade since the municipality made its zero waste city commitment. In this timespan, they have doubled the amount of materials separately collected for recycling & reuse, whilst also reducing the volume of residual waste by two-thirds.

The story of Calatafimi Segesta is one of getting the foundations right first to reduce waste, and then keeping that energy and enthusiasm to address more systemic issues next. For example, the opening of the reuse centre is an excellent example of how to address the problem of a key waste stream but doing so in a socially inclusive way.

This initiative not only helps to reduce textile waste, but also creates a community of people who are informed and aware about the need to shop and act sustainably, across all age groups. Furthermore, the municipality has not only sought to **implement policies that address waste generation**, but they have done so in a way that seeks to **bring the community together**, through the provision of new skills and job opportunities within the local economy.

The approach of Calatafimi Segesta reflects a major shift in the way we should be dealing with today's environmental problems. It must not just be about managing waste, but rather also focus on **creating the right tools and support for communities to promote change themselves**. It is a clear example of how a wide range of local actors can work together to address environmental challenges and create a more sustainable future.

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- IRIB CNR, Palermo (Institute for Biomedical Research and Innovation)
- SRR Trapani Nord, Mr Enzo Novara (Society for the regulation of waste management service)
- Mayor of Calatafimi Segesta Municipality, Mr Francesco Gruppuso
- Councillor for the Environment of Calatafimi Segesta Municipality, Mr Massimo Fundarò
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Pictures: Calatafimi Segesta Municipality and Patrizia Lo Sciuto



Zero Waste Italy was established in May 2009. Its primary task is to connect the Italian Zero Waste initiatives with the European and global networks of this movement-project. It acts in a complementary and non-competitive manner with the Italian Zero Waste Network, mainly by developing the application of the 10 steps towards zero waste as defined by the International Naples Charter of the Zero Waste International Alliance.



Zero Waste Europe is the European network of communities, local leaders, experts and change agents working towards the elimination of waste in our society. We empower communities to redesign their relationship with resources, and to adopt smarter lifestyles and sustainable consumption patterns in line with a circular economy.



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