



European Green Capital Award 2025

Brescia application Indicator 4

4. Waste and Circular Economy

4.A Present Situation

Please complete the following table providing the most recent data that is available for the city. If city data is not available, please provide a brief explanation and use regional data where available.

Table 1: Benchmarking Data – Waste

* For EGL applicants the following applies: when the applicant cannot provide certain benchmark data, a brief description of the current situation regarding waste.

Indicator	Type of Data (City/Regional)	Data	Unit	Year of Data
Amount of municipal waste generated per capita		572.57	kg/capita/year	2021
Percentage of municipal waste that is recycled (including through composting and anaerobic digestion of biowaste)		100 (*)	%	2021
Percentage of municipal waste sent to incineration (R1 code)		17.38	%	2021
Percentage of municipal waste sent to landfill (or other forms of disposal (D codes)		0	%	2021
Percentage of recycled packaging waste		42	%	2021
Established collection systems for hazardous waste:	Type of Data (City/Regional)	Yes/No	Unit	Year of Data
i) Waste from electrical and electronic equipment	City	Yes 5.06	kg/capita/year	2021
ii) Batteries	City	Yes 0.17	kg/capita/year	2021
iii) Waste oils	City	Yes 0.23	kg/capita/year	2021
iv) Household chemicals	City	Yes 0.60	kg/capita/year	2021
v) Asbestos	City	No	kg/capita/year	2021
vi) Construction & demolition waste	City	Yes 12.67	kg/capita/year	2021
vii) Unused pharmaceuticals	City	Yes 0.10	kg/capita/year	2021

Official data on municipal solid waste are released by the Province of Brescia in the autumn of the upcoming year. Thus, in April it is only possible to express 2021 data.

(*) This data includes the share of waste sent to the incinerator of 17.38 %.

Describe the present situation in relation to waste production and management by providing details about each of the following areas:

1. Current waste collection system, including the types of waste collected separately and the extent of rollout (% coverage) of the systems.

2. Application of the 'polluter pays' principle and economic instruments, including through differentiated tariffs ('Pay as You Throw' initiatives) and landfill and incineration charges.
3. Green public procurement of the municipality.

(max. 1000 words and five graphics, images or tables)

European guidelines

The Environmental Energy System, as outlined in the City Introduction and Context, represents the innovating heart of the city and it not only provides Brescia with electricity and thermal energy but is an outstanding example of circular economy [1]. While the Landfill Directive requires EU countries to reduce the landfilling rate to 10% or less by 2035, Brescia already has a 0% landfilling rate. This result has been achieved for two reasons: on the one hand, the ability to differentiate urban waste, which in Brescia has exceeded 70%; on the other hand, the ability to treat and recover 100% of waste, either through material or energy recovery, in line with the Waste Framework Directive (data provided by A2A SpA, the waste collection system manager in Brescia). Thanks to the Brescia WtE Plant (termoutilizzatore), municipal solid waste, otherwise destined to landfills, becomes fuel for the production of electricity and heat for district heating. The Brescia Environment-Energy System thus fully meets the waste hierarchy principle established by the Waste Framework Directive, according to which landfilling should be kept to a minimum in favor of other uses of the waste, including energy recovery.

The following figure shows a summary of the environmental benefits of the Energy Environment System, as outlined in the City Introduction and Context Air Quality Climate Change Mitigation section.

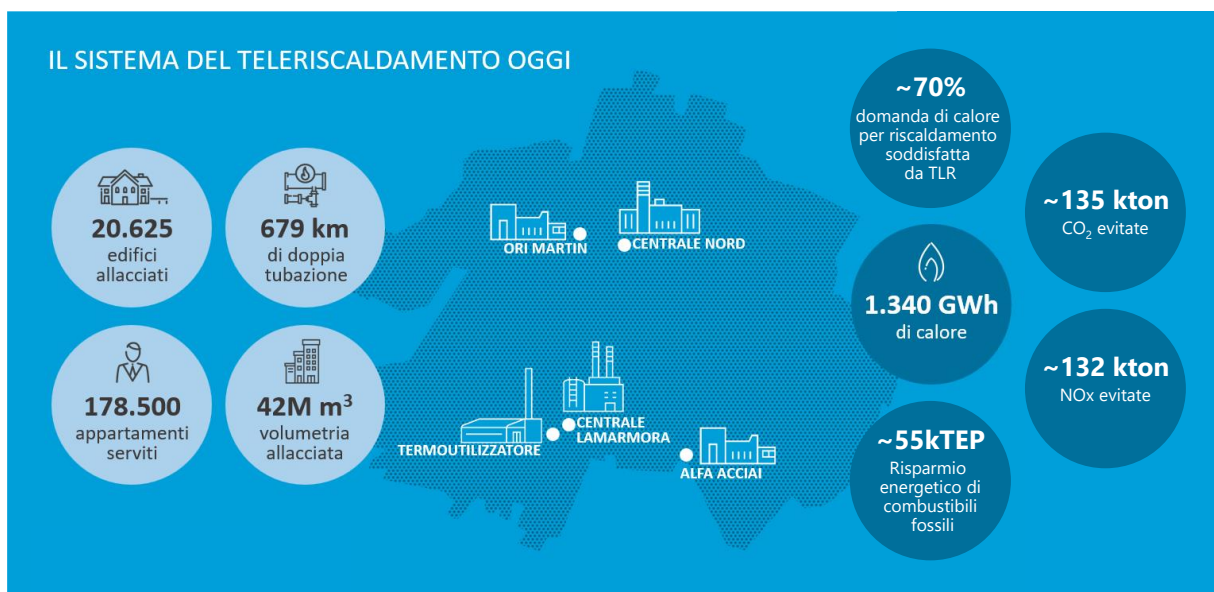


Figure 1: Brescia district heating network. Data provided by A2A spa

The following table shows the waste delivered to the Brescia waste-to-energy plant (Termoutilizzatore).

Waste delivered to the waste-to-energy plant 2019-2020-2021 (T)			
Type of waste	2019	2020	2021
MSW province	152.170	147.447	150.748
MSW extra-province	64.850	69.436	80.859
Special waste province	100.989	80.822	89.528
Special waste extra-province	360.439	399.330	359.176
Sludge and other sewage waste province	24.710	26.965	27.269
Sludge and other sewage waste extra-province	32.247	26.480	26.715
Total (waste-to-energy plant)	735.405	750.480	734.295

Table 1: waste delivered to the Brescia waste-to-energy plant (*Termoutilizzatore*).
Province of Brescia - Waste Observatory [2]

The current waste collection system [3] [4] [5] [6]

The Municipality of Brescia, following European and national principles, launched a new combined doorstep collection system in 2016, including:

- Municipal solid waste and organic fraction collection through conditional access bins (OFMSW)
- Domestic door to door collection of paper and cardboard, plastic, glass and metal (with open-access bins in the city center) as well as cuttings.



Figure 2: the combined domestic collection system

In addition, there are 5 collection facilities platforms for separate and bulky waste. Referring to the latter, also a doorstep pickup service is available. Moreover, a travelling truck service, known as Ecocar, is employed to complement the collection of household hazardous waste at some local markets and other meeting points. A Service Card was developed, in cooperation with stakeholders, to protect consumers.

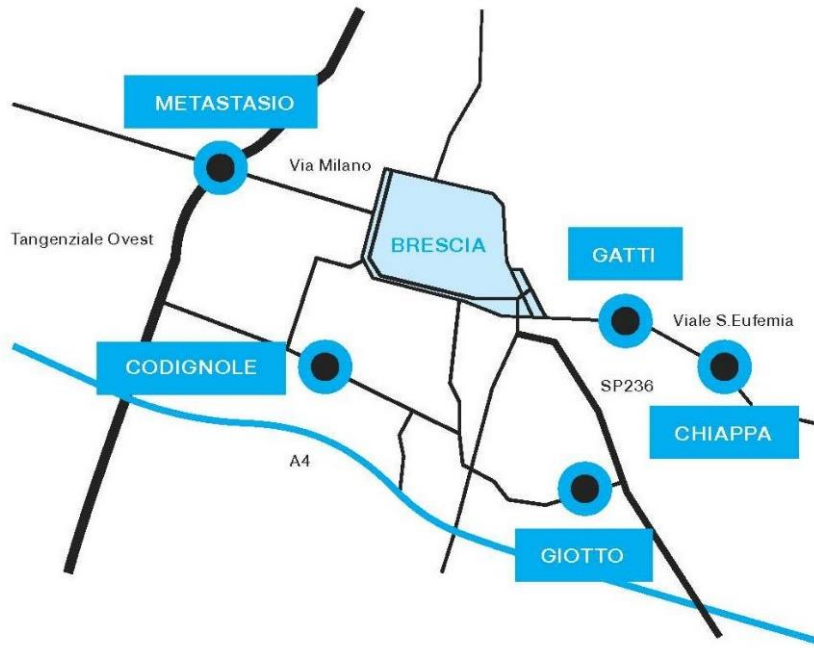


Figure 3: Brescia's Collection Centres

In the town of Brescia, the fleet consists of 219 vehicles. There are 124 low-impact vehicles (electric, euro 6 and methane) 21 of which are electric.



Figure 4: Multilingual guide to separate waste collection

Municipal Regulation

The Municipal Regulation [7] approved with the introduction of the new waste collection system is inspired to the principles of empowerment and subsidiarity. The community collaborates, with the involvement of associations, parish churches and stakeholders, to achieve the objectives in order to support, in terms of subsidiarity, the culture of non-waste, reuse, and waste reduction.

Plastic-free

In 2019, the Municipal Council approved a plastic-free [8] motion with the purpose of minimizing the use of plastics and promoting conscious lifestyles. Following this motion, municipal departments internally undertook actions to remove single-use plastic from beverage dispensers and to influence suppliers to choose products with biodegradable packaging in dispensers.

In February 2023, the Municipal Council decided to join ANCI Emilia-Romagna's #moNOuse Manifesto to encourage disposable reduction strategies and strengthen reuse models.

Food waste

In order to reduce food waste, municipal canteens of nurseries, kindergartens and primary schools gather food surplus and distribute it to charities. Similarly, since 2003, the Cauto Cooperative has implemented a virtuous model of recovering foodstuffs close to best before end date through Banco Alimentare. This initiative includes the disposal of foodstuffs to individuals who then distribute them to families in socially fragile conditions. In addition, as part of the school project Tutti in campo per il nostro pianeta food boxes were distributed to all primary school children to reduce post-canteen food waste. [9].

The implementation of the project Cibi e Bici promote 'proximity solidarity' through the involvement of trained young volunteers on bicycles delivering foodstuffs close to the expiration date from neighborhood business realities to families in need. [10]

Eco-events

Since 2007, actions for proper waste management at events and festivals have been introduced in accordance with associations and parish churches envisaging operating protocols and specific toolkits. In 2016, ***Guidelines for eco-friendly festivals*** were established [11].

Season al Swap

The initiative *Season al Swap*, in collaboration with Legambiente, has been in place since 2007 to promote the re-use of items, such as furniture, toys, books, pottery, etc.. During spring and fall, items goods donated by citizens are collected and distributed for free [12]

Application of the 'polluter pays' principle and economic instruments, including through differentiated tariffs ('Pay as You Throw' initiatives) and landfill and incineration charges.

Conditional access bins devoted to the collection of MSW and OFMSW are equipped with a 'canopy' that can be opened by using a 'badge'. Thus, each delivery of mixed waste and organic fraction becomes nominal and traceable. The 'canopies' enable to monitor the amount (volume) of waste delivered by each individual user. Thus, the system is potentially suitable for the introduction of a points-pricing system due to the quantities produced. The most appropriate strategies for its introduction are currently being examined.

Green Public Procurement of the Municipality

Since 2007 there has been a steady focus on Green Public Procurement (GPP). The selection of low-impact supplies and staff training allowed the City of Brescia to be awarded the Lombardy Region prize for the best GPP policy in 2008. Currently, the Minimum Environmental Criteria are included in all contracts involving the supply of goods and services.

4.B Past Performance

The aim of this section is to make clear how the situation described in the previous section has been achieved. Where available, quantitative information and data should be provided for the previous ten years in order to show recent trends. Please provide information on:

1. Trends or changes in:
 - a. Amount of municipal and packaging waste produced per capita in the city.
 - b. Percentage of municipal waste sent to incineration (R1 code).
 - c. Percentage of municipal waste sent to landfill (or other forms of disposal (D codes)
 - d. Separate collection systems in the city.
2. Actions and measures taken by the city authorities in the last 10 years that significantly affected the trends and changes mentioned under 1.

(max. 600 words and five graphics, images or tables)

The Integrated System

In the early 1990s, the Municipality of Brescia, in order to cope with the municipal waste problem, approved an Integrated System Project for waste management based on the following cornerstones:

- 36% separate waste collection, a goal achieved in 2001
- Development of a waste-to-energy plant (*Termoutilizzatore*), launched in 1998;
- Bulky and composting waste selection and sorting plants for organic and green waste
- From 1991 to 2015, the waste collection system was carried out with open-access bins with the increase over the years of waste separation fractions

Trends

The shift in the waste collection system from *open-access bins* (1991 to 2015) to the newly combined doorstep collection (2016), described in the **Present** Section, has resulted in considerable benefits as shown in the following figures.

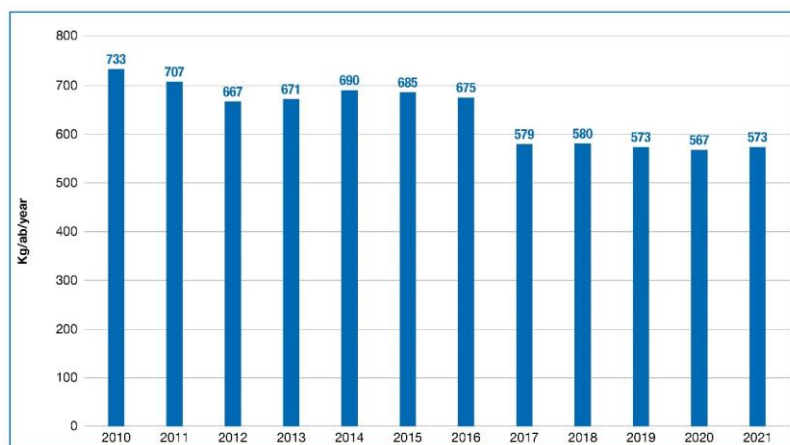


Figure 5: Amount of municipal waste generated per capita for 2010 – 2021

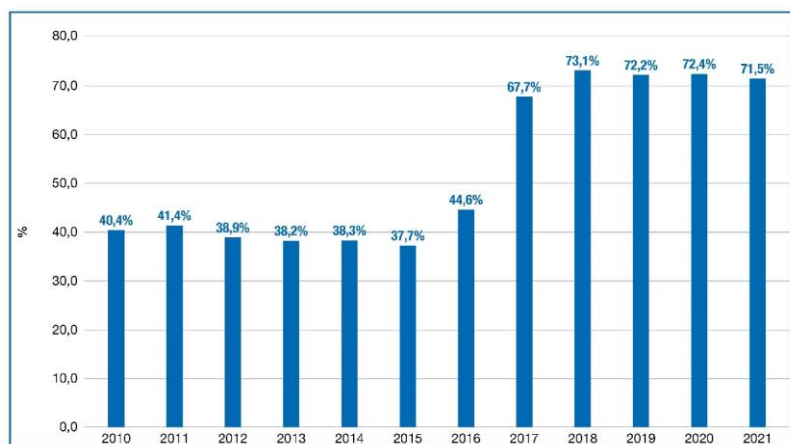


Figure 6: Percentage of separate waste collection for 2010 – 2021

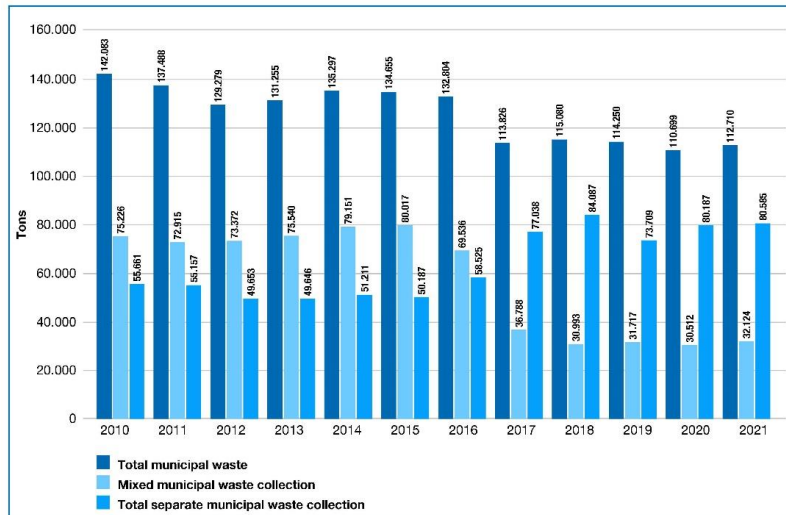


Figure 7: Total municipal waste - mixed municipal waste collection - Total separate municipal waste collection for 2010 – 2021.

Materials recovery

Besides the improvement of waste reduction goals and separation in the collection, over the years particular emphasis has been devoted to the recovery of materials collected through plants largely managed directly by A2A close proximity to the production area (Data provided by A2A and referring to 2020).

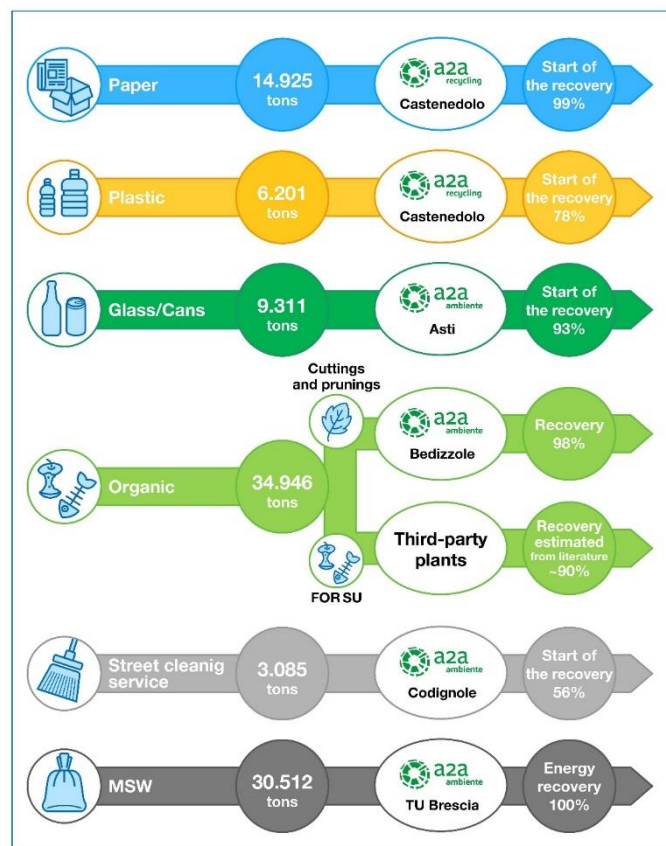


Figure 8: effective start of the recovery of collected materials

To conclude, the key actions and interventions implemented over the past 10 years, capable of altering significantly trends and habits, are the following:

- Making citizens more responsible through a tailored marketing and education campaign associated with the introduction of the new partial door-to-door collection system in 2016;
- Making businesses more responsible through the introduction and optimization of tailored services;
- The introduction of an effective repression system for ill-behaved acts, by:
 - The adoption of a sanction system in the Municipal law;
 - Training of the Municipal Police and establishment of a dedicated team;
 - Policing by specifically-trained officers.

The waste collection system is funded by a local waste tax, which represents the compensation paid to cover the costs for waste collection and disposal.

Citizens' involvement and information

A complete overview of the subject has been made available to citizens through the **Report on the State of the Environment of the Municipality of Brescia (DPSIR) [8]**.

The debate on environmental issues is complex and involves several fundamental aspects of citizens' lives such as health, social, economic, and production issues. For this reason, such issues are frequently the focus of public opinion, media, and political discussion, in some cases generating open controversy.

In particular, the WtE Plant has always raised a great deal of concern among the citizens because of the potential effects on the surrounding environment, health and overall waste management in the plant.

In order to create a beneficial dialogue with all stakeholders, the city administration established the Termoutilizzatore Observatory in June 2014.

The launch of WtE Plant has generated a heated debate on the potential environmental and health impacts caused by the plant.

The various points of view concerning this topic, the somewhat complex accessibility of the data regarding the inspections carried out by the Monitoring Bodies and the provider as well as the need to start an effective confrontation on the issue, led the municipal administration to create, the '**Termoutilizzatore' Observatory [13]**.

In particular, the Observatory has published the **Reports on the Termoutilizzatore** from 2007 to 2022. The reports include operational data, emissions and detailed aspects requested by the Observatory members.



Figure 9: Termoutilizzatore Observatory

4.C Future Plans

Please provide information on:

1. The medium term (2030) and long term (2050) objectives for the management of waste and specifically of plastics and the prevention of food waste.
2. The planned measures to achieve the ambitions described under 1. Please also indicate which innovations your city is planning to use.
3. How the measures and ambitions described under 1 and 2 are supported by:
 - a. strategic and policy commitments
 - b. budget and resource allocations
 - c. plans for monitoring of impacts
 - d. participatory approaches
4. Current or outstanding ongoing environmental legal proceedings, including infringement procedures under the Waste Framework Directive. If there are, please indicate how and when you are planning to comply.

(max. 600 words and five graphics, images or tables)

Technical Monitoring Board

The performance of the waste collection system is constantly monitored through various tools. In particular, a technical (2016) and an institutional forum (composed of political and social representatives) have been established. While the first one aims to identify the most effective solutions and solve the critical issues encountered, the purpose of the institutional table is to assess the solutions adopted and inform the Municipal Council about the outcome of the analyses carried out. Following this approach, five main goals for the future were devised:

1. identification of the most effective methods to improve the quantitative and qualitative performance of separate collection;
2. testing of 'smart' waste collection bins with compactors and experimentation of a software that constantly monitors waste filling. The introduction of such technologies will allow both the optimization of the emptying service and the reduction of environmental impacts;
3. evaluation of the most effective methods of the points-pricing system;
4. strengthening actions in a subsidiary perspective to promote the involvement of citizens, students and associations with particular reference to waste reduction, re-use and recycling through responsible and conscious lifestyles;
5. fighting the phenomenon of illegal dumping by intensifying the surveillance of the Local Police and trained Environmental Inspectors, also by increasing video surveillance and special services;
6. strengthening of waste collection centres: development of one facility in the north of the city and establishment of a reuse center (with the involvement of associations);
7. realization of a reuse center with the involvement of associations in order to promote the culture of reuse and the development of a network policy among the entities operating in this field.

Further actions will be adopted, in the implementation of the 'Plastic free' motion and adherence to the *#moNOuse Manifesto*, targeting educational institutions and citizens in order to promote conscious lifestyles and waste reduction. In addition, GPP actions will be implemented to promote the use of bioplastics and plastic-free alternatives.

Climate emergency motion [14]

By Resolution No. 108 of 30.9.2019, the City Council listed the activities that should be implemented to address the climate emergency and environmental sustainability issues in general. These include waste management issues, namely:

- *the continuation of actions aimed at reducing waste production, optimising separate waste collection and recycling;*
- *Drastic reduction in the use of single-use plastic containers, as stated in the recent EU directive and approved by the City Council with the "Plastic free" motion in July 2019;*
- *supporting actors involved in the fight against food waste;*
- *promote the complete transition from the linear economic model to the circular model.*

A2A Strategic Plan Update 2021-2030

As a result of A2A actions, the main circular economy projects planned and/or being assessed in the Brescia territory include:

- Development of a project related to hydrogen (Hydrogen Valley - H2Valcamonica) produced through electrolysis, with energy delivered by WtE plant (Termoutilizzatore) and destined to power hydrogen trains on the Brescia-Iseo-Edolo route (2025).
- Efficiency optimisation of the Brescia WtE plant, performed through the flue gas recovery project in order to increase energy production, maximise heat recovery, and further reduce emissions.
- Further developments in the bio-methane sector to reduce reliance on fossil fuels, according to the objectives of the REPower EU plan. Biomethane from agricultural/food waste could be used, in a circular economy perspective, within cogeneration plants feeding district heating.

4.D References

List supporting documentation, adding links where possible. Further detail may be requested during the pre-selection phase. Documentation should not be forwarded at this stage.

(max. 400 words)

[1] Municipality of Brescia: The Environmental Energy System

<https://www.comune.brescia.it/aree-tematiche/ambiente/impianti-termici/teleriscaldamento-di-brescia>

[2] Provincial of Brescia - Waste Observatory

https://www.provincia.brescia.it/sites/default/files/allegati/documenti/79365/quaderno_rifiuti_2022_def.pdf

[3] Municipality of Brescia: waste collection system

<https://www.comune.brescia.it/aree-tematiche/ambiente/rifiuti/servizio-di-igiene-urbana>

[4] Municipality of Brescia: Guide to separate waste collection in 4 languages

https://www.comune.brescia.it/lfs/servizi/ambienteeverde/Ambiente/Documents/Raccolta%20domiciliare%20combinato%20dei%20rifiuti/Opuscolo%20nuovo%20sistema%20raccolta%20differenziata_Def.pdf

[5] A2A spa: Our services for the municipality of Brescia

<https://www.apricaspa.it/cittadini/brescia>

[6] Relazione sullo stato dell'ambiente (DPSIR) – Comune di Brescia

<https://www.comune.brescia.it/aree-tematiche/ambiente/relazione-sullo-stato-dellambiente>

[7] Municipality of Brescia: Municipal Regulation

<https://www.comune.brescia.it/lfs/comune/statutoregolamenti/Documents/UltimeVersioni/REG-GESTIONE%20RIFIUTI%20URBANI.pdf>

[8] Municipality of Brescia: motion plastic free 2019

<https://www.comune.brescia.it/sites/default/files/2023-04/Mozione%20cc%20plastic%20free%2025.6.19.pdf>

[9] Municipality of Brescia: reduce food waste

<https://www.comune.brescia.it/news/lotta-allo-spreco-alimentare>

[10] Cibi e Bici project

<https://ilcalabrone.org/cibibici>

[11] Municipality of Brescia: Guidelines for eco-friendly festivals

<https://www.comune.brescia.it/sites/default/files/2023-04/Linee%20guida%20per%20ecofestesostenibili%202016.pdf>

[12] Municipality of Brescia: Season's Exchange
https://www.comune.brescia.it/sites/default/files/2023-04/Scambio%20di%20stagione%202023_Locandina.pdf

[13] Municipality of Brescia: Termoutilizzatore' Observatory
<https://www.comune.brescia.it/aree-tematiche/ambiente/osservatori/osservatorio-termoutilizzatore>

[14] Municipality of Brescia: Climate emergency motion
https://www.comune.brescia.it/sites/default/files/2023-04/Mozione%20emergenza%20climatica_1.pdf

Word Count Check

Please complete the below word count check.

Section	Number of words in graphics/images/tables	Number of words in body of text	Total number of words in graphics/ images/ tables and body of text	Max. words
4A	0	901	901	1000
4B	0	527	527	600
4C	0	547	547	600