



The hidden costs of incineration: the case of Madeira and Azores

Case Study

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The true impact of incineration in Europe's outermost regions: the case of Madeira and Azores

Nothing prevents islands from achieving ambitious waste reduction and recycling targets – but waste incineration can slow them down.

As the incineration plants in Madeira and Azores need a constant input of waste in order to function, the regions have to burn most of their municipal solid waste, with Madeira presenting one of the lowest recycling rates in the country.

The case of Madeira

Madeira is one of two autonomous regions in Portugal. It comprises the islands of Madeira and Porto Santo, with 2017 data showing a total of 254,368 inhabitants between the two islands (249,195 and 5,173 inhabitants, respectively).

Madeira has an above national average population density (around 300 inhabitants per km²), with around 75% of the population living in just 35% of the territory. Population is denser in the southernmost part of the island, with 45% of the island's population (130,000) living in its capital, Funchal. Madeira is a tourist destination, with many of the tourist lodgings also located on the south of the island.

According to official data¹, the Autonomous Region of Madeira provided the following figures on the destination of the municipal solid waste produced in 2017:

Table 1: Municipal waste management in 2017²

	Tonnes	%
Incineration	109,197	89
Landfill	1,170	1
Recycling	12,114	10
Total	12,2481	100

Madeira has a waste incineration capacity of 140,000 tons per annum. This is above the total amount of municipal solid waste generated, therefore the incineration centre has been operating below maximum capacity. To compensate, Madeira deactivated its composting unit several years ago, in order that all waste would instead be incinerated. At present, Madeira recycles 0% of its organic waste.

It should be noted that Madeira's status as an 'outermost region' does not justify discontinuing organic waste recycling. Indeed, there are economic activities that could benefit from recycled organics, such as flower production and agriculture.

¹ <http://www.aguasdmadeira.pt/Portals/0/Documentos/RC2017-ARM.pdf>

² Source: Águas e Resíduos da Madeira, S.A.

Moreover, waste incineration has resulted in an extremely low recycling rate, with official data recording only 10% recycling in 2017³. The mandatory municipal waste recycling target of 55% for 2025 therefore implies the need to drastically reduce the role of waste incineration in the region's waste management in the coming years.

All costs relating to the separate collection and transport to mainland Portugal of the recycling materials are covered by the organisations responsible for the management of packaging and packaging waste materials, under Extended Producer Responsibility schemes. Therefore, the islands' status as an outermost region doesn't represent an obstacle to recycling, nor is it in any way a barrier to achieving ambitious recycling targets for these (and other) materials.

The decision to install an urban solid waste incinerator in Madeira has directly contributed to very low recycling rates and the abandonment of organic waste recycling to date. Even more worrying are the potential impact of the incinerator on the future of recycling in Madeira, and the barriers it poses to Madeira's transition to a truly circular economy model.

The case of Azores

Azores is the second autonomous region of Portugal. It comprises nine islands, with a total population of 246,772. The island of São Miguel (where Ponta Delgada, the region's capital is located) has 137,699 inhabitants, while the second largest island, Terceira, has a population of 56,062 inhabitants (2011 data).

The nine major islands of Azores are divided into three groups: Flores and Corvo to the west, Graciosa, Terceira, São Jorge, Pico e Faial in the centre, and São Miguel and Santa Maria to the east.

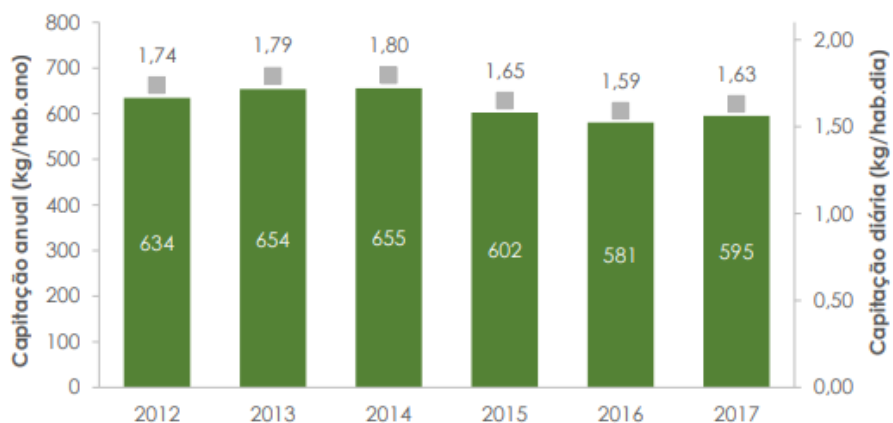
The Autonomous Region of Azores has a municipal solid waste incinerator on Terceira, with a second incinerator planned for São Miguel.

Terceira

In Terceira, the per capita generation of municipal solid waste has decreased in recent years, reaching 33,179 tonnes in 2017. This is below the maximum capacity of the incinerator (40,000 tonnes). The annual urban solid waste generation per capita is 595 kg, with a daily per capita generation of 1.63 kg.

³ *Ibid.*

Figure 1: Evolution of municipal waste generation rate on Terceira⁴



The data show that recycling rates are relatively low, with no significant increase in recent years⁵.

Table 2: Evolution of the municipal solid waste treatment⁶

	2016, Tonnes / %	2017, Tonnes / %
Selective recovery (materials/organics)	10 190t / 31%	9942t / 30%
Incineration	19 727t / 61%	20 599t / 62%
Landfill	2687t / 8%	2638t / 8%
Total	32 604	33 179

Recycling has increased by only 1% between 2016 and 2017, (from 7532 tonnes – 23% - to 7905 tonnes – 24%) falling far short of the 55% target required in 2025.

The existing incineration unit in Terceira requires all of the waste available in order to be economically viable. It has also absorbed much of the regional funding that might otherwise have been directed towards the creation of a functional and circular collection system to allow for more and better recycling. Here, again, the incinerator is a direct cause of poor recycling results, and disincentivises the implementation of the necessary measures to achieve the ambitious circular economy targets recently adopted by the EU.

⁴ Source: SRIR (2012-2017)

⁵ <http://www.azores.gov.pt/Gra/srrn-residuos/conteudos/livres/Relatorios+SRIR.htm>

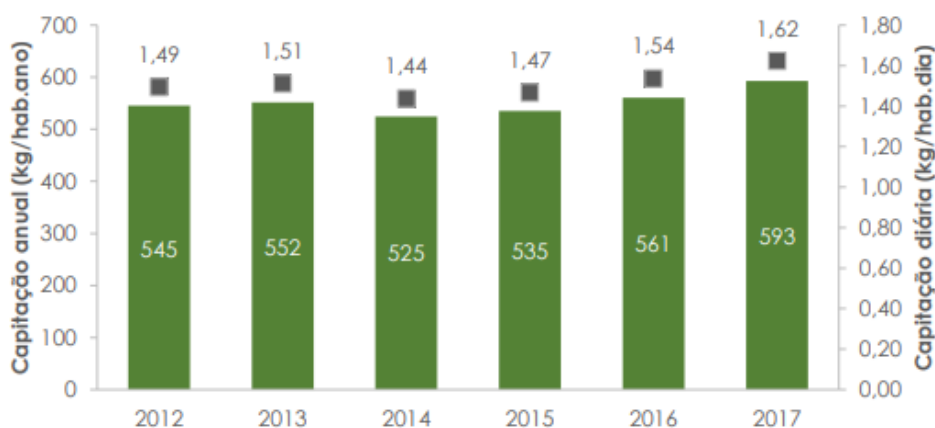
⁶ Source: SRIR – Registration System of Waste in the Azores Autonomous Region

São Miguel

In São Miguel the per capita generation of municipal solid waste has increased in recent years, reaching 81,668 tonnes in 2017, slightly above the capacity of the proposed incinerator (72,000 tonnes). The annual production per capita of municipal solid waste is 593 kg, with a daily per capita production of 1.62 kg.

Figure 2: Evolution of municipal solid waste generation in São Miguel⁷

Gráfico 2 – Evolução da produção per capita de resíduos urbanos, na ilha de São Miguel



Although in São Miguel's recycling results are relatively low and have decreased in recent years⁸, they are nevertheless better than those of Terceira, where an incinerator already exists.

Table 3: Evolution of municipal solid waste treatment in São Miguel⁹

	2016, Tonnes / %	2017, Tonnes / %
Selective recovery (materials/organics)	20 596t / 27%	21 059t / 26%
Landfill	56 917t / 73%	60 185t / 74%
Total	77 513t	81 668t

Here, recycling results are also relatively low and have decreased in recent years¹⁰ (from 19 670 tonnes – 25,4% - to 17375 tonnes – 21%).

An incineration project is planned for São Miguel, with its financing already foreseen in investment programmes based on EU Funds. The construction of the plant has not yet started, due to local opposition, as well as to problems relating to the dimensions of the incinerator and its interconnection with the construction of a dam (to harness the excess electricity produced).

⁷ Source: SRIR (2012-2017)

⁸ <http://www.azores.gov.pt/Gra/srrn-residuos/conteudos/livres/Relatorios+SRIR.htm>

⁹ Source: SRIR – Registration System of Waste in the Azores Autonomous Region

¹⁰ <http://www.azores.gov.pt/Gra/srrn-residuos/conteudos/livres/Relatorios+SRIR.htm>

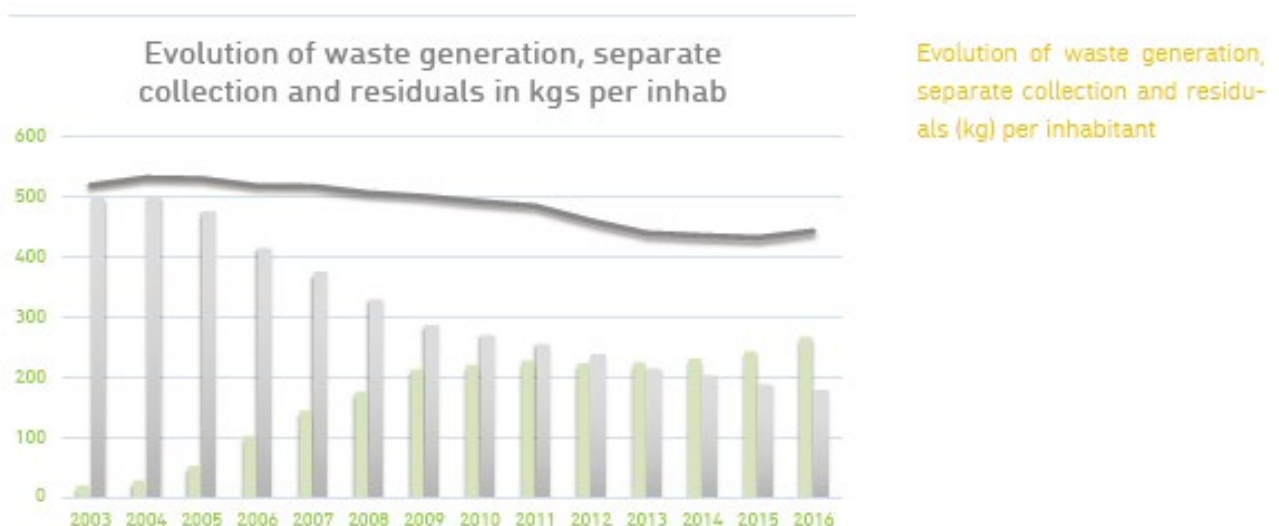
The project is based on the assumption that by 2035 only 30% of municipal solid waste generated on the island will be recycled. This target is less than half of the recycling target recently approved by the EU (65% by 2035).

The incinerator will use 20% of the financial resources assigned to municipal solid waste management in Portugal for the period until 2020, but will treat only 1.4% of all municipal solid waste produced in the country (mainland and islands).

Like in Madeira, the same financial supports exist for transporting waste for recycling to mainland Portugal from any of the Azores Islands, and there is a similar demand for compost to use in agriculture. This strongly suggests that the recycling targets agreed at EU level can equally be achieved on the islands.

There are several good examples of islands over-performing on zero waste strategies. Sardinia¹¹ is a case in point, managing to maximise its recycling and reduce the amount of waste produced.

Figure 3: Evolution of waste generation, separate collection and residuals (kg) per inhabitant in Sardinia



Conclusions and recommendations

When it comes to urban solid waste management, nothing prevents outermost regions such as islands from performing as well as other European regions in terms of reducing waste production and increasing recycling.

On the other hand, both in Madeira and the Azores the presence of incinerators has clearly been detrimental to waste reduction and recycling strategies, and represents a substantial barrier to circular economy.

¹¹ <https://zerowasteurope.eu/downloads/case-study-10-the-story-of-sardinia/>

In the Portuguese islands where incinerators exist, recycling plants have been discontinued or were never built, as they would interfere with the large quantities of waste required for the incinerators to be economically viable and efficient on a day-to-day basis.

Besides, building new incinerators will consume a considerable proportion of the scarce financial resources available for municipal solid waste management, preventing solid investments in more sustainable alternatives.

If the EU is truly committed to promoting a circular economy, exceptions should not be accepted – especially when based on erroneous assumptions on islands' abilities to achieve equally ambitious reduction and recycling targets.

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Zero Waste Europe is the European network of communities, local leaders, businesses, experts, and change agents working towards the same vision: phasing out waste from our society. We empower communities to redesign their relationship with resources, to adopt smarter lifestyles and sustainable consumption patterns, and to think circular.



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