



Sustainable Tourism Observatory of Málaga

Energy management



Ciudad
de Málaga



INSTO

International Network
of Sustainable Tourism
Observatories



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Plan de
Recuperación,
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01.

Context

Energy efficiency is essential to address the current and future challenges associated with energy supplies, the climate crisis and resource management, as well as providing an opportunity for companies to improve their competitiveness.

The European Commission adopted the EU Green Deal in 2020 with the aim of becoming climate-neutral by the year 2050. In this vein, the Fit for 55 targets were introduced in July 2021, a set of proposals aimed at revising and updating existing European legislation, as well as meeting climate neutrality targets. To achieve this, it aims to reduce Member States' emissions in various production sectors by 55% by 2030. Additionally, through the 2022 REPowerEU Plan, it established a set of measures to end dependence on Russian fossil fuels by 2027.

The fulfilment of these targets led to a further revision of the EU Energy Efficiency Directive in 2023, incorporating the above elements and highlighting the importance of the "energy efficiency first principle", where the focus is on renewable energy consumption and production.



At a national level, in order to comply with EU requirements, a number of plans and standards have been put in place, including the following:

- > Royal Decree 314/2006 approving the Technical Building Code, an attempt to unify the regulations on energy efficiency in buildings.
- > Royal Decree 1027/2007, approving the Regulation on Indoor Heating and Air Conditioning Systems (RITE).
- > Regulation on Energy Efficiency in Outdoor Lighting Installations, approved by Royal Decree 1890/200
- > The Renewable Energy Plan (PER) 2011-2020
- > National Energy Efficiency Action Plan 2017-2020
- > Integrated National Energy and Climate Plan 2021-2030 (PNIEC)
- > Energy Saving and Efficiency Measures Plan of the General State Administration (2022)
- > Royal Decree-Law 14/2022. This establishes energy saving and efficiency measures in the transport sector and administrative buildings, measures to reduce energy dependence on natural gas and steps to promote electrification and the deployment of renewable energies, especially in the area of self-consumption.

In line with the above, the Regional Government of Andalusia is committed to achieving sustainability and combating the climate crisis through the Energy Strategy for Andalusia 2030. This is designed to promote the transition to an efficient, sustainable, secure and carbon-neutral energy model. In September 2022, the Administration of the Regional Government of Andalusia approved the Energy Saving Plan 2022-2026, which establishes measures aimed at saving energy and using renewable energies.



Targets

- To reduce total energy consumption per capita to below 0.78 (toe) by 2050.
- To ensure that renewable energy accounts for more than 15% of total final energy consumption by 2050.
- To develop photovoltaic solar parks to generate an estimated 53 GWh per year and reduce CO2 emissions by 16,000 tonnes.
- To promote energy savings and efficiency by installing solar photovoltaic systems for self-consumption with renewable energies on the roofs of municipal buildings to generate an estimated 4,100 MWh per year and reduce CO2 emissions by 2,160 tonnes.
- To produce renewable energy through photovoltaic systems on the roofs of drinking water tanks, primarily for self-consumption in water cycle management systems (pumps), thereby reducing energy consumption by 800,000 KWh/year.
- To encourage reductions in the energy consumption of municipal facilities and public lighting by installing astronomical clocks, incorporating light flow stabilisers/dimmers (which reduce the intensity of light at off-peak hours), introducing LED lighting in the city and adapting traffic light systems to LED technology.
- To harness energy from biogas generated through municipal solid waste management and gas produced from sewage sludge treatment.
- To encourage hotels to reduce energy consumption by 60% through measures such as contracting power that is suitable for their energy and air conditioning needs, identifying the lighting requirements of each space and using switch-off timers for outdoor areas.
- To reduce energy consumption in restaurants by 8-13% through temperature control in the winter and summer, using thermostatic valves and programmable controllers.

Results

Programmes to increase energy efficiency

Our first observation is that there are clear strategies for energy management in Malaga. The programmes aimed at implementing energy consumption targets in the city of Malaga include: the SEAP (2010), adherence to the EU Covenant of Mayors for Climate and Energy (2015) and the Malaga Climate Plan (2020).

In Malaga's public sector, work has been carried out to improve the energy efficiency of several public buildings through the Administration of the Regional Government of Andalusia's Energy Network. In 2011, the European Regional Development Fund implemented measures in the municipality of Malaga's private sector, aimed at modernising, reshaping and changing the structure of its businesses with regard to energy consumption by 2017. That year, the city council assumed these functions, extending their scope to the whole city and not just the business sector.

Malaga City Council has an Environmental Quality certification (Figure 1). There are currently 1069 certified establishments from ten different sectors.

This programme highlights the importance of waste management, recycling and water and energy management. In the case of the hotel sector, the use of local and/or environmentally friendly products is viewed positively, as is proper waste management of electrical and electronic equipment, especially luminaires. Similarly, energy saving is encouraged through steps such as contracting power that suits their needs, identifying the lighting requirements of each space, using switch-off timers for outdoor spaces and in air conditioning. The goal is to reduce energy consumption by 60%.

In the catering and food manufacturing sector, the energy saving plan consists of: choosing the optimal temperature (in summer 25° and in winter 20°, with every additional degree, consumption increases by 8%), using thermostatic valves and programmable controllers to save 8-13% of energy, and choosing energy-saving light bulbs.

In the port of Malaga, the “Green Port” initiative is underway. The aim of this project is to introduce tree-lined areas and tree barriers in various locations in the port, particularly in the transition areas between the city and the industrial zones of the port. Moreover, renewable energy facilities are to be built on the site in order to reduce carbon emissions and increase energy efficiency.

Minimising energy consumption for economic and environmental emission purposes is one of the priorities. One of the proposed changes involves luminaires, where private sector investment is geared towards a transition to renewable energies, i.e. the installation of solar panels.

Energy consumption of the city of Malaga

The study on energy consumption for the 2015-2019 period shows that it is growing steadily, with an increase of 2.5% with respect to 2019 (Figure 2). In 2020, there was a fall in energy consumption due to the Covid-19 pandemic, but in 2021 it increased again to continue the trend.

If we analyse per capita consumption, we can see that the trend is fairly constant. In fact, consumption was the same in 2018 and 2019, representing an increase of just 1.4% on 2015. Subsequently, the decline in consumption due to the pandemic and a recovering economy can be observed.

Figure 1: Procedures for obtaining the Environmental Quality Certificate



Source: Department of Environmental Sustainability. Malaga City Council

Figure 2: Energy consumption of the city of Malaga (2015-2021)



Source: Urban Environment Observatory (OMAU)

Renewable energies

“In 2019, renewable energy predominantly came from automotive biofuels (67.8%), followed by electrical energy (22.8%).”

1%, reaching values of 1.25%, representing an increase of 37.5% if we compare 2021 with 2015.

However, in terms of production, the effects of the renewable energy consumption initiatives are evident (Figure 5). In 2021, renewable energy production increased by 33.5% compared to 2015. During the pre-pandemic years (2015-2019), year-on-year renewable energy production levels increased by 2%, which is equivalent to approximately 150 toe of renewable energy being produced. However, this growth accelerated in 2020 and 2021, with a rise of 28.3% in 2021 compared to 2019.

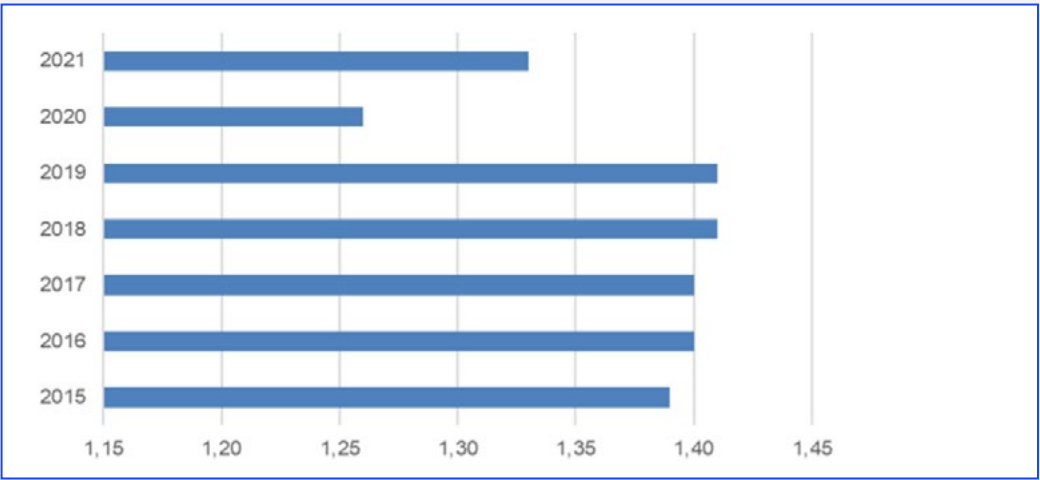
Regarding energy types, in 2019 we can see that renewable energy predominantly came from automotive biofuels (67.8%), followed by electrical energy (22.8%).

In order to meet the targets that have been set, Malaga City Council is working on a plan to expand the city’s network of photovoltaic roofs, aiming to improve energy production and reduce carbon dioxide emissions generated by its photovoltaic systems. Photovoltaic energy provides a very small share of energy compared to other types of renewable energy (fig. 6), and this investment may help to increase its use.

In 2022, the 58 systems in operation achieved annual photovoltaic energy production of 2,474 MWh and reduced carbon dioxide emissions by 1,289 tonnes per year. With the addition of 12 new photovoltaic systems over the course of 2023, it is estimated that an extra 666 MWh were generated and CO2 emissions were reduced by 347 tonnes, according to data from the Department of Innovation, Digitalisation and Investment Attraction.

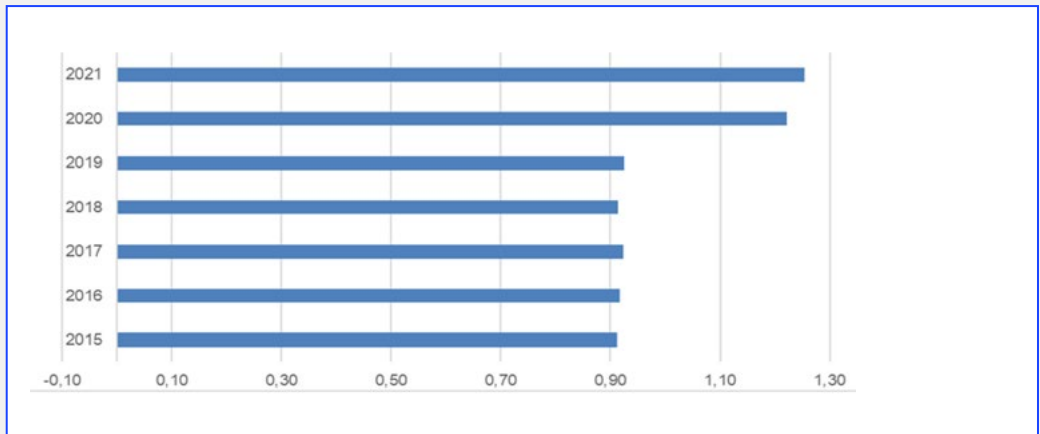
Regarding renewable energies for the 2015-2021 period, renewable energy accounted for just over 1% of total final energy consumption in the city (Figure 4). Between 2015 and 2019 these values fluctuated between 0.91% and 0.93%. In subsequent years, renewable energy production rose above

Figure 3: Final energy consumption per capita in toe (2015-2021)



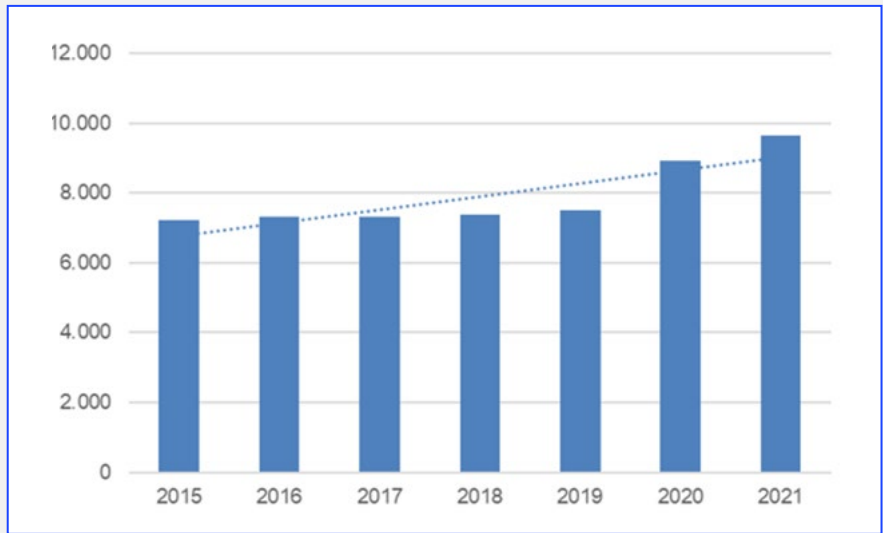
Source: Urban Environment Observatory (OMAU)

Figure 4: Energy consumption as a percentage of total energy consumption (2015-2021)



Source: Urban Environment Observatory (OMAU)

Figure 5: Total renewable energy production in toe (2015-2021)



Source: Urban Environment Observatory (OMAU)

Energy consumption by sector

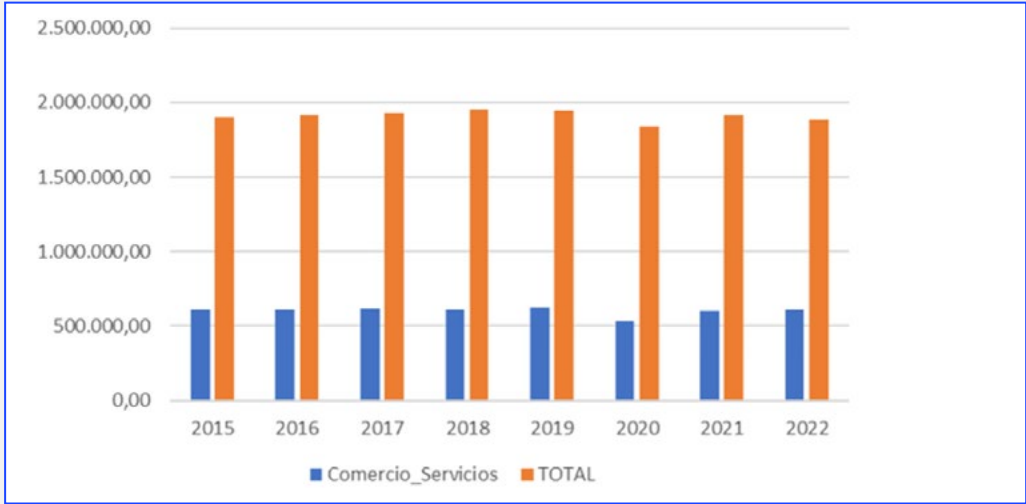
“The trade and services sector accounts for a significant share of total electricity consumption in the city, averaging 31.5% of the total in the period (2008-2017).”

The trade and services sector accounts for a significant share of total electricity consumption in the city, averaging 31.5% of the total.

In terms of energy consumption by sector (MWh), using an average of the years for which figures are available (2008-2017), the service sector, together with road transport, consumes around 76% of total energy through electricity,

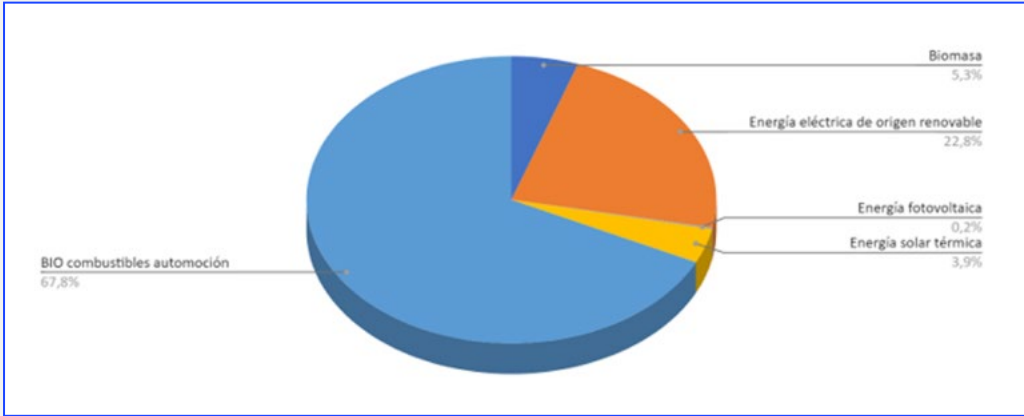
diesel or petrol. This means an average consumption of 3,146,047 (MWh) in the transport sector and 827,574 (MWh) in the services sector. In the case of the services sector alone, the heating oil accounts for approximately 10%, natural gas for 7% and liquefied petroleum gas (LPG) for 3%.

Figure 6: Electricity consumed in trade/services sector MWh (2015-2022)



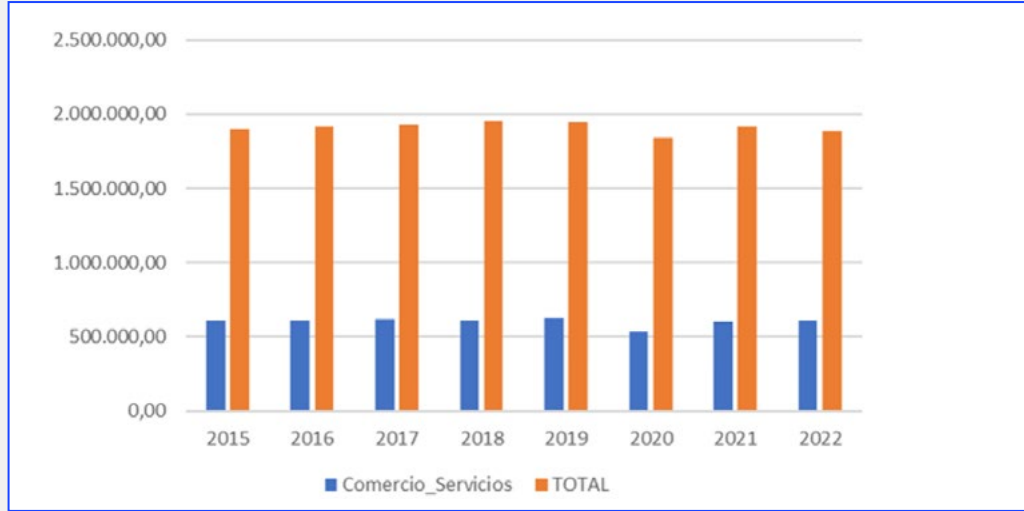
Source: Alicia Plan

Figura 7: Percentage of renewable energy by type 2019



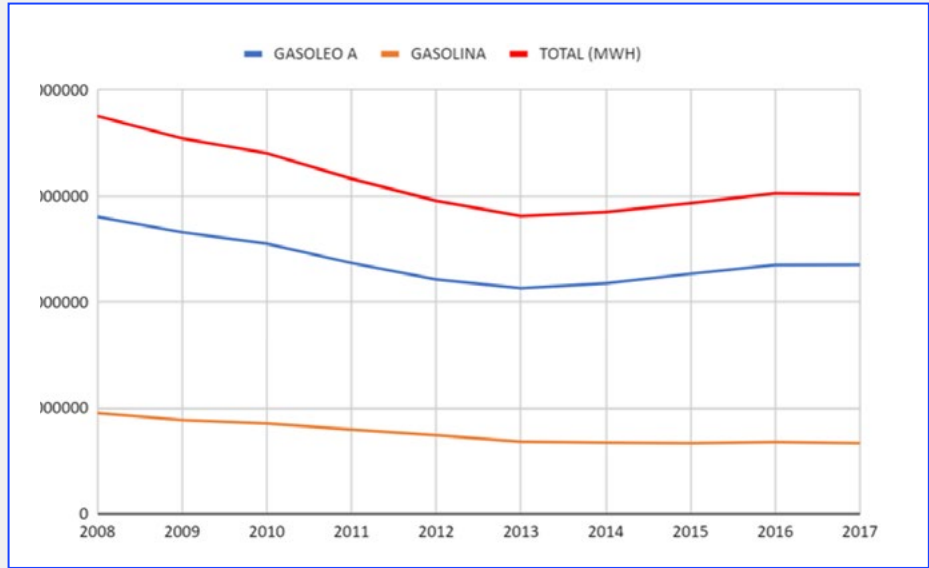
Source: Ministry for Sustainability, Environment and Blue Economy. Carbon footprint of the municipalities of Andalusia

Figure 8: Consumption by commercial buildings 2008-2017



Source: Alicia Plan

Figure 9: Private and commercial traffic consumption 2008-2017



Source: Alicia Plan

04.

Conclusions

Tourism in particular and the region in general require regulations aimed at improving energy efficiency in all types of accommodation, be they hotels, aparthotels, holiday accommodation and housing for residents, as well as any other type of public or private facilities.

At present, it is clear that local authorities have a key role to play in achieving more efficient energy use and greater energy savings. This is not only because of their ability to directly influence the energy behaviour of the population, but also because of their ability and responsibility to implement energy efficiency policies in their own facilities and services to set an example. Municipal bylaws have become essential tools in the process of shifting towards a more efficient energy model, ensuring that the policies proposed by local authorities are implemented through mandatory regulations.

In this respect, the city of Malaga is working to meet the EU's requirements and the targets set for the year 2050. Measures include, firstly, the Alicia Climate Plan approved in 2020, which was discussed in the previous report, and the EU-funded NEXT GENERATION project to work on establishing the municipality's Low Emission Zone in order to comply with sectoral regulations. This area, in which vehicle access is restricted or limited in order to improve air quality, will cover 437 hectares, including not only the central area of the old town, but also other surrounding neighbourhoods. Such initiatives can be very beneficial in reducing energy consumption, as the transport sector is one of the most energy-intensive industries.

“Malaga is laying the groundwork for a circular economy and mitigating the effects of climate change to achieve carbon neutrality by 2050.”

This also underlines the importance of renewable energies in achieving carbon neutrality by 2050. Therefore, it is the city of Malaga’s ambition to become a flagship Green Local Valley project for the European Union (MALAGA going to H2 GREEN Valley project) by using hydrogen as one of the main renewable ener-

gies. There are also plans to install photovoltaic solar panels in City Council facilities for self-consumption. Finally, the Circular City concept is crucial for addressing the planet’s climate challenges. In this regard, the city of Malaga has signed the Seville Declaration for the Circular Economy, representing a commitment to further implement a model of sustainable, inclusive and resilient urban development, shifting towards zero landfill and promoting the reuse and recycling of waste. Along these lines, the eCityMálaga project is a public-private initiative that was launched by Malaga TechPark, Malaga City Council and Endesa. It will turn the technology park into a model eco-efficient city, making better use of resources by the year 2027. It would be worthwhile to develop a carbon footprint calculator not only for tourists, but also for buildings. This would make hotel establishments more aware of their impact on the environment and make them more efficient. There is also growing awareness in the private sector, as demonstrated by the energy cluster formed by the Association of Hotel Entrepreneurs of the Costa del Sol (AEHCOS) to ensure that they are better informed and advised on this matter

In short, the current planning and initiatives being carried out in Malaga in relation to energy efficiency and promoting renewable energies are in line with EU requirements and address the challenges posed by climate change. However, a major effort is needed to reach carbon neutrality targets by 2050 - therein lies the challenge of sustainability.

© Carbon footprint calculator. Turismo y Planificación Costa del Sol. Can be viewed at <https://www.visitacostadelsol.com/planifica/turismo-responsable/calculadora-de-huella-de-carbono>





<https://sto.malaga.eu/indicadores/gestion-de-la-energia/>