metrotenerife

GREEN BOND ALLOCATION AND IMPACT REPORT

2025

CONTENTS

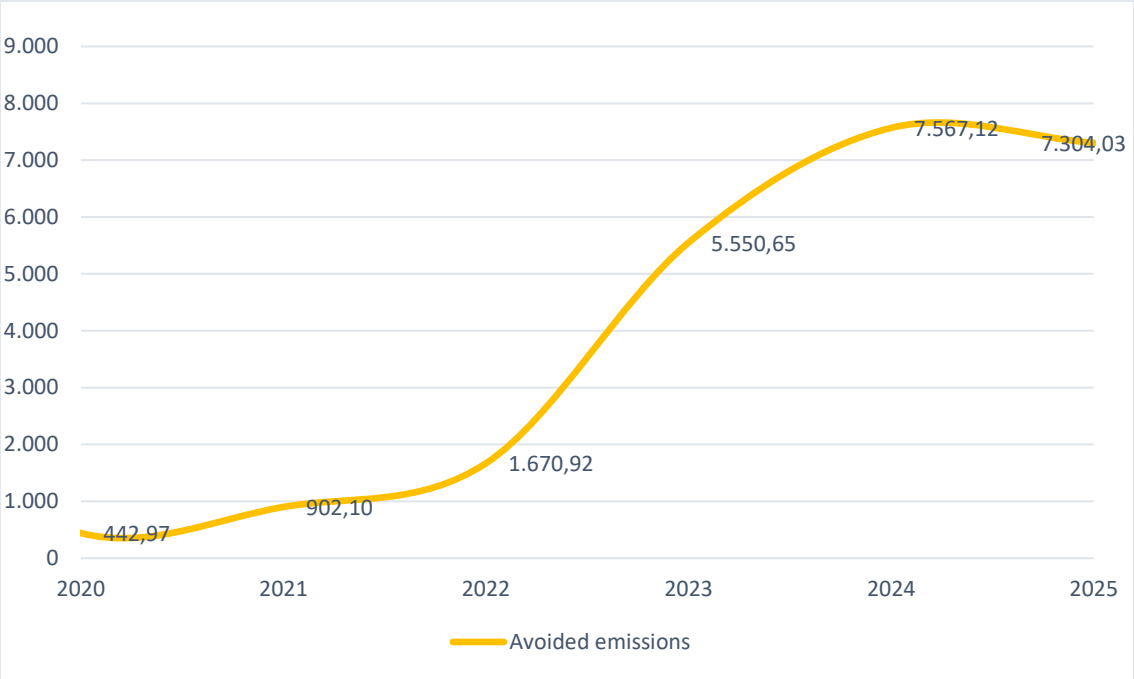
EXECUTIVE SUMMARY

At the end of July 2021, Metropolitano de Tenerife issued its first green bond with a volume of 130 million euros and a maturity of 15 years. The issue was carried out in accordance with Metropolitano de Tenerife's 2021 Green Bond Framework, designed in line with the ICMA Green Bond Principles (2018) and verified by Sustainalytics and S&P. The proceeds from the bond will be used to finance green projects, in particular the refinancing of tram line infrastructure and the financing of a photovoltaic plant integrated into the transport system's infrastructure. The projects fall, respectively, within the categories of clean transport and renewable energy. The projects are expected to contribute to the achievement of Sustainable Development Goals 7 (Affordable and Clean Energy), 9 (Industry, Innovation and Infrastructure), 11 (Sustainable Cities and Communities) and 13 (Climate Action).

In addition to the environmental impact, this report incorporates, for the first time, social outcome indicators, in line with the ICMA's recognition that green projects can also generate social benefits alongside environmental ones. These indicators enable the characterisation of tram users, as well as an analysis of the service's accessibility and its contribution to more sustainable mobility, offering a more comprehensive view of the project's impact on the population of the Tenerife metropolitan area.

Figure 1 shows the trend in greenhouse gas (GHG) emissions avoided during the period 2021 - 2025. The lowest point occurred in 2020 due to the COVID-19 pandemic. Since then, the number of tram passengers has risen exponentially, leading to a corresponding increase in avoided GHG emissions. In 2025, there is a slight decrease in avoided emissions, resulting from a combination of factors. On the one hand, this is due to lower emission factors for private petrol vehicles and buses compared to 2024; on the other hand, there is in 2025 a decrease in the number of passengers travelling in private diesel vehicles.

Figure1 . Trend in emissions avoided through tram use (tonnes of CO_2e)



Source: Author's own calculations

In terms of average values, over the period 2020–2025, the annual average of emissions avoided was **3,906.30 tCO_2e/year.**

1. INTRODUCTION

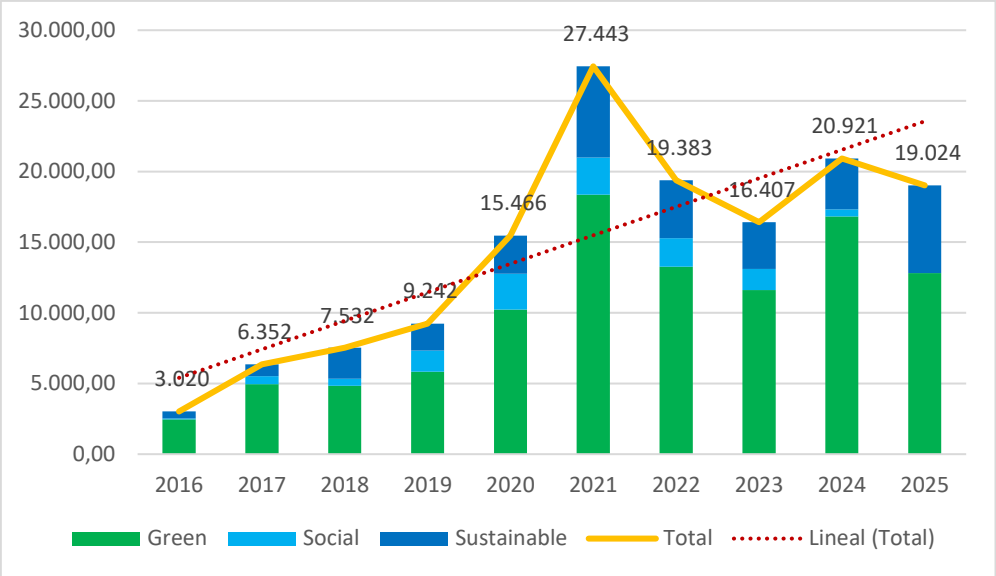
1.1 BRIEF DESCRIPTION OF THE CONTEXT

The European Investment Bank issued the first green bond in 2007. In Spain, within the public sector, the pioneer in issuing sustainable bonds was the Government of the Community of Madrid, which has since been followed by many other regional and local authorities. Specifically, regarding green bonds, ADIF and ICO were the first entities to issue this type of debt, until Metropolitano de Tenerife, S.A., the Spanish Government and the Community of Madrid entered the market in 2021. In the private sector, there is greater diversity amongst issuers of sustainable and green debt, as various industrial, infrastructure, energy, telecommunications and engineering organisations have entered the market as bond issuers in recent years.

There is a growing trend towards channelling financial resources towards sustainable projects, as shown by the trend line in Figure 2. However, against a backdrop of greater market volatility and high interest rates, coupled with favourable access to the banking sector, bond activity has contracted. This is what occurred in the 2022–2023 financial years and, more recently, during 2025. At the end of 2025, the volume placed had fallen by approximately 9% compared with 2024.

A detailed analysis of sustainable bond issuance for the year 2025 shows that green bonds accounted for 67.4 per cent of the total, significantly higher than the 32.6 per cent accounted for by sustainable bonds. Furthermore, it is noteworthy that there were no social bonds issued in 2025. The prevalence of green bond issuance over sustainable bond issuance continues, indicating that the commitment to a transition towards sustainable development based on a decarbonised economy and a reduction in dependence on fossil fuel energy resources remains firm.

Figure 2. Issuance of green, social and sustainable bonds in Spain (€ million).



Source: Own analysis based on Bloomberg, June 2026

1.2 MAIN OBJECTIVES OF THE REPORT AND DESCRIPTION OF THE ‘ ’ BOND

This report is based on the premise set out by the International Capital Market Association (ICMA):

“Green bond issuers are encouraged to report on the use of proceeds, as well as the expected environmental impact, at least annually”[1] .

Metropolitano de Tenerife S.A. (Metrotenerife) is a public transport company[2] founded in 2001 with the aim of developing new alternative public transport solutions in the form of railway lines and linking the island’s two major cities via a light rail system. The Tenerife Island Council recognised the need to tackle the transport problem in the metropolitan area of Santa Cruz de Tenerife and San Cristóbal de La Laguna, given the growing density and complexity of the road network, the increase in traffic volume on urban and inter-urban roads, and the resulting pressures on the island’s environment. At the time, it was an ambitious project situated in a geographical area presenting many technical challenges (steep gradients, routing along the cities’ main roads). It was also a novel concept for the public, but one that brought with it several

[1] ICMA et al. (2018, 2020): Handbook. Harmonised Framework for Impact Reporting. Translated by Afi. https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Handbook-Harmonized-Framework-for-Impact-Reporting-December-2020-151220.pdf

[2] Wholly owned by the Tenerife Island Council, Metrotenerife is a sound and self-sufficient company whose revenue from the two tram lines covers all operating and maintenance costs

positive externalities for the transport system, such as speed, reliability, punctuality and reduced environmental impact.

Metrotenerife is headquartered in Spain, on the island of Tenerife in the Canary Islands. With the aim of building a rail network serving the whole island, Metrotenerife is working on rail projects in the north and south. At the same time, the company is upgrading existing facilities and developing other projects to continue expanding and proposing innovative solutions for public transport.

The rail transport sector will play a key role in meeting the EU's commitments to reduce greenhouse gas (GHG) emissions by at least 40 per cent by 2030, as well as the goal of climate neutrality by 2050. As a provider of public transport services in the Tenerife metropolitan area, Metrotenerife aims to make a significant contribution to this commitment at a local level. Indeed, rail transport is the most energy-efficient mode of transport. The development and use of trains can reduce air pollution and GHG emissions and thus contribute to the fight against climate change.

Metrotenerife recognises the importance of providing a transport service that contributes to sustainable development whilst meeting the travel needs of its citizens. It is firmly committed to steering Tenerife towards a more sustainable, accessible and smart mobility system. In this regard, the company aims to be a key player in sustainable public transport and one of the main pillars of the island's transport system.

Metrotenerife is firmly convinced that green bonds are an effective financing tool for bridging the funding gap required to combat climate change and, consequently, to facilitate the transition to a carbon-neutral world. Through its first green bond issue, it strives to contribute to the development of the Sustainable Debt Market by providing both itself and the investor community with an opportunity to channel proceeds towards the financing of green projects (see Use of Proceeds).

In accordance with the Green Bond Principles (GBP; ICMA, 2018), this report follows the guidelines set out in the fourth component: the preparation of a fund's allocation report. Although these principles are not mandatory, they serve as the reference framework in the sustainable debt market. This report has also considered the Harmonised Framework for Impact Reporting (ICMA, 2020).

The purpose of this report is to provide information on the allocation of proceeds from the inaugural green bond issued by Metrotenerife on 20 July 2021. The issue size was 130 million euros (for further details, see Table 1).

In November 2019, Standard & Poor's (S&P) assigned Metrotenerife long-term and short-term ratings of 'A/A-1' with a stable outlook; this rating was upgraded to 'A+/A-1' in September 2025 and confirmed in S&P's latest rating review in October 2025. This rating is on a par with that of the Kingdom of Spain.

Table 1. Financial terms and conditions of Metropolitano de Tenerife's inaugural green bond

Terms and Conditions	
Issuer	**Metropolitano de Tenerife.** *Ratings*: A (Negative outlook) by S&P
ISIN	ES0205597000
Pricing date	20 July 2021
Settlement date	30 July 2021
Maturity date	30 July 2036
Volume	€130 million
Coupon	1.229
Spread	SPGB[3] Interpolated Yield Curve (07/35 & 07/37) + 55bps
Listing	IBERCLEAR / AIAF

Source: Metrotenerife, Bloomberg, Afi

[3] Spanish government bonds.

Furthermore, in accordance with the ICMA Green Bond Principles (2018), it is recognised that green projects can generate positive social impacts, insofar as they contribute to improving the quality of life, accessibility and well-being of the population; in the case of Metrotenerife, this translates into greater social cohesion and more inclusive mobility in the Tenerife metropolitan area.

In line with the ICMA Green Bond Principles (GBP), Metrotenerife's Green Bond Framework[4] sets out the guidelines to be followed in its green bond issuances, comprising four key components:

i. Use of Proceeds

This section defines the eligibility criteria for green expenditure and classifies it into two green categories: clean transport and renewable energy. This component also specifies:

- The eligibility criteria.
- The types of projects that could be included in each expenditure category.
- The contribution to the United Nations Sustainable Development Goals (SDGs).

ii. Project evaluation and selection process

Metrotenerife is responsible for the financing strategy for infrastructure projects to be operated by Metrotenerife, which must be approved in advance by the Tenerife Island Council.

Metrotenerife has established a Green Bond Committee which proposes to Metrotenerife's Board of Directors the financing of new infrastructure or the refinancing of existing infrastructure in line with the eligibility criteria defined in the Green Bond Framework.

The Green Bond Committee builds and oversees Metrotenerife's green portfolio, comprising eligible green projects. It is responsible for removing projects that are no longer eligible, which may be replaced by new eligible green projects should this be deemed necessary.

iii. Management of funds

Each year, the Green Bond Committee will monitor the green portfolio to ensure that the total value of eligible green projects exceeds the total value of the Green Bonds issued. Should there be insufficient eligible green projects in the portfolio, Metrotenerife will invest the balance of net proceeds in cash or equivalent instruments in accordance with its cash management policy.

[4] https://inversor.metrotenerife.com/aptdo-elemento/marco-de-bonos-verdes/

In the event of refinancing and given that the project costs will have been fully disbursed in the past, no separate management of proceeds is required.

iv. Reporting

Metrotenerife will provide investors and other stakeholders with a report on the allocation of net proceeds and the environmental impact of the eligible green projects financed. This report meets the requirements of this fourth component.

The report will be available on the Metrotenerife website:

Investor Portal

This report is structured into three sections and an appendix. Section 1 (point 2) describes the methodology used and the assumptions made in preparing this report. The second section (point 3) describes the allocation of funds to green projects, together with relevant financial and qualitative information on the funded projects. The report concludes with Section 3 (point 4), which contains an analysis of the results and impact from a sustainability perspective, whilst Annex I is used to provide further details.

2. METHODOLOGY AND ASSUMPTIONS

This section explains how resources have been allocated and their impact measured. In accordance with the ICMA guidelines (Harmonised Framework for Impact Reporting), qualitative and quantitative indicators have been compiled for each selected project. Consequently, this analysis has been carried out on a project-by-project basis, rather than at programme level. All the results described in the following sections are based on this methodology.

The set of **quantitative monitoring indicators** and **impact indicators** has been selected according to their ability to determine and demonstrate the extent to which an objective has been achieved. In particular, the indicators must be:

- **Relevant**: they must enable an analysis of the impact on the socio-economic environment by measuring the achievements or outcomes generated by the funded projects.
- **Meaningful**: they must be capable of monitoring progress in such a way as to facilitate the communication of results to key stakeholders.
- **Reliable**: they must allow the information to be quantified and updated as it evolves over time. The reliability of the indicators depends on how the information is collected and processed, on the credibility of the sources, and on the information quality control processes.

In this report, we will distinguish between outcome indicators and impact indicators, where the former refers to the tangible services produced as a result of the projects and the latter to the long-term changes resulting from the projects. In the case of the selected impact metric – namely, the estimate of annual GHG emissions avoided – the methodology used is detailed in section 4.2 and the assumptions adopted are set out in Annex I.

3. RESOURCE ALLOCATION AND IMPACT

3.1 QUALITATIVE ANALYSIS OF FUNDED PROJECTS

This section describes the list of refinanced and funded projects. It provides information on the project name; the project's green category and eligibility criteria; alignment with the SDGs; and the amount of green bond proceeds allocated to the selected projects. Furthermore, the target population is also indicated.

Funds are allocated to green projects in one of two eligible categories: clean transport and renewable energy. Thanks to the financial resources from the Metrotenerife green bond, it has been possible to develop two green projects related to the roll-out of the Tenerife tramway:

1. Full and early redemption of the previous financial structure to fund the infrastructure of the tram lines (see Figure 3).

   This project falls under the clean transport category and contributes to SDG 9 (Industry, innovation and infrastructure; targets 9.1, 9.5), SDG 11 (Sustainable cities and communities; target 11.2) and SDG 13 (Climate action; target 13.2).

Figure 3. Lines 1 and 2 of the Tenerife tramways.

Source: Metrotenerife Annual Report, 2020

Specifically, the funds have been used to refinance the infrastructure of the tram lines (Lines 1 and 2 of the light rail system).

In the first few years following the establishment of Metrotenerife (see section 1), mobility studies, environmental impact assessments, construction projects and spatial planning were carried out, so that the investment began to take shape as a real project. The financial quantification of the implementation costs and the search for the

necessary funds were carried out in two ways: by signing collaboration agreements with all the local authorities involved and through financing from banks.

The construction and commissioning of Line 1 took place in 2007. Subsequently, in 2008, drawing on the experience gained, Metrotenerife began construction of Line 2 of the light rail system, which was completed in 2009, the year in which it entered service.

2. Lease agreements for a photovoltaic plant (Phase I and Phase II)

   The second project relates to the lease agreements for the photovoltaic plant. This project falls within the renewable energy category and contributes to SDG 7 (Affordable and clean energy; target 7.2) and SDG 13 (Climate action; target 13.2).

   The photovoltaic plant is integrated into the transport system's infrastructure. In 2008, Metrotenerife carried out an investment project for a photovoltaic plant, which was installed on the roof of the building used as workshops and depots for the tram infrastructure. Specifically, the photovoltaic plant was installed in two phases. Installation of the first phase began in July 2008, whilst the second phase began in September of the same year. The photovoltaic plant became operational in September 2008 (phase I) and in January 2009 (phase II).

   In 2023, the finance lease agreement entered to finance the photovoltaic plants came to an end.

3.2 FINANCIAL INFORMATION

Tables 2 and 3 present a summary of the key figures relating to the financing structure of the tram infrastructure, divided into four parts:

- Total costs of the tram infrastructure (lines 1 and 2) and the investment costs for the photovoltaic plants
- Previous financing agreements:
  - (A) Allocation of green bond proceeds: project (1) and project (2)
  - (B) Balance of unallocated revenue

Table 2. Previous financial structure.

Implementation costs for the Tenerife Tram Lines 1 and 2 projects	
Total cost of Line 1	€342,705,208.00
Total cost of Line 2	€60,743,326.00
Cost of the investment in the photovoltaic plant integrated into the transport system infrastructure	
Total cost of the photovoltaic plant	€4,977,808.98
Total cost	€408,426,342.98
To partially finance these projects, several funding agreements were signed	
Financing costs (funding agreement and syndicated bank loan)	€117,644,000.00
Unamortised financing costs (at the time of the green bond issue, 20 July 2021)	€93,838,350.00
Cost of interest rate hedging transactions (value as at 20 July 2021)	€33,900,000.00
Total financing costs	**€127,738,350.00**

Source: Compiled by the author based on data from Metrotenerife

Table 3. Allocation of funds to projects 1 and 2 (A) and remaining funds (B).

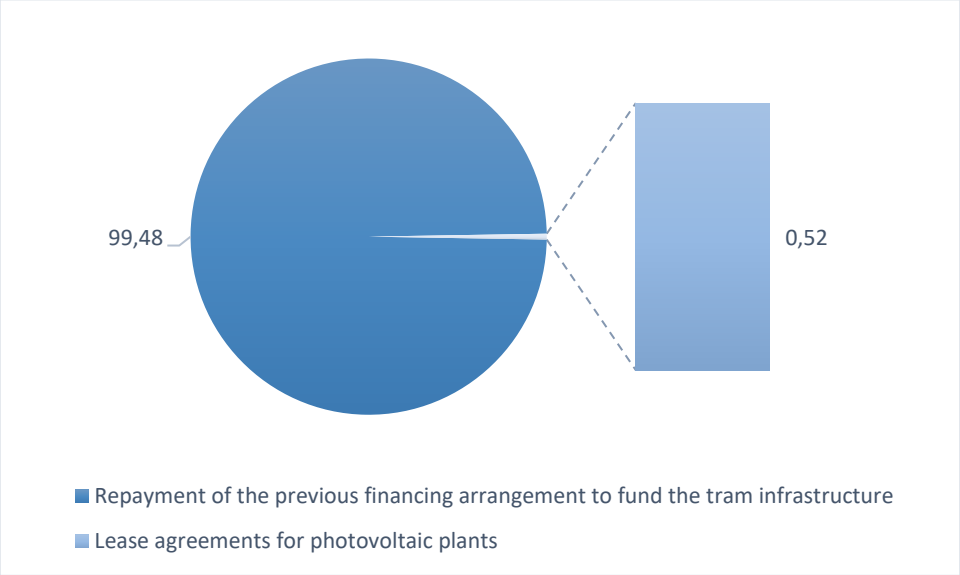
A. Allocation of funds from the green bond issue (€130M)	
(1) Full and early repayment of the previous financial structure	
Settlement of debt under the financing agreements	€127,738,350.00
Total allocated (1)	**€127,738,350.00**
(2) Lease agreements relating to the photovoltaic plant (Phase I and Phase II)	
Lease instalment payments – Phase I photovoltaic plant	€396,806.43
Payment of lease instalments – Photovoltaic Plant Phase II	€275,081.23
Total allocated (2)	**€671,887.66**
Total funds allocated (1+2)	**€128,410,237.66**
B. Balance of unallocated funds (surplus)	
Total surplus*	**€1,589,762.34**

** The remaining unallocated funds will be allocated to projects to extend the current network and to the costs of renovating and maintaining the infrastructure on Lines 1 and 2.*

Source: Compiled by the authors based on data from Metrotenerife

In financial terms, as can be seen in Figure 4, the refinancing of the financial costs arising from the implementation of the tram (clean transport) has been particularly significant. However, the photovoltaic plant (renewable energy) has been equally important in terms of sustainability criteria, as it accounts for 14.61 per cent[5] of the total energy consumed annually by the Tenerife tram.

Figure 4. Allocation of funds by eligible green category.



Source: Compiled by the authors based on data from Metrotenerife

Finally, the remaining funds (1.22 per cent of the bond proceeds) will be allocated to projects to extend the current network and to the costs of renovating and maintaining the infrastructure of Lines 1 and 2.

[5] See Metrotenerife's annual reports. Average for the period in question, 2010–2025

4 RESULTS AND IMPACT REPORT

This section sets out the results and impact arising from the projects financed with funds from the Metrotenerife green bond. To this end, three types of indicators are presented:

1. Outcome indicators, which reflect the tangible and operational achievements of the tram infrastructure project and the photovoltaic plant;
2. Social outcome indicators, which help to characterise service users and assess the tram's influence on the public's travel habits; and
3. Climate impact indicators, which quantify the GHG emissions avoided by replacing private cars and buses with the tram.

Taken together, these indicators provide a comprehensive overview of the environmental and social value generated by the investment made.

4.1 OUTCOME INDICATORS

This section includes quantitative information for monitoring the outcomes resulting from the investment in Projects 1 and 2.

Project 1. Investment in the Metrotenerife tram infrastructure, light rail lines 1 and 2.

- Kilometres of infrastructure built or renovated

Table 4: Kilometres of infrastructure built or renovated

Line 1 – km between Intercambiador and La Trinidad stations	**12.45 km**
Line 2 – km between La Cuesta and Tíncer stations	3.43 km
Total	15.88

Source: Compiled by the author based on data from Metrotenerife

- Number of passengers carried annually

Table 5: Number of tram passengers

Year	**Passengers**
2020	10,313,051
2021	12,543,185
2022	14,981,498
2023	22,676,315

Year	Passengers
2024	24,949,754
2025	24,957,105

Source: Metrotenerife - Afi

- Number of jobs

Table 6: Number of employees at Metrotenerife

Year	Number of employees
2020	195
2021	206
2022	202
2023	206
2024	210
2025	227

Source: Metrotenerife - Afi

Project 2. Photovoltaic plant integrated into the transport system infrastructure.

The installation of the solar panels was carried out in two phases. Firstly, Phase I was constructed: a 600 kW plant with a total surface area of 4,698.04 m^2. The plant comprises 3,680 photovoltaic modules with a maximum power of 175 W and six three-phase inverters with a rated power of 100 kW.

In Phase II, the photovoltaic plant was expanded by 280 kW, covering a total area of 2,132 m^2. The expansion comprises 1,608 photovoltaic modules with a rated power of 175 W and 3 three-phase inverters with a rated power of 100 kW.

The average annual output of the photovoltaic plant, from the year of its installation until 2025, is 1,364,714.48 kWh/year. To feed all the energy into the grid, there is a 1,000 kVA[15] transformer which supplies a three-phase voltage of 20 kV[16] at a frequency of 50 Hz.

4.2 CLIMATE IMPACT INDICATOR

Having defined the social impact indicators, we can identify the tangible results of this change on the population using the climate impact indicator.

In this case, the selected impact indicator will be the avoided GHG emissions (in CO_2e/year) resulting from the introduction of the tram (Figure 5).

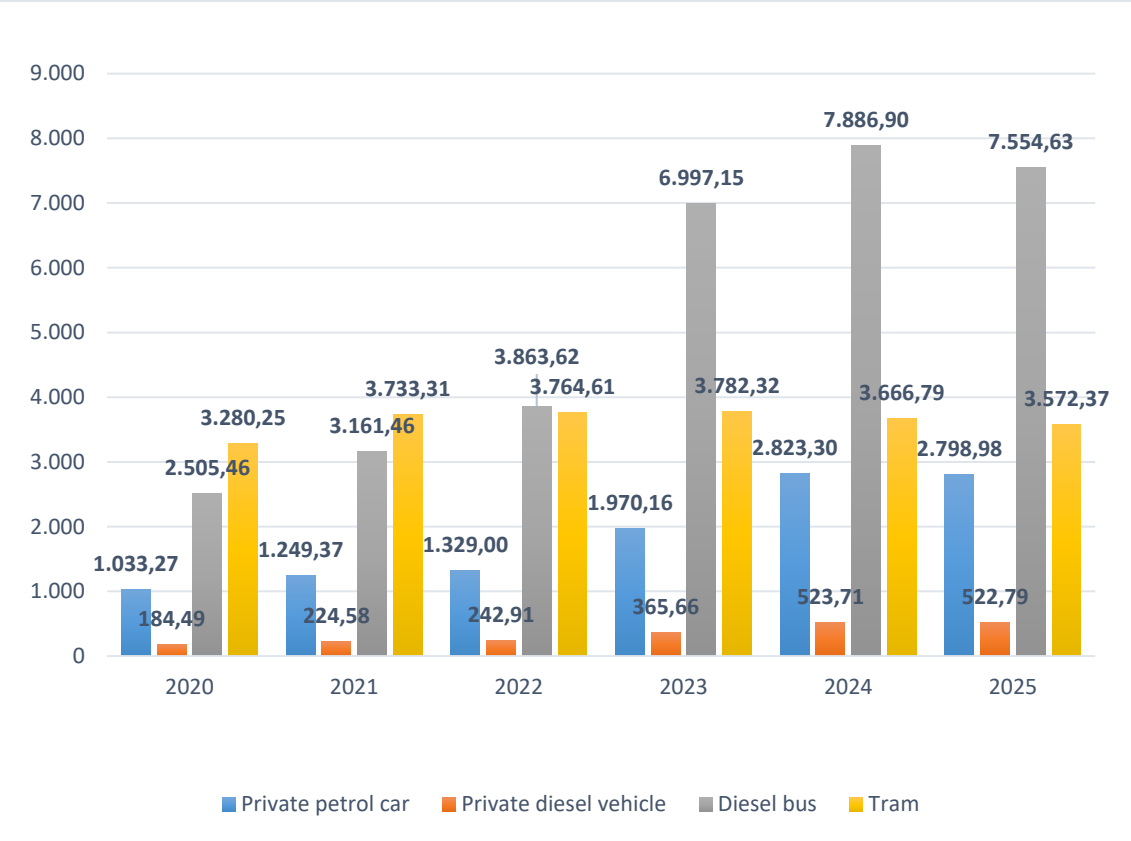
The methodology used to estimate the annual avoided GHG emissions resulting from the use of the Tenerife tram consists of comparing two scenarios: the counterfactual scenario (or Baseline Project) and the actual scenario (or Tram Project). It is based on a set of assumptions included in Annex I.

The counterfactual scenario represents the situation that would have arisen had the tram not been built. This scenario considers the alternatives that existed prior to the construction of the tram – bus routes (operated by TITSA), private cars and taxis (diesel or petrol), and other options that do not generate GHG emissions (cycling or walking) – and emissions are estimated by allocating the total number of tram passengers across these three travel categories, based on tram users' preferences for each mode of transport. The calculation of GHG emissions for this scenario is summarised as the distance travelled by users for each mode of transport multiplied by the corresponding factor (see details in Annex I).

The actual scenario assumes that the tram exists and estimates the GHG emissions resulting from its operation. In this case, the calculation is the product of the annual energy consumed by the tram's traction – i.e. electricity consumption – and its emission factor.

The trend in t CO_2e emissions for each mode of transport is shown in Figure 5 for the period under consideration (2020–2025).

Figure 5. Trends in GHG emissions (tCO_2e) for each mode of transport.

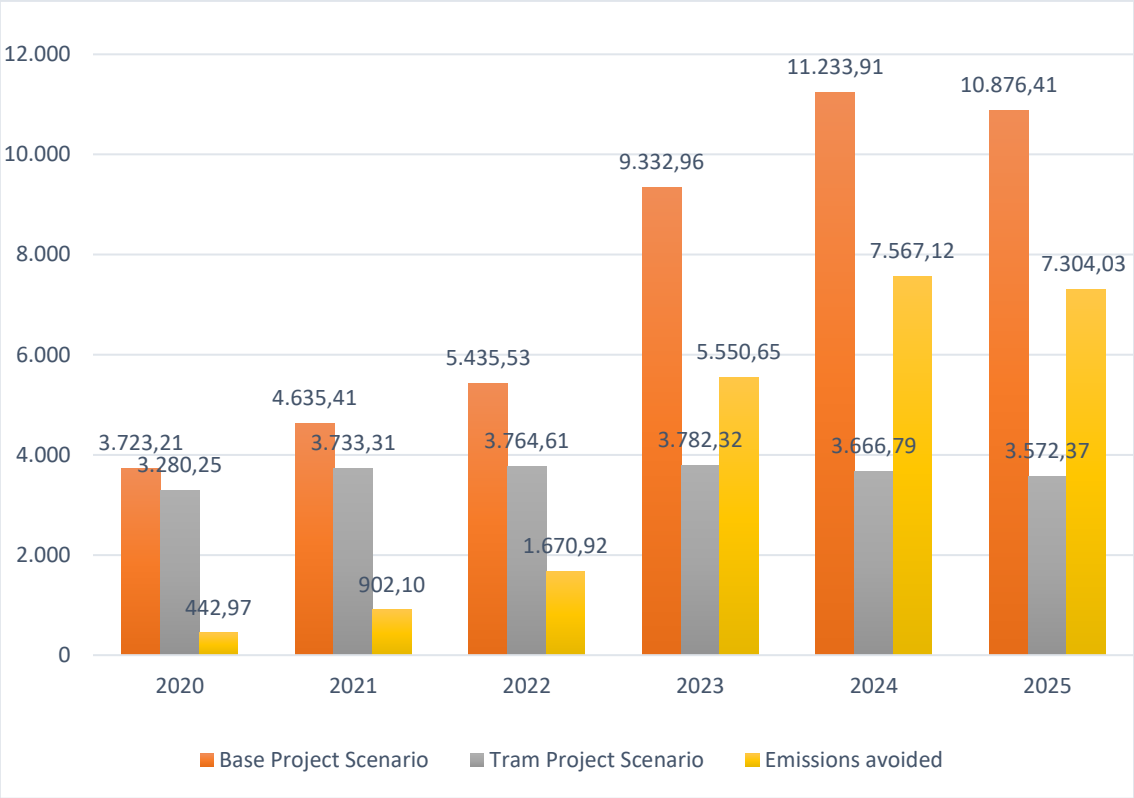


Source: Metrotenerife, Afi

The estimate of annual GHG emissions avoided is calculated by subtracting the GHG emissions generated in the counterfactual scenario (petrol vehicle, diesel vehicle, bus) from those generated in the actual scenario (tram), expressed in tonnes of CO_2e (tCO_2e).

Figure 6 shows a strong result for 2025, with avoided GHG emissions remaining broadly in line with 2024 levels. The slight decrease observed is mainly due to a reduction in the number of passengers who would otherwise have travelled by private diesel vehicles, together with lower emission factors for petrol-powered private vehicles and buses compared with 2024. As a result, an estimated 7,304.03 tCO_2e of GHG emissions were avoided in 2025.

Figure 6. Trend in GHG emissions for each scenario and estimate of avoided emissions (tCO_2e)



4.3 SOCIAL BENEFIT OUTCOME INDICATORS

The assessment of the social impact of the Metrotenerife green bond is structured around three key indicators — travel, accessibility and sustainable mobility — which enable an objective measurement of the contribution made by the funded project to improving urban mobility in the Tenerife metropolitan area.

Travel profile and patterns

Passenger data for the service show that the tram primarily meets mobility needs linked to the labour market and the education system, with the passenger mix consisting mainly of workers (45.6 per cent) and students (34.9 per cent), accounting for 80.5 per cent of total ridership. By line, journeys to home, work and educational establishments account for 68 per cent and 34 per cent of usage on lines 1 and 2 respectively, highlighting the service's importance as an essential mobility infrastructure for the public. Table 7 shows the breakdown of passengers by purpose of travel.

Table 7: Reasons for travel and usage

Reasons for travel and usage by line	**(%) of passengers using the service for that purpose**	
	Line 1	Line 2
Journeys home	26	15
Journeys to work	24	10
Journeys to educational	18	9
	68	34

Source: Metrotenerife - Afi

Accessibility to the system

Furthermore, following the study of journeys, we proceed to relate this to the **accessibility indicator**. This is based on users' proximity to tram facilities, where, thanks to the well-planned layout of the stops, we can ascertain whether this mode of transport offers a better alternative to existing options, not only for the environment but also for passengers' personal interests.

We can confirm that the vast majority find the tram easily accessible, as shown by the analysis of the proportion of users who walk to and from their daily activities (Table 8), using only this mode of transport, which proves to be of great importance to the residents of Santa Cruz.

The fact that the majority access it on foot highlights the positive impact of this project, as it does not generally require users to use another mode of transport to access it, thereby avoiding the generation of GHG emissions that would not otherwise have occurred, thus reinforcing its additionality and promoting active transport.

Table 8: Accessibility to the system: proximity and sustainability

Accessibility to the system: proximity and sustainability	Users who walk to the tram	Passengers walking away from the tram	Users arriving at/leaving the tram by bus
	84.60%	82.60%	Second most common option after walking (12%)

Source: Metrotenerife - Afi

Contribution to sustainable mobility

The impact of the tram on the population's travel habits is the most significant indicator from a sustainability perspective. The extent to which the service has succeeded in replacing private car use is, ultimately, the direct link between the project's social impact and the avoided GHG emissions analysed in section 4.2, 'Climate impact indicator'.

Survey data reveal a direct and quantifiable impact on the population's travel habits. 33.8% of users have completely replaced their private car with the tram, 25.1% use it as their main mode of transport, and 30.3% have reduced their use of private cars. Furthermore, assuming the tram did not exist, 64.2% of users would opt for the bus, which would significantly increase GHG emissions associated with urban transport (Table 9).

Table 9: Impact on sustainable mobility

Impact on sustainable mobility	Respondents who have completely replaced their private car with the tram	Respondents who consider the tram to be their main mode of transport for their daily journeys	Respondents who now use their car less frequently
	33.80%	25.10%	30.30%

Source: Metrotenerife - Afi

ANNEX 1

To estimate the GHG emissions avoided using the tram for the period 2020–2025, the methodology described below has been followed, which is based on methodologies for modal shift in road freight transport (MITECO, 2025).

Scenarios

The criteria for defining the scenarios are as follows:

Criterion 1 (C1): It is assumed that all passengers using the tram would use other modes of transport if the tram did not exist.

Criterion 2 (C2): It is assumed that the average distance travelled by tram passengers is the same as for other modes of transport.

Based on these criteria, the following scenarios are proposed:

1. ***Base Case or Counterfactual Scenario***, which is the situation in which there is no tram and passengers travel using the following modes of transport:
    a. Private diesel or petrol car.
    b. Diesel or petrol motorbikes.
    c. Diesel or petrol taxis.
    d. Bus.
    e. Other modes of transport with no GHG emissions: walking and cycling.
2. ***Tram Project scenario***: the tram exists and there are users who use this mode of transport.

Methodology for estimating avoided GHG emissions

The calculation of avoided GHG emissions is carried out using the following equation (EC.1):

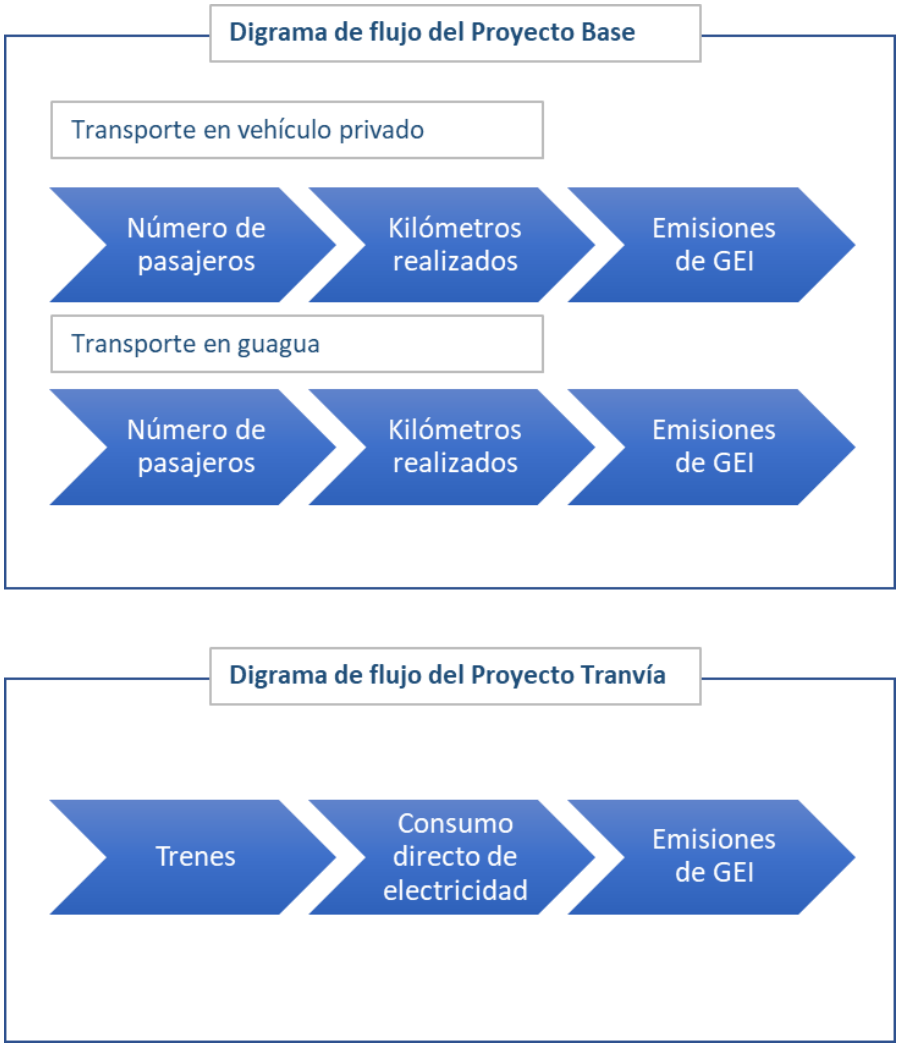
$$Avoided\ GHG\ emissions\ =\ Baseline\ Project\ GHG\ emissions\ -\ Tram\ GHG\ emissions\ \ Eq.1$$

To calculate emissions for each scenario, the following calculation method (Eq. 2) will be used:

$$GHG\ emissions\ (kg\ CO_2)\ =\ Activity\ data\ (units)\ \times\ Emission\ factor\ (kg\ CO_2/unit)\ \ Eq.2$$

Figure 7 shows the flowchart of the methodology for quantifying GHG emissions for each scenario and estimating the GHG emissions avoided using the tram.

Figure 7: Flowchart for the estimation of avoided emissions



The following section provides a detailed explanation of how each of the variables requested in EC2 is derived, along with the flowchart in Figure 7.

Activity data for the 'Base Project' scenario

To estimate GHG emissions for the Base Project, it is necessary to know the distance travelled (in kilometres) for each mode of transport: private vehicle and Guagua (EC3):

$$Distance\ travelled\ (km) = Number\ of\ passengers \times Average\ distance\ travelled\ (km/passenger) \quad \text{EC.3}$$

The available data consist of the number of tram passengers and the average distance travelled by each tram passenger. This situation necessitates the use of modelling to estimate the distance travelled for each mode of transport.

To obtain the required data, the model is based on criteria C1 and C2 described in this document and uses information on trends in changes to the mode of transport used if the tram did not exist.

The steps to be followed to obtain the average distance travelled for each mode of transport are as follows:

1. Estimate the number of passengers for each mode of transport. This will be done using the surveys published in Metrotenerife's Annual Reports on the quality of the service provided.
2. Estimate the average distance travelled for each mode of transport.

Each of these steps is explained below.

Estimating the number of passengers for each mode of transport

From 2020 onwards, Metrotenerife has included in its service quality surveys the trend in passenger use of other modes of transport if the tram did not exist, showing the percentage breakdown of which modes are used most frequently. Using this information, it is possible to estimate the number of passengers for private vehicles, buses and other modes of transport.

As there are two types of private vehicle – petrol and diesel – the breakdown has been calculated by applying the percentage distribution for the two types of each mode of transport based on the fuel they consume. This data has been taken from the vehicle register of the Directorate-General for Traffic (DGT) (Table 10).

By summarising the information obtained from the DGT, it is possible to estimate the number of passengers for each mode of transport (Table 11).

Table 10: Number of private vehicles in Santa Cruz de Tenerife, taken from the General Directorate of Traffic's vehicle register

Vehicle type	Fuel type	2020	2021	2022	2023	2024	2025
Tourism	Petrol	469,676	473,105	480,518	482,836	484,274	494,525
	Diesel	109,575	111,426	112,826	113,339	114,775	116,270
Motorcycle	Petrol	71,982	75,794	80,679	87,344	95,155	102,404
	Diesel	46	50	49	50	55	59
Other vehicles	Petrol	2,319	2,361	2,455	2,545	2,651	2,725
	Diesel	8,361	9,155	9,861	10,624	11,594	12,580
Total	Petrol	543,977	551,260	563,652	572,725	582,080	599,654
	Diesel	117,982	120,631	122,736	124,013	126,424	128,909
Total percentage	**Petrol**	**82.18**	**82.05**	**82.12**	**82.20**	**82.16**	**82.31**
	Diesel	**17.82**	**17.95**	**17.88**	**17.80**	**17.84**	**17.69**

Table 11: Number of passengers by mode of transport for the Base Scenario

		2020	2021	2022	2023	2024	2025
Number of respondents		1,486	1,527	1,507	1,478	1,488	1,508
Tram passengers	A	10,313,051	12,543,185	14,981,498	22,676,315	24,949,754	24,957,105
Private vehicle (%)	B	17.2	16.3	14.2	12.70	16.4	16.4
Bus (%)	C	65.82	64.9	67.8	68.60	64.2	64.2
Other zero-emission modes of transport (%)	D	16.98	18.8	18	18.70	19.4	19.4
Number of passengers in a private vehicle	**E=A*B**	1,773,844.77	2,044,539.16	2,127,372.72	2,879,892.01	4,091,759.66	4,092,965.22
Number of passengers in private petrol vehicles	***(1)***	1,457,689.611	1,677,463.539	1,746,968.021	2,367,297.533	3,361,634.46	3,368,772.45
Number of passengers in private diesel vehicles	***(2)***	316,155.16	367,075.62	380,404.69	512,594.472	730,125.20	724,192.77
Number of bus passengers	**F = A × C**	6,788,050.17	8,140,527.07	10,157,455.64	15,555,952.09	16,017,742.07	16,022,461.41
Number of passengers using other modes	**G=A*D**	1,751,156.06	2,358,118.78	2,696,669.64	4,240,470.91	4,840,252.28	4,841,678.37

(1) These figures are calculated by multiplying the number of passengers in private vehicles by the percentage of petrol-powered vehicles shown in Table 7.
(2) They are the result of multiplying the number of passengers in private vehicles by the percentage of diesel vehicles shown in Table 7.

Estimate of the average distance travelled per passenger for each mode of transport

The average distance travelled per passenger is based on criterion C2: all passengers, regardless of the mode of transport used, travel the same average distance as the tram.

In this case, reliable data on average distances travelled are only available for the years 2020 and 2021; therefore, linear regression is used to obtain the data for the years 2022, 2023, 2024 and 2025. Figure 8 shows the regression used for this estimate.

The results obtained are shown in Table 12.

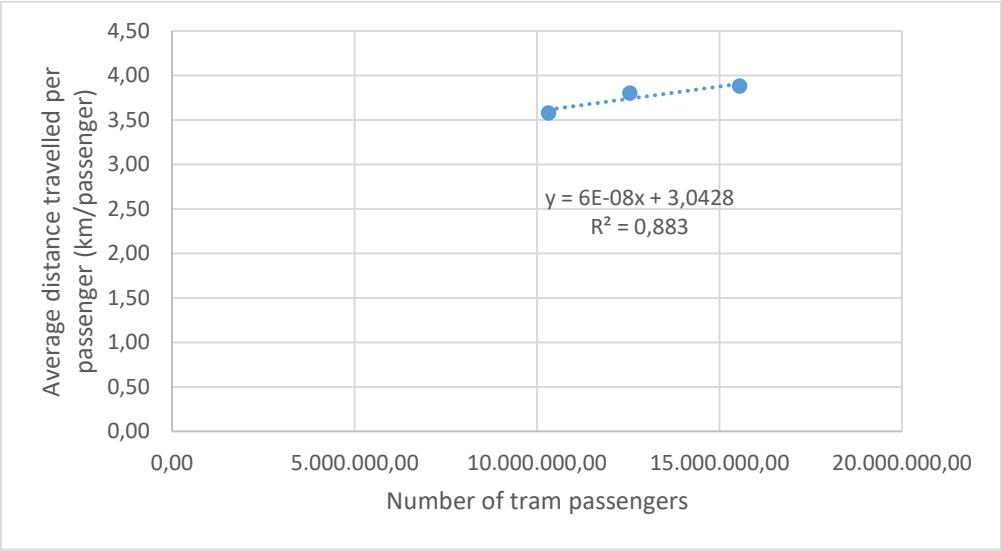
Table 12: Average distance travelled per passenger

Year	***Total number of passengers***	***Average distance travelled per passenger (km/passenger)***
2020	10,313,051	3.58
2021	12,543,185	3.80
2022	14,981,498	3.94
2023	22,676,315	4.40
2024	24,949,754	4.54
2025	24,957,105	4.54

The data in blue are estimates

The data in blue are the result of applying the equation in Figure 8.

Figure 8: Model for quantifying the average distance travelled per passenger (km/passenger)



Estimate of the distance travelled by each mode of transport

To estimate the distance travelled for each mode of transport, Equation 3 (EC3) is applied; the results are shown in Table 13.

EC3

$$Distance\ travelled\ (km)\ =\ Number\ of\ passengers\ \times \\ Average\ distance\ travelled\ (km/passenger)$$

Activity data for the 'Tram Project' scenario

The electricity consumption data provided by Metrotenerife represent the energy used to power the tram, from which the energy produced by the solar panels has been proportionally deducted from the total energy consumed. The result is shown in Table 13.

Table 13: Electricity consumption of the tram

Year	Calculated traction consumption, net of photovoltaic energy
2020	5,665,368.60
2021	6,763,235.94
2022	6,783,087.96
2023	6,778,343.77
2024	6,715,734.76
2025	6,527,576.73

(*Figures in blue are estimates)*

In 2021 and 2022, it was not possible to calculate the actual total electricity consumption due to errors in the meter readings provided by the electricity supplier. For this reason, it has been decided to use the electricity consumption figures from another year with a similar number of passengers, meaning that the energy consumed could be considered equivalent:

- For 2021, the total consumption for 2014 is used.
- For 2022, the total consumption for 2018 is used.

Emission factors

Base Project

The emission factors used are as follows (Table 14):

- For private vehicles, the *emission factors from the Carbon Footprint Registry, Offsetting and* Carbon *Dioxide Absorption Project* (2026) have been used.

- For buses, the factors provided by DEFRA (Department for Environment, Food and Rural Affairs, 2026) have been used.

  It is important to note that the reason for choosing these emission factors is the quality of the data; DEFRA is an internationally recognised body in matters of climate change, providing assurance and reducing uncertainty regarding the final result.

Table 14: Emission factors (EF) for private cars and buses

Year	***Private vehicle EF (kg CO_2e/km)***		***Bus EF (kg CO_2e/km per passenger)***
	diesel	**Petrol**	
2020	0.163	0.198	0.1031
2021	0.161	0.196	0.1022
2022	0.162	0.193	0.0965
2023	0.162	0.189	0.10215
2024	0.158	0.185	0.10846
2025	0.159	0.183	0.10385

Source: MITECO (2025); DEFRA (2025)

Tram

To calculate the GHG emissions generated by tram use, the emission factor provided by Red Eléctrica de España for electricity generation in the Canary Islands has been used (Table 15).

Table 15: Emission factor for electricity consumption

Year	***Canary Islands emission factor (tCO_2e/MWh)***
2020	0.579
2021	0.552
2022	0.555
2023	0.558
2024	0.546
2025	0.547

Source: Red Eléctrica (https://www.ree.es/es/datos/aldia)

Quantification of avoided GHG emissions

To calculate the avoided GHG emissions (Table 18), Equation 1 (EC1) is applied; to calculate the emissions from the Baseline Project and the Tram, Equation 2 (EC2) is applied using the corresponding emission factors (Tables 14 and 15). The results are:

- GHG emissions from the Baseline Project (Table 16)
- GHG emissions from the tram (Table 17)

Table 16: GHG emissions from the Baseline Project

Private petrol vehicle		**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
number of passengers	A	1,457,689.61	1,677,463.54	1,746,968.02	2,367,297.53	3,361,634.46	3,368,772.45
km/passenger	B	3.58	3.80	3.94	4.40	4.54	4.54
km	C = A × B	5,218,528.81	6,374,361.45	6,886,006.17	10,424,108.01	15,261,098.50	15,294,989.30
kg CO_2 per km**	D	0.198	0.196	0.193	0.189	0.185	0.183
Petrol VP emissions (t $_{CO2}$e)	**E = C × D**	**1,033.27**	**1,249.37**	**1,329.00**	**1,970.16**	**2,823.30**	**2,798.98**

Private diesel vehicle		**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
number of passengers	A1	316,155.16	367,075.62	380,404.69	512,594.47	730,125.20	724,192.77
km/passenger	B1	3.58	3.80	3.94	4.40	4.54	4.54
km	C1 = A1 × B1	1,131,835.47	1,394,887.34	1,499,437.34	2,257,147.68	3,314,611.59	3,287,999.04
kg CO_2 per km**	D1	0.163	0.161	0.162	0.162	0.158	0.159
Diesel VP emissions (t CO_2e)	**E1 = C1 × D1**	**184.49**	**224.58**	**242.91**	**365.66**	**523.71**	**522.79**

Bus		**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
number of passengers	A2	6,788,050.17	8,140,527.07	10,157,455.64	15,555,952.09	16,017,742.07	16,022,461.41
km/passenger	B2	3.58	3.80	3.94	4.40	4.54	4.54
Passenger-km	$C^2 = A^2 \times B^2$	24,301,219.60	30,934,002.85	40,037,540.12	68,498,751.20	72,717,109.02	72,745,600.68
kg CO_2 per passenger-kilometre	D2	0.1031	0.1022	0.0965	0.10215	0.10846	0.10385
Bus emissions (t CO_2e)	**E2 = C2 * D2**	**2,505.46**	**3,161.46**	**3,863.62**	**6,997.15**	**7,886.90**	**7,554.63**

Total emissions from the baseline project (t $_{CO2}$) e	**F = E + E1 + E2**	**3,723.21***	**4,635.41**	**5,435.53**	**9,332.96**	**11,233.91**	**10,876.41**

** This figure is not representative due to the impact of COVID-19*

*** Data on emission factors have been retroactively updated by MITECO, which alters the emissions results for 2023*

Table 17: GHG emissions from the tram

Tram		2020	2021	2022	2023	2024	2025
Energy consumed (kWh)	A3	5,665,368.60	6,763,235.94	6,783,087.96	6,778,343.77	6,715,734.76	6,527,576.73
FE Energy (tCO_2per MWh)	B3	0.579	0.552	0.555	0.558	0.546	0.547
Tram emissions ($t_{CO2}e$)	**C3 = A3 × B3**	**3,280.25**	**3,733.31**	**3,764.61**	**3,782.32**	**3,666.79**	**3,572.37**

Using the results from Tables 16 and 17 and applying equation EC1, the GHG emissions avoided through the use of the tram are calculated (Table 18).

Table 18: GHG emissions avoided through the use of the tram.

		2020	2021	2022	2023	2024	2025
GHG emissions avoided ($t_{CO_2}e$)	**G=F-C3**	**442.97***	**902.10**	**1,670.92**	**5,550.65 ****	**7,567.12**	**7,304.03**

** This figure is not representative due to the impact of COVID-19*

***Emissions factor data have been retroactively updated by MITECO, which alters the emissions results for 2023*