

# Six steps increase Manauara Shopping's energy efficiency and save over €1.3 million in costs



Sustainability



234 shops



Manaus, Brazil



Energy Efficiency

## KEY HIGHLIGHTS

- Facing the consequences of an energy and economic crisis, the commitment from Manauara Shopping to reduce the electricity consumption was crucial to improve its performance, reducing costs and environmental impact. An action plan was implemented, where around €228,501 were invested, decreasing the centre's electricity consumption by 11% and generating around €1,300,000 savings in the annual budget.

## SOLUTION

- After analysing several systems to detect where improvements could be made, six steps were implemented that contributed to a decrease in electricity consumption and associated costs:
  - Night time energy rationing
  - Creation of LED lighting towers
  - Fluorescent lamps replaced by LED lighting
  - Installation of timer in equipment
  - Improvement of HVAC efficiency
  - Change electricity provider for the free market

## KEY NUMBERS

**€1.3 million**  
savings in the  
annual budget

**11%**  
decrease in electricity  
consumption

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Manauara Shopping



Manaus, Brazil



47,297m<sup>2</sup>



234 shops



2,750 parking spaces



Sustainability

### Abstract

Concerned by the physical impacts of climate change and the emerging energy crisis in Brazil, **Manauara Shopping** wanted to make a positive contribution to reducing its energy consumption and GHG emissions. Added to this, the country's economic recession, which had a particularly acute impact on Manaus, emphasised the need for the shopping centre to take swift action to reduce its own operational costs and those of its condominium partners and tenants.

The **Manauara Shopping** team identified a range of interventions which could reduce energy consumption in the centre, some of them with quite significant investment costs. But all of them proved successful, collectively contributing to a €1.3 million saving in the annual budget and delivering a more cost effective energy tariff for tenants. Moreover, **Manauara Shopping** was able to improve its electricity efficiency by 45% compared to 2011, saving the equivalent of the energy needed to supply 42.8 million Brazilian households for one month in a context of a market where the grid cannot keep pace with demand.

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## Introduction

Global climate change, triggered by the rapid increase in the extraction and use of fossil fuels to feed industrialisation, is disrupting usual weather patterns, giving rise to extreme events and natural catastrophes which threaten people's safety, livelihoods, food, water and energy security.

Reducing energy consumption through the use of more efficient equipment and management practices and switching to renewable sources of fuel are among the most effective ways to tackle climate change. What is more, with attention to financial costs and budgets, energy efficiency interventions can be chosen which deliver immediate economic benefits or offer an attractive longer-term investment.

## Background

In Brazil, high temperatures and a prolonged period of drought in 2015 led to a drop in reservoir levels and record low capacity in hydroelectric dams, perpetuating the country's largest energy crisis in history. With the growing population already putting pressure on the country's natural resources and the national grid relying on hydroelectric power for over 66% of its supply, energy scarcity soon became a reality and costs rose significantly.

To make matters worse, Brazil was hit by an economic crisis in early 2015 leading to a drop in household income, restrictions on credit and a rise in the basic interest rate. For the residents and businesses of the industrial city of Manaus, the situation was tough.

## Challenge

In Manaus itself, industrial production fell by 30 percent and around 20,000 jobs were lost, resulting in a dramatic fall in household incomes and purchasing power of the population.

What is more, the combined energy and economic crisis gave rise to a 63 percent increase in the cost of electricity,

translating into higher costs overall for retail unit and shopping centre operators.

**Manauara Shopping** and its tenants were directly impacted by the double burden of reduced consumer spend and an increase in operational costs, and knew that something had to be done to keep their businesses afloat.

## Solution

**Manauara Shopping** took inspiration from Sonae Sierra's Safe People & Resource Resilience strategy and 'Improving our Work' (IoW) programme to identify a series of actions which would reduce the shopping centre's energy consumption and costs. They studied the technical and economic feasibility of their implementation, and honed their focus on six key interventions designed to achieve win-win outcomes:

- **Night time energy rationing** was implemented throughout 2016. The shopping centre team identified the unnecessary use of indoor and outdoor lighting during closing hours. As a result, they carried out night lighting control achieving considerable reductions in energy use with no investment cost.
- **LED lighting towers were created** to provide lighting needed for night time activities (such as floor treatment and maintenance activities), which would otherwise require complete illumination of the mall area.
- **Around 4,000 fluorescent bulbs were replaced with LED light bulbs** in the mall, parking and technical areas. The new LED lights use 69 percent less power than the old ones; do not contain heavy metals and have a

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longer useful life than fluorescent bulbs, making them all around a better choice for the environment.

- **A timer was installed on fans** in the car parks, common areas and walkways, enabling equipment to be automatically switched on and off in scheduled periods, eliminating human intervention and, consequently, the time of unnecessary use.
- **The efficiency of the HVAC system was improved.** The shopping centre identified the opportunity for intervention in the refrigeration system, so it included the Cold Water Plant in the maintenance plan, where the chemical cleaning of the 3 chillers and cleaning of the beehives of the towers was carried out, improving the efficiency of the equipment. Along with this, the team scheduled the operational use of the equipment during the year, potentially leaving one piece of equipment in standby mode.
- **The overall cost of electricity to the shopping centre was reduced by switching to the free market**, where energy is purchased directly from generators or marketers through bilateral contracts with freely negotiated conditions. This brought about a 60 percent reduction in the energy tariff costs and also allowed for the purchase of energy from renewable sources thus reducing the emission of greenhouse gases.

With a lack of qualified labour in the region and the complexity of having to manage some complex partnerships in order to set the interventions in motion, it wasn't always easy, but the team was determined to see the project through.

In total, **Manauara Shopping** invested €228,501 across all six energy efficiency interventions, which together generated a €1,325,271 saving in the shopping centre's annual budget. Furthermore, the new energy procurement strategy enabled **Manauara Shopping** to reduce the cost of energy for condominium partners and tenants. In 2016, the centre recorded an 11 percent reduction in annual KWh consumption (or 1.38 million kWh) compared to the previous year, and a 45 percent reduction against 2011.

## Closure

Faced with three urgent needs to combat climate change, reduce energy consumption and save costs, **Manauara Shopping** identified effective strategies to reduce its environmental impact whilst delivering much needed economic benefits for the shopping centre's operational management, co-owners and tenants.

By implementing cost free management actions; creating LED towers for nocturnal specific works; replacing LED lighting; automating systems; increasing HVAC efficiency and changing to the energy free market, the shopping centre was able to achieve impressive energy savings, the enough to supply around 42,800,00 million Brazilian households for one month; a more meaningful achievement in a context where pressure on resources is acute and not all Brazilians are able to access the energy they need.

Rationing of Energy



HVAC Efficiency



Free Market



Retrofit - LED



Night Time Illumination Towers



Timer

