

STARDUST lays the foundations for energy transition in Pamplona

Abstract

Pamplona is the capital of the region of Navarra, in the north of Spain. It is home to 200,000 inhabitants and its wider metropolitan area has around 360,000 inhabitants. Pamplona is a Lighthouse city of the H2020 STARDUST project, and involves nine local partners, i.e. the City Council, CENER, MCP, NASUVINSA, the Public University of Navarra (UPNA), the Government of Navarra, BeePlanet, Zabala and SICE. Over five years since the start of the project, the local consortium has implemented several measures in the field of energy, mobility and smart cities, with the ultimate goal of advancing towards more sustainable and resilient cities. The most relevant projects include a platform monitoring Passivhaus buildings, a modern district heating powered by local biomass, smart grids helping decision making in combined energy production, storage and e-mobility, or the deployment of e-mobility.

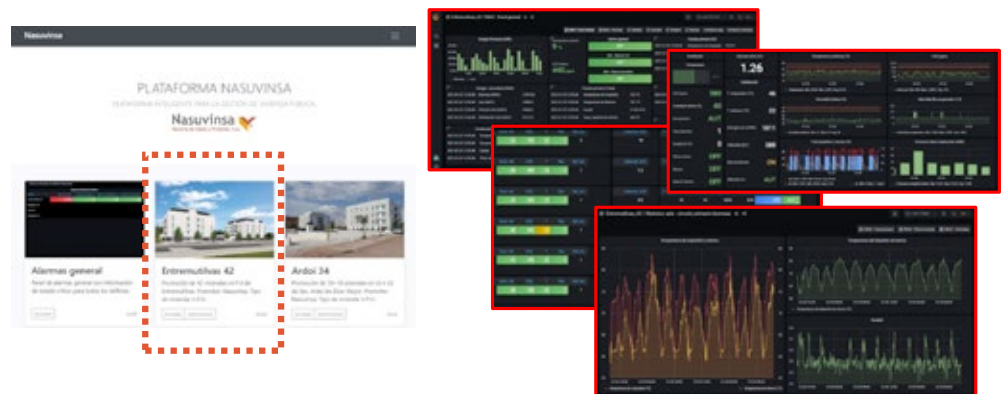
Key points

Pamplona City Council's Energy Transition and Climate Change Strategy 2030 aims to limit the temperature increase to 1.5°C with respect to pre-industrial levels, to step up the capacity to adapt to the adverse effects of climate change and to promote climate-resilient development with low greenhouse gas emissions, leaving no one behind.

For its part, the metropolitan authority responsible for water supply and sanitation, waste management and public transport in Pamplona (MCP), has a carbon neutrality strategy for 2030.

[New data monitoring and control platform helps social housing residents to improve energy use](#)

Advanced smart energy management systems have been installed in 3 Passive House certified buildings (138 social housing units). An energy management platform from NASUVINSA monitors comfort, ventilation, heating and DHW data. The collection and statistical processing of this data, carried out by CENER, has made it possible to optimise energy efficiency, detect malfunctions and carry out an awareness campaign among neighbours, informing them of the best practices for saving energy



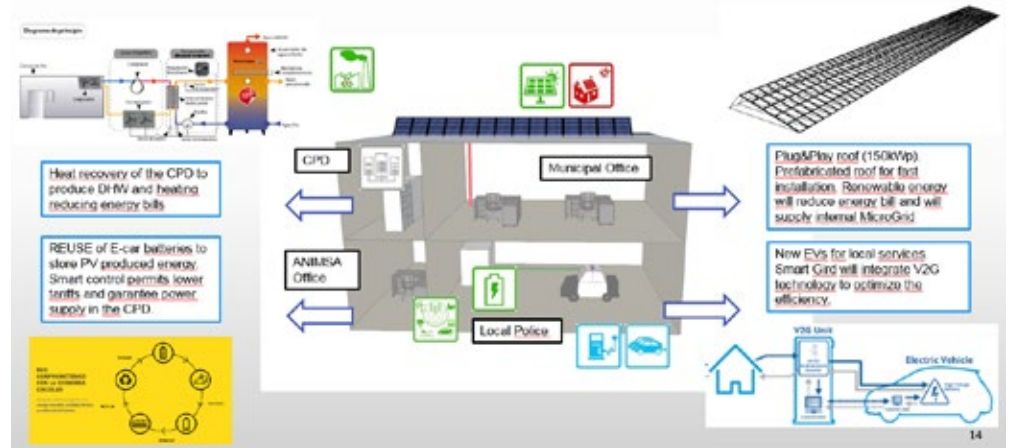
[Innovative district heating system set to cut CO2 emissions by 80%](#)

NASUVINSA has built a new thermal power plant that will provide heating and DHW to 4,500 homes and several public buildings in the Txantrea neighbourhood, through a district heating system powered by local biomass, certified as sustainable forestry management. This new district network will replace and unify eight existing small, inefficient networks that use fossil fuels as an energy source. Replacing the current community boilers with central heating production using biomass will reduce CO2 emissions by 80% compared to current levels.



Smart Microgrid Integrated with integrated with a prototype Plug&Play solar roof and Energy Storage

A smart grid has been installed in a public building. This grid integrates on-site renewable production through an industrialised wooden plug & play photovoltaic roof with an installed capacity of 76kWp, a storage system using second-life batteries (180kWh) and two bi-directional charging points for electric vehicles (V2G system), which allow vehicles to be charged or discharged as required. The smart grid is controlled by a smart energy management system that optimises its operation.



Buses, batteries and a bit of sun – new solar microgrid designed to help get Pamplona residents from A to B

The public transport authority of Pamplona's metropolitan area (MCP), has fully electrified Line 9, which connects the train station to the Public University of Navarra (UPNA) with six e-buses. Two pantographs (fast-charging stations with a 350 kWe grid connection) charge the buses at the start and end of the line.

Parallel to this, UPNA has installed a PV system (40 kWp) on the roof of one of its buildings, together with electrical storage in batteries. This installation is integrated into the existing microgrid on the university campus and is able to reduce the electrical energy required by the pantograph by 20%.



Hydrotermia in Navarra's Water Treatment Plant with the Help of Arteta Spring

MCP, the metropolitan authority of Pamplona responsible for water supply and sanitation, waste management and public transport, has installed a heat pump integrated with the water supply network. The hydrothermal installation provides heating and cooling for the pilot plant at the Eguillor water treatment plant, a renovated 1,700 m² laboratory and office building. In addition, 100 kWp of photovoltaic panels have been installed on the roof, producing more energy than the air-conditioning system consumes.



Supporting e-mobility and modal shift

Pamplona City Council has deployed an [e-charging infrastructure](#), with 46 charging stations on public roads, significantly increasing this type of infrastructure in order to meet the present and future demand for e-vehicle charging. The 34 new places are distributed across a total of 17 double charging posts installed in 12 different locations.

In this way, Pamplona is taking an important step forward in the development of this type of infrastructure, becoming one of the best equipped Spanish cities in terms of charging services for e-vehicles with public access. This action is part of the 'Go Green Pamplona' strategy that encompasses all matters that promote the fight against climate change.

In addition, and with the aim of reducing the use of private cars in the city, the Council has promoted the deployment of a [system of 400 electric bicycles](#), the impact of which is being monitored by analysing different indicators, such as the number of users, number of journeys, distance travelled, emissions avoided, etc. It has set up a network of 15 sheltered and video-surveilled bicycle-parking areas, which also include bike-charging for private e-bikes.

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