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## P.9.1 Action plans for regions where demonstration buildings belonging to civil services are located

**Project: “New Evaluation Method for Homes of Social, Sustainable and Energy Efficient Interest – Architecture for Climate- in the Sudoe Territory (ARCAS)”**

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<b>Author(s)</b>	Enrique Alonso Moreno, Ángela Nogués Linares
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## ACTION PLANS FOR REGIONS WHERE DEMONSTRATION BUILDINGS BELONGING TO CIVIL SERVICES ARE LOCATED.

This document presents the results of each of the three axes of the ARCAS Project and defines the strategies to facilitate decision making regarding the development of the basic regulations and the criteria for the allocation of financing and subsidies for the rehabilitation of housing occupied by vulnerable groups.

### 1. WHAT IS ARCAS?

ARCAS is a project whose main objective is to create a technical assistance application for the rehabilitation of social collective residential buildings, which consider three main axes in the intervention: **energy efficiency, energy poverty and air quality.**

Each of the axes has a determining importance for the solution adopted, although the tool is designed to be able to emphasize and direct the solutions designed by strengthening any of them, so that the demandability of each of them can be modulated.

ARCAS is based on the use of similar climatology, of the SUDOE environment of the Atlantic coast, for the development of a tool that allows, through key indicators, the optimization of the architectural design of buildings and the resources used in the rehabilitation thereof.

The final objective of the tool is its application by technicians who carry out rehabilitation projects in residential buildings intended for social housing, whose application will allow to know the current status and the result according to the solutions adopted for rehabilitation, taking into account the three axes.

Due to its field of application, social housing, it entails a special observation on the economic aspects related to energy poverty and the achievement of a habitable physical well-being for the entire population.

**The public administrations** involved have in the ARCAS tool a unique technical support in the market, which will help them to make decisions on rehabilitation and rehabilitation aid policies.

The ARCAS Project differs from other projects or tools in that it takes into account the social component, introducing the energy poverty axis in the evaluation tool, and has been developed specifically for rehabilitation projects.

## 2. THE THREE AXES

The three main axes of the tool, **energy efficiency**, **energy poverty** and **air quality**, are developed from the measurement of its different indicators.

In Axis 1, Energy Efficiency is tested with the following indicators:

- Primary Energy Consumption
- Heat losses
- Energy needs
- Renewable energy self-sufficiency ratio
- Renewable energy self-consumption ratio
- Global warming potential

These energy indicators allow a holistic assessment of the energy efficiency aspects of residential buildings.

In Axis 2, Energy Poverty is tested with the following indicator:

- 10% indicator

This indicator relates the cost of energy to the household's net income, considering that an energy expense higher than 10% of income places the household at risk of energy poverty.

In Axis 3, the Indoor Air Quality of the dwellings is checked with the following indicators:

- Thermal comfort, exclusively indoor temperature
- Acoustic comfort
- Indoor air quality, with 8 measures inside the house
- Light comfort, checking the lighting level of the house

The indicators of this axis, as well as those of the previous axes, are reflected in the ARCAS online tool so that their results can be represented in a certain scale class and interpreted.

## 3. THE CLIMATE MAP

As a technical aid, and since the ARCAS project is based on a similar climatology between the SUDOE territories, a climatological map has been prepared in collaboration with the Spanish State Meteorological Agency.

This map contains the historical data of temperatures, humidity, etc... and two future scenarios with the same data so that the best solutions for rehabilitation can be sought with the most accurate climate information possible.

## 4. RECOMMENDATIONS

For each of the Axes, a series of recommendations have been provided, mainly aimed at public administrations, to improve the aspects of each of them.

For Axis 1, Energy Efficiency, the administration must promote policies that help implement the indicators of this axis concerning the sustainable development and energy efficiency policies that are being promoted by the EU, to reduce primary energy consumption and achieve greater consumption of renewables.

In addition, the creation of energy communities must be promoted, to generate renewable energy proximity to homes, regardless of the own facilities that can be installed in the rehabilitated buildings.

For Axis 2, Energy Poverty, the main recommendation is to try to obtain the most reliable data on this issue, bills, consumption, types of contracts, in order to adapt the tool to the closest reality, so that the most appropriate measures can be adopted to improve this Axis.

In addition, temporary aid formulas should be promoted for situations such as those that have occurred in recent times with the increase in the price of energy, as these aids are necessary in extreme situations.

For Axis 3, Air quality, a fundamental axis in terms of the health of the occupants of the dwellings, the most advisable technical solutions must be promoted in order to obtain acceptable levels of comfort, taking into account that the main variables of the dwellings that influence health are: Temperature and humidity conditions, lighting, ventilation and insulation.

There is a 4th Axis, as a fusion of the three previous ones, in which the possible effects that will be produced with the application of the ARCAS tool in different aspects of the social, administrative, economic and all those activities that are affected within the rehabilitation of social housing buildings have been collected.



a) In the social field.

The rehabilitation of a building using the ARCAS tool entails a series of benefits, beyond the strictly technical ones, which have a positive impact on the rest of society.

- i. The health of the users of these buildings will improve, since a healthier indoor environment and a family economy with greater purchasing power will be achieved, so the health system will be directly improved.
- ii. The implementation and consumption of renewable energies helps to reduce the emission of CO2 into the atmosphere, which helps to achieve the objectives that the territories within the scope of the project have assumed in this regard.
- iii. The rehabilitative activity generates direct and indirect jobs that improve the labour market, reducing the data on the unemployed active population, with the corresponding decrease in unemployment subsidy expenses.
- iv. The revaluation of the rehabilitated properties is a real fact that increases the economic assets of the owners immediately.

b) In the field of administration.

The decision to incorporate the ARCAS tool to define rehabilitation projects in the social housing rehabilitation process also generates a series of benefits at the administrative level.

- i. The tool provides a global solution to the most widespread problems in this type of building.
- ii. It allows the tool to be adjusted according to the most necessary policies at the time they are decided, so that the objectives to be achieved with the projects can be determined in a more concrete way.
- iii. In the case of establishing a system of subsidies, the rehabilitation itself generates a reversion of the subsidized funds.

c) In the economic sphere.

The decision to be able to rehabilitate the buildings included in this area of study cannot fall exclusively on the shoulders of the owners of these dwellings; their capacity does

not allow it because this investment would generate even greater imbalances than the existing ones.

- i. The administrations, in the case of the Spanish territory already do so, should encourage and financially support the rehabilitation of these residential buildings, and the use of the ARCAS Tool should be a tool that helps the administrations to verify the optimization of the investment according to the objectives that are intended.
- ii. The financial sectors of the different states must become aware of the usefulness of rehabilitation in general, and more deeply in this type of buildings. The formulas used to help finance this type of work must be in line with the income of the units, with the type of work to be undertaken and with the results obtained. In this sense, the ARCAS Tool becomes an element of verification for the financing provided.

## 5. IMPLEMENTATION OF THE ARCAS TOOL

The strategy for the implementation of the ARCAS tool in the different territories should take into account that:

- i. It is recognized as a complementary tool to the requirements established in each territory.
- ii. Its main objective is to help technicians and owners to make the necessary decisions to undertake the rehabilitation works of their buildings in a more efficient way and with better results.
- iii. The administrations may adopt ARCAS, within the scope of their competences, for the verification of the decisions taken and the results, to include their use in the lines of aid for the works to be carried out.
- iv. The implementation of ARCAS will be projected in phases, having to establish some lines of action that allow its diffusion among the technicians and the different administrations.
- v. This implementation will be done with the support of:
  - The organizational capacities of the administration and its infrastructure.
  - The companies that manage the social housing stock.



- The professional associations involved in these matters.
- Property administrators.
- Neighbourhood associations.
- And all those sectors of society that may be beneficiaries of this tool.
- The specialized publications that serve as dissemination of the tool.

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