

VIOLET PROJECT

Andalusian Agency for Housing and Rehabilitation (AVRA)



ACTION PLAN

Note

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INTRODUCTION

1. CONTEXT

1.1. International context

Energy efficiency improvement of existing buildings is a priority action included in EU Directives 2010/31, 2012/27 and 2018/844. The application of minimum requirements to the energy performance of existing buildings that are subject to major renovation was required in Directive 2012/27 and a rate of 3% per year was established to set the pace of the energy retrofit of public buildings that have an area greater than 500 m² and are owned and occupied by central governments. However, Article 5 of this Directive allows the Member States to decide whether exempt the officially protected buildings or not, because the compliance with certain minimum energy efficiency requirements could unacceptably alter their character or appearance. All EU Member States, except United Kingdom, chose to exclude the protected buildings (public and private) from complying with the energy efficiency requirements that the rest must abide to when renovated.

Nevertheless, more recently, many researchers and urban policy-makers, in line with the sustainability-centred heritage conservation approach proclaimed by UNESCO in the “Recommendation on the Historic Urban Landscape” in 2011 (ratified by ICOMOS in 2015), began to weigh the potential risks and the unintended socio-economic consequences deriving from such an exemption. Underestimating the energy saving and CO₂ emission reduction potential of such buildings could lead to entire urban areas being condemned to energy waste or obsolescence in terms of comfort. In this scenario, high energy costs and low levels of well-being would discourage the use and occupation of historic neighbourhoods, which would contribute to accelerate the ongoing commodification process, now globally recognized as a cause of unsustainable metropolitan imbalances.

Three recent events illustrate the general acceptance of this new approach:

- The Directive 2018/844/EU in its article 18 states: “Research into, and the testing of, new solutions for improving the energy performance of historical buildings and sites should be encouraged, while also safeguarding and preserving cultural heritage”.

- ICOMOS included among its List of Scientific Committees the International committee on Energy and Sustainability (ISCES),
- The Technical Committee (CEN/ TC346, Conservation of Cultural Heritage) of the European Committee for Standardization published the first “Guidelines for improving energy performance of historic buildings” (EN 16883)

1.2. National context

In Spain, as in most European countries, heritage buildings are exempt from compliance with the *Technical Code on Energy Saving* (CTE-HE) in refurbishment projects.

Energy efficiency measures, when considered, are taken irregularly and based in general assumptions, standards and energy efficiency ‘formulas’, partly inaccurate and untested. Even so, at the post-intervention state the results are hardly ever evaluated and consequently, a considerable uncertainty remains on how these buildings really performance in terms of energy use, carbon emissions and on the impact that the intervention have had on their physical integrity.

1.3. Regional context.

1.3. a) Legislation

The Regional Government of Andalusia, one of the European regions with more abundant and rich building heritage, has full competence in heritage preservation. In Andalusia there are about 21.000 catalogued public buildings which could be potentially energy-retrofitted, contributing to the exemplary role of public bodies stated in Article 5 of Directive 27/2012/EU.

The current regional law on heritage conservation, **Law 14/2007** on the Historical Heritage of Andalusia, address the problem of the visual and perception pollution in its article 19. It compels the municipalities with heritage assets registered in the *General Catalogue of Andalusian Historic Heritage* to include in their urban planning or municipal regulations control measures regarding “permanent or temporary installations whose high, volume or distance may disturb the perception of the asset” and specifically “installations related to the energy supply, generation and consumption”. Thus, although it is not explicitly prohibited, the installation of renewable energy sources or some other high-efficiency systems in the historic centres of the great majority of the

778 Andalusian municipalities is complicated, discouraging ambitious urban decarbonisation policies.

On 23 February 2018, the draft bill amending Law 14/2007 was approved. The new law has included the obligation to incorporate the *Heritage Impact Assessment* in projects that affect buildings or elements located in Andalusia that are inscribed on the World Heritage List. To date, there is no methodological consensus, at international level, on how to carry out this particular type of impact assessments. In Andalusia there is no single system or procedure and very little previous experience. This fact could hamper the future mandatory *Heritage Impact Assessments*, although in 2011 ICOMOS published its *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* and many experts are currently working on its application.

1.3. b) Regional programmes supported by European funds

In the Andalusia ERDF 2014-20 OP the cross-sectional issue of the energy retrofit of heritage buildings is branched in three different thematic objectives:

OT1: Promote the research, the technologic development and the innovation. Priority line 1b is focused on the ecological innovation, smart specialization and promotion of applied research and pilot actions.

OT 4: Promote the transition to a low carbon economy in all the sectors. Priority axis 4c targets the energy efficiency and the smart energy management and renewable sources in public infrastructures, including public buildings and housing.

OT 6: Preserve and protect the natural environment and promote the efficiency of the resources. Priority line 6.c supports the conservation, protection and promotion of the natural and cultural heritage.

Regarding the **Thematic Objective OT1**, it includes among its investment priority 1b, the following three specific objectives:

SO 1.2.1. Impulse and promotion of company-led R+D+I activities, support for the creation and consolidation of innovative companies and support for *Innovative Public Procurement* (IPP).

SO.1.2.2. Knowledge transfer and cooperation between companies and research centres.

SO.1.2.3. Promotion and generation of *frontier knowledge* and knowledge oriented to the challenges of society, development of emerging technologies.

In line with SO. 1.2.1., in 2018 it was approved the "Strategy for the promotion and consolidation of *Innovative Public Procurement* (IPP) in the Public Administration of the Regional Government of Andalusia". Its aim is to give maximum relevance to this figure of public procurement that integrates the promotion of R+D+I and ensures a more efficient use of public funds, boosting value-generating changes in administrative processes. The strategy has started with five pilot projects selected from a diagnostic work in which have been identified about twenty priority needs and demands. None of these pilot projects is related to the energy rehabilitation of the built heritage.

The SO.1.2.2. could host and boost future regional strategies and/or plans for the energy rehabilitation of heritage, based on the knowledge generated through the cooperation between the public administration, the private companies and the research sector. It is precisely the need to generate knowledge through this cooperation one of the obstacles that hinder progress in this field.

The SO 1.2.3. promotes the generation of frontier knowledge. One of the obstacles to the energy rehabilitation of heritage is the diversity of disciplines and methodologies involved, which requires infrequent approaches.

OT1 has provided support to the "Andalusian Plan for Research, Development and Innovation", known by its Spanish acronym as **PAIDI 2020** and available at [1], which is the main instrument to programme, coordinate, invigorate and evaluate the R+D+I policy in our region. The PAIDI's General Objective 3 encourage safe, clean and efficient energy, as well as actions for the climate, the environment and an efficient use of resources and raw materials. The PAIDI's General Objective 4, called "Boosting the Knowledge Economy", includes as one of the highest and most urgent priorities of the plan itself the encouragement of synergistic collaboration between industry and academia, so that the Andalusian system of innovation and investment in R+D+I obtain maximum socio-economic impact. In conclusion, the Specific Objectives and the Actions contemplated in both General Objectives 3 and 4 of the PAIDI 2020 would allow the development of plans, programmes or projects aimed at the generation of the necessary knowledge on the subject. Nevertheless, it had not been promoted by any of the two Regional Ministries with main powers in the sustainable rehabilitation of historic buildings (Ministry of Culture and Historical Heritage -CCPH- and Ministry of Development, Infrastructures and Territorial Planning -CFIOT-) to date, despite the declared need of remedy the shortage of knowledge and the test of new solutions

through the specialized research on the topic (stated at the Preliminary considerations number 18 of Directive 2018/844/EU).

On the other hand, with the triple purpose of joining efforts, boosting possible synergies of different administrative institutions in convergent activities and avoiding duplication by prioritizing the allocation of resources, *PAIDI 2020* has among its objectives the inclusion of **sectoral strategies** and programs planned by the Andalusian administration. As mentioned above, two different ministries have competence in the field (CCPH and CFIOT) and both have R+D+I sectoral strategic lines integrated in *PAIDI 2020*. With respect to the CCPH, its sectoral R+D+I lines related to the issue are:

- Creation of multilevel frameworks and collaborative environments for research and the generation of innovative knowledge that allows for an increase in trans-disciplinary synergies with other areas of public policy for the benefit of the common good.
- Creation of collaborative working networks with both public and private knowledge centres, improving the levels of contribution and social transfer of research into heritage and artistic creation.
- Design of strategies for the territorial management of cultural heritage that promote its preservation and sustainable development.
- Research on the public use of cultural spaces guaranteeing their sustainable preservation.

The CFIOT has five sectoral R+D+I strategic lines. The fifth is called "Horizontal Line" and includes: "Platforms for the generation of knowledge from the information produced in the different areas of the Ministry such as: housing, land, architecture, rehabilitation, city and public space, mobility, road and transport infrastructure, transport planning and inspection of the quality of building, construction and public works".

Fulfilling its objective of integrating the Andalusian Administration's R+D+I sectoral strategies, *PAIDI 2020* generated a matrix that brought together the sectoral strategies of all the ministries and organised it in relation to the general objectives of *PAIDI* and the *priority subjects* established by the "Andalusian Innovation Strategy" (RIS3). In this *PAIDI 2020* matrix the two ministries involved appear together under the same *priority subject* on two occasions:

1º OBJ 3. *Priority subject* "Territorial-based endogenous resources". Action 5: "Incentives for R+D+I activities, with special interest in those developed in collaboration between the universities and the companies for the improvement of social and territorial cohesion".

2^o OBJ 4. *Priority subject* "Renewable energies, energy efficiency and sustainable construction". Action 18: "Implement techniques for the exploitation of statistical data, knowledge mining and Big Data that extract links from both the public and private sectors in order to maximise the development of Andalusian priority areas".

The second **axis OT 4** has co-financed, among others, programs such as "Plan Andaluz de Vivienda y Rehabilitación 2016-2020" [2] and "Andalucía es más" [3]. All of them are aligned with the "Energy Strategy in Andalusia 2020" (available in PDF at [4]) and with the "Integral Plan for the Promotion of the Construction Sector and the Sustainable Rehabilitation in Andalusia Horizon 2020" (known by its Spanish acronym as **PICSA** and available in PDF at [5]). It includes specific measures for heritage buildings in its Lines 8 and 9:

"L8-01. Promotion of the energy efficiency improvement and the renewable energy use in existing buildings (...) and in the heritage building stock of Andalusia".

"L9-07. Boosting the rehabilitation of heritage buildings, as "exemplary spaces" of improvement technologies integrating the management and the maintenance.

However, cases of energy retrofit of heritage buildings are uncommon. One of the rare cases was that of the energy rehabilitation of the listed building which holds the public body headquarters of "Defensor del Pueblo Andaluz" in Seville. It was conducted thanks to an agreement between that institution and Andalusian Energy Agency (AAE), signed in 2008 and including REDEJA (Energy Net of Andalusian Public Administration, a management tool of AAE).

The Call for Tenders of the first "Sustainable Construction Programme", developed under PICSA in the framework of ERDF PO 2007-2013, won the European Union's "Regiostars 2015" award and is included as Best Practice in the Interreg Europe database.

The program "**Andalucía es más**": **Programme to the sustainable energy development in Andalusia (2017-2020)**" [3] is managed by the Andalusian Energy Agency (AAE) and includes three incentives lines dedicated to private or public housing, tertiary sector and public administrations: (1) Sustainable Construction, with a specific line for small municipalities (2) Sustainable Small and Medium Enterprises and (3) Smart Grids. Although it does not exclude the heritage buildings, the interventions on this kind are almost inexistent.

The "**Plan Andaluz de Vivienda y Rehabilitación 2016-2020**" regulates and give financial support to five specific programmes aimed at the rehabilitation of residential buildings and dwellings. Two of them address the rehabilitation of public low-income housing: one is for the public stock owned

by municipalities and another for the public stock owned by the Regional Government. The first has not been put into operation yet. Neither of the two programmes allude to dwellings or buildings of historic or artistic value, catalogued or not.

Nevertheless, this plan also regulates a third programme, in whose order of development the condition of a heritage building has been considered. This programme is dedicated to privately owned buildings [6]. Owners' Associations who meet a maximum income threshold can apply for grants/subsidies for the improvement of their buildings (including energy efficiency) on a competitive basis. In case the building is declared an Asset of Cultural Interest (the highest protection grade existing in Spain), catalogued or integrally protected in the corresponding Urban Planning, the programme provides for an additional grant of €1,000 per dwelling, to be added to the maximum subsidy and, in addition, in the evaluation of proposals 4 extra points are given. However, very few listed buildings have been refurbished under this programme and the general energy efficiency standards, based on the current Spanish energy code, have not been applied either, given the exception treatment granted by the EPB EU Directive. No follow-up plan has been implemented neither.

On the other hand, **AVRA** (Housing and Rehabilitation Agency of Andalusia) under the above mentioned "Plan Andaluz de Vivienda y Rehabilitación 2016-2020" [2] and both "Programme to the sustainable energy development in Andalusia" (2017-2020) and "Sustainable Construction Programme" emerged in 2014, has been developing since 2013 its own line in energy retrofit of buildings [7]. It was selected as Good Practice by Interreg Europe in the BUIL2LC project.

From 2014 to the present AVRA has developed an energy rehabilitation line through a number of funding sources supported by the axis OT4 and targeting the residential public stock of which it is in charge, consisting in almost 80.000 dwellings. Since then AVRA has rehabilitated around 120 residential complex (housing blocks and/or groups of housing blocks) and 7,282 dwellings. In many cases, innovative solutions, such as eco-materials, ventilated facades and highly efficient hot water equipment, were implemented. During 2014-2015, 140 rehabilitated dwellings were monitored in order to promote awareness and provide data for future evaluation and improvement of solutions. The line did not exclude cases of heritage buildings, although their number within the inventory is small. None historic building has been energy retrofitted by AVRA due to the presumed difficulty of meeting the efficiency requirements established in the public tenders.

Since 1986 the **axis OT 6** has partially funded the *Rehabilitation of Public Buildings of Architectural Interest Programme* (known by its Spanish acronym as PREPIA¹). Under the PREPIA, the most ambitious program to date aimed at the rehabilitation of Andalusian architectural heritage, more than 400 public listed buildings of municipal property, of different uses and typologies, have been renovated under high quality standards. The programme is still operational today, managed by the Architectural Service of the Regional Ministry of Development, Infrastructures and Territorial Planning (CFIOT). The interventions are financed by the CFIOT (financing rate 80% ERDF, OT6) and by the municipalities. In some cases, such as the specific line for the rehabilitation of theatres, the Regional Ministry of Culture has also contributed to the funding. The actions of this program also benefit from funding under the 1.5% Cultural established by the Historical Heritage Law².

This programme has accumulated a long and valuable experience of collaboration with the local authorities responsible for the buildings. These, although have full competence to carry out the task, benefit from the support of the Regional Ministry not only in economic terms, but also in terms of management and expertise.

The PREPIA has been working in the following way: the initiative of rehabilitate a historic building comes from the municipal authority in charge of the building, who must apply for the rehabilitation project to be included in the programme. To this effect the building must meet three basic conditions: to be of public-municipal ownership, to have public use and to be officially protected. The criteria for the evaluation and approval of the applications include five objective technical criteria: (1) the location of the building in a relevant urban context, (2) the building conservation state, (3) the interest and need of the use program proposed by the City Council, (4) technical and economic feasibility and (5) balanced distribution on the Andalusian territory. Once the application is favourably reported and the building is included in the programme, a Framework Agreement is signed by the two public administrations. It regulates the participation percentages sets out the rights and obligations of each party throughout the process. The signature allows the preliminary studies (topographic and architectural plans, geotechnical studies, identification and characterization of the constructive elements, samples extraction, identification of lesions and pathologies, mechanical testing of the structure...) to be contracted and developed. Both, these preliminary studies and the public tender for the development of the architectural project, are managed by the Architectural Service in charge of the PRPHIA.

¹<https://www.juntadeandalucia.es/organismos/fomentoinfraestructurasyordenaciondelterritorio/areas/arquitectura/intervenciones-patrimonio-urbano/paginas/patrimonio-interes-arquitectonico.html>.

² The Spanish Historical Heritage Law establishes the obligation to allocate at least 1% of public works contracts to work for the conservation or enrichment of Spanish Historical Heritage or to the promotion of artistic creativity, with preference for the work itself or its immediate surroundings. This obligation is embodied in the Andalusian regional legislation.

Note: It is very important to note that Andalusia is currently undergoing the final phase for the approval of the new PLAN VIVE EN ANDALUCÍA 2020-2030 [8], that will substitute the mentioned “*Plan Andaluz de Vivienda y Rehabilitación 2016-2020*”. Its definitive approval is expected for March-April 2020. This new regional policy is the plan that will govern the policies and programs of rehabilitation of the next years, including the PREPIA. Simultaneously to the plan, a new “*Order for the development of the PLAN VIVE EN ANDALUCÍA 2020-2030 which approves the regulatory bases for the granting of subsidies, on a competitive basis, to Andalusian Public Universities for the development of research projects in the areas of housing, rehabilitation and architecture*” is also going to be approved. This AP include an action (Action 3) addressing this order.

2. DIAGNOSIS.

Thanks to the stimulus and resources triggered by VIOLET project, a complete diagnosis of the issue has been carried out. Many barriers and difficulties of different nature have been identified, but possibilities and opportunities as well.

Identified barriers within VIOLET project.

In the CoP meetings held in **Seville on 19 June and 28 November 2017**, some representatives of the Andalusian public bodies in charge of the building heritage conservation and rehabilitation highlighted the complexity of introduce energy efficiency criteria in this kind of public tenders. Thanks to the interchange promoted by VIOLET project, AVRA knew that many of them are common to all partners. Thus, the main barriers identified in the interregional SWOT analysis can be classified in five groups:

- 1 Difficulty of **planning** energy retrofit projects for historic buildings:
 - The possibility of additional costs associated with all phases of the process (management, implementation, monitoring and control, evaluation), the magnitude of which is unknown at the initial planning phases.
 - New requirements on energy efficiency might aggravate the already time-consuming procedures.
 - Ignorance of where to put the limit of the energy efficiency criteria of a historic building, since there are no standardized values and previous experience is almost inexistent. Demanding a

specific energy rating at the tender project stage does not seem appropriate, as it may be unrealistic and cause additional costs or damage.

2 Difficulty of **predicting potential risks** to the physical integrity of the buildings and/or their content, especially in cases of buildings listed under the highest levels or buildings housing collections or objects of artistic value.

3 Difficulty of **assessing** energy retrofit actions. In the case of ambitious energy efficiency interventions, it is not all clear how to evaluate the results, how to finance these evaluations nor how to carry them out. In the case of energy performance assessment, there are sufficiently tested international recommendations and guidelines for buildings in general; although the experience of assessment in historic buildings is considerably less. In the case of the impact on the heritage significance of the building, the difficulty of assessing is especially relevant due to the absence of a common accepted procedure and lack of previous experience.

4 In the case of Andalusia, difficulty of predicting **possible legal obstacles** of an energy retrofit project targeting a historic building in the initial management phase. This barrier refers mainly to the potential visual and perception impact of implementing some renewable or highly-efficient energy production systems within a historic urban landscape context (Art. 19 Law 14/2007 of Historical Heritage of Andalusia).

5 Difficulty of **coordination** between professionals and experts from different disciplines (heritage and energy) involved in the processes of energy rehabilitation of heritage.

[Influence of the ERDF OP 2014-2020 on the related programmes.](#)

The lack of knowledge and experience in the field could be partly remedied by actions linked to **OT1**. The European Directive 2018/844 itself, which amends the previous Directives 2010/31/EU and 2012/27/EU, includes among its preliminary considerations: "(18) Research into, and the testing of new solutions for improving the energy performance of historical buildings and sites should be encouraged, while also safeguarding and preserving cultural heritage".

In the particular case of Andalusia, R+D+I projects that encourage the generation of knowledge on the energy rehabilitation of historic buildings could have had a place in the matrix structure of the PAIDI 2020 previously described, but to date none has been developed. Although both the regional ministries, CCPH and CFIOT, have planned and classified sectoral actions aligned with the general objectives of the PAIDI 2020 (see Section 1.3. of this AP) the issue is not clearly identified in any of the planned actions and the actions most related to the subject are again dispersed and/or disaggregated in

different *priority subjects* of the PAIDI. This complicates the designing of focused research projects and might have been hampered their development: none of the R+D+I projects subsidized within the scope of PAIDI2020 in the last period 2015-2019 directly addresses or is related to the energy retrofit of heritage buildings.

In conclusion, despite the declared to remedy the scarcity of knowledge and the need to test new solutions through specialised research, experimental studies are almost non-existent.

With regard to **OT4**, the energy retrofit of heritage buildings is strategically considered at the regional level and interventions of this type are not explicitly excluded in any of the programmes currently underway, as explained in the previous section. However, the energy retrofit of heritage buildings is often dismissed in these programmes due to:

- These group of buildings are a minority share of the whole stock targeted by OT4 programmes.
- There is no specific budget earmarked for the implementation of energy-efficient actions in this type of buildings.
- There is a perception of the risk involved in this kind of intervention for the preservation of the values of the building and its content.
- It is assumed that the levels of energy performance required to buildings in general are difficult for historic buildings to achieve. Moreover, there are no tools to determine what level would be reasonable to require.

The PREPIA, co-funded by **OT6**, is the more important programme devoted to the rehabilitation of the built heritage in Andalusia, as explained in the previous section. Exigent energy efficiency standards have been generally forgone in the technical projects of PREPIA, since the Spanish Energy Code (designed on the basis of the EPBD) set aside historic buildings from its application range. Although in same recent cases the architects might have been adopted solutions to approximate the historic building performance to the general standard as much as possible, it has not been systematically demanded nor controlled by the PREPIA managers. The results of such efforts have not been evaluated neither. As a consequence, the lack of knowledge in the issue remains and the questions brought out in the CoP meetings, such as: where put the limit of the energy performance requirements of this kind of buildings, which are the risks for the physical integrity of the protected elements conservation, which are the methods and costs involved in assessing and quantifying the results after the energy retrofit, whether it is feasible or not to implement renewable energy sources, etc...continue unsolved.

In order to safely introduce energy efficiency measures in any heritage building rehabilitation project, from the point of view of conservation and the possible impact on their heritage significance, it would be necessary to carry out **preliminary technical analyses** that allow:

- a) To estimate the potential for energy-efficiency improvement of the building, in order to be able to request realistic performance thresholds in the tender documents.
- b) To support project-contract holders in making decisions on what energy efficiency measures to implement.
- c) To evaluate the results obtained after the intervention, by comparing them to the pre-intervention analysis results.

These preliminary studies can be done in two ways:

- 1) Case-by-case audit: when the building to be rehabilitated is in operational conditions (it is occupied) and the use will not change after the rehabilitation.
- 2) By extrapolation of results obtained from other buildings in the same climate zone and with similar characteristics (especially the use), when the building to be rehabilitated is not in operational conditions and an energy audit is not possible. In these cases, the existence of a database of correctly obtained data of sufficient magnitude on how other buildings of similar characteristics and location behave energetically, makes it possible to establish "reference buildings" for each case and thus approximate the potential for improvement of the building to be rehabilitated, setting limit value requirement intervals similar to those of the reference building.

As the PREPIA is currently designed and financed, it is not possible to finance these preliminary technical studies and analyses in either case. This makes it extremely difficult to introduce limits on specific energy requirements in the tendering of projects, which implies that the project drafters act according to their own criteria and that the achieved results after intervention cannot be evaluated.

Conclusion

In short, the rehabilitation of heritage buildings in Andalusia with demanding energy efficiency criteria implies that a multi-faceted challenge should be faced:

Strategic challenge: the dispersion of strategic objectives of the ERDF OP 2014-2020 (three different Thematic Objectives involved in the same issue) produces a dispersion of funding lines that make it extremely difficult to apply demanding energy efficiency standards to heritage buildings. It is therefore necessary to introduce modifications in some of the thematic axes (OT4, OT6 or OT1) in order to make it possible for actions of the type intended to be carried out.

Legislative challenge: as mentioned above, Article 19 of the current Law 14/2007 of the Historical Heritage of Andalusia compels the municipalities with heritage assets registered in the General

Catalogue of Andalusian Historic Heritage to include in their urban planning or municipal regulations control measures regarding “permanent or temporary installations whose high, volume or distance may disturb the perception of the asset” and specifically “installations related to the energy supply, generation and consumption”. Both renewable energy installations and efficient thermal installations for tertiary buildings are usually large and could cause integration difficulties in historic buildings and complexes. On the other hand, completely dispensing with certain high-efficiency systems, such the mentioned, may contradict the current international recommendations on urban sustainability:

- Aalborg Charter 1994 and Leipzig Charter 2007 on Sustainable City (EU)
- Recommendation on Historic Urban Landscape (UNESCO 2011)
- Valletta Principles (ICOMOS, 2011).
- Paris Agreement (2015) and Agenda 2030 for Sustainable Development of the United Nations.

The new law amending Law 14/2007 will introduce the need for *Heritage Impact Assessment* in those projects that affect buildings or elements inscribed on the World Heritage List, despite the lack of generally accepted procedures. This would work as a new barrier to the energy retrofit of many heritage buildings in Andalusia.

Scientific-technological challenge: the rehabilitation of heritage buildings with demanding energy efficiency criteria is a complex matter that requires rigorous scientific methodologies to avoid over-investment and/or damage to protected values. The methodology must be based on real data of monitoring, in situ testing and trial and dynamic energy simulation. In addition, it must be correctly focused and cases must be selected appropriately. The level of functional satisfaction (comfort and economy) must be equal to that of unprotected buildings, or with an admissible margin, respecting their values. It will be necessary to determine an individual level of satisfaction for each case in very different uses, such as housing and museums, for example. Given the novelty of the matter, advances in the scientific and technological knowledge should be encouraged.

Organisational challenge: the learning gained from R+D+I activity should be transferred to the public management practice, ensuring the feasibility of the planned actions and an efficient use of public funds. A strong and resolute impetus should be given to the transfer of knowledge between research and public sectors. It will contribute to the improvement of the administrative processes involved in the energy retrofit of heritage buildings, facilitating planning from the initial phases, avoiding possible over-costs and damages and helping to prevent and avert possible conflicts with heritage legislation.

The following Action Plan has been designed to respond to the four challenges mentioned above. The first of the actions responds to the need for a strategic change of a political nature, from where a sustainable approach must come in the long term. The second action aims to address the scientific and

legislative challenges by boosting experimental and training initiatives. The third action seeks the improvement of the cooperation between the public and research sectors.

3. CONTENT OF AVRA ACTION PLAN.

The VIOLET project is an excellent opportunity to get to know and exchange experiences on how other European regions face the new challenge of rehabilitating heritage buildings under the paradigm of urban and territorial sustainability. Since the practice of the energy retrofit of the built heritage is a complex task that involves many different agents, through this Action Plan, AVRA aims to share ideas with the different stakeholders, to encourage energy efficiency actions in the rehabilitation of Andalusian heritage public buildings and to promote the necessary cooperation between the R+D+I sector and the public administration in order to strengthen the generation and application of new knowledge in improving existing programmes.

AVRA aims at impacting three policy instruments:

1. Specific Objective OE.6.3.1. of Thematic Objective OT6 of Andalusia ERDF 2014-20 OP.
2. Programme for the Rehabilitation of Public Buildings of Architectural Interest (known by its Spanish acronym as PREPIA) managed by the Architecture Service of the Regional Ministry of Public Works, Infrastructures and Territorial Planning (CFIOT).
3. Regional Plan VIVE EN ANDALUCÍA 2020-2030.

To this end, AVRA has designed three priority actions, the implementation of which it commits to carry out in the period 2020-2021:

Action 1. It consists of broadening the objectives and actions included in Specific Objective 060c1, EO.6.3.1. of Thematic Objective OT6 of ERDF OP 2014-2020, so that actions to improve energy efficiency in heritage buildings can receive the necessary economic support from the programmes financed by this axis. It is a long-term strategic action.

Action 2. This action seeks to improve a particular regional policy instrument co-financed by OT6. Its results will be replicable in all other regional plans or programmes co-financed by the same axis. The chosen instrument is the *Program for the Rehabilitation of Public Buildings of Architectural Interest* (PREPIA) of the *Regional Ministry of Development, Infrastructures and Territorial Planning* (CFIOT), which will serve as a basis for experimentation of energy efficiency solutions in heritage buildings. The results of this experimentation will be applied to the improvement of the planning, management, execution and evaluation of all those plans and/or programs addressing the rehabilitation of the *Buildings forming part of the Historical Heritage of Andalusia* (EIPHA).

Action 3. The aim of this action is to contribute to the improvement of the regional R+D+I policies promoting the knowledge transfer in the field of the energy performance improvement of the historic buildings.

4. ACHIEVEMENTS RESULTING FROM PHASE 1 OF VIOLET AND THEIR LINK WITH THE PROPOSED ACTIONS.

The impetus and exchange of ideas provided by VIOLET during the period 2017-2019, has fostered to **two important advances**.

The first refers to the identification of potential improvements on the *sectoral strategies* in R+D+I of the two regional ministries with competences in the matter (CCPH and CFIOT), integrated in the current strategic plan “Andalusian Plan for Research, Development and Innovation” (PAIDI2020). The identified need (explained in more detail in the Sections “1.3. Regional Context” and “2. Diagnosis” of this AP), would be considered for the development of the forthcoming Andalusian R+D+I strategy.

Once the problem has been identified, as a results of the diagnosis made in the VIOLET context, a specific action (Action 3) addressing the issue has been included in this AP. Although influencing the forthcoming PAIDI would have been also included among the actions of this AP, the need to propose attainable actions within the VIOLET timeframe, led us to restrict Action 3 to the specific framework of CFIOT's competences. Therefore, improving PAIDI's policies in this area is a pending task that VIOLET has promoted.

The second advance refers to the PREPIA management: VIOLET exchange of ideas has encouraged the managers of the PREPIA to test some changes relating energy efficiency in their rehabilitation projects. They were:

1 In 2017, two PREPIA projects were selected to introduce in the project-drafting phase a new requirement: the successful tenderers were required to submit a specific report on building sustainability. It was a new Addendum to the Architecture Project addressing issues as energy, water and materials cycles, environmental quality, management, use and maintenance. In Spain part of the content of this report is mandatory since 2006 (when National Energy Code came into force), but a big part is not. They also had to justify that the rehabilitated building would be of energy rated under categories A or B, according to the National Certification System. Adding this Addendum to the Architecture Project documentation was a prerequisite for its favourable supervision. These pilot projects were:

- Rehabilitation of the Town Hall of Fuentes de Andalucía, in Seville. Currently in the phase of contracting the construction works.
- Rehabilitation of the Town Hall of Ecija, in Seville. The construction works are currently on going.

The two teams presented the Addendums, with unequal detail and depth. The projects were favourably evaluated and the rest of the usual procedure continued. The evaluation of this first experience can be summarized as follows:

Identified strengths:

- Each rehabilitation project becomes a pilot-case, based on the principle of "plan-act-test" or "learn by doing".
- If the results are evaluated, it will contribute to generate more practical knowledge on the subject, as well as to set realistic objectives and more concrete limits for future projects.
- It is a challenge for architects, who know from the initial phase of the project the obligation to put the CTE-HE to the test. This also contributes to the intelligent specialization of the sector and to give an innovative character to the call.
- No additional expenditure has been incurred.

Weaknesses detected:

- The Addendum document, designed as a list of subjects to which the architects had to give an overall response, was too general and undefined. It didn't include specific indicators for each subject (some were redundant with the current CTE) and, therefore, its subsequent evaluation is very difficult.
- No external evaluation of these documents was foreseen.
- The assessment of the impact on the heritage values of the buildings was not included.
- The evaluation and monitoring of results was not foreseen.

Opportunities:

- They could serve as first pilots where the EN 16883 could be tested in the after-intervention stage.

Threats:

- Since a risk assessment was not carried out, significant uncertainty remains about the impact that the energy rating A or B requirement could have on the following aspects:
- Economic: risk of over-investment
- Technic: risks on the conservation of constructive features and on the emergence of constructive pathologies.
- Energy: life cycle of energy demand in terms of use of renewable primary energy and non-renewable primary energy could be non-favourable.
- Environmental: unintended consequences on the quality of the outdoor and indoor environment, including comfort.

2 In 2018 a new PREPIA project was selected for testing a second modification of the commonly used procedure. In this case it was decided to introduce the modification in the tender phase: a call including energy efficiency criteria for the evaluation of proposals was launched. The project was the Rehabilitation of the "*Casa de los Aragoneses*" in Monachil, Granada. The public call for the awarding the Drafting Project was carried out in March 2019 and the contract was recently signed. The energy efficiency criteria were introduced as follows:

1º Three new objectives related to energy efficiency were introduced in the Technical Specifications for Contracting: a) introduction of passive strategies that contribute to reducing the energy demand of the building, b) pre-analysis of the feasibility of introducing renewable energy sources and c) the use of traditional materials and techniques.

2º Proposals were evaluated according to their demonstrated ability to meet the specific objectives mentioned above.

The achievable score for each objective is specified in the Administrative Conditions of the Tender. It is true that there is an inherent difficulty in valuing an architectural proposal according to energy efficiency objectives that can only be measured after the intervention. For this reason, the Technical Bases of the competition do not set specific limits (such as, for example, Energy Rating A, B, C, D, etc... according to the national Certification system) that could lead to over-investments. Rather, it was a try to encouraging architects to reflect on the issue from the initial stages of the project and to be able to materialize the results of such reflections in their proposal in order to be evaluated.

3 In 2019, special execution conditions have been included in the contract specifications of two new projects with the intention that the winning teams will rely on the Energy Efficiency Reports that will be developed within the framework of the VIOLET for the drafting of the technical documents of the execution project. They are:

- Rehabilitation of the Church of Santa Catalina of the old Convent of Santo Domingo in Jaén.
- Rehabilitation of the church of Coín, Málaga.

The new special condition reads as follows: "With the intention of incorporating measures that favourably affect the preservation of the environment and, given that the rehabilitation of (...) has been selected as one of the pilot cases for the experimental implementation of the EN 16883-2108 standard "*Guide for the improvement of the energy efficiency of historic buildings*", in the framework of EU Interreg VIOLET project, the contract holders will have to take into consideration, for the drafting of the execution project, the reports on Energy Efficiency in the conservation of the Historical Heritage carried out within the framework of VIOLET project".

These achievements, stimulated by VIOLET, are linked to our Action 2 that is focused on the improvement of the planning, management, execution and evaluation of this type of projects. According to the internal SWOT analysis described above, these kind of management changes are first steps to establish management procedures that ensure the safe energy retrofit of heritage buildings. They are important because they contribute to raise awareness between the managers and the professionals, which are encouraged to reflect on the best solutions, avoiding recourse to standardised formulas. Since these achievements are considered positive but not sufficient, Action 2 has been design to complete them.

PART I. General information

Project: VIOLET

Partner organisation: The Public Enterprise for Social Housing and Refurbishment in Andalusia, Regional Ministry of Public Works and Housing (AVRA)

Other partner organisations involved (if relevant): Regional Ministry of Public Works, Infrastructures and Territorial Planning (CFIOT). General Secretary of Housing. Architecture Service.

Country: Spain

NUTS2 region: Andalusia.

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PART II. Policy context

The Action Plan aims to impact:

☒ **Investment for Growth and Jobs programme**

Operational Programme on Growth and Employment Investment (OP ERDF 2014-2020). Objective OT6, Investment priority 6.c. (Conservation, protection and promotion of natural and cultural heritage), SO 6.3.1 (Promote the protection, promotion and development of cultural heritage).

☐ European Territorial Cooperation programme

☒ **Other regional development policy instrument (2)**

Name of the regional policy instruments addressed:

(1) Programme for the Rehabilitation of Public Buildings of Architectural Interest (PREPIA) of the Ministry of Development, Infrastructure and Land Management (CFIOT).

(2) Regional Plan VIVE EN ANDALUCÍA 2020-2030.

PART III. Details of the actions envisaged

ACTION 1

Title of action

To extend **the goals** of the investment priority 6c, SO.6.3.1. (Promote the protection, promotion and development of the cultural heritage) in the OT6 (Environment and resource efficiency) of the Andalusian ERDF 2014-20 OP, in order to **improve the regional policies** on energy efficiency of the Andalusian cultural and architectural heritage, so that energy efficiency improvement and low carbon actions can be financed in the rehabilitation projects of those cultural sites and buildings included in programmes supported by the OT6.

Sub-actions

Sub-action 1.1.

Proposal to broaden the scope of the investment priority 6c, SO.6.3.1. (Promote the protection, promotion and development of the cultural heritage) in the OT6 (Environment and resource efficiency) of the Andalusian ERDF 2014-20 OP

...to extend its *expected results* (section 2A5), its *actions to be financed* (section 2A61-A) and its *guiding principles* (section 2A62),

...in order to consider, where feasible in the rehabilitation and conservation of cultural and architectural heritage, energy efficiency improvement actions which guarantee the preservation of its protected values,

...so that such actions can be financed in the rehabilitation projects of those buildings and cultural sites included in programmes supported by the OT6.

This sub-action is currently ongoing. The proposal to modify the text of the SO 6.3.1 was submitted from the Vice-Ministry of Development, Infrastructures and Territorial Planning to the Directorate General of European Funds of the Junta de Andalucía in April 2019 as a result of VIOLET exchange and experiences. In the text of the proposed amendment it was included the need for alignment with the

new European Directive 2018/844 which promotes the research and testing of new solutions. The opportunity that VIOLET offers for the introduction of necessary changes was also underlined.

The EU Funds Managing Authority positively understood the reasoning behind the proposed change and the issue started immediately being addressed. Their first response was received on October, 4th. In the last week, the MA has broadly (though unofficially) agreed to the proposal of change. Therefore, the proposed amendment is expected to be officially approved in January 2020.

Sub-action 1.2.

Redistribution of the budget allocated to the PREPIA, so that part of it is assigned to studies, assessments, analysis and / or energy audits of historic buildings included in the program.

In the same text of proposed amendment of April 2019 above mentioned (sub-action 1.1) was also included the request for reallocation of funds (sub-action 1.2).

It has been estimated that about 20 historic buildings will be analysed for testing innovative solutions, turning the PRPHIA into a living laboratory, if the request is accepted.

Sub-action 1.3

To participate and to contribute to the next Andalusian ERDF 21-27 Operative Programme in order to give continuity to the change that this AP promoted in the investment priority 6c, SO.6.3.1. of the OT6 of ERDF 14-20 OP.

At the CoP meetings that VIOLET has promoted, it was general consensus about the need of give continuity to the change in OT6 that this AP has brought out. The implementation and achievement of this sub-action is essential for the enabled strategic change to be firmly established.

Background

Territorial need to meet

The lack of political commitment, and its consequent lack of financial resources, to undertake the energy retrofit of the built heritage in Andalusia is the main strategic challenge we must face. As described in the Introduction of this AP, the issue is scattered over three different Thematic Objectives of the ERDF OP 2014-2020: OT1, OT4 and OT6. This dispersion of funding lines makes it extremely difficult to apply demanding energy efficiency standards to heritage buildings under the different existing programmes.

Action 1 of this AP intends to do it through the introduction the necessary changes in the ERDF OP 2014-2020 itself.

Regarding **OT4**, the energy retrofit programs supported by this axe do not explicitly exclude the heritage ones, as described in the Introduction, even though none of them contemplate specific measures for them. These programmes cover a very heterogeneous sample of cases: publicly and/or privately owned buildings, different uses, etc... where the heritage buildings constitute a minority. It is precisely this heterogeneity, together with the scarcity of cases, which could complicate the management of the application of a common strategy on energy efficiency and would make it difficult to evaluate the actions. For this reason, it has been considered that the modification of the OT4 axis could be less effective in achieving the objectives of the VIOLET project.

By contrast, **OT6** has for more than 30 years supported the rehabilitation of heritage buildings with a very specific programme, the *Programme for the Rehabilitation of Public Buildings of Architectural Interest* (PREHIA), exclusively targeted at historic public buildings. The PREPIA was identified from the beginning as the most suitable programme to be influenced by this AP for a number of reasons:

1. Its specific character focused on heritage buildings is accurately aligned with VIOLET's objectives.
2. Uniformity of management agents: as public buildings are intervened with public funds, the future management of the actions is more easily controllable and the interventions, which may be of a certain experimental nature, will play an exemplary role in encouraging the private sector. This characteristic makes it the most appropriate framework for the objectives of Article 5 of European Directive 2018/844.
3. Its maturity and evidence of success: the experience accumulated in the management and implementation of the rehabilitation of public architectural heritage, under high quality

constructive standards, makes it particularly suitable for the management of the wide variety of actors involved: municipal officials, agencies related to heritage protection and urbanism, professional and business sector.

4. The sample of heritage buildings included in the PREHIA is very appropriate for the intended purpose, because it allows the generation of a sufficiently broad set of comparable cases. The stock is sufficiently rich in terms of typologies, climatic zones and use and at the same time is homogeneous enough, since all of them are publicly owned buildings of tertiary use, where the potential for improvement is considerable.

5. The results may lay the foundations for a future general strategy on the energy efficiency of historic public buildings in Andalusia.

The current design of operation and funding of the PREPIA is not sufficient to ensure that the energy efficiency measures can be implemented in the rehabilitation projects. This is due to the fact that the introduction of energy efficiency measures into heritage buildings, in a safe manner from the point of view of conservation and the possible impact on their heritage significance, needs of technical analyses which allow:

- a) To estimate the potential for improvement of the energy efficiency of the building and thus, to be able to request a certain level of exigency in the procurement specifications.
- b) To serve as a support-document for the successful tenderers in order to support them in the selection of the more appropriate energy-efficiency measures and enable them to draft the technical documents of the projects on a solid (scientific) basis.
- c) To evaluate the results obtained after the intervention, as the preliminary analysis results act as a reliable benchmark.

These analyses can be done in two ways:

- 1) **Case-by-case audits**, when the building to be rehabilitated is in use and operational condition and the use will not change after the rehabilitation.
- 2) **By extrapolation of results** obtained from other buildings in the same climate zone and with similar characteristics (especially its use), when the building to be rehabilitated is not in use and an energy audit is not possible. In these cases, the existence of a correctly obtained collection of results, using a sample of sufficient magnitude, on how other buildings of similar characteristics and location behave energetically, makes it possible to establish theoretical "reference buildings" for each case. These theoretical models can be used to approximate the potential for improvement of the building to

be rehabilitated, setting intervals of limit values of particular indicators (i.e. energy demand of cooling and heating, consumption of non-renewable primary energy...)

As the PRPHIA is currently designed, it is not possible to finance these technical studies and analyses in neither one case nor the other. This makes it extremely difficult to introduce limits on specific requirements (indicators) in the public procurements and, as a result, the professionals in charge of the energy efficiency design projects act according to their own criteria. In addition, the results obtained in the post-intervention state cannot be evaluated since there is no reference of the previous state.

In order to enable this programme to finance the technical studies and analysis needed to safely implement demanding energy efficiency measures to heritage buildings, the corresponding actions must be integrated into OT6, in such a way as to guarantee their financing. Therefore, the introduction of the necessary modifications to OT6 was envisioned from the start as a major need. A letter of support was signed by the Managing Authority (Directorate General of European Funds of the Regional Ministry of Public Finance, Industry and Energy) in May 6, 2016 to confirm that they will consider possibilities for the implementation of the VIOLET Action Plan through the policy instrument OT6, Priority Line 6c: conservation, protection and promotion of the natural and cultural heritage.

To introduce changes in OT6, Priority Line 6c, constitutes Action 1.1 of this Action Plan, aiming at overcoming the strategic barrier, and was directly motivated by the VIOLET project discussion and interchange.

Lessons learnt thanks to VIOLET. How did you learn about the above described GPs / Lesson learnt?

Due to the novelty of the subject, the Good Practices developed are still scarce. However, the exchange of experiences between VIOLET partners and various experiences related to the subject within Interreg Europe have been decisive in promoting Action 1 of this Action Plan.

The issue of the dispersion of Thematic Objectives in the ERDF Operational Programmes, common to all VIOLET partners, was put on the table by the Romanian partner (SERDA) at the kick-off meeting held in **Tulcea (Romania) on 12-13 April 2017**. This aspect was from the beginning identified as one of the main barriers for all the partners. In the Cyprus meeting on **20-21 September of 2017**, CEA pointed out that additional laws might not be necessary, but the political commitment was essential.

The first meeting of the Community of Practice held in **Seville on 19 June 2017** served to carry out a regional multi-sector SWOT analysis that laid the foundations for the future Action Plan. As a result of this internal analysis, it was concluded that the main barrier is of a strategic nature: since there is no legal requirement to apply demanding energy efficiency standards to heritage buildings, the political

commitment is absent. In this sense, it was determined that VIOLET offers the perfect opportunity to introduce the necessary changes in the related regional policies, starting from the more far-reaching one, the ERDF OP 2014-2020. In view of the official support it had received from the beginning (a letter of support was signed by the Managing Authority in May 6, 2016) it was definitively decided that the first of the actions should incorporate the necessary strategic change in the ERDF OP 2014-2020 itself. From then on, AVRA had several meetings with their Managing Authority to discuss ways to incorporate the necessary change in the ERDF OP 2014-2020.

The partners' exchanges held in **Cyprus on 20-21 September 2017** led us to confirm the need to overcome the absence of political commitment for release financial resources. The importance to take advantage of the opportunity that VIOLET offered to introduce the necessary changes in the ERDF OP 2014-2020 was reaffirmed by AVRA.

At the regional CoP meeting carried out in Seville on **28 November 2017**, a general consensus about the need of taking ambitious long-term strategic actions to overcome the difficulties and barriers involved in the rehabilitation of heritage buildings under high energy performance standards was reached by all the stakeholders. In addition to the strategic change, the following needs were also identified at this regional meeting:

1. The need of implement, at regional scale, energy retrofits policies targeting historic buildings.
2. The need to generate knowledge to enable us to establish realistic energy performance targets.
3. The need of an interdisciplinary approach in the energy retrofits of historic buildings.
4. The need of correctly approach the energy retrofits from the initial stages: the type of use a building (residence, tertiary, cultural ...) is determinant of the type of energy rehabilitation that can be carried out.

There was also general consensus on choosing the OT6 as the most convenient priority axis in which to introduce the necessary modifications and on identifying the PREPIA as the most appropriate framework for testing energy efficiency solutions which lay the foundations for a future general strategy on the energy efficiency of historic public buildings in Andalusia. At this point, the idea of work with the PREPIA as basis for experimental actions on a regional diagnosis on the potential of energy-efficiency improvement of the public heritage Andalusian building stock began to gain strength.

How will you adapt the described GPs / Lesson learnt to your territory?

One of the experiences, learnt thanks to VIOLET, that was most useful to confirm and boost the change proposed in AVRA Action 1 was the SERDA proposal of extend the scope of their ROP priority axe 3 to

include specific actions for the heritage buildings energy retrofit. Both actions, theirs and ours, are long-term strategic changes and serve as a solid basis for future policy instruments and programmes.

In order to carry out the above mentioned general diagnosis based on real case-studies of the PREPIA, it is necessary, firstly, to allow such actions to be included in the programme (sub-action 1.1.) and, secondly, to allocate the necessary funds for this purpose (sub-action 1.2).

Players involved

P1. Regional Ministry of Public Finance and Civil Service. Directorate General of European Funds. Managing authority.

Role 1: to approve and process the incorporation of energy efficiency actions in the OT6 (Sub-action 1.1)

Role 2: as responsible for the EU funds managing, expenditure approval, monitoring and control, one of its more important role is to approve the new allocation of funds described in sub-action 1.2., in case the proposal of sub-action 1.1. is accepted.

P2. The Andalusian Agency for Housing and Rehabilitation (AVRA)

VIOLET partner. It has large experience in Energy Retrofit Programmes and European Funding.

Role 1: to foster the implementation and to monitor Action 1 in coordination with the Architecture Service of CFIOT.

P3. Regional Ministry of Public Works, Infrastructures and Territorial Planning (CFIOT). General Secretary of Housing. Architecture Service.

It is the administrative body in charge of PREPIA management. It has large experience of conservation and protection of historical buildings, sites and urban spaces in Andalusia.

Role 1: to follow-up sub-action 1.2 implementation.

Role 2: to define the operation of Sub actions 1.1 and 1.2. in ERDF (to frame it in the ERDF 2014-2020 PO, to establish objectives and indicators, ...).

Role 3: to implement Sub-action 1.3., participating and contributing to the next Andalusian ERDF 21-27 Operative Programme in order to give continuity to the change 1.1. and 1.2., in coordination with AVRA and rest of the stake holders.

P4. Culture/Heritage Andalusian institutions (Andalusian Institute of Historical Heritage –IAPH- and the Regional Ministry of Culture and Heritage. Directorate General for Cultural Innovation and Museums. Cultural Infrastructures Service).

Role 1: as members of the CoP, they have contributed to the AP development and they will also contribute to the future documents and actions.

P5. Andalusian Energy Agency (AAE) and Andalusian Energy Network (REDEJA).

Role: as member of the CoP, they have contributed to the AP development and they will also contribute to the future documents and actions.

P6. Sector R+D+I sector: universities and research centres.

Role 1: as member of the CoP, they have contributed to the AP development and they will also contribute to the future documents and actions.

Timeframe and Outputs

The calendar is subject to the approval by the Directorate General of European Funds of the Regional Government of Andalusia of the modifications to the OT6 referred to in sub-actions 1.1 and 1.2. This is likely to occur in January 2020.

				TIMELINE			OUTPUTS
				Start date	Expected completion date	Monitoring	Tracking indicators
ACTION 1	1.1.	Proposal to broaden the scope of 6c, SO.6.3.1.	Letter of support: 6/05/2016	January 2020	Approval April 2019-January 2020	To modify the text of the OT6: Yes/No	
			Amending proposal: April 2019				
			First answer: 4/10/2019				
			Second feedback (positive): 16/12/19				
	1.2.	Redistribution of the budget allocated to the PREPIA, so that part of it is allocated to studies, analysis and / or energy audits.	Letter of support: 6/05/2016	January 2020	Approval April 2019-January 2020	To redistribute the budget: Yes/No	
			Amending proposal: April 2019		Preparation of the documents for the financing of this action-January-February 2020		
			First answer: 4/10/2019				
			Second feedback (positive): 16/12/19				
	1.3	To participate and to contribute to the next Andalusian ERDF 21-27 Operative Programme in order to give continuity to the change 1.1. and 1.2.	Depends on the start of the planning process by the MA of DG European Funds	December 2020	January 2020-December 2020	The change 1.1. and 1.2. has been given continuity in ERDF 21-27 PO: Yes/No	

Costs and funding sources.

Action 1 has no additional costs, as it is going to use the PREPIA existing funds, coming from CFIOT (financing rate 80% ERDF, OT6) and from Municipalities own resources.

Risks and Contingency Plan.

			RISKS AND CONTINGENCY PLAN		
			Risk description	Level of probability	Contingency Plan. Description
ACTION 1	1.1.	Proposal to broaden the scope of 6c, SO.6.3.1.	None		
	1.2.	Redistribution of the budget allocated to the PREPIA, so that part of it is allocated to studies, analysis and / or energy audits	The amendment proposal is approved by the DG of EU Funds, but they obligate to framing the actions in a strategic plan.	Medium (according to the feedback of October and December 2019)	Justify the actions under the strategic frame of PLAN VIVE EN ANDALUCÍA 2020-2030 (to be definitively approved in March-April 2020) which gives continuity to the PREPIA.
	1.3	To participate and to contribute to the next Andalusian ERDF 21-27 Operative Programme in order to give continuity to the change 1.1. and 1.2.	The continuity of the change is not approved.	Very low.	

ACTION 2

Title of action

Improvement of the planning, management, execution and evaluation of Rehabilitation of Public Buildings of Architectural Interest Programme (PREPIA) for the appropriate implementation of demanding energy efficiency standards in the conservation, restoration and rehabilitation projects.

Sub-actions

Sub-action 2.1

Testing of EU recommendation EN-16883: *Guidelines for improving the energy performance of historic buildings*, in a set of case-studies using funds from the PREPIA.

Sub-action 2.1 has been designed looking at DUMO, CREBA and Task 59 lessons because they constitute an extremely valuable set of knowledge obtained from real historic buildings which may be used as reference buildings for a specific climate zone, as long as the assessments have been done under a common procedure. The transfer of this knowledge to the public management will help them to improve the public tenders, avoiding over-investments since they will demand more realistic energy targets, and accomplishing the energy retrofit of historic buildings safely from the point of view of their conservation and the preservation of their significance.

In order to implement Sub-action 2.1, two tasks have been identified, to be chronologically developed. Both will be covered by the OT6 funds made available through sub-action 1.2 of this AP.

List of tasks:

2.1.1. Delivery of at least 3 Energy Efficiency Analysis of heritage buildings of the PREPIA, based on EN 16883. *Guidelines for improving the energy performance of historic buildings*.

Sub-action 2.1.1 seeks to produce, within the VIOLET time-frame, the first case-studies on which try and test the EN 16883 in real heritage buildings. Its results will constitute real data on the energy performance of these particular buildings and on their potential for improvement. It will be useful for taking the first steps towards improving management processes, as it will help

to start reflecting on need for establish realistic limits in the public tenders. Its results will be also very useful to design the public procurement of sub-action 2.1.2.

2.1.2. Design of a public procurement for contracting a regional-scale diagnostic study on the energy efficiency of buildings in of PREPIA based on EU recommendation EN-16883: *Guidelines for improving the energy performance of historic buildings*.

This task will include aspects such as: selection of the sample buildings, organization of the work packages according to the different disciplines involved, timeframe, costs, definition of outputs and indicators...in order to deliver the *Technical Specifications Document* of the public tender.

In order for expenditure to be approved, the EU Funds Management Authority would require the setting of a regional strategy to frame it. The PLAN VIVE EN ANDALUCIA 2020-2030 (PVA), which final approval is expected for March-April 2020, is the most appropriate framework because it gives continuity to PREPIA and also includes specific lines on research, training and dissemination related to the issue. Consequently, the start of this sub-action 2.1.2 would be subject to PVA approval date, which may most likely begin in June 2020, within the VIOLET timeframe.

Both tasks 2.1.1 and 2.1.2 are preparatory steps for a larger scale study seeking to produce the first body of knowledge on the matter, using the EN 16883 as a tool and the PREPIA as a laboratory. Relying on the lessons learned mostly from DUMO, CREBA and Task 59, the envisioned regional-scale diagnosis study will enable us to analyse and check the adaptability of EN16883 to the needs and particular circumstances of our region. It will generate a reliable set of “reference buildings” for future projects and interventions in Andalusia.

Sub-action 2.2.

Dissemination and training on the activities carried out in the analysis of sub-action 2.1.1.

At least, two training and informative sessions will be carried out, both in Western and Eastern Andalusia. They will be dedicated to disseminate the results of the pilots developed in Sub-action 2.1.1. It will be addressed to the technical staff involved in the management of this type of projects/programs in Andalusia administration, to the professional associations and also to the building's users.

VIOLET material and outputs will be used in order to raise awareness and disseminate good practices.

Sub-action 2.3.

Introduction of an information field on energy efficiency parameters in two heritage buildings inventories that are currently being developed: (1) the *Andalusian Inventory of Buildings of Architectural Interest of Local Public Ownership* and (2) *Inventory of Municipal Heritage Buildings of the Seville City Council*.

The Architectural Service of CFIOT in charge of PREPIA is, using its own funds, is currently starting the bidding process for the preparation of the *Andalusian Inventory of Buildings of Architectural Interest of Local Public Ownership*. This inventory is an update of the previous existing one, dating back to the year 1987. Such updating is indispensable as instrument for the prioritization of actions and to support competitive concurrency processes cofounded by OT6.

Thanks to the sharing of ideas enabled by VIOLET, the CFIOT has decided to take advantage of the circumstance and has begun to study the possibility of adding a new field of information in the new inventory. The information refers to the current characteristics of the installations and technical facilities of each building: air-conditioning, hot water supply and lighting. It has judged to be of great use for the development of sub-action 2.1.2. and other future management- related actions as well.

Similarly, thanks to the VIOLET regional meetings interchange, the City Council of Seville was open to, in coordination with CFIOT, incorporate this type of information to the inventory that is currently being carried out in the frame of its *Master Plan for the Conservation of the Immovable Heritage of the City of Seville*.

Background

Territorial need to meet

Action 2 is designed to address the scientific-technological and legislative challenges mentioned in the Introduction of this Action Plan.

Energy efficiency measures in old buildings must be based on a deep understanding of how these buildings behave in practice, not just in theory. The guiding principle for actions should be "plan-act-test" or "learn by doing", since architecture has traditionally been developed as a practical activity (and still is) and simulation tools cannot accurately predict the full amount of complex events involved in construction processes. However, the scientific approach to analysis and assessment is absolutely essential to minimise the risks of over-investment and damage arising from the setting of unrealistic scenarios and targets.

As explained in the introductory section, one recent event that illustrates the general acceptance of a new more scientific and integral approach to the issue is the publishing of the new *Guideline for Improving the Energy Performance of Historic Buildings*, EN16883 [9]. This guideline has been developed by the European Committee for Standardization [8], CEN/TC 346 "Conservation of cultural heritage" as a consequence of the increased concern about the consequences of exempting heritage buildings from compliance with the EU Directive on Energy Efficiency.

Many of the difficulties and barriers mentioned in this AP (see Action 1, Background Section) are also addressed in the EN16883. This new standard is based on the recognition that, in order to improve the energy performance of historic buildings, specific procedures appropriate to their characteristics are needed. It points out that "this aspect distinguishes working with such buildings from working with the building stock in general". The main goal of EN16883 is providing guidelines for such a procedure. It complements existing standards (among others EN 15603, EN 16096 and EN16247-2) on the energy performance of buildings in general by focusing on the particular aspects of the historic ones and showing how existing standards can be properly applied. The standard EN16883 "presents a systematic approach to facilitate the best decisions in each individual case. It does not presuppose a need for energy improvements in all historic buildings". It has established the first "normative working procedure for selecting measures to improve energy performance, based on an investigation, analysis and documentation of the building and its heritage significance". One of its most important contributions is to include the need of assessing the impact of those measures on the preservation of the heritage assets of the building.

Seven categories of evaluation (bundling 26 sub-categories) have been set at EN16883. Under a comprehensive and multi-disciplinary approach, all possible issues have been addressed: technical

compatibilities, economic viability, energy, indoor environment quality, impact on the exterior environment, use-related aspects and impact on the heritage significance.

As stated in the EN16883, the selection of measures to improve the energy efficiency of a historic building or the decision not to intervene (as this standard “does not presuppose a need for energy improvements in all historic buildings”) is supported by the results of “investigation, analysis and documentation of the building and its heritage significance”, above mentioned.

Regarding the energy performance assessment, there are two possible main scenarios:

- a) Energy retrofit of a historic building which is in use and the use is not going to change.
- b) Energy retrofit of a historic building which is empty and/or neglected.

In the first case, it is possible to measure the energy performance of the building in its current state and to introduce the data in the model, which will predict how the building would perform if such or such a measure is implemented. The level of the uncertainty of its predictions could be very low, if the procedure is carried out properly.

In the very frequent second case, the measurement is not possible and the future energy performance of the buildings can be only “calculated” theoretically, under a specific use scenario. To increase the confidence level of the calculated model, the use of a validated building calculation model (as described in EN 15603) is recommended by EN 16883.

This explains why, in order to obtain results able to predict the energy performance of the buildings under low or moderate levels of uncertainty, validated models are necessary. Due to the great diversity of cases (the heritage building stock is enormously heterogeneous) and the lack of previous experience on the matter, to generate the first body of knowledge is judged as critical, if appropriate implementation of demanding energy efficiency standards is pursued.

The aforementioned lack of experience on applying the knowledge generated by the R+D+I sector (see Section Diagnosis at the Introduction of this AP) must be resolved through cooperation between it and the Public Administration; otherwise the management of the energy rehabilitation of heritage buildings will continue to be hindered by:

1. Doubts about whether or not to undertake energy efficiency actions in certain historic buildings of high patrimonial value, due to the potential conservation risks on the building itself or on its content.
2. Risk of execute inappropriate interventions, based on theoretical calculation results about the energy performance of the building that may be very far from the real.

3. Doubts about the most appropriate procedure to implement energy efficiency measures in historic buildings, about the selection of appropriate indicators and their acceptance thresholds.
4. Risk of over-investment when a specific Energy Rating value is required as a criterion for selecting proposals: bidders may overestimate the building's improvement capabilities, generating unrealistic expectations for adding points in the tender. This is especially critical in the case of historic buildings, where the prior knowledge accumulated through experience is scarce.

Lessons learnt thanks to VIOLET. How did you learn about the above described GPs / Lesson learnt?

At the kick-off international meeting held in **Tulcea (Romania) on 12-13 April 2017**, two major needs were identified: the need to address the scarcity of knowledge in the field and to overcome the lack of dual specialization. These two knowledge-related flaws contribute to slowing down the launch of energy retrofit projects, which in turn, in a chain reaction, contributes to the lack of management experience. This fact was highlighted in the common SWOT analysis conducted in the partners' exchanges held in **Cyprus on 20-21 September 2017**.

In the same way, in the report on the SWOT analysis carried out after the CoP meeting in **June 2017 in Seville**, it had been pointed out that, in addition to political and financial factors, in Andalusia the origin of the recognized lack of experience is largely due to the lack of cooperation between the R+D+I sector and the Public Administration. Indeed, there was general agreement on the fact that the problem was not strictly the *lack of knowledge*, but this knowledge is restricted to the research field. With regard to the latter, another difficulty appears: to date, the number of case studies analysed for research purposes in Andalusia is low, due to the fact that these buildings were outside the scope of energy efficiency purposes. As mentioned at the Introduction in the last period 2015-2019 no research project was funded, under the existing regional programs, which directly addresses the energy retrofit of heritage buildings.

At the Third Meeting of VIOLET Partners held on **15 and 16 May 2018 in Schwäbisch Gmünd, Germany**, the Cypriot partner (CEA) presented the "Handbook for the Rehabilitation of Historic Buildings in Cyprus". At the same meeting, SERDA (Romania) presented the "Guide for the Protection of Local Architecture in the rural area of Dobrogea", which includes recommendations on energy efficiency in traditional buildings. These experiences are very interesting but too undemanding for the VIOLET aims and scope because of their lack of a common methodology for setting energy objectives, for conduct the previous studies and interventions and for analysing the results.

Three experiences were presented at the interregional meeting held in **Seville on 24 October 2018**, that have been decisive for this AP development:

1º The Dutch DUMO programme. It was introduced by Mr. Bernard Vercooteren, from the HZ University of Applied Sciences. DUMO connection to VIOLET is clear as it was born out of the need to make the conservation of historic and monumental buildings sustainable, respecting their qualities. It is a public-private initiative to develop a tool capable of measuring and quantitatively evaluating the outcome of energy rehabilitation on a protected building. The tool is used by professionals and aims to set realistic objectives and identify which types of interventions are cost-effective and can be generalized to several historic buildings and which should be avoided.

It is intended that the results obtained can be used to orient Middelburg Municipality's new regulations on sustainable buildings. Currently, this Municipality relies on this program for the implementation of its incentives for sustainable rehabilitation, launching the figure of "DUMO Coach", an expert advisor who guides individuals interested in obtaining the "Monument Passport" to rehabilitate their homes (information gathered at the Meeting in Bordeaux, 29-31 October 2019).

The DUMO programme has given rise to a collection of energy efficiency actions in heritage buildings that can be consulted on a web platform (<http://www.dumoprestatie.nl/>). Although this programme has not yet generated a manual of its own, the experience of cases already accumulated could serve as a basis for its generation. The major contribution of the DUMO experience to this Action Plan consists of:

- The potential of its "learning by doing" philosophy.
- Its ambitious scope: to date, more than fifty cases have been conducted. The sample can allow to compare results and draw useful conclusions.
- Its scientific methodology support: several universities has participated in developing the theoretical backing for the tool.
- Its aim at quantitatively measure and evaluate the intervention results.
- Its transversal vocation: companies working in building sustainability participate in the project (NIBE)
- Its cost-effective orientation.
- The incorporation of external consultants' reports (diagnostics) prior to any intervention in the building.
- Its acceptance of limits: for some cases certain energy retrofit actions should be avoided.
- Its aim at set realistic objectives.
- The ambition that the results may lead to a modification of local rules and regulations.

2º "Ma renov" programme of the region of Bordeaux, France. It has much in common with the Andalusian programmes mentioned in the Introduction ("Plan Andaluz de Vivienda y Rehabilitación 2016-2020" [2] and "Andalucía es más" [3]) though the scope of these two is broader than "Ma

Renov”s: they include not only private owners, but also the public sector and companies and apply to any type of building and use, as well as to specific actions for intelligent networks. However, some operations included in” Ma renov” (as in DUMO) which have not been taken into account in the aforementioned Andalusian programmes, are of great interest to be considered for the future development of schemes under the OT4, because they guarantee the quality of the results. These operations are:

- Self-diagnosis of energy consumption by means of an on-line tool.
- The elaboration of a comprehensive energy rehabilitation plan for each case.

3º Task59 experience of the International Energy Agency, Solar Heating and Cooling Programme (SHC) on "**Renovating Historic Buildings towards Zero Energy**".

It was presented by Daniel Herrera, from the EURAC Research Renewable Energy Institute. He explained the need of clearly define what a "Good Practice Experience" is, when it comes to energy rehabilitation of heritage buildings. According to the International Energy Agency, the characteristics of a Good Practice Experience are five:

1. Renovation of an entire building, not just a small part.
2. Significant reduction of energy demand to the lowest possible level, which will depend on each particular case.
3. The solution adopted has considered the impact on the patrimonial values of the building, which has been previously evaluated.
4. The project has already been executed, as the problems only come to the fore then.
5. There are data on the technical solutions adopted and data from monitoring.

Task59 shows, compared to DUMO and “Ma renov”, the most appropriate integral approach to the issue, since the impact on the heritage values has been also taken into account. It sets a positive example in the incorporation of criteria to distinguish among all the possible projects, those with a higher potential to be a future “best practice”.

Apart from these three experiences, the Financial Incentives for The Rehabilitation of Historic Buildings in Cyprus, active since 1998 and presented at the same meeting, also have similarities with the tax credits that many Andalusian municipalities grant for the rehabilitation of their catalogued historic buildings. Like the Cyprus programme, no specific incentives for energy retrofit actions have generally been incorporated, but they are not explicitly excluded either. Just recently, city councils such as that of

Seville, have implemented tax incentives for the implementation of solar energy facilities in the city, without distinguishing whether they are heritage buildings or not. Although the experience gained from this Cyprus' practice can be transferable to improve the municipal incentives in Andalusia, due to its lack of attention to the energy efficiency issue, it is not as adaptable to this Action Plan objectives.

At the interregional meeting held in **Bordeaux on 30 and 31 October 2019**, the French partner made known the **CREBA Project** (<http://www.rehabilitation-bati-ancien.fr/fr/>), that was presented by Jacky Cruchon (www.sites-cities.fr). This is an initiative in which 12 public and private partners participated, including associations of specialised architects (www.effinergie.org), the French "Agence Qualité Construction" and the LRA, "Laboratoire de recherche en architecture" of the "Ecole Nationale Supérieure d'Architecture" of Toulouse (<http://lra.toulouse.archi.fr/lra>). In the framework of this project, more than 70 projects for the rehabilitation of historic buildings have been carried out under the supervision of the Quality Construction Agency. By 2020 they have secured private funding for 20 more projects. CREBA has produced a large amount of technical documentation, which is intended to serve as a guide for professionals and researchers, and an own certification label called "Effinergie Heritage". The representative of Effinergie, the architect André Pouget, also present at the meeting, stressed the need for experimentation and for analysing each case particularly in order to create the certification label. In the experimental phase that *Effinergie* carried out by studying case studies from two French regions, architects, experts in energy efficiency, certifying bodies and bodies dependent on the Ministry of Culture took part.

In addition, CREBA has adapted "The Responsible Retrofit Guidance Wheel" (<http://responsible-retrofit.org/wheel/>) developed by the STBA (Sustainable Traditional Building Alliance, <http://stbauk.org/>) to its territory and particularities, based on the results of all the case studies analysed. This interactive guide is available at: <http://www.rehabilitation-bati-ancien.fr/fr/outils/guidance-wheel>. It is of great educational and formative use and cannot be used to apply for licences or permits. It is currently being used to great advantage by professionals.

CREBA's success consists of being a case of scientifically planned and guided experimentation and a good example of multidisciplinary team organization. Its results are very valuable because of the breadth of the sample analysed and the rigour with which the studies have been carried out. One of its successes consists of having relied on the work already carried out by English organisations such as the aforementioned STBA and by SPAB ("Society for the Protection of Ancient Buildings", <https://www.spab.org>), that have managed to influence national policies such as the "Green Deal", successfully demonstrating that there is no single energy efficiency solution for all buildings and achieving, thanks to rigorous analysis, firstly, identifying the "knowledge gaps" and secondly, filling them, enabling the design of the "STBA's Guidance Tool" (<http://www.responsible-retrofit.org/wheel/>) that has been transferred by CREBA to France.

In parallel with all these experiences, between 2017 and 2019 some advances were carried out, thanks to the stimuli provided by VIOLET, regarding the experimental introduction of changes at the contract phase of architectural projects of PREPIA. These management improvements, described at Section 4 of the Introduction of this AP, served us to conclude that these kind of management changes are positive but not sufficient in order to safely carrying out the energy retrofit of a heritage building. DUMO, Task 59 and CREBA experiences were decisive to starting to know the technical barriers that hinder the improvement of this type of projects. It explains why a specific Action 2 is dedicated to improve their planning, management, execution and evaluation.

The **summary** of what has been learned from all these experiences is:

- The energy retrofit of heritage buildings is a complex matter which needs of a scientific approach. The improvement of the project management needs of the R+D+I sector to be involved from the beginning.
- It is necessary to incorporate the "learning by doing" method into the rehabilitation process. This requires the collaboration of the R+D+I sector and the public administration.
- It is necessary to base actions on previous audits, where possible. In many cases the buildings are abandoned and/or in ruins. In these cases, the application of the studies-results becomes more restricted.
- A common systematic procedure is needed to evaluate the energy performance of buildings before and after interventions. It must be implemented in all phases: initial planning, call for projects, evaluation of technical solutions and risks in the heritage assets, evaluation of projects, call for construction works, evaluation of results in the operational phase of the building. The monitoring of results in the post-intervention state must be done correctly and incorporate the impact on heritage values and Life Cycle Analysis.
- Despite the comprehensive nature and the appropriate approach of DUMO experience, the lack of a procedure to evaluate the risks on the conservation and the impact of the energy retrofit actions on the heritage assets of the buildings is remarkable. A more integral approach, including non-technical aspects such as the qualitative evaluations involved in the transformation of the heritage buildings, should also be provided, as Task 59 does. In this sense, using a common framework as the international recommendation EN-16883 has been judged essential, since it contains the most complete set of evaluation criteria, including technical and non-technical aspects, such as the above mentioned impact on the heritage significance and other user-behaviour related parameters.

How will you adapt the described GPs / Lesson learnt to your territory?

The design of Action 2 took form after Middelburg meeting in May 2019, though it was definitively adjusted to VIOLET framework after Bordeaux meeting in October 2019. Our Action 2 adopts some methodological aspects contained in the DUMO, CREBA and Task 59 experiences, such as:

- Their ambitious scope: the size of the building stock which would be energy-audited with the funds of sub-action 1.2 will allow to compare results and draw useful conclusions. The design of a public procurement for contracting a regional-scale diagnostic study (sub-action 2.1.2.) is the first step included in this AP, to develop a data base of future “reference buildings” as those of DUMO and CREBA.
- Their scientific methodology: it is intended that the R+D+I sector participate in the analysis and audits of Action 2.
- Their transversal vocation: multi-sectorial agents working in heritage building sustainability will participate in the diagnosis works of Action 2.
- The importance of proper planning of the regional-level-diagnostic study, transferred to Sub action 2.1.2.
- The importance of a correctly elaborated inventory. This has been translated to Sub-action 2.3.

The idea of **Sub-action 2.1.** is that the economic resources, made available thanks to the strategic Action 1, need of a methodological change in order to ensure its efficient use. In this respect, the methodological approach of the above mentioned other region’s experiences, known thanks to VIOLET, has been a determining factor in the impetus given to Action 2. In these experiences projects prove to be cases of fruitful multi-sectoral cooperation between R+D+I, companies and public administration. The funds of made available thanks to Action 1 will be dedicated to give raise to a collection of energy analysis of a set of historic buildings of the PREPIA. This is going to be done in two steps: (1) carrying out preliminary analysis on a set of case-studies (at least three) achievable within the VIOLET timeframe, which constitutes the sub-action 2.1.1., and (2) designing of a public procurement for contracting a regional-scale diagnostic study, inspired by DUMO and CREBA experiences and based on the systematic procedure proposed at the new EN16883, which constitutes Sub-action 2.1.2. The development of the diagnosis study itself stands outside the time frame of VIOLET. Summarizing, sub-action 2.1. will be dedicated to contribute to solve the lack of case-studies under a solid methodologic approach, contributing to solve the management barriers.

Sub-action 2.2. aims to disseminate these activities among technical public staff involved in the management of this type of projects and among the building’s users. VIOLET material and outputs will be used in order to raise awareness and disseminate good practices.

Sub-action 2.3. is a complementary action that has been made possible thanks to the exchange of ideas promoted by VIOLET. Its convenience has been also inspired by extensive studies as

DUMO, CREBA and Task 59, since including information on the energy facilities of the buildings inventoried by CFIOT and the Seville City Council will greatly simplify the establishment of spending priorities for future projects and analysis.

Players involved

P2. The Andalusian Agency for Housing and Rehabilitation (AVRA)

VIOLET partner. It has large experience in Energy Retrofit Programmes and European Funding.

Role 1: Monitoring and control of Action 2

P3. Regional Ministry of Public Works, Infrastructures and Territorial Planning (CFIOT). General Secretary of Housing. Architecture Service.

Role 1: to implement Action 2 of this AP, as it is in charge of the PRPHIA.

P4. Culture/Heritage Andalusian institutions (Andalusian Institute of Historical Heritage –IAPH- and the Regional Ministry of Culture and Heritage. Directorate General for Cultural Innovation and Museums. Cultural Infrastructures Service).

Role 1: to be part of the team in charge of the evaluation of Sub-action 2.1. results. One of its main contribution may lay in the impact assessment on the patrimonial significance of the buildings about which it does not yet exist methodological consensus.

Role 2: to participate in the sub-action 2.2. (dissemination and training activities).

Role 3: as part of the administrative body of Andalusia, they could potentially be interested in adopting some of the technical specifications of the public procurement of sub-action 2.1.1. into their projects.

P5. Andalusian Energy Agency (AAE) and Andalusian Energy Network (REDEJA).

Role 1: to be part of the team in charge of the evaluation of Sub-action 2.1.1. results.

Role 2: to participate in the sub-action 2.2. (dissemination and training activities).

P6. Sector R+D+I sector: universities and research centres.

Role 1: to develop the analysis, studies and audits of sub-action 2.1.1.

Role 2: to participate in the knowledge interchange, to advise and provide guidance throughout the implementation phase of Action 2.

Role 3: to disseminate the results and encourage training.

P7. Town Planning Department of the City Council of Seville.

It is in charge of the *Master Plan for the Conservation of the Immovable Heritage* of the City of Seville, in whose framework *the Inventory of Municipal Heritage Buildings of the Seville City Council* is being developed.

Role 1: to implement sub-action 2.3. of this AP, by including in their Inventory the new information field, jointly designed with that of the CFIOT.

Role 2: to be part of the team in charge of the evaluation of Sub-action 2.1.1 results.

Role 3: to participate in the sub-action 2.2. (dissemination and training activities).

Role 4: as part of the administrative body of Andalusia, they could potentially be interested in adopting some of the technical specifications of the public procurement of sub-action 2.1.1. into their projects.

P8. Management authorities of the buildings used as pilot cases in sub-action 2.1.1.

Role 1: as those responsible for the management and maintenance of buildings, they must collaborate in the process involved in Sub-action 2.1.1.

Role 2: to participate in the dissemination and training sessions of sub-action 2.2.

P9. Professional associations (architects, engineers, heritage conservationists, constructors, developers, etc...)

Role 1: Disseminate results, raise awareness on the issue and to participate in the dissemination and training sessions of sub-action 2.2.

Timeframe and Outcomes.

		TIMELINE			OUTPUTS
		Start date	Expected completion date	Monitoring	Tracking indicators
ACTION 2	2.1.	Testing of EN-16883 in a set of case-studies using funds from the PREPIA.			
		2.1.1. Delivery of at least 3 Energy Efficiency Analysis of heritage buildings of the PREPIA, based on EN 16883.			
		February 2020	June 2021	February 2020-June 2021	Number of historic buildings in which the EN16883 has been tested.
	2.2.	2.1.2. Design of a public procurement for contracting a regional-scale diagnostic study on the energy efficiency of buildings in of PREPIA based on EN-16883			
		January 2021	October 2021	January-October 2021	Development of the Document of Technical Specifications for the Public Procurement: Yes/No
		Dissemination and training on the activities carried out in the analysis of sub-action 2.1.1.			
	2.3.	March 2020	July 2020	March 2020-July 2020	Number of training sessions held.
		March 2021	July 2021	March 2021-July 2021	Number of people attending the sessions
	2.3.	February 2020	October 2021	February 2020-October 2021	Number of different public administrations represented among attendees.
		February 2020	October 2021	February 2020-October 2021	Number of information items added to the new field.

Costs and funding sources.

Sub-action 2.1. (Testing of EU recommendation EN-16883: Guidelines for improving the energy performance of historic buildings, in a set of case-studies using funds from the PREPIA): this action does not require the use of additional funds, as they will derive from the existing funds of PREPIA, enabled by the implementation of Sub-action 1.2 of this AP.

Sub-action 2.2. (Dissemination and training on the activities carried out in the analysis of sub-action 2.1.1.): this action will be financed with CFIOT's own funds.

Sub-action 2.3. (Introduction of an information field on energy efficiency parameters in two heritage buildings inventories that are currently being developed): this action does not involve expenditure.

[Risk and Contingency Plan.](#)

No significant risks have been identified for the development of Action 2.

ACTION 3

Title of action

To contribute to the improvement of the regional R+D+I policies to promote knowledge transfer in the field of the energy performance improvement of the historic buildings.

The aim of this action is to conclude agreements on the incorporation into the “*Order for the development of the PLAN VIVE EN ANDALUCÍA 2020-2030 which approves the regulatory bases for the granting of subsidies, on a competitive basis, to Andalusian Public Universities for the development of research projects in the areas of housing, rehabilitation and architecture*” which final approval is expected to be in April 2020, a new “priority area” dedicated to the “REHABILITATION OF BUILDINGS OF ARCHITECTONIC INTEREST AND HISTORIC URBAN ENSEMBLES WITH CRITERIA OF SUSTAINABILITY AND ENERGY EFFICIENCY WITHOUT DIMINISHING THEIR PATRIMONIAL SIGNIFICANCE”.

Background

This order is currently under preparation by CFIOT and is expected to be approved on the same date as the PLAN VIVE EN ANDALUCÍA 2020-2030 itself, around March or April 2020. The subsidies that it will provide come from CFIOT own funds.

This sub-action is also inspired by DUMO and CREBA experiences, enabled by the regional sharing of ideas provided by VIOLET and based on the interregional diagnosis carried out within the framework of the VIOLET project (see Sections 2 and 4 of this AP). It seeks to influence the order in preparation by including among its research projects *Priority Themes* a new one which may read as: “Rehabilitation of buildings of architectonic interest and historic urban ensembles with criteria of sustainability and energy efficiency without diminishing their patrimonial significance”.

It is foreseen that the proposed new theme give rise to research projects on the analysis and testing of new solutions capable of improving the level of energy efficiency and sustainability of public buildings of architectural interest, as promoted by the European Directive 2018/844 at its preliminary consideration 18 (“Research into, and the testing of, new solutions for improving the energy performance of historical buildings and sites should be encouraged, while also safeguarding and preserving cultural heritage”). It will contribute to solve the lack of knowledge and experience in the field mentioned in the Section 2. Diagnosis of this AP.

Players involved

P2. The Andalusian Agency for Housing and Rehabilitation (AVRA)

VIOLET partner. It has large experience in Energy Retrofit Programmes and European Funding.

Role 1: Monitoring and control of Action 3.

P3. Regional Ministry of Public Works, Infrastructures and Territorial Planning (CFIOT). General Secretary of Housing. Architecture Service.

Role 1: to incorporate the new proposed *Priority Theme* into the order and to manage its processing until its approval.

Role 2: to disseminate the results of the call for projects derived from the order and encourage training.

P6. Sector R+D+I sector: universities and research centres

Role 1: to participate in the call for projects.

Role 2: to disseminate the results and encourage training.

Timeframe and Outputs.

Start date: December 2019

Expected completion date: April 2020 (expected final approval of the order).

Monitoring: January-April 2020 (expected final approval of the order).

Tracking indicators. New Priority Theme included in the order: Yes/No

Costs and funding sources.

This action does not involve expenditure.

Risks and Contingency Plan

No significant risks have been identified for the development of Action 3.

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European Union
European Regional
Development Fund



Signature

Date: _____

Signature: _____

Stamp of the organisation (if available):



Agencia de Vivienda y Rehabilitación de Andalucía
**CONSEJERÍA DE FOMENTO, INFRAESTRUCTURAS
Y ORDENACIÓN DEL TERRITORIO**