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## INTERVIEW WITH ELENA GIGLIARELLI, THE INSTITUTE OF HERITAGE SCIENCES

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**Full Name**  
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**Position and organisation**  
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ITALY

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*“BEEP aims to create an efficient, transparent, and highly technological operational and procedural model at the service of public administrations, to facilitate and strengthen their skills to design and implement innovative energy and environmental improvement interventions for buildings of historical and architectural value, of whom they are owners or users”.*

*Elena Gigliarelli*

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**What is the main role of your organisation in the BEEP project?**

The Institute of Heritage Sciences (ISPC) of the National Research Council of Italy (CNR) is the coordinator of the BEEP project. Although our research background drives us to focus the attention on implementing our scientific tasks, we put the right attention on the ongoing management of administrative and financial issues.

So, during the BEEP project's lifetime, and in addition to the scientific activities that we have as the other partners, we performed a lot of mandatory responsibilities, such as monitor that the action is implemented properly, act as the intermediary for all communications between the consortium and the granting authority, distribute the payments received from the granting authority to the other beneficiaries without unjustified delay, etc.

In order to achieve the planned goals, the attention, cooperation and contribution of all involved partners was essential. In this sense we have been constantly active and keep an ongoing and open communication channel between all parties while closely monitoring the project's progress in order to ensure its smooth implementation.



Which pilot building has been chosen as a case study in Italy and why?



The Italian pilot building is Palazzo Maffei-Borghese a listed building the second half of the sixteenth century, located in the historic Renaissance center of Rome. It is owned by the State Property Agency and currently the seat of the State Advocacy. It is a classic example of a public building stock owned by one administration body but used by another and may well represent a wide range of historic public buildings to be renewed in Italy.

The involvement of two stakeholders is another important element for the Italian sector. The Legal Council of State, who currently uses the building, can be introduced to the benefits of a Building Information Modeling (BIM) based process from a regulatory point of view, which can foster a larger adoption of this approach.

As for the other stakeholder, the Italian State Property Office is the most active actor on BIM and energy efficiency intervention on public buildings, being the manager of the largest public-

owned building stock in Italy, and it is particularly interested in the ongoing development of the general process guideline by BEEP project, that will help the public administration going through an energy and environmental improvement intervention of a historical public building.



*Palazzo Maffei-Borghese:  
interior façade and courtyard*



*Palazzo Maffei-Borghese:  
external façades*



### What retrofitting scenarios are envisaged for the case study?

Three progressive scenarios have been proposed for the intervention on the building. The first (short term) foresees the most economical and rapid interventions to be carried out on some parts of the envelope that are currently underperforming and on the currently undersized systems, a revision of the user profiles of the systems thanks to the upgrade and a photovoltaic system on the roof.

The second intervention involves actions on a wider portion on the envelope (the external insulation on the vertical facades of one wing of the building and the improvement of the current flat roofs), capable of guaranteeing a significant improvement in the passive energy performance of the building with consequent positive effects on the systems, and the implementation of a Building Automation And Control System capable of making the building more responsive to the random use of part of its premises.

The third intervention adds to the first two the creation of a photovoltaic bioclimatic buffer space in the internal cloister of the building, capable of improving the passive behaviour of the main block in the winter and summer seasons and of providing extra surface area to produce renewable energy from photovoltaics.



### What opportunities does the BEEP project offer to your region?

The BEEP Project is an opportunity for the Lazio Region to improve its regional policies on the energy improvement of the building stock, with the development of guidelines, standards and new professional figures and the dissemination of financing tools, such as the Energy Performance Contracts for energy improvement interventions in historical buildings.

### What results of the BEEP project would you highlight?

The main objective of BEEP that I want to underline is to create an efficient, transparent, and highly technological operational and procedural model at the service of public administrations, to facilitate and strengthen their skills to design and implement innovative energy and environmental improvement interventions for buildings of historical and architectural value, of whom they are owners or users.



The process involves the use of multidisciplinary Information Communication Technology (ICT) tools integrated into a BIM and performance-based-design (EE-HBIM) approach, while the mechanism for economic support was envisaged through the use of Energy Performance Contracting (EPC), a tool based on the energy savings obtained by the redeveloped buildings, able to involve and attract private financing.

The interventions carried out aimed at reducing energy consumption but also at enhancing users' comfort; they will also serve to preserve them in the future as well as insert them into a virtuous process of ecological transition; especially as our monuments convey values and are important points of reference for the users and the communities that interact with them. The procedure developed was validated in nine Mediterranean case studies and explained with examples and comparisons, in a recently published [Guideline](#).

**How will your organisation exploit the results of BEEP after the end of the project?**

We are planning a series of events, including an international conference, to give maximum dissemination to the project, as well as the publication of the main results in our dissemination channels.

## THE TEAM

**Institute of Heritage Sciences, ISPC of CNR National Research Council**

The [Institute of Heritage Sciences \(ISPC\)](#) is an interdisciplinary institute whose mission is to pursue scientific excellence and encourage innovation in the understanding, conservation, and enhancement of Cultural Heritage through collaborative research involving the humanities, experimental sciences, and technological applications. With over 180 researchers, technologists, and technicians from various disciplines, ISPC is the CNR hub for research, innovation, training, and technology transfer of the Cultural Heritage strategic area, open to collaboration in national and international networks of expertise.



*The ISPC building, Rome Research Area*



The Built Heritage Innovation Lab (coordinated by Elena Gigliarelli) is an interdisciplinary laboratory of the ISPC, open to researchers with different backgrounds, who exert their theoretical and applied skills to improve the knowledge and conservation of built heritage, by innovating analysis and intervention procedures through ICT methodologies' integration.



*The Built Heritage Innovation Lab team*

The lines of research concerns: the development and application of methodologies for survey and analysis of the architectural, structural and functional characteristics of buildings, the management of diagnostic, geometric, structural, Mechanical, electrical and plumbing (MEP), functional, energy-environmental information and general conservation state of built heritage, with the support of ICT platforms (including HBIM to Internet of Things "IoT" workflows); the analysis and energy-environmental improvement of historical buildings and their technological adaptation; the development of new applications and strategies for museum spaces' design and for the conservation, adaptation and fruition of archaeological sites.



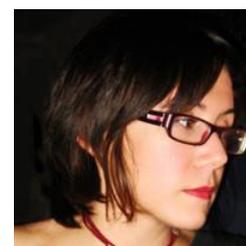
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## COLOPHON

### About the BEEP project:

BEEP project aims at strengthening the use of Building Information Modelling (BIM) to enhance energy efficiency in buildings. The testing of this emerging technology on built heritage will be performed to demonstrate its scalability to the entire building stock. The project will provide public administrations with a powerful method for the energy rehabilitation of public buildings to be supported with private funds through the Energy Performance Contracting (EPC). The project main outcome will be an innovative methodology based on the integration of emerging technologies tested on 9 heritage public buildings located in Italy, Spain, Cyprus, Jordan, Palestine, Lebanon, and Egypt.

The BEEP project, which started in September 2019, has a duration of three years, and counts with a total budget of € 1,934,184.51 of which 90% is funded by the EU under the ENI CBC Med Programme.

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