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Methodological approach for recovery and energetic requalification of historical buildings

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Among Renewable Energy Sources (RES) defined in European Directive 2009/28/CE, as coming from renewable non-fossil sources„ are included hydrothermal energy –referring to surface water –and oceanic energy. The extension of this definition to energy contained in seas should be taken into account: in specific boundary conditions, sea hydrothermal energy, mainly deriving from solar radiation, is a valuable resource for possible exploitation, occurring through heat pumps that withdraw heat from the sea transferring it to the cold sink, a heat transfer fluid.

A possible application in the city of Trieste refers to exploit this energy source to serve buildings characterized by high historical and architectural values. The plant provided for this goal consists of three main parts: an open-loop system that picks up seawater through main heat exchanger and then restores it to sea; a closed-loop ring in which a heat transfer fluid brings sea-recovered energy to final users'derivations; installations inside buildings, consisting in water-to-water heat pumps in order to meet the energy needs of those buildings.

Particular attention has to be paid to the positioning of heat pumps in historical buildings: complying rules on safety during operation, there should be considered settings for exclusive use, suitably located and partitioned form remaining part of the asset. Similar importance is due to replacements and integration of technical distribution facilities in historical buildings. The proposed system must then interface with architectural features, distribution network and plant of each building. Intervention design, therefore, must firstly identify technical elements contemporary with the construction of the building, distinguishing them from those, following, of lesser value. Based on this analysis, identifies the most suitable positions for insertion of new distribution network, realized by minimizing the invasiveness of operations in accordance with the operating principles of the restoration.

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Figure 1: C.A. STIVAL

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