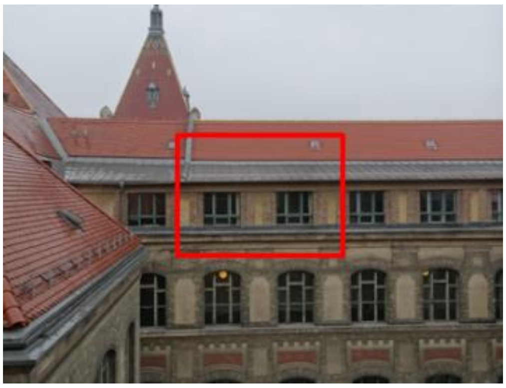
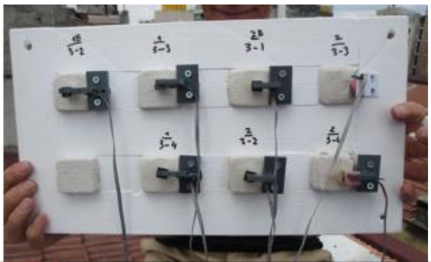
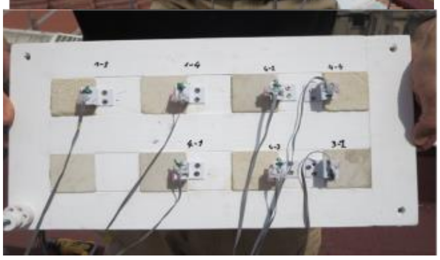
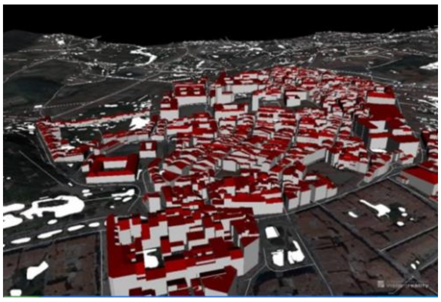
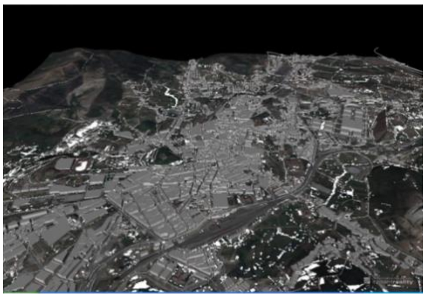
GENERAL INFORMATION OF THE CASE STUDY	
Country	United Kingdom
City	Glasgow
District	Yoker
Climate	Temperate oceanic (Cfb)
Type of building	Four storey tenement building, traditional stone masonry (sandstone bedded in lime mortar), plasterboard interior finishes from a 1980s refurbishment
Year of Construction	1910-1920
Use of building	Residential
Classification	Traditional building, not listed and not in a conservation area
Type of intervention	Building refurbishment: retrospective installation of an aerogel fibre insulation product, manufactured from a polyester fibre mesh impregnated with silica aerogel as insulant
Suitability of intervention	In historic buildings, the application of external wall insulation is often inappropriate, as it can impact adversely on the exterior character of the building. Insulating internally is often also problematic, as this can impact on interior character and can reduce the usable space. The product developed, a loosefill material, is to be blown into existing cavities behind internal wall finishes. Using commercial blowing machines, this retrofit approach avoids any changes to the interior or exterior appearance of the walls. The applicability of the product is suitable for buildings with plaster-on-laths wall finishes, as these leave air cavities which can be filled by blowing in an insulant. The same application technique can be used to fill cavities behind plasterboard drylining, often used in 20th century renovations. The installation process only requires a few holes and is thereby fast and cost effective and only causes minimal disruption to building fabric and occupants.
Scope of intervention	To demonstrate practicality of the installation under real-world conditions; to monitor the insulation's hygrothermal performance; and to test the product's reversibility
Installation requirements	It is recommended to blow the material with strong ventilation or vacuum cleaner, due to the dust produced during the installation.
Monitoring	Over a period of 10 months, heat flow, relative humidity and temperatures are being measures externally, internally and interstitially in two rooms. In one room, the insulation was installed into the internal cavities at window breasts. The other room is monitored to allow comparative assessment.
Pictures	 

GENERAL INFORMATION OF THE CASE STUDY	
Country	Hungary
City	Budapest
District	Lágymányos (11. district)
Climate	Continental (Dfb) with warm summers
Type of building	The case study is one classroom in in the main building of the Budapest University of Technology and Economics located on the riverbank of Danube. The demonstration area is a 60m^2 classroom situated on the 3rd floor facing to the West with traditional double sash windows; the classroom alongside is being used as reference.
Year of Construction	1883 (1909)
Use of building	Educational
Classification	Traditional building, listed
Type of intervention	Building refurbishment: windows upgrading and integration of optimized intelligent indoor climate solutions
Suitability of intervention	The intervention consisted in the replacement of two traditional double sash windows together with new ventilation valves on the frames, the installation of new blinds between the glass panels and the installation of an exhaust fan in order to improve the ventilation of the classroom. Intelligent Indoor Climate Solutions were also installed, with the aim of controlling lighting according to occupancy and incoming daylight through luminance and presence sensors, blinds and illumination; operating ventilation through CO2 sensors and controlling heating. Furthermore opening sensors were also mounted on doors and windows lighting, heating and blinds movement control.
Scope of intervention	To evaluate the performances of the developed windows and the impact of the intelligent management of lighting and heating through energy consumption differences in the demo and reference rooms.
Installation requirements	In order to install intelligent indoor climate solutions, the building should be equipped with a BMS (Building Management System)
Monitoring	The monitoring system installed at Budapest has been developed to specifically measure the performance of the newly developed windows. The monitoring of the indoor comfort parameters (air temperature, relative humidity, lux and CO_2) and the electrical/thermal energy consumption has been integrated in the Building Management System
Pictures	 

GENERAL INFORMATION OF THE CASE STUDY	
Country	Turkey
City	Istanbul
District	Beyoğlu, Kallavi Street
Climate	Temperate Mediterranean (Csb)
Type of building	Traditional stone masonry. Five storey building has large window openings with thick walls
Year of Construction	Before 1930
Use of building	Public building
Classification	Traditional building, not listed.
Type of intervention	Building refurbishment: radiant reflective coating for outdoor application
Suitability of intervention	The intervention consisted in the application of two radiation selective coatings on different substrates placed on the roof of the building. The coatings were not applied directly on the facade of the building as its removal, on such a porous stone, cannot be guaranteed and the energetic improvements can be reduced by the very thick walls of the building. Eight lime mortar samples, eight Istanbul stone and five metal plates were mounted and sensors installed in each of them.
Scope of intervention	To evaluate the applicability of the product on historic buildings materials in real environmental conditions and to evaluate the energetic performances of the coating.
Installation requirements	The complete reversibility of the coating can be guaranteed only on some substrates, depending on its porosity and roughness. The coating has better performance if applied on large opaque surface
Monitoring	The monitoring system will evaluate the performance of the coating by measuring ait temperature, relative humidity and contact temperature.
Pictures	  

GENERAL INFORMATION OF THE CASE STUDY	
Country	Germany
City	Benediktbeuern
District	Benediktbeuern
Climate	Continental climate (Dfb) with cold winters and warm summers
Type of building	Benediktbeuern Monastery is one of the oldest in upper Bavaria, its roots going back to 8th century AD. The “Alte Schäfflerei” of the monastery, as the building under investigation is called, belongs to the former craftsmen court of the monastery. The two storey building with massive stone walls owns a baroque roof with a special hanging column construction in the first floor, which yields a column free ground floor area.
Year of Construction	1758/1759
Use of building	Monastery
Classification	Listed
Type of intervention	Building refurbishment: insulating mortar for indoor and outdoor application
Suitability of intervention	The selection of the building was made according to specific requirements, such as substrate, poor level of insulation, orientation and insulated windows, in order to better evaluate the performances of the mortar. The application of the product was possible only of the complete removal of the product is guaranteed and the original situation of the building is restored after the demonstration period. Prior to the mortar application, a substrate protector was used. The product is suitable both for indoor and outdoor application and is compatible with a wide range of historic buildings typologies, mainly characterised by porous substrates, as stone and brick.
Scope of intervention	To evaluate the applicability, workability and reversibility of the product in real conditions and to measure the energetic improvements.
Installation requirements	The mortar can be applied in a conventional way. To have a good adhesion existing plaster should be removed or treated with commercial products. If the wall is not flat, the mortar should be applied in two cycles.
Monitoring	Energy consumption and environmental conditions will be compared before and after the intervention. The monitoring system comprises air and surface temperature, humidity sensors, heat flux and radiation.
Pictures	 

GENERAL INFORMATION OF THE CASE STUDY	
Country	Spain
City	Santiago de Compostela
District	Rúa Nova (RN) - Rúa do Vilar (RdV)
Climate	Temperate oceanic (Cfb) with dry, warm summers
Type of district	The district is located in the medieval urban area of the Old Town of Santiago de Compostela. The urban scenario changed from medievalism (narrow unpaved streets, dark wooden houses with overhangs and lack of public places) to baroque (from 1650 to 1750 there was a deep renovation of the existing buildings and the construction of big houses for the nobility elite). The old town consists of many narrow winding streets lined by historic buildings in the surrounding of the cathedral. The historic centre has not merged with the newer parts, so the basic structure of the centre is still clearly recognizable and surrounded by large green areas. It remains the administrative, political, social and cultural centre of the city.
Classification	Listed. UNESCO World Heritage Site
Type of intervention	Urban analysis: implementation of the H-GIS, the multiscale data model, the categorization tool and validation of the DSS in the Level of Decision Making (LoDM) II.
Suitability of intervention	The city of Santiago had already a rich database regarding the buildings of the historic district in a GIS therefore it was possible to develop the multiscale data model without fieldwork and the implementation of the DSS in LoDM II.
Scope of intervention	To evaluate the applicability of the multiscale data model, the H-GIS, the categorization tool, and the DSS in LoDM II. Energy use as well as energy production has always a geographic correspondence. Energy production facilities can be located geographically and energy demands can be assigned to an area. The planning and optimisation of transportation lines and grids is very close to the original core tasks of GIS in mapping and cartography.
Information requirements	The EFFESUS decision making methodology has been designed in order to answer to different levels of availability of information, without the need of field work, taking advantage of the existing information infrastructure. In Santiago a high-medium level of information scenario was intended to study: with the information available it is going to be possible to develop the multiscale data model in a high medium level of completion and therefore to validate the categorization tool and the DSS in LoDM II.
Monitoring	To test new control strategies to decrease the energy demand, the building selected is the museum Casa do Cabildo situated in the historic district. In particular the demonstration will focus on Comparison of the thermal and economic benefits of the building under the control strategy and of the thermal and economic benefits of the building under the control strategy against one based on electrical price variations, decreasing the electrical costs but keeping the internal comfort.
Pictures	 

GENERAL INFORMATION OF THE CASE STUDY	
Country	Sweden
City	Visby
District	The historic city of Visby which is within the medieval city wall
Climate	Continental (Dfb)
Type of district	Visby, located on the island of Gotland, is an example of a north European medieval walled trading town which preserves a townscape and assemblage of high-quality ancient buildings that illustrate graphically the form and function of this type of significant human settlement. Even though the character of the town is medieval, there is a wide range of historic buildings representing various time periods and construction types. Visby is representative of many European historic city centers where the building constructions and conservation aspects set a limit to energy performance. Tourism is important and thus preserving buildings and townscape is an essential factor for a sustainable management of the city and its built heritage.
Classification	Listed as a UNESCO World Heritage site
Type of intervention	Urban analysis: validation of the structured categorization method, implementation of the multiscale data model, validation of the Transferable Models, categorization tool and the DSS (LoDM II)
Suitability of intervention	The city of Visby had already an inventory regarding the buildings of the historic district. It was possible to develop the multiscale data model in a medium level of completion and therefore to validate the DSS in LoDM II.
Scope of intervention	To evaluate the applicability of the categorization method and tool and the Transferable Models method, along with the multiscale data model and the DSS in the Level of Decision Making (LoDM) II.
Information requirements	In Visby a medium level of information scenario was intended to study: with the information available is going to be possible to validate the categorization method and tool and develop the multiscale data model in a medium level of completion and therefore to validate the LoDM II.
Pictures	

GENERAL INFORMATION OF THE CASE STUDY	
Country	Italy
City	Genoa
District	Via Garibaldi
Climate	Warm Mediterranean climate (Csa) with dry summers
Type of district	The historical district of “Via Garibaldi” is located in the town centre of Genoa (Italy) and is one of the earliest existing urban development planning examples carried out in just one hundred years. Once called Strada Nuova and Via Aurea (Golden Street) on account of its splendid showpiece buildings, this street is one of the most impressive examples of 16th century European urban residential planning, symbolising Genoa’s economic and financial power in the 16th and 17th centuries. Since 2006 it has been included in the list of UNESCO World Heritage Sites. The district includes municipal museums – Palazzo Rosso & Palazzo Bianco -, the Municipality in Palazzo Tursi, art galleries, clubs, residences, offices, trades, restaurants and cafes.
Classification	Listed. UNESCO World Heritage Site
Type of intervention	Urban analysis:, validation of the Transferable Models and validation of the DSS (LoDM I)
Suitability of intervention	The study of the existing data infrastructure in Genoa gave as result the low level of available information. That is the reason why it was selected as scenario for the validation of the DSS in LoDM I.
Scope of intervention	To evaluate the applicability of the DSS when a multiscale data model is not available using the Transferable Models (LoDM I)
Information requirements	In Genoa a low level of information scenario was intended to study: with the information available it is going to be possible to validate the DSS in LoDM I
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