

# SUNSHINE

Annex to deliverable D2.1

## Data Model for EnergyMap Data Collection

Revision: v1.0

## REVISION HISTORY AND STATEMENT OF ORIGINALITY

Revision	Date	Author	Description
v1.0	5 <sup>th</sup> August 2014	Piergiorgio Cipriano, Luca Giovannini	Document created.

### Statement of originality:

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# 1 Introduction

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This document is one of the internal deliverable of the Sunshine project, related to Work Package 2, Task 2.1.

The data model are based on the INSPIRE "Buildings" Implementing Rules, as defined in the COMMISSION REGULATION (EU) No 1253/2013, of 21 October 2013, amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services [1] and the corresponding Technical Guidelines [2].

[1] <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:331:0001:0267:EN:PDF>

[2] [http://inspire.jrc.ec.europa.eu/documents/Data\\_Specifications/INSPIRE\\_DataSpecification\\_BU\\_v3.0.pdf](http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_BU_v3.0.pdf)

## 1.1 What data to collect?

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The following chapters describe in full the model for sunshine building data collection. This section instead just aims at summarizing what are the attributes that have mandatorily to be filled as necessary to the fulfilment of the scenario 1 aims.

**1. Mandatory Spatial data** are the 2D shape footprints of the buildings. No polygons for sub-units or other building subdivisions shall be given, every building shall be considered as a single element and its footprint provided.

**2. Mandatory attributes** (using DBF attribute name):

- CLASSID: Unique building ID
- BEGIN, END: Construction period
- HEIGHT\_VAL: Height (of building as a single element).
- ELEV\_VALUE: Building elevation (from DTM or other sources)
- S\_USE: Building main use (residential or other)

**3. Energy performance validation attributes**

This is the data coming from either energy certifications of real consumption data. In both cases data shall be aggregated at the building level. If both data sources are available, data from certification should be used. If only real consumption data is available, and data for more than a year is available, then data from the most recent year should be used.

The availability of these validation data is mandatory, but it is not mandatory to have data for all the buildings in the pilot area. This is why the corresponding DBF attribute (PERF\_VALUE) is optional.

#### 4. Optional attributes

All the other attributes in the model. Optional attributes such as the following greatly increase the accuracy of the Energy Map estimation:

- NATURE: Building nature
- BDG\_UNITS: Number of building units
- FLOORS: Number of floors above ground
- REFURBISHM: Refurbishment level
- AVE\_FLOOR\_H: Average floor height

## 2 Sunshine building data model

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This group is a logical set of CLASSs, attributes, dataTypes and enumerations to be considered for data collection related to "Buildings" in the Sunshine project.

This group is structured into 2 sub-groups:

- Building base: contains the data models needed for the scenario 1 of Sunshine project;
- Building extended: extends the previous with additional, conditional elements.

The two options are alternative to each other.

### 2.1 GROUP: Buildings and building units (base) BU\_base

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The following statements are included in the INSPIRE Implementing Rules document (Commission Regulation 1253/2013) available at:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:331:0001:0267:EN:PDF>

In addition to the definitions set out in Article 2, the following definitions shall apply:

- (1) "2D data" means data where the geometry of spatial objects is represented in two-dimensional space.
- (2) "2.5D data" means data where the geometry of spatial objects is represented in three-dimensional space with the constraint that, for each (X,Y) position, there is only one Z.
- (3) "3D data" means data where the geometry of spatial objects is represented in three-dimensional space.
- (4) "building component" means any sub-division or element of a building

**CLASS <<ABSTRACT>>: *Abstractconstruction (AbstractConstruction)***

**SUPERCLASS *Disjoint complete DI [ ABSTRACTBUILDING ]***

Abstract spatial object type grouping the semantic properties of buildings, building parts.

*Attributes*

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<i>Attributes of CLASS</i>			
<b>name</b>	<b>NAME</b>	<b>name [0..1]</b>	<b>String(40)</b>
<b>dateOfConstruction</b>	<b>DATEOFCONSTRUCTION</b>	<b>dateofconstruction</b>	<b>Dateofevent (DataType)</b>
	Date of construction.		
<b>heightAboveGround_value</b>	<b>HEIGHT_VAL</b>	<b>heightaboveground_value</b>	<b>Real</b>
	Value of the height above ground.		
<b>heightaboveground_status</b>	<b>HEIGHT_STA</b>	<b>heightaboveground_status [0..1]</b>	<b>Enum (Heightstatusvalue)</b>
	The way the height has been captured		
<b>elevationValue</b>	<b>ELEV_VALUE</b>	<b>elevationvalue</b>	<b>Integer</b>
	Value of the elevation, in meters.		
<b>elevationReference</b>	<b>ELEV_REF</b>	<b>elevationreference [0..1]</b>	<b>Enum (Elevationreference)</b>
	Element where the elevation was measured.		

**CLASS <<ABSTRACT>>: Abstractbuilding (ABSTRACTBUILDING - AbstractBuilding)**

**SUBCLASS DI : Abstractconstruction**

**SUPERCLASS Disjoint complete DI [ BUILDING\_B ]**

Abstract spatial object type grouping the common semantic properties of the spatial object types Building and BuildingPart. This type is a sub-type of AbstractConstruction.

<i>Attributes</i>			
<i>Attributes of CLASS</i>			
<b>buildingNature</b>	<b>NATURE</b>	<b>buildingnature [0..1]</b>	<b>Enum (Buildingnaturevalue)</b>
Characteristic of the building that makes it generally of interest for mappings applications. The characteristic may be related to the physical aspect and/or to the function of the building.			
<b>multipleuse</b>	<b>M_USE</b>	<b>multipleuse [0..*]</b>	<b>Currentuse (DataType)</b>
Activities hosted within the building. This attribute addresses mainly the buildings hosting human activities			
<b>numberOfBuildingUnits</b>	<b>BDG_UNITS</b>	<b>numberofbuildingunits [0..1]</b>	<b>Integer</b>
Number of building units in the building. A BuildingUnit is a subdivision of Building with its own lockable access from the outside or from a common area (i.e. not from another BuildingUnit), which is atomic, functionally independent, and may be separately sold, rented out, inherited, etc.			
<b>numberOfFloorsAboveGround</b>	<b>FLOORS</b>	<b>numberoffloorsaboveground [0..1]</b>	<b>Integer</b>
Number of floors above ground.			
<b>singleuse</b>	<b>S_USE</b>	<b>singleuse</b>	<b>Enum (Currentusevalue)</b>
Main (or single) activity hosted within the building.			

	This attribute is alternative to "multipleUse" attribute (having cardinality 0..*) defined by INSPIRE		
<b>name</b>	<b>NAME</b>	<b>name [0..1]</b>	<b>String(40)</b>
<b>dateOfConstruction</b>	<b>DATEOFCONSTRUCTION</b>	<b>dateofconstruction</b>	<b>Dateofevent (DataType)</b>
	Date of construction.		
<b>heightAboveGround_value</b>	<b>HEIGHT_VAL</b>	<b>heightaboveground_value</b>	<b>Real</b>
	Value of the height above ground.		
<b>heightaboveground_status</b>	<b>HEIGHT_STATUS</b>	<b>heightaboveground_status [0..1]</b>	<b>Enum (Heightstatusvalue)</b>
	The way the height has been captured		
<b>heightaboveground</b>	<b>HEIGHTABOVEGROUND</b>	<b>heightaboveground</b>	<b>Integer</b>
	Vertical distance between a low and a high reference		
<b>elevationValue</b>	<b>ELEV_VALUE</b>	<b>elevationvalue</b>	<b>Integer</b>
	Value of the elevation, in meters.		
<b>elevationReference</b>	<b>ELEV_REF</b>	<b>elevationreference [0..1]</b>	<b>Enum (Elevationreference)</b>
	Element where the elevation was measured.		

**CLASS: Building base (BUILDING\_B - BuildingBase)**

**SUBCLASS DI: ABSTRACTBUILDING**

A Building is an enclosed construction above and/or underground, used or intended for the shelter of humans, animals or things or for the production of economic goods.

A building refers to any structure permanently constructed or erected on its site.

This type is a sub-type of AbstractBuilding.

<i>Attributes</i>			
<i>Attributes of CLASS</i>			
<b>refurbishmentLevel</b>	<b>REFURBISHM</b>	<b>refurbishmentlevel [0..1]</b>	<b>Enum (Refurbishmentlevel)</b>
<b>averagefloorheight</b>	<b>AVE_FLOOR_H</b>	<b>averagefloorheight [0..1]</b>	<b>Real</b>
Average value of height of floors, in meters.			
<b>buildingNature</b>	<b>NATURE</b>	<b>buildingnature [0..1]</b>	<b>Enum (Buildingnaturevalue)</b>
Characteristic of the building that makes it generally of interest for mappings applications. The characteristic may be related to the physical aspect and/or to the function of the building.			
<b>multipleuse</b>	<b>M_USE</b>	<b>multipleuse [0..*]</b>	<b>Currentuse (DataType)</b>
Activities hosted within the building. This attribute addresses mainly the buildings hosting human activities			
<b>numberOfBuildingUnits</b>	<b>BDG_UNITS</b>	<b>numberofbuildingunits [0..1]</b>	<b>Integer</b>
Number of building units in the building. A BuildingUnit is a subdivision of Building with its own lockable access from the outside or from a common area (i.e. not from another BuildingUnit), which is atomic, functionally independent, and may be separately sold, rented out, inherited, etc.			

<b>numberOffFloorsAboveGround</b>	<b>FLOORS</b>	<b>numeroffloorsaboveground [0..1]</b>	<b>Integer</b>
	Number of floors above ground.		
<b>singleuse</b>	<b>S_USE</b>	<b>singleuse</b>	<b>Enum (Currentusevalue)</b>
	Main (or single) activity hosted within the building. This attribute is alternative to "multipleUse" attribute (having cardinality 0..*) defined by INSPIRE		
<b>name</b>	<b>NAME</b>	<b>name [0..1]</b>	<b>String(40)</b>
<b>dateOfConstruction</b>	<b>DATEOFCONSTRUCTION</b>	<b>dateofconstruction</b>	<b>Dateofevent (DataType)</b>
	Date of construction.		
<b>heightAboveGround_value</b>	<b>HEIGHT_VAL</b>	<b>heightaboveground_value</b>	<b>Real</b>
	Value of the height above ground.		
<b>heightaboveground_status</b>	<b>HEIGHT_STATUS</b>	<b>heightaboveground_status [0..1]</b>	<b>Enum (Heightstatusvalue)</b>
	The way the height has been captured		
<b>heightaboveground</b>	<b>HEIGHTABOVEGROUND</b>	<b>heightaboveground</b>	<b>Integer</b>
	Vertical distance between a low and a high reference		
<b>elevationValue</b>	<b>ELEV_VALUE</b>	<b>elevationvalue</b>	<b>Integer</b>
	Value of the elevation, in meters.		
<b>elevationReference</b>	<b>ELEV_REF</b>	<b>elevationreference [0..1]</b>	<b>Enum (Elevationreference)</b>
	Element where the elevation was measured.		

<i>Spatial components of CLASS</i>			
<b>geometry2D</b>	<b>SHAPE</b>	<b>Geometry2d</b>	<b>GU_CXSurface2D - Complex Surface 2D</b>
2D or 2,5D geometric representation of the building.			

## 2.2 GROUP: Building extended BU\_ext

According to INSPIRE "Buildings" Technical Guidelines [1] the extended profiles contain the recommendations to provide more detailed information about theme buildings. In addition to building and building part, the main features represented are other constructions, building units and installations.

[1] [http://inspire.jrc.ec.europa.eu/documents/Data\\_Specifications/INSPIRE\\_DataSpecification\\_BU\\_v3.0.pdf](http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_BU_v3.0.pdf)

### **CLASS: Building extended (BUILDING\_E - BuildingExtended)**

According to INSPIRE "Buildings" Technical Guidelines:

The extended profiles contain the recommendations to provide more detailed information about theme buildings. In addition to building and building part, the main features represented are other constructions, building units and installations.

Building and building parts get the additional properties defined in this application schema, namely the official information coming from BuildingAndBuildingUnitInfo and the more detailed topographic description coming from BuildingInfo.

<i>Attributes</i>			
<i>Attributes of CLASS</i>			
<b>energyPerformance</b>	<b>ENERGY_PERF</b>	<b>energyperformance [0..1]</b>	<b>Energyperformance (DataType)</b>
	The energy performance of the building or building part or building unit .  NOTE: The energy performance is required by the Energy Performance of Building Directive for the new buildings being rent or sold.		
<b>heatingSource</b>	<b>HEAT_SOUR</b>	<b>heatingsource [0..*]</b>	<b>Enum (Heatingsourcevalue)</b>
	The source of energy used for the heating		
<b>heatingSystem</b>	<b>HEAT_SYST</b>	<b>heatingsystem [0..*]</b>	<b>Enum (Heatingsystemvalue)</b>
	The system of heating.		

	EXAMPLES : stove, central heating, heat pump		
<b>officialArea</b>	<b>OFFICIALAREA</b>	<b>officialarea [0..*]</b>	<b>Officialarea (DataType)</b>
	The area of the building or building part or building unit as registered in an official information system		

## 3 DATATYPE

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### 3.1 DATATYPE: Currentuse (currentUse)

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This data type enables to detail the current use(s).

<i>Attributes del Datatype</i>			
<b>currentUse</b>	<b>USE_VALUE</b>	<b>currentuse</b>	<b>Enum (Currentusevalue)</b>
	The current use.		
<b>percentage</b>	<b>USE_PERC</b>	<b>percentage [0..1]</b>	<b>Integer</b>
	The proportion, given as a percentage, devoted to this current use.		

### 3.2 DATATYPE: Dateofevent (DATEOFEVENT - DateOfEvent)

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This data type includes the different possible ways to define the date of an event.

The data type DateOfEvent enables to supply temporal information about an event (construction, renovation, demolition) in the following cases:

- a data producer has the date of the event but without any other information about which phase of the event the date refers to
- a data producer does not have the date of the event but has the information as an interval (e.g. before 1950, between 1800 and 1900); this case applies mainly for old buildings
- a data producer has several dates corresponding to different points of the event, e.g. the beginning and the end of the event.

EXAMPLES (for date of construction):

- producer knows that construction date is 1978

\* beginning: 1978

\* end: 1978

- producer knows that construction took place before 1950

\* beginning: void

\* end: 1950

- producer knows that construction took place between 1800 and 1900

\* beginning: 1800

\* end: 1900

<i>Attributes del Datatype</i>			
<b>Beginning</b>	<b>BEGIN</b>	<b>beginning [0..1]</b>	<b>Integer</b>
	Date when the event begun (4 digits)		
<b>end</b>	<b>END</b>	<b>end [0..1]</b>	<b>Integer</b>
	Date when the event ended (4 digits)		

### 3.3 DATATYPE: Energyperformance (ENERGYPERFORMANCE - energyPerformance)

This data type describes the energy performance of the building or building unit.

<i>Attributes del Datatype</i>			
<b>energyPerformanceClass</b>	<b>PERF_CLASS</b>	<b>energyperformanceclass</b>	<b>Enum (Energyperformancevalue)</b>

	The class of energy performance of the building or building unit.		
<b>energyPerformanceValue</b>	<b>PERF_VALUE</b>	<b>energyperformancevalue</b>	<b>Real</b>
	The value of energy performance of the building or building unit, in kWh/m <sup>2</sup> /year (or other relevant unit of measure to be specified in the assessment method).		
<b>dateOfAssessment</b>	<b>PERF_DATE</b>	<b>dateofassessment [0..1]</b>	<b>Integer</b>
	The date when the energy performance of the building or building unit was assessed.		
<b>assessmentMethod</b>	<b>PERF_METHOD</b>	<b>assessmentmethod [0..1]</b>	<b>String(50)</b>
	The reference to the document describing the assessment method of energy performance.		

### 3.4 DATATYPE: Officialarea (OFFICIALAREA - OfficialArea)

This data types includes the official area of the building, building part or building unit and information about the exact meaning of this area.

<i>Attributes del Datatype</i>			
<b>officialAreaReference</b>	<b>AREA_REF</b>	<b>officialareareference</b>	<b>Enum (Clge_officialarearefvalue)</b>
	The type of official area may be described either by using the values provided by the CLGE measurement code for the floor area of buildings (which values are provided by the CLGE_OfficialAreaReferenceValue) or by using another standard (which values are provided by the empty code list OtherStandard OfficialAreaReferenceValue, this code list having to be defined at Member State level).		
<b>CLGE_value</b>	<b>CLGE_VALUE</b>	<b>clge_value</b>	<b>Real</b>
	The value of the official area		

## 4 DOMAINS

### 4.1 DOMAIN: Buildingnaturevalue (BuildingNatureValue)

Values indicating the nature of a building.

The allowed values for this code list comprise the values specified in the table below and additional values at any level defined by data providers.

This is a partial list of the BuildingNatureValue codelist values provided by INSPIRE.

<i>DOMAIN values</i>		
<b>bunker</b>	<b>bunker</b>	A facility, partly underground, intended for or used by the military either for location of command/control centers or for troop encampment.
<b>canopy</b>	<b>canopy</b>	An overhead roof providing shelter to things below.  Canopies may be free standing frameworks over which a covering is attached or may be linked or suspended to the outside of a building
<b>caveBuilding</b>	<b>cavebuilding</b>	A space hosting human or economic activity which is usually enclosed within rock with the addition of man-made exterior walls and which may contain structures comparable to the interior structures of freestanding buildings
<b>chapel</b>	<b>chapel</b>	A Christian place of worship, usually smaller than a church.
<b>castle</b>	<b>castle</b>	A large ornate or fortified building usually constructed for the purpose of a private residence or security
<b>church</b>	<b>church</b>	Building or structure whose primary aim is to facilitate the religious practice of a Christian community
<b>dam</b>	<b>dam</b>	A permanent barrier across a watercourse used to impound water or to control its flow

<b>shed</b>	<b>shed</b>	A building of light construction, which usually has one or more open sides, that is typically used for storage.
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## 4.2 DOMAIN: Clge\_officialarearefvalue (CLGE - CLGE\_OfficialAreaRefValue)

List of values for the reference of official area, as defined in the CLGE measurement code for the floor area of buildings.

SOURCE: <http://www.eureal.eu/>

<i>DOMAIN values</i>			
<b>constructedArea</b>	<b>CONSTRUCTEDAREA</b>	<b>constructedarea</b>	<p>Constructed area is the difference between the external area and the internal area of the building or building unit.</p> <p>NOTE: Constructed area is mainly used as technical data.</p>
<b>externalArea</b>	<b>EXTERNALAREA</b>	<b>externalarea</b>	<p>External area is the area within the outer perimeter boundary of a building or building unit, including any outer cladding, measured at floor level.</p> <p>NOTE: External area is mainly used for spatial planning purpose.</p>
<b>internalArea</b>	<b>INTERNALAREA</b>	<b>internalarea</b>	<p>Internal area is the area within the interior perimeter of a building or building unit, measured above skirting-board level.</p> <p>Internal area is mainly used as reference unit of measure in valuation, property transaction, renting and building management.</p>
<b>internalPrimaryArea</b>	<b>INTERNALPRIMARYAREA</b>	<b>internalprimaryarea</b>	<p>Internal primary area is the sum of all floor areas with a heightroom superior or equal to heightParameter and that are associated with the principal uses of the building.</p> <p>Internal primary area includes:</p> <ul style="list-style-type: none"> <li>- in housing: living areas (dining rooms, bedrooms), toilet, areas (bathrooms, lavatories), interior space and passageways, storage areas...</li> <li>- in offices: work areas, meeting rooms, annexes, recreational areas, toilets, interior space and passageways...</li> </ul>
<b>internalOtherArea</b>	<b>INTERNALOTHERAREA</b>	<b>internalotherarea</b>	<p>Internal other area is the sum of all floor areas with a heightroom &lt; heightParameter and that are associated with the main uses of the building.</p>

			Internal other areas includes in particular garages, passageways and non-enclosed covered area (canopies, car-ports, ...).
<b>internalResidualArea</b>	<b>INTERNALRESIDUALAREA</b>	<b>internalresidualarea</b>	Internal residual area is the sum of all floor areas regardless of height that are not consistent with the principal use of the building.  Internal residual area includes in particular underground storage and archive rooms, cellars, parking garage, balconies, upper floor terraces, loggias.
<b>internalServiceArea</b>	<b>INTERNALSERVICEAREA</b>	<b>internalservicearea</b>	Internal service area is the sum of all floor areas used for building services, irrespective of their height or occupation.  Internal service area includes in particular lift shafts, stairwells, access ramps, maintenance and technical areas serving the building.

### 4.3 DOMAIN: Elevationreference (elevationReference)

List of possible elements considered to capture a vertical geometry.

The allowed values for this code list comprise only the values specified in the table below.

<i>DOMAIN values</i>		
<b>aboveGroundEnvelope</b>	<b>abovegroundenvelope</b>	The elevation has been captured at the level of the maximum extent of the above ground envelope of the construction.
<b>bottomOfConstruction</b>	<b>bottomofconstruction</b>	The elevation has been captured at the bottom of the usable part of the construction.
<b>entrancePoint</b>	<b>entrancepoint</b>	The elevation has been captured at the entrance of the construction, generally the bottom of entrance door.
<b>generalEave</b>	<b>generaleave</b>	The elevation has been captured at eave level, anywhere between the lowest and the highest eave levels of the construction
<b>generalGround</b>	<b>generalground</b>	The elevation has been captured at ground level, anywhere between the lowest and the highest ground points of the construction.
<b>generalRoof</b>	<b>generalroof</b>	The elevation has been captured at roof level, anywhere between the lowest edge roof level and the top of the construction.

<b>generalRoofEdge</b>	<b>generalroofedge</b>	The elevation has been captured at roof edge level, anywhere between the lowest and the highest roof edges of the construction.
<b>highestEave</b>	<b>highesteave</b>	The elevation has been captured at the highest eave level of the construction.
<b>highestGroundPoint</b>	<b>highestgroundpoint</b>	The elevation has been captured at the highest ground point of the construction.
<b>highestPoint</b>	<b>highestpoint</b>	The elevation has been captured at the highest point of the construction, including the installations, such as chimneys and antennas.
<b>highestRoofEdge</b>	<b>highestroofedge</b>	The elevation has been captured at the highest roof edge level of the construction.
<b>lowestEave</b>	<b>lowesteave</b>	The elevation has been captured at the lowest eave level of the construction.
<b>lowestFloorAboveGround</b>	<b>lowestflooraboveground</b>	The elevation has been captured at the level of the lowest floor above ground.
<b>lowestGroundPoint</b>	<b>lowestgroundpoint</b>	The elevation has been captured at the lowest ground point level of the construction.
<b>lowestRoofEdge</b>	<b>lowestroofedge</b>	The elevation has been captured at the lowest roof edge level of the construction
<b>topOfConstruction</b>	<b>topofconstruction</b>	The elevation has been captured at the top level of the construction.

#### 4.4 DOMAIN: Energyperformanceclass (ENERGYPERFORMANCECLASS - EnergyPerformanceClass)

Code list for possible classes of energy performance of a building or building part or building unit.

The codelist includes recommended classes that may be used by data providers.

<b>DOMAIN values</b>		
<b>A</b>	<b>A</b>	<b>a</b>
		First class according to the energy performance of the building

			(i.e. the most efficient buildings for energy performance).
<b>B</b>	<b>B</b>	<b>b</b>	Second class according to the energy performance of the building.
<b>C</b>	<b>C</b>	<b>c</b>	Third class according to the energy performance of the building.
<b>D</b>	<b>D</b>	<b>d</b>	Fourth class according to the energy performance of the building.
<b>E</b>	<b>E</b>	<b>e</b>	Fifth class according to the energy performance of the building.
<b>F</b>	<b>F</b>	<b>f</b>	Sixth class according to the energy performance of the building.
<b>G</b>	<b>G</b>	<b>g</b>	Seventh and last class according to the energy performance of the building (i.e. the least efficient buildings for energy performance).

#### 4.5 DOMAIN: HeatingSourceValue (HEATINGSOURCEVALUE - HeatingSourceValue)

Code list for the possible values of the heating source of a building, building part or building unit.

<i>DOMAIN values</i>			
<b>biogas</b>	<b>BIOGAS</b>	<b>biogas</b>	Biogas may come from a local biogas plant or more rarely be produced on a household scale.
<b>electricity</b>	<b>ELECTRICITY</b>	<b>electricity</b>	The heating source is electricity distributed from power plant.
<b>liquidFuels</b>	<b>LIQUIDFUELS</b>	<b>liquidfuels</b>	Liquid fuels include all sorts of liquids, petroleum, fuel oil etc.
<b>naturalGases</b>	<b>NATURALGAS</b>	<b>naturalgas</b>	The heating source is fossil gas distributed by pipeline.
<b>solidFuels</b>	<b>SOLIDFUELS</b>	<b>solidfuels</b>	Solid fuels include wood, charcoal, peat, coal, tablets and pellets made from wood.
<b>straw</b>	<b>STRAW</b>	<b>straw</b>	The heating source is solid biofuels from straw and agricultural waste.

<b>warmwaterStream</b>	<b>WARMWATERORSTREAM</b>	<b>warmwaterorstream</b>	Warm water or steam is generally distributed by central district heating.
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#### 4.6 DOMAIN: Heatingsystemvalue (HEATINGSYSTEMVALUE - HeatingSystemValue)

Code list giving the possible values for the heating system of a building, building part or building unit.

<i>DOMAIN values</i>			
<b>centralHeating</b>	<b>CENTRALHEATING</b>	<b>centralheating</b>	Central heating system performed at building or at building unit level.
<b>districtHeating</b>	<b>DISTRICTHEATING</b>	<b>districtheating</b>	The public heat network is connected to the central heating of the building by a heat exchanger. The warm water or steam used in the district heating system is not mixed with the water of the central heating system in the building.
<b>electricRadiators</b>	<b>ELECTRICRADIATORS</b>	<b>electricradiators</b>	Electric radiators could be single portable units or an integrated installation of the building.
<b>heatPump</b>	<b>HEATPUMP</b>	<b>heatpump</b>	The heating is performed by a heat pump that transfers thermal energy from an air source or geothermal source.  The device is sometimes connected to the central heating system in the building.
<b>portableGasHeating</b>	<b>PORTABLEGASHEATING</b>	<b>portablegasheating</b>	Heating is performed by a portable device using liquefied petroleum gas.
<b>solarHeating</b>	<b>SOLARHEATING</b>	<b>solarheating</b>	The heating is performed by a solar collector heating the air or liquid based heating system.  This value is usually not used for solar cells producing electricity.
<b>stove</b>	<b>STOVE</b>	<b>stove</b>	Stove includes all kinds of devices designed to burn solid fuel, traditionally wood etc. including masonry fireplaces, tile stoves and fire stoves made of cast iron.

#### 4.7 DOMAIN: Heightstatusvalue (HeightStatusValue)

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From INSPIRE IRs:

Values indicating the method used to capture a height.

The allowed values for this code list comprise only the values specified in the list below.

<i>DOMAIN values</i>		
<b>estimated</b>	<b>estimated</b>	The height has been estimated and not measured.
<b>measured</b>	<b>measured</b>	The height has been (directly or indirectly) measured

#### 4.8 DOMAIN: Refurbishmentlevel (refurbishmentLevel)

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Level of refurbishment of the building

<i>DOMAIN values</i>		
<b>0</b>	<b>norefurbishment</b>	No refurbishment occurred for the building.
<b>1</b>	<b>standard</b>	Basic refurbishment occurred for the building.
<b>2</b>	<b>advanced</b>	High refurbishment occurred for the building.

## 5 HIERARCHICAL DOMAINS

### 5.1 DOMAIN: Currentusevalue(CurrentUseValue)

Values indicating the current use.

The allowed values for this code list comprise the values specified in the table below and narrower values defined by data providers.

This code list is hierarchical.

<i>DOMAIN values</i>		
<b>residential</b>	<b>residential</b>	The building (or building component) is used for residential purpose.
<b>individualResidence</b>	<b>individualresidence</b>	The building (or building component) hosts only one dwelling.
<b>collectiveResidence</b>	<b>collectiveresidence</b>	The building (or building component) hosts more than one dwelling.
<b>twoDwellings</b>	<b>twodwellings</b>	The building (or building component) hosts two dwellings.
<b>moreThanTwoDwelling</b>	<b>morethantwodwelling</b>	The building (or building component) hosts at least 3 dwellings.
<b>residenceForCommunities</b>	<b>residenceforcommunities</b>	The building (or building component) hosts a residence for communities.
<b>agriculture</b>	<b>agriculture</b>	The building (or building component) is used for agricultural activities.
<b>industrial</b>	<b>industrial</b>	The building (or building component) is used for secondary sector activities (industrial).
<b>commerceAndServices</b>	<b>commerceandservices</b>	The building (or building component) is used for any service activities.  This value addresses the buildings and building components

		dedicated to tertiary sector activities (commercial and services).
<b>office</b>	<b>office</b>	The building (or building component) hosts offices.
<b>publicServices</b>	<b>publicservices</b>	The building (or building component) hosts public services. Public services are tertiary services provided for the benefit of the citizens.
<b>trade</b>	<b>trade</b>	The building (or building component) hosts trade activities.
<b>ancillary</b>	<b>ancillary</b>	A building (or building component) of small size that is used only in connection with another larger building (or building component) and generally does not inherit the same function and characteristics as the building (or building component) it is linked to.

## 6 NULL VALUE DOMAIN

List of null value typologies:

CODE	DESCRIPTION
91	<p>Unpopulated: the characteristic is not part of the dataset maintained by the data provider.</p> <p>However, the characteristic may exist in the real world. For example when the “elevation of the water body above the sea level” has not been included in a dataset containing lake spatial objects, then the reason for a void value of this property would be ‘Unpopulated’. The characteristic receives this value for all objects in the spatial data set.</p>
99	<p>Unknown: the correct value for the specific spatial object is not known to, and not computable by the data provider. However, a correct value may exist. For example when the “elevation of the water body above the sea level” of a certain lake has not been measured, then the reason for a void value of this property would be ‘Unknown’. This value is applied on an object-by-object basis in a spatial data set.</p>