The European Commission’s science and knowledge service

Joint Research Centre

Use case 1 “INSPIRE harmonization of existing Energy Performance Certificate datasets – Phase 1”

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Energy Pilot internal seminar
Outline

- Overview of Use Case 1
- INSPIRE core schemas extension
- Re3gistry implementation
- Data transformation
- Data validation
- Data publication
- Data use
- Web-application / SDS
- Next steps
Overview of Use Case 1

STEP 1
Open cadastral vector dataset

STEP 2
EPC dataset

STEP 3
To define a methodology to georeference the EPC dataset using cadastral data

STEP 4
Georeferenced EPC dataset

STEP 5
To create the target data model extending the INSPIRE core data model for Buildings

STEP 6
To transform the georeferenced EPC dataset into the INSPIRE extended target data model

STEP 7
To publish the transformed dataset by means of INSPIRE Network Services (WMS + WFS)

STEP 8
To use the harmonised dataset into a GIS client desktop application

STEP 9
To develop a web application to make harmonised data accessible by non GIS experts

STEP 10
To assess the possibility to apply the methodology (or enhance it) to other EPC datasets, managed by other organizations in other countries/regions
INSPIRE core schemas extension

• Content and structure of INSPIRE application schemas for theme Buildings
INSPIRE core schemas extension

- INSPIRE extended data models
- INSPIRE core data models
- Energy Pilot extended data models
- CityGML Energy ADE
INSPIRE core schemas extension

INSPIRE Data Specification Extensions

The Purpose of Patterns

In software engineering, a software design pattern is a general reusable solution to a commonly occurring problem. It is a description or template for how to solve a problem that can be used in many different situations. Design patterns are formalized best practices that the designers or programmers can use to solve common problems when building a system.

Software design patterns fall into multiple categories such as structural and behavioural patterns. Structural pattern show relationships between classes that are static. In our extension design context, we define several new categories of design patterns. Based on the information given for each pattern, you will be able to make informed choice about how to design your model extension, and how to make it INSPIRE compatible.

Types of Patterns for INSPIRE Extensions

Model extension design as described in the extension methodology is a hierarchical top-down process, where you first design a wide scope, and then drill down to make individual aspects concrete. We start at the level of the entire model, the proceed with adding classes, and then define these classes in detail by adding properties. For each of these phases, there are different patterns you can apply:

1. **Patterns for Model compliance**: These patterns define restrictions you can apply to ensure compliance of your model to INSPIRE and to other frameworks where you want to comply to.
2. **Patterns for adding classes and properties**: These patterns describe how one or multiple classes are linked to classes in the INSPIRE data specification you’d like to extend. If in another language they describe which language features you use to implement them, and what consequences there are on a conceptual and implementation level.
3. **Patterns for modifying properties**: Property modification patterns describe how you can extend individual properties, e.g. by adding new constraints or by extending code lists. They also include consequences there are on a conceptual and implementation level.
INSPIRE core schemas extension

NEW FEATURE TYPES

INSPIRE CORE

DRAFT INSPIRE EXTENDED
Building unit

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.
**EULF Energy Pilot code list register**

- **ID:** http://inspire-sandbox.jrc.ec.europa.eu/codelist
- **Label:** EULF Energy Pilot code list register
- **Content Summary:** This code list register contains code lists and their values, as defined in the EULF Energy Pilot use cases. NOTE: None of the code lists referred to in this register are contained in any of the code lists referred to in the INSPIRE code list register.
- **Owner:** European Union
- **Register manager:** European Commission, Joint Research Centre
- **Control body:** European Commission, Joint Research Centre
- **Submitter:** European Commission, Joint Research Centre (EULF Energy Pilot)
- **Contact point:** EULF Energy Pilot Registry Team
- **Licence:** Europa Legal Notice

**Other formats:**
- XML
- XML
- RDF/XML
- JSON
- Atom
- CSV

**Code Lists**

<table>
<thead>
<tr>
<th>Label</th>
<th>Themes</th>
<th>Application schema</th>
<th>Status</th>
</tr>
</thead>
<tbody>
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<td>EULF Energy Pilot UC1</td>
<td>Valid</td>
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<td>CertificateType</td>
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<td>EULF Energy Pilot UC1</td>
<td>Valid</td>
</tr>
</tbody>
</table>
## Data transformation

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Type</th>
<th>Values</th>
<th>Example value</th>
</tr>
</thead>
<tbody>
<tr>
<td>edificio</td>
<td>Building</td>
<td>String</td>
<td>382L3FRENO</td>
<td>Building address, City</td>
</tr>
<tr>
<td>annoCostruzione</td>
<td>Year of construction</td>
<td>Integer</td>
<td>1935</td>
<td>Year of construction</td>
</tr>
<tr>
<td>spazioCorridoio</td>
<td>Corridor area</td>
<td>Integer</td>
<td>400</td>
<td>Area of corridor</td>
</tr>
<tr>
<td>piano</td>
<td>Floor</td>
<td>Integer</td>
<td>1</td>
<td>Floor number</td>
</tr>
<tr>
<td>loggia</td>
<td>Loggia</td>
<td>Integer</td>
<td>54</td>
<td>Loggia size</td>
</tr>
<tr>
<td>portone</td>
<td>Entrance door</td>
<td>Integer</td>
<td>7</td>
<td>Number of entrance doors</td>
</tr>
<tr>
<td>classificazione</td>
<td>Classification</td>
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<td>7</td>
<td>Classification code</td>
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<td>codiceCertificazione</td>
<td>Certificate code</td>
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<td>42</td>
<td>Certificate number</td>
</tr>
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<td>Administrator</td>
<td>String</td>
<td></td>
<td>Name of administrator</td>
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<td>dataUscita</td>
<td>Exit date</td>
<td>Date</td>
<td></td>
<td>Exit date</td>
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<tr>
<td>dataSaldatura</td>
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<td>emissioneCO2</td>
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<td>emissioneO3</td>
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<td>O3 emissions value</td>
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</tbody>
</table>

### Source data model - Code lists

- Codetests
- Data modelling issues

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**European Commission**

[Image of the European Commission logo]
Data transformation
Data validation
Data publication
Data use
ELISE Energy pilot - INSPIRE Web App

Web app to facilitate access to and use of INSPIRE compliant harmonised data also by non-GIS experts

Requirements

- Specific type of data to be accessed;
- Elaborations eventually required on the data to be accessed (e.g. transformations);
- Common libraries (supporting the inbound data format)
- User interface
ELISE Energy pilot - INSPIRE Web App

The prototype

- **Dataset**: Energy Performance Certificate Dataset from APRIE (public buildings)
- **Data format**: INSPIRE GML 3.2 (produced using an INSPIRE extended schema)
- **Web map library**: OpenLayers / Leaflet
ELISE Energy pilot - INSPIRE Web App

Prototype available for test!
http://europa.eu/!xM86nX
Conformance class: interoperable
INSPIRE SDS metadata
Next steps

• Improve Persistent Identifier management in the target schema
• Apply HALE alignment to all dataset
• Deploy WFS on a publicly accessible server
• Enrich code list register content with more detailed description of code list values and translation in English
• Support partner to operationalize the pilot workflow into its organization
• Re-use pilot workflow in other Regions/Countries
Thank you!

@EULocation

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