

DELIVERABLE D.T4.2.5

Implementation of pilot actions for EE
improvement

Version 1
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D.T4.2.5: EE actions related to historical buildings in the Province of Ferrara

Activity A.T4.2 Implementation of pilot actions for EE improvements

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1. Introduction

The deliverable T4.2.5 belongs to the activity related to the implementation of pilot actions for EE improvement (A.T4.2). In particular, for each implemented pilot action, a document has been created reporting the information on how Pilot Action is developed, what upstreamed and downstreamed TARGET-CE tools are used in the new pilot areas and what is the overseen outcome of performed Pilot Action. This document describes Pilot Action included in D.T4.2.5 and performed by PP8 Sipro Development Agency – Ferrara in TARGET-CE project.

2. Pilot Action Statement

Summaries your vision pilot project in a concrete statement giving a target and timeframe. Describe the differences between actions planned and implemented.

The aim of the pilot action is to support the Municipality of Ferrara to:

- adopt smart energy tools aim at improving the energy performance of buildings also through the identification of financial tools;
- enlarge the dissemination and awareness raising about energy issues,
- start from the sample of households and citizens reached with CitiEnGov and involve more families

During the implementation of the pilot action, the CitiEngov Energy dashboard has been extended to 45 buildings located in a portion of the district “Giardino” in Ferrara.

3. Pilot Action Objectives

Give specific goal and quantifiable numbers of pilot action

The dashboard has been extended to 45 buildings located in a portion of the district “Giardino” in Ferrara (PA5). One of the stages of preparation of the pilot action was characterized by the experimentation of integration of the OnePlace 3D viewer with the municipal Geonext webGIS application with 3D model of the selected pilot buildings.

The scope of the work is to analyze, from an energy point of view, a series of buildings (45), mostly residential, within the same neighborhood. Sipro, in the preparation phase, actively cooperated with the ICT sector and the Architecture Faculty of the University of Ferrara for the creation of the 3D models of the 45 pilot buildings







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3.1 Objective scope and targets values

State the objective of the Pilot Action in detail. Break the objective down into sub-objectives, e.g. covering different areas of action like technical improvements, capacity buildings, consumer information, etc.

A new functionality has been added to Geonext able to call OnePlace using coordinate as parameter in the URL:

<https://oneplace.fbk.eu/3d/?lat=44.834737&lon=11.610546>.

In this way, OnePlace will be open in the same geographical extent of the 2D viewer and will show the 3D model of the buildings in that area.

3.2 Target indicators

Describe which indicators used to measure the status of the objective and how measurement took place.

| Objective | Target indicator | Method of measurement and validation |
|--|--|---|
| <ul style="list-style-type: none"> adopt smart energy tools aim at improving the energy performance of buildings also through the identification of financial tools | <ul style="list-style-type: none"> Councilors and technicians of the Municipality of Ferrara, Province of Ferrara and other municipalities Technical reports Citizens raising awareness | <ul style="list-style-type: none"> Meetings and coffee with mayors/public councilors Communication activities (newsletter, social posts, articles...) Training local event |
| <ul style="list-style-type: none"> enlarge the dissemination and awareness raising about energy issues | | |

4. Pilot Action description

One of the stages of preparation of the pilot action was characterized by the experimentation of integration of the OnePlace 3D viewer with the municipal Geonext webGIS application with 3D model of the selected pilot buildings.

The scope of the work is to analyze, from an energy point of view, a series of buildings (45), mostly residential, within the same neighborhood. After the analysis phase, strategies and actions could be defined in future to favor the reduction of energy consumption for the entire city area identified.

The analysis is therefore not focused on a few, single buildings but on buildings with many residential units.



4.1 Business-as-usual

Describe how would look like energy management in PA buildings without TARGET-CE activities

The important output of the pilot action carried out as part of the Target project was the possibility of updating the Citiengov Energy dashboard and making it usable by the technicians of the Municipality of Ferrara. Energy dashboard is an innovative tool tested in the City of Ferrara, with real data, for energy consumption for all the urban buildings (private and public). It represents an essential tool for energy policies and strategies outline. SIPRO conceived and develop the dashboard, and extended the system in order to assure the periodical energy data collection from different sources.

45 historic buildings were selected and the added value given by the pilot action implementation was the possibility of viewing them in 3D format on the OnePlace portal which was connected directly to the CitiEnGov Energy Dashboard. Thanks to the project, the buildings of an entire district of Ferrara were represented in 3D, all urban planning and energy information was collected and displayed using the Geonext and OnePlace tools.

4.2 Action and development scenario

Describe Pilot Action and steps needed to implement it

- Updating of the municipal webGIS application with the new Geonext solution implemented in CitiEnGov (already configured with energy dashboard plugin)
- Porting of CitiEnGov Ferrara energy database into Municipal database together with automated ETL procedures to update data processes
- Configuration of the editing functionality in Geonext to allow the Municipality to modify online data about “municipal energy units” and/or “historical buildings”
- Integration of the OnePlace 3D viewer with the municipal Geonext webGIS application (with 3D model of pilot buildings)

In detail, the following technical actions have been carried out:


- Reproduction of the current state of Citiengov made with:
 - migration of the energy database (stored on the Dedagroup servers and accessible from the web gis energy dashboard) on the Lepida servers of the Municipality of Ferrara in a dedicated scheme ENERGY_FERRARA in the SIT databases
 - the configuration of the energy dashboard on the GeoNext activated in phase 1 of the project with pointing to the migrated data on the energy database of the SIT of Ferrara Connection to the SIT databases
- The energy database (his content) has been connected to the updated ACI database of the SIT (in particular buildings and house numbers); there are currently 237 buildings in more than the data in the system database, total 49820 buildings
- The energy database (his content) has been connected to the updated DBTL database of the SIT





- It should be noted that the consumption data obtained from Siatel's electricity and gas supplies the same ones present in the Citiengov Energy database of the plant remain; Yes is agreed with the customer not to systematize the updated consumption data (from 2015 to 2019) since the same data contains sensitive data; the same goes for data metrics of the TARI-TARES declarations used to calculate the volumes of the buildings Corrections and additions to the energy database:
- Integrated the BUILDINGS table data regarding the height_eight_value heights with the data deriving from the heights of the volumetric units of the DBTR
- Prepare building epochs update scripts and apply them to a table copy of the BUILDINGS
- The addresses of the APEs after the change were put into the system, cleared and normalized regulation (APE post) in the Energy database.


The Data Catalog, a web application that stores, centralizes, configures data, users and plugins, allows the configuration of data coming from sensors and the Geonext allows the visualization of the observations collected.



Gestione sorgente dati ?

Nome* 

Descrizione* 

Tipo* 

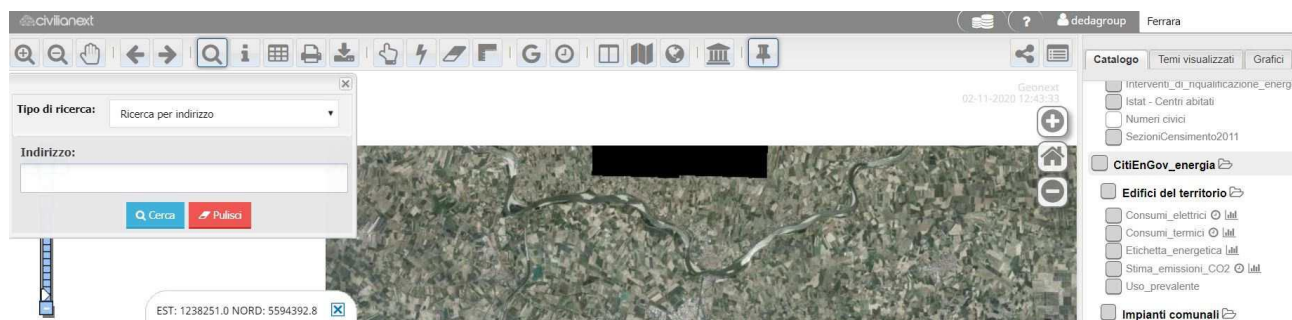
Tag semantico 

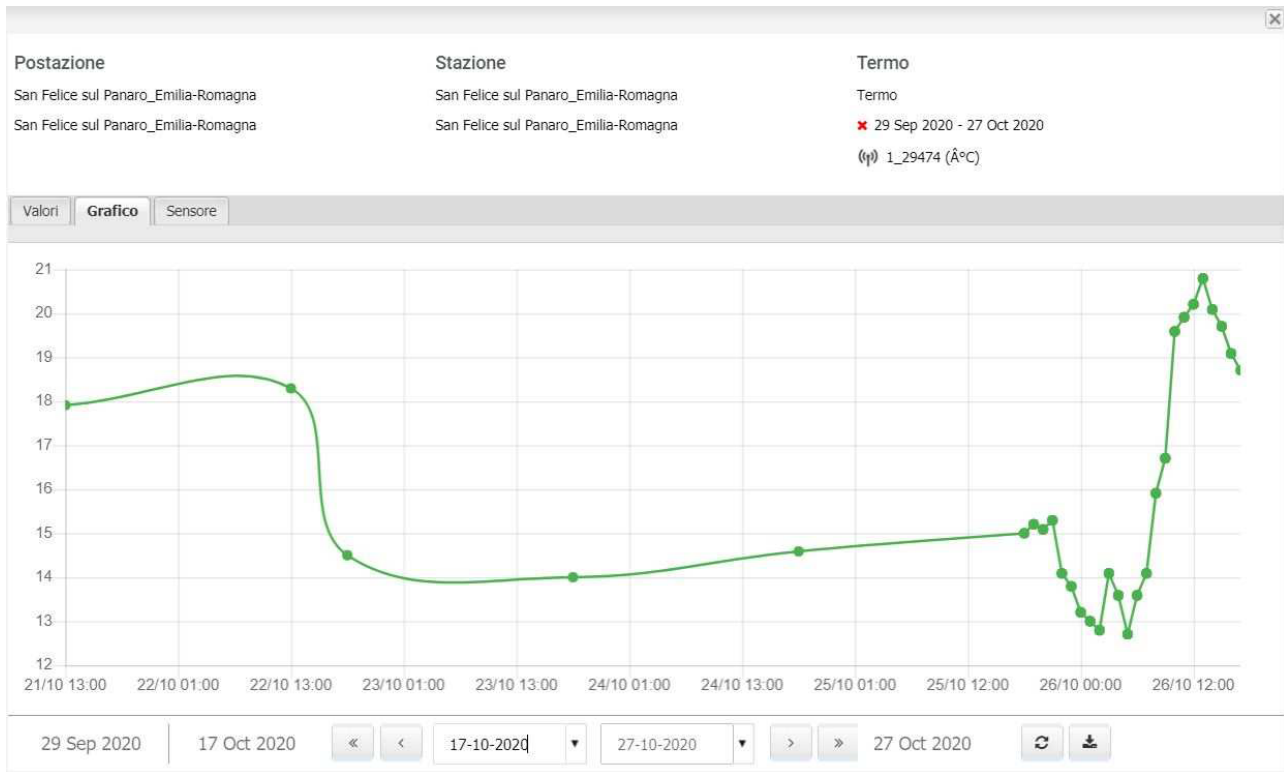
Url endpoint* 
 Versione* 

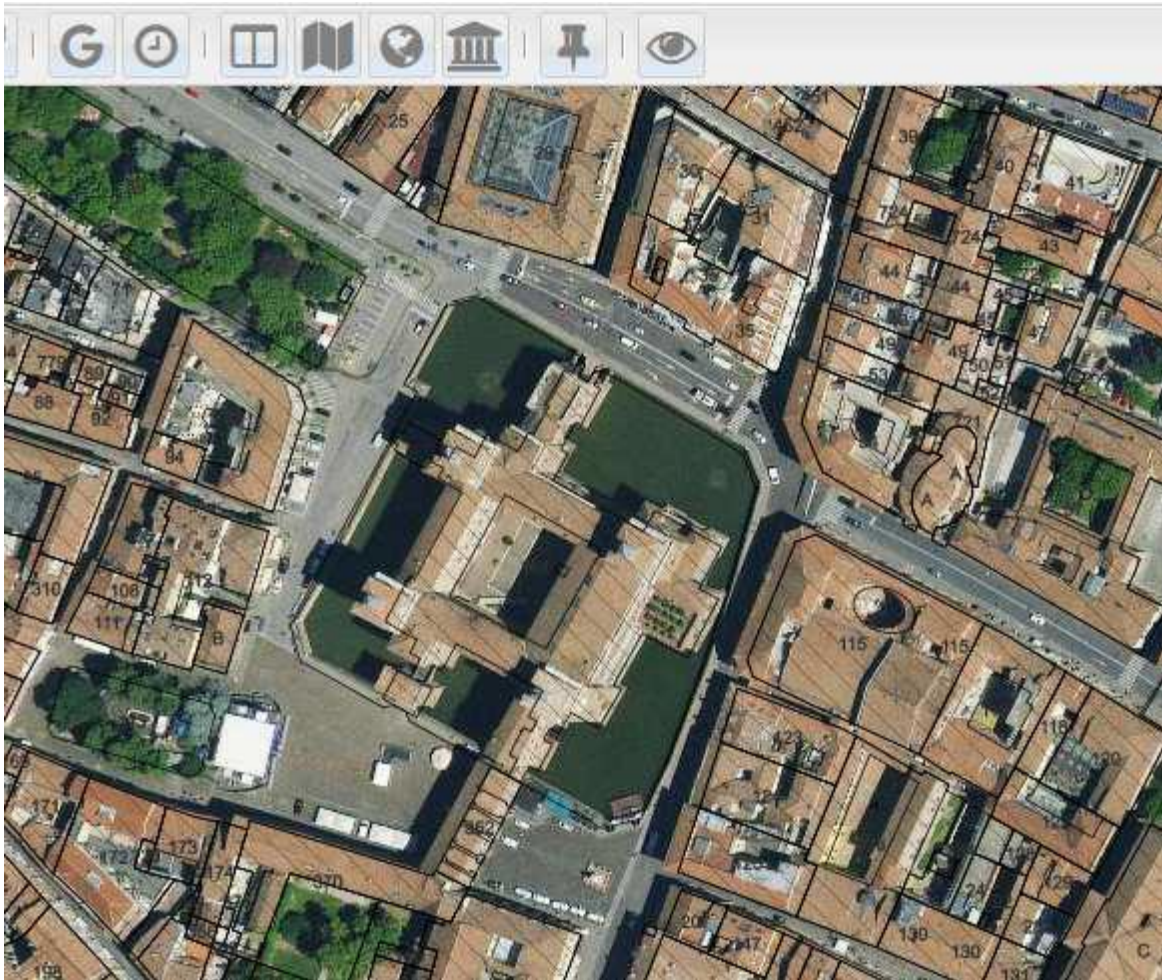
Valido MultiDatastreams

Then the data set has been configured.

Finally, the Weather data layer was configured and added to the Data from sensor mapping below Dynamic data group in the map dedicated to the Energy dashboard.







4.3 Time schedule and milestones

Include a time schedule for the steps given above. Specify Milestones along the way, where you can evaluate the progress against the set targets and adapt the concept in regular time intervals – can be shown in the same way as it is in D.T4.1.2



| EE actions related to historical buildings in Ferrara – Italy (PA5) | | | | | |
|---|--|--|----------------|----------------|---------------------------------------|
| No. | Phase | Phase description | Start of phase | End of phase | Resources needed |
| 1. | Municipal <u>webgis</u> updating | Updating of the municipal <u>webGIS</u> application with the new <u>Geonext</u> solution implemented in <u>CitiEnGov</u> (already configured with energy dashboard plugin) | June 2020 | September 2020 | External expert |
| 2. | Integration of <u>Citiengov</u> energy dashboard | Porting of <u>CitiEnGov</u> Ferrara energy database into Municipal database together with automated ETL procedures to update data processes | September 2020 | November 2020 | External expert |
| 3. | Editing functionality in <u>Geonext</u> | Configuration of the editing functionality in <u>Geonext</u> to allow the Municipality to modify online data about “municipal energy units” and/or “historical buildings” | October 2020 | December 2020 | External expert |
| 4. | <u>Onplace</u> and <u>Geonext</u> integration | Integration of the <u>OnePlace</u> 3D viewer with the municipal <u>Geonext</u> <u>webGIS</u> application with 3D model of pilot buildings | January 2021 | May 2021 | External expert/FBK teams (One Place) |

5. Pilot Action imported solutions

Describe other all imported solutions used in pilot development, describe the importing process and adaptation.

a) TARGET-CE tools

| No. | Name of building | Type of building (school, public utility ect.) | Tools used in PA | Scope of tool usage (what will be done by using the tool (trainings, visualizations, behavior change ect.)) |
|-----|--|--|-----------------------------|--|
| 45 | Buildings located in a portion of the district “Giardino ” in Ferrara (no specific name) | Residential | -CitiEnGov Energy Dashboard | - Extension of the CitiEngov Energy dashboard to buildings located in Ferrara. The Energy dashboard is a database (for both Oracle and PostgreSQL platforms) useful to easily organize geographical data about buildings with their properties and attributes. |



| | | | | |
|--|--|--|------------------|---|
| | | | - BOOSTEE- CE | - Experimentation of integration of the OnePlace 3D viewer with the municipal Geonext webGIS application (with 3D model of pilot buildings) |
|--|--|--|------------------|---|

6. Pilot Action barriers

Describe the policy, institutional, technological, financial barriers, which are addressed through this pilot

In Ferrara, for the pilot action implementation, 45 residential buildings have been chosen.

They are all private buildings for which it is difficult to obtain specific details about the occupancy and data on thermal systems.

We are trying to integrate data from different database in order to have a complete overview about the energy data of the buildings.

As for the integration of the of the OnePlace 3D viewer with the municipal Geonext webGIS application there were some difficulties in identifying the correct format of the georeferenced 3D files to be transmitted.

7. Pilot Action Monitoring

Describe when and how target indicators were checked against the implementation plan. Name responsible parties to continuously monitor and evaluate the progress in certain time intervals.

After the analysis phase, strategies and actions could be defined in future to favor the reduction of energy consumption for the entire city area identified.

The analysis is therefore not focused on a few, single buildings but on buildings with many residential units. It will be possible to evaluate in the future a series of strategies to be adopted to obtain energy savings for these buildings and make citizens more aware of these issues.



8. Conclusions

Short summary about implementation of Pilot Action

The energy dashboard is a very useful tool for local authorities and various municipal sectors to define new urban and energy policies for cities. The possibility of integrating the dashboard with different types of data (energy, urban planning, tourism, mobility) allows all sectors of public offices to obtain information and develop studies and strategies to improve the use of renewable energy and the energy performance of cities and specifically of buildings.

The pilot action developed during the Target project helped the Municipality of Ferrara to define:

- a common conceptual data model, to be considered as a possible target schema for exporting and sharing data outside the local context and outside the organization;
- a reference implementation, as SQL-based relational database (possibly for Oracle and PostGIS platforms)