

DELIVERABLE D.T2.2.3

Functionality testing and validation of the
3D city models with energy audit
functions

Version 1
04/2019





D.T2.2.3: Deliverable

A.T2.2 Development of an advance 3D Energy Management System (EMS)

Feedback on 3D EMS

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1. Introduction

The 3D Energy Management System (EMS) is one of the four modules of the BOOSTEE-CE OnePlace platform. 3DEMS is probably the most important and technological tool developed by the project consortium. It is a simple yet powerful GIS-based tool that provides a 3D representation of a selected set of buildings and is able to display energy-related information (i.e. consumptions, energy audits, building attributes, solar power potential, etc.) available for a building.

Why create such an online system?

The main advantage of the 3DEMS over more traditional applications is its simpleness and intuitive online solution that building operators, energy planners and municipality staff can use everywhere and every time without the need of special expertisealities. It is accessible without having to install any program, as it is a web-based tool requiring only a web browser to function.

What is it useful for?

The main function of the 3DEMS is to help building operators, energy & urban planners, municipality staff to better understand energy use and flows within a building in a much more graphical way, having a view also to the surrounding of a building and its location in the city. 3DEMS allows to share, visualize and query energy-related information to citizens and public authorities. It can be combined with smart metering live energy data and, being customizable, a wide range of data can be stored, displayed and managed within the platform. 3DEMS combines the most important functionalities of a GIS/CAD application into an easy-to-use web application which can be easily replicated and adapted to any municipality.



Koprivnica X

- ▾ Building type: **Health center/ Public health institute**
- ▾ Height [m]: **16** 
- Extended attributes (7)**
- ▾ Building ID: **17234** 
- ▾ Building address: **Tomislav dr. Bardek square 10**
- ▾ Height from the terrain to the building eaves [m]: **9** 
- ▾ Name: **Health center/ Public health institute**
- ▾ Number of floors: **2**
- ▾ Roof slope (angle in degrees): **45/Cross gable roof**



2. Questionnaire

Please select your country

- Austria
- Croatia
- Czech Republic
- Hungary
- Italy
- Poland
- Slovenia

1. Do you find the display of attributes of pilot buildings

	1	2	3	4	5	
not understandable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	easy to understand

Do you have any suggestion for improvement?

2. Would you prefer the attributes in local language?

- Yes
- No



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Where the numerical attributes or attributes with coded or text values are available for more than just one building, the analysis / comparison can be performed.

Two different analyses are available:

- **Filter analysis:**

On numerical attributes the following operations are possible:

- Equal
- Not equal
- Less than
- Less or equal
- Greater than
- Greater or equal

On attributes with coded values the following operations are possible:

- Equal
- Not equal

On attributes with text values the following operations are possible:

- Equal
- Not equal
- Regexp*

*regular expression – matching a pattern in text

- **Colour coding** of attribute classes: Visualisation based on colour coding of attribute values segmented into classes.

Possibility to choose number of classes or class values and visualisation of single class.

On numerical attributes and attributes with coded values filtering according to the classes is possible.

3. Do you find the analysis of the attributes easy to perform?

	1	2	3	4	5	
Not easy at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very easy

4. Do you find these two analysis (filtering, colour coding) useful?

	1	2	3	4	5	
Not useful at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very useful

Do you have any suggestion for improvement?

5. Would you prefer having additional documents attached to the building like thermal acquisition photo or energy audit document, if available?



- Yes
- No

6. If more energy data would be available, do you find the 3D EMS useful for estimating energy performances in public buildings and producing visualizations?

	1	2	3	4	5	
Not useful at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very useful.

7. If more energy data would be available, do you find the 3D EMS useful for delineating and prioritizing intervention areas/districts for large-scale, concerted and cost-effective investments aimed at building refurbishment?

	1	2	3	4	5	
Not useful at all.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very useful.

8. Do you see an opportunity for using 3DEMS in your daily work?

- Yes
- No

9. Would you attend a training seminar on using the 3DEMS tool, if it was organized in your country?

- Yes
- No

3. Questionnaire results

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- Slovenia

There have been in total twelve (12) participants who have attend the focus group meeting regarding the 3DMS functionality testing in Koprivnica, Croatia on April 19, 2019.

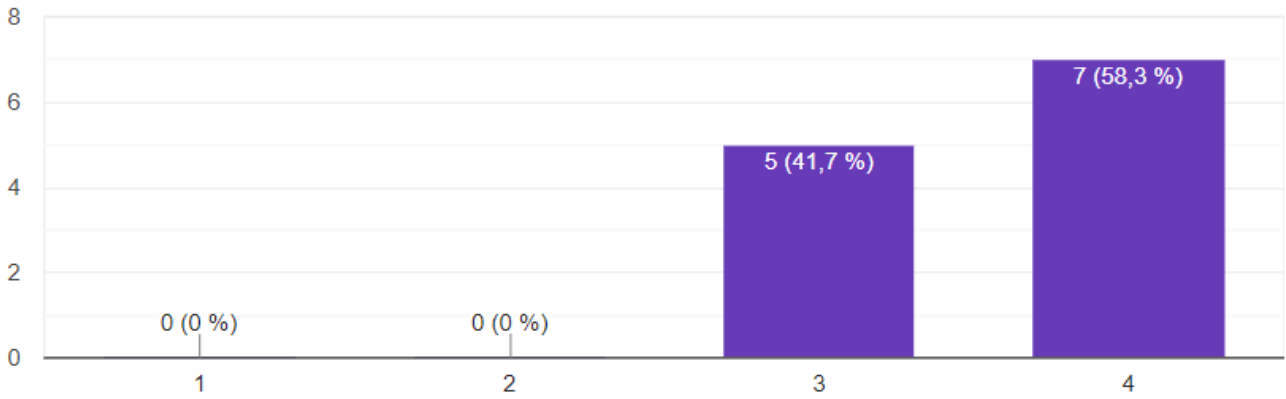




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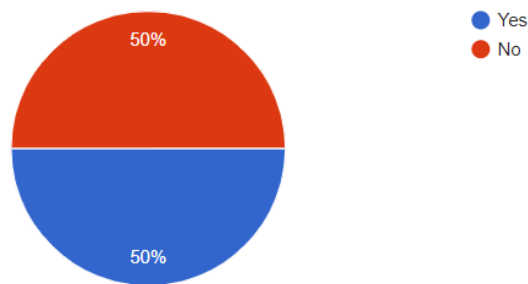
1. Do you find the display of attributes of pilot buildings

not understandable 1 2 3 4 easy to understand



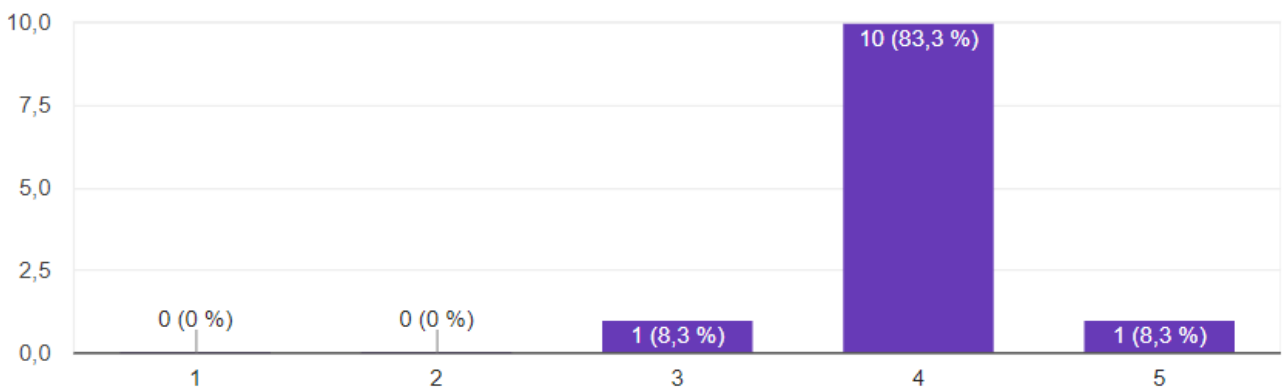
Do you have any suggestion for improvement? -

2. Would you prefer the attributes in local language?



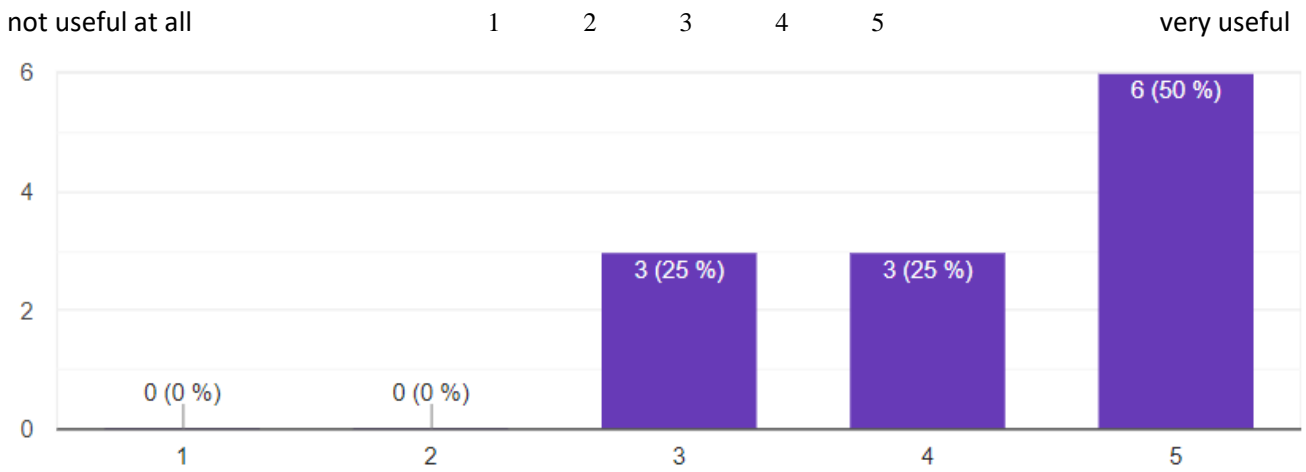
3. Do you find the analysis of the attributes easy to perform?

not easy at all 1 2 3 4 5 very easy



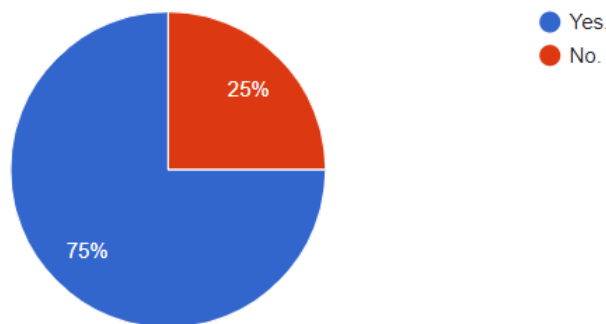


4. Do you find these two analysis (filtering, colour coding) useful?

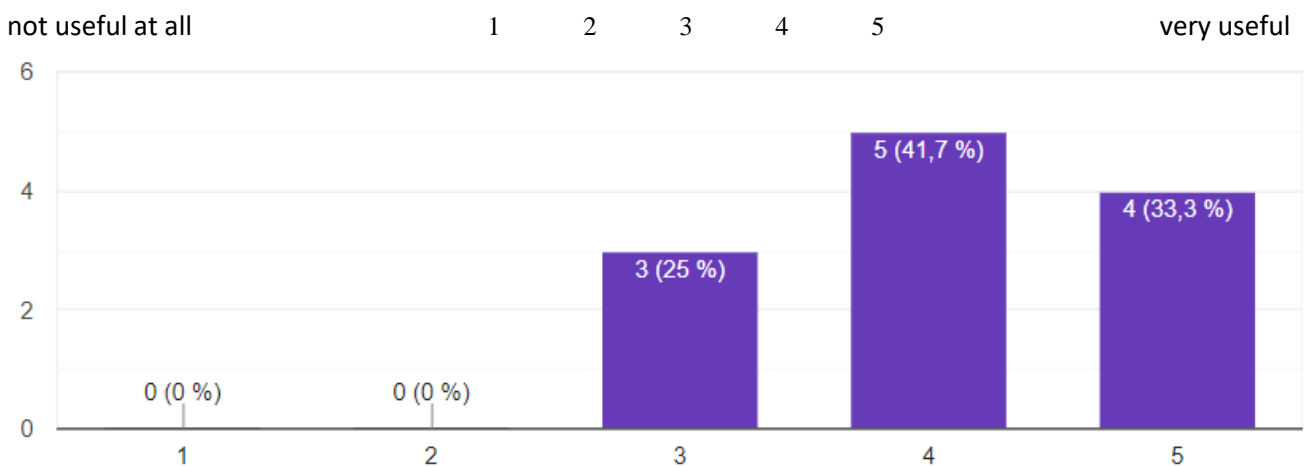


Do you have any suggestion for improvement? -

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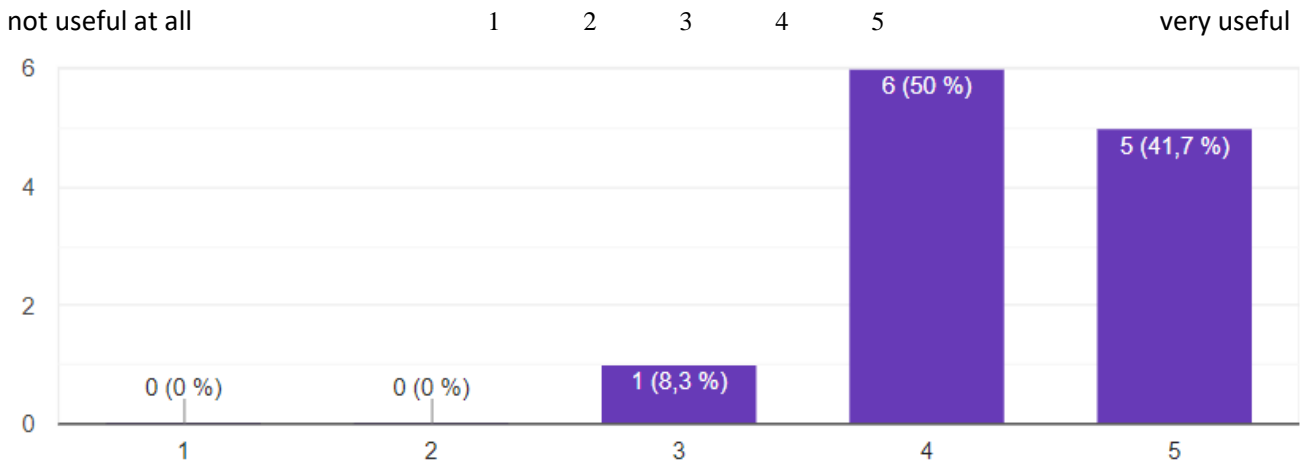


6. If more energy data would be available, do you find the 3D EMS useful for estimating energy performances in public buildings and producing visualizations?

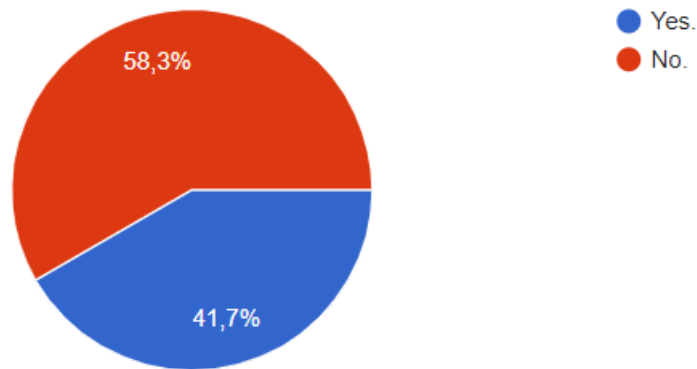




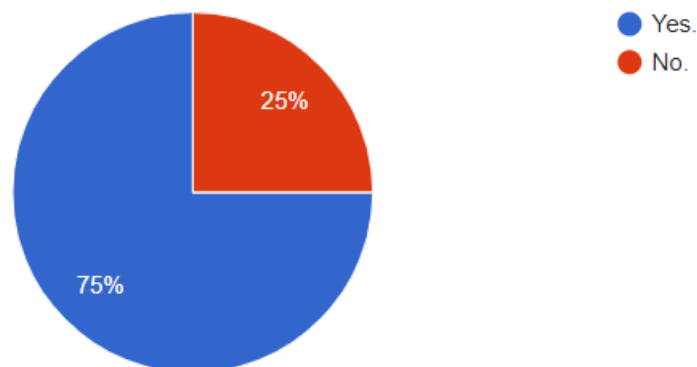
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8. Do you see an opportunity for using 3DEMS in your daily work?



9. Would you attend a training seminar on using the 3DEMS tool, if it was organized in your country?





4. Conclusions and recommendations

The main function of the 3DEMS is to help building operators, energy & urban planners, municipality staff to better understand energy use and flows within a building in a much more graphical way, having a view also to the surrounding of a building and its location in the city. 3DEMS allows to share, visualize and query energy-related information to citizens and public authorities.

During this focus group meeting where participants have been introduced with the possibilities and functions of the 3DMS, many constructive questions and suggestions have been discussed and overall conclusion is that this tool is one helpful online tool that can be used in a daily work for those people who are dealing with the public buildings in the City of Koprivnica. There is still room for improvement and adjustment of the tool possibilities to actual needs of the target groups. Nevertheless, this kind of short educational event was very useful for public authority employees because they showed their will and desire to gain new knowledge and skills that can upgrade their competences in the field of energy efficiency in buildings. Recommendation is to keep going with the educational events of this type in order to introduce as many as possible people with the possibilities of this tool because its usefulness is unquestionable.



Annexes

4.1. Annex 1: Online questionnaire

BOOSTEE-CE user feedback on 3DEMS

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3. Do you find the analysis of the attributes easy to perform?

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Not easy at all.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very easy.

4. Do you find the two analysis (filtering, colour coding) useful?

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Do you have any suggestion for improvement?

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1 2 3 4 5

Not useful at all. Very useful.

8. Do you see an opportunity for using 3DEMS in your daily work?

Yes.

No.

9. Would you attend a training seminar on using the 3DEMS tool, if it was organized in your country?

Yes.

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Google nije izradio niti podržava ovaj sadržaj.

Google Obrasci

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BOOSTEE-CE user feedback on 3DEMS

Please select your country

- Austria
- Croatia
- Czech Republic
- Hungary
- Italy
- Poland
- Slovenia

1. Do you find the display of attributes of pilot buildings

- 1 2 3 4
- not understandable easy to understand.

Do you have any suggestion for improvement?

2. Would you prefer the attributes in local language?

- Yes
- No

3. Do you find the analysis of the attributes easy to perform?

	1	2	3	4	5	
Not easy at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Very easy.

4. Do you find the two analysis (filtering, colour coding) useful?

	1	2	3	4	5	
Not useful at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Very useful.

Do you have any suggestion for improvement?

5. Would you prefer having additional documents attached to the building like thermal acquisition photo or energy audit document, if available?

- Yes.
- No.

6. If more energy data would be available, do you find the 3D EMS useful for estimating energy performances in public buildings and producing visualizations?

	1	2	3	4	5	
Not useful at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Very useful.

7. If more energy data would be available, do you find the 3D EMS useful for delineating and prioritizing intervention areas/districts for large-scale, concerted and cost-effective investments aimed at building refurbishment?

1 2 3 4 5

Not useful at all. Very useful.

8. Do you see an opportunity for using 3DEMS in your daily work?

Yes.

No.

9. Would you attend a training seminar on using the 3DEMS tool, if it was organized in your country?

Yes.

No.

Google nije izradio niti podržava ovaj sadržaj.

Google Obrasci

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4.2. Annex 2: List of participants

Attendance List – Focus group meeting Functionality testing and validation of the 3D city models with energy audit functions Koprivnica, 19.04.2019.

No.	Name and Surname	Organization	Contact	Signature
1.	ANA KURUC	GRAD KOPRIVNICA	048/279-570	Ana Kuruc
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6.	IGOR KRVIĆ	KC VOŠE	059/251 7486	Igor Krvić
7.	VIKICA ISTAJ	PUKO OTKROENJE UVIŠTE	048-222-7871	Vikica Istaj
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