



Co-funded by the European Community Horizon 2020 Program

Project Title:

ORganizational Behaviour improvement for Energy Efficient administrative public offices



OrbEEt

Grant Agreement No: 649753

Collaborative Project

OrbEEt Pilot Site in Germany: Final Results

1.1 OrbEEt pilot site in Germany

Demonstration of OrbEEt framework performed from **01/04/2017 (M26) – 28/02/2018 (M36)**, considering the different periods for trials:

- **1st Trial: M23 - M28 (baseline: M21-M25 with OrbEEt trials starting in M26)**
- **2nd Trial: M29 - M34**

Total energy savings (Annual)

Load Type	Actual (KWh)	Baseline (KWh)	Savings
Heating	15123	18476	18.15%
Lighting	2689.84	3410	21.12%
Other	1126	1227	8.23%
Total	18938.81	23113	18.06%

Table 1 Total Energy Savings - Erlangen

Peak Demand Reduction: For peak demand analysis, we take into account the week-days hour-period: 09:00 -13:00; following the analysis of a typical load curve in Germany. The impact of OrbEEt framework during peak hours is depicted in the following table (analysis during peak hours):

Load Type	Actual (KWh)	Baseline (KWh)	Savings
Heating	5512	7390.3	25.42%
Lighting	1207.2	1534.4	21.30%
Other	561.6	613.6	8.47%
Total	7280.8	9538.4	23.69%

Table 2 Peak Demand Savings - Erlangen

CO₂ Emissions Reduction: For CO₂ emission analysis, we take into account the typical generation mix of each country (source: ENTSOE). In Germany, by taking also into account the CO₂ ratio for gas consumption (heating load), we estimate the total impact in CO₂ emission:

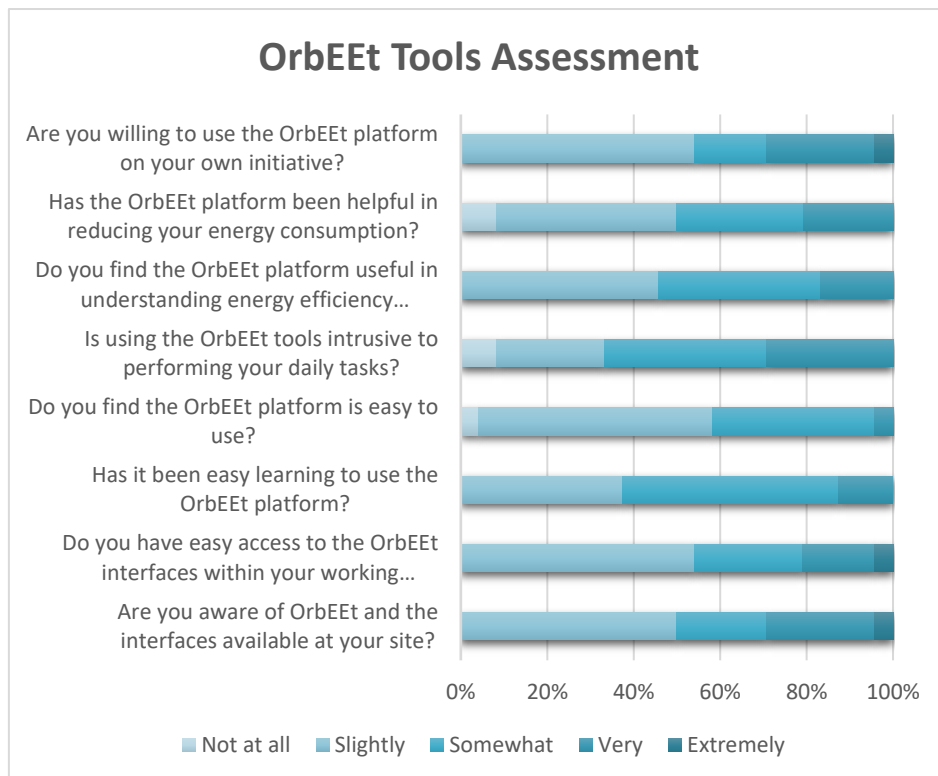
Load Type	Actual (Kg)	Baseline (Kg)	Savings
Total	3661.83	4527.21	19.11 %

Table 3 Total CO₂ Emissions Savings - Erlangen

Some key points following the demonstration of OrbEEt in Erlangen:

- In Erlangen, (heat consumption) savings were higher in single occupant offices (e.g. Researcher's office I, Manager's office) compared to multi-occupancy zones
- In Erlangen, end users preferred to adjust their lighting consumption (in contrary to heat consumption): the location of pilot site and business activities performed affected the final impact of the OrbEEt framework
- In Erlangen, the level of engagement of end users in project activities also affecting the final results, and space had an effect (Researcher's office I, Manager's office);
- (Near) real time notifications were the preferred method of user engagement- end users were familiar with the technology and the provision of personalized apps.
- The deployment of the applications affected the final results; large screen display in meeting room affecting the impact of OrbEEt in this specific zone. Erlangen was also one of the two sites to use the serious game.

Towards evaluating the impact of the project at the end users; we present the level of end users engagement



The commitment of the end users in project activities is comparatively low; mainly due to the type of personnel involved in the project activities (researchers/scientists) and the extreme weather conditions in the region.