H2020 ZEROPLUS PROJECT COMPLETION BRIEF

Future New Net Zero Energy (NZE) Settlements

A new completed EU-funded applicative research project proved significant cost reduction of up to 26.7% when designing settlement rather than NZE buildings.

The project, names ZERO-PLUS, focused on reducing cost and net regulated energy consumption, with improved generation of renewable energy at the settlement-level instead of on single buildings. The approach brought together settlement planners, building designers, technology developers and suppliers, energy efficiency and renewable energy experts, contractors, and building owners to collaborate from the earliest stages. The approach included three phases, Design, Construction and Occupancy, with each having its own set of activities, as well as its own methodologies and tools, developed within the project for each phase.

The impressive results of the project proved successful in four deployed pilot projects across Europe: UK (York), France (Voreppe), Italy (Granarolo dell' Emilia), and Cyprus (Nicosia). With post occupancy evaluation, presents tenants satisfaction alongside the above-planned results of:

- Up to 26.7% cost reduction
- Up to 123 KWh/m2/year

ZERO-PLUS is a comprehensive, cost-effective system for the design, construction and monitoring of Net Zero Energy Settlements which has been tested and implemented in four pilot projects across Europe. The project included process development to address the typical challenges in realizing NZE Settlements: Increased technological complexity, Numerous stakeholders, and complex design process.

In addition to the reduced cost and increased renewable generation, data analysis showed high satisfaction with individual parameters (ventilation, temperature, noise, lighting, odours) and overall satisfaction with the buildings.

ZERO-PLUS provides the market with an innovative, yet readily implementable combination of services and tools for designing and building NZE residential neighbourhoods that will significantly reduce both their initial and operational costs. It was born from a vision aiming to simplify the design and construction process of highly energy efficient buildings, by using an integrated, iterative and collaborative

approach to design and construction management.

Consequently, the ZERO-PLUS concept can achieve the following:

- Housing that achieves renewable energy and energy savings targets set by the recipient at the lowest possible cost;
- Clear information on the trade-offs between cost and performance;
- Ensure that the recipient has all the information they need for optimal, cost-effective maintenance.

The cutting-edge aspect of the ZERO-PLUS concept is its focus on the settlement-level and on integrating cost and construction considerations from the outset of building design. The level of performance required for a settlement is defined at the outset.

The targets of the pilot projects were that compared to a reference highly efficient building, the ZERO-PLUS building will achieve:

- 16% initial cost reduction compared to reference case calculated comparing technologies selected by ZERO-PLUS against conventional technologies that would achieve the same energy performance;
- Net regulated energy consumption of less than 20 kWh/m2 per year;
- Energy production by Renewable Energy Sources (RES) of at least 50 kWh/m2 per year.

The consortium includes three major types of partners:

- Universities (National and Kapodistrian University of Athens, Cyprus Institute, Technical University of Munich, Ben-Gurion University of the Negev, Oxford-Brookes University, University of Perugia, Technical University of Crete),
- Technology providers (ABB, Anerdgy, Arca, British Gas, Fibran) and
- Case study owners (Contedil, JRHT, OPAC38, George Vassiliou).

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Guidebook "Designing Net Zero Energy (NZE) Settlements"