



Since 1891

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COMSA Challenge 1





NEAR-ZERO ENERGY TEMPORARY CONSTRUCTION SHEDS



Introduction

Currently, buildings account for approximately **40% of total energy consumption** in the European Union and are responsible for around **36% of greenhouse gas emissions**. This is mainly due to the **low energy efficiency** of many existing structures. At the same time, **global warming is driving up average temperatures**, which in turn increases the demand for cooling solutions, further intensifying energy use.

Temporary Construction Sheds

A particular example of inefficient building practices are the **temporary construction sheds** commonly used on building sites. These structures are used for their **ease of installation, low rental cost, and flexibility**, making them ideal for short-term applications. However, they are typically constructed from **lightweight, poorly insulated materials**, which offer minimal protection against **ambient heat and solar radiation**. As a result, **thermal comfort for occupants is often compromised**.

To address this, these sheds rely heavily on **air conditioning systems**, which significantly **increase energy consumption** and contribute to the overall carbon footprint of construction activities.



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Use of temporary Construction Sheds in COMSA Projects

At COMSA, these types of temporary sheds are extensively used in projects due to their **versatility**, **modular configuration options**, and the ability to **locate them close to the construction site**, enhancing operational efficiency.



The electricity consumption at COMSA's construction sites in Spain is around 500 MWh yearly, with an average of 7 MWh per site.



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Challenge: Designing Near-Zero Energy Temporary Construction Sheds

Objective:

Develop innovative solutions to transform temporary construction sheds into **near-zero energy structures**, significantly improving their **energy efficiency** and **reducing their carbon footprint**, while maintaining or improving **occupant comfort**.

Challenges:

- **Energy Efficiency:** Integrate low-energy cooling systems or renewable energy sources (for example solar panels) and/or storage systems.
- **User Comfort:** Ensure thermal and acoustic comfort for occupants.
- **Scalability and Cost:** Maintain affordability and ease of deployment.

Expected Impact:

Solutions should aim to reduce operational energy use, minimize environmental impact, and contribute to the broader goals of sustainable construction and climate resilience.



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Let's
DO
This
THING