# Digital Twin for a MECU

Energy Transition Camping Olmenveld and ONS BUITEN

Eduardo Rios, Joao Martins **Project/Research Group: MNEXT Contact information:** eduardorios.sousa@gmail.com - joaovitor@tinoconsultoria.com.br **Date:** 12 June 2025



The "Energy Transition Camping Olmenveld and ONS BUITEN" project focuses on electrifying campsites in Zeeland without reinforcing the local power grid. It integrates solar energy, smart battery storage (MECU), and electric heating systems to replace gas use. The project will be tested at two locations and aims to reduce CO<sub>2</sub> emissions, cut energy costs, and support sustainable innovation in tourism.



## Development

A digital twin system is being developed based on real data from Campsite Olmenveld, with the potential to be scaled to other areas. It simulates the behavior of each energy component individually and collectively—under user-defined conditions. Integrated with a user-friendly interface, the system allows real-time monitoring of energy generation and consumption.







# Energy Independence: Smart, Scalable, and Sustainable

The campsite receives energy from two main sources:

- Electrical Grid
- Locally installed Solar Panels

The system was architected and developed based on:





Scalability to other Neighborhoods Operating within configurable limits set by the project manager, it ensures stability during peak demand. Additionally, it automatically calculates key parameters such as daily solar radiation, energy loads, and the number of required LiFePO4 batteries, promoting sustainability, autonomy, and economic efficiency.



am



### Accuracy of the Predictions





Management	Reduced Operational	Commercialization of surplus energy
Solar energy, Battery storage, Smart energy management	Costs Decreased Grid Dependency	New recurrin revenue stre

ation ergy ng Plug-and-

play design

efficiency

Environmental responsibility

Competitive advantage

Reference

### 1. 20231116 Bijlage-A-projectplan-OPZuid-2021-2027 Olmenveld







### CENTRE OF EXPERTISE