WeForming Mid-Project Milestones: Revolutionising Energy Management with Intelligent Grid-Forming Buildings (iGFB)

Viseu, Portugal – 11/07/2025 – The WeForming consortium gathered after completing half of the project and holding their first successful review meeting with the European Commission. WeForming is revolutionising energy management by transforming buildings into **Intelligent Grid-Forming Buildings (iGFBs) empowering end users** to take a central role in optimising energy consumption.

Demo Developments

🇱🇺 Luxembourg: The WeForming Interoperable Buildings Reference Architecture (**W-IBRA Connector)** is acting as a crucial link. It allows all the smart energy technologies within the demo to communicate with each other and with the central **COFIGFB platform**. This connectivity is vital for the use of Digital Twins, AI, and ML to predict energy needs, optimise real-time energy flow, manage EV charging, and support the main electricity grid.

🇵🇹 Portugal: The Palácio do Gelo has **a decade's worth of siloed energy data** fueling AI-driven energy management tools. It uses Digital Twin and forecast-based control to simulate and implement energy-saving strategies. It takes advantage of a large thermal storage system to store ice and consume it in peak hours while offering flexibility to the grid. **The goal** is to enable building-grid interactions while making the heating, ventilation, and HVAC more efficient.

🇭🇷 Croatia: A zero-emission island since 2012 with seasonal demand variations due to tourism. WeForming ensures local stakeholder participation in energy efficiency initiatives actively and inclusively. Krk objectives are: manage **seasonal energy storage**, facilitate local **energy communitie**s, and provide **demand response** services to the grid alleviating voltage problems. A local data hub is upgraded with new meters and distributed gateways, ensuring efficient real-time data acquisition.

🇧🇪 Belgium: The Martelange demo combines bidirectional thermal power processing with seasonal storage. The idea is to store thermal energy produced in summer (from solar panels and electric resistances) in underground reservoirs. A **Carnot Battery** is connected to test its performance and to provide balancing services to the grid. **Digital Twins and AI/ML** optimise the demo's operation with a preliminary deployment of the **W-IBRA** service.

🇪🇸 Spain: The Fornes demo is a Rural Renewable Energy Community (REC). It tackles energy poverty and increases energy independence. The demo connects **25 residential and 6 public buildings** with smart meters, EV chargers, PV panels, and a Wireless Sensor Network. An optimisation model utilises real-time data and consumption forecasts to minimize energy costs and manage multi-energy assets. They are developing a **Web Application** for its users from the co-creation workshops.

🇩🇪 Germany: Karlsruhe smart district integrates electricity, heat, gas, PV, and transport across 140,000 m². The district comprises industrial, commercial, residential, and educational buildings. They have achieved **bidirectional charging for electric vehicles** (EVs) acting as mobile energy storage units, enhancing grid flexibility and resilience. Detailed and frequent energy data (15-min, 1-min, 1-sec active power, 1-sec frequency) for business models is transmitted via JSON/MQTT.

Key Discussions

Business models: One-Stop-Shop, Product-as-a-Service, Innovative Financing Schemes, and New Revenue Models. It focuses on the WeForming project's role in enabling the development of Smart Cities emphasizing regulatory compliance.

Technological enablers: Two iterations of the WeForming intelligent Building Reference Architecture (W-IBRA) has been developed as prototypes to enable transversal interoperability in the context of iGFBs, by aligning with EU initiatives such as the Common Energy Data Spaces.

The WeForming middleware serves as the primary layer of the WeForming IT infrastructure (W-IBRA), facilitating secure and trusted information exchange for all participants. The Middleware encompasses all the surrounding (i.e., core and optional) data space components/building blocks on it.

The WeForming Data Space connector: Currently in development for WeForming's MVP 2.0 platform, simplifies how data is shared. It packages the connector with its own local storage, a data handler, and a custom user interface, allowing iGFBs to easily exchange information as both providers and consumers within the system.

Participant agent affiliation with Connector-as-a-Service (CaaS) approach. No specific need is required on installing a connector; the CaaS is considered as a trusted connector that renders, by intermediating, the participant agent connection on the data space.

The consortium is expanding its reach through synergies and collaboration with other European initiatives and EU projects. Join our Linkedin Group: Sustainable Energy Hub.

About WeForming

WeForming is at the forefront of transforming energy management in buildings, focusing on seamless integration with the energy ecosystem. This EU project addresses digital operation, management, and maintenance, along with efficient and interactive energy processing for Intelligent Grid-Forming Buildings (iGFBs). The WeForming project (full name: Buildings as Efficient Interoperable Formers of Clean Energy Ecosystems) is an innovation action funded by the European Union through the Horizon Europe Programme under the Grant Agreement No. 101123556 that started in October 2023 and will last for 36 months.

Partners of WeForming: European Dynamics, Luxembourg Institute of Science and Technology, Regulatory Assistance Project, F6S Innovation, Hardware and Software Engineering, Holistic, Iko Real Estate, Sudstroum, Circu Li-ion, GenCell, Builtrix, MOVIDA, R&D Nester, Grid One, Smart Island Krk, University Of Zagreb - Faculty of Electrical Engineering and Computing, Wingest, Flexide Energy, University of Liège, Cuerva, Schneider Electric España, Aggregering, Vergy Community, AIR Institute, University of Málaga, Karlsruhe Institute of Technology (KIT), FZI Research Center for Information Technology, Stadtwerke Karlsruhe, BES - Badische Energie-Servicegesellschaft, Obots Energy

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Links

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- Sustainable Energy Hub: https://www.linkedin.com/groups/10011646/

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UK Research and Innovation

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