



## PROJECT OVERVIEW

**Project Title:** EVNext2030+: A Socio-Technical Platform for Co-Designing Equitable EV Charging Infrastructure and Driving a Fair Energy Transition.

**Lead Organisation:** International Energy Research Centre (IERC), Tyndall National Institute, University College Cork (UCC).

**Funding Pathway:** SEAI National Energy RD&D Programme 2026 (Open Strand).

## The Challenge

As Ireland accelerates towards its 2030 climate targets, the deployment of Electric Vehicle (EV) charging infrastructure faces a critical double-sided bottleneck. First, top-down technical models frequently overlook local human constraints, leading to a severe "charging deficit" for residents in multi-unit developments (MUDs), apartments, and rented accommodation who lack off-street parking. Second, localised infrastructure deployment is currently hindered by fragmented datasets and a lack of visibility into low-voltage distribution grid constraints. To deliver a Just Transition, public planners and commercial operators urgently require a unified tool that balances commercial viability, electrical grid resilience, and social equity.

## The EVNext2030+ Solution

**EVNext2030+** is a pioneering national initiative that moves beyond conventional, siloed planning software. It establishes an advanced **socio-technical spatial intelligence platform** that fuses high-resolution remote sensing, geographic data layers, and spatial-temporal machine learning with deep stakeholder co-design.

The core innovation is the development of an equity-based **EV Vulnerability Index**. This predictive engine maps shifting regional transport energy poverty, identifies underserved commuter and rural hubs, and simulates localised temporal charging demand. By pairing these social metrics with real-world low-voltage grid capacity modelling, the platform enables public bodies and operators to pinpoint optimal, grid-compliant charging locations that protect local network resilience whilst ensuring fair access for all communities.

## Core Project Pillars

- 1. Spatial Intelligence & Predictive AI:** Overcoming data scarcity by integrating disparate public and satellite datasets into an automated AI/ML/GIS engine to forecast geographic and temporal EV charging demands.
- 2. Socio-Technical Co-Design:** Placing local authorities, planners, and potential Sustainable Energy Communities (SECs) at the centre of the design process to ensure the user interface directly answers real-world statutory and civic needs.
- 3. Grid Infrastructure Resilience:** Simulating localised peak loads and exploring Vehicle-to-Grid (V2G) flexibility potential to ensure that proposed charging layouts actively support and stabilise the distribution network.

## Ecosystem Partnerships & Real-World Impact

**EVNext2030+** is built to deliver immediate, actionable decision support across the transport and energy landscape:

**Local Authorities:** Provides the precise, evidence-based spatial data required to design and execute statutory regional and local EV charging network plans efficiently.

**Charge Point Operators (CPOs):** De-risks public-private partnership investments by identifying highly utilised, grid-ready deployment sites.

**Grid Operators (ESB Networks):** Supplies predictive localised demand profiles to allow for proactive low-voltage congestion management.

### **Collaboration Structure**

To eliminate administrative burden, the IERC project team at Tyndall/UCC handles the entirety of the proposal development, text drafting, and funder reporting. **Partner** involvement during the proposal stage requires no financial commitment or resource dedication – other than your revision of the proposal and eventual contributions with ideas, corrections, and suggestions at your convenience. For successful project execution, **collaboration** is focused on high-value, low-effort strategic alignment - primarily participating in targeted virtual workshops during the co-design phase to ensure the platform's ultimate dashboard outputs are optimised to support specific planning, operational, or policy goals.

### **HIGH-LEVEL WORK PACKAGE DRAFT FOR EVNEXT2030+**

#### **WP1: Project Management & Impact Governance**

**Objective:** Ensure milestone delivery and coordinate between IERC/Tyndall and external stakeholders. **Key Tasks:** Risk management, financial reporting, and establishing a Project Steering Committee including ZEV and Local Authority (LA) representatives.

#### **WP2: Engaged Research & Socio-Technical Co-Design**

**Objective:** Directly address the "Social Science Gap". **Key Tasks:** Conducting stakeholder workshops with LA planners to define "User Stories" identifying the specific barriers for apartment dwellers and rural commuters through surveys.

#### **WP3: Spatial Intelligence & Vulnerability Mapping**

**Objective:** Solve the data scarcity and MUD/Apartment challenges. **Key Tasks:** Developing a high-resolution GIS framework using remote sensing and creating the EV Vulnerability Index to identify areas with high demand but low off-street parking availability.

#### **WP4: AI Forecasting & Grid Flexibility Engine**

**Objective:** Align with Priority Area F (Digital/AI) and A (System Resilience). **Key Tasks:** Developing the ML models for temporal demand forecasting; integrating Vehicle-to-Grid (V2G) and Vehicle-to-Home (V2H) potential as a layer for grid resilience mapping.

#### **WP5: National Intelligence Platform & Pilot Validation**

**Objective:** Scale the project beyond a "small-scale tool" to a "National Intelligence Platform". **Key Tasks:** Implementing the dashboard for 2–3 pilot "Commuter Hubs" and validating the model's accuracy against real-world charger usage data from partner Charge Point Operators (CPOs).

#### **WP6: Policy Integration & Knowledge Transfer (C&D, and capacity building)**

**Objective:** Maximise "Impact" scores. **Key Tasks:** Producing a "Policy White Paper" for the Department of Transport; conducting knowledge transfer sessions for the Climate Action Regional Offices (CAROs) to ensure the tool is adopted into future Local Authority strategies.