



Beyond the Dashboard: Activating the Digital Energy Citizen

Building a Common European Reference
Framework for a Resilient and Sustainable Future

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The Vision – Empowering the Heart of the Energy Transition

For decades, the relationship between European citizens and the energy grid has been one of passive consumption. We flip a switch, and the light comes on; we receive a bill at the end of the month, often without understanding the complex machinery behind it. At **ECLIPSE DIGITAL Project** (Digital Europe Project), we believe that the success of the European Green Deal depends on a fundamental shift: moving the consumer from the sidelines to the very center of the energy ecosystem

Our mission is the implementation of the **Common European Reference Framework (CERF)**. This is not just a technical specification; it is a blueprint designed to standardize how energy applications across the EU interact with citizens. By providing users with real-time, actionable data on their energy consumption, CO2 impact, and potential **reductions in their energy bills** we are turning energy management into a daily, empowering habit.

Did you know?

Most current energy applications act only as a "rearview mirror," showing you what you have already spent. ECLIPSE DIGITAL Project is shifting the focus from passive monitoring to active participation, providing you with real-time tools to reduce your CO2 footprint and lower your energy bills while supporting the stability of the entire European grid.

Why it matters:

The CERF aims to foster a win-win situation. For the citizen, it means lower bills and a reduced environmental footprint. For the grid, it means enhanced stability and resilience through consumer-driven flexibility. Deployed across **13 pilot sites in 17 EU countries**, ECLIPSE DIGITAL is proving that digital innovation can turn every household into an active partner in the green revolution



The App Revolution is Here, but is it Working?

To build the future, we first had to understand the present. In Work Package 2, our consortium conducted an exhaustive Landscape Analysis (D2.1) of existing energy monitoring applications across the European Union. We analyzed solutions from retailers, DSOs, TSOs, and energy aggregators to identify what is working and, more importantly, what is missing.

The Findings: Our research revealed a significant "Interoperability Gap." While nearly 68% of the applications currently on the market are excellent at helping you monitor your past usage, only a tiny fraction allows you to actually interact with the grid in real-time. Most apps act like a rearview mirror, showing you where you've been but not helping you navigate the road ahead.

Furthermore, we found that current market offerings are often fragmented by national borders and proprietary systems. ECLIPSE DIGITAL Project's CERF is the solution to this fragmentation. By aligning with EU regulations like the Data Governance Act and GDPR, we are ensuring that data flows securely and transparently, allowing for cross-border innovation and a truly unified European digital energy market.



Over 50 unique energy applications across 17 EU countries were evaluated to define the CERF requirements.

The Fragmented Market

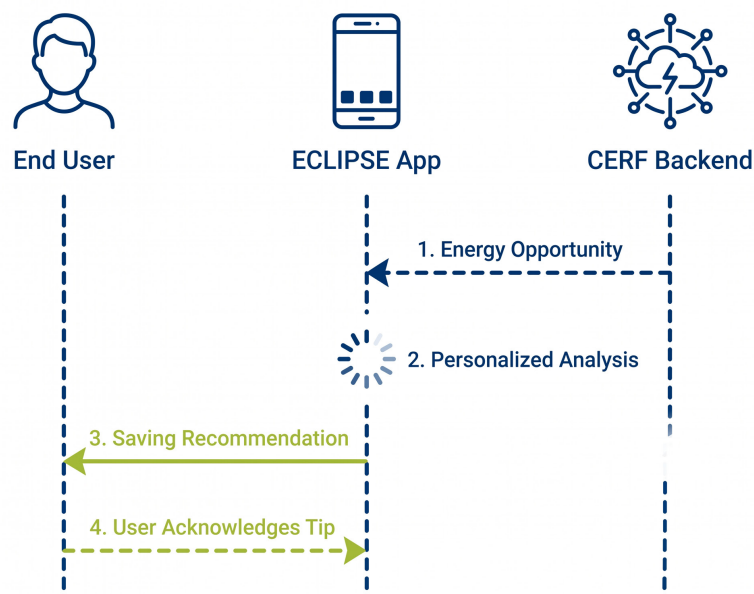
The current European digital energy landscape remains a patchwork of isolated national "silos." Research shows that most platform operators still utilize proprietary means for identification and authentication, resulting in frequent "media breaks" and a critical lack of a shared chain of trust.

Because market actors strictly adhere to varying national practices and non-standardized procedures, interoperability is hindered, and growth opportunities for innovative services are severely limited. These technical barriers, combined with fragmented regulations and legal uncertainties, create expensive obstacles that prevent the free flow of data across EU borders. ECLIPSE DIGITAL provides the unified blueprint necessary to bridge these gaps and empower a truly integrated European digital energy market.

56 Ways to Change the Grid

The CERF wasn't designed in a vacuum; it was co-created through an iterative process involving energy experts, technical providers, and end-users from across the continent. This collaborative effort resulted in the definition of **56 specific Use Cases**, clustered into six powerful categories that define the future of energy engagement:

- 1. Energy invoice reduction:** Developing personalized financial advice that helps customers shift consumption to off-peak hours, directly lowering costs.
- 2. Carbon footprint awareness:** Turning "green energy" into a measurable reality by notifying users when the grid is powered by peak renewable generation (the "Follow the Sun" strategy).
- 3. Enhancing grid resilience:** During demand periods, the CERF allows the grid to request voluntary load reductions that prevent local outages and stabilize the network.
- 4. Optimizing home energy assets:** Appliances are becoming increasingly smart, allowing for more optimal management from an energetic and economic standpoint. This effect is further enhanced by a variety of resources such as solar panels, batteries, and electric vehicles, which our framework coordinates to maximize self-consumption.
- 5. Flexibility market participation:** Beyond offering a service to the grid, participating in markets enables peer-to-peer ("P2P") services that maximize flexibility remuneration and educate consumers on active grid participation.
- 6. Smart EV charging:** Aligning electric vehicle needs with grid availability so that charging your car supports the network rather than straining it.



*"Flexibility is not only a technical tool for grid stability but also a **key enabler of a cleaner, more resilient, and environmentally sustainable energy model.**"*



Tested in 17 Countries. Designed for One Europe.

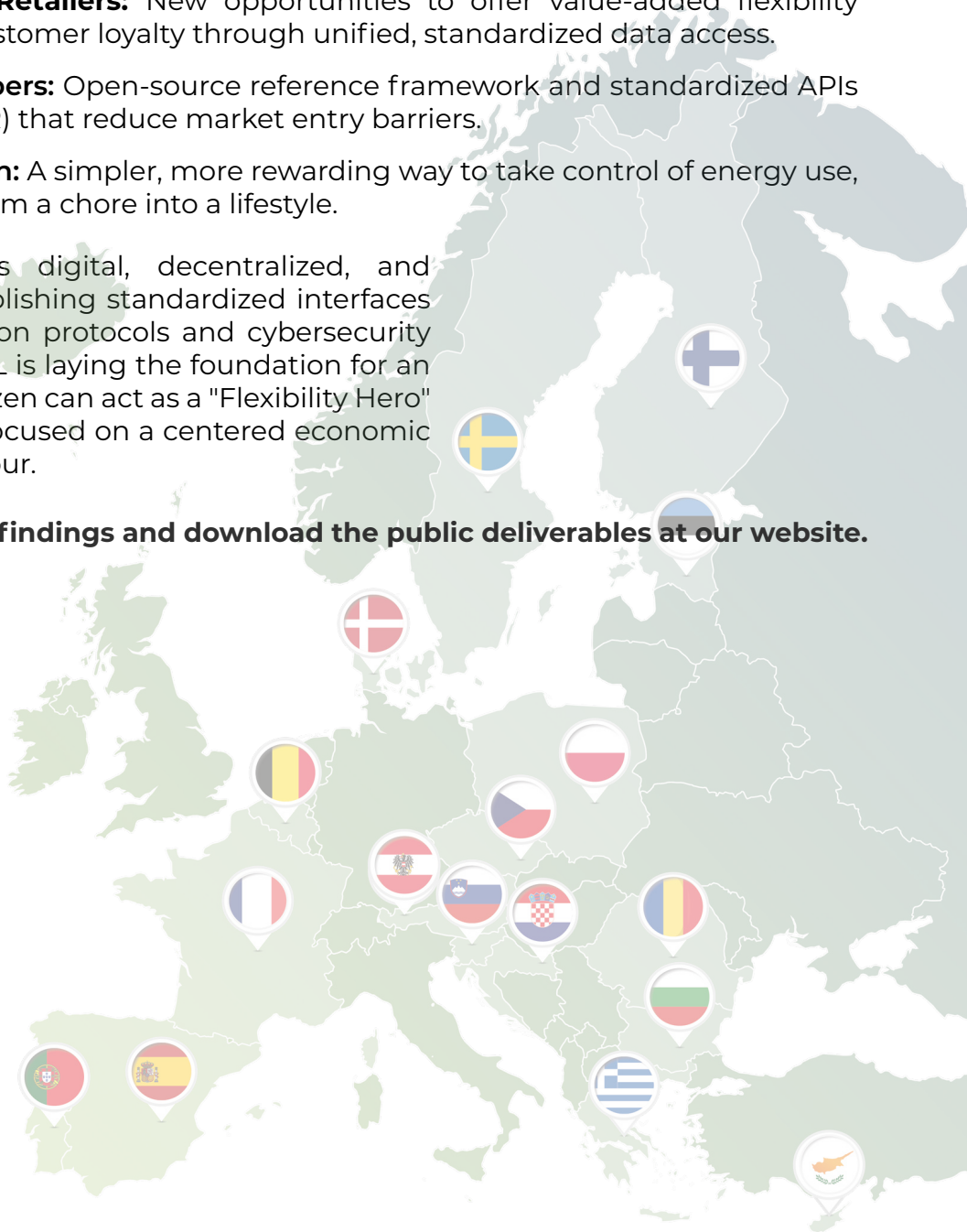
ECLIPSE DIGITAL Project is a live demonstration of what is possible when we synchronize technology with policy. Our framework is being rigorously tested in diverse regulatory contexts, from large-scale grids across Europe to energy communities that increasingly are extending flexibility for end-users.

The Impact for Our Stakeholders:

- 1. For System Operators (DSOs/TSOs):** A scalable model for managing demand-side flexibility, reducing the need for costly infrastructure upgrades.
- 2. For Aggregators and Retailers:** New opportunities to offer value-added flexibility services and improve customer loyalty through unified, standardized data access.
- 3. For Technology Developers:** Open-source reference framework and standardized APIs (like REST and OpenADR) that reduce market entry barriers.
- 4. For the European Citizen:** A simpler, more rewarding way to take control of energy use, turning sustainability from a chore into a lifestyle.

The future of energy is digital, decentralized, and consumer-centric. By establishing standardized interfaces and rigorous data protection protocols and cybersecurity measures, ECLIPSE DIGITAL is laying the foundation for an ecosystem where every citizen can act as a "Flexibility Hero" where their decisions are focused on a centered economic and environmental behaviour.

Discover our full technical findings and download the public deliverables at our website.





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