O-CEI

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OPEN CALL
TECHNICAL GUIDELINES

O-CEI: Open Cloud-Edge-IoT Platform Uptake in Large Scale Cross-Domain Pilots

2nd Open Call for Uptake projects

Submission of applications starts on **November 12th 2026**, at **13:00** Brussels Time

Submission deadline: **January 14th 2027**, at **17:00** Brussels Time

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UTILISATION OF THE DOCUMENT

The already published Guide for Applicants (GfA) sets the rules of the 2nd Open Call of O-CEI (OC#2): eligibility, the requirements checked in the scope screening, the evaluation criteria, the Support Programme and the payments.

These Technical Guidelines aim at explaining:

a) The underlying terms, concepts and technical reality of O-CEI provisions
b) The O-CEI methodology from blueprint to CEI deployment
c) What is expected from each Uptake Project

… so that to guide the preparation of an application for O-CEI Uptake Project proposal from technical angle. Section 1 offers a global vision of O-CEI methodology, O-CEI platform and the Blueprint lifecycle methodology. Session 2 digs deep in the required technical actions as well as **in the challenges that must be specifically addressed** by the applicants. To conclude, Section 3 and 4 subsequently detail how to build a Blueprint one-pager and a Layout design using LayoutStudio Lite tool (provided by O-CEI partners).

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We encourage all applicants to read this document carefully to understand the technical demands for aligning with O-CEI environment. Additionally, the applicant should also refer to:

- O-CEI Platform detailed description: link pending
- User manual of LayoutStudio Lite: O-CEI Layout Studio Lite: User Guide
- A **first webinar on the Open Call** funding opportunity: elegibility, overall rules, timing and goals – to be held online on **9th November at 2.30pm CET**
- A **second webinar** about the application submission process: the microsite, the technical details of O-CEI platform and usage of LayoutStudio Lite – to be held online on **11th December at 10.30 am CET.**

For any questions, please contact us at oc-office@o-cei.eu. Good luck!

O-CEI Open Call Team O-CEI

1 O-CEI IN A NUTSHELL

More and more applications run across many machines at once: sensors and controllers in the field, servers on site and resources in the cloud. Together they form the **Cloud-Edge-IoT (CEI) continuum**. The growing demand for data and computing in these networks raises energy use, costs and emissions, and the fragmentation of cloud ecosystems, extended to the edge and to devices such as electric vehicles, makes resources hard to manage. Independent organisations also need to share data and insights to work together.

O-CEI is a Horizon Europe Innovation Action that builds an open CEI platform focused on interoperability, security and reliability, so that different sectors can collaborate and share data in real time. Energy is the common thread: every O-CEI Blueprint pursues an energy-related target, and in this call **energy flexibility** must be central to the use case. Energy flexibility is defined as the modulation of electricity production, storage or consumption, at one or more sites and over a given period, in response to an external signal such as a tariff, a market signal or a grid request. It can mean shedding, shifting or adjusting demand or supply, manually or automatically.

Three more terms appear throughout this guide:

- **Cloud-Edge-IoT continuum:** devices, edge servers and cloud resources treated as one environment, so that each function can run where it works best.
- **Interoperability:** components from different vendors and organisations work together through open interfaces and shared data models.
- **Cross-domain:** knowledge, data or software move between sectors, for example from an energy community to a logistics depot.

1.1 O-CEI OVERALL METHODOLOGY – THE BLUEPRINTS LIFECYCLE

O-CEI proposes a 7-step methodology moving from a global innovative idea with a clear target to solve an issue via Cloud-Edge-IoT technologies all the way down to deploying actual hardware and software on a real environment, fostering reuse in further cases.

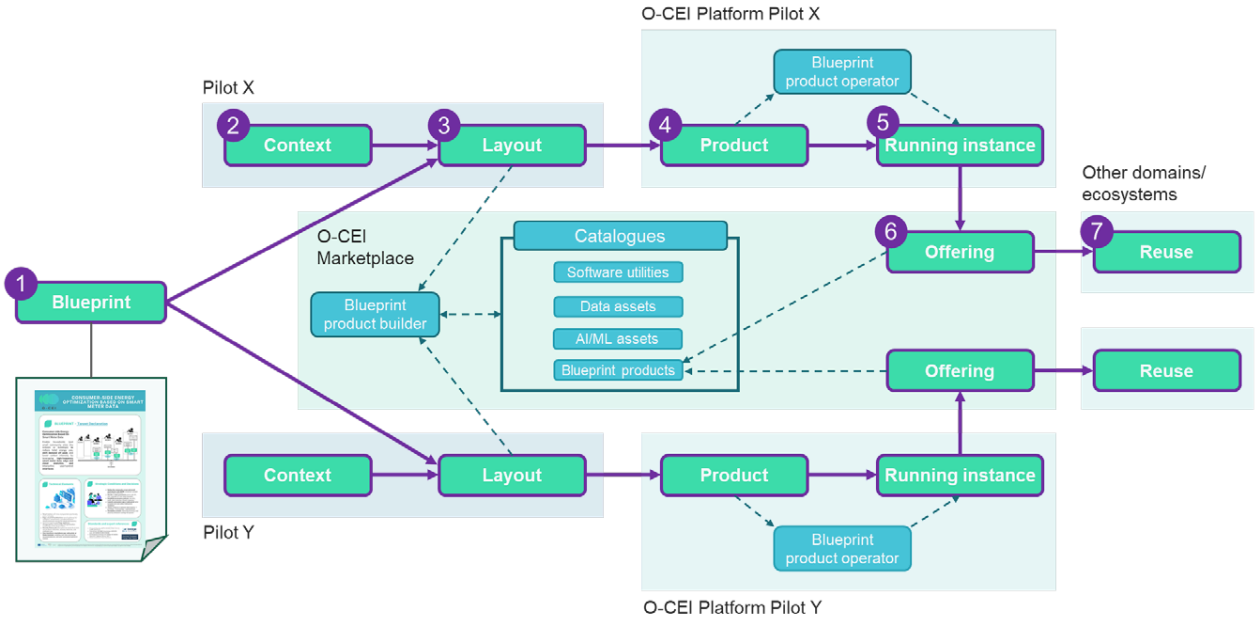


Figure 1. How one Blueprint becomes running solutions in different pilots: the seven steps of the O-CEI Blueprint lifecycle.

The 7 steps are as follows:

1. **Blueprint.** A one-page, reusable statement of an energy-related target and of how Cloud-Edge-IoT technologies can reach it.
2. **Context.** The real environment where Blueprint is applied: actors, data, infra and constraints.
3. **Functional Layout.** The technical design for that Context: which functions run on devices, at the edge and in the cloud. O-CEI provides LayoutStudio to draw it.
4. **Blueprint Product.** The technical implementation of the Blueprint in that Context. Composed in the O-CEI Marketplace from Digital Assets: software utilities, data assets, AI models and other assets.
5. **Running instance.** The Blueprint Product deployed and operated on the pilot's own infrastructure, through the Platform's Blueprint Product Operator (in this context, an Uptake Project acts as a pilot).
6. **Offering.** A validated B. Product published in a Marketplace catalogue, so that others can find it.
7. **Reuse.** Other organisations adopt it and adapt it to their own Context.

1.2 O-CEI Platform

The O-CEI Platform is a **modular software distributed system** that supports the last four steps of the Blueprint lifecycle. It must not be understood as a local Smart IoT Platform (since it does not replace local infrastructure). Its main goal is to allow the materialization of a Blueprint Product over adopter's own devices, edge and cloud nodes. It also does not replace sovereignty: each organisation keeps control over its own data and workloads.

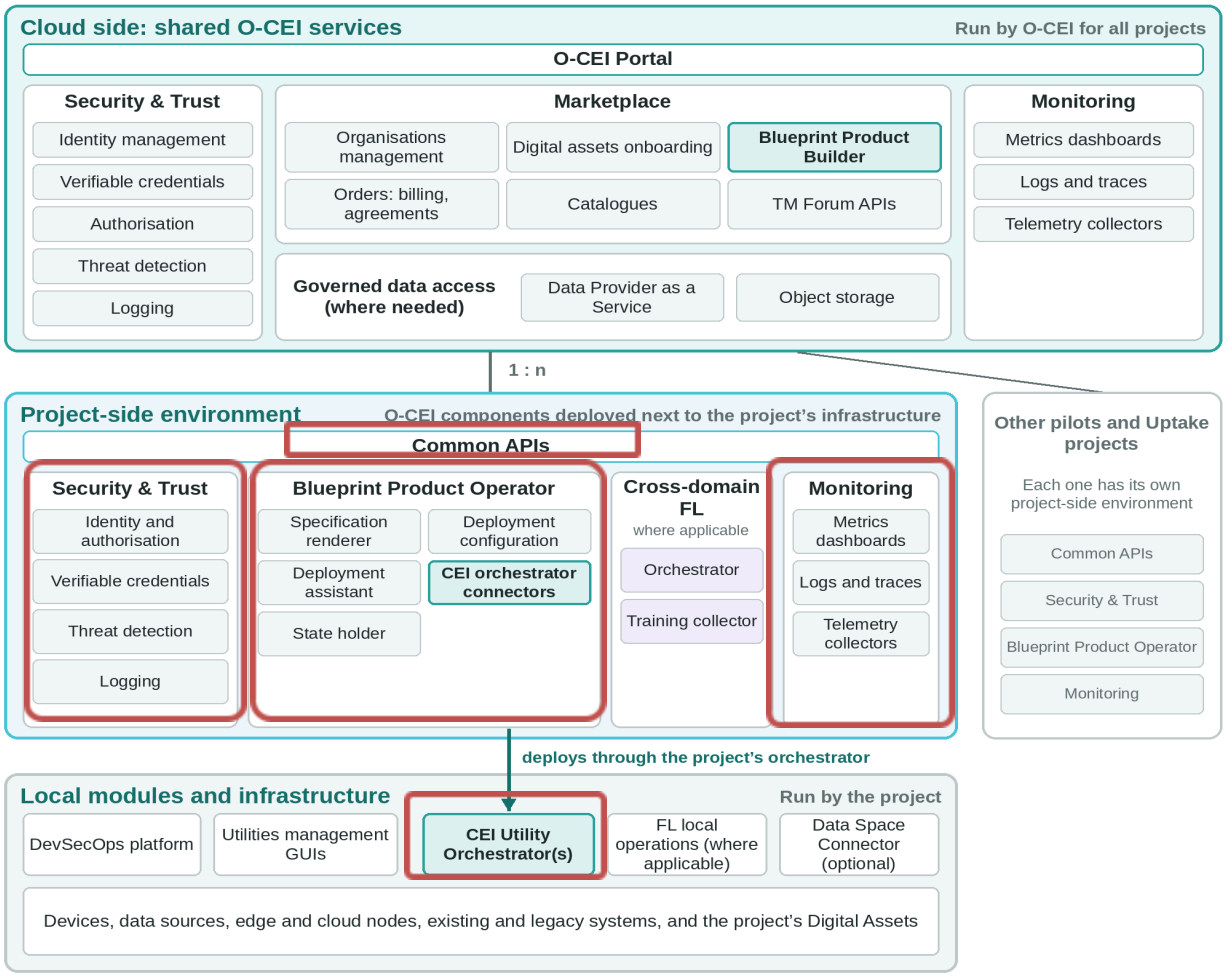


*Figure 2. Where each O-CEI component runs. Uptake projects must focus on: **Project-side environment** and **Local Models and Indrastructure**. For interpretation of the figure, consider that Uptake projects are equal to "pilots".*

The Platform itself has two sides – **shared cloud services** and a **project-side environment** – while the local modules and infrastructure of each project sit beneath them, as shown in Figure 2 of next page:

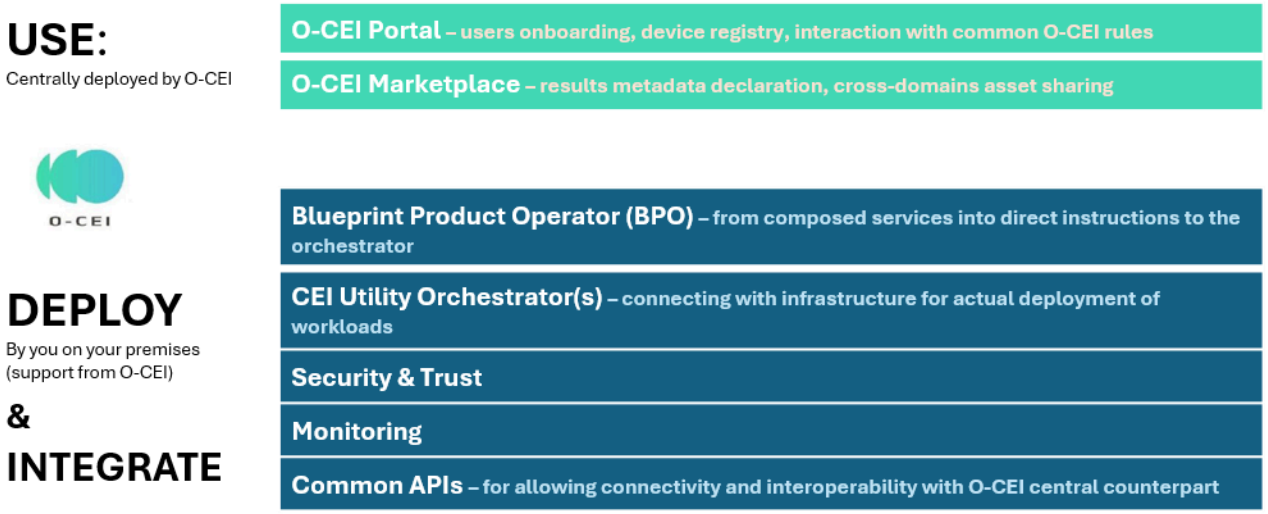
- **The cloud side**, run by O-CEI and shared by all pilots and projects: the Portal, the single entry point; the Marketplace, where Digital Assets and Blueprint Products are catalogued, published and ordered, and where the Blueprint Product Builder composes each product; Security and Trust; governed data access; and Monitoring.
- **A project-side environment** for each pilot or project, next to its infrastructure: the Common APIs, through which the cloud side reaches that environment; the Blueprint Product Operator, which coordinates deployments; local Security and Trust; Monitoring; and, where applicable, cross-domain federated learning. Execution and observability stay here.

- **The project's local modules and infrastructure**, which are not part of the O-CEI Platform: the CEI orchestrator, DevSecOps tooling, utilities management interfaces, devices, data sources and existing systems.

If the project is selected, Uptake Projects will be commissioned to use O-CEI Platform. Concretely, departing from a Layout, O-CEI Platform will then support the next stages of the lifecycle. In practical terms, the project will rely on the Layout Design, and use O-CEI Platform the Platform to:

1. register or reference the Digital Assets needed by the solution;
2. compose those assets into a Blueprint Product based on the Layout;
3. deploy and operate the Blueprint Product on the project's own infrastructure through its orchestrator, while following status, metrics and logs;
4. support exchange with O-CEI pilots and, where applicable, make a validated result available for reuse through the Marketplace.

In terms of modules, those will mean that the applicants are expected to (squared in red in Figure 2):



In addition, depending on the challenge selected and the goal of the Blueprint devised, other modules might be appropriate (e.g., Federated Learning or Data Space Connector.

More information on O-CEI Platform, how to interpret the components and a detailed technological specification can be found in the documentation available at: pending.

2 WHAT IS EXPECTED?

2.1 Uptake Project

An **Uptake Project** is an 11-month pilot project funded under O-CEI's 2nd round of FSTP **that applies the O-CEI method end to end in its own Large Scale Pilot**. In the words of the GfA, Uptake projects *"must be focused on replicability of O-CEI methodology, and whole adoption of our technologies": proposals devise a Blueprint, understand the configuration of the Layout to be deployed and comply with the O-CEI Platform tools and techniques".*

The consortium to be funded in an Uptake Project has to be composed of up to two entities: a technology or service provider, which must be an SME, and an end user. Together they cover the value chain of the use case. Use cases can extend the platform within O-CEI's six current sectors (energy, automotive, logistics, telecommunications, urban and agrifood) or open pilots in new domains; in case of ties, new domains are prioritised.

Thus, contextualising to the methodology of previous section, the proposal covers steps 1 to 3 of the lifecycle and plans step 4. For selected projects, steps 4 and 5 take place during the 11-month Support Programme, which is expected to start on 1 May 2027.

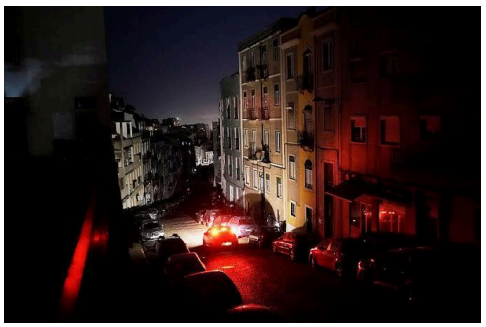
In addition, an Uptake Project must address one of the four challenges outlined in the Guidelines for Applicants, that relate to energy and are aimed at targeting EU-wide relevant current priorities.

2.2 The Challenges to be Addressed

2.2.1 Challenge # 1: Energy Blackout

Goal: Maintaining a stable and resilient power grid in case of electricity blackout

The Iberian blackout of 28 April 2025 illustrates how interconnected disturbances can trigger systemic failures. ENTSO-E attributed the outage to interacting factors, including voltage-control deficiencies, oscillations and cascading generator disconnections, recommending improved monitoring, operational coordination and data exchange[1]. In response, Spain's CNMC updated operating procedures in 2026 to strengthen dynamic voltage control and renewable participation[2].



Berlin's blackout of 3 January 2026 illustrates a different challenge: damage to high-voltage infrastructure disrupted supply to approximately 45,000 households and 2,200 businesses for several days[3]. Both cases highlight the importance of real-time monitoring, local operational autonomy and flexible energy resources during disturbances and restoration. **CEI architectures** can support these capabilities by distributing sensing, analytics and control across devices, edge nodes and cloud services.

In relation to this challenge, applicants are encouraged to envision use cases (in relevant application domains) where energy blackouts imply a real risk, and propose CEI-based implementations on how to anticipate, react or recover.

[1] ENTSO-E, "ENTSO-E Publishes Expert Panel Final Report on 28 April 2025 Blackout in Spain and Portugal", 20 March 2026: https://www.entsoe.eu/news/2026/03/20/entso-e-publishes-expert-panel-final-report-on-28-april-2025-blackout-in-spain-and-portugal/
[2] CNMC, "La CNMC aprueba modificar dos procedimientos de operación para incentivar que las renovables participen en el control de tensión", 10 July 2026: https://www.cnmc.es/en/node/421392
[3] Euronews, "Power restored to thousands of Berlin homes after attack on lines caused outage", 7 January 2026: https://www.euronews.com/2026/01/07/power-restored-to-thousands-of-berlin-homes-after-attack-on-lines-caused-outage

As a conclusion, recent power outages have highlighted the vulnerability of critical infrastructure and electricity-dependent services, reinforcing the need for distributed, intelligent and resilient energy management. Applicants are encouraged to identify use cases (in relevant application domains) where power disruptions pose significant operational risks, and propose CEI-based solutions to anticipate, respond to or recover from such events with the goal of maintaining critical operations, reducing disruption impacts or accelerating recovery.

Proposed solutions may explore predictive monitoring, early-warning mechanisms, autonomous edge operation, intelligent load prioritisation, distributed energy resource coordination or service restoration. Only for illustrative reference, applicants are encouraged to observe how O-CEI pilots tackle similar challenges, such as **Pilot 1.2** exploring edge-based voltage control at secondary substations and **Pilot 1.3**, addressing resilient positive-energy districts and islanding.

2.2.2 Challenge 2: Logistics Supply Chain Disruption

Goal: Maintain the logistics supply chains resilient during disruption to ensure continuous operational functioning (and, if applicable, mobility of goods).



The Strait of Hormuz illustrates how geopolitical disruptions can simultaneously affect energy and logistics. Following the conflict involving Iran in February 2026, daily vessel transits fell from approximately 125 to just seven by September[4]. By October, the IEA had coordinated the release of around 330 million barrels of emergency oil stocks[5], while diesel shortages, rising freight costs and disrupted routes were affecting supply chains worldwide[6].

Supply chains also face material shortages. The 2025 Nexperia semiconductor crisis threatened European automotive production[7], while Chinese rare-earth export restrictions caused production stoppages[8].

Together, these events demonstrate how disruptions in energy, transport and components can propagate across interconnected value chains. **Supply-chain resilience therefore requires continuous visibility, early disruption detection and coordinated responses** across logistic hubs, production facilities and operators. CEI architectures can support these capabilities through distributed monitoring, analytics, information exchange and adaptive operational decisions, including energy flexibility.

Therefore, applicants targeting this challenge must focus on interconnected logistics supply chains and the need for greater operational visibility, adaptability and coordination. Concretely, applicants are encouraged to identify use cases where supply-chain disruptions pose significant operational risks, and propose CEI-based solutions to anticipate, detect and respond to such events, minimizing impact on the continuity of operations. Only for illustrative reference, **Pilot 4** of O-CEI faces logistic chain disruptions when vessels arrive to Malta island with large energy requirements affecting operational environment.

2.2.3 Challenge 3: Distributed Ledger Technologies (DLT)

Goal: The awarded project must include DLT utility(ies) in its layout and substantially demonstrate market acceptance departing from a LSP in the declared targeted sector.

Recent EU initiatives are increasing the need for trusted information exchange across organisations. In July 2026, the European Commission launched the Digital Product Passport (DPP) Registry, supporting decentralised product information and interoperable identifiers[9]. From February 2027, electronic

[4] Reuters, "Hormuz shipping traffic in single digits, data shows", 10 September 2026: https://www.reuters.com/world/middle-east/hormuz-shipping-traffic-single-digits-data-shows-2026-09-10/
[5] IEA, "IEA Governing Board statement on energy markets and security", 15 October 2026: https://www.iea.org/news/iea-governing-board-statement-on-energy-markets-and-security
[6] IEA, *Oil Market Report – October 2026*: https://www.iea.org/reports/oil-market-report-october-2026
[7] ACEA, "ACEA calls for quick resolution to critical chip supply shortage", 16 October 2025: https://www.acea.auto/press-release/acea-calls-for-quick-resolution-to-critical-chip-supply-shortage/
[8] CLEPA, "Urgent action needed as China's export restrictions on rare earths disrupt European automotive supply chains", 4 June 2025: https://www.clepa.eu/insights-updates/press-releases/urgent-action-needed-as-chinas-export-restrictions-on-rare-earths-disrupt-european-automotive-supply-chains/
[9] European Commission, "The Digital Product Passport Registry is now live", 20 July 2026: https://single-market-economy.ec.europa.eu/news/digital-product-passport-registry-now-live-2026-07-20_en

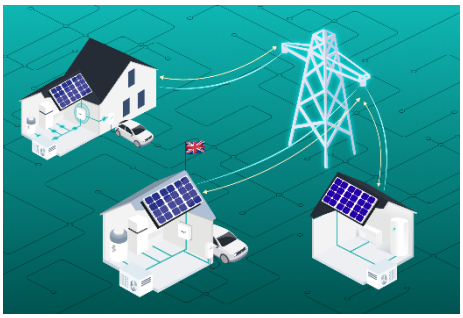
battery passports will become mandatory for electric-vehicle batteries, light-means-of-transport batteries and industrial batteries above 2 kWh[10]. Meanwhile, EU electricity-market reforms establish rights to energy sharing for households, SMEs and public bodies[11], complemented by Commission recommendations supporting energy communities and self-consumption[12]. Both developments involve multiple stakeholders exchanging and verifying information across organisational boundaries.

Distributed Ledger Technologies **(DLTs)** can support **trusted, tamper-evident records and verification** without relying on a single universally trusted operator. Potential applications in energy-related scenarios include battery lifecycle traceability, energy-sharing transactions or flexibility-service settlement, among others. However, neither DPP nor energy sharing inherently requires DLT, which opens a substantive research field. Within O-CEI, **Pilot 7** uses Hyperledger Fabric to record V2G charging events and support revenue settlement through smart contracts. **Pilot 1.3** explores ledger-supported energy trading in the Krk energy community, with Hyperledger Besu under assessment. Both illustrate opportunities for DLT-enabled trust and coordination across distributed energy ecosystems.

Thus, DLT at large in energy is the focus of this challenge, responding to the growing need for trusted information exchange and coordination among independent stakeholders. Applicants are encouraged to identify use cases across relevant application domains where DLT-based solutions supported by CEI architecture can improve trust, transparency or other DLT-enabled traits in operations such as energy-sharing transactions, flexibility-service verification or battery lifecycle traceability, among others. The challenge particularly encourages solutions that demonstrate **the added value of DLT over conventional data-management approaches**, emphasizing market acceptance of such technologies.

2.2.4 Challenge 4: Virtualisation and Home Energy Management Systems

Goal: Strengthening technological sovereignty and resilience through open-source virtualisation stacks, enabling greater control over critical energy infrastructure.



Recent reports highlight worrisome technological dependencies in critical energy infrastructure. In 2025, undocumented communication devices were reportedly found in Chinese-made inverters, raising remote-access concerns[13]. In 2026, EU introduced funding restrictions involving high-risk inverter suppliers[14][15].

Open-source virtualisation offers an alternative to vendor dependence. For instance, LF Energy's SEAPATH enables virtualised substation functions, adopted by French operator RTE to improve transparency and control[16], while others exist that align with the sovereignty-oriented EU statements such as OSS, Cyber Resilience Act or Energy Smart Appliances initiative.

However, open source does not inherently guarantee security or sovereignty: vulnerabilities, HW dependencies, real-time performance and operational continuity remain critical. Within O-CEI, **Pilot 1.2** virtualises substation functions using K3s and OpenNebula; **Pilot 7** uses ECLIPSE aeriOS and OpenNebula for on-premises virtualization and orchestration .

Applicants are encouraged to propose CEI-based solutions **using open-source virtualisation and interoperable interfaces** to strengthen technological sovereignty, cybersecurity and resilience in energy applications, such as substations, EV charging infrastructure and Home Energy Management Systems (HEMS).

[10] Regulation (EU) 2023/1542 concerning batteries and waste batteries, Article 77: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023R1542
[11] Directive (EU) 2024/1711, Article 15a, Right to energy sharing: https://eur-lex.europa.eu/eli/dir/2024/1711/oj/eng
[12] Commission Recommendation (EU) 2026/1007 of 30 April 2026 on supporting energy communities and maximising self-consumption: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32026H1007
[13] Reuters, "Rogue communication devices found in Chinese solar power inverters", 14 May 2025: https://www.reuters.com/sustainability/climate-energy/ghost-machine-rogue-communication-devices-found-chinese-inverters-2025-05-14/
[14] IEA, "Inverter supply chains and cybersecurity", 29 July 2026: https://www.iea.org/commentaries/inverter-supply-chains-and-cybersecurity
[15] Euronews, "EU Commission rejects calls to delay phase-out of Chinese power inverters", 23 September 2026: https://www.euronews.com/2026/09/23/eu-commission-rejects-calls-to-delay-phase-out-of-chinese-power-inverters
[16] LF Energy, "What Do Virtualization and SEAPATH Really Change for RTE?", 26 February 2026: https://lfenergy.org/what-do-virtualization-and-seapath-really-change-for-rte/

2.3 In/Out Scope Screening Requirements For Each Consortium

The In/Out Scope Screening consists of reviewing the overall summary/general objectives of all proposals included in the 'List of Eligible Applications' to evaluate the following items:

1. **Scope**. The objectives of the proposal must fit within one out of the four challenges described in Section 1. Details of those challenges (and expectations) can be found above.
2. **(a) Demonstrable evidence of track and capacity** to execute the action. Here, the Selection Committee will qualitatively and quantitatively assess whether a Consortia conveys enough track record and demonstrable evidence of capacity to properly tackle the selected challenge. Aspects such as previous innovation experiences solving assimilable situations, as well as infrastructure and impact outreach means will be considered.

   OR

2. **(b) Open Source critical mass.** All applicants must demonstrate their link to an active EU Open Source community which mature open source project that is relevant, and operates, in their selected field and challenge (for instance: ECLIPSE SDV, Catena-X, LF Energy, EOSC, OpenSSF...). This engagement must include, at least, alignment, cooperation and contribution with a sizable community.

3. **European Dimension.** The project should have a European dimension as it is described in the ground rules and formal requirements of Section 1 of this document.

A "Yes/No" approach will be used to assess those criteria, and non-compliant proposals will be rejected.

Each proposal will be reviewed by one partner from the Selection Committee (other than FBA) and, once reviewed, the Selection Committee will generate an *'In Scope List'*.

2.4 Technical Expectations of an Uptake Project Application

Apart from addressing one of the challenges above, every Uptake Project will abide by the following mandatory requirements (pre-requisite to be eligible):

- The application **must conform a Large Scale Pilot**. Here, it is important to justify that the experiment has wide impact and a relevant scale in numbers (e.g., data, # of assets, maturity...).
- The consortium of the two entities **constitutes a value chain** to solve the problem. The role of each partner must be justified with demonstrable complementarity.
- Energy flexibility is pivotal. The applicants must dig deep into the **energy implications of their solution**, including what provides to the community and how to quantify its impact.
- The consortium guarantees and justifies that the necessary data, equipment and its own Cloud-Edge-IoT distributed infrastructure exist and are available before the start of the actions. The application must include details on the equipment and data sources (format, granularity, access rights) and nodes (capacity, connectivity, who operates them)
- **Applicants declare a Blueprint** following the O-CEI methodology. Using the LayoutStudio provided by O-CEI Consortium, a one-pager must be created. * Note that if the applicant targets Challenge #3, this requirement does not apply, since they will follow an existing blueprint.

- The **application must include a Layout** following the O-CEI methodology (using again the LayoutStudio) and include the result in the application. This includes functional blocks, their placement across devices, edge and cloud, and what is new versus existing.
- The Layout above must include, at least, **one Edge-Cloud orchestrator.** Such must be understood as a software that deploys and manages applications across the project's nodes over frameworks such as Docker, Kubernetes... O-CEI project offers several options among which the applicant may select. If none of those adjusts to the neds of the Uptake Project, the proposing consortium can determine the use of their own software as Edge-Cloud orchestrator (note: this will entail larger integration/development efforts).
- During the project, the consortium must: (i) compose Blueprint Product with the Platform and (iii) deploy any operational services (e.g., algorithms, software, data processing, AI models...) **using O-CEI Platform** on the Uptake Project's infrastructure.
- The work plan must include an activity to exchange data, models, software or knowledge, in a cross-domain fashion, with at least one O-CEI pilot.
- After identifying the exploitable result, the application must include a **preliminary market analysis**, with a feasibility assessment for the exploitation of the result (note that this must be well described and justified in the Impact section of the online application).
- The consortium reserves resources, such as a task or a deliverable, for **feedback towards O-CEI Platform refinement**. O-CEI solution will be used, and Uptake Projects will contribute to improve it by reporting what was used, what worked and what blocked progress. Surveys, interviews or webinars will be promoted by O-CEI project.
- The work plan must **include a benchmark performance exercise** chosen by the applicants. The benchmark can be fixed/refine during Stage 1 (Individual Mentoring Plan). It must include comparison against a baseline: indicators, baseline, method and timing (depending on the challenge addressed and the indicators to be observed).

The process is designed to allow for a **maximum of 75 proposals to pass this Selection Committee Analysis**.

3 DEVISING A BLUEPRINT AND DEFINING THE CONTEXT

A **Blueprint** states an energy-related target and how Cloud-Edge-IoT technologies can reach it, without tying it to one site, vendor or product. A Blueprint:[17]

- declares a clear energy-related target to be solved by CEI technologies. In the context of Uptake Projects, a clear alignment of the proposed case, the challenge addressed and the crucial elements present is expected.
- names the key technologies and hardware, the strategic decisions and the standards involved;
- uses simple language, without specific implementation tools or business logic;
- can be reused in other scenarios and even in other domains.

It fits on a one-page template with four blocks: Target Declaration, Technical Elements, Strategic Conditions and Decisions, and Standards & expert references. O-CEI provides a tool for creating your own Blueprint. Manual and details on how to use it are at this page: O-CEI Layout Studio Lite: User Guide

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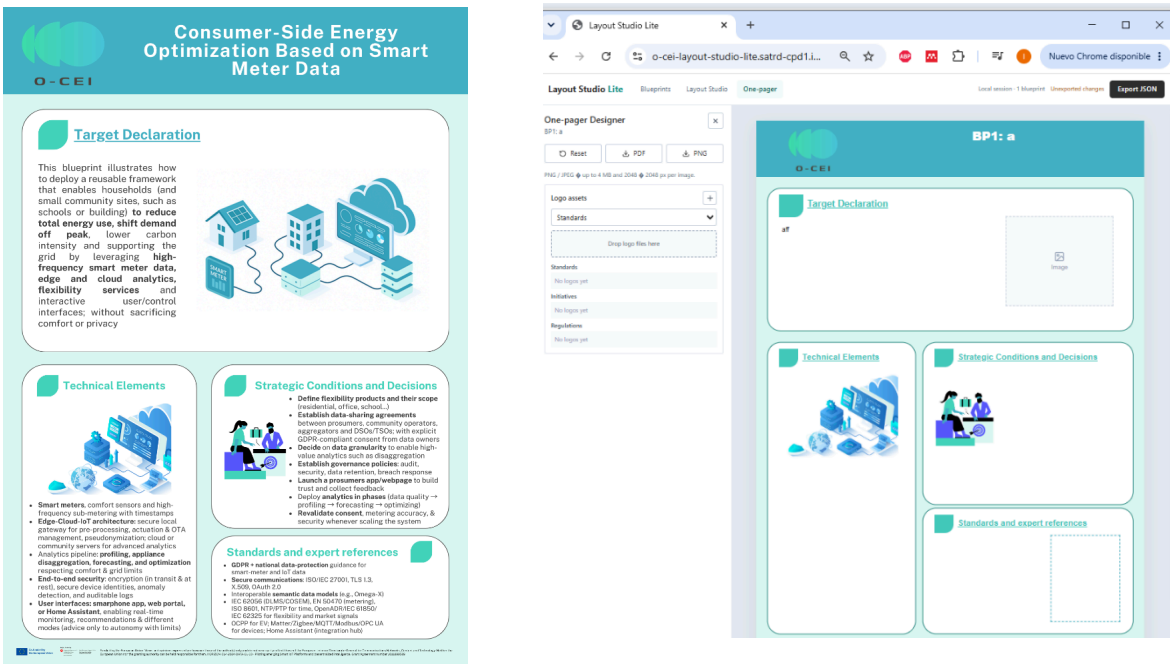


Figure 3. A real Blueprint one-pager: BP1, Consumer-Side Energy Optimisation Based on Smart Meter Data.

The **Context** describes where the Blueprint will run and explains why the same Blueprint can lead to different designs. In Uptake Projects, this is the place where the "description of pilot premises and conditions" will be expected. Particularly, it must include the following aspects:

- Domain, location and actors of the value chain
- Data sources: granularity, models, protocols, quality, availability
- Available infrastructure: devices, edge, cloud, network, storage
- Regulatory and legal aspects, including national ones
- Business and operational constraints: legacy systems, processes, scale, investment capacity

4 DESIGNING A LAYOUT

The **Functional Layout** turns the Blueprint and the Context into a technical design. O-CEI does not impose a notation, but every Layout should:

- specify the functional blocks and what each one does;
- show where each component runs: on IoT devices, at the edge or in the cloud;
- distinguish new software utilities from the existing or legacy platforms they integrate with.

A Layout is a visual artefact that represents the tools that are needed (to be integrated/combined) to solve a Blueprint case. Figure 3 shows a real Layout (for solving BP3 in Pilot 3 of O-CEI), made with LayoutStudio. Note that nothing is deployed by Layout Studio Lite itself. Its role is to make the design clear enough to support the proposal and the later implementation work.

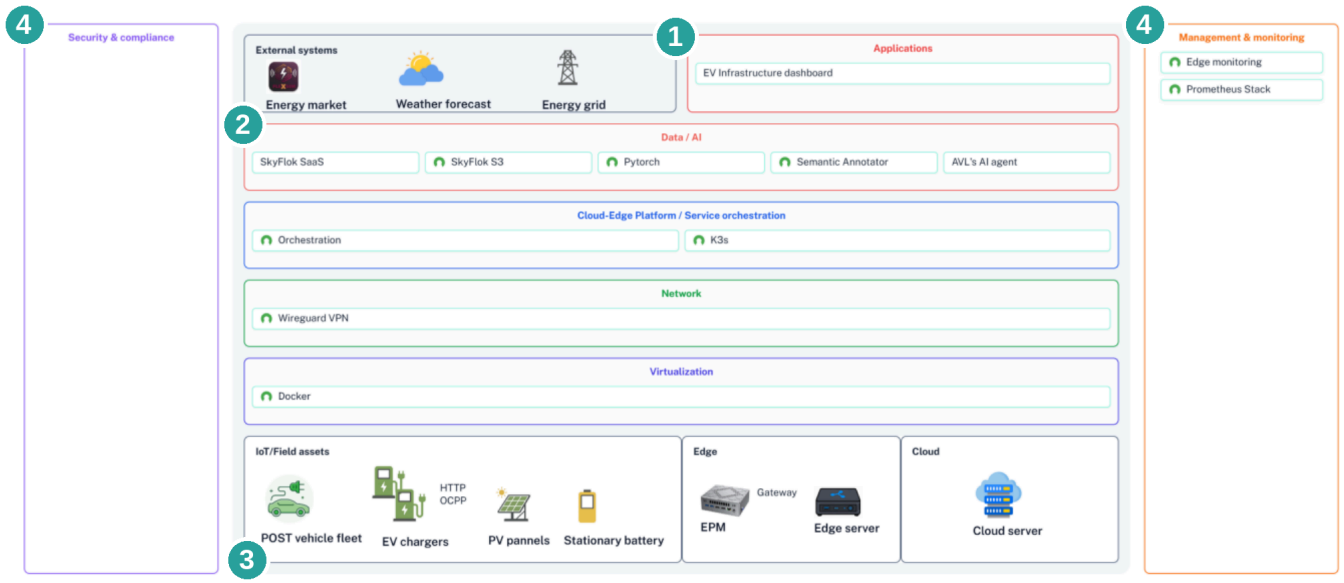


Figure 3. A real Functional Layout made with LayoutStudio: to realise BP3 in Pilot 3 of O-CEI.

Applicants must complete a Layout using the tool provided by O-CEI partners (LayoutStudio Lite), following the O-CEI methodology and including the result in the application. Manual and details on how to use it are available at this page: O-CEI Layout Studio Lite: User Guide.

The Layout completed can combine legacy or pilot-specific tools, external systems, software from O-CEI partners and open-source de facto standards. In the O-CEI pilots, each selected software utility is described and justified, stating **whether it is open source** and what it depends on; **proposals should do the same**. If a tool is not chosen yet, the proposal should name the capability needed and when the choice will be made.

The rules to bear in mind for completing a Layout (before exporting it and adding to the application) are:

- There is no need to "drop" (i.e., add/declare) a tool/technology per each of "boxes" of the diagram. The boxes represent building blocks as defined by the working group of TF3 in EUCEI.
    - The only mandatory box is: "Cloud-Edge Platform / Service orchestration".
- However, proposals will be evaluated observing the Layout as a whole, analysing whether the included utilities would suffice to perform the blueprint defined by the applicants.

- Note that O-CEI partners have developed a series of utilities falling under many categories. Those can be explored in O-CEI Marketplace. There is no obligation to use any of those.

4.1 Selecting an Orchestrator

An **orchestrator** is the software that installs, updates and removes applications on devices, servers and cloud nodes. The O-CEI Platform does not deploy software by itself: its Blueprint Product Operator instructs the project's orchestrator.

The Layout must include at least one Edge-Cloud orchestrator. It is important to note that, as per O-CEI Platform, an orchestrator is useful only when accompanied by a BPO (Blueprint Product Operator), which is in charge of decomposing the Bluieprint Product in atomic operations (commands) to instruct the orchestrator on how to deploy the software workloads.

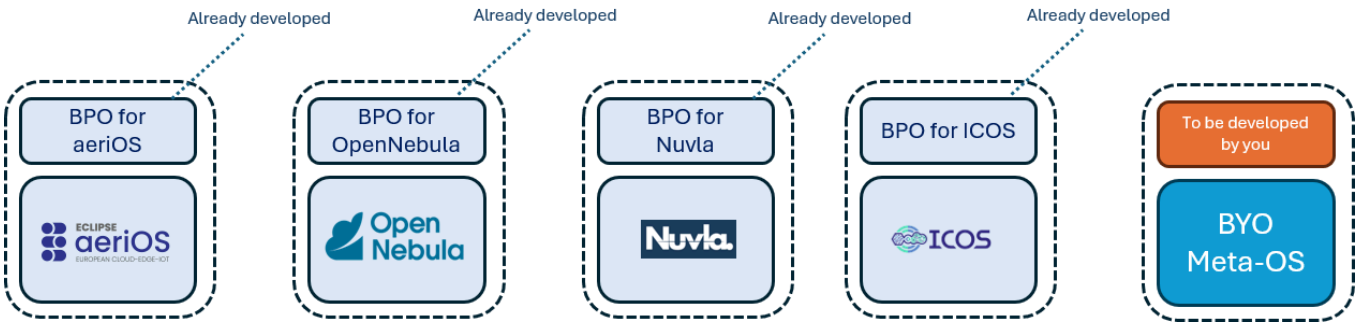


Figure 4. Available orchestration options

As visible in Figure 4 above, the applicant is free to select an orchestrator coming from O-CE (ECLIPSE aeriOS, Nuvla, OpenNeblula and ICOS) or to propose their own orchestrator (in Figure 4 above, "*BYOD Meta-OS*"). If the latter is preferred, the applicant must bear in mind that they will need to develop their own BPO (whereas for the former 4 options, a BPO already exists and is being tested in various O-CEI pilots). The proposal should name it, show where it runs and explain why it suits the infrastructure.

4.2 Cross-Domain: Exchanging Data with O-CEI Pilots

Uptake Projects must plan an exchange with at least one O-CEI pilot, acting as provider, consumer or both. The O-CEI Marketplace provides the common entry point: providers publish their Digital Assets and describe their access conditions, and consumers discover and acquire them. The data itself is accessed outside the Marketplace, through the access pattern that best fits the resource, its update frequency and the level of control that the provider needs to retain.

Three access patterns are defined, and the proposal should indicate, for each asset, the pattern foreseen and whether the Uptake Project acts as provider or consumer:

- Reference or direct delivery: The provider publishes a download, link or repository reference in the Marketplace, allowing consumers to obtain a local copy. Suitable for static resources, but provider control is limited after delivery and copies are not automatically updated.

- Managed provisioning (Data Provider as a Service): The provider uploads the dataset to the O-CEI Platform, which stores it and enforces access conditions. Suitable for static or periodic datasets, without requiring provider-side deployment.

- Provider-served exchange (Data Space Connector): The resource remains with the provider, accessible through an API, service or event stream using configured credentials. Suitable for live

or frequently updated resources requiring provider control. A provider-deployed Data Space Connector enables runtime access policy enforcement when needed.