2026 — LIFE-SHIELD – Strategic Hazard-based Infrastructure Exposure and Long-term climate aDaptation

Country	Contract value (€)	% by Epsilon	Staff # provided	Client	Origin of funding	Date (start/end)	Consortium Members
EU-27	**€2.12 M** (EU grant)	**11.15%** (€235,935.00)	3 (35 PM)	EC (CINEA)	LIFE Programme (CCA)	48 months (start TBC)	POLIBA (Coord.), CNR, INGV, RINA, Oritia & Boreas, EPSILON, Ports of Genoa, Patras, Algeciras

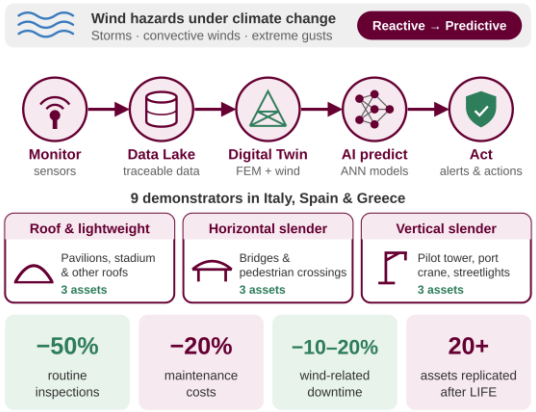
The Project (2026)

Context

Coastal, urban and port infrastructure across Europe is increasingly exposed to *storms, convective winds and extreme gusts* under climate change, yet its management remains largely reactive, relying on scheduled inspections, precautionary restrictions and post-event interventions.

Objective

Proposed to Integrate and validate a *Climate Adaptation Toolkit* that turns monitored wind conditions and structural responses into infrastructure-specific procedures for inspection planning, *predictive maintenance*, preparedness and operational decision-making, while final decisions remain with infrastructure owners.



Climate Adaptation Toolkit

- **Monitoring & data:** permanent environmental and structural sensor networks feeding a traceable Data Lake.
- **Digital Twins:** asset-specific, physics-based FEM models with wind–structure interaction and uncertainty-aware reduced-order methods.
- **AI prediction:** Artificial Neural Network modules, operational thresholds and alerts on a common Digital Platform.
- **Adaptation procedures:** infrastructure-specific workflows linking monitored wind and structural response to inspection, maintenance and preparedness actions.

Demonstration

Nine wind-sensitive assets in Italy, Spain and Greece were proposed in the proposal covering three structural typologies: roof and lightweight structures, bridges and pedestrian crossings, and vertical structures such as a pilot tower, a port crane and streetlights, including the ports of Genoa, Algeciras, Patras and Kyllini.

Expected results

Performance was targeted to be quantified through KPIs, LCA, LCC and CBA, targeting **50% fewer routine inspections**, **20% lower maintenance costs** and **10–20% less wind-related downtime**, with replication to **≥20 more infrastructures** after the project. Deliverables include nine monitoring systems, nine Digital Twins, nine adaptation procedures and a validated replication methodology.

Services to be provided by EPSILON

EPSILON is a technical partner responsible for **impact assessment, exploitation and replication**. It **leads WP6 and WP8**, contributes to all other work packages and leads demonstration activities in Greece, with **35 person-months** of effort, drawing on its expertise in environmental assessment, LCA, geomatics and EU research projects.

Impact assessment, KPIs & sustainability (WP6, M1–M48)

Harmonised KPI framework and baseline for all nine demonstrators (T6.1); Life-Cycle Assessment, Life-Cycle Costing and Cost–Benefit Analysis comparing reactive and monitoring-informed management (T6.2); final impact evaluation aligned with LIFE KPIs (T6.3).

Exploitation, replication & After-LIFE (WP8, M7–M48)

Market and user-needs analysis, competitor assessment and business model for the Toolkit (T8.1); service packages, pricing and licensing principles, IP and governance, including a possible EEIG (T8.2); After-LIFE strategy for replication to at least 20 additional infrastructures through service packages, training and sustainable deployment models (T8.3).

Demonstration (WP3, WP5)

Leads deployment of the 24-sensor monitoring network on the streetlights of the Port of Kyllini and coordinates their operational validation; supports validation of the Patras port crane.

Project governance (WP1–WP2)

Participates in consortium coordination and risk management, and in the definition of requirements and baselines for the nine demonstrators across Italy, Spain and Greece.

Digital integration & communication (WP4, WP7)

Integrates impact-assessment datasets and KPI management into the LIFE-SHIELD Digital Platform; supports communication on exploitation and market uptake, workshops and training.

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