

## OBJECTIVES



**Simplification & Automation** O1: Reduce Edge-Cloud Setup and Management Time



**Data-compute-network Orchestration** O2: Optimize Edge-Cloud Operation via a privacy-preserving data-compute-network orchestration



**Security & Privacy Preservation** O3: Provide automated, privacy preserving secure management for multi-clusters



**Openness & Greenness** O4: Support multi-domain Edge Cloud operations integrating openness and greenness



**Broad Impact** O5: Build a consolidated eco-system appealing to the different CODECO stakeholder groups

## PROJEKT INFORMATION

**Start Date:** 01. January 2023  
**End Date:** 31. December 2025  
**Project ID:** 101092696  
**Programme:** Horizon Europe  
**Keywords:** Edge, Cloud, Kubernetes, orchestration, IoT, federated Learning, data, network, computation

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CODECO  
Website



CODECO  
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## PARTICIPANTS

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Affiliated Entities: City of Göttingen, ATOS IT, Universidad Carlos 3 de Madrid

## SOCIAL MEDIA



# CODECO

Cognitive Decentralised  
Edge Cloud Orchestration

**CODECO PROJECT**  
A novel Edge-Cloud orchestration framework, focusing on data-compute-network



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## ABSTRACT

The overall aim of **CODECO** is to contribute to a smoother and more flexible support of services across the Edge-Cloud continuum via the creation of a novel, cognitive Edge-Cloud management framework. To achieve this aim, **CODECO** proposes a unique, smart, and cross-layer orchestration between the decentralised data flow, computation, and networking services, to address Edge-Cloud challenges derived from the rising Internet and IoT service decentralisation.

**CODECO** shall develop an ecosystem consisting of open-source toolkits, large-scale experimentation, training tools and events, use-cases across 4 vertical domains (Smart Cities, Energy, Manufacturing, Smart Buildings), multiple events integrated into a unique Innovation and Research Community Engagement Programme.

The **CODECO** consortium comprises a total of 16 partners across Europe and its associated states Israel and Switzerland. The consortium partners represent several types of organizations, ranging from **SMEs** with a focus on open-source software and innovation management (Inova Mais, Eclipse Foundation, Almende); renowned **universities** (University of Göttingen, Universidad Politecnica de Madrid, University of Piraeus research Center) and **research institutes** (fortiss, I2CAT, ATH-ENA); **large companies** (ATOS, Telefonica, Siemens, Intracom-Telecom, RedHat, Netsoft-Intrasoft, IBM).

## KERs (Key Exploitable results)

- A1 Open, cognitive toolkits and smart Apps,** integrating the elastic and advanced concepts to manage, in a smart and flexible way, containerized applications across Edge and Cloud dynamic-cluster and multi-cluster environments.
- A2 Open-source Eclipse repository.** A developer-oriented Eclipse open-source software repository, to be available in an early stage of the project, thus allowing for early exploitation of initial, advanced results and a better adaptation throughout the project lifetime.
- A3 Training Database.** Training tools and events, to support the development of services based on the CODECO framework.
- A4 Edge-Cloud Use-cases.** 6 Use-cases across 4 domains (Smart Cities, Energy, Manufacturing, Smart Buildings), to be deployed in operational environments.
- A5 R&I Engagement Programme.** Research and Innovation Community Engagement and multiple community events, based on the different use-cases and including different CODECO stakeholders.
- A6 Open Experimental Framework.** CODECO framework integration into the large-scale EdgeNet4, experimental infrastructure, to assist in the building of experimentation and novel concepts by the research community.

## USE CASES

- P1 Smart Monitoring of the Public Infrastructure (Smart Cities)**
  - Goal: Smart monitoring of e.g., road status, traffic congestion
  - Value-proposition: Improved Quality of Experience of the citizen
- P2 Vehicular Digital Twin for Safe Urban Mobility (Mobility)**
  - Goal: vehicular digital twin for safe urban mobility
  - Value-proposition: Increased road safety
- P3 Media Delivery Streaming across Decentralized Edge Use-case (Smart Cities)**
  - Goal: Resource-efficient usage via context-aware selection of MDS points
  - Value-proposition: Optimized Edge-Cloud and networking for MDS
- P4 Collective Demand Side Management in Decentralized Grids (Energy)**
  - Goal: Smart monitoring of the energy generation, consumption, storing and availability
  - Value-proposition: Improved energy management based on Edge computing
- P5 Decentralized, Wireless AGV Control Flexible Factories (Manufacturing)**
  - Goal: Decentralized ML/AI to assist energy reduction based on network adaptation
  - Value-proposition: Increased AGV autonomy and scalability via decentralized wireless control
- P6 Smart Buildings (Energy)**
  - Goals: Smart management of Crownstone meshes and their distributed applications
  - Value-proposition: flexible far Edge to Cloud data processing