EU CONEXUS
European University for Smart Urban Coastal Sustainability

Co-funded by the European Union

Innovation Contest 2025 Challenges

Challenge #1: Coastal Resilience and Climate Adaptation

Topic: Innovative Solutions for Coastal Flooding, Erosion, and Sea-Level Rise

Objective:
Develop **smart technologies and nature-based solutions** to protect coastal cities from the impacts of **climate change**, including rising sea levels, storm surges, and erosion. The proposed solutions should address both short-term risks (e.g., flood barriers, early warning systems) and long-term sustainability (e.g., living shorelines, urban planning).

Key Areas to Explore:
- Smart flood detection and response systems (IoT sensors, AI-based prediction models)
- Nature-based coastal defences (e.g., artificial reefs, wetland restoration)
- Adaptive urban infrastructure and zoning policies for flood-prone areas

Expected Outcomes:
- Prototypes of smart devices or platforms for early flood warnings
- Policy recommendations for integrating coastal resilience into urban planning
- Demonstration projects in local coastal areas

Challenge #2: Sustainable Coastal Tourism

Topic: Transforming Coastal Tourism into a Green and Digital Experience

Objective:
Design innovative solutions to **reduce the environmental impact of coastal tourism** while enhancing visitor experiences through **digitalization** and **sustainability practices**. Solutions should benefit both local economies and ecosystems, particularly in high-traffic coastal destinations.

Key Areas to Explore:
- Smart tourism platforms promoting eco-friendly businesses and activities
- Digital tools for monitoring the environmental footprint of tourism
- Gamified solutions to educate tourists on coastal conservation

Expected Outcomes:
- Mobile apps/platforms to promote green tourism options
- Interactive visitor engagement tools for promoting responsible tourism
- Business models for sustainable tourism services

Challenge #3: Blue Circular Economy in Coastal Cities

Topic: Turning Coastal Waste into Valuable Resources

Objective:
Propose **circular economy solutions** to manage **marine and coastal waste**, such as **plastic pollution**, **wastewater**, and **biomass** from the sea. The solutions should aim to **close resource loops** and **boost local economies** through innovation in waste management, recycling, and upcycling.

Key Areas to Explore:
- Smart waste collection systems and recycling technologies
- Upcycling marine litter into new products (e.g., textiles, building materials)
- Bio-based innovations using seaweed or marine biomass

Expected Outcomes:
- Pilot projects for coastal waste upcycling
- Business cases for circular economy solutions
- Public awareness campaigns on coastal waste management

Challenge #4: Smart Coastal Mobility and Logistics

Topic: Decarbonizing Urban Mobility in Coastal Areas

Objective:
Create **sustainable mobility solutions** to address **transportation challenges** unique to coastal cities, such as **port logistics**, **tourist traffic**, and **ferry services**. Solutions should focus on **reducing emissions**, improving **public transport**, and enhancing **last-mile connectivity** in urban coastal settings.

Key Areas to Explore:
- Smart port and ferry systems for reducing emissions and congestion
- Shared, electric, and autonomous mobility solutions for coastal cities
- Digital platforms for optimizing coastal urban logistics

Expected Outcomes:
- Prototypes of smart mobility solutions (e.g., apps, devices)
- Feasibility studies for sustainable urban logistics systems
- Policy recommendations for decarbonizing coastal transport

Challenge #5: Digital Twin Solutions for Coastal Urban Planning

Topic: Developing Digital Twins to Enhance Urban Coastal Sustainability

Objective:
Develop **digital twin solutions** for coastal cities to improve **urban planning**, **disaster**

preparedness, and **resource management**. Digital twins should integrate **real-time data** from **sensors**, **satellites**, and **citizen inputs** to create dynamic, virtual representations of coastal cities.

Key Areas to Explore:
- Smart infrastructure monitoring (e.g., sea walls, bridges, ports)
- Simulations for climate adaptation scenarios (e.g., flooding, heatwaves)
- Citizen engagement through digital twin platforms

Expected Outcomes:
- Functional digital twin models for pilot cities
- Recommendations for integrating digital twins into city governance

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Challenge #6: Solutions for preventing and fighting forest fires

Topic: Finding new ways of fighting forest fires

Objective:
Develop **solutions** for new ways and methods to prevent and fight forest fires also for areas lacking enough water support with inaccessible areas and limited resources.

Key Areas to Explore:
- Environmentally friendly methods of rain induction to combat drought
- Creating new firefighting chemicals for extended use in the environment in case of fire
- Environmentally friendly methods to increase composting of dry leaves, with special emphasis on dry pine needles, at the point of deposition (forests)

Expected Outcomes:
- New ideas and methods for preventing and fighting forest fires
- Innovative strategies on warning systems

Additional topics may be:
- Environmentally friendly methods to reduce water pollution from oil products in the event of an accident
- New ways of sea water desalination for drinking water production
- Biodegradable, smart nets to reduce the impact of overfishing on the environment