PAAD Lite: Recyclable Modular Buoys for Coastal Erosion Control, Water Filtration, and Adriatic Coast Intelligence Monitoring

Sector: Other - Circular blue economy / Marine manufacturing & shipbuilding

Short description of the needs:

Moxà Design proposes PAAD Lite: low-profile floating buoys (ø1.8 m, 80 kg) with custom embedded electronics designed to address coastal erosion (+7 cm sea level rise projected by 2050), bacterial and nutrient pollution, and toxic algal blooms (Ostreopsis) along the Adriatic coasts.

The buoys, positioned 80 m offshore (with zero interference to navigation), integrate:
(i) a ballasted skirt for sediment capture (+20 cm beach accretion in 6 months),
(ii) passive bioreactors using native macroalgae to absorb nitrogen and phosphorus,
(iii) custom solar-powered LoRaWAN monitoring units (1 unit every 5 buoys), designed by Moxà, measuring pH, turbidity, temperature, and dissolved oxygen, with a real-time dashboard for municipalities.

A 10-buoy pilot prototype costs €11k, requires 1 day for installation, and annual maintenance. Testing is planned on an eroded beach (e.g., Lido di Volano).

We are seeking Adriatic partners (coastal municipalities, marine biologists, Croatian shipyards, aquaculture operators) for:
• bioreactor co-design
• at-sea testing
• LCA and circular KPI validation
• pilot demonstrator deployment.

Moxà Design (www.moxa-design.it) specializes in robotics, custom electronics design, mechanical engineering, embedded electronics manufacturing, and industrial automation.
Core competencies include electronic control units for harsh environments (IP68), custom sensors, LoRaWAN/BLE communication, PCB prototyping, real-time firmware, and low-power solar-powered systems.

PAAD Lite leverages this expertise in custom electronics for harsh marine environments, combined with precise mechanical design, to address urgent Adriatic challenges such as coastal erosion and water quality degradation.

The custom sensor unit integrates:
• 10 W solar panel

- LiFePO4 battery
- 4 environmental sensors
- LoRaWAN communication

The system is fully designed and manufactured in-house.
An electronic prototype can be ready within 3 weeks.

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Company position in the value chain: Technology Developer + Tier 1 Advanced Manufacturing Service Provider (OEM/Tier 1).