

# AI4 WASTE

FOSTERING AWARENESS AND INNOVATION IN ADULT EDUCATION

2023-2-PT01-KA210-ADU-000184346

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**AI4WASTE – Fostering Awareness and Innovation in Adult Education** is a 15-month transnational project (March 2024 – May 2025), developed in partnership between organizations from Portugal, Spain, and Türkiye, funded by the Erasmus+ Programme (KA210-ADU – Small-scale Partnerships in Adult Education).

The project responds to two major challenges of our time: the need for digital transformation and the urgent demand for sustainable waste management.

As Europe advances toward a circular economy and strengthens its climate action commitments, the integration of Artificial Intelligence (AI) into environmental services— particularly waste management— offers new opportunities for innovation and efficiency. However, to ensure a fair and inclusive transition, it is essential that adult learners, professionals, educators, and decision-makers are equipped with the right knowledge and skills to understand and apply these technologies.

**AI4WASTE** was created to bridge this gap, by providing practical, accessible, and engaging learning tools that support the use of AI in building smarter, cleaner, and more sustainable waste systems.

# Objectives
# of the Project

- **To increase knowledge and understanding** of AI technologies and their potential applications in waste management among adult learners, professionals, municipalities, and local communities.
- **To enhance the skills** of adult learners and waste management technicians through training programs focused on digital tools, AI models, and real-world environmental data usage.
- **To foster international collaboration** between organizations in Portugal, Spain, and Türkiye through the exchange of experiences, best practices, and learning models related to waste management innovation.
- **To spread the outcomes** and key learnings of the project widely among stakeholders—policy makers, educators, environmental NGOs, and the public—stimulating broader adoption of AI solutions.
- **To embed climate action** and green transition strategies into adult education through content that aligns with the European Green Deal, Circular Economy Action Plan, and digital readiness goals.








# Kickoff Meeting in Portugal

The **AI4WASTE** project officially launched in Portugal, bringing together partner institutions for an intensive kickoff meeting hosted by LIPOR in May 2024.

Over 2 days, the partners aligned on the project's mission, detailed the work plan, and began the co-creation of the training curriculum and toolkit structure. Participants had the opportunity to tour **LIPOR**'s state-of-the-art waste recovery and energy facilities, attend presentations on the role of AI in municipal waste management, share insights on national waste strategies and challenges, and engage in discussions about the future of adult education in the context of climate action and digital transformation.

A highlight of the meeting was the participation of Eugénia Inácio from the **Portuguese National Agency Erasmus+**, whose insights into the project's alignment with Erasmus+ priorities brought confidence, motivation, and strong institutional support to all partners.

# Capacity-building training -Türkiye

In October 2024, the **AI4WASTE** project held its capacity-building training in Darıca, Türkiye—a 5-day immersive experience focused on the real-world application of Artificial Intelligence in municipal waste management. The event brought together participants from Portugal, Spain, and Türkiye, including educators, environmental technicians, municipal officers, and digital innovation professionals.

This activity formed the core of the project's learning journey, giving participants the chance to explore both local AI-driven waste strategies and engage in hands-on cocreation of solutions. Throughout the five days, sessions were delivered by local and international experts and focused on key AI applications in waste management.



The sessions balanced technical presentations with interactive group activities, ensuring deep engagement and practical skill development for adult learners from diverse professional backgrounds. Participants visited **IZAYDAŞ**, one of Türkiye's leading facilities for waste processing and energy recovery, where they observed AI-driven systems in action. They also explored Darıca's local waste collection and transfer stations, learning about underground containers, citizen engagement, and the handling of special waste streams.

This 5-day training marked a key moment in the project, blending knowledge exchange with real-life insights into AI and smart waste governance.

"This 5-day training marked a key moment in the project, blending knowledge exchange with **real-life insights into AI**"



# AI4WASTE Toolkit
# A Practical Resource for AI in Waste Management

The **AI4WASTE** Toolkit is a key result of the project and it is aimed at professionals in waste management, adult education, and municipal services, offering practical guidance on how AI can be applied in real-world waste systems. The toolkit includes:

- **TRAINING MODULES**
  - Introduce essential AI concepts: machine learning, deep learning, and computer vision
  - Explain the connection between AI and circular economy strategies
  - Use real examples to help learners understand and apply the knowledge
- **CASE STUDIES**
  - 20 case studies from across Europe and beyond
  - Cover AI solutions such as robotic sorting, smart bins, and automated classification
  - Include insights on outcomes, challenges, and potential for replication
- **BEST PRACTICES**
  - Highlight successful AI-based solutions in urban recycling, food waste prevention, and hazardous waste management
  - Include tips for implementation and adaptation to different local context
- **EXERCISES AND QUIZZES**
  - Developed by all project partners
  - Based on real-life scenarios to support hands-on learning
  - Can be used in group training or self-study formats
- **ADDITIONAL RESOURCES**
  - Curated list of articles, scientific papers, and European policy documents
  - Access to open datasets and free AI tools for deeper exploration

The **AI4WASTE Toolkit** is designed to be practical, accessible, and adaptable. It offers a learning path that supports not only skill development but also strategic thinking around sustainability and innovation in waste management. Rather than a static manual, this toolkit is a living resource—a training tool, a guide to best practices, and a starting point for cities and institutions looking to integrate AI into their environmental strategies.

# Partners

**LIPOR – Associação de Municípios para a Gestão Sustentável de Resíduos do Grande Porto (Coordinator)**

Founded in 1982, LIPOR is a leading organization in Portugal in the integrated and sustainable management of waste. It serves a population of more than one million citizens in eight municipalities in Greater Porto. LIPOR's approach is based on modern waste management concepts, which advocate the adoption of integrated systems and the minimization of waste disposal in landfills. Therefore, it develops an integrated management strategy based on four main components: Multimaterial Valorization, Organic Valorization and Energy Valorization, complemented by a Sanitary Landfill to receive rejects from processes and previously prepared waste.Through its LIPOR Academy, the organization also leads in adult education and professional development, offering certified training for teachers, technicians, and citizens.

**CCVOC – Consell Comarcal del Vallès Occidental (Spain)**

Located just outside Barcelona, CCVOC is a regional public authority serving 23 municipalities in Vallès Occidental, an area known for its strong commitment to sustainability, innovation, and regional development. With over 900,000 inhabitants, the region is an important economic hub and home to universities, research centers, and green-tech initiatives. CCVOC plays a leadership role with the "Vallès Circular" and "RECOOPEREM: Food Sustainability Vallès Occidental" initiatives, which promotes the circular economy and the Food Waste prevention through local partnerships, waste reduction strategies, and innovation.

**Darıca Belediyesi (Türkiye)**

Situated in the Kocaeli province, Darıca is one of Türkiye's most rapidly developing municipalities. As part of a larger metropolitan and industrial region near Istanbul, Darıca faces both urban growth and environmental pressure—making smart waste management essential to its future. The municipality has launched digital governance and smart city strategies and is deeply engaged in climate-conscious policies, including renewable energy, energy recovery from waste, and public environmental awareness.

**Sucessos Criativos, Lda (Portugal)**

Founded in 2017, Sucessos Criativos is a future-oriented SME working at the crossroads of technology, education, and sustainability. The team specializes in the design and implementation of digital tools and training resources powered by AI, IoT, mobile applications, and circular economy principles. Its mission is to translate complexity into usability, supporting cities, schools, and organizations in embracing innovation with confidence.

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