



MICRO-CREDENTIAL

CIRCULAR ECONOMY FOR LAND AND WASTE MANAGEMENT

2.- Principles and Models of Circular Economy

CE policy frameworks (EU and relevance for Central Asia)

CELWS-W02-V04



Bridging the European Green Deal with transformative opportunities across Kazakhstan, Uzbekistan, Kyrgyzstan, and the broader Central Asian region.

01 Agenda

EU Circular Economy Architecture

Policy evolution from 2020 to 2025, key legislation, and flagship targets

04 Transferable Levers & Partnership Pathways

Adapting EU tools, procurement frameworks, and digital registries for the region

05 Roadmap & Call to Action

Milestone targets through 2030 and mobilizing leaders to act

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Successes, Gaps & Funding in the EU

Real-world case studies, investment landscape, and persistent challenges

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Central Asian Policy Snapshot

National and city-level CE initiatives across Kazakhstan, Uzbekistan & beyond (2024–2025)

The EU's Circular Economy Vision

"Keep products, materials, and resources in use as long as possible."

— European Commission, 2020

The European Union's circular economy model fundamentally challenges the traditional linear "take-make-dispose" paradigm. By designing out waste, keeping materials in circulation at their highest value, and regenerating natural systems, the EU has positioned the circular economy as both an environmental imperative and an economic opportunity — one that creates jobs, reduces import dependency, and drives industrial innovation.

EU Circular Economy Action Plan (CEAP) 2020 → 2023

2020 Launch

1

100% recyclable packaging by 2030; 65% recycling target for municipal waste by 2035. Horizon Europe "Industry 2020" programme deploys €650M across 12 Member States.

2023 Revision

2

European Green Deal integration adds three critical strands: the Sustainable Products Initiative, a dedicated Textiles Strategy, and a Construction Materials Framework.

Political Champions

3

Executive VP Frans Timmermans and Environment Commissioner Kati Kulmuni drive the agenda, embedding circularity across all EU industrial policy.

Waste Framework Directive 2024

Mandatory separate collection systems across all Member States; total ban on mixed-waste landfill by 2029, replacing ad hoc national approaches with harmonized standards.

Critical Raw Materials Regulation 2023

Requires 20% of EU demand for lithium, cobalt, and rare earths to come from circular (recycled) sources by 2030, reducing strategic dependency.

Extended Producer Responsibility (EPR)

Product-by-product compliance schemes for electronics, batteries, and packaging — shifting end-of-life costs from taxpayers to manufacturers.

Sustainable Products Initiative 2024

Eco-design mandates covering durability, reparability, and recyclability as prerequisite standards for EU market entry — not voluntary commitments.

EU Targets & Hard Numbers (2023–2025)

2.5Bn t

Waste Generated Annually

Current recycling rate stands at 47%, with an ambitious target of 65% by 2035.

30%

Virgin Plastic Demand Cut

Reduction in virgin plastic demand achieved across the EU between 2024 and 2025.

€200M

Global Gateway for Central Central Asia

EU funding earmarked specifically for circular economy pilots in Kazakhstan, Uzbekistan, and Kyrgyzstan (2025).

12%

C&D Waste Landfill Drop

Decrease in construction-and-demolition waste sent to landfill, recorded in 2024.

Plastic Packaging Redesign in Action Action

Nestlé — France (2024)

Introduced 100% recyclable PET bottles across its French product portfolio, eliminating **150,000 tonnes** of virgin plastic annually. The redesign required upstream supply-chain restructuring and new partnership agreements with certified recyclers across three countries.

Unilever — Germany

Launched a nationwide network of refill stations in retail outlets, directly reducing single-use packaging volume by **12%**. The program demonstrated that consumer behavior change — when supported by accessible infrastructure — can deliver measurable circularity outcomes at scale.

Construction Waste Reduction: Germany's Circular Building Pilot Pilot

Running from 2023 to 2025, Germany's flagship "**Circular Building**" pilot demonstrated that urban regeneration need not come at the cost of resource depletion. Across 14 participating demolition and retrofit sites, **35% of all demolition material** was reused directly on-site — including reclaimed timber, brick, and structural steel — bypassing the conventional waste-chain entirely. The pilot established a new set of material-passport standards that are now being integrated into the 2026 revision of Germany's national construction code, offering a replicable blueprint for other Member States and partner countries.

Horizon Europe

€2.3 billion allocated for circular-economy research across 2024–2026, funding material innovation, industrial symbiosis, and digital traceability pilots.

European Investment Bank

€1.1 billion green-bond pipeline financing next-generation recycling facilities and waste-to-energy infrastructure across Member States.

Innovation Deals 2024

Regulatory fast-track for **18 startups** working in eco-materials — reducing time-to-market by bypassing standard compliance review for breakthrough technologies.

EU–Asia Global Gateway

€200 million dedicated to co-developing CE pilot projects in Kazakhstan, Uzbekistan, and Kyrgyzstan — a landmark commitment for the region.



Eco-Label & Environmental Footprint

Mandatory certification for **30 product groups** by 2025, enabling consumers and procurers to identify genuinely low-impact products using standardized lifecycle assessment methodology.



Digital Waste Registry

EU-wide platform launched in 2024 to track cross-border waste flows in real time — a critical tool for enforcing EPR compliance and preventing illegal waste exports.



Green Public Procurement (GPP)

By 2025, **40% of all EU public contracts** must meet circular criteria — harnessing €2 trillion in annual public spending as a direct driver of market transformation.

Durability Standards for Smartphones

From 2024, all smartphones sold in the EU must carry a **minimum 5-year warranty** backed by guaranteed spare-parts availability. Manufacturers must also provide software support for at least seven years — eliminating planned obsolescence as a business model in the world's largest consumer market.

Repairability Score for Appliances

All household appliances entering the EU market must achieve a **minimum 3-star repairability rating**, assessed against standardized criteria including disassembly ease, component availability, and repair manual accessibility.

Why It Matters

The Sustainable Products Initiative transforms eco-design from a voluntary aspiration into a binding market-access condition. For Central Asian manufacturers seeking EU trade access, these standards define the new baseline for product competitiveness.

Circularity Quota

20% of EU demand for lithium, cobalt, and rare-earth elements must be met from recycled sources by 2030 — directly linking battery and tech sectors to end-of-life collection systems.

EU Material-Flow Database

A live tracking system launched in 2024 monitors the extraction, active use, and end-of-life pathways of critical materials across all 27 Member States, providing the data foundation for circular sourcing mandates.



Waste Framework Directive 2024 – Key Provisions



Ban on Mixed Municipal Waste Waste Incineration

After 2029, incinerating unsorted mixed waste becomes prohibited — forcing pre-sorting and material-specific treatment across all Member States, and driving investment in separation technology.



Mandatory Organic Waste Separation

All Member States must implement mandatory separate collection of organic and food waste by **2026**, unlocking large-scale composting and biogas production from materials currently sent to landfill.



30% Landfill Tax Increase

A significant increase in the EU-minimum landfill levy — deliberately making disposal more expensive than recycling to reshape the economics of waste management for both industry and municipalities.

EU EPR Roll-Out: A Data-Driven Compliance System

The EU's Extended Producer Responsibility framework is not a single regulation — it is a living, product-by-product compliance architecture spanning electronics, batteries, vehicles, packaging, and textiles. At its core is a real-time digital dashboard accessible to regulators, producers, and auditors across all 27 Member States, displaying collection rates, recycling targets, and financial guarantees in a unified, transparent interface. This infrastructure represents a model that Central Asian nations can adapt and replicate as they develop their own EPR frameworks.

Fragmented National EPR Schemes

A **9% compliance variance** between best- and worst-performing Member States in 2024 reveals that decentralized implementation creates uneven playing fields for producers and undermines the single market.

Recycling Quality Deficit

Only **55% of collected plastics** meet the quality standards required for high-grade circular use. Contamination in collection streams remains the primary technical bottleneck to closing the loop.

Supply-Chain Transparency

Despite the Critical Raw Materials Regulation, traceability of cobalt, lithium, and rare earths through multi-tier supply chains remains limited — hampering circularity verification.

Central Asia Landscape – Policy Snapshot (2024–2025)

Kazakhstan

Waste Management Concept 2025–2030 adopted in 2025, setting national recycling targets and establishing a dedicated circular economy fund backed by international financing.

Uzbekistan

Agri-Food Circular Action Plan (2024) focuses on post-harvest losses and mandatory composting — embedding circularity in the agricultural sector, the region's economic backbone.

Almaty City Pilot

City-wide CE pilot launched in 2025, integrating construction, industry, and food-waste streams within a single urban circular economy governance framework.

SWITCH-Asia Dialogues

Regional policy dialogues in Bishkek and Almaty (2025) recorded a **150% increase** in parliamentary participation — signaling growing political will for CE transformation.

Kazakhstan: Waste Management Concept 2025–2030

Ambition in Numbers

Kazakhstan aims to scale municipal waste recycling from just **12% in 2023** to **70% by 2030** — one of the most ambitious CE acceleration targets among emerging economies globally.

A **National Recycling Fund of \$150 million** has been established, co-financed by the EU Global Gateway and the World Bank, to drive infrastructure investment across the country's largest urban centers.

Smart Waste Innovation

Almaty is piloting IoT-connected "**Smart Waste Bins**" across residential and commercial districts, increasing collection efficiency by **30%** compared to conventional systems. Sensors alert collection services when bins reach 80% capacity, eliminating missed collections and reducing transport emissions. The pilot is set for national rollout by 2027, integrated with Kazakhstan's emerging digital waste registry.

Uzbekistan: Agri-Food Circular Action Plan



Cutting Post-Harvest Losses

Uzbekistan's plan targets a reduction in post-harvest food losses from **15% to 7% by 2027**, piloted first in Samarkand's fertile agricultural corridors — directly increasing food security and farmer incomes.



Mandatory Farm Composting

Compulsory composting of organic waste across registered farms is projected to avoid **2 million tonnes of CO₂e annually**, transforming a linear waste stream into a regenerative soil-health asset.

Public-Private Nutrient Recycling

A landmark partnership with **Nestlé Central Asia** will finance nutrient-recycling facilities that close the loop between food processing waste and agricultural inputs across the Fergana Valley.

Almaty City Circular Pilot: A Region-Leading Model

Almaty's "**Zero-Waste**" **district pilot**, launched in 2025, is the most integrated urban circular economy experiment in Central Asia. It combines a modular waste-to-energy plant — sized to process 500 tonnes of residual waste per day — with a recycled-aggregate road network that repurposes construction debris from the city's extensive infrastructure renewal program. Early results show a **40% reduction in landfill volumes** within the pilot zone and a measurable improvement in air quality indicators. The pilot is designed for phased replication across Almaty's 8 administrative districts by 2028.

Regional Cooperation: SWITCH-Asia Dialogues 2025

Key Voices

"The circular economy is not just an environmental agenda — it is Central Asia's next economic transformation." — **Johannes Baur**, EU Delegation

"Kazakhstan will establish a national Circular Waste Fund of **\$200 million** to back our 2030 commitments." — **Hon. Arman Kalykov**, Kazakhstan Mazhilis

Dialogue Outputs

The SWITCH-Asia dialogues in Bishkek and Almaty produced **12 policy briefs** covering three priority areas:

- **Extended Producer Responsibility** — model legislation templates for packaging and electronics
- **Green Public Procurement** — circular criteria for municipal contracts
- **Material-Flow Analysis** — methodology for national CE baseline assessments

Transferable Levers: EU → Central Asia

Legislative Scaffolding

Adopt EU-style Waste Framework Directive structures, adapted to national legal systems and waste-stream compositions specific to Central Asian economies.

Extended Producer Responsibility

Launch first EPR schemes in **packaging** and **electronics** in Kazakhstan and Uzbekistan — sectors where producer concentration makes initial compliance feasible.

Circular Public Procurement

Deploy EU-backed GPP template contracts for municipal tenders — immediately leveraging public spending as a circular market driver without requiring new legislation.

Digital Waste Registry

Pilot Almaty integration with the EU's existing platform architecture — enabling interoperable, cross-border waste-flow tracking from day one.

1

Policy Alignment

Embed CE targets directly into National Development Plans for 2026–2030, ensuring circularity is a cross-sectoral priority — not siloed within environment ministries alone.

2

Capacity Building

Launch an EU-funded "**Circular Academy**" for regulators, procurement officers, and municipal planners — proposed inaugural location: Bishkek, 2026.

3

Financing Mechanisms

Blend EU Global Gateway grants, World Bank concessional loans, and private green bonds into a single-window financing platform — reducing transaction costs for project developers.

EU Global Gateway

€200 million earmarked for CE pilots across Kazakhstan, Uzbekistan, and Kyrgyzstan (2025–2027), focusing on waste infrastructure and digital registry deployment.

World Bank Facility

\$500 million "Circular Economy for Central Asia" blended loan-grant facility (2024), the largest multilateral CE investment package ever directed to the region.

Private Sector Co-Investment

EU-based circular-tech firms including **Climeworks** and **Veolia** are positioned to co-invest in waste-to-energy and advanced recycling projects, bringing technology transfer alongside capital.

Horizon Europe Research Calls

Joint research calls between Horizon Europe and Central Asian universities from **2026** will build local scientific capacity in circular materials, bio-economy, and industrial symbiosis.

Roadmap 2026-2030: Milestones

2026

Adopt regional EPR legislation for packaging and electronics; launch digital waste registry pilots in **Almaty** and **Tashkent** using EU platform architecture.

2027

Reach **30% municipal waste recycling rate** across all five Central Asian states; operationalize the Circular Academy in Bishkek with first cohort of 200 public officials trained.

2028

Deploy **circular construction standards** in at least two major infrastructure projects in Kazakhstan and Uzbekistan — establishing regional precedent for material passports.

2030

Achieve EU-aligned circularity benchmarks: **50% of construction waste recycled, 20% of critical raw materials** sourced from circular streams, and full EPR rollout in all five countries.

"Turn policy into practice, finance into impact, and ambition into a circular future for Central Asia."

Policymakers

Embed CE targets in national plans now — 2026 is the critical adoption window before infrastructure investment locks in linear pathways for a generation.

Financiers

Activate the EU Global Gateway and World Bank facility — blended finance structures are ready; project pipelines are waiting for committed capital to move.

Industry Leaders

Partner with EU circular-tech firms to co-invest in waste-to-energy and recycling infrastructure — positioning Central Asian industry for EU market access under emerging trade circularity requirements.