

Success Stories of the implementation of Industrial Symbiosis and Resource Efficient and Cleaner Production (RECP) Practices in Industrial Parks

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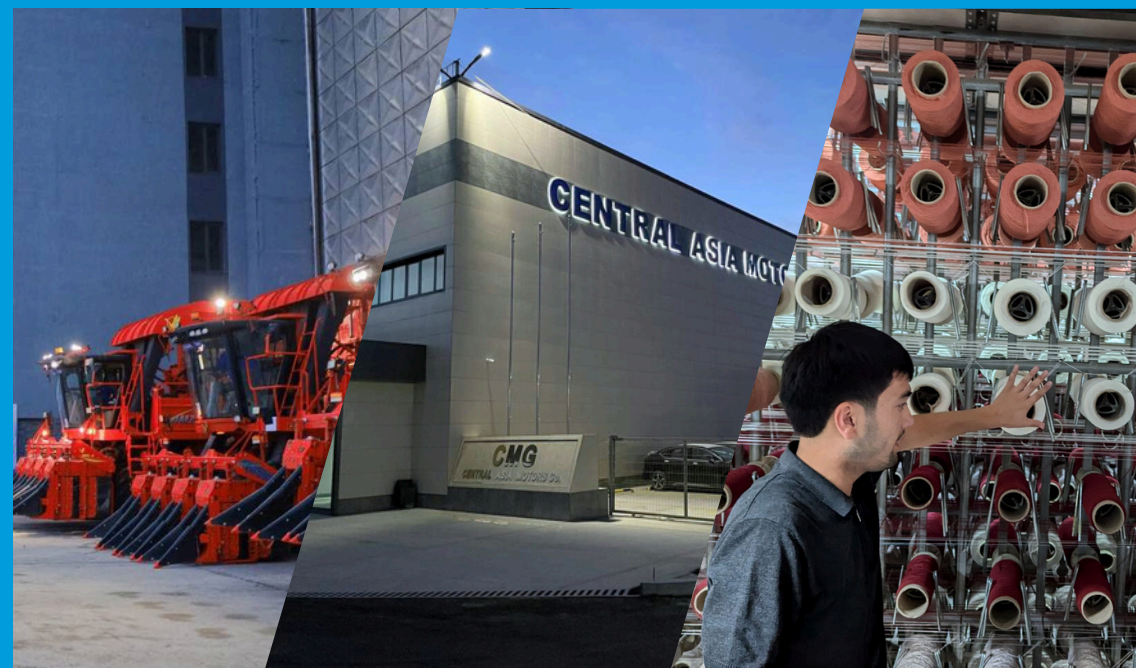


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Impact

Two case studies discussed previously illustrate how RECP and industrial symbiosis can generate multiple benefits for industries. Beyond energy savings and emissions reductions, these approaches enhance productivity, reduce costs, enhance operational reliability, and support sustainable growth.

Their impact also includes better waste management and circular material use, stronger collaboration between enterprises, and the creation of green jobs and innovation opportunities, demonstrating the broad potential of resource-efficient and collaborative industrial practices.

Conclusions and Way Forward

Scaling RECP and industrial symbiosis initiatives across Uzbekistan’s industrial zones supports the country’s sustainable development goals, including affordable and clean energy (SDG 7), industry and innovation (SDG 9), and climate action (SDG 13). Aligned with the “Year of Environmental Protection and a “Green” Economy”, these approaches reduce emissions, enhance competitiveness, and foster innovation. By integrating cleaner production and collaborative industrial practices into national policy, Uzbekistan can accelerate its transition to a low-carbon, resource-efficient economy and position its industries as regional leaders in sustainable manufacturing.

Case Study #2

Integrated Rooftop Solar PV & Water Heating – ELEKTRONIKS IDEAL LLC & SAM ELEKTRO SERVIS LLC

Two neighboring household appliance manufacturers in the Urgut FEZ collaborated on an integrated renewable energy solution. By jointly installing a 330 kWp rooftop solar photovoltaic system combined with a solar water heating unit, the companies reduced their reliance on grid electricity and fossil fuels, while sharing infrastructure costs and benefits.

Key benefits:

- Clean energy generation: ~537,772 kWh/year.
- Climate benefit: ~250 t/year CO₂ reduction.
- Economic gain: ~€36,000/year savings.
- Financials: 3 years payback; NPV €614,112; IRR ~45%.
- Social impact: Creation of skilled jobs during installation and maintenance phases.

Why it matters: This initiative showcases industrial symbiosis through shared renewable energy infrastructure, allowing two companies to jointly benefit from economies of scale, increased energy security, and reduced environmental impact. It provides a replicable model for other industrial zones where enterprises are located in close proximity.

Introduction

The **Uzbekistan Eco-Industrial Parks (EIP) Pilot Initiative** (2023–2025) provides technical assistance to two industrial zones - Free Economic Zone (FEZ) Urgut (located in Samarkand region), and Small Industrial Zone (SIZ) Mechanic (located in Fergana). The EIP initiative is part of the broader project “Private Sector Development and Economic Policy Advice in Uzbekistan”, funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the United Nations Industrial Development Organization (UNIDO). Through this initiative, UNIDO introduces in Uzbekistan EIP approaches, including Resource Efficient and Cleaner Production (RECP) and Industrial Symbiosis (IS) as its key elements.

What is Resource Efficient and Cleaner Production?

RECP is a preventive approach that helps companies use fewer resources, reduce environmental impacts, and increase productivity. For Small and Medium Enterprises (SMEs), it **reduces costs, boosts competitiveness, and promotes circular economy practices**. RECP assessments map material, energy, and water use, uncovering opportunities to improve productivity and identify by-products or wasted materials as resources that can be shared with other companies, laying the foundation for industrial symbiosis.

What is Industrial Symbiosis?

Industrial Symbiosis (IS) is one of the key elements of the Eco-Industrial Park approach, promoting collaboration among enterprises to exchange materials, energy, water, and by-products in a way that creates mutual benefits. Instead of operating in isolation, companies identify opportunities where the output or waste of one process can become the input for another, thereby reducing costs, improving resource efficiency, and lowering environmental impacts. In Uzbekistan's pilot zones, IS initiatives have demonstrated potential how neighboring companies can pool resources—such as steam, heat, and renewable energy infrastructure—to achieve economies of scale and build resilience. This practical cooperation not only strengthens competitiveness at the firm level but also contributes to broader environmental and climate goals, making IS a powerful tool for transforming traditional industrial zones into sustainable, future-ready ecosystems.

The following cases from the project's pilot zones demonstrate how RECP and industrial **symbiosis** can work in practice to deliver measurable results, aligned with the **International Framework for Eco-Industrial Parks**¹ and with strong potential for replication in Uzbekistan and globally.

¹ Based on the International Framework for Eco-Industrial Parks, Version 2.0 (UNIDO, World Bank Group, GIZ, 2021).

Case Study #1

Centralized Steam Supply Hub – KAMALAK Tekstil LLC & ASIA FIBER LLC

Two neighboring textile manufacturers in the Urgut FEZ joined forces to replace outdated individual boiler systems with a shared high-efficiency steam generation hub. The system supplies both companies via an insulated underground pipeline network, with automation controls and condensate recovery to maximize efficiency.

Key benefits:

- Energy savings: 30% less natural gas use.
- Climate benefit: ~2,500 t/year CO₂ reduction.
- Economic gain: ~€104,000/year savings.
- Financials: 5 years payback; NPV €1.43M; IRR 15%.
- Operational benefits: Improved reliability, lower maintenance costs, longer equipment life.

Why it matters: As a textbook example of industrial symbiosis — where two companies are sharing infrastructure to achieve economies of scale, reduce emissions, and improve efficiency, the model is transferable to other industrial parks with similar energy needs.



CO2 EMISSIONS



BUDGET



DURATION