Interreg Danube Region

Co-funded by the European Union

Plan-C

Best practice examples

Deliverable D.2.1.3

Responsible Partner: UTB

Document Content

Introduction

Although the recycling and reuse of materials as one of the steps towards a circular economy and sustainability is more often mentioned in the context of consumer products, led by plastic products, the following overview suggests that the machine industry is not lagging behind. In each of the participating countries in the Danube Region, machine-engineering companies can be found that have implemented aspects of the circular economy in their production processes, waste management and corporate policies in general and can thus set an example for other companies across the region and Europe.

Austria

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
Reuse and retrofit of used machines	**ATM Recyclingsystems GmbH**	Business model, Collection of used machine parts and their reintegration/ refurbishment/recycling	Reuse of machines as well as retrofit to old machines for a new life.	Reduction of waste.
Machines as rental or refurbished used, electrified machines	**Komptech GmbH**	Technology, Business model, Processing technologies including energy savings, Collection of used machine parts and their reintegration/ refurbishment/recycling	Reuse of machines as well as switch to non-fossil-based engines.	Reduction of waste, reduction of carbon emission, job creation.
Revision, Modernization, and Upgrade of used machines	**Braun Maschinen-fabrik**	Business model, Collection of used machine parts and their reintegration/ refurbishment/recycling	Refurbishment/ remanufacturing of used machines, especially steel cutting & grinding machines, and hydraulic steel construction & rake cleaning systems.	Circular economy in the machine industry, reducing costs for remanufacturing compared to purchasing a new machine, reducing costs for operating the machine, energy efficiency, waste reduction.
Processes for plastics recycling	**EREMA Group GmbH**	Technology, Recycling process, Materials processing	Plastics recycling systems producer - innovative recycling machinery and processes.	Impact on sustainability, reduction of plastic waste, decrease in the reliance on virgin materials, reducing carbon footprint, circularity in plastic use, job creation, supporting local economies.

Bosnia and Herzegovina

Title of Practice	Practice Owner	Type of Practice	Short Description	Evidence of Success
Sustainable waste management and recycling initiatives at Aida Commerce d.o.o.	**Aida Commerce d.o.o.**	Business model, Technological waste management, Collection of used machine parts and their reintegration/ refurbishment/recycling	Implementing waste management practices: collection, sorting, and recycling of various materials. Proper disposal of hazardous materials and promoting the reuse or recycling of electronic components. Technological waste management and refurbishment of used machine parts.	Collective action among various stakeholders, raising awareness about the importance of recycling and environmental protection, environmental sustainability, building company image.
Promoting sustainable education through bioplastic toys	**Bioplastic Toys**	Technology, Eco-friendly innovations in the plastic processing machine production	Producing didactic toys from 100% biodegradable bioplastics (PLA) made from cornstarch, sugar cane, beans etc.	Waste management, environmental and health benefits, circular economy, raising awareness of environmental issues, enhancing its product image.

Czech Republic

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
Comprehensive approach to customers – from research to public relations	**BOCO PARDUBICE machines, s.r.o.**	Technology, Business model, Processing technologies including energy savings, Collection of used machine parts and their reintegration/ refurbishment/recycling	Manufacturing and refurbishment of nitrided and armoured screws, barrels and other components for one and twin-screw extruders, injection moulding machines and blow moulding machines for plastics, rubber and food industries.	International cooperation in the field of refurbishment, declaration of product quality, generation of new projects.
Innovative products for energy saving	**DATRIA s.r.o.**	Technology, Processing technologies including energy savings, Collection of used machine parts and their reintegration/ refurbishment/recycling	Production of special extrusion lines (biodegradable materials), renovation of screws and barrels, thermal insulation (injection moulding), regranulation lines with low energy consumption.	Reducing energy consumption, using biodegradable materials, building product image, satisfied customers.
Renovation and reconstruction of injection moulding machines	**Zejatech s.r.o.**	Technology, Collection of used machine parts and their reintegration/ refurbishment/recycling	Rebuilding and revitalization of injection moulding machines, compression and vulcanizing presses.	Complete reconstruction and modernization of hundreds of large and small rubber and plastics processing plants, implementation in the Czech Republic, Europe (Germany, Spain) and overseas (Morocco, USA)

Germany

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
Surface Treatment Innovations	**Plasma technology GmbH**	Technology, Business model, Material sourcing for plastic processing machine production, Processing technologies including energy savings	Implementation of cobots (collaborative robots) that work alongside human workers to optimize tasks, especially tasks that require precision, repeatability and safety.	Improved workplace safety, reducing injury rates, improvement in task completion times and overall efficiency, strong market acceptance.
Vacuum Automation Solutions	**J. Schmalz GmbH**	Technology, Business Model, Processing technologies including energy savings	Development and implementation of energy-efficient vacuum handling systems and components, using of automation solutions to meet specific needs of different industries, integration of Industry 4.0 technologies.	Reductions in energy consumption, improvements in production efficiency, awards received for sustainable technologies, positive feedback from industries, expanded market presence.
Lean Manufacturing Solutions	**Morali Produktionstechnik GmbH**	Technology, Business Model, Processing technologies including energy savings	Implementation of lean manufacturing principles to streamline production; focus on reduction of waste, lead times and costs.	Improvements in waste reduction, efficiency, growth in client base.

Hungary

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
Machines as rental or refurbished used, electrified machines	**Amco Kft.**	Technology, Business model, Processing technologies including energy savings, Collection of used machine parts and their reintegration/ refurbishment/recycling	This practice offers customers the option of buying an inspected used machine or renting a machine.	Reduction of waste, multiple awareness campaigns, enhance product image, offer of circular products, rented machines.
Machines as rental or refurbished used, electrified machines	**UgrinPack-Erdősi Kft.**	Technology, Business model, Product design	Purchase older machines and convert them, combining them into a completely different technology currently needed by the company.	The machines are not disposed, cost-effectiveness for customers, convenient for PR strategy of the company, improvement of ESG indicators through waste reduction.

Republic of Moldova

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
Innovative Plastic Design and Sustainable Engineering	**Alecu Russo State University of Bălți**	Policy/business support, Material sourcing for plastic processing machine production	Education and training in field of plastic properties, designing of plastic parts and integration of sustainable manufacturing techniques to develop high-performance, durable, and eco-friendly plastic products (for automotive).	Collaboration between research institutions and industries supports development of practical solutions, raising awareness, influenced policy discussions, 20% reduction in material waste by implementing techniques, new projects and jobs.
Sustainable Plastic Waste Management	**Uniplast**	Business model, Processing technologies including energy savings, Technological waste management	Educating farmers about the importance and methods of recycling polyethylene waste, providing finance and service support for collecting and recycling PE.	Reduction of polyethylene waste in agriculture, increasing recycling rates, raising awareness among farmers about sustainable plastic waste management.

Romania

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
Eco-moulded fibre with many applications including automotive industry (Initiative of Replacing plastic with cellulose)	**ASINED**	Technology, Business model, Processing technologies including energy savings	Replacing plastic used in manufacturing packaging with eco-moulded cellulose fibre.	Minimum waste, without toxic substances, bio-degradable, 100% recycled, using renewable resources, create up to 93 jobs, awareness campaigns.
SC KIMAVILLSRL – Our plastic is fantastic! Innovative products and services for processing, recycling and commercialization	**KIMAVILL**	Business model, Collection of used machine parts and their reintegration/ refurbishment/recycling, Eco-friendly innovations in the plastic processing machine production	Promoting sustainable recycling practices, commercialization of imported recycling machines, integration of various waste management practices, including technological waste management, recycled machines and spare parts.	Reuse of used machines and recycled plastics, awareness campaigns, exhibition EXPOPLAST, reduction of waste.

Serbia

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
Electronic and electrical waste recycling	**SET Reciklaža**	Technology, Business model, Processing technologies including energy savings	Recycles waste from electronic and electrical devices, converts EE waste into raw materials and alternative fuel.	Waste management, reduction of hazardous waste
Water, energy, and waste management	**Veolia Water Solutions & Technologies DOO**	Technology, Technological waste management, Collection of used machine parts and their reintegration/ refurbishment/recycling	Water, waste and energy management, reuse of water (treated waste water for power generation and fertilizers production), energetic use of biomass and waste, waste sorting, identification of waste plastics, recycling of metal waste, collecting used solvents, and recovering them for reuse, decommissioning services, remediation of landfills and contaminated locations.	processing, sorting and identification of waste, reuse of waste including water and biomass, hazardous waste management, decommissioning services, new jobs, new companies,

Slovakia

Title of Practice	Practice Owner	Type & Field of Practice	Short Description	Evidence of Success
HEMP CLUSTER	**KURUC Company spol. s r.o.**	Technology, Processing technologies including energy savings, Technological waste management	Separation of TetraPack into PE, aluminium and paper, paper is used to produce boards adding hemp shives and recycled PE to paper pulp.	Recycling of difficult-to-process waste, products with new utility properties (building boards), possible use of bioplastics, successful incorporation in several houses.
Slovakia connects the Europe	**LPH Group**	Technology, Product design, Eco-friendly innovations in the plastic processing machine production	Production of highest quality moulds for multi-component injection moulding (CNC machining centres with advanced EDM technology), 3D printing (metal and plastics), injection moulding and blow moulding of plastic parts, bending etc.	Sustainable growth, efficiency in materials production, eco-friendly waste management.

Conclusion

Basic data on exemplary practices, as introduced by the project partners from each country, are presented in the previous chapters in the form of tables. In addition to machine engineering companies operating in the field of plastics machinery, technologies referring to waste management related to plastics products manufacturing or difficult-to-process waste are also presented, such as ***Kuruc Co. (Slovakia), Asined (Romania), Uniplast (Moldova)*** and ***Aida Commerce (Bosnia and Herzegovina)***.

Serbia presented ***SET Reciklaža***, a company that collects and recycles electrical and electronic equipment, and ***Veolia***, a company with a global competence in water, waste and energy management. In addition to the management of waste, including metal, plastic or hazardous waste, they pointed out ***Veolia's*** services related to the decommissioning of industrial process equipment or the collection and recycling of solvents, lubricants, etc.

Moldova highlighted the need for education in the field of sustainable plastics processing by presenting the ***Alecu Russo State University of Bălți***, while educational activities are also emphasised by ***Bioplastic Toys (Bosnia and Herzegovina)*** and ***Uniplast (Moldova)***.

Germany focused their attention on business models using state-of-the-art and energy-saving technologies, robotization, digitalization and the integration of Industry 4.0 technologies, represented by ***Plasma technology, J. Schmalz*** and ***Morali Produktionstechnik***.

The vast majority of the exemplary practices are focused on refurbishments, rebuilds and upgrades of used machines, with an emphasis on energy savings, saving of primary resources, optimization of the production cycle through better process control, etc. This group of best practices includes the ***Austrian*** companies ***ATM Recyclingsystems, Braun Maschinenfabrik*** or ***EREMA Group, Aida Commerce (Bosnia and Herzegovina), the Czech*** companies ***BOCO Pardubice machines, DATRIA*** or ***Zejatech***, as well as ***KIMAVILL (Romania)*** or ***LPH Group (Slovakia)***. In addition to this refurbishment activity, some companies also offer the possibility of renting refurbished equipment, such as the ***Hungarian*** companies ***Amco and UgrinPack-Erdősi*** or ***Komptech (Austria)***.