



Best practices of circular economy

Smart KOM 4.0 competence center

 Białystok, Poland

 www.metalklaster.pl/en

Description of the company

The Metal Processing Cluster is the largest cluster of the metal and machine industries in Poland. It brings together nearly 115 companies operating in the field of services, production and trade, as well as 20 strategic partners such as universities, business environment institutions and local government authorities. Cooperation within the cluster enables combining potentials, exchange of experience, generation of synergies and strengthens competitive advantages. The cluster has created a Smart KOM 4.0 competence center, which is equipped with a number of stations for educating pupils, students and employees in a hybrid system.

Circular practices example & Added value

Smart KOM 4.0 Comptence Center is used for practical teaching of processes used in Industry 4.0 in a hybrid system , including:

- advanced product design using CAD/CAM software (26 workstations equipped with the software),
- CNC milling (2 CNC milling machines with tooling, including one adapted for cooperation with a KUKA robot),
- CNC turning, including CNC turning with milling function (CNC lathe numerically controlled in XZC axes with automatic tool head)
- 3D printing (two 3D printers),
- welding (2 augmented reality welding simulation training stations),
- industrial robot operation (robotics station equipped with a 7-axis KUKA industrial robot and automatic assembly line).



Best practices of circular economy

3D LAB



Warsaw, Poland



www.3d-lab.pl

Description of the company

3D Lab was founded in 2007, and our knowledge and experience in the field of incremental manufacturing technology, particularly 3D printing and new material creation, spans more than 15 years.

A significant part of their team consists of skilled engineers who have daily access to a research laboratory, a fully equipped and independent production line and the necessary technical resources. They use innovative solutions to flexibly and quickly produce parts by 3D printing.

3D LAB is one of the few entities in Poland with a long history in the 3D printing industry. Their experience and commitment to the distribution of professional 3D printers have contributed to the development of the 3D printing market in Poland.


Circular practices example & Added value

- They have developed their own ATO equipment for ultrasonic production of metal powders. Currently, one of the main limitations to faster implementation of 3D printing in industry is the severely limited palette of available metal powders suitable for 3D printing. Developed and patented within the company, ATO technology is a revolutionary method for producing highly spherical metal powders. It is used to produce the highest quality metal powders in office and laboratory conditions. ATO technology allows a wide range of previously unavailable powders to be made in customers' laboratories, and then the resulting powder can be used as a raw material for 3D printing. Thus, they are surpassing current technology and material barriers. Parts produced by 3D printing in this way save material and time.



Best practices of circular economy

Future Industry Platform

 Radom, Poland



www.przemyslprzyszlosci.gov.pl

Description of the Institution

The Future Industry Platform is a not-for-profit Polish governmental foundation established in 2019 and supervised by the Ministry of Economic Development and Technology. The main goal of the Platform is to accelerate the digital transformation of the Polish industry. The Platform achieves its goals by combining interdisciplinary knowledge transfer, awareness-raising campaigns, expert trainings as well as the development and application of digital transformation supporting tools.

Circular practices example & Added value

- The key enabler of the initiative is the network of field experts and digital tools gathered within the consulting services and Digital Platform bringing together various stakeholders of the I4.0 ecosystem in Poland, from RTOs, Competence Centers, Digital Innovation Hubs, through technology providers and public institutions, to individual enterprises.
- One of the goals of the organization's work is to support companies' activities in the area of the closed loop economy. They support companies by spreading information about green solutions, tax credits and interesting examples of green transformation. They also provide industry support services..



Best practices of circular economy

SaMASZ Sp z o.o.

 Zabłudów, Poland



www.samasz.pl/en

Description of the company

SaMASZ is one of the world's leaders in production and sales of high quality agricultural and municipal machines. Close contact with the customer supports them in the dynamic development. Their strategy relies on dialogue and we are open to the needs of our existing and future customers. Thanks to that approach they can manufacture up to date machines, that are appropriate for the changing needs of the customers and becoming indispensable partner at work. SaMASZ has 39-year experience in designing and machine production. They have manufactured over 140 000 machines and employ over 1 000 workers.

Circular practices example & Added value

- SaMASZ has expanded its factory, where it employs about 1,100 people, the area of the land for the investment is 13 hectares, the area of the production halls including the office building is about 4 hectares. An important part of the investment is also the Research and Development Center, through which SaMASZ takes care of the expansion of its products in an innovative and environmentally friendly way. The company uses digital twin technology to optimally implement changes on production. In areas such as:

Eco-design:

- Design to reuse as much as possible parts from previous generations,
- Design to repair- designed to be easy for maintenance and equipped with supporting systems,
- Designed for modularity - families of products using same parts,
- Design for rent – contracting companies - higher machine utilisation at the same time (R1 Think),

Eco-use:


- R3 Reuse - re-sell machines - plan,
- R5 Refurbish - restore machines and re-sell - plan



Best practices of circular economy

Sulichrec Sp. z o.o.

 Zaścianki, Poland

 www.sulichrec.pl/

Description of the company

SULICHREC is a company with 30 years of experience that is part of the Closed Waste Circuit. The company's activities are focused on increasing the amount of metal waste recycled, while at the same time taking care of environmental protection through proper collection, transportation, selection and processing of this waste. Sulichrec complies with all legal requirements in the field of environmental protection, which allows them to be a reliable and stable partner for customers. It has all the necessary permits for the storage and transportation of waste, which confirms its legality and integrity in conducting business. The company's stable and solid position in the market is due to the high quality and speed of its services and timely payment.

Circular practices example & Added value

As a key component of circular economy, the company contributes to increasing the amount of metal waste sent for recycling. The company's practices include:

- Waste consultancy - providing clients with professional advice and support on waste management to promote sustainable material cycles.
- Spectrometer testing - using specialised equipment to analyse the chemical composition of metal waste to accurately determine its recyclability and recyclability.
- Customer collection - providing a convenient and timely collection service of metal waste from our customers to facilitate the process of segregation and transfer of waste for further processing.
- Full documentation - preparing the comprehensive documentation that is required for the waste transport and treatment process to ensure full transparency and compliance with regulations.
- Processing - performing various metal waste processing operations such as analysis, sorting, cutting and baling to prepare it for further recycling.
- Transfer to recycler - working with reputable recyclers who have the capacity and technology to process metal waste to obtain secondary raw materials.
- Launching a full-value product - using recovered secondary raw materials from metal waste recycling to produce new products of high quality and added value, helping to close the material cycle and reduce the use of primary raw materials.



Best practices of circular economy

schultech GmbH



Hüttisheim, Germany



www.schultech.de

Description of the company

schultech is the first company in the field of media technology for schools to be certified as a climate-neutral company. Together with the independent organisation ClimatePartner, they have had their CO² footprint calculated in an unvarnished manner and disclose it openly.

Transparency and proactive commitment are part of schultech's corporate culture. Therefore, in addition to the footprint, they also share their commitment to offsetting our emissions through certified climate protection projects.

Circular practices example & Added value

Their primary goal is to avoid environmentally harmful emissions without having to compensate for them. What they do not currently manage to do will be compensated for. Some examples of the measures they have already implemented in terms of climate protection include:

- Since 2020, all new vehicle registrations have been purely electric
- 80% of our vehicle fleet is electrically powered
- Their office is powered by 100% renewable energy
- For every piece of Visio media furniture they plant 4 trees
- Job bike leasing for all employees



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CEMIVET

Circular Economy in Metal Industries
Vocational Education and Training

Best practices of circular economy

PRETTL Produktions Holding GmbH



Pfullingen, Germany



www.prettl.com

Description of the company

The PRETTL group is a successful, internationally operating group of companies. Together, PRETTL Produktions Holding GmbH, PRETTL Beteiligungs Holding GmbH and the PRETTL Foundation serve the five business segments Automotive, Display, Electronics, Energy and Strategic build-up. More than 6,500 employees work for the PRETTL group at over 35 locations in more than 25 countries.

Circular practices example & Added value

In 2020, a voluntary commitment to climate protection was launched with the PRETTL GoZero initiative. The project describes the group's path to climate neutrality in the four areas of energy efficiency, renewable energies, green electricity and compensation measures.

This comprehensive understanding of sustainability connects all five divisions, our companies and all employees at the PRETTL group. Together they are working on solutions for the challenges of the future.



Best practices of circular economy

Robert Thomas Metal & Electrical Works

 Neunkirchen, Germany



www.robert-thomas.de

Description of the company

THOMAS is a brand of the traditional company Robert Thomas Metall- & Elektrowerke GmbH & Co. KG. Family-run in the 4th generation, company headquarters have been located in Neunkirchen/Siegerland for over 100 years. There are developed and produced premium hoovers and spin dryers "made in Germany"

Circular practices example & Added value

Where possible, they work with local suppliers and regional service providers. Short transport distances keep carbon footprint low. They provide their suppliers with plastic crates in which suppliers deliver their materials for production. The reusable crates remain in constant circulation between the suppliers and Robert Thomas Metal & Electrical Works. This eliminates unnecessary or even additional transport packaging.

Good quality results in a long product life. Beyond the two-year manufacturer's warranty, Robert Thomas Metal & Electrical Works grant a 6-month warranty extension in good conscience if the customer registers his new product with them. Repairing instead of buying new is important to them.



Best practices of circular economy

ATB WATER GmbH

 Porta Westfalica, Germany

 www.atbwater.de

Description of the company

Since its foundation in 1999, the company ATB, based in Porta Westfalica, has developed into one of the world's leading producers and suppliers in the field of decentralised wastewater treatment. In addition to the production and service of small sewage treatment plants and sewage treatment systems, ATB also offers the entire range of mechanical equipment for biological wastewater treatment. For this purpose, ATB maintains production and research facilities at various locations in the EU. Our engineering team supports you with its expertise throughout the entire planning process.

Circular practices example & Added value

Use of a photovoltaic system / use of a rainwater harvesting system / switch to environmentally friendly printer devices (incl. cartridges) with a CO₂ saving of 4.2 kg per month (compared to previous devices).

With the plants, biologically treated wastewater can be reused through additional modules (e.g. for plant irrigation systems). In addition, the plants are designed for particularly energy-saving operation.



Best practices of circular economy

Falco GmbH



Dusseldorf, Germany



www.falcogmbh.de

Description of the company

Falco is a manufacturer of street furniture, including bicycle parking systems, street furniture, (bicycle) canopies, traffic guidance systems and much more.


Circular practices example & Added value

- Falcos production site completely self-sufficient.
- Wherever possible, sustainable materials will be used in the manufacture of products. All wood is certified with the FSC quality mark of the Forest Stewardship Council®.
- The way of working has been circular for generations.
- With the launch of their own powder coating facility in 2018, they were able to further reduce these transport movements
- All steel waste generated during production is cleanly separated and collected by a metal recycling company.
- Rainwater that accumulates at site in Vriezenveen is discharged into surface water and does not enter the sewer system.
- Repair and renovation work is often very simple, cheaper and certainly more sustainable.
- Waste separation is a daily part of work
- As a BBL training company and with many trainees every year, they help the next generations to develop to do better.



Best practices of circular economy

Sinfin energy

 Gijón, Asturias, Spain
www.sinfinenergy.com/en

Sinfin's Hydroscrew is based on the millenary hydraulic ingenuity of the Archimedes Screw and when applying reverse engineering, we have transformed it into a micro hydraulic generation turbine.

Circular practices

The Hydroscrew is one of the most efficient existing micro-hydraulic generation technologies on the market, reaching nominal results higher than 90% with a minimum water flow.

This is due to its lineal shape, resulting in a compact design, completely adaptable to riverbeds or derivations, and permitting an optimized performance on a wide range of water flows even with low water jumps.

Added value

Their HYDROSCREW is capable of generating between 1 and 100kW per unit, and the turbine can be designed for each specific application need. To achieve more power, they add turbines in series or parallel being able to reach any power needed.



Best practices of circular economy

Aguas de Avilés



Avilés, Asturias, Spain

www.aguasdeaviles.es

Aguas de Avilés S.L. is a mixed economy company established in 2009. Its purpose is the management of the integral water cycle of Avilés, providing its services to more than 75,000 inhabitants, taking daily care of the quality of the water consumed in Avilés. There is a long way between water in its natural state and the complex social use we make of it.

Circular practices

In order to make environmental sustainability a reality and develop a greater social commitment to the most vulnerable groups, a new strategic plan for sustainable development has been drawn up, with general objectives to guide its actions.

Added value

Sustainable management allows us to offer our customers a service commitment based on quality assurance and respect for the environment, based on ongoing research and an intense commitment to technological innovation. Every time you turn on the tap at home, Aguas de Avilés professionals bring all their knowledge and innovation to the different stages of the urban water cycle.



Best practices of circular economy

Idesa



Avilés, Asturias, Spain

<https://www.idesa.net/index.php>

Founded in 1993 as a Technical & Commercial office to support local manufacturing shops in the Oil & Gas business, IDESA has become one of the most recognized and respected companies for the design, fabrication and supply of static and modular equipment worldwide.

Circular practices

They are extremely vigilant to ensure that their activity and projects have the least possible impact on the environment and the ecosystem in which they are located. Since 2014, they have implemented measures to reduce consumption in our facilities, achieving a substantial reduction in the carbon footprint generated by our activities. Among other actions, they have changed all manufacturing facilities to LED lighting, also replaced part of the machinery in their workshops in Avilés, which has allowed significant energy savings.

Added value

They are currently expanding their business development by participating in the value chain of new energy vectors such as the processing and storage of blue or green hydrogen or liquefied natural gas for the maritime transport sector.



Best practices of circular economy

Gonvarri Industries



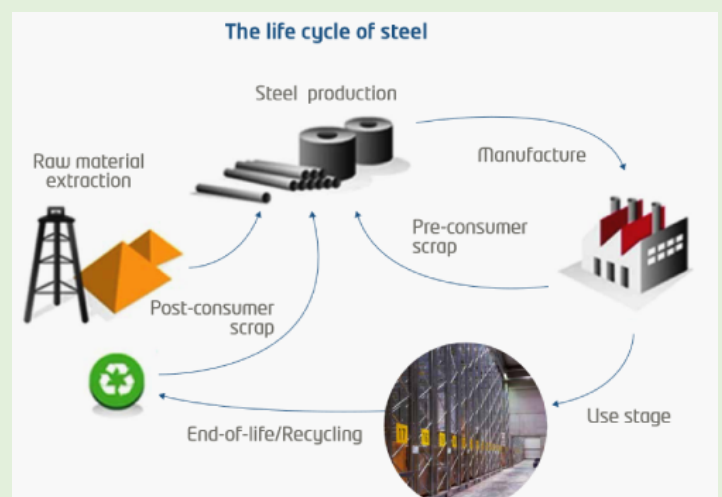
Asturias, Spain

www.gonvarri.com/en/

Leading company in the transformation of flat steel and aluminum, with more than 60 years of experience. They manufacture various products grouped into four business lines: Service centers, Material Handling. Precision Tubes and Metal Structures

Circular practices


At Gonvarri, instead of focusing on the Circular Economy as an end goal, they use the concept as a tool to guide us towards continuous improvement of production processes and greater environmental responsibility. The proposals cover the whole life cycle, from production and consumption to waste management, including the secondary raw materials market.





Best practices of circular economy

Fundyser

 Gijón, Asturias, Spain
fundyser.com

FUNDYSER has a team of highly qualified personnel, specialising in the production of cast components moulded in steel and various alloys. FUNDYSER has adapted to market changes, updating its technology, and the technical and professional qualifications of its personnel, in order to become a leading company in the foundry industry, setting the standard at an international level.


Circular practices example & Added value through a project


Fundyser has developed a project whose main objective is the metallurgical research for the manufacture of high performance cast steel components for hydroelectric power generation turbines. An experimental design is proposed to maximize the percentage of internal returns charged to the furnace, with the objective of optimizing the circular economy, thus minimizing the consumption of high cost first melt raw materials. The results of the research carried out at pilot plant scale are validated through the development of an industrial demonstrator, whose characterization allows validating the knowledge generated during the project, from two points of view: optimization of the resources required for its manufacture, and improvement of the properties in use of these components, which will confer an important competitive advantage over the rest of suppliers existing in the market of this type of components, of application in the renewable hydroelectric energy sector.



Best practices of circular economy

ZERO CENTO

 Cremona, Italy

 <https://zerocento.eu/>

Description of the company

ZEROCENTO srl is a company that since 2010 has specialized in the production of an artificial basalt,

Circular practices

The success policy of Zerocento is linked to the recovery of a waste material, which is cheaper and more performing than natural material.

The basalt is obtained from the waste of the iron and steel industry, and intended for the production of conglomerates.

The production cycle that starts from the collection of industrial waste and arrives at the creation of the artificial Ipergrip aggregate.

Added value

- Iron and steel collected from industry waste
- This artificial basalt leads to a significant improvement in the performance of the conglomerates.



Best practices of circular economy

Feralpi Group

 Lonato del Garda (Brescia), Italy



www.feralpigroup.com

Description of the company

Feralpi is specialised in the production of steels for the construction industry and special applications in a domestic and industrial setting.

Circular practices

Feralpi introduce innovative circular economy models that could affect the different phases of the value chain.

- Innovative models relating to the supply of resources.
- Efficient use of resources in production processes, including solutions designed to reduce resources and the energy required; waste or by-products from one industry become production elements for another.
- Solutions aimed at reducing the generation of waste in production processes and consumption, organising reuse and recycling or energy recovery, with a view to integrating waste management within industrial processes and across the different resource supply, production and consumption phases.

Added value

- Circular management of the waste with a value chain view
- 93% of the steel produced came from recycled materials.
- Application of digitization systems and industry 4.0 with the aim of better process monitoring and control.



Best practices of circular economy

Gruppo Alfa Acciai

 Brescia, Italy



www.alfaacciai.it

Description of the company

Among the main Italian and European producers of steel for reinforced concrete and wire rod, Alfa Acciai represents a technologically advanced production reality, attentive to the environment and present along the entire iron and steel supply chain.

Circular practices

Thanks to the properties of recyclability and durability that characterize steel, the Alfa Acciai Group has a business model which is based on the concept of the circular economy, which allows it to minimize the use of virgin natural resources and valorise residues products.

The Alfa Acciai Group annually valorises over 2 million tons of ferrous scrap. The finished product has minimal material content certified recycled (UNI/PdR 88:2020 Certification according to UNI CEI EN ISO/IEC 17067) equal to 98.9%.

The Group is constantly committed to enhancing each residue generated (i.e. valorisation of black slag, the recovery of fume abatement powders)


Added value

- Circular management of the waste transferring to other business and promoting material recovery;
- 98.9% of the steel produced came from recycled materials.
- The black slag that is generated during the melting of ferrous scrap in the electric furnace, thanks to a controlled process of its formation and subsequent solidification, is crushed, deferrized and screened until it becomes a material as a by-product marketable high-performance, named Sinstone®.



Best practices of circular economy

Fondazione Nuove tecnologie per il Made in Italy

 Crema, Italy



www.itscremona.it

Description of the company

Vocational education training school focused on mechatronic area, answering to the need of the territory and its value chain.

Circular practices

The school provides the course *Automation and innovation for the ecological transition*, aimed at training future industrial automation expert for manufacturing sector with a particular focus on the sustainability of production processes.

Particular attention will be given to the theme of industry 4.0 and to the development of "lean" production systems which, through the use of data, the Internet of Things and adequate organizational models, allow to promote the sustainability of production processes

Added value

- The course is co-produced with enterprises on the basis of their needs.
- The students will be hired by local companies.



Best practices of circular economy

Weldone

 Castelleone, Italy



www.weldone.it

Description of the company

Weldone Srl operates in the field of technical industrial supplies and more specifically in providing products and services in the welding and cutting domain. Weldone, besides the sale and rental of certified quality products, there's a testing department for welding systems, including a cobot station, also used for welding classes.

The Weldone Weldin School with a classroom for theory lessons and equipped workstations for practice, only uses teachers of proven skills and experience and fulfills the training offer with the use of Soldamatic.

Circular practices

Soldamatic is the first and only augmented reality welding simulator, which represents a real innovative method to train the next generation of welders, attracting young people and modernizing welding training programs to fill the global gap in for skilled welders.

Soldamatic allows to:

- Prepare a welding routine before applying it to the production environment.
- Train robot operators on programming and operating for real welding routines.
- Modernize the welding training center training students for the latest manufacturing requirements.
- Augmented Reality technology allows using the real teach pendant on real robots while reducing waste and risk.

Added value

- Digital Solutions attract new generations to Welding and train employees for Industry 4.0.
- Labor opportunities to have access international certifications and better salaries.
- Students get used to the 5 most important welding techniques without risks. An Analysis module help teacher to check result and correct students mistakes.
- Reduce training time up to 56%, consumable costs up to 68%, and 34% more Certified welders.
- Reduction of environmental impact : less air pollution, less waste material.
- Customize welding training and welding pieces to your specific requirements.
- Increase productivity by in-sourced training and retaining your employees.



Best practices of circular economy

Astra LT, AB



Alytus, Lithuania



www.astra.lt

Description of the company

Astra LT is one of the oldest Lithuanian companies in the metalworking sector, the most widely known in the region and Europe as a producer/exporter of black and stainless-steel tanks and pressure vessels to many European and worldwide countries. Astra is located in Alytus, Lithuania.

Company founded in 1929 with visionary idea in production of agriculture equipment. Since then, "Astra" experienced huge transformations but has always stayed true to its roots – the steel and already many years known as one of the leaders in production of tanks and pressure vessels in carbon as well as different types of stainless steel.

Circular practices

Manufacturing:

- Modern stainless steel processing technologies: microprocessor-controlled welding, software-based cutting, stamping, cutting and folding centers, special equipment to produce bottoms, polishing, dimple jackets and other special items. All materials and consumables are used exclusively supplied from trusted European suppliers, which ensures high quality and reliability of the final product.
- Regenerates natural systems by using renewable energy and materials, restoring ecosystems.

Added value


Astra has implemented an ERP system that integrates all stages of the project, from receiving an order to delivery of produced equipment. Each project is individual, so planning is essential, successful planning is determined by factory plant load monitoring, designers' employment awareness, and strict delivery schedule of material deliveries, all of which control the production deadlines while maintaining the highest quality of production.


The largest tank diameter we are able to produce is 6 000 mm, the length of the cylindrical part is up to 50 000 mm, the maximum.



Best practices of circular economy

Lanksti Linija, UAB

 Alytus, Lithuania

 www.lankstilinja.lt

Description of the company

UAB "Lanksti Linija" is a metalworking company based in Alytus. The company has been in metalworking business since 2001. Over the years the company has developed substantially as a contract manufacturer of sheet and tube products.

"Lanksti Linija" is focused on building a relationship as a trusted partner, not simply a supplier. Main activities: design and production of sheet and tube products, powder coating, mixed articles (metal-plastic, metal-wood articles), packaging services, parcel delivery lockers.

Circular practices

"Lanksti Linija" offers a proactive approach to problem solving. Professionals sit around the table with a customer looking for the best solution possible.

The company uses renewable energy sources in its production.

Added value

UAB „Lanksti Linija“ has implemented quality management system ISO 9001:2015 and environmental management system ISO 14001:2015 as well as quality management system based on IKEA internal standard IWAY.

Shift from consumers to users by promoting sharing, leasing, and service models.



Best practices of circular economy

TANKOS, UAB



Alytus, Lithuania



www.tankos.lt

Description of the company

UAB TANKOS has been working in the field of metal processing since 2001. The main activity of the company is the manufacture of metal furniture for shop fitting, hotels, and other furniture components productions.

Company's production area is 3000 m². The factors determining company's success are: precise manufacturing of metal parts, project management, from client inquiry to complete order delivery also variety of offers based on customer needs.

Circular practices

Keeps products and materials in use by making them durable, repairable, reusable, and recyclable.

Added value


TANKOS is recognized as the TOP company: under the customer's request, they may install the shop equipment in the shop area.


Working closely with their partners, the company can also supply products completed with wood, plastic, and tempered glass products.



Best practices of circular economy

Montuotojas, UAB

 Vilnius, Lithuania

 www.montuotojas.lt

Description of the company

"Montuotojas" is one of the largest engineering solutions, industrial equipment manufacturing, industrial construction and installation companies in the Baltic countries. The origins of the company go back to 1959. "Montuotojas" provides general contracting, engineering solutions, design, production, installation and consulting services to industrial, energy and other companies both in Lithuania and Europe. Currently, "Montuotojas" manages two modern metal processing factories operating in Alytus and Panevėžys. "Montuotojas" factories can produce 700 tons of various metal constructions per month, so even large orders can be implemented at the same time.

Circular practices

In accordance with good practices, the company "Montuotojas" has set priorities for sustainable activities, which it strives to implement every day:

- Quality of services and products
- Employees safety and Health
- Sustainable and economical production
- Employee education and professional development

Added value


Sustainable and economical production. By creating products for large companies, "Montuotojas" contributes to the sustainability goals of various companies in the industrial sector, helping to increase operational productivity, save resources and the environment, and improve operational processes.

"Montuotojas" organizes production processes by conserving resources, aiming to reduce the impact of production activities on the environment, in compliance with waste management, energy efficiency, and environmental protection standards.



Best practices of circular economy

ENERMEGA, UAB

 Alytus, Lithuania

 www.enermega.lt

Description of the company

UAB „ENERMEGA“ production is woodworking tools. Company is making, sharpening, repairing most of the tools used in industry for woodwork. Planning heads, cutters, saws, drills, chisels, cutter sets for windows, doors production, all this are supplied to many Lithuanian and foreign companies.

Metal products and industrial metal structures are made of tool steel, hard alloy, diamond surfaces. This guarantees durability and longevity.

Circular practices

Eliminates waste and pollution by designing products and processes that reduce or avoid them.

Regenerates natural systems by using renewable energy .

Added value

By observing the working conditions of cutters recommended at work, the durability of cutters (the work resource of the cutter between sharpenings) in the following conditions:

When sharpening tools, a quality guarantee is provided that the tools will be technically sound and accurate.