CIRCULAR PLASTICS

IDENTIFICATION OF TARGET GROUPS AND PROFESSIONAL NETWORKS

ARRS RPROJ-JR-PRIJAVA/2020/36

Design and Management of Sustainable Plastic Value Chains to Support a Circular Economy Transition (Circular Plastics)

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Identification of target groups and professional networks

PROFESSIONAL NETWORKS AND MEMBERSHIPS

- A member of scientific advisory boards of international conferences SDEWES, LA SDEWES and SEE SDEWES (Lidija Čuček)
- A member of international scientific committee of international conference PRES (Lidija Čuček)
- A member of editorial board of Process Integration and Optimization for Sustainability (Lidija Čuček)
- 2018 – 2021: member of executive board of SATENA (Prof. dr. Mojca Škerget)
- 2017 – present: member of the Technology Council and the Program council (since 2021) of SRIP Networks for Transition to the Circular Economy (Prof. dr. Mojca Škerget)
- 2017 – present: head of the pillar Functional Materials within the SRIP Networks for Transition to the Circular Economy (Prof. dr. Mojca Škerget)
- 2010 – 2015: member of Expert body of Scientific council for Engineering Sciences and Technologies at Slovenian Research Agency (Prof. dr. Mojca Škerget)
- 2019 – present: Member of the editorial board of the Croatian Journal of Food Science and Technology (CJFST) (Prof. dr. Mojca Škerget)
- 2021 – present: Member of the editorial board of the journal "Processes" ISSN: 2227-9717 (Prof. dr. Mojca Škerget)
- Member of Slovenian Chemical Society (1978-) (Prof. dr. Zdravko Kravanja)
- Secretary of the Chemical Process Engineering division of the Slovenian Chemical Society (1992-1994) (Prof. dr. Zdravko Kravanja)
- Member of European Forum for Computer Aided Process Design (1994-) (Prof. dr. Zdravko Kravanja)
- Secretary of the Organizing Committee of the Fifth European Symposium on Computer Aided Process Engineering, ESCAPE 5, Bled 1995 (Prof. dr. Zdravko Kravanja)
- Member of Slovenian Simulation Society (SloSim) (1995-) (Prof. dr. Zdravko Kravanja)
- Member of Working Party for Computer Aided Process Engineering at EFCE (2000-) (Prof. dr. Zdravko Kravanja)
- Member of Working Party for Chemical Engineering Education at EFCE (2000-) (Prof. dr. Zdravko Kravanja)
- Member of the editorial boards at Chemical Engineering Research and Design, and Chemical and Biochemical Engineering Quarterly, Periodica Polytechnic (Prof. dr. Zdravko Kravanja)
- Member of the American Institute of Chemical Engineers (AIChE) (2009-) (Prof. dr. Zdravko Kravanja)
- Member of Scientific Council for interdisciplinary research at the Slovenian Research Agency (2013-) (Prof. dr. Zdravko Kravanja)
- Associate Editor of Journal of Cleaner Production (Dr Yee Van Fan)
- Associate Editor of Energy Sources, Part A: Recovery, Utilization and Environmental Effects (Dr Yee Van Fan)
- Subject Editor of Energy (Prof Dr Habil Petar Varbanov)
- Co-Editor in Chief of Cleaner Energy System (Prof Dr Habil Petar Varbanov)
- Associate Editor for Europe, Clean Technologies and Environmental Policy (Prof Dr Habil Petar Varbanov)

- Member of the International Scientific Committee of the International Conference on Low Carbon Asia (Prof Dr Habil Petar Varbanov, Dr Yee Van Fan)
- Conference Chair of Conference on Process Integration for Energy Saving and Pollution Reduction (Prof Dr Habil Petar Varbanov)
- Member of Working Party for Chemical Engineering Education at EFCE (2019-) (Prof Dr Habil Petar Varbanov)
- Member of the International Scientific Committee of the Conference on Sustainable Development of Energy, Water and Environment Systems – SDEWES (Prof Dr Habil Petar Varbanov)
- Conference co-chair of Conference on Process Integration for Energy Saving and Pollution Reduction (Dr Yee Van Fan)

COOPERATION WITH COMPANIES

Aquafil: sustainable textile company (https://www.aquafil.com/the-group/)

Since 1965, the Aquafil Group has been a pioneer of the circular economy and a landmark in terms of quality and product innovation for Italy and the globe. We primarily manufacture Nylon 6 fibers and polymers but also Nylon 6.6 and Dryarn. Our flagship product is ECONYL® nylon, which revolutionizes the world of synthetic fibers through a closed-loop model.
Today, Aquafil remains a leader in the research of new production systems for sustainable development. The Group has a presence in eight countries on three continents with 20 plants employing more than 2,800 people in Italy, Slovenia, Croatia, the United Kingdom, the United States, Thailand, China, Japan and Chile.
Aquafil operates through four product areas:

1.) Yarn for Carpets (The production of textile flooring yarns has been Aquafil's core business since their foundation. Today, company is recognized as a leading player in the Bulk Continuous Filament sector globally. Research excellence in the circular economy field has made Aquafil Group one of the main suppliers of sustainable synthetic fibers for carpet flooring around the world)
2.) Yarn for Textile (The clothing yarns product area is dedicated to the production of Polyamide 6 and 6.6, and Dryarn® for underwear, sport, fashion, and leisure clothing. Thanks to its long experience in the sector and its production of ECONYL® regenerated nylon, Aquafil has won an important share of the textile market as a major supplier of Italian and international apparel and sportswear brands)
3.) Polymer (Aquafil's Polyamide 6 Polymer production has some unique characteristics: High mechanical strength, stiffness, hardness and toughness, Good fatigue resistance, High mechanical damping ability, Good sliding properties, Excellent wear resistance, Good electrical insulating properties, Good workability)
4.) Engineering (Aquafil Group also operates in the plant engineering sector through the company Aquafil Engineering, which is specialized in the design of industrial plants for the chemical and polymer industries).

Rupar plastika d.o.o. (https://www.mica.si/en/the-company/)

Since 1978, the Rupar plastika company do their best to meet the needs of customers in Slovenia and Europe in packaging. Today, the customer wants everything in one place, that's why together with their designers, plan and produce packaging – from bottles to lids and other objects. Their packaging can be used for filling with vinegar, fruit syrup, oil, herbicides and other fluids including aggressive substances. Since 1995 they are offering also decomposable PET packaging to the Slovene and European market. They offer: Packaging for medications, Agro programme, Industrial packaging, Packaging for cleansers, Diary programme, PET programme, Personal care programme. Our main contact with company is Rok Miklavčič from sales department.

Saubermacher Slovenia d.o.o. (https://saubermacher.si/podjetje/o-nas/)

Saubermacher co-shapes the future of waste and the circular economy. By protecting natural resources and our fair relationship with all future generations. For people and the environment. Their beginnings date back to 1990, when they started introducing separate waste collection through the BioPaS system (separation of waste into bio-waste, paper and glass). Their vision of "Zero Waste" or no waste is a commitment to real sustainability - it is not a theory, but an established practice. They can process a large part of the material that is discarded in the waste. Their main goal in the future is to recycle everything that is possible. They are 100% devoted to the purpose of waste prevention. With innovation for the benefit of the environment, with the constant flow of new, fresh ideas and innovations, thanks to their own research and development, they are raising the level of waste logistics and their recovery or recycling of key raw materials. Their philosophy is an environment worth living in. So, the climate and environmental protection are very close to them, as reflected in daily activities. In their business, they have three branches of process. These are divided into the waste management and recycling segment, environmental protection and environmental protection advice.

Plastik SI d.o.o. (https://www.plastik.si/en/)

Plastik SI d.o.o. is one of the leading manufacturer of plastic packaging for industrial products in Slovenia**.** The company has continued the 60-year-long tradition, optimized the production, introduced new technologies, production processes and approaches. Since 2016, Plastik SI d.o.o. has been a member of the JUB group. The company uses two types of technology in the production of plastic packaging. With the technology of blow moulding, it produces products such as: barrels, handles, spare fuel handles, plastic bottles. With the technology of injection moulding it produces various types of buckets (oval, rectangular, cylindrical, round), crates, multifunctional containers, waste containers, plastic baskets. In the production process for buckets (injection moulding technology) technology allows them to glue IML labels to their products. IML technology (IN MOLD LABELLING) is injection moulding technology with automatic insertion of labels into the injection mould. Since the label is printed on the same material as used for buckets production, the negative

impact on the environment is reduced by allowing easy recycling. The Vision of Plastik SI d.o.o. is to maintain a leading role in the production of plastic packaging for industrial products in Slovenia and to become a recognized development supplier of plastic products in Europe. The Mission of Plastik SI d.o.o. is to produce quality, safe, useful, attractive and environmentally friendly plastic products, while providing sophisticated solutions to customers who are focused on the rational usefulness of products and, consequently, environmental responsibility. Their values are passion for victory, teamwork, proactivity, customer satisfaction, responsibility, honesty and respect for colleagues and customers, as well as innovation and creativity in production and sales. Our main contact with company is Peter Brezavšček, an R&D Engineer.

Plastika Skaza d.o.o. (https://www.skaza.com/)

Plastika Skaza is Plastic manufacturing specialist & Creator of sustainable products for home & garden. The Slovenian-based company, setting high standards in design and plastic manufacturing. They meet various demands of injection molding and custom-made plastic industrial products for their clients all over the world. Because of the constant upgrade of their skills and technology, they are able to deliver the most stringent requirements and the most demanding products on time. They promote responsible ways of living. The principles of sustainable development are the guide to all their processes. By connecting people and nature with their clear vision, which is reflected in the development of their innovative products, they want to build a base for responsible lives on our planet. Driven by their values, which are the source of responsible fulfilment of given promises, they strive for progress, show courage in finding inspiring solutions and a sustainable attitude, which is proven by our respect towards natural resources.

We are also working with many other companies, which are named in Appendix 1. Some of them are in the form of consultation or information providers.

COOPERATION WITH LCA ANALYSES FOR COMPANIES ON PLASTICS

Microbium d.o.o.

Microbium company works in the field of industrial microbiology. The main activities of the company are detection of microbes, elimination of them, research and development, disinfection and some more. They can eliminate microbes with the help of many technologies, they can remove microorganisms from water supply systems and production lines in companies in an environmentally friendly way, with the help of ozone, chemicals, UV technology or ultrasound.
Their product »Microbium ETC Analyser«, for which we worked lca analysis, can be used for automated detection and quantification of E. coli and coliform bacteria in drinking water. The manual Microbium® ETC Analyzer is very handy, does not require additional training, has a very low detection limit, is cost-effective (analysis with it costs 10x less than the analysis in the laboratory) and represents the principle of "zero waste" as there is no laboratory waste produced. It is designed for re-use and provides for 100 analytical cycles (equivalent to 3-5 years of use). It is made of polypropylene (PP) plastic material and weighs only 0,18 kg.

Procesni inženiring d.o.o.

Procesni Inženiring started its operation in 1990. They have evolved from a company working on projections of gas installations and stations into a company providing upgrades, and replacements for existing industrial oven heating systems, yet at the same time also manufacturing its own units –ovens, furnaces and air cleaning devices. Their vision is to become the most widely-known brand dealing with upgrades and solutions of technological processes for our clients, always putting their satisfaction first. Their mission is to ensure: technological advancement, the use of smart technology, high-quality production with the use of BAT technology, energy optimisation, secure use and sustainability of our products, first grade solutions to concrete technological processes, "hot line" support for as long as you choose to use our products (directly connected to the equipment), execution that takes into account our customers' minimum and maximum production, a combination of different technologies is being used in one product, should this be dictated by your needs, a long product life span, durability and a high degree of reliability, prompt integration of any new processes with your existing production process, expert know-how, flexibility, cooperation, innovation, the satisfaction of our clients, social responsibility.

DC eNeM d.o.o.

The company Development Center eNeM New Materials d.o.o. was founded on May 16, 2011. The key goal and purpose of the establishment of the New Materials Development Center is to promote development and research activities in a joint development and research company in various fields with the aim of research and development of new materials, the establishment of new innovative companies with high added value and faster development of entrepreneurship in the Zasavje region.

DISSEMINATION VIA TBMCE AND OTHER CONFERENCES

International Conference on Technologies & Business Models for Circular Economy (TBMCE)

International Conference on Technologies & Business Models for Circular Economy (TBMCE) is devoted to presentations of circular economy concepts, technologies and methodologies that contribute to the shift of business entities and society as a whole to a more responsible, circular management of resources. The conference program includes panel discussions, plenary and keynote sessions, oral and poster presentations on the following topics: Sustainable energy, Biomass and alternative raw materials, Circular business models, Secondary raw materials and functional materials, ICT in Circular Economy, Processes and technologies. In the framework of TBMCE, the Strategic Research and Innovative Partnership – Network for the Transition to Circular Economy (SRIP-CE) is presented as a platform for establishing a successful long-term public-private partnership. TBMCE is organized by the Faculty of Chemistry and Chemical Engineering, University of Maribor every year in September.

The 5th International Conference on Technologies & Business Models for Circular Economy (TBMCE 2022) was organized by the Faculty of Chemistry and Chemical Engineering, University of Maribor in cooperation with the Chamber of Commerce and Industry of Štajerska and SRIP- Circular Economy. The conference was held in Portorož, Slovenia, at the Grand Hotel Portorož from September 12th to September 14th, 2022 and our project was presented to a large number of gathered participants. Researchers who work on our project "Design and Management of Sustainable Plastic Value Chains to Support a Circular Economy Transition" have presented there more than 6 presentations.

Conference on Process Integration for Energy Saving and Pollution Reduction (PRES)

The PRES conference series represent recognised platform for bringing together scientists, engineers and decision-makers, to discuss and innovate solutions and technologies for improved efficiency and sustainability of industrial and regional systems.

This year conference was Silver Jubilee 25th Conference on Process Integration for Energy Saving and Pollution Reduction – PRES'22. This year conference edition is organised by the University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in the city of Split and municipality Bol on the island of Brač in the Republic of Croatia from September 5th to September 8th 2022. Researchers who work on our project "Design and Management of Sustainable Plastic Value Chains to Support a Circular Economy Transition" have presented there more than 11 presentations or posters.

SDEWES Conferences

Conferences are organized by International Centre for Sustainable Development of Energy, Water and Environment Systems (SDEWES Centre), who is a non-governmental and non-profit scientific organization based in Zagreb, Croatia. It engages in specific R&D activities that address the problems common for the countries of the East and Southeast European and Mediterranean regions. SDEWES Centre has almost 800 regular and supporting members from over 50 countries (6 continents). Its members are experts, professors, scientists, students and business people in the field of sustainable development of energy, water and environmental systems.

SPIL Conferences

A yearly conference organised by SPIL (member of the Circular Plastics project), where international researchers, students and representatives of industries are gathered for knowledge exchange. World-leading researchers are invited as speakers to provide up-to-date insight into their respective expertise. It serves as a networking platform for collaboration on sustainability research. 4 presentations based on the research output of Circular Plastic projects have been presented at the 6th Sustainable Process Integration Laboratory (SPIL) Scientific Conference.

µMED - III International Conference on Microplastic Pollution in the Mediterranean Sea

We also had the opportunity to present our project at The III International Conference on Microplastic Pollution in the Mediterranean Sea – µMED, held in Naples, Italy from September 25th to September 28th, 2022).

Our researchers also regularly attend some other conferences:

- CLES-CE Conference: 1st International Scientific Conference on Cleaner Energy and Chemical Engineering for Sustainable Circular Economy
- ESCAPE: The European Symposium on Computer Aided Process Engineering
- BioPPul@UC Workshop,
- International Conference on Sustainable Solid Waste Management
- ICLCA: International Conference on Low Carbon Asia

and some others.