



DELIVERABLE D.T2.2.2 REPORT BASED ON THE OUTCOMES OF THE BUSINESS SUPPORT SERVICE

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1. TRENDS IN EUROPE

1.1. BIOPLASTICS

According to the forecasts, there is an increasing demand for the use of bioplastics, so the market certainly could use a TPS or PLA production plant with a capacity of 100 to 130 tons per year. The production of TPS in any other Western European country exceeds this amount. During the production, TPS in itself is used rarely, usually mixed with other types of plastics, so the amount of produced raw material can be multiplied and be able to supply the local market. It is important to emphasize that there is no similar initiative in this region - for setting up PLA or TPS factory - and it cannot be expected in the catching-up countries, so the establishment of the factory is justified from several point of view.

1.2. PACKAGING MARKET

Consumer applications such as food, beverages and cosmetics account for the bulk of the global packaging market. In 2018, the consumer sector was worth almost \$511 billion, or 56.4% of the overall packaging market. Since 2013, the consumer sector has grown by a rather modest 1.4%, owing to factors such as the maturity of the packaging market and many leading end-user sectors across much of the developed world. The share taken by the consumer sector is expected to decrease slightly within the next decade at the expense of its industrial counterpart, shrinking to just under 56% by 2023 and 55.5% by 2028.

1.3. NEW POTENTIAL MARKETS OF PLA (HELPS TO SPREAD PAPER AND PLA COMBINED MARKET)

Method of processing: polylactide, in addition to its advantageous characteristics, still has a beneficial feature that can be processed with existing polymer processing technologies and equipment.

- extrusion,
- blow molding,
- injection molding,
- injection blow molding,
- thermoforming.

It can be used for producing extruded products with different profiles, injection molded parts, decomposable foils, biaxially oriented films, hollow objects, thermoformed trays, anti-cracking foams, fibers, textiles. Packaging and medicine industries are the main users of PLA. Syringes, sachets for blood storage, catheters, surgical catguts, implants, prosthesis, tissue engineering products for patients with burn injures, and also can be used in pharmacy, e.g. by controlled release drug delivery.

1.4. REGULATORY ENVIRONMENT

Sustainability issues are having a profound effect on regulatory activity within the packaging industry at present, driven by the growing desire for a truly circular economy. Europe and the EU appear to be at the forefront of much of the regulatory activity currently taking place as far as sustainability is concerned, via legislation such as the Packaging Waste Directive and the new law banning single-use plastic items such as plates, cutlery, straws and cotton buds stick by 2021.

An important driving force would be the propagation and impact of the EPR system at EU level. Extended Producer Responsibility (EPR) involves the extension of a producers' financial and/or physical responsibility for its product to the post-consumer stage of the product's life cycle.

2. COUNTRY SPECIFIC DATA – SLOVENIA

2.1. SLOVENIAN MARKET

Slovenia is a small country with a highly diversified economy, which is dominated by small and medium companies and a smaller number of large companies. Due to the small domestic market even medium companies, especially if operating in niches, export a significant part of their production. Slovenia's export is mainly oriented towards other EU countries, mainly Germany, Austria, Italy and France but also further afield. A consequence of high exports even in smaller enterprises are very active contacts with players in other economies, integration in international value chains and an understanding of sectoral trends. Exports of goods and services (% of GDP) in Slovenia was reported at 77.65 % in 2016.

2.2. MULTIMATERIAL PRODUCTS AND PAPER INDUSTRY

Multimaterial papers and products are the production domain of the paper value chain. Plastics converters do not produce such products. So the more important industry for this sector is the paper industry. Multimaterial products are mainly used in packaging, especially in retail (e.g. large quantities of windowed paper bags) and for food stuffs where they serve to display, protect and preserve the product. Other less specific and very varied products are also packaged in combined materials (pharmaceuticals, batteries ...). Products mainly consist of laminated papers for print, packaging or other products and of packaging and other products with added barriers, windows, plastic envelopes etc.

Packaging market trends are focusing on sustainable packaging solutions, growing popularity of flexible and lightweight packaging, consolidation of the packaging market, improving product recyclability, optimizing packs for ecommerce and on smart packaging solutions.

There is no actual existing raw material producers of bioplastics (this is the only missing actor in value chain in our country but it does not pose any problem due to possible imports) and just a small number of bioplastics packaging producers (no paper-bioplastics packaging producers) in Slovenia. There is no market developed for the paper-bioplastic packaging products yet, nevertheless, it has a good potential to develop as demand for such products is rising.

The paper industry has a long tradition and is organized through The Paper and paper converting Industry Association (PPCIA) which serves as a joint meeting point and is also part of labour negotiations and an industry representative in dealing with government and policymakers. It is associated with the Chamber of commerce and industry of Slovenia (CCIS) which provides essential services for enterprises operating in Slovenia, and it is the ideal local partner for foreign investor.

2.3. BIODEGRADABLE PLASTIC PRODUCTION

A share of 27% of the world production of bioplastics is produced in Europe, mostly from starch, and experimentally from whey and other renewable sources. The EkoPlastik d.o.o. is the only Slovenian company,

distributing biodegradable polymers within the European Union. There is no manufacture of biopolymers in Slovenia, because there is no market for such products in our country yet. Some companies just process bioplastics, making a few packaging products as biodegradable bags are. The latter is meaningful for us, knowing, there is available biodegradable foil in our country. There is also a company producing PLA (polylactic acid) bottles, but only for the purpose of export. Large retailers have expressed interest in using more sustainable packaging however the (higher) cost is normally a limiting factor. Producers that use combined paper/plastic packaging are a group with high potential for use of paper/bioplastic products. Especially in product lines for bio- eco- food products where they wish to complement the environmental product with sustainable packaging. Several attempts at finding such packaging have been mentioned however at the moment none are used commercially.

Bioplastics and packaging made of it have no specific regulations in Slovenia. Bioplastics undoubtedly brings a change in the market both for consumers and producers. The market is turbulent and the supply/demand system uncoordinated. Recently in European Union the biopolymer products in the rise are thermoplastic foil products. Slovenia has a potential for a development of bioplastics and paper-bioplastics products market

3. ASSESSMENT REPORT

3.1. COMPANY PROFILE

The EICHNER Group comprises the companies EICHNER Organization GmbH & Co. KG and BOI-DOKUTECH GmbH located in Coburg, Germany and Termopol d.o.o. in Sovodnj, Slovenia. EICHNER Group has been family owned for over 85 years and operates with almost 200 employees in numerous industries and niche markets. Their ability to produce diverse organisational solutions and products is the basis for all their business segments.

Termopol d.o.o. is a medium size company in foreign private ownership. It was established in 1959 as a family owned business and has been part of the EICHNER Group since 1994. All kinds of plastic and cardboard products are developed and produced there. Termopol also looks after customers in Macedonia and Croatia as well as the local market. High-quality products made of PVC, PP, PET, PC, PS and cardboard are produced with the existing machinery. They have the option of cost-effectively producing large quantities fully automatically, or individual products in small quantities.

Company revenue growth in the last year is 10 %. They invest almost all of their profit further in investments. Their total assets three years ago were estimated at 1,4 million EUR, two years ago 1,75 and last year at 2,19 million EUR. They employed 95 employees three years ago, 107 two years ago and 120 in the last year, so their company is expanding.

The innovation is very important for the company, they have a medium term plan for it, implement it from one to five years. They invested from 20 to 25 % of annual investment budget on average in the last three years in investments in innovation. Innovation predominantly happens internally in the department. They have approx 4 % innovative patented products and around 15 % of not patented in the last five years. Decision makers are top management, their support towards innovation is very high. Also the staff attitude toward change is high, but they mostly work in the way that top management decides. Their sources of knowledge are research projects and scientific publications. They also gain some knowledge from suppliers and regarding on customer demand. They have difficulties with finding a new skilled staff, usually they train their new employees by themselves, because of the specific of their work.

3.2. SUSTAINABILITY, USING OF BIOMATERIALS

Sustainable development is very important for them, they have qualitative goals. EICHNER Group has already published sustainability report. They are already working to get the FSC certified and have a DIN ISO 9001 standard. They give 85 % of their investment budget to improve sustainability. Activities on sustainability are caused by external and internal factors. They are aware of the importance of bio-based content, but at the moment they are not doing anything in this area, cause they don't have access to bio-based materials jet. For their customers', which are mostly B2B, sustainability is important, price is not a decisive factor, because their customers prefer quality. A key limitation of biomaterials by their opinion is lack of customer awareness.

As from the point of their environmental sustainability strategy, paper is not so important, at the moment they just use it as reinforcement for their products. On the other side bioplastics, plastic and bio-composites are very important for them, they see biomaterials as a new opportunity in a more sustainable product production. They are fairly familiar with legislation for sustainable products as it is recycling, composting, biocontent etc.

3.3. PRODUCTION SPECIALITIES

Termopol produces end use products that are nonfood, secondary packaging. Their base materials are PVC (Polyvinyl chloride), PP (Polypropylene), PET (Polyethylene terephthalate), PC (Polycarbonate) and PS (Polystyrene). Their suppliers provide the company with technical data sheet, SDS and Declaration of conformity (certificates), also if they need, they deliver them analytical report. Their end products need to have mechanical resistance, barrier to liquid and grease. The legislation they need to comply with is EU and REACH. The main target of their products are esthetics, functionality, consumer and waste management level. At the moment most of their product at the end-of-life phase go to thermos valorization, but their goal is to change that so their products can be reused and recycled when they wear out.

At the moment their main sustainability goal on the production side is energy and material saving. On the end-of-life side their main goal is to reduce carbon-footprint and to follow buyer specification, but in the future they plan to promote renewable biobased products and favour local circular economy. Their current printing technology is pad, screen and digital printing. For adhesives, they use hot melts and glutinous glue ("klej"). They use solvent based screen printing inks and UV varnish for digital and screen printing.

3.4. SUMMARY AND SOLUTIONS

Termopol sees an opportunity of getting competitive advantages in participating in pilot action as in a form of getting more knowledge of legislation, financial benefit and knowledge of biocomposites materials. They need more information about biomaterials and are prepared to start testing them right away and use biomaterials and knowledge as their further strategy.