

Industrial Symbiosis, or the Waste's Second Chance

In the last century our consumption has started to grow in an unmeasurable way while the amount of generated waste has also been increasing. In nature there is no real waste neither surplus: all by-products, waste will be the input of another process, forming a large closed cycle. This type of rotation is hardly found in our economy, in most cases the principle of "production and disposition" applies.

Circularity works perfectly in nature and to help it improve in our industry TRIS (Transitional Regions Industrial Symbiosis) project was launched by a few European countries in April 2016. Hungary is represented in the Interreg Europe project by IFKA Public Benefit Non-Profit Ltd. for the Development of Industry (IFKA) and Herman Ottó Institute Non-Profit Ltd. (HOI). The five-year project aims to promote the circular economy, increase resource efficiency and enhance the competitiveness of small and medium-sized enterprises which can be practically achieved through so-called industrial symbiosis.

A key pillar of joint work in the project is the collection and dissemination of good practices. If we were to look for this professional expression as "industrial symbiosis" in the Hungarian industry we would not be very effective because, even if they exist in practice, this expression is not widespread. It means: "The waste, surplus of one production process is used as an input of another production process".

Based on the tasks carried out during the first two years of the TRIS project, we can conclude that it is possible to use some waste as secondary raw material in almost all industries and successful application cannot be restricted to only one industry. Of course, there are sectors where this is more difficult to implement, such as food industry, but there are some where environmentally conscious synergies often appear. For example, the construction industry. Some of the good practices that have been gathered so far - domestic and foreign - will be shared in this article with the reader.

Lafarge Cement Factory - Hungary

A year has hardly passed by since the pilot plant was set off, but already thousands of tons of contaminated limestone had been reused at the Királyegyháza Cement Factory operated by LAFARGE. In a Hungarian automotive painting plant, ~ 2500 tons of contaminated limestone powder is produced every year, which is used as a filter material in the plant in its clean state. Recycling of contaminated limestone powder had not been solved so far instead it was deposited. Saubermacher-Magyarország Kft. stepped up and made some recommendations for recycling. Due to the joint investment of LAFARGE Cement Magyarország Ltd., its Geocycle Business Department, and the Saubermacher-Magyarország Ltd. a new venture project was introduced. A series of technologies were built in which contaminated limestone can be used as secondary raw materials for cement production.

WYW Block Ltd.

WYW BLOCK Ltd. is a Hungarian company engaged in the production of energy concrete partitions, CEMEXA bricks, roof structures and steel profiles for energy efficient buildings. In

addition to manufacturing, it also engages in research and development activities to find the most environmentally friendly and energy-saving solutions and to extend the construction industry. Thanks to this conscientious management, WYW BLOCK has successfully developed the technology for manufacturing high quality, tradable construction products from recycled waste (plastic, EPS).

The collected EPS packing and sealing materials will become an excellent secondary raw material after grinding and sorting. The polystyrene concrete products can be used for the construction of residential buildings, industrial and commercial facilities as well as for exterior insulation work.

End-of-life and unnecessary products can be returned to WYW BLOCK Ltd. after completion of the construction and insulation, instead of being carried out to a landfill.

Clean-Way

Most of the construction and demolition waste can be reused, but in the absence of information and mutual confidence, the rate of using these valuable secondary raw materials is still low. This was recognized by Clean-Way Ltd., a domestic waste management company and found a solution to increase this rate. A mapping application has been developed that can be used to share on-site and quality data about the secondary raw materials that are being generated or needed. After that, the logistic companies can easily find each other, and raw material savings and waste reduction can start. With this application, more than 440,000 tonnes of waste have been used.

Good examples from Swedish partners

It is known of Sweden that it seeks to develop a conscious and sustainable lifestyle throughout the country, and some regions work for this goal harder than others. This is why the company Green Pipe was established in Kronoberg region, which manufactures 100% of used plastic pipes and protective tubes mainly for underwater or underground use. Much of the secondary raw material is primarily used as a bumper that is made of high quality plastic and is available in large quantities in the region, but also in the whole country. According to a Swedish survey, 100% recycled plastic products reduce their environmental impact by 80% compared to primary raw material (plastic) products.

Another good example in Sweden is the biogas production and operation of several dairies, Alvesta Biogas AB. Biogas plants using manure and other organic waste (eg slaughterhouse waste), as raw material, produce gas for gas-fuelled buses and the residual material after fermentation is used as a fertilizer.

The 11 farms are located 15 km away from the biogas plant. They mainly keep cows for meat production, but also cows, pigs and lambs. Farmers deliver the manure and receive the same amount of high quality organic material in return for fermentation.

These examples illustrate the wide range of industrial symbiosis in the industry, if we are thinking of a non-linear but a circular economy. Thanks to these solutions, less waste is deposited, fewer primary raw materials are needed, and the creation of new technologies

has a job creation effect as well. This way we can experience the environmental, economic and social benefits of a circular economy.