Paper Recycling in Covid-19 Conditions

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Abstract

Recycling is an example of a sustainable process within the proclaimed circular economy, and paper is the most recycled material in the world. The new conditions imposed by the Covid-19 crisis put the pulp and paper industry to the challenge of coping with emerging difficulties and maintaining its position in individual sub-sectors. The aim of this study is to present the development of recycling of paper and paper products within of the last year, marked by the conditions of the Covid-19 pandemic. In the study have been used the descriptive - analytical approach, the methods of comparison, analysis and synthesis.

Keywords: paper recycling, Covid-19, recovered paper, circular economy

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Introduction

The Covid-19 pandemic has posed enormous challenges to the world's economies. The consequences of the crisis that began in March 2020 have a different impact on sectors in different countries. The effect is contradictory, generating negatives, but also positives for specific productions.

In conditions of a proclaimed circular economy and the tendencies for ecological productions, the pulp and paper industry is an example of the activities that meet the requirements for resource-saving and green technologies. Circular economy indicators require a new approach to action by identifying aspects of environmental risk and introducing measures to minimize it. Aspects are concluded to environmentally oriented industries and activities through real and specific consideration of regulated indicators: minimization of production waste, resource efficiency - reducing the consumption of basic production raw materials - water and energy, accounting for harmful emissions into the atmosphere and the amount of accumulated hazardous substances in waste water, according to recalculated and applied methodology. Recycling is an example of a sustainable process in this regard, and paper is the most recycled material in the world.

The new conditions imposed by the Covid-19 crisis put the pulp and paper industry to the challenge of coping with emerging difficulties and maintaining its position in individual sub-sectors. In this connection, interest are the effects of the crisis Covid-19 on the activities of the sector directly related to the ability to provide a circular economy - the recycling of paper and products from it. How the pandemic has an impact and how the negative consequences of it can be overcome in the paper recycling activities determines the **relevance** and defines the authors' **interest** in the study.

The aim of this study is to present the development of recycling of paper and paper products within the last year, marked by the conditions of the Covid-19 pandemic.

1. Thesis statement and literature review

Among the many effects of this unprecedented pandemic coronavirus, COVID-19, practices and procedures for waste management seems to earn more interest over time. **(**Smart Waste Report European Union 2020**).** Authors (Kulkarni and Anantharama, 2020; ACRPlus-Association, 2020; Yang et al., 2021; Ikiz et al, 2021) examine the impact of the pandemic on the challenges and opportunities in waste management, some of which have recycling activities. Dente and Hashimoto (2020) conclude that much uncertainty remains about the positive and negative effects of the pandemic on resources and waste streams and stocks, as a transfer of environmental impact between sectors and regions can be expected. According to the circular economy, that prioritizes recycling, it is one of the approaches to waste management affected by COVID-19. (Reike, Vermeulen and Witjes, 2018). It is difficult to decide whether to avoid or continue recycling during this crisis. Recycling can expose the worker to the risk of infection. Staub (2020) reports that the coronavirus pandemic has been affecting U.S. recycling programs since mid-March. According to the author's team (Fan et al., 2021) it is still important to minimize the environmental impact of waste management as much as possible, even when the most preferred management options of waste and the hierarchy of the circular economy cannot be observed. According to them, the implementation of recycling would be a greater challenge if the incentives for green initiatives are reduced in the economy after COVID-19.

Study (Zambrano-Monserrate, Ruano and Sanchez-Alcalde, 2020) on the positive and negative indirect effects of COVID-19 on the environment, especially in the most affected countries such as China, the United States, Italy and Spain indicates that the virus also has negative secondary aspects, such as reduced recycling and increased waste, which further threaten the pollution of physical spaces (water and land) in addition to air.

The reviewed authors focus their attention on the impact of the crisis on the overall recycling activities, as one of the options to the management of waste. Against this background, it is of interest to present specifically the recycling in certain areas of material flows and in particular paper.

2. Methodology of the research

The object of research is the functioning of the paper recycling sector in the conditions of Covid-19. In the study have been used the descriptive - analytical approach, the methods of comparison, analysis and synthesis.

3. Results and discussion

Carminati (2020) writes that, The Confederation of European Paper Industries (CEPI) recently published official data on the sector's performance over the past 11 months, pointing out that despite the dramatic impact of the pandemic, producers can anticipate interesting development opportunities. There is no doubt that the production of paper and cardboard, as well as many other industrial activities, are significantly affected by the spread of Covid-19 in the first two quarters of this year. However, there is still a chance for a stable recovery; it should be noted that the slowdown in the sector is not as noticeable as in other production activities. The data show a decrease in paper and board production by 4.5% between January and May 2020, compared to a decline of 20.4% in other industries. At the same time, the coronavirus seems to be able to increase sales of product categories such as tissue and toilet paper, and of course packaging (driven by growth in e-commerce). CEPI also notes that "the Covid-19 crisis is accelerating the development of a fundamental shift in the consumer models related to increased teleworking and digitalization." Moreover, that these trends "will have a lasting impact on retail structures and production patterns."

The Confederation (CEPI) also recalls that during the state of emergency, the important role of the paper industry in many European countries, such as Belgium, Finland, Hungary, Italy, Spain and the Czech Republic, stood out. Moreover, this is because industry is making consistent efforts to ensure that "EU citizens have access to products needed for hygiene, health and food". In addition, it is able to cooperate with other major players in the value chain, "to provide security of supply and transport" and thus ensure the maintenance of "normal business".

In the crisis with Covid-19, the pulp and paper industry proved to be extremely important to ensure the continuous supply of pharmaceuticals, food, beverages and medical equipment. Paper and cardboard packaging are leaders in the field of transport and packaging for consumer goods. The industry is doing everything possible to stay fully operational to ensure sufficient packaging and the safe delivery of food and pharmaceuticals, which are currently extremely important for European society (PAPNEWS, 2020).

The Fibers Packaging Association, togheter with the American Forest and Paper Association, encourages federal, state, and local governments to recognize the corrugated industry as "critical" when preparing orders to support the "stay home." They want "a clear exception for their production activities in order to limit the disruption of the supply chain."(BB 13/2020).

CEPI has issued a statement on the COVID-19 pandemic, explaining that the sector needs rapid access to ***recycled paper fibers*** in order to support production. The association calls on local municipalities to help with the service by ensuring seamless collection of paper and cardboard during the crisis. Otherwise, there will be a shortage of raw materials within a few weeks and plants would be forced to stop production (Matthis, 2020).

Since 2000, the European chain of creating value of paper has been committed to the dual aim of improving recycling and increasing efforts to remove all barriers to paper recycling in Europe. In 2016, all members who signed the new European Declaration on Paper Recycling declared their commitment to reach 74% paper recycling by 2020 (Monitoring report EPRC, 2020).

According to CEPI (2020) data, the performance of the paper recycling sector has grown over the past 10 years as per Table. 1.

Table 1. European Recycling Rate 2010-2019

Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Recycling Rate, %	68.5	70.4	71.4	72.0	71.7	71.9	72.0	72.4	71.6	72

The recycling rate is defined as the ratio between used paper recycling including net trade of paper for recycling, and paper and board consumption.

At the regional level, the number of countries with a recycling rate below 60% was 8 in 2019 compared to 7 in 2018. Last year, the number of countries exceeding recycling rates of 70% was 15 compared to 14 in 2018. In 2019, 72% of all paper consumed in Europe was recycled. The collection of paper for recycling decreased by 2.5% compared to 2018 and reached 57.5 million tons. In fact, paper consumption is declining more than in 2018, reaching 79.8 million tonnes. The recycling rate increased from 71.7% in 2018 to 72% in 2019 due to the stable use of paper for recycling (PfR) in the European paper industry. A great signal for greater sustainability is the fact that paper collection for recycling is maintained at high levels in Europe, despite the reduction in paper and board consumption in Europe. The sharp and continuing decline in demand in China, European paper recycling was balanced by increased demand from other countries such as Turkey and India. According to Angelika Christ, President of the European Paper Recycling Council (EPRC) the increase to 72% shows that paper recycling is not only a promise, but also a model for circularity and a strong contribution to the European green deal. The ERPC is monitoring the development of the European paper recycling rate and its progress in 2019 towards the 74% recycling target of 2020 (Italia, 2020).

The European Commission, supported by the States' members, has published detailed rules on the calculation data for verification of compliance with the recycling targets set out in the revised Waste Directive and the Packaging and Packaging Waste Directive. Medugno (2020) summarizes that recycling paper and cardboard greatly contributes to achieving these goals.

According to the ERPC Report (Monitoring Report, 2020), in Europe, the paper industry constantly uses ***paper for recycling***. The decline in collection can be explained by a further reduce Chinese demand for recycled paper corresponding to the Chinese government's decision to decrease its dependence on recyclables product originating in third countries by 2020. China has also applied strict quality requirements for imported paper for recycling. As a result, for the first time in many years, China is not the first destination to export European paper for recycling, but is behind of India. Other countries such as Turkey and Thailand have also increased imports of European recycled paper, but total net exports of recycled paper outside Europe have shrunk by 16.2%.

Whether the 74% recycling target by 2020 will be reached will depend on the development of paper and board consumption, which will be affected by the Covid-19 outbreak and the overall economic downturn. New recycling capacities are being built, but not all of them will appear due to the economic consequences of Covid-19.

In 2019 the decline in the consumption of newsprint accelerated in 2019 at a rate of 6.5%, while the consumption of materials for boxes, the other most recycled paper product, decreased only slightly by 0.6%. For the commitment period from 2016 to 2020, the recycling rate calculations are verified independently by Deloitte.

Internationally, Europe continues to be a world champion in paper recycling, followed by North America (fig. 1). Paper recycling rates in other regions of the world are improving, but at lower levels. In Europe, paper fibers are used an average of 3.6 times, while the world average is 2.4 times. (Monitoring Report, 2020).

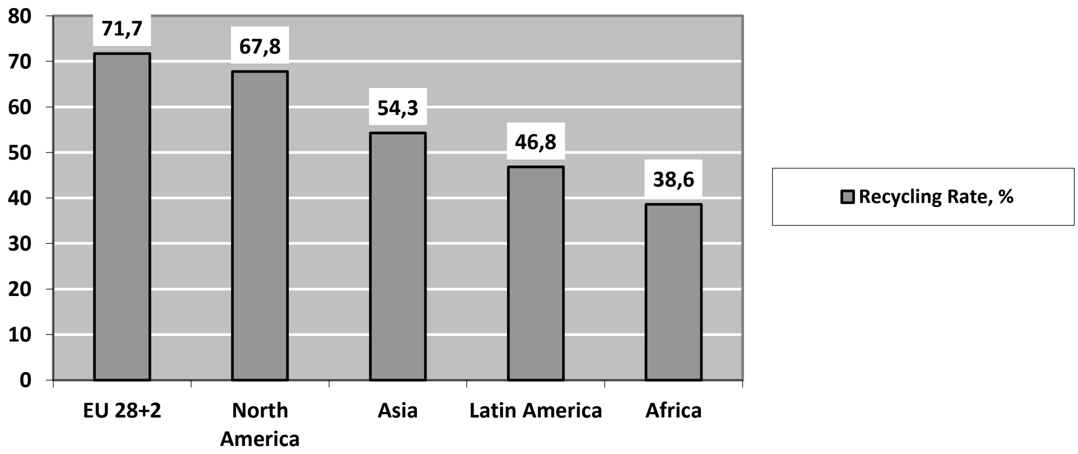

Figure 1. Recycling Rate in World Regions in 2018

*EU-28 + 2: EU-28 + Norway and Switzerland.

The EU has increased its targets for the recycling of household and packaging waste; it is clear that a functioning paper recycling chain is a key driver for achieving these goals. Paper recycling is a "Made in Europe" industry. It prolongs the creation of value and job opportunities in Europe from a renewable and mainly European resource: wood. Making recycling easy and simple, year after year, requires a huge effort to create value from paper.

In May 2020, the spread of the coronavirus crisis was having an increasing impact on the recycling business with used ***recovered paper (RP)***. Collection volumes in Germany are decreasing, especially in the commercial and industrial sector, as many companies have shut down. The collection of RP from households also faces increasing restrictions in a situation that is complicated by import violations. However, the paper industry emphasizes that so far there are no signs of a shortage of raw materials in Germany (BB 19/2020).

The coronavirus has created enormous uncertainty and pressure on the world's second largest economy, China. At the beginning of the year, industrial production, investment, consumer spending and employment levels all went down steeply, badly affected by COVID-19, writes Ranjit Baxi, J&H

Sales International Ltd., in the World Mirror Recovered Paper of the Bureau of International Recycling (BIR).) for the first quarter of 2020. When a state of emergency (quarantine) was imposed in China after the Spring Festival at the end of January, it became clear that there would be no rapid economic recovery. Instead, there has been a drastic drop in production and disruption of supply chains, with goods and containers remaining in companies' ports and warehouses. China's GDP fell by more than 6.5% in the first quarter compared to the first three months of 2019. Moreover, maritime cargo continued to grow during the first quarter, increasing by more than 200% - from about $ 800 to $ 2,500 per box, due to reduced vessel capacity and reduced cargo volumes at the beginning of the period. Obtaining space for containers remains a major obstacle to maintaining export levels. As a result, Chinese imports of recovered paper (RP) were drastically reduced to 1.34 million tons (from 3.29 million tons in the first quarter of 2019). European supplies are particularly affected by the decline: the United Kingdom (still the second largest supplier in the first quarter of 2019) fall behind Japan, Hong Kong, Australia and Canada. Italy, a normally important source of RP for China, imported only 500 tonnes (during the same period in 2019: 44,000 tonnes). There are no RP deliveries at all from Germany, France and Poland. Two different factors lie behind this development: in January and February, the ***slowing economy and declining import licenses*** led to weak demand from the Chinese in Europe, which in turn caused a deep crisis in European RP markets (with fees for some types, quite common in several markets). Since March, the crisis around COVID-19 and the closures in Europe have led to greatly reduced supplies of RP. Prices are starting to rise sharply, and European sellers often prefer to sell their material within Europe, as they can avoid inspections and reduce the risk of quality claims. Asian buyers, on the other hand, are often unwilling to pay high prices. However, the Chinese economy seems to be returning to normal in May 2020, and markets in Europe are beginning to ease the state of emergency. Stakeholders are waiting for sea transport in containers and trade channels to resume normal activities (BB 22/2020).

A summary of the information from the national member associations of the Bureau of International Recycling (BIR) on the current level of the sector as of May 2020 shows that:

China has removed almost all restrictions of emergency, but the plants do not have enough orders to operate at full capacity, and enough markets to supply. Problems associated with demand are likely to continue, as some countries avoid the risk of buying from China, not only because of fear of the virus, but also as part of an effort to reduce their dependence on others - something that can drastically change the Chinese business in the coming years.

India, trade associations continue to liaise with the government in ongoing port congestion, in particular to cancel detentions, to reduce the impact on international trade. In general, the state of emergency measures in the country are gradually easing, although the reopened plants use only 30-40% of their production capacity and face problems related to delays in payments and inability of employees to return to work. Nevertheless, Indian industry is expected to become fully operational in the next few weeks.

United States continue to report challenges related to supply amid strong demand. The Environmental Protection Agency is assisting in urging society to continue recycling, especially paper. Meanwhile, the industry is concerned about workplace liability and insurance coverage, which exclude exceptional circumstances. The issue has been raised in Congress, but nothing is expected to happen before June. There have been no reports of export problems or export controls. Supply and demand are in a reasonable balance, but at low levels.

Canada is heavily dependent on imports and exports, mainly with the United States, and this relationship will determine the pace of recovery as its provinces begin to loosen restrictions imposed by the virus. Canada is also focused on a green economic recovery, with companies having to show sustainability plans - criteria for accessing government funding. There is currently a shortage of containers on the west coast of Canada.

Gradual economic recovery is taking place in many countries in Europe. In Germany, industrial production restarts in varying degrees, and on May 15 the borders are open again for the rest of the European Union (EU), which reduces logistical problems. Meanwhile, 35% of the members of the Association in Germany have applied for state aid under the long-term leave scheme (preferably before the dismissal of employees).

Restrictions on business imposed by the state of emergency have been eased for many in the United Kingdom. Some warehouses only deliver or collect, but while sales are a problem, business is slowly improving. In the sector of recovered paper, volume reduction helps to increase prices and improve profits while collecting slowly resumes. However, prices are expected to fall again as EU borders open. In anticipation of a second wave of the virus, some plants are stockpiling.

In Spain, where virus infections are concentrated around Madrid, Catalonia, Castilla-La Mancha and Castile and Leon, the industry has grown by about 15% in the last two weeks of May.

In the Netherlands, recycling is seen as a major sign during the crisis. Initially, many workers were absent due to illness, but companies now operate at almost normal capacity.

Industry in Poland is severely affected by the pandemic. Meanwhile, negotiations are under way with the government on public aid, loans and possible suspension of payments.

As the Russian metallurgical and recycling sectors are export-oriented, they are seriously affected by the pandemic. Of particular concern to Russia is the UAE's decision to suspend exports of ferrous metals and recovered paper for four months. Although this measure aims to strengthen local demand in the UAE, the Middle East Recycling Bureau warns that local industry will not be able to cope with all the scrap available and therefore exports will have to resume soon.

Meanwhile observed improvement in exports from the UAE to India, but some customers are unwilling to pay, while containers remain detained at ports and others reported lack of liquidity. The UAE economy is expected to be fully operational again with the end of Ramadan on May 23, when Saudi Arabia expects an increase in the currently very low volume of scrap exports.

Brazil is also concerned about restrictions on UAE exports and may respond with the same.

In South Africa, by easing emergency measures, some suppliers are pushing for short-term contracts in late May to reduce potential risks (BB 22/2020).

In the spotlight of the ongoing crisis are also the ***ways of infection*** and the material carriers of the virus. In this regard, studies have summarized the potential of paper/cardboard surfaces for virus transmission. Cited facts from Research and guidance from global health organizations, incl. The WHO, the Journal of Nosocomial Infections and the National Institute of Allergy and Infectious Diseases, shows that the risk of transmitting Covid-19 from surfaces is relatively low. According to the WHO, "The probability of an infected person contaminating commercial goods is low and the risk of infection with the COVID-19 virus from packaging that has been moved, traveled and exposed to various conditions and temperatures is very low.". Since the **paper and the cardboard** are porous, the virus on the their surface has the least strength and for the shortest period of time.

The most cited scientific study on the incidence of superficial infections was conducted by the National Institutes of Health (NIH), the Centers for Disease Control (CDC), the University of California, Los Angeles (UCLA) and Princeton University, which studied how stable the coronavirus is on various surfaces. It turns out that between plastic, stainless steel and cardboard, the virus grows the longest on plastic (up to 72 hours) and the least on cardboard (up to 24 hours)**.** This time is shortened when the surface is exposed to air, and the longer it lives under these conditions, the less powerful the virus becomes. The printing process also reduces the strength of each virus. George Lomonossoff, a virologist at the John Innes Center in the United Kingdom said that newspapers are quite sterile because of the way they print and the process they go through and the chances of getting infected are extremely small. (BB 23/2020).

The outbreak of the coronavirus pandemic significantly affects the ***international trade in recovered paper (RP)*** of the member states of the European Union (EU). Data for the first half of the European Statistical Office (Eurostat) show a decline in exports from the EU to third countries from early February and March. This affects almost all exporting and importing countries. In the long term there is a significant shift in trade flows. Apart from India, Turkey and Indonesia are also becoming especially popular destinations for European RP exports.

Overall, RP exports from the 27 EU Member States to non-EU countries (third countries) amounted to 2.79 million tonnes in the first half of 2020. This represents a decrease of about 10% compared to the same period last year. Data on non-EU trade also reveal a significant decline in ***RP prices***: the value of total tonnage exported between January and June 2020 is € 234 million, compared to € 365 million in the same period in 2019 (according to information of Eurostat).

Until the end of 2018, China is the most important buyer of European RP. However, China has started to tighten regulations on RP imports and other waste streams, and since then RP imports into the EU have been declining significantly every year.

In 2018, the EU exported an average of 187,000 tons of RP to China per month, but this amount decreased to 57,000 tons in 2019 and to only 23,000 tons/month in the first half of 2020. Overall, China imported only 137 000 tonnes of RP from the EU between January and June - a drastic decrease compared to 506 000 tonnes imported during the same period last year.

India is becoming the most important trading partner for European exporters of RP. In the first half of 2020, deliveries to India increased to 707,000 tons, an increase of about 1/3 compared to the same period in 2019. EU exports from the EU to Indonesia increased by 11% in the first six months this year up to 543,000 tonnes. However, as of March 2020 - when the spread of the coronavirus is growing into a pandemic - the export curve to India and Indonesia falls sharply. According to participants in the recycling industry, violations in port operations are greater in India than in many other, more severely affected countries.

At the start of the pandemic, Turkey became an alternative destination for RP - according to Eurostat, EU exports reached a record value of 123,000 tonnes in March, doubling volumes from February. In April and June, exports to Turkey were again significantly reduced, but overall statistics show that European exports of RP to the country increased by 38% to 460,000 tons in the first half of 2020. Therefore, Turkey is now the third largest buyer of RP from the EU. However, the export curve may be reversed as the Turkish government recently announced that it wanted to limit imports of secondary raw materials such as waste plastics and paper to encourage separate waste collection in the country.

Malaysia is another country that shows a strong increase in RP volumes imported from the EU in the first half of 2020. After their approximate doubling in 2019, tonnages increased by 62% to 86,000 tonnes. The quantities exported to Ukraine are increased by 38% and those to the United Kingdom - newly classified as a third country - increased by 30%.

Conversely, Vietnam and Thailand - two other countries - important buyers of European RP in recent years - have significantly reduced their imports in the first half of 2020. According to Eurostat, EU exports to Vietnam decreased by 42% during the reporting period to 173 000 tons, and to Thailand - by 55% to 145 000 tons. Swiss imports are 1/5 less - up to 92 000 tons.

According to Eurostat data for the first half of this year, imports of RP in the EU was reduced by 9% to 1.19 mln. tons, worth 117 million. €. About half of this quantity (547 000 tonnes) originates in the United Kingdom. Other important suppliers are: Switzerland - with 211,000 tons, Norway - with 173,000 tons, and the United States, which exported a total of 146,000 tons of RP to the EU in the first six months of this year. The largest importers of RP from third countries are Germany (imported 301 000 tonnes), followed by the Netherlands (278 000 tonnes) and Sweden (195 000 tonnes).

The Chinese authorities have repeatedly stated that they want to stop importing waste for recycling from the beginning of 2021. Recyclable materials arriving in the country after January 1 will be subject to large fines imposed on illegal waste imports. The deadline - by the end of the year - does not leave European suppliers much time to use the newly issued import quotas. Under normal conditions, shipments should reach China in October and even November before the end of the year, but according to market participants, transportation times can now last up to twelve weeks due to longer stays and routes.

This makes it unlikely that many new purchases will be made in Europe as time goes on. Experts emphasize that the new volume quotas are valid only until the end of the calendar year. Accordingly, some paper makers still plan to buy RP from Japan and the West Bank, ensuring that their last shipments from these markets to China are shipped no later than October 10th. High-quality aluminum alloy, brass and copper scrap are destined for a new classification as non-hazardous "recyclable materials", although details remain unclear. There are no such plans for RP.

The process of ***registering companies supplying recovered paper (RP)*** to Indonesia is progressing very slowly in Europe. As of September 25 this year there is no European company that has completed this process according to Andreas Otto, vice president of the European Recovered Paper Association (ERPA), a paper recycling branch of the The European Recycling Industries' Confederation (EuRIC). He addes that many companies, especially in Germany, have not yet submitted their documents. From 1 October 2020, companies that have not completed the registration process will no longer be able to supply RP to Indonesia. According to ERPA, Indonesia is a large market, importing 3.13 million tons of RP in 2019, of which Europe has delivered a significant share. Since 2017, when China began phasing out RP imports in order to ban them completely in 2021, European suppliers have increasingly turned their attention to Asian markets.

Indonesia is closely following the growing imports of RP from overseas countries. To ensure that only high-quality paper is imported, the country has announced strict quality criteria, as well as a ceiling on import volumes in 2019. Another new tool is the registration process for companies that want to supply RP to the country. In the spring of 2020, the responsibility for registration was finally delegated to the Indonesian embassies. Each embassy creates its own registration process for the respective host countries in accordance with the requirements of the Indonesian Ministry of Trade and the Ministry of Foreign Affairs. Therefore, the process often varies from country to country and is open for applications at different times - but rarely before September in Europe.

The registration process for RP exporters in Italy, France and the United Kingdom is under way. It is easier to meet the requirements in the United Kingdom than in Italy and France, where they are "very demanding and cumbersome".

German RP experts have to deal with particular difficulties**,** according to Thomas Braun, chairman of the German Federal Association for Secondary Raw Materials and Waste Management. He explains that the Indonesian embassy in Berlin published its list of requirements for RP suppliers wanting to register in early September. However, the requirements are so contradictory that they make it virtually impossible to register German companies. For example, a company wanting to register must do that in relation to specific items, but it is impossible to arrange delivery of an unregistered company.

Unlike the registration process in Germany, applying for companies in the United States, New Zealand and Australia is quite simple according to Institute of Scrap Recycling Industries (ISRI). But the process in the United States is very slow. For European Recovered Paper Association **(**ERPA), the various registration processes constitute a non-tariff trade barrier. ERPA refers the matter to the Market Access Advisory Committee of the European Commission. ERPA is worried that in October, Indonesian producers must increasingly be equipped with paper outside Europe since its European business partners will not be able to provide them with supplies due to incomplete registration process. (BB 42/2020).

The paper recycling sector is passing smoothly through the challenges of the ongoing crisis. In general, the pulp and paper industry can be characterized by a positive development, against the background of a separate normal abandonment within different subsectors. Paper recycling is an example of activities with specific achievable goals. The main obstacle to paper recycling is the ***legislative framework and the administrative burdens of import-export operations.*** Access to ***quality raw material for recycling*** depends on the ***conditions of its collection, sorting*** and the ability to ensure these processes in conditions of strict ***hygiene restrictions*** as a result of the crisis. For its part, RP is the main raw material for the production of transport packaging based on it, which in the conditions of difficult international economic relations and online trade are ***priority products***. This means that ensuring a ***sufficient amount of waste material*** is crucial for recycling activities.

Conclusion

The world is called to be ecologically oriented. New technologies, changing market conditions and trends in resource conservation are a key priority of economic development. In the context of climate change, appeals for "green" industries, "green" economies and societies are on the agenda for every country. Europe is part of a long-term strategy for growth and sustainability through recycling. Missions and policies set requirements for energy-saving and resource-saving economies.

On this background, recycling activities are an example of sustainable development that should be encouraged and maintained. In the current crisis, the paper recycling sector is dependent on all activities related to **the provision of quality raw material** (**RP**) according to the capacity of recycling companies and **the conditions for the normal functioning of production facilities**. **The facilitation of the logistics processes and the efficiency of the supply chain** for the processed raw material are directly related.

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