

Paper Industry's Strategy for Sustainable Growth

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While paper as a medium of information is declining in demand, paper as a sustainable alternative to plastic packaging is gaining interest. In light of these changes, the paper industry is seeking new growth by developing highly-functional paper material that can replace plastics. To this end, the industry needs to develop paper with high-barrier and strength properties, as well as technologies that can improve recyclability of such material. Beyond paper, the industry is also developing novel wood-based chemicals that can replace traditional fossil-fuel derivatives. For these to become commercially viable, the industry needs to focus on achieving cost-competitiveness. Finally to reinforce these two initiatives, the government needs to engage in active dialogues with the industry leaders and provide related R&D support.

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The Current State of Paper Industry

What comes to your mind when you think of the paper industry? Most people are likely to recall a decline in paper demand due to recent digitalization, slowing population growth, and low birth rate in advanced countries with relatively high paper consumption.

Global paper demand continued to grow at a modest annual average rate of 1.6% during the ten years from 2009 to 2018. This was negatively affected by a decrease in demand for graphic paper, a medium of information, following the growth of digital media. However, with the emergence of plastic-related environmental issues, countries are paying more attention to paper as an eco-friendly alternative. As a result, interest in paper as a sustainable packaging material is increasing worldwide. In light of these changes, I would like to discuss the strategy of the paper industry for sustainable growth.

Paper Industry's Path for Sustainable Growth

Leading paper manufacturers are pursuing sustainable growth through two major initiatives: 1. Development of new innovative paper materials for packaging, and 2. Development of wood derived chemical materials beyond paper.

According to an OECD report, food and industrial packaging account for about 40% of plastic waste, and there is consensus that we can achieve effective plastic reduction by replacing such packaging with highly recyclable paper materials.

Although paper is based on eco-friendly wood-based raw materials, it is not widely used yet as a substitute for plastic-based packaging material, due to limitations in barrier properties and mechanical strength. As a result, instead of using paper as a standalone material, industry leaders are actively developing technologies that use paper in

combination with other barrier materials. Furthermore, they are developing technologies that enable recycling of such composite material with ease.

In addition, there are active studies in progress to develop eco-friendly wood-based biochemicals that can replace petroleum-derived materials. However, mass adoption of such materials require further cost improvements as well as favorable regulatory environment. Nevertheless, the ongoing environmental crisis and active discussions centered on carbon neutrality are giving impetus to the development of wood-derived chemical materials.

Challenges for the Growth of the Paper Industry

While paper and wood-derived chemicals are useful eco-friendly solutions to the plastics problem, there are several challenges to overcome in order to expand their usage and demand.

With regards to paper, the first goal is to secure necessary technologies that can enhance barrier properties and mechanical strength, so that paper can be used for wider packaging applications. Since paper is by nature weak in its resistance to moisture and oil, the material is currently in use by only a segment of the packaging industry, and most of the time its properties are enhanced through traditional chemical coating or addition of other materials with good barrier properties. To accelerate mass adoption, the paper industry first needs to continue developing technologies that can further improve properties of these composite materials, followed by technologies to improve the recycling of such materials. Ultimately, the industry needs to develop technologies that can give standalone paper superior moisture/oxygen barrier properties without addition of any composite materials, in order to maximize recyclability.

Second, the industry needs to develop dedicated technologies as well as additional demand for wood-derived chemicals. Leading paper manufacturers in Europe and North America are actively expanding their research and commercial investments in various wood-derived biochemicals, including nanocellulose and lignin, by establishing research institutes or subsidiaries specialized in wood-derived materials. However, in order to secure a clear competitive advantage over petrochemicals that dominate the existing market, the industry not only needs to invest more heavily in the related R&D, but it also needs to focus on differentiated technologies such as those involving smart drop-in or dedicated chemicals.

Proposal

Paper and wood-based chemicals are realistic and eco-friendly substitutes for fossil fuel-derived counterparts. They are also essential business items for sustainable growth of the paper industry. In order to solve the enormous environmental challenge of securing earth's sustainability, there needs to be support not only from the industry but also from the governing bodies. The government should form a consultative body with the interested parties and channel industry opinion and reflect them in policies. In addition, while making efforts to lower dependence on fossil fuel-based materials, the government should take fiscal initiative to promote development of eco-friendly, highly-functional materials, rather than delegating such effort to individual companies. To this end, industry, academia, research institutes, and governments should all bring their minds together to establish a vitalization strategy, draw up a development roadmap, and nurture wood-derived materials as realistic substitutes for fossil fuel-derived counterparts.