

How the paper industry in Japan has technologically responded to the paradigm shifts of the Japanese society

Part 5: The paper industry in the 2010s --- Adapting to Information Society

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Introduction

While the Japanese paper industry was struggling for a way to move forward in the 2000s, the Japanese society shifted to one called Information Society. This shift occurred in the world as well in the 2010s, and paper industry in the world suffered from decline in demand. This issue will follow how the Japanese paper industry dealt with it.

5.1 Paper industry as a member in the world economy

The decline in paper and paperboard consumption occurs not only in Japan but also in the world as a whole. Fig. 35-1 is prepared from data by FAO⁶⁶⁾. The growth of wood pulp production slowed down at around 1995, as recycled fiber became an alternative. Then, paper and paperboard production became stagnated. An averaged growth rate per year of paper and paperboard production between 1970 and 2008 is 3.14% and that after 2008 is almost zero.

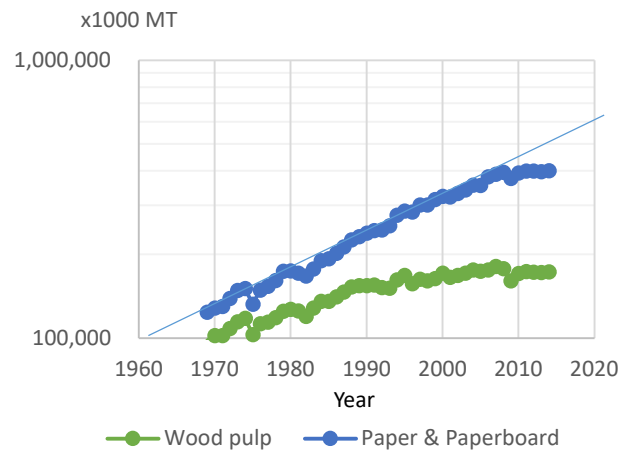


Fig. 35-1 Paper and paperboard, and wood pulp produced in the world

The nominal GDP of the world from 1980 to 2016 is depicted in Fig. 35-2⁶⁷⁾. Its averaged growth rate per year was calculated and was 3.11%. It was almost the same to that of paper and paperboard production, which was probably close to that of the consumption, until 2008. They were in a good correlation as had been. Then, they started to diverge each other at

2008, which indicated that the way of using paper and paperboard changed in the world. Japan experienced that change 10 years earlier than the world.

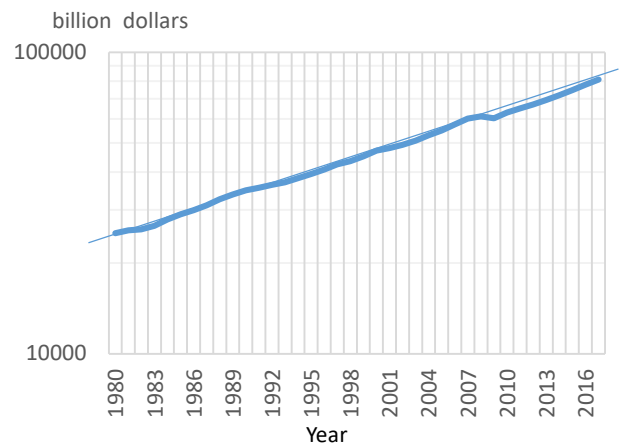


Fig. 35-2 Nominal GDP of the world

Then, it is interesting to know how much in volume the steel, which has historically been a basic material like paper, had been produced. It is shown in Fig. 37⁶⁸⁾. Though there was not so good a linearity as paper and paperboard did in Fig. 35-1, it increased its production with almost the same rate per year, 3.06%, throughout the period, even after 2000. The behavior well corresponded to that of GDP, and quite different from that of paper and paperboard.

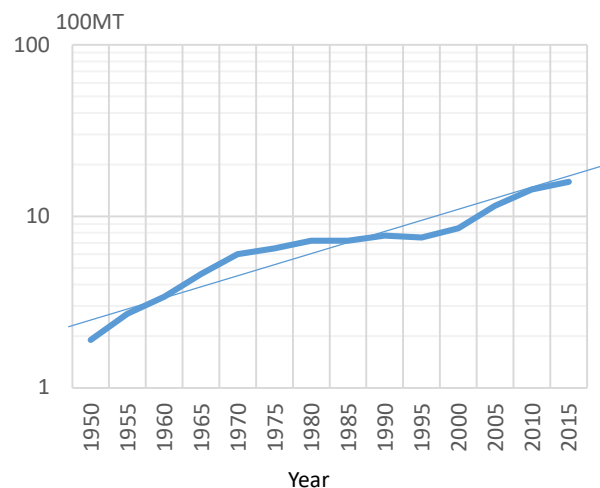


Fig. 36 Crude steel produced in the world

Intuitively, it is understood that there is no alternative of steel, while paper is being replaced with digital devices. Studying the data by FAO in detail, Fig. 37 is obtained in which yearly production volumes of three different grades, paperboard, printing papers and newsprint, are presented. As usual, approximating with linear lines, a growth rate per year for a certain period was calculated. They are summarized in Table 14.

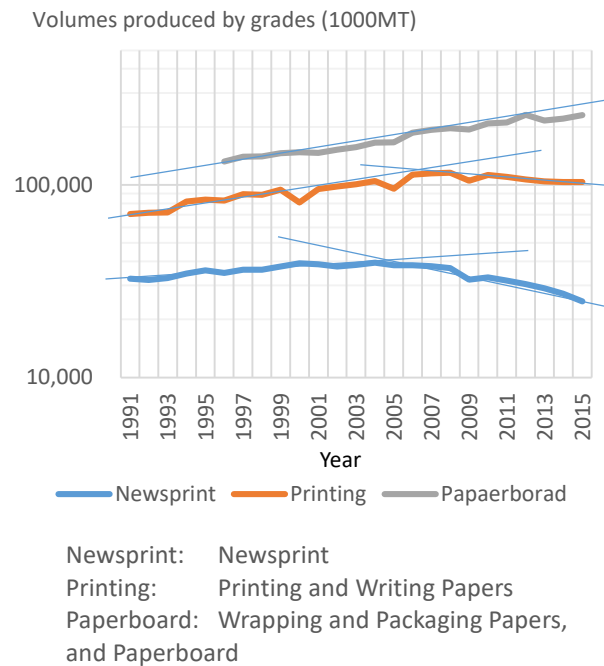


Fig. 37 Volumes produced by grades (world total)

Table 14 Annual change rates calculated from Fig. 37

	1996-2015	
Paperboard	3.24	
	1991-2008	2007-2015
Printing	3.29	-1.36
	1991-2004	2004-2015
Newsprint	2.03	-5.13

Paperboard is still growing, proportional to GDP, as there is no substitute available. Printing paper and newsprint are in negative growth rates, especially newsprint with a higher losing rate. As a result, the total production became stalemated as in Fig. 35-1.

5.2 Japanese paper industry thereafter

Then, what did the Japanese paper industry head for in the 2010s? Being requested by the Ministry of Economy, Trade and Industry, a report entitled "To make it feasible for the paper industry to grow

sustainably" was submitted by a consulting company, of which content is reviewed as follows⁶⁹.

To make sustainable growth feasible, three kinds of viewpoints should be taken in management.

(1) To strengthen overall competitiveness by restructuring areas of business with profit-oriented basis.

(2) To plan strategy with an international viewpoint: if some region looks to be profitable, it will be your territory.

(3) To be respected as an eco-friendly industry by taking counter-measures more than ever on global warming and energy saving.

Specifically, followings were advised.

(1) Competitiveness: scrap and build, reinforcing distribution network, studying cooperation, developing original products, clarifying pricing system, being customer-oriented and securing raw materials and energy

(2) International viewpoint: defining targets clearly and selecting measures properly fitting to policy, human resources development and tuning organization

(3) Environment: (omitted)

Regrettably, as the report was issued in 2006, there was no understanding on the paradigm shift starting around 2005, and the advices were on extrapolation of old concepts. It either lacked substantial comments on technological development.

In 2015, Miyanishi, the then Executive Director of JAPAN TAPPI, introduced characteristics of Japanese paper industry at the joint conference of the 9th International Papermaking and Coating Symposium and International Paper Physics Conference⁷⁰.

He listed the use of recycled pulp, afforestation overseas and energy saving for reducing carbon dioxide emission. As for technological innovations, Eucalyptus by gene recombination and on-demand digital printing were included. He also referred to R&D topics overseas. A new pulping process using eutectic solvent was interested in Europe. TAPPI of the USA listed chemical pulp of high yield, condensing black liquor with less energy, recycling process water, reducing moisture content at the inlet of dryer section, cellulose nano-fiber and bio-products of high-value added. He mentioned that Japan was also interested in nano-fiber and

cooperation was going on with academy and industry.

In this situation, in 2016, corporate executives in the industry began to address their concerns on the future of the industry and the direction of technology they should head for. Followings are excerpts from addresses at the annual conferences of JAPAN TAPPI and the new-year speeches in the journals by the then presidents of JAPAN TAPPI.

In 2014, Yamazaki wrote that it was a time for the industry to restructure its business model and listed followings as new directions ⁷¹⁾ : to expand the business field in which characteristics of paper would be re-evaluated, and to become a corporation based on bio-mass in general and to diversify its activity to new areas in which its traditional technology would be an advantage like power generation. He insisted: "As East Asia will be integrated to be one market soon, the Japanese paper industry has to have an edge in technology and R&D and to increase and refine its competitiveness." ⁷¹⁾

In 2015, Suzuki mentioned that even the paper industry of Asia which had grown robustly passed a turning point. It was necessary to find uses of paper in which its characteristics would be an advantage against digital devices. To develop them, the industry had to change its innate character of basic material industry ⁷²⁾.

In 2016, Aoki wrote that the industry had to keep working for saving energy and to promote further use of recycled paper (note: its utilization rate was already 63.9% in 2014). Besides, new business would be developed by applying technologies the industry had nurtured for a long time to needs in the present market ⁷³⁾.

In 2017, Koseki addressed as follows ⁷⁴⁾. "As the demand for paper and paperboard in Japan will not be expected to grow, paper companies are working to reduce cost in traditional business, to save energy consumption, to expand business in packaging and tissue areas which are relatively healthy, to increase activities overseas and to establish new businesses like power generation and nano-fiber. As wood resource has a potential as energy and new materials, the paper industry has a character to be resilient to changing environment."

Then, in 2015, METI published a study report

entitled "The current status and future of the paper industry" ⁷⁵⁾. It consisted of 61 pages with a large number of figures and tables, analyzed the present status of the Japanese paper industry in the world and proposed three strategies for the industry to take in the future.

Strategy 1: consolidating existing businesses (restructuring)

- Consolidating business sectors like paper, paperboard and so on
- Converting paper machines from making printing paper and newsprint
- Removing excessive competition by reorganizing the industry
- Improving wholesale system which is of multi layers
- Reorganizing globalization with foreign capital if necessary

Strategy 2: moving to growing markets and taking new ventures

- Securing softwood resources (expanding pulp business)
- Expanding packaging business in an ASEAN zone

Strategy 3: creative strategy for being a bio-mass industry of high quality

- Making a society of low carbon emission and high recyclability in advance in the world and creating a bio-mass industry of high quality to which paper industry can make use of its strength (power generation, bio-fuel, bio-chemistry and nano-cellulose fiber)

These recommendations were what the presidents of JAPAN TAPPI addressed in the 2010s, and will be a guideline of the paper industry in the future. This report had two different things from old ones. One is that the term "paper industry" was used instead of the term "pulp and paper industry" which had traditionally been used in government reports. The other is that only the name of the division in charge of the paper industry in METI was registered and individuals who worked for the report were not listed, though the report was of 61 pages, big enough, and contained detailed analysis on the current status. It looked quite unusual.

In the crisis of the 1970s, though the growth of demand for paper was slowing down, the demand itself was still increasing at the rate of 4% per year. Moreover, the industry realized what it should

technologically deal with, and could solve them with big investment and hard work. In the crisis after 2000 (or 2005), the demand was declining which the industry had not experienced before. One thing noticed was that fiber resource supply which had been an obsession in the industry became not so big a problem as before. Ironically, the industry was released from that obsession by the declining demand.

The demand for paper as a media of information kept increasing, since invented, for 2000 years. During those years, paper faced rivals such as bamboo slips, papyrus, and parchment, and outrivalled them by its excellent cost performance. After 2000, however, new kinds of media begin to take the market from paper steadily. Now, it is a hard time for paper to maintain its presence.

5.3 Post script

Paper has helped civilization to develop for as long as 2000 years as a media on which characters have been written. By writing characters on paper, letters were invented, literatures were born and calligraphy was nurtured. Paper was a device for recording and delivering information in human civilization. Then, electricity and telecommunication were invented in the early 1900s, and by using them, new technology for recording and delivering information were developed in the late 1900s. This technology becomes common in the 21st century with an accelerating speed.

Then, the culture of a new type which uses new devices and new systems of delivering information is being born. It will be different in nature from the traditional one based on paper. Taking a century as a unit, the 20th century was a transition period to electronic devices and the 21th century is the beginning in which paper will be replaced by them.

In addition, current social changes will be reviewed in Chapter 6 in the next issue.

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