

Fujitsu Activities for Green Logistics

● Kazuhiko Niwa

(Manuscript received July 8, 2008)

The revision of Japan's Energy Conservation Law in April 2006 requires transporters and shippers to make efforts to protect the environment in their logistics activities. Fujitsu, which has been active in green logistics for some time, is expanding environmental load reduction activities across the entire supply chain, setting a tough industry-leading target of reducing transport-related CO₂ emissions by 30% from fiscal 2000 levels by the end of fiscal 2010. This paper introduces Fujitsu activities toward this goal with a focus on "reducing CO₂ emissions by using an intensive vehicle-allocation control system from parts procurement to product delivery" in the Tokyo metropolitan area through modal shift expansion and the Green Logistics Partnership Promotion Project.

1. Introduction

Fujitsu activities for green logistics began in July 2003 when the logistics departments of all Fujitsu business groups came together to launch a working group (WG) to promote environmental preservation^{note 1)} activities in logistics. This WG came to measure transport-related CO₂ emissions and to study and promote specific activities toward reducing them. The WG, however, was an organization consisting of only logistics departments, and efforts at dealing with various problems that could not be solved on the basis of logistics departments alone did not go well. In response to this outcome, the Green Logistic Committee was formed in April 2006 as a company-wide organization that included all relevant departments in addition to logistics departments. After the establishment of this committee, company-wide

activities began in earnest. Meanwhile, against a backdrop of heightened concern about environmental problems in society, the Kyoto Protocol to the United Nations Framework Convention on Climate Change went into force in February 2005, and Japan's target under this protocol was to reduce total greenhouse gas emissions by 6% from 1990 levels by 2010 as a countermeasure to global warming. Preliminary figures for 2006, however, show an increase of 6.4% from 1990 levels with the transport sector, in particular, responsible for a big increase of 17.0%, indicating that environmental preservation in logistics is a grave problem. Furthermore, in 2005, the Green Distribution Partnership Conference^{note 2)} was held by the Ministry of Economy, Trade and Industry (METI), Ministry of Land,

note 1) In Japan, the term environmental preservation has a looser meaning than in some other countries. It is used to describe a range of preservation, conservation, and protection activities.

note 2) Managed by METI, MLIT, Japan Institute of Logistics Systems, Japan Federation of Freight Industries, and Nippon Keidanren with the aim of reducing CO₂ emissions in the transport sector through mutual collaboration beyond each organization's framework.

Infrastructure, Transport and Tourism (MLIT), Nippon Keidanren, Japan Institute of Logistics Systems, and Japan Federation of Freight Industries to promote collaborative activities by transporters and shippers toward reducing CO₂ emissions in the transport industry, and the Green Logistics Partnership Promotion Project was launched as a grant program. Then, in April 2006, Japan's Law Concerning the Rational Use of Energy was revised (Revised Energy Conservation Law), obligating the transport sector, that is, transporters as well as shippers, to pursue energy-saving measures. In the above ways, the role of environmental preservation activities in logistics is increasing and more responsibility is being given to shippers, in particular.

Against the above background, this paper introduces Fujitsu's activities for green logistics as a shipping company using key examples.

2. Fujitsu's approach to green logistics

In June 2005, Fujitsu integrated the logistics management functions of all its business groups into the newly formed Logistics Division with the aim of optimizing these functions both individually and overall. The Logistics Division works closely with each business group and endeavors to find solutions to company-wide logistics problems in an expedited manner. Part of this work includes green logistics, and in April 2006, the Green Logistic Committee was established as a company-wide organization that includes relevant departments in addition to logistics departments. Targeting the entire supply chain from parts procurement to product transport, delivery, and recovery, the goal of this committee is to enhance partnerships with transporters, group companies, retailers, and parts suppliers to promote the reduction of environmental load. It also aims to create environment-friendly logistics that maintains a balance of cost, lead time, and quality.

Fujitsu promotes environmental preserva-

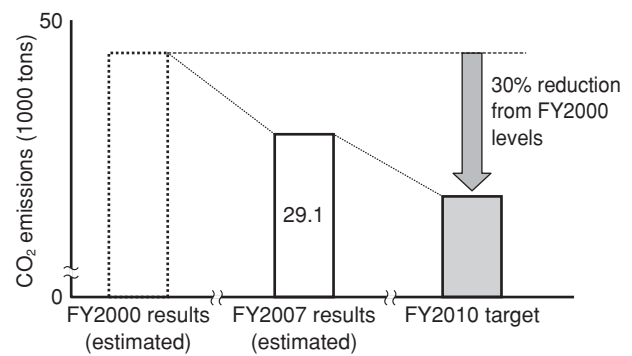


Figure 1
Change in transport-related CO₂ emissions at Fujitsu.

Table 1
Reduction targets for transport-related CO₂ emissions of various companies (electronics/precision-equipment manufacturers).

Company	Transport-related CO ₂ reduction target		
	Base year	Target year	Reduction
Fujitsu	2000	2010	Absolute value of emissions by 30%
Company A	2000	2010	Absolute value of emissions by 30%
Company B	2000	2010	Real production unit by 4%
Company C	2000	2010	Real production unit by 25%
Company D	2000	2010	Basic unit by 4%

tion activities across all group companies also from the viewpoint of logistics as part of its company-wide activities. In cooperation with transporters, Fujitsu is working to make the whole series of logistics processes from product-package design to storage and transport more efficient and to reduce the environmental load produced by the transport of goods. As shown in **Figure 1**, Fujitsu has set itself a tough industry-leading target of reducing transport-related CO₂ emissions by 30% from fiscal 2000 levels by the end of fiscal 2010. (See **Table 1** for comparison with other companies.) Since 2006, when activities in green logistics were expanded to include all group companies, the reduction of transport-related CO₂ emissions has come to be pursued at individual group companies the same as at

Fujitsu itself (annual reduction rate of 3.5%).

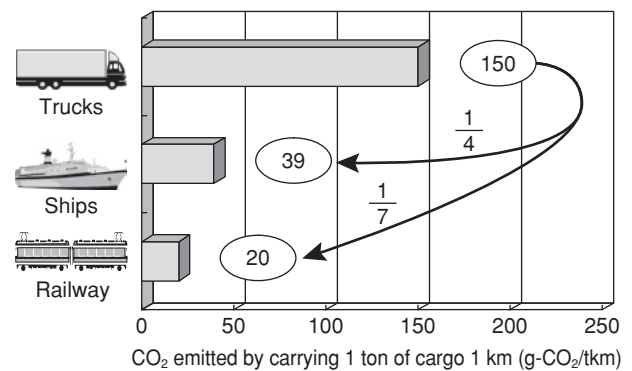
In addition, Fujitsu has been independently measuring CO₂ emissions since the founding of the green-logistics WG in fiscal 2003 and is currently working to establish group-wide measurement criteria and mechanisms and to improve measurement accuracy. As a result of these efforts, Fujitsu is meeting the requirements of the Revised Energy Conservation Law enacted in April 2006. This law requires transporters and shippers doing more than a certain amount of business (for shippers, 30 million ton-kilometers of goods transported) to report on the amount of CO₂ emissions (amount of energy consumed), to make and report on plans for reducing CO₂ emissions, and to achieve an annual reduction of 1% as a basic unit. Since Fujitsu transports more than 30 million ton-kilometers of goods, it reports on the above items as a designated shipper.

3. Activities toward reducing transport-related CO₂

Fujitsu's activities for reducing transport-related CO₂ emissions center on ways of making logistics more efficient, which is an area that Fujitsu has been involved in for some time. These activities include rationalizing distribution centers, reducing transport distances by simplifying delivery routes, and reducing the number of trucks. Such measures can reduce both costs and CO₂ emissions at the same time. However, to reduce CO₂ emissions even further, new measures must be combined with existing ones. The upgrading activities mentioned here began several years ago with the aim of reducing transport-related CO₂ emissions through a modal shift and intensive vehicle-allocation control from parts procurement to product delivery and recovery.

3.1 Modal shift

The modal shift in transport, which means switching from airplane and truck transport to railway and ship transport, is gaining recognition as an effective means of reducing the environ-



Source: Ministry of Land, Infrastructure and Transport: Countermeasures against global warming in the transport sector.¹⁾

Figure 2
CO₂ emissions by type of transport for FY2006.

mental load. This is because transporting goods by railway and ship emits less CO₂ and generates less environmental load than truck transport. For example, the amount of CO₂ emitted when 1 ton of cargo is carried 1 kilometer by railway (ship) is equivalent to about one seventh (one fourth) of that emitted by a truck (Figure 2).

While a modal shift is an indispensable countermeasure, the switch to railway transport involves a number of issues involving cost, lead time, and quality that must be addressed. In terms of cost, Fujitsu is investigating the application of a modal shift to transport routes that are advantageous taking into consideration distance and the quantity of goods. In terms of lead time, it is investigating its application to customers (order originators) who do not mind a slightly longer delivery time after placing an order. Moreover, as the bare transport of precision equipment is difficult from a quality perspective, Fujitsu is considering the application of a modal shift to boxed items (in this case, personal computers). A transportation mode selection system that Fujitsu has developed to enable truck transport or railway transport to be selected as needed has been applied to the transport of corporate-use personal computers since October 2004. However, the percentage of railway transport used when this system was first deployed reached no

more than 12%. When the reasons were examined, it was found that dispersion loss occurs for a transport format consisting of both railway transport and truck transport (for example, the goods previously transported by one truck might be divided into two dispatches: a truck and a railroad container), so overall, there is no cost advantage. Consequently, to achieve greater cost reductions, we chose to use fixed-quantity ordering of railway containers to reduce the fees and introduced new types of pallets that increased the number of pallets that could be loaded into one container (8 instead of 6). These changes raised the percentage of railway transport to 20%.

As a result of the above measures, Fujitsu was certified in March 2007 under the Eco Rail Mark system, which was established to recognize products and businesses that use above a certain percentage of environment-friendly railway freight transportation. This certification adds to Fujitsu's reputation as a company that is actively dealing with global environmental problems.

3.2 Green Logistics Partnership Promotion Project

In the past, Fujitsu and its group companies, retailers, and clients would allocate vehicles and transport and deliver parts or goods based on schemes optimized for each company or plant and for each of the procurement, manufacturing, and sales processes. This approach suffered from various problems such as dispersion of distribution centers and different data formats for cargo and shipping among the various companies. Against this background, Fujitsu began activities to minimize the number of transport vehicles and reduce CO₂ emissions through comprehensive optimization. These activities involved:

- 1) Rationalization of distribution centers
- 2) Standardization of shipping instructions based on fixed rules
- 3) Revision of operations systems among logistics partners to optimize vehicle allocation
- 4) Further reduction of CO₂ emissions through

the use of Fujitsu logistics solutions

Full-scale operation of this system began in February 2007 targeting the Tokyo metropolitan area, where the amount of goods transported is considerable. Distribution centers dispersed among five locations were rationalized into three locations in June 2006 establishing an environment much more conducive to joint transport. Information from each company is now uniformly managed by standardizing cargo and shipping information and creating an intensive vehicle-allocation control system that converts and unifies data formats. Vehicle allocation is optimized by a logistics partner based on the information in activity 3) above. Fujitsu solutions such as a traffic control system promoting eco-driving, in-vehicle terminals, and a recently developed CO₂ exhaust estimation tool are being actively utilized.

These activities constitute a mechanism for achieving a reduction in environmental load over the entire supply chain that involves not only group companies, but also retailers and clients. The novelty of this mechanism led to its designation as a model project of the 2006 Green Logistics Partnership Promotion Project, a METI grant program. Specific objectives were achieved as a result of the assistance so received.

In particular, a 20% reduction in CO₂ emissions was achieved within the target area by rationalizing distribution centers (from 5 to 3 locations) and reducing the number of trucks by intensive vehicle-allocation control as well as by installing in-vehicle terminals in transport trucks and implementing eco-drive practices and improving gasoline mileage. In this way, creating a model targeting the entire supply chain from parts procurement to product transport and recovery enabled Fujitsu to achieve a totally optimized reduction in CO₂. Furthermore, to calculate CO₂ emissions by each shipper in the case of joint transport, Fujitsu created and introduced a tool for making accurate calculations based on actual truck mileage data. This model project

was praised as a groundbreaking case study combining multiple ideas and measures and received a commendation from the Minister of Economy, Trade and Industry on December 14, 2007.

4. Future activities

At Fujitsu, the introduction of the Toyota Production System (TPS) has led to an expansion of production innovation activities throughout the company and the launch of interrelated logistics TPS activities. Production innovative activities can eliminate various types of waste on a production floor and free up space that can then be used for performing the logistics functions of an external warehouse. As a result, drayage to external warehouses can be eliminated and CO₂ emissions can be reduced. These activities were first implemented at Fujitsu IT Products (Kasajima Plant), which manufactures servers, and have since been incorporated at Shimane Fujitsu, which manufactures notebook computers. There are plans to expand these activities to the Fujitsu Nasu Plant (mobile systems and mobile phones).

As for logistics TPS activities, vehicle allocation can be made more efficient when shipping a variety of goods from a manufacturing plant by setting different times for handing over products to a logistics company according to the directions in which those products are to be shipped. This can reduce the number of trucks needed and reduce the CO₂ emissions. Fujitsu is also active in procurement logistics in accordance with production innovation. Here, the “milk run” system (routing to make regularly scheduled pickups) combined with product transport can minimize increases in CO₂ emissions caused by high-frequency, small-lot transport.

Fujitsu has also been surveying and analyzing logistics processes at logistics sites since 2007 with the aim of creating processes that eliminate waste by linking the movement of information and things. In particular, Fujitsu, as a shipper of goods, is now developing a new logistics-oriented system called Logistic B2B New System that pre-

pares logistics specifications (product packaging, weight, volume, etc.) and provides these specifications and delivery information and handover conditions to a logistics company in a timely manner. These activities have resulted in a standard model for servers. For the future, Fujitsu plans to expand this model to all products and make further radical improvements to logistics processes with the aim of reducing CO₂ emissions as a group effort.

5. Conclusion

Although this paper described only transport-related CO₂-reduction activities across the entire supply chain, Fujitsu is addressing diverse logistics problems through cross-sectional activities that go beyond the business-group framework. Looking to the future, Fujitsu plans to improve vehicle-allocation efficiency by expanding the use of the intensive vehicle-allocation control system from milk runs in procurement logistics to product transport including group companies, retailers, and clients and to promote the modal shift to railway transport. In this way, Fujitsu aims to rebuild its environment-friendly transport system and achieve a 30% reduction in transport-related CO₂ from fiscal 2000 levels by the end of fiscal 2010.

Reference

- 1) Ministry of Land, Infrastructure and Transport: Environmental Portal Site. Countermeasures against global warming in the transport sector. (in Japanese). <http://www.mlit.go.jp/sogoseisaku/kankyou/ondanka1.htm>



Kazuhiko Niwa
Fujitsu Ltd.

Mr. Niwa received the B.Com. from Kwansei Gakuin University, Nishinomiya, Japan in 1989. He joined Fujitsu Ltd., in 1989 and was in charge of production control of PCs and word processors from 1989 to 1998. He moved to the Logistics department in 1998 and was in charge of improving the efficiency of domestic logistics and controlling logistics expenses. Since 2005, he has been in charge of green logistics.

E-mail: niwa.kazuhiko@jp.fujitsu.com