Intelligent Freight System
- Efficient Intermodal Integration as Low Carbon Solution in Japan

Masaru Kumai, Deputy Manager,
Eco-Mo Foundation, Japan
CO₂ Emission Amount of Transportation Department in Japan

- Out of CO₂ emission amount in Japan, emission amount from transportation field accounts for 17.7% of the share.
- The overall automobile accounts for 86.8% of transportation field (15.4% of overall Japan)

CO₂ emission amount per individual division in Japan

- Transportation Division (Cars, ships, etc.)
  - 226 million ton (17.7%)
- Other operational sectors
  - 272 million ton (21.4%)
- Household division
  - 230 million ton (16.0%)
- Industrial division (Plant, etc.)
  - 418 million ton (32.7%)
- Other
  - 156 million ton (12.2%)

CO₂ total emission amount

1.276 billion ton (Definitive value of 2012)

CO₂ emission amount in transportation field

- Transportation division accounts for 86.5% of overall automobiles (15.4% of overall Japan)
- Trucks account for 33.32% of transportation division (5.9% of overall Japan)

Private cars
- 114 million ton (50.2%)
- Bus
  - 4.13 million ton (1.8%)
- Tax
  - 3.46 million ton (1.5%)
- Coastal shipping
  - 10.85 million ton (4.8%)
- Aviation
  - 9.52 million ton (4.2%)
- Train
  - 9.59 million ton (4.2%)

Business Trucks
- 37 million ton (16.3%)
- Private Trucks
  - 38 million ton (16.9%)

※ Emission amount for power generation caused by electric utility, emission amount for heat generation caused by heat supplier will be allocated according to each respective final demand division.
※ Drawn up by Environmental Policy Division of Ministry of Land, Infrastructure and Transportation based on greenhouse effect gas inventory office “Japan Greenhouse Effect Gas Inventory Report.”
Shift of CO₂ emission amount in transportation division of Japan

- With 2001 as the peak, the CO₂ emission in transportation division is showing a declining trend.

Carbon dioxide emission amount

(\text{Mt-CO}_2)

- Private cars: +1.6%
- Other transportation sectors: +12.7%
- Trucks: +10.8%

Definitive value of 2012: 226 Mt-CO₂

Other transportation sectors: bus, taxi, train, ships, airplanes
Low carbonization structure of distribution field

\[ \text{CO}_2 \text{ emission} = \text{Transport Volume} \times \text{Efficiency} \times \text{Improving CO}_2 \text{ emission source unit} \]

[Examples]

- Make modal shift from using trucks to trains/ships
- Streamlining of truck transportation through traffic control
- Consolidation of distribution facilities
- Improvement of truck's load factor through joint delivery, etc.
- Streamline through cooperation between distribution operator and goods
- Shift from using private truck to commercial truck
- Reducing service frequency by increasing the size of vehicle
- Active use of information system
- Reducing weigh/size of packaging materials
- Use of third party logistics

- Reducing CO\_2 emission source unit of cars, trains, ships, airplanes through technology innovation
- Make a shift from using diesel car to natural gas car with lesser CO\_2 source emission unit.
- Improving fuel costs through eco-drive, etc.

(Other examples related to low carbonization of distribution field)

- Low carbonization of sea port
- Low carbonization of warehouse
Low carbonization structure of distribution field

Modal shift (using trucks to trains)

Reducing CO₂ emission source unit of ships airplanes through technology innovation

Make a shift from using diesel car to natural gas car with lesser CO₂ source emission unit.
Green logistics partnership meeting

Meeting held for the sake of advancing concerned participants such as model shippers, distribution operators to be able to share and exchange their awareness concerning the importance of “green” logistics.

Host: Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Economy, Trade and Industry; Japan Institute of Logistics System, Japan Federation of Freight Industries

Support: Japan Business Federation

Establishment: April, 2005

Number of Members: 3,314 (as of December, 2013) distribution operator, cargo owner enterprise, individual industry groups, thinktank, research institutes, etc.

Implementation of awarding/introduction of excellent business enterprises, holding discussions, etc. concerning “green” distribution to expand public's voluntary initiative toward CO₂ reduction.
Ministry of Land, Infrastructure and Transport minister's secretariat distribution deliberation official commendation

Project Name:
“Streamlining of coal chemical product through modal shift of trains ~ new potential for liquid product transportation through birth of oil freight train & special coal chemical product tank container train”

business operators:
JAPAN OIL TERMINAL CO., LTD, Shin-Etsu Chemical Co., Ltd, Japan Freight Railway Company, VORTEX SEIGUN Co., Ltd., Kanagawa Express

Special award for “green” distribution partnership meeting

Project Name:
“Moving toward further evolution of cooperative delivery ~ Realization of CO2 reduction through coordination with wholesale stores by reducing standby delivery vehicles for cooperative delivery”

business operators:
KONPOU UNYU SOKO, Inc., Kanakan Inc., HOKURIKU CHUO SHOKUHIN CO., LTD., HOKURIKU RYOSHOKU
Laws concerning advancement of centralization and streamlining of distribution operation

【Law summary】

＜Basic policy＞
○ To implement transport/storing/distribution processing in comprehensive manner
○ Must make sure transportation and delivery are being streamlined through consolidation/joint transporting, etc.
○ Must make sure the plan is centered around distribution operation facilities located near highways/seaport/etc.
Laws concerning advancement of centralization and streamlining of distribution operation

【Support measures】

○ Advancement of comprehensive implementation of distribution business: Lump-sum obtainment of project approval, etc.

○ Servicing of distribution facility base coordinating with social capital: Providing consideration to special measures for taxation system, location regulations

○ Support for small/mid sized business entrepreneurs, etc.: financial, etc. support, monetary policy, human resources development

【Effect】

○ Advancing of distribution reform, reduction of environmental load, regional vitalization
  • roughly 20% reduction of CO2 emission amount
Law Regarding the Rationalization of Energy Use

Target transportation division
＜Freight and passenger transportation＞

Freight Transportation

Passenger transportation

Transportation business operator + Model shippers

Planning ➔ Periodic report
Transportation business operator （Cargo・passenger）
Freight・Entity with passenger transportation as their business （Includes private transportation）
Truck transportation, coastal shippings, trains, airplanes

Specified transportation business operator （As of June, 2013  585 companies）
Specification condition
Number of owned trucks : Over 200 trucks
Freight space of coastal shipping : Over 20,000 tons
Number of owned trains : Over 300 trains
Maximum take-off weight of airplanes :
over 9,000 tons

Model shipper
Entity that have transportation business operator transport their goods （includes private transportation）

Specified model shipper （As of June, 2013  850 companies）
Specification condition
Yearly transportation volume of one's own goods （Own transportation portion + entrustment portion） is over 30 million tons
Certificate system for green management of transport division

- Draw up manual that will allow business operators to engage in voluntary environmental conservation activities through Eco-Mo Foundation coordinating with the government and affiliated industry entities.
- Eco-Mo Foundation giving certification to business operators with above certain qualified level pursuant to the manual
  - Certifying institution: Eco-Mo Foundation
  - Target categories: truck, bus, taxi storage, harbor transportation, passenger ship, coastal shipping
  - Valid period: 2 years
  - Certification condition: Must perform above certain level of initiatives per individual rating items
- Registration result: 4,522 cases, 7,313 business office (as of October 20, 2014)
## Certificate system for green management of transport division

### Category: Rating Items (For trucks)

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating Items</th>
</tr>
</thead>
</table>
| 1. Servicing the structure/system for environmental conservation | • Draw up of environmental policy  
• Draw up of environmental action plan  
• Construction of advancement system  
• Implementing environmental education to employees |
| 2. Implementation of eco-drive | • Implementation of fuel management  
• Fuel goal setting  
• Constructing implementation system  
• Implementing banning of idling  
• Servicing of eco-drive promotion method |
| 3. Implementation of low pollution vehicles | • Incorporation of newest regulation approved diesel car  
• Corresponding to region specified low pollution vehicles, etc. |
| 4. Service/inspection of cars | • Construction of implementation system  
• Appropriate inspection, implementation of service  
• Inspection based on one's own standard, implementation of service |
| 5. Promoting appropriate disposal of toxic wastes and recycle | • Implementing education toward employees concerning toxic wastes  
• Scrapped cars, appropriate management of toxic wastes |
| 6. Promoting environmental conservation of management division | • Advancement of environmental conservation in office |
Promotion of eco-drive

【Purpose】
Our goal is to reduce CO₂ emission from transportation division through promotion of eco-drive that can easily be implemented by ordinary citizens as the measure against global warming.

10 tips for eco-driving

- Accelerate gently "e-start"
Promotion of eco-drive

【Content of measures】

Promotion of eco-drive popularization and promotion conference activities（1997~）
- Holding of symposium, distribution of flyers, etc.

Issuing of eco-drive course certificate and course completion certificate (as of end of February, 2014)
- Issuing of course completion certificate, fuel analysis software, providing of posters, etc., issuing of eco-drive correspondence

<table>
<thead>
<tr>
<th></th>
<th>Number of certified organization</th>
<th>Number of course completion certificate for 2013</th>
<th>Total number of course completion certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trucks(2007～)</td>
<td>16</td>
<td>11,132</td>
<td>118,136</td>
</tr>
<tr>
<td>Cars(2008～)</td>
<td>237</td>
<td>1,535</td>
<td>9,491</td>
</tr>
</tbody>
</table>

Competition event to encourage eco-drive activities and have so far received application from over 1,000 business offices.
New initiatives to reduce wasteful transportation volume
~Demand forecast improvement /information sharing thorough weather data~

- Occurrence of food loss and wasteful transportation/delivery for products such as tofu, etc. where demand is affected by the weather topped with short expiration period.

- Sharing information between related entities by improving demand forecast through Japan Weather Association.

- Strive to achieve food loss reduction and reduce 5% of unnecessary CO₂ occurrence
New initiatives to reduce wasteful transportation volume
~Demand forecast improvement /information sharing through weather data~

Daily food (Tofu) : One time/daily delivery of information
Seasonal products (Noodle soup・pot soup) : one time/weekly delivery of information

Used for production plan
Waste loss reduction

Used for inventory planning
Waste loss reduction

Used for sales plan
Waste loss・opportunity loss reduction

---

Maker

Wholesale・distribution operator

Retail

Inventory

Japan Weather Association
Weather Information・Demand forecast

Raw materials (Agricultural products)

Consumer

Product flow

Information flow
New initiatives in improving transportation efficiency
~ Low carbonization type collection/delivery system that uses tramcars ~

- Constructing the collection/delivery system that uses tramcar for transportation between distribution terminal and business office.

- Carts equipped with collection/delivery containers are being loaded onto a train at departing station, such carts are unloaded at each respective stations, and the sales driver loads it up (without making any changes) onto an electric bicycle attached with two-wheeled cart and goes on making collection/delivery.

![Diagram showing the process of collection and delivery using tramcars and electric bicycles, with reduced intracity trucks.]
New initiatives in improving transportation efficiency
~ Low carbonization type collection/delivery system that uses tramcars ~

Transportation by chartered train

Sight of unloading cart from train at station

Making delivery by using bicycle attached with two-wheeled cart
New initiatives in improving CO₂ emission source unit
～Driving support that uses operation data of trucks～

- Promotion of digital tachometer for the obtainment of trucks operation data
- Starting of initiative where obtained operation data are being gathered by cloud and being utilized
- Implementation of service, etc. where driving level is being rated with actual numbers instead of just Intuition by analyzing data gathered by cloud center and making comparison between actual speed during the drive and ideal speed
- Thanks to this driving support service, in addition to seeing the effect of incorporating digital tachometer, fuel costs have improved roughly 15% along with reduction of accidents since it leads to safe driving.
New initiatives in improving CO₂ emission source unit
～Driving support that uses operation data of trucks～

Image of driving data collection

cloud center

Digital tachometer

Example of driving support system

【speed】

Actual speed

Ideal speed

【time】
Thank you

Masaru Kumai, Deputy Manager,
Eco-Mo Foundation, Japan