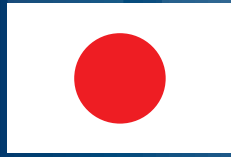
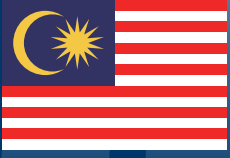
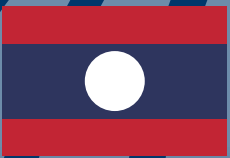




ASEAN-Japan Best Practices on Green Logistics



November 2018
ASEAN-Japan Transport Partnership

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ASEAN-Japan Transport Partnership

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1. Outline

1-1. Objective

ASEAN-Japan Best Practices on Green Logistics under the ASEAN-Japan Transport Partnership (hereinafter referred to as “The compilation”) is a compilation of the best practices on green logistics in ASEAN Member States and Japan. The compilation pick up the best practices on green logistics from ASEAN Member States and Japan, which are implemented by logistics companies such as trucking companies, warehousing companies and associations related to trucking and forwarding address to reduce environmental burden through cooperation with shippers. In addition to the best practices from private sectors, the compilation contains political activities which will be lead green logistics promotions by governments. Referring to the compilation, ASEAN Member States and Japan are expected to promote green logistics.

1-2. Background

(1) Green Logistics Vision and Action Plans aligned with KLTSP

Green logistics is an essential concept to be introduced and implemented by the ASEAN Member States, to sustain the economic growth of the region while achieving efficient and environmental-friendly logistics. The Brunei Action Plan (ASEAN Strategic Transport Plan 2011-2015) incorporates the strategic goal and actions to develop environmental-friendly logistics through green logistics concept.

Due to the fact that green logistics is recognized as a relatively new concept to ASEAN, Japan had been asked to cooperate on this development. Taking into account the need for inputs on green logistics measures in ASEAN, Japan co-chaired with Malaysia held the 9th ASEAN-Japan Expert Group Meeting on Logistics (AJ-EGML) on 6-7th, March 2014 in Kuala Lumpur, Malaysia. This meeting had confirmed the needs to (i) specify the definition and scope of green logistics; (ii) have the common consensus in exchanging information on current status of green logistics policies of respective ASEAN Member States (AMSs); and (iii) discuss future processes and measures to develop green logistics in ASEAN.

At the meeting, Japan proposed to set up the common Green Logistics Vision within ASEAN, as well as the need to create the Green Logistics Action Plans for ASEAN to promote green logistics beyond 2015. To further elaborate this Vision and Action Plans, the 10th AJ- EGML was held on 5-6th, March 2015 in Kuala Lumpur, Malaysia to discuss issues on green logistics. Japan drafted the wordings for the Green Logistics Vision and Action Plans, and the meeting agreed on proposed draft wordings to be aligned with the actions plans in the KLTSP in supporting the Green Logistics measures under Sustainable Transport. These proposed vision and action plans were submitted to the 3rd Task Force Meeting on the Successor of ASEAN Strategic Transport Plan (3rd TFM), 29th ASEAN Transport Facilitation Working Group (TFWG), as well as at the 13th ASEAN-Japan Senior Transport Officials Meeting (STOM+J), before being adopted in the 13th ASEAN Transport Ministers’ Meeting held in Kuala Lumpur on 5th Nov 2015.

(2) Milestones of KLTSP under sustainable transport

The Green Logistics Action Plans has three policy pillars which are based on the milestones of KLTSP to support the Green Logistics measures under Sustainable Transport. : (i) Develop and implement green logistics measures that would encourage private sectors and individual consumers to promote green logistics; (ii) Share and create the best practices summary report on green logistics of AMSs; and (iii) Create a Checklist Guide on green logistics to provide guidance and instruction toward. The compilation is one of the deliverables in (ii) Share and create the best practices summary report on green logistics of AMSs, which will be submitted to the 16th ASEAN-Japan Transport Ministers' Meeting (ATM+J) in 2018.

Figure 1-1: Milestones of KLTSP under Sustainable Transport

SPECIFIC GOALS	ACTIONS	MILESTONES	WG INVOLVED	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1. Intensify regional cooperation in the development of sustainable transport-related policies and strategies	1.4 Develop a regional framework towards green and efficient freight and logistics in order to support ASEAN Member States in implementing respective policies	1.4.1 Develop Green Freight and Logistics database	LTWG TFWG										
		1.4.2 Develop Green Freight and Logistics Strategy	LTWG TFWG										
		1.4.3 Develop and implement Green Logistics Measures that would encourage the private sectors and individual consumers to promote Green Logistics	LTWG TFWG										
		1.4.4 Share and create the best practices summary report on Green Logistics of ASEAN Member States	LTWG TFWG MTWG										
		1.4.5 Create a Checklist Guide on Green Logistics to provide guidance and instruction toward the private sectors initiatives and operations to promote Green Logistics.	LTWG TFWG MTWG										

The report is one of the deliverables

1-3. Composition

The compilation includes (24) practices from ASEAN Member States and 11 practices from Japan. For ease of reference, the best practices are composed as following: Each practice sets out a title and category, project operators, project overview, key points, effects and supplemental explanation. And the best practices categorized as 6 models: (I) Modal shift; (II) Joint transportation; (III) Unification and relocation of cargo bases; (IV) Technologies; (V) Infrastructure; (VI) Policy / Institution / Cooperation Framework. Please note that the effects of the best practices covers not only global environmental impact such as reducing carbon dioxide emission (CO₂) but also regional environmental impacts such as reducing air pollutants. And the effects of the best practices can be measured in a quantitative way as well as a qualitative way.

[Categorized models of Green Logistics Promotion]

(I) Modal shift

- Changing to low-carbon transportation modes such as migration from trucks to either rails or vessels.

(II) Joint transportation

- Improving load efficiency by consolidating and combining cargos from various shippers.

(III) Unification and relocation of cargo bases

- Reduction of lead and delivery times by unification and relocation of cargo bases through shortening transport distance.

(IV) Technologies

- Introducing new technologies for CO2 emissions reduction or improving efficiency of business activities such as energy-efficient trucks or digital tachometer to monitor their operation. And standardizing or reusing of transport items such as pallets for their efficient use.

(V) Infrastructure

- Building or rehabilitation of logistics infrastructure such as roads, truck-terminals and ports those contribute to improving efficiency of logistics industry as a whole.

(VI) Policy / Institution / Cooperation Framework

- Establishing policy/institution/cooperation framework that help reduce CO2 emission from transport or logistics sector.

1-4. List of Best Practices

Figure 1-2: List of best practices by state/country

States / countries	Title	(I) Modal shift	(II) Joint transportation	(III) Unification and relocation of cargo bases	Technologies (IV)	Infrastructure (V)	(VI) Policy / Institution / Cooperation Framework
Brunei	● Port Clearance Module (PCM)	-	-	-	○	-	○
Cambodia	● Sustainable Freight Transport and Logistics in the Mekong Region	-	-	-	○	-	-
Indonesia	● Green Logistic Implementation through Development of Terminal Teluk Lamong as First Green Port in Indonesia	-	-	-	○	○	-
Lao PDR	● Implementation Eco Drive in Lao PDR.	-	-	-	○	-	-
Malaysia	● Green Supply Chain Project with Consideration to Environmental Conservation and Sustainable Manufacturing (CO2 Reduction and Productivity Improvement)	-	-	-	○	-	○
Myanmar	● Container Barge Operation on Yangon River	○	-	-	-	-	-
Philippines	● Clean Fleet Management Toolkit with Low Environmental Impact	-	-	-	○	-	-
	● Implementation of Terminal Appointment Booking System (TABS)	-	○	-	○	-	○
Singapore	● Green Freight Asia's industry network and certification program	-	-	-	○	-	-
Thailand	● Green Freight Technology Implementation for SME	-	-	-	○	-	-
	● Service Quality Standard for Truck Operation (Q Mark)	-	-	-	-	-	○
Vietnam	● GHG Inventory and Scenario Development in Transpor Sector	-	-	-	-	-	○
	● Green Freight Project	-	-	-	-	-	○
Japan	● Establishment and operation of Green Logistics Partnership Conference	-	-	-	-	-	○
	● F-Line Project: Establishment of Logistics Platform towards realization of effective sustainable logistics in the Food Industry	○	○	-	-	-	-
	● Distribution measures of Green Logistics in Kichijoji	-	○	○	-	-	-
	● Modal Shift to Rail and Shipping towards realization of Environmentally Friendly Deliveries to Customers - Green logistics in a partnership with retailers, makers and distribution businesses-	○	-	-	-	-	-
	● Reduction of CO2 Emissions through Modal Shift from Truck to Rail way	○	-	-	-	-	-

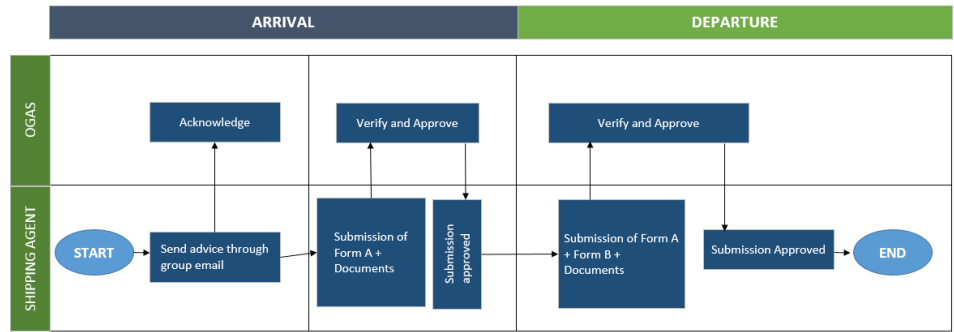
States / countries	Title	(I) Modal shift	(II) Joint transportation	(III) Unification and relocation of cargo bases	(IV) Technologies	(V) Infrastructure	(VI) Policy / Institution / Cooperation Framework
	<ul style="list-style-type: none"> ● Efforts for a low-impact on the environment by providing dedicated trains for AEON Global SCM Co., Ltd 	○	○	-	-	-	-
	<ul style="list-style-type: none"> ● Modal shift to ships and rail modes to reduce amounts of CO2 emission and upsizing trucks to deal with shortage of long-distance truck drivers 	○	-	-	-	○	-
	<ul style="list-style-type: none"> ● Green logistics project with consideration to environmental conservation (for reduction of CO2 emissions, nitrogen oxides (Nox) and particulate matters (PM) through efficient loading by ordering the optimal quantities, the milk-run system and modal shift) 	-	○	○	○	-	-
	<ul style="list-style-type: none"> ● Energy-saving project on road-to-rail modal shift of cellular base stations by introducing vibration/shock isolators 	○	-	-	○	-	-
	<ul style="list-style-type: none"> ● Introduction of cooling system with Dynamic Ice (i.e.; Ice thermal storage system) into trucks for perishables to reduce CO2 emission 	-	-	-	-	○	-
	<ul style="list-style-type: none"> ● "Super Green Shuttle Train" project by joint usage of 31ft containers 	○	○	-	○	-	-

2. Best Practices

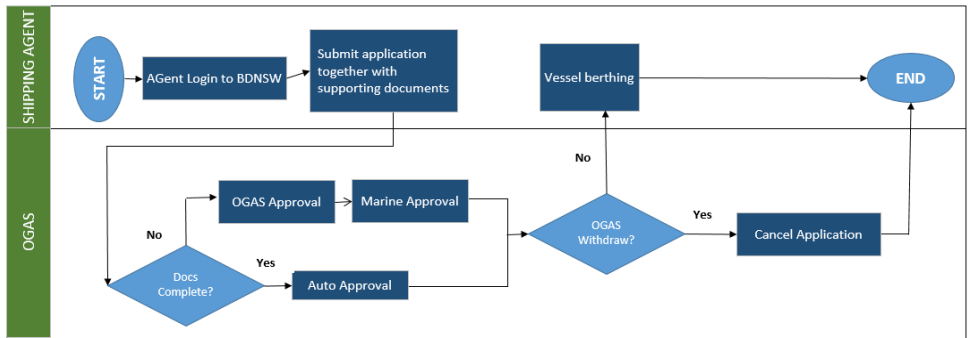
2-1. Brunei

(I) Title and category	Title	<ul style="list-style-type: none"> Port Clearance Module (PCM)
	Category	(IV) Technologies (VI) Policy / Institution / Cooperation / Framework
(II) Project operators		<ul style="list-style-type: none"> The project was funded by Royal Custom and Excise Department (RCED) in order to include Port Clearance Processes in Brunei Darussalam National Single Window. <ul style="list-style-type: none"> Royal Custom and Excise Department (RCED) Former Marine and Ports Department (Currently known as Maritime and Port Authority of Brunei Darussalam) Port Health, Ministry of Health
(III) Project overview		<ul style="list-style-type: none"> The port clearance application originally provided by Former Marine Department is using two sets of forms (Form A and Form B) that requires physical approval from four other Government Agencies (RCED, Ministry of Health, Ports Department and Marine Department) also known as OGAS. The agents have to visit each agency's office to obtain an approval by presenting documents required. Different agencies have different sets of requirements and documents. For each application, it may take hours or even day(s) to complete one application for an agent to go from one office to another office. With cooperation with RCED as well as one of initiates to improve time taken for Vessel Clearance, all other agencies have been co-operated to develop the online system application for Port Clearance Process. The Port Clearance Process is developed in Brunei Darussalam National Single Window System (BDNSW) known as Port Clearance Module (PCM). The module's main purpose is to ease the process by uploading documents instead of submitting physical copies to OGAS.
(IV) Key points		<ul style="list-style-type: none"> Brunei sets an initiative in Ease of Doing Business (World Bank) to minimize the requirements and times. PCM is aimed to increase efficiency of Port Clearance Application and Processes for all agents. PCM introduces single login system for users to make other applications that are available in BDNSW. It takes minute(s) instead of day(s) in the process of approval. PCM is monitored daily by RCED and administered by the four agency's Project Manager.
(V) Effects		<ul style="list-style-type: none"> PCM in BDNSW since 2017 has streamlined the process of submitting and approving application for inward and outward vessels clearance. PCM contributes to reduce procedures of the agents to obtain the port clearance and save the following environmental burden: <ul style="list-style-type: none"> Papers of documents for saving natural resources Energy and fuels of transporting among related four other Government Agencies for reducing GHGs Furthermore, the agents can reduce time for the procedures which leads to cost reduction.

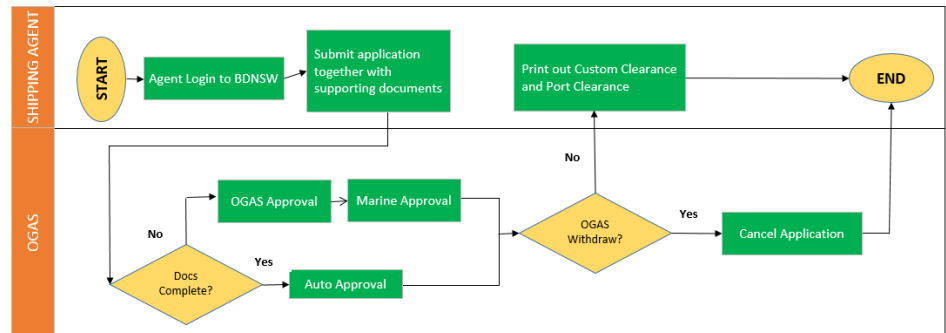
[PCM manual process]



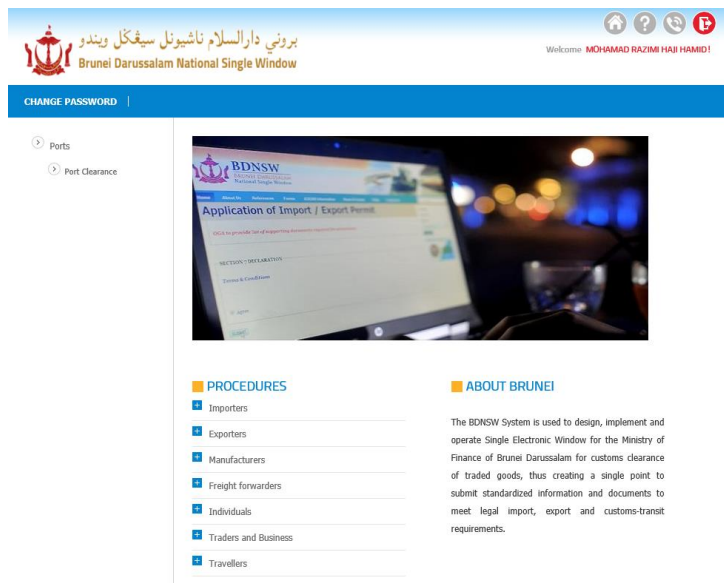
[PCM arrival manual]



[PCM departure manual]



[BDNSW]



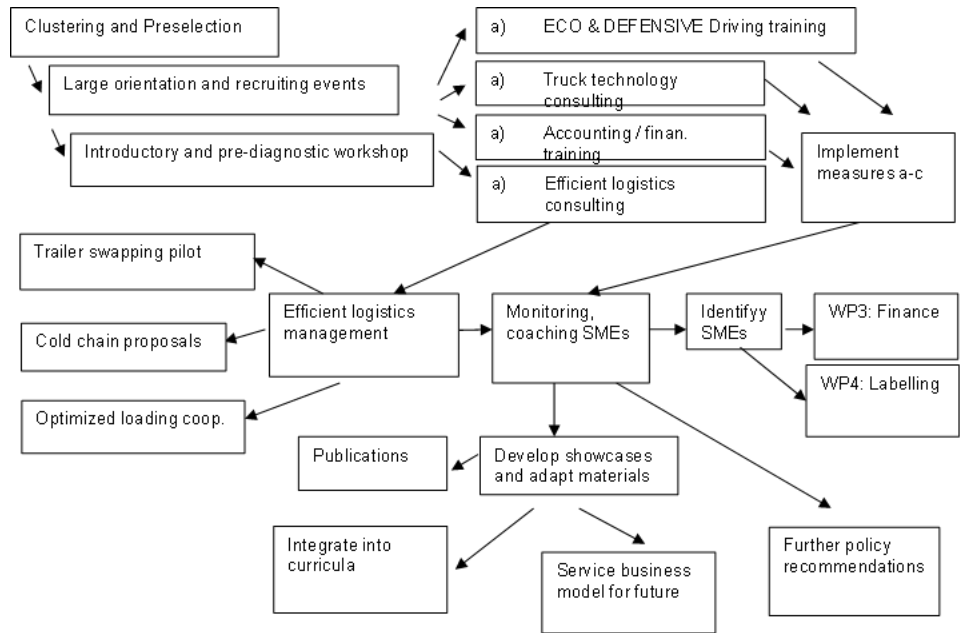
(VI) Supplemental explanation

2-2. Cambodia

(I) Title and category	Title Category	<ul style="list-style-type: none"> ● Sustainable Freight Transport and Logistics in the Mekong Region
(II) Project operators	(IV) Technologies <ul style="list-style-type: none"> ● The project is funded by the Switch Asia fund of the European Union, which promotes sustainable consumption and production project across Asia. GIZ is in charge of leading the implementation of this project, in close partnership with the Mekong Institute, the GMS Freight Transport Association (FRETA) as well as GIZ's regional Transport and Climate Change project. ● Greater Mekong Sub-region Business Forum/GMS FRETA CAMFFA, CAMTA and CCC in CAMBODIA 	
(III) Project overview	<ul style="list-style-type: none"> ● This project aims to increase sustainable freight transport and logistics in at least 500 small and medium enterprises (SME) in Cambodia, Lao PDR, Myanmar, Vietnam (CLMV) and Thailand. In order to improve the fuel efficiency and thus the environmental footprint of freight transport operations in the region, the project works with local companies, freight associations, banks and the national governments on actions like eco-driving, better maintenance, adoption of fuel-saving technologies, enhanced access to finance for truck upgrades, green freight labelling and national action plans. A second field of action is the safe transport of dangerous goods, where the project also aims to build capacity of local companies and improve the legal framework. 	
(IV) Key points	<ul style="list-style-type: none"> ● Fuel Efficiency (WP1), Strengthen driver-training and certification systems to improve eco-driving and maintenance practices. ● SCG Skills and Development training curriculum has been selected and adjusted to suite to target group. Eco and Defensive Driving training materials were translated into 4 local languages. ● Safe Dangerous Good Transport (WP2), A Gap Analysis was initially conducted to understand the current situation. All countries have agreed on establishing Working Group and EU ADR translation to support the future development of dangerous goods transport national regulations. ● Access to Finance (WP3), Study on Vehicle Import Duty for new versus used commercial vehicles in Myanmar and Cambodia. ● Policy support and awareness (WP4), introduction to Green Freight Asia (GFA) and Q Mark certificates through regional and national seminar, especially as well show case of companies certified with GFA. 	
(V) Effects	<ul style="list-style-type: none"> ● Under this project (WP1) 6 National Trainers, from both government and private sector, have been qualified in Eco and Defensive training under GIZ/SCG Skills and Development program. ● 33 companies on 80 targeted had their drivers trained and monitored in Eco and Defensive training by 31/01/2018 in Cambodia. ● The development of a Truck Driving Education training and testing center is under consideration by MPWT, ● Extension of this Eco and Defensive training to all Cambodian driving school trainers is being considered. 	

[Flow of “Sustainable Freight Transport and Logistics in the Mekong Region”]

(VI) Supplemental explanation



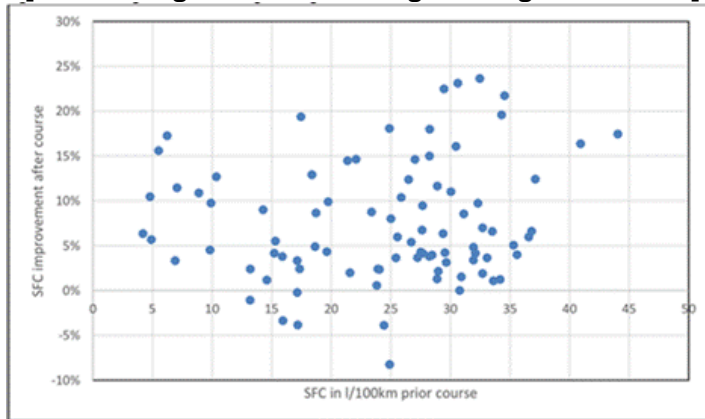
2-3. Indonesia

(I) Title and category	Title	<ul style="list-style-type: none"> Green Logistic Implementation through Development of Terminal Teluk Lamong as First Green Port in Indonesia
	Category	(IV) Technologies (V)Infrastructure
(II) Project operators		<ul style="list-style-type: none"> PT. Pelabuhan Indonesia (Pelindo) III (Persero) PT. Terminal Teluk Lamong
(III) Project overview		<ul style="list-style-type: none"> Indonesia has 6 main ports which become the entrance gate of products from abroad as well as exchange of goods from within the country. The ports are the port of Belawan Medan, Tanjung Priuk Jakarta, Tanjung Emas Semarang, Tanjung Perak Surabaya, Makassar Port and the Port of Sorong in Papua. Those ports are still lacks of technology and innovation in management, thus there are often problems ranging from overcapacity, document maintenance, and dwelling time. For example, dwelling time at the port of Tanjung Priok takes 7-8 days, while in Singapore only takes 1-3 days. The duration of dwelling time is allegedly due to the lack of use of information systems technology at the port. Authorities in charge of port in Indonesia are PT Pelindo I, PT Pelindo II and PT Pelindo III. In the current era of globalization PT Pelindo are required to continue to innovate and improvise in order for the major ports in Indonesia can compete with other ports in the region as well global. The project is conducted by PT. Pelindo III as one of port authorities in Indonesia in order to overcome the problems. Along with the environmental and sustainability issues, PT. Pelindo III constructed Terminal Teluk Lamong which was built as a development of the port of Tanjung Perak in Surabaya. Terminal Teluk Lamong was built in 2010 into several phase and fully operated in 2014. Terminal Teluk Lamong serves container loading and unloading services and dry bulk. With the availability of modern equipment, the purpose of the construction of Terminal Teluk Lamong is to improve safety, productivity, and market share of ports in Indonesia.
(IV) Key points		<ul style="list-style-type: none"> The company (PT. Terminal Teluk Lamong) applied green port concept, which requires all terminal trucks and loader equipment use gas as fuel in order to reduce CO2 emissions. Trucks from outside the port that have not used gas fuel put up a transit area to be subsequently replaced by a truck provided by the terminal to pick up and send the container to stacking field. All light bulbs used in the operational area of the terminal use LED lamps, which are more energy efficient. The terminal using ASC (Automated Stacking Crane), which is operated automatically (without using the operator in the tool cabin). Automatic Gate. Online system is used for the user of the service.
(V) Effects		<ul style="list-style-type: none"> Reduced CO2 emissions (no specific data) According to GTZ Study (2002), reducing emissions which is specific to the Gas Fuel Vehicle compared to gasoline is: <ul style="list-style-type: none"> ➢ CO, 60-80% ➢ non-methane organic gas (NMOG), 87% ➢ NOX, 50-80% ➢ CO2, about 20% ➢ reactivity of ozone production, 80-90% ➢ (These numbers vary depending on vehicle comparison used.)

2-4. LaoPDR

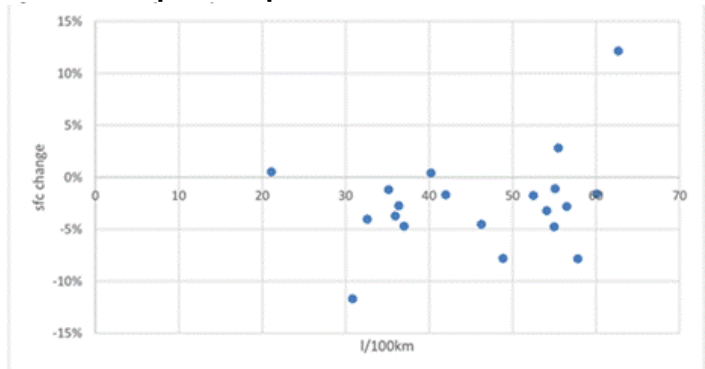
(I) Title and category	Title Category	<ul style="list-style-type: none"> ● Implementation Eco Drive in Lao PDR.
(II) Project operators		<ul style="list-style-type: none"> ● Asian Development Bank (ADB) ● Thongsangnang Driving School in Vientiane, Lao PDR
(III) Project overview		<ul style="list-style-type: none"> ● ADB's report summarizes and assesses the experience with Eco Drive to reduce fuel consumption and GHG emissions of Heavy Duty Vehicles (HDVs, focus on trucks) in Lao PDR. The report also summarizes international experience, the curricula developed for Lao PDR and potential future steps. Eco Drive was implemented with a focus on long haul truck drivers within the scope of a Green Freight Program (GFP) of ADB realized 2015-2016 in Lao PDR. ● Based on experience with an initial Eco Drive course for truck drivers a Curriculum for Eco Drive was developed². Thereafter, the curriculum was applied in various training courses with around 100 truck and also bus in Lao PDR drivers being trained in Eco Drive). The curriculum includes a theoretical and a practical part: <ul style="list-style-type: none"> ● Theoretical part: This includes motivating the driver, explaining reasons why Eco Drive is good, explaining what needs to be done and why, and demonstrating the results of changing the driving style. ● Practical experience: This includes test-driving either on a simulator or with actual trucks. The instructor thereby gives the driver tips on how to improve his Eco Drive skills. Ideal is if a first test-drive can be realized prior the theoretical course and another test-drive after the course. ● The 4 golden rules of Eco Drive are promoted: <ul style="list-style-type: none"> ➢ 1. Check your vehicle prior driving; The most relevant checks for low fuel consumption prior driving are tire pressure, cargo and aerodynamics ➢ 2. Up-shift as early as you can and use high gears ➢ 3. Drive defensively running at constant speed ➢ 4. Effectively utilize the engine brake and retarders
(IV) Key points		<ul style="list-style-type: none"> ● The major benefits identified for applying Eco Drive are: <ul style="list-style-type: none"> ➢ 1. Environmental impact (reduced GHG emissions and local pollutants), ➢ 2. Economic benefits due to reduced fuel consumption and lower maintenance costs, ➢ 3. Lower accident rate and less stressful driving ● Basically two types of trainings were realized: <ul style="list-style-type: none"> ➢ 1. Capacity building of trainers of driving schools on Eco Drive on the curriculum developed. This was realized in 2015 through a half-day workshop realized with around 15 trainers in each country. ➢ 2. Training of 100 truck and bus drivers in Lao PDR in various courses during 2015 and 2016 using the developed curriculum. In all trainings all drivers performed trips on a standardized route prior course with precise fuel consumption measurement and just after the course measuring again the performance. The run after the course included feedback and recommendations of the instructor whilst the run prior course the driver had to drive as usual without assistance.
(V) Effects		<ul style="list-style-type: none"> ● The results during the trainings with valid data from 89 drivers indicates an average improvement rate of 8% of fuel consumption with a maximum of 24% and a minimum of -8% (median value 6%; see figure below). 5% of drivers worsened their fuel consumption. However, this is probably due to differing driving circumstances. The 95% confidence level of fuel efficiency improvement is thereby between 6.2% and 8.9% improvement. ● Average speed driven was around 50 km/h. Comparing the average speed prior and after the course latter was on average 6% higher i.e. Eco Drive did not result in lower but higher average speeds (which also explains at least partially the fuel savings). Absolute fuel consumption levels were on average 25 l/100km. The average GVW of trucks during training was 15t using to a large extent trucks of 18t and to a smaller part buses with an empty weight of 12t and smaller units of 3.5 tons.

[Fuel saving measured during training in Lao PDR]



Source: Grütter Consulting

[Fuel consumption impact Eco Drive Short-Term Lao PDR]



Source: Grütter Consulting based on data 1 month prior and 1 month after course (positive values indicate an increase in the specific fuel consumption and negative values a decrease)

(VI) Supplemental explanation

[Practical training]



[Theoretical teaching]



Source: Asian Development Bank, "Report B4: Implementation Eco Drive", 2016

2-5. Malaysia

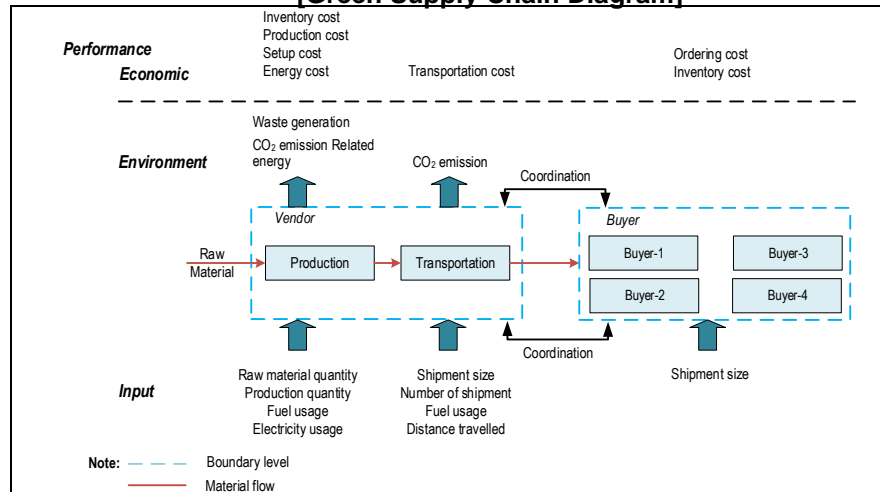
(I) Title and category	Title	<ul style="list-style-type: none"> Green Supply Chain Project with Consideration to Environmental Conservation and Sustainable Manufacturing (CO2 Reduction and Productivity Improvement)
	Category	<ul style="list-style-type: none"> (IV) Technologies (VI) Policy / Institution /Cooperation Framework
(II) Project operators		<ul style="list-style-type: none"> Universiti Kebangsaan Malaysia SIRIM Berhad Tenaga Cable Industries Sdn. Bhd.
(III) Project overview		<ul style="list-style-type: none"> This project helps Tenaga Cable Industries Sdn. Bhd in moving towards environmental conservation through optimization of vendor – buyer coordination engagement, lean manufacturing practices in the waste management and production efficiency based on SIRIM 20: 2017 – Good Practices in Green Supply Chain Management. This project presents the coordination models considering greenhouse gases (mainly, CO₂) emissions related energy consumption from the production and transportation operations between a single vendor (manufacturer) and multi-buyer. This project integrates carbon policies (I. Carbon Tax, II. Strict Carbon Cap, III. Carbon Trading) in operational decision-making for implementing of new carbon regulations in Malaysia as there is increased pressure on organization to improve environmental performance. Creates measurable improvements in performance and nurture company environmental awareness among stakeholders such as buyers and vendors
(IV) Key points		<ul style="list-style-type: none"> Achievement of CO₂ reduction, increase production efficiency and waste reduction through green initiatives: Minimizing supply chain operations costs through optimizing manufacturing and distribution process by effective decision-making in procurement (order size), production (batch production size, production time) and transportation planning (number of shipment, delivery quantity). Higher energy consumption is associated with higher CO₂ emission in manufacturing process. Therefore, in order to reduce emission related energy, CO₂ emission must be taken into account when determining the best design and operations of supply chain. Imposing carbon policies (I. Carbon Tax, II. Strict Carbon Cap, III. Carbon Trading) in supply chain operations as an alternative policy to curb carbon emission. Producing less waste materials through improved resource efficiency and optimized production planning. Design for green supply chain through production, inventory, and transportation management by defining optimal strategies of a replenishment control at vendor and buyers, which usually evaluated based on three sustainable dimensions (economic, environmental, and social). Improving supply chain efficiency by minimizing costs, waste, and emission related energy. Aim of the project is to integrate the best practices standards along the supply chain activities from vendor – buyer coordination based on SIRIM 20:2017 Industry Standard – Good Practice in Green Supply Chain Management.
(V) Effects		<ul style="list-style-type: none"> Green supply chain practices can contribute to: <ul style="list-style-type: none"> ➢ Reach reduction target of CO₂ emission and energy consumption up to 10% in a year. ➢ Impose carbon policies (e.g. strict carbon cap, carbon tax) into supply chain operations projected that can reduce the CO₂ emission below the emission limit given by the authority. Moreover, the implementation of carbon policies (e.g. carbon trading) can benefit the firms in selling of some of their emission allowance as the result of emitting less than their emission cap. ➢ Improve resource efficiency up to 5% through waste reduction. ➢ Increase the profit by reducing supply chain costs up to 10% in a year. ➢ Increase the customer service level. ➢ Integrate the best practices standard along the green supply chain initiatives and standard.

(VI) Scheme chart

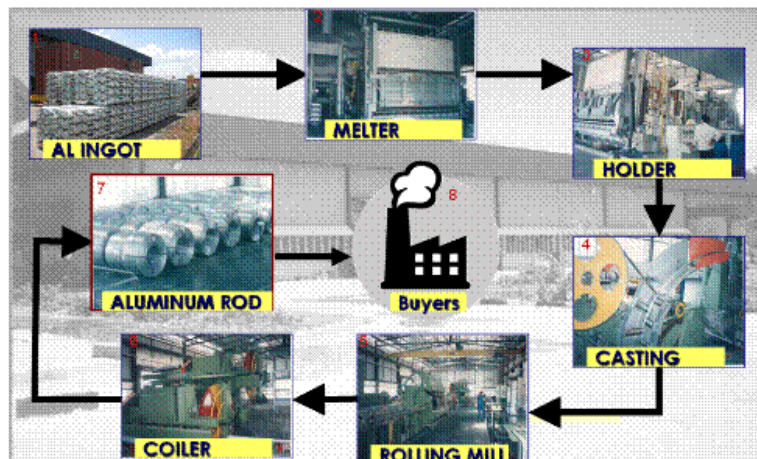
[Covers of SIRIM INDUSTRY STANDARD]




[Green Supply Chain Diagram]



[Aluminum Rod Manufacturing (A Case study of Tenaga Cable Industries)]

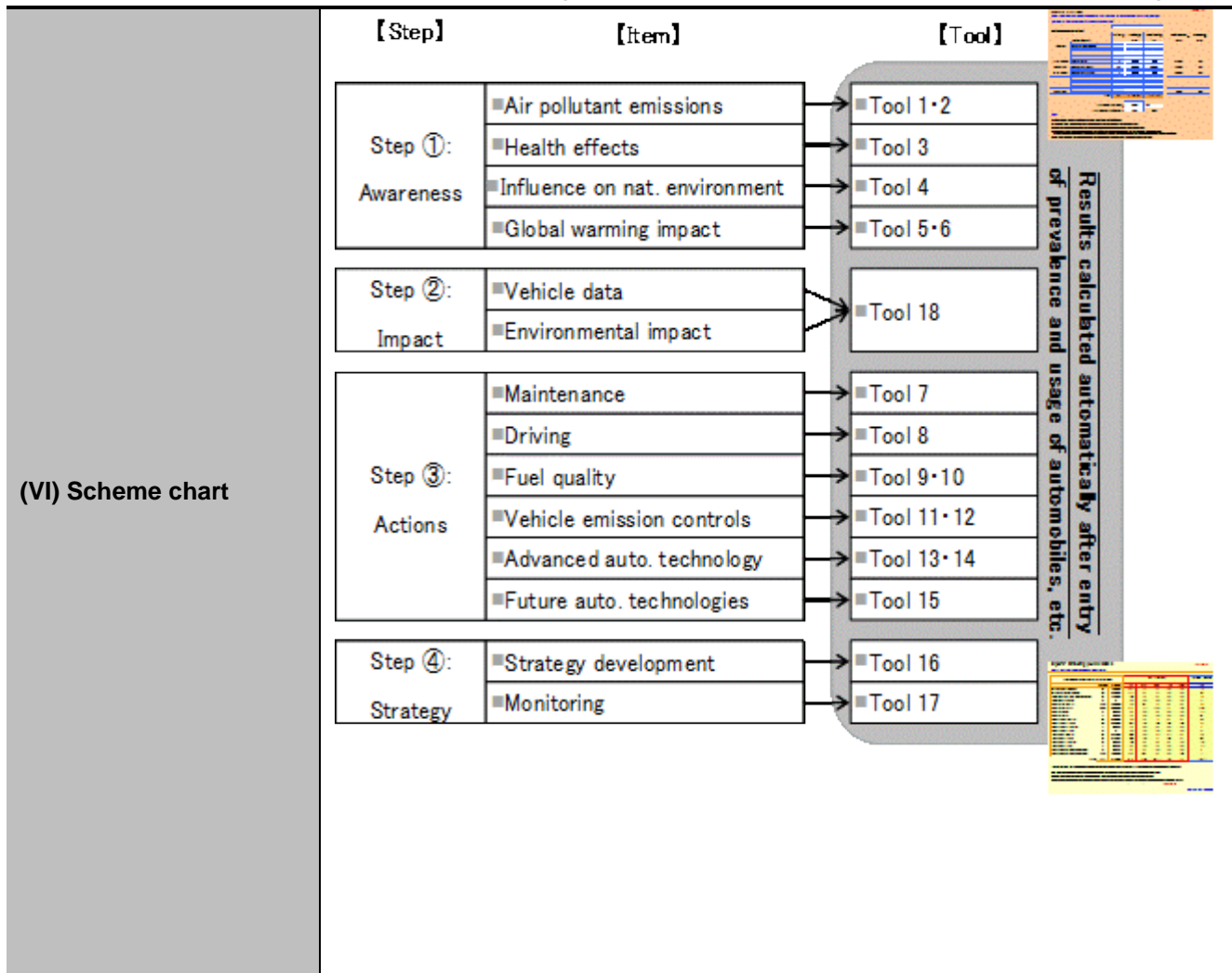


2-6. Myanmar



(I) Title and category	Title	<ul style="list-style-type: none"> ● Container Barge Operation on Yangon River
	Category	(I) Modal Shift
(II) Project operators		<ul style="list-style-type: none"> ● Inland Water Transport ● SA Marine
(III) Project overview		<ul style="list-style-type: none"> ● Yangon Downtown struggle with heavy traffic congestion resulting in waste of time and unnecessary GHG emission on roads. This project is shifting the containertrailer transportation between Thilawa port terminal and Industrial Zones through Yangon Downtown to ease the congestion and avoid GHG emission.
(IV) Key points		<ul style="list-style-type: none"> ● Thilawa is a newly developing port area located in the south of Yangon and neighboring to Thilawa SEZ. Thilawa port terminals are disadvantaged to conventional terminals in the city center because of the distance from major industrial zones on the north side of Yangon. Thus, Thilawa port terminals needed cheap and punctual transportation to the industrial zones. With this project, container barge can provide punctual service avoiding the traffic jam while shifting the demand of road to river. However, the best point of the project is that the container barge consumes much less fuel taking advantage of the following current because of the strong current on Yangon River that changes the direction four times a day.
(V) Effects		<ul style="list-style-type: none"> ● With this project, the GHG emission will be reduced on road due to less congestion and less demand while minimizing the fuel consumption on the river.
(VI) Supplemental explanation		<p style="text-align: center;">[Barge of SA Marine]</p> 

2-7. Philippines

(I) Title and category	Title	<ul style="list-style-type: none"> ● Clean Fleet Management Toolkit with Low Environmental Impact
	Category	(IV) Technologies
(II) Project operators		<ul style="list-style-type: none"> ● Asian Development Bank (ADB) ● Department of Transportation and Communications, Philippines (DOTC) ● Department of Energy (DOE) ● Department of Finance, Philippines (DOF) ● Mandaluyong City
(III) Project overview		<ul style="list-style-type: none"> ● In collaboration with TNT, UNEP developed the Vehicle Management Toolkit with Low Environmental Impact to manage the amount of fuel consumption by vehicles. Four steps and 14 items make up a spreadsheet and 18 tools were prepared. ● PBE collaborated with CAI-Asia in The Philippines to spread the use of the Toolkit. Meralco did a pilot project with the Toolkit and improved fuel efficiency and reduced air pollutants and CO₂ emissions.
(IV) Key points		<ul style="list-style-type: none"> ● [Setting effective process] It is important to have a system to reduce the burden on transport companies that use the Clean Fleet Management Toolkit with Low Environmental Impact. The Toolkit has 18 spreadsheet tools. When vehicle data is entered, the environmental impact and response are automatically calculated. ● [Utilizing technology and know-how] It is important to prepare the support for transport companies being able to easily use the Toolkit in daily operations and also to understand the transport business. The Toolkit is supported by UNEP, developed in cooperation with the global logistics company TNT. In the Philippines CAI-Asia is supporting use of the toolkit. ● [Promoting motivations among concerned parties] To encourage wide use of the Toolkit, it is important to show the effect of fuel efficiency on fuel costs when the Toolkit is used by transport companies. With Meralco, the Toolkit was used and the fuel efficiency increased, which saved fuel costs while reducing air pollutant and CO₂ emissions. This was widely introduced through the CAI-Asia website.
(V) Effects		<ul style="list-style-type: none"> ● Meralco, a participant in PBE, received support from CAI-Asia and experimented with the kit in 2009 for effective vehicle management. Meralco established a team to utilize the Toolkit. The team collects data, analyzes the issues, sets the targets, discusses the strategy, and executes and monitors it. Meralco targets improvements in fuel cost, CO₂ emissions, repair costs, fleet utilization, productivity, regulatory compliance and corporate image as the goals for utilization of the Toolkit. ● An effective environmental response was done, including low environmental impact driving, improvement of vehicle maintenance and management and understanding of the environmental impact by vehicle type and size. Meralco improved the fuel efficiency of the total fleet by 16.6% between 2008 and 2009. Reductions in air pollutant emissions were 1.5% ~ 6%. Reduction of CO₂ emissions was 9.9%. Meralco reduced the fuel cost by fuel efficiency improvements, contributing to increases in revenue.



(I) Title and category	Title	<ul style="list-style-type: none"> ● Implementation of Terminal Appointment Booking System (TABS)
	Category	(II) Joint Transportation (IV) Technology: Electronic System Technology (Advance Booking System) (VI) Policy/Institution/Cooperation Framework
(II) Project operators		<ul style="list-style-type: none"> ● Philippine Ports Authority (PPA)/Terminal Operators ● Asian Terminals, Inc. (ATI) for South Harbor ● International Container Terminal Services, Inc (ICTSI) for Manila International Container Terminal (MICT)
(III) Project overview		<ul style="list-style-type: none"> ● The port congestion experienced in 2014 at the Port of Manila was a major factor hindering the free-flow of goods and services passing through the ports with its domino-effects immediately cascading and impacting on the demand-supply chain and eventually to the country's economic growth and performance. ● This has tremendously disrupted industries and businesses not only in Metro Manila but across the country. ● The drastic restriction in the movement of trucks transporting cargoes in and out of the Port of Manila imposed by the City Government of Manila resulted in the abnormal movement accumulation and piling up of cargoes and eventually severe port congestion. Waiting trucks along port access roads have contributed to the already worsening road congestion. ● To avert further damaging effects to the country's economy, policy and operational measures were adopted by the government to immediately and effectively address the port congestion in the Port of Manila, including the implementation of Terminal Appointment Booking System (TABS). ● The Cabinet Cluster on Port Congestion through the Philippine Ports Authority (PPA) directed the Asian Terminals, Inc. (ATI) and the International Container Terminal and Services, Inc. (ICTSI) the two terminal operators at the Port of Manila to implement the Vehicle Booking System, which later came to be known as the Terminal Appointment Booking System (TABS). ● The Terminal Appointment Booking System (TABS) is a web-based on-line system which schedules in advance the withdrawal and delivery of containerized cargoes at the international ports of Manila, thereby ensuring orderly and predictable flow of trucks being accommodated at the port for the benefit of all port users.
(IV) Key points		<ul style="list-style-type: none"> ● TABS is monitored and updated on a daily basis to ensure that the stake holders are compelled to adhere to the schedule posted on the websites of the terminal operators. The idea is to do the queuing of trucks on the web instead of physically at the port side or along port access roads. This, in effect, limits the number of vehicles on the road at any time of the day only to those with scheduled deliveries and pick ups. ● The objectives of TABS are: <ul style="list-style-type: none"> ➢ Utilize traditional supply-demand chain off-peak hours; ➢ Reduce the number of trucks during traffic peak hours, thus, reducing the CO2 emissions along the port area, without affecting the total number of import and export going in and out of the port; ➢ Reduce the truck cycle times which also reduces CO2 emissions and minimizes truck utilization; ➢ Promote 24/7 supply-chain operation; ➢ TABS allows brokers, forwarders, importers/exporters and shipping line representatives to select specific time slots and/or day(s) for the pick-up or delivery of cargoes; ● It streamlines the operation or flow of containers/trucks to, from, and surrounding the port area thereby addressing port congestion, regulating container truck queuing/arrival/departure and reduce CO2 emissions.

<p>(V) Effects</p>	<ul style="list-style-type: none"> ● Prior to the implementation of TABS, the following were observed: <ul style="list-style-type: none"> ➢ Pronounced port congestion attributed to chaotic bumper-to-bumper queuing/accumulation of trucks around the port; ➢ Unregulated first-come-first-serve basis had encouraged truck arrivals without assurance of accommodation at the port on the same day creating a discomfoting scenario for those trucks unable to be attended or to be contained inside the port on the same day, to be forced to return on the next day; and ➢ The average gate outs recorded at the Manila Ports ranged from 4,500 TEUs/day to 5,000 TEUs/day (or a midpoint average equivalent to 4,750 TEUs). ● With the implementation of TABS, the following were observed: <ul style="list-style-type: none"> ➢ There is an orderly arrival of trucks based on schedule spread across the 24-hour period; ➢ Monitoring of cargo is done in real time basis; ➢ Truck turn time becomes faster; and ➢ There is reduction of CO2 emissions by the reduction of containers/trucks surrounding/queuing at the port area. ➢ The average gate outs recorded at the Manila Ports ranges from 7,000 TEUs/day to 7,500 TEUs/day (or a midpoint average equivalent to 7,250 TEUs/day). ● The two (2) aforesaid equivalent midpoint averages registered a difference of +2,500 TEUs (7,250 TEUs - 4,750 TEUs). A two-pronged approach of analysis is in order in this scenario. The first scenario is that the +2,500 TEUs/day reflect a daily increase in CO2 emissions equivalent to 375 kg of CO2/day. The second scenario is that the TABS increases the daily port performance efficiency in terms of effectively catering to +2,500 TEUs/day at the port while effectively eliminating the chances of unwanted CO2 emissions from the unattended trucks that would have been usually queuing and/or accumulating around the port, or, those inbound trucks that would have been usually in transit along the port road access, had these not been constrained by the implementation of the TABS.
<p>(VI) Supplemental explanation</p>	<p style="text-align: center;">[Cargo trucks in queue at the Port of Manila]</p>  <p style="text-align: center;">[TABS speeds up transactions at the Port of Manila]</p>  <p>Source: Philippine Ports Authority</p>

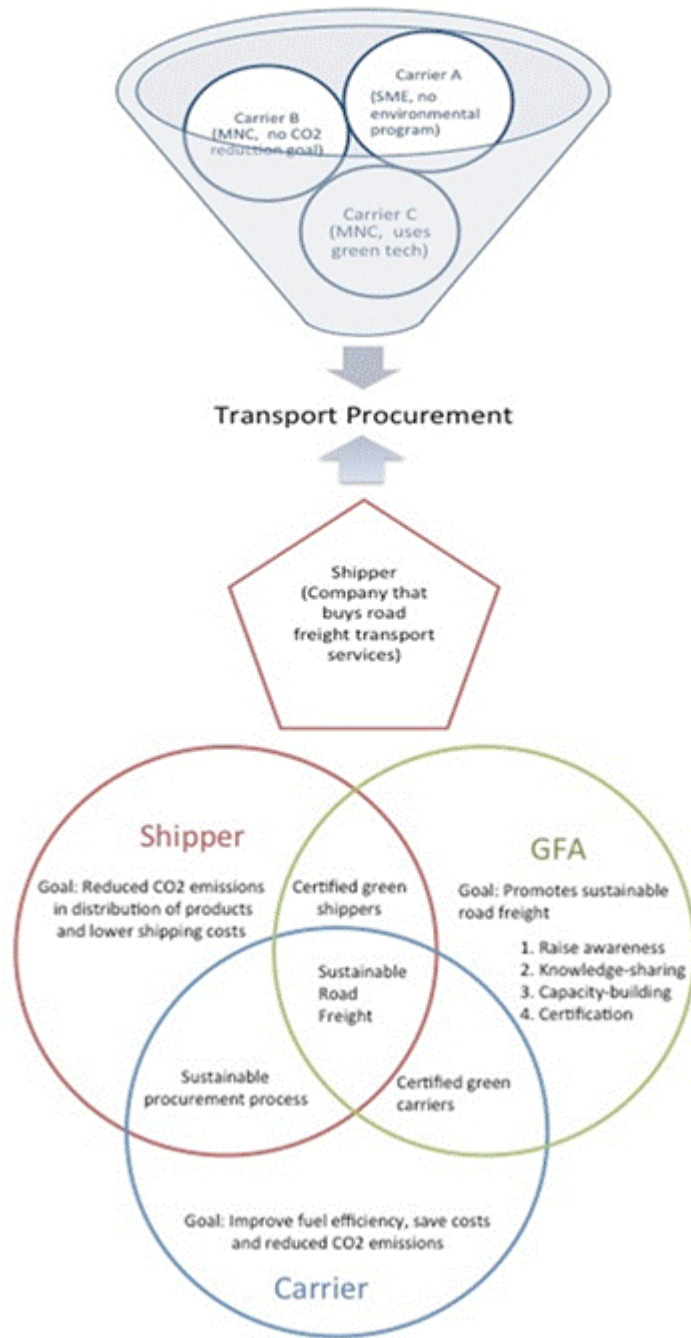
2-8. Singapore

(I) Title and category	Title	<ul style="list-style-type: none"> Green Freight Asia's industry network and certification program
	Category	(IV) Technologies
(II) Project operators	<ul style="list-style-type: none"> Headquartered in Singapore, Green Freight Asia (GFA) is an industry network of shippers and carriers operating across Asia. It's over 50 members include: <ul style="list-style-type: none"> Shippers: Asia Pacific Brewery (Hanoi), Bridgestone Tyre, Heineken Asia Pacific, H&M, HP Inc, IKANO, IKEA, Infineon Technologies, Lenovo, Procter & Gamble, Schneider Electric Logistics, Vietnam Brewery Carriers: 20Cube, AI Futtaim Logistics, All Purpose Enterprises, Ants Logistics (Chengdu), Australian National Couriers, Beijing Long March Risheng Supply Chain, Blue Dart Express, Bollere Logistics, Daosavanh Transport Service, Delex Cargo India, DHL Supply Chain Asia Pacific, Emirates Logistics, Express Freight Management, Geolink Group Co. Ltd. [U Express], Green Star Lines One Member Limited Company (GS Lines), MKD Transcorp, Perpetual Niugini (Logistics), Phuonganh Transport and Trading, Qingdao Guangyunda Logistics [EuroAsia], Qingdao Guoxing Logistics Co.Ltd, Sailing Logistics Limited, Sentup Australia, Shanghai Asian Development Internationall Transport Pudong, Shanghai Beiyeye Newbrother Supply Chain Mgt, Shanghai FuYing Logistics, Shanghai Huasong Logistics, Shanghai Lifeng Logistics, Shanghai Shendong Shipping, Shanghai Tranwins Supply Chain Management, Shanghai Uton Supply Chain Management, Shantou Longjie Logistics Company, Shenzhen Onsoon Transportation, Shinkai Transport Systems, Shreeji Transport Services, Singapore Haulage Services, Sunjex Logistics Corporation, Sunwa Logistics (Shenzhen), Toll Networks (NZ), U Express, United Storage Logistics (Shanghai), United Parcel Service (UPS), VINAFCO, Xuan Thieu Nam Dinh Joint Stock Company, Yusen Logistics and Transport Co. 	
(III) Project overview	<ul style="list-style-type: none"> Established in 2012, Green Freight Asia is a network of Asian road freight companies working together to improve fuel efficiency and reduce CO2e emissions, across supply chains. GFA supports efforts by member companies through three types of solutions: <ul style="list-style-type: none"> The GFA Label: a voluntary certification program, awarded to companies who demonstrate commitment to adopting green freight technologies and practices. It has 4 tiers (leafs) of certification depending on criteria met. Technology Network: helping companies develop awareness of and access to technology solutions that can improve vehicle fuel efficiency and emissions. Capacity Building: Trainings and knowledge-sharing opportunities to help members develop their ability to design and implement a green freight strategy. There are multiple examples of companies who have applied green technologies to their fleets and have achieved GFA certification as a result. The label is an external verification of their green actions, which helps differentiate them to their customers. 	

<p>(IV) Key points</p>	<ul style="list-style-type: none"> ● GFA, through its GFA Label program has externally validated member companies for their existing green freight practices. DHL Supply Chain Asia is an example of a GFA member that has best practices and its 2 country business units – DHL SG and DHL TH were awarded with the GFA Label for green logistics: ● DHL Singapore received the GFA Label – Leaf 2 certification, which is a validation of its use of green technologies to reduce carbon emissions and lower fuel consumption. It had also provided training on safety and eco-driving to its drivers. ● DHL Thailand was awarded with GFA Label – Leaf 3, which is a proof of its strong green freight practices, the use of multiple technologies and increased eco-driving training programs. DHL Thailand also actively participates in GFA and its activities and takes the lead in promoting sustainable road freight within the network. ● GFA also audited Singapore Haulage Services (SHS), a smaller transport provider in Singapore and it received the GFA Label –Leaf 1 in December 2017. Next to DHL SG, SHS is the second Singapore-based company that is certified as a green road freight carrier. ● GFA will also be guiding SMEs (like SHS), which had just started their green freight journey to move to a more advance implementation.
<p>(V) Effects</p>	<ul style="list-style-type: none"> ● GFA is creating an ecosystem of certified green road freight carriers and shippers in Singapore and the rest of this region ● DHL SG and DHL TH reduced CO2 emissions between 2.5% to 3.1%. (Please see attached file for details.) ● GFA's certification program certifies SMEs like Singapore Haulage Services on their existing environmental programs and investments, which is an advantage at the transport tender especially with MNCs that have sustainability agenda. ● GFA as a non-profit based in Singapore gives Singapore a leadership position in green transformation as it drives initiatives across the region

(VI) Supplemental explanation

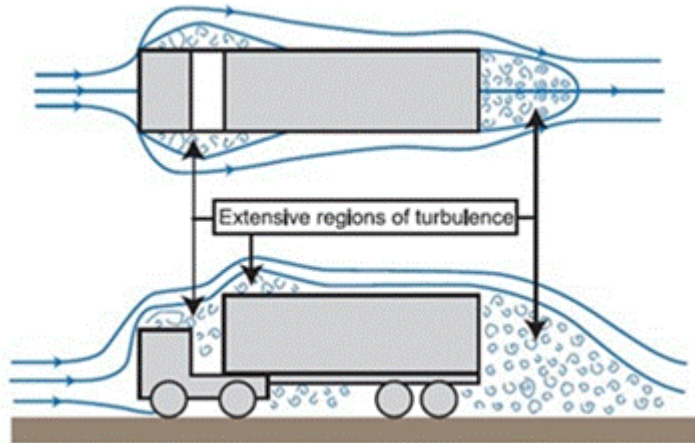
[Image of GFA's activities]



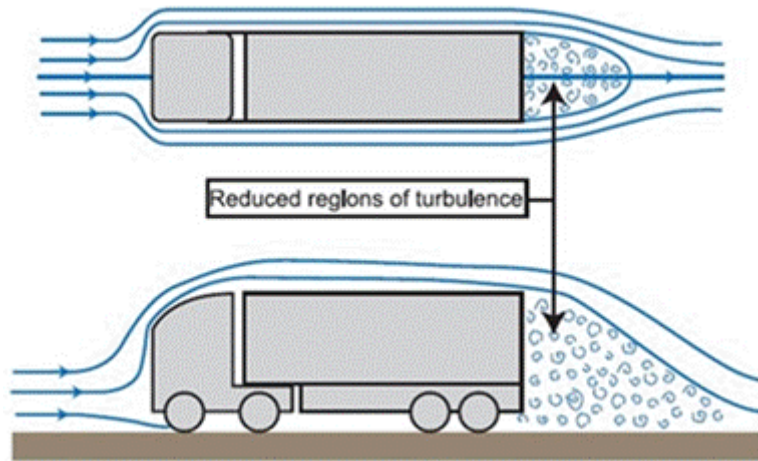
2-9. Thailand

(I) Title and category	Title	● Green Freight Technology Implementation for SME		
	Category	(IV) Technologies		
(II) Project operators	<ul style="list-style-type: none"> ● The Federation of Thai Industries ● Asian Development Bank (ADB) ● Office of Transport and Traffic Policy and Planning 			
(III) Project overview	<ul style="list-style-type: none"> ● Background: Thailand has relied on road transport for more than 80 percent. As a result, 36 percent of total energy consumption is in transport sector. It is also estimated that the CO₂ emission in transport share 30 percent of total emission. ● Objectives: Promote the green freight technology implementation on SMEs and small transport operators. ● This project tested Green Freight Technology by using (1) Aerodynamic, (2) Low-Rolling Resistance Tires or Energy Tire, (3) Air suspension and (4) GPS technology. ● These technologies have proved to reduce the emission of CO₂ and improve efficiency of energy consumption of truck operation. ● Finally, the study has set up a financial workshop to suggest a financial model, indicating investment requirement and benefit of implementation with payback period to encourage SMEs to apply to their businesses. 			
(IV) Key points	<ul style="list-style-type: none"> ● Introduce these technologies to the SMEs and small transport operators and increase the green logistics awareness to all stakeholders. 			
(V) Effects	<ul style="list-style-type: none"> ● The result of green freight technologies shows : 			
	Green Freight Technology	Truck type	Theory %	Actual %
	1.Vehicle Aerodynamic			
	at 80 KM/hour	Semi-trailer	18 – 22 %	15.65%
	at 60 KM/hour	Semi-trailer	-	13.88%
	● Tractor Aerodynamic		2%	2.00%
	● Gap between tractor and container		2%	2.00%
	● Under Run Skirting Aerodynamic		4-6%	3.80%
	● Back Frame Extension Aerodynamic		5-8%	6%
	at 60 KM/hour	10 Wheels Truck	-	11 %
	2.Rolling Resistance Tire (Energy)	Semi-trailer	7.5%	7.3%
		10 Wheels Truck	7.5%	5.8%
	3. Air Suspension	Semi-trailer	No official test	1.80%
10 Wheels Truck		1.10%		
4. GPS Tracking (Speed and Engine Idle)	Semi-trailer	5-15%	5%	
	10 Wheels Truck	5-15%	5%	

[Typical airflow pattern around a non-aerodynamic truck]



[Typical airflow pattern around an aerodynamically effective truck]



(VI) Supplemental explanation

[Test starting at Chirachoen Co.,Ltd]



(I) Title and category	Title Category	<ul style="list-style-type: none"> ● Service Quality Standard for Truck Operation (Q Mark)
(II) Project operators		<p data-bbox="469 212 1013 248">(VI) Policy/Institution/Cooperation Framework</p> <ul style="list-style-type: none"> ● Department of Land Transport, Thailand (Regulators) ● 10 Inspection Bodies*, namely: <ul style="list-style-type: none"> ➢ TTLA Company Limited; ➢ Eastern Transportation Association; ➢ Northeastern Transport Association; ➢ The Land Transport Association of Thailand; ➢ Thai Logistics and Supply Chain Association; ➢ College of Logistics and Supply Chain, Sripatum University; ➢ TPS Consultant Company Limited; ➢ Thai Society for Transportation and Traffic Studies; ➢ TIFFA Company Limited; and ➢ Siamdhamma Enterprise Company Limited ● 391 certified truck transport operators across Thailand* <ul style="list-style-type: none"> *Information as of 28th February 2018. Source: Department of Land Transport, Thailand
(III) Project overview		<ul style="list-style-type: none"> ● Background <ul style="list-style-type: none"> ➢ In order to enhance the quality of road freight transport services, truck transport operators need to be supported and encouraged, in both technical and informational capacities, to improve their services. In this regards, the Department of Land Transport (“DLT”) has established a “Service Quality Standard for Truck Operation” as known as “Q Mark”. This standard provides guidelines to improve each transport services activities to an acceptable level, with a dual goals of ensuring compliance as well as satisfying the customers. ● Objectives <ul style="list-style-type: none"> ➢ To raise service level of road freight transport ➢ To enhance capacity building of truck operators for competition in the world of free trade and services ➢ To be a tool for the customer in selecting a qualified transport operator ➢ To have a government policy and action plan to enhance the quality standard of road freight transport service ● Development <ol style="list-style-type: none"> (1) DLT, together with the researching team, has studied the guidelines from many standards i.e. The Truck Safe (AUS), Smart Way (USA), G MARK (JAP), ISO 9001, ISO 14001, OHAS, in order to create the standard that suitable to Thailand’s context. (2) The workshop with both public and private stakeholders from various fields related to transport such as Universities, Thai National Shippers Council (TNSC), Land Transport Federation of Thailand (LTFT) and many truck associations was held to receive views and comments from stakeholders. (3) Pilot inspection of the standard application has been tested with 20 truck operators. (4) After 2 years of research, discussion and evaluation, the Service Quality Standard for Truck Operation (Q Mark) points has been finalized and adopted. (5) DLT has promoted and conducted training seminar and workshop related to Q Mark through out the country. (6) After another 3 years of public relation, Q Mark certification has been well-known as the reputable standard towards transport operators and customers. (7) DLT continuously develop the incentives for Q Mark certified operators, in order to promote and encourage truck operators to obtain Q Mark. In addition, DLT is working on reviewing and updating the Q Mark criteria, in order to keep up with the context of the present world where technology and innovation are abruptly developed and constantly changed.

- Outcomes

- The Service Quality Standard for Truck Operation or Q Mark is a certified standard that DLT allow the truck operators to voluntary apply for the certification.
- The Q Mark standard combines existing transport law with additional mandatory controls focus on the management of freight transportation, in which it included the aspects the industrial sectors and customer required from the transport operators. This will support and increase the efficiency of logistics and supply chain management while reducing cost, maintaining safety, improving operations and adding values to multiple stakeholders through out the transport sectors.
- The validity of Q Mark certification is 5 years, starting from the date of issuance, but no longer than the expiration of the truck operators' license. In addition, to maintain the Q Mark certification, DLT will audit the company every 2 years.
- The Q Mark requirements divide into 5 aspects (organization, transport operation, personnel, vehicles and customer responsibility) with the total of 44 requirements, where there are 24 compulsory requirements and 20 optional requirements. By fulfill all compulsory requirements, the Q Mark certification will be granted to the applied transport operators.

(IV) Key points

- Though the compulsory requirements for Q Mark certification, in general, are contributed to matters related to green logistics and transport efficiency, the compulsory requirements that directly related to green logistics on each aspect of Q Mark are as follow;
- Organization
 - Establish key performance indicators (KPIs) for management purposes; for example, on-time delivery, fuel consumption efficiency, accident rates, and customer satisfaction. Actively measure and monitor KPI data.
 - Plan to reduce environmental impact with a proper disposal plan for waste such as batteries, tires, and engine oil.
- Transport Operation
 - Have performance data records, which relate to transport efficiency such as pick-up and delivery times and cargo volume.
- Personnel
 - Provide training in safe and energy-efficient driving.
- Vehicle
 - Record fuel consumption, both for the whole fleet and individual vehicles, to analyze fuel efficiency.

DLT's strategy is to make Q Mark as an acceptance standard for Thai transport operator by starting from big size company (L and XL) due to their readiness capacity to comply with the standard. After that, the medium (M) size company and then during the 5th year of Q Mark introduction, the focus is on coaching the SMEs (S) company. Currently, there are 391 Q Mark certified truck operators and the total number of truck under those operators are 56,169 trucks. *

Size of operators	Certified Operators	Percent (%)	Number of truck under Q mark operators	Percent (%)
S (1-30 trucks)	94	24.04	1,327	2.27
M (30-100 trucks)	120	30.69	7,162	12.24
L(101-1,000 trucks)	172	43.99	43,312	74.00
XL(more than 1,000 trucks)	5	1.28	6,726	11.49
total	391	100	58,527	100

- **Remark:** The total number of public truck operators is 25,627 operators, in which the number of 391 Q mark certified operators is account for 1.52 % of the total operators number o

The total number of trucks owned by all public truck operators is 297,027 trucks, in which the number of 58,527 Q Mark cetified trucks under public truck operator is account for 19.70% of the total truck number.

Most of public truck operators in Thailand are S size which is now the DLT's main focus group, to coach them for obtaining Q Mark. The main obstacle to introduce the S size operator to Q Mark standard is the lack of finiacial access to boost their organization, and also, the lack of company's management skills.

*Information as of 28th Feburay 2018. Source: Department of Land Transport, Thailand

- There are two main factors that help boosting number of Q Mark certified operators as following;

- Promoted Q Mark by giving incentives

➤ Since Q Mark is a voluntary standard endorsement scheme, in order to attract transport operators to participate and receive certification required attractive incentives. According to the survey conducted on Q Mark operators, the most attractive incentives views by track operators is the road tax and vehicle tax reduction, so that they can reduce their operation costed and focus more on safety and environmental friendly issue. In this regards, since the tax incentive is involved with many concereded agencies, it has been placed as a long-term goal for Q Mark incentive. Nontheless, DLT has gradually developed many incentives for Q Mark operators, in which can be categorized into 3 main phases as follow:

The 1st phase

- Prioritized Q Mark operator on accessing the development and training program/events hosted by DLT
- Arranged the awarding ceremony to promote and create the honor for operators who received Q Mark

The 2nd phase

- Prioritized Q Mark operator on accessing the public truck terminal which owned by DLT
- Obtained additional points when applying for the International Road Transport Permit that issued by the DLT

The 3rd phase

DLT has partnered with different agencies, in order to expand the inentives to the Q Mark operators such as:

- **Industrial Estate Authority of Thailand**-Promoting the freight transport in industrial estate area to be operated by Q Mark road freight operators.
- **Germany International Cooperation (GIZ)**- Cooperate in sustainable freight transport development in Greater Mekong Subregion by using Q Mark as best practice government tool for standardize the road freight industry.
- **SCG Logistics Management Company Limited** - The 3PL who provide biggest road freight transport network for construction materials in Thailand decides to join cooperative program by using Q Mark as a Standard for all of the company truck operator subcontractors.
- **The Viriyah Insurance Company** - The insurance company creates a new truck insurance product with special discount rate (15-20%) for Q Mark certified truck operators. The company claims that the truck operators with Q Mark have lower accidental rate.

	<ul style="list-style-type: none"> ● Appointed private inspection body to perform Q Mark inspection <ul style="list-style-type: none"> ➢ At the beginning, the Q Mark was solely audited and certified by DLT. However, in order to facilitate the audit process, DLT has delegated the inspection task to the 3rd party. The 3rd party, called Inspection Body (“IB”), will be approved by DLT before they can audited the transport’s company. The IB, which located across the country, will visit the truck operator’s office and conduct the audited and then submit the report to DLT to verify. The DLT then will submit the audit’s report to to the Quality Assurance Committee, which is the committee that have the authority to approve the Q Mark certification. By having the IB, the efficiency of certifying Q Mark has been increased due to the convenient of receiving inspection as the IB is located through out the country. Moreover, to maintain the credibility of the IB, DLT have a mechanism to random check the audited process of IB on site without prior notice to both IB and the audited transport operator. The assessing results of such random check will be summarized to the annually IB meeting workshop which is the forum for improving the standard of IB audition.
(V) Effects	<ul style="list-style-type: none"> ● Established the tools for transport operators on how to perform their business in professional manner and, in parallel, create awareness on environmental issue, in order to keep the trucking business to efficiently operate and environmental friendly. ● Reduced the impact from accidents and pollution from transportation as trucks operators with Q Mark have safety standards and business ethics according to the set up standard. ● Emphasized the truck operators on the importance of fuel consumption tracking which lead to proper transportation management plan. The habit of fuel efficient driving of the driver also contributes to less accident and fuel cost saving. ● Increased awareness on the importance of safety and energy efficient driving which lead to the development of courses curriculum to train the driver across the country. ● Developed a waste management plan, which instruct the truck operators the steps to reduce environmental impact. ● Provided the customers to choose the qualified transport service operators that are safe, reliable and efficient via www.thaitruckcenter.com as an official source of truck operators’ database.

[Q Mark Awarding ceremony by H.E. Arkhom Termpittayapaisith, Minister of Transport Thailand]

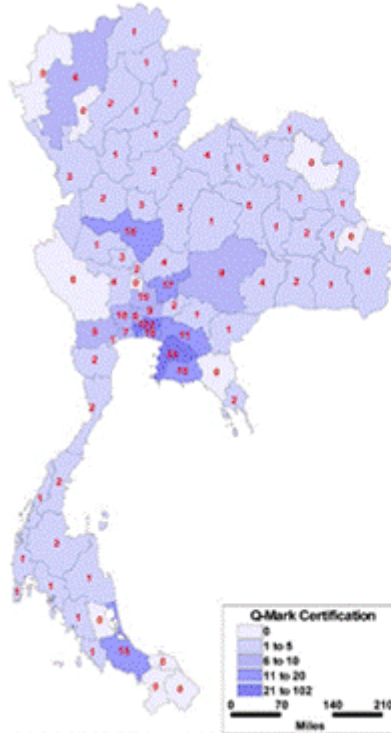


[Training for Trainers on safety and energy efficiency driving]



VI) Scheme chart

[Number of Q-Mark Certified operators by province]



2-10. Vietnam

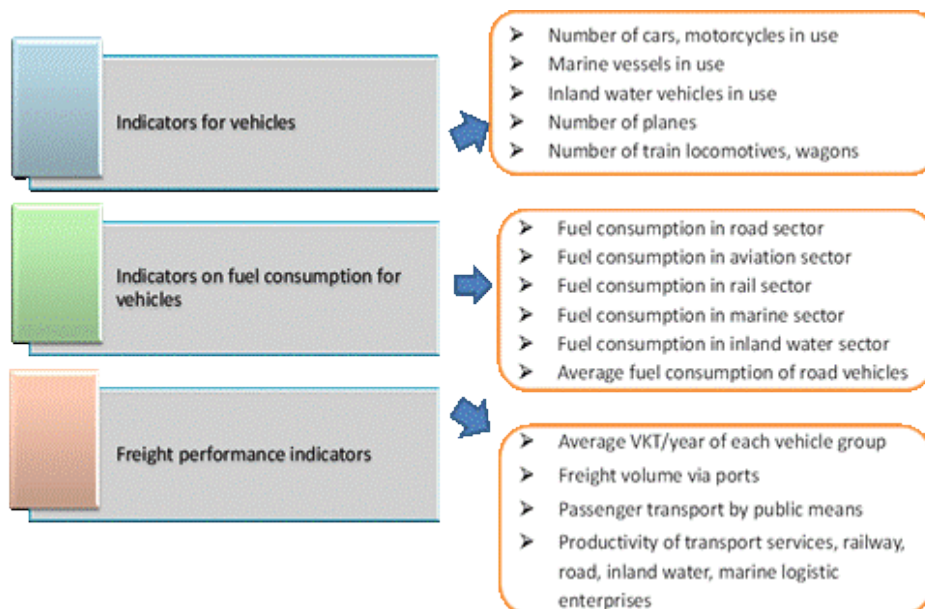
(I) Title and category	Title	● GHG Inventory and Scenario Development in Transport Sector
	Category	(VI) Policy / Institution /Cooperation Framework
(II) Project operators		● Ministry of Transport. (Supported by GIZ from 06/2016 to 01/2019)
(III) Project overview		<ul style="list-style-type: none"> ● GHG inventory in Transport sector including road, inland waterway, maritime, rail way and aviation. ● Clearly quantify emissions of vehicles in subsectors. ● Develop emission reduction scenarios and implementation costs to identify GHG emission reduction options (Including for Green Logistics)
(IV) Key points		<ul style="list-style-type: none"> ● Development of Monitoring, Reporting and Verification (MRV) methods for the transport sector strategy <ul style="list-style-type: none"> ➢ The effectiveness of Viet Nam's transport sector strategy with regard to climate change mitigation depends on the availability of data that is measurable, reliable and verifiable. This component aims to support the Government of Viet Nam in applying tools to measure, report and verify the total fuel consumption and GHG emissions of the transport sector (road, maritime, railway, inland waterway, aviation) complementing existing top-down approaches with so called "bottom-up" approaches based on transport activity data. ● Support for scenario development process <ul style="list-style-type: none"> ➢ In order to be able to identify specific targets for the implementation of Viet Nam's NDC and mitigation strategies, realistic scenarios need to be developed. The objective of this component is to build scenario for GHG emission reduction based on BAU and two mitigation scenarios. It coordinates with World Bank to assess the cost of mitigation measures ● Capacity building support on mitigation actions <ul style="list-style-type: none"> ➢ Viet Nam's Ministry of Transport is tasked with the development of a sectoral climate change strategy. The objective of this component is to offer capacity development measures, facilitating an exchange with transport authorities in other countries, and mobilising international expertise on emission calculations and mitigation actions in the transport sector.
(V) Effects		<ul style="list-style-type: none"> ● Determine the emissions of vehicles in the road, inland waterways, railways and maritime sectors; ● Develop scenarios and costs for reducing GHG emissions when modal shift from road transport to inland waterways, railways and maritime and planning for optimal mitigation measures; ● Assess the logistic options availability.


[Minister of MOT issue Circular on statistical indicator system and reporting regime in the transport sector]



(VI) Supplemental explanation

[Statistical indicators for emission calculation]



(I) Title and category	Title Category	<ul style="list-style-type: none"> ● Green Freight Project
(II) Project operators		<ul style="list-style-type: none"> ● Directorate for Roads of Viet Nam (Under MOT) hosted this project and sponsored by ADB (The Project was implemented from 01/2015 to 08/2016)
(III) Project overview		<ul style="list-style-type: none"> ● 26 trucking companies participated in the project in which 11 trucking companies were supported to install low rolling resistance tires of Michelin (project support and trucking companies shared the cost for all tires per trucks), 15 trucking companies were installed aerodynamics with 100% support of project. ● 100 drivers and 15 instructors were educated for eco drive skills ● 2 trucking companies were assessed for green freight Asia label ● The project tested the technology application including low rolling resistance tires usage, aerodynamic installation, standard tire pressure control how to reduce fuel consumption in the real condition. The fuel consumption of trucks was monitored in maximum 6 months to check the efficiency of technology. ● Eco-drive skills were trained for 15 instructors and 100 truck drivers. The drivers were encouraged to apply those skills frequently in the real condition. The fuel consumption of drivers' trucks was monitored within 6 months. ● 2 trucking companies were supported to apply green freight Asia label.
(IV) Key points		<ul style="list-style-type: none"> ● Implementation results: <ul style="list-style-type: none"> ➢ Efficient tires reduce fuel consumption by 4-6%; ➢ Aerodynamic devices reduce fuel consumption by 2-3%; ➢ 1 bar higher tire inflation reduces fuel consumption by 2%; ➢ Eco Drive reduces fuel consumption by 3-6% (lower impact over time); ➢ Combined measures reduce fuel consumption and GHG emissions by 10-13% representing per truck per annum 11-15 tCO₂ for Viet Nam. ● The economics are: <ul style="list-style-type: none"> ➢ Efficient tires require an incremental investment of 900 USD per truck with a payback time of 12-13 months; ➢ Aerodynamic devices require an investment of 900-1,000 USD per truck with a payback time of 2-3 years; ➢ Eco Drive requires an investment of around 150 USD and has a payback time of 3-6 months; ➢ Combined the measures require an additional investment of 2,000 USD, with a payback time of 1 year and a FIRR of >90%. Measures are profitable but encounter barriers like lack of reliability and visibility of savings, additional investment, and drivers being paid a fixed amount for fuel and therefore lack of interest of the truck owner to invest in energy saving devices.
(V) Effects		<ul style="list-style-type: none"> ● Directorate for Roads of Viet Nam issued handbook of Eco drive skills for trucking companies. ● Trucking enterprises were interested in Green Freight Asia label. ● Low technology availability can be applied in Viet Nam with support of additional cost for Green Freight Technologies (such as climate finance) due to high cost of low technologies (such as low rolling resistance tires).
(VI) Supplemental explanation		<p style="text-align: center;">[Trucks with low rolling resistance tires]</p> 

2-11. Japan

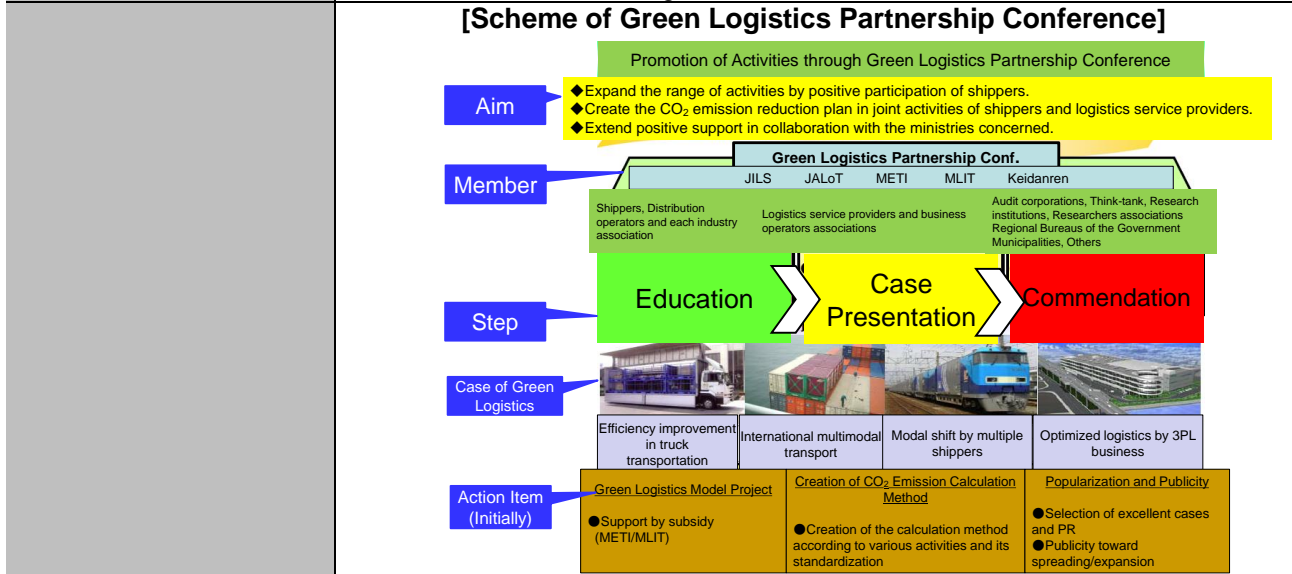
(I) Title and category	Title	<ul style="list-style-type: none"> ● Establishment of the Green Logistics Partnership Conference
	Category	(VI) Policy / Institution /Cooperation Framework
(II) Project operators		<ul style="list-style-type: none"> ● Organizers <ul style="list-style-type: none"> ➢ Ministry of Economy, Trade and Industry ➢ Ministry of Land, Infrastructure, Transport and Tourism ➢ Japan Association for Logistics and Transport ➢ Japan Institute of Logistics Systems ● Cooperation <ul style="list-style-type: none"> ➢ Keidanren (Japan Business Federation) ● Members (3,235 companies and organizations, 118 individuals as of February 17, 2016) <ul style="list-style-type: none"> ➢ Logistics operators ➢ Shippers ➢ Industry associations in related industries ➢ Think tanks ➢ Research institutions ➢ Regional bureaus of the government ➢ Municipalities ➢ Individuals
(III) Project overview		<ul style="list-style-type: none"> ● Background of the establishment of the Green Logistics Partnership Conference <ul style="list-style-type: none"> ➢ In industrialized countries such as Japan, the Kyoto Protocol was adopted in 1997, which has set the goal of reducing emissions of greenhouse gases such as CO₂. It came into effect in 2005. In Japan, the Cabinet decision was made on the Kyoto Protocol Target Achievement Plan in 2005. In this plan, the formation of low carbon logistics systems was proposed. Until then, logistics operators in Japan tried to reduce CO₂ emissions individually by introducing fuel-efficient vehicles. However, there was limited room for the activity to be effective. Therefore, the organizers in Japan established the Green Logistics Partnership Conference in 2005 and logistics operators tried to further reduce CO₂ emissions by cooperating with shippers to expand the activities to the areas of production, distribution and sales. Following the Paris Agreement in 2015, Japan needed to continue reducing its CO₂ emissions. Since then, the Green Logistics Partnership Conference has become even more important. ● Commendations for the best practices on green logistics and presentations of their high-quality activities <ul style="list-style-type: none"> ➢ At the Green Logistics Partnership Conference, 3,235 companies and organization members and 118 individual members participated voluntarily (as of February 17, 2016), under the auspices of the organizers. At the Green Logistics Partnership Conference, the best practices by member companies were given commendations for their activities to reduce CO₂ emissions in collaboration with shippers and logistics operators. These 60 cases were cited in order to be shared and promoted and were placed on the web page. ● Establishment of guidelines for calculation methods of CO₂ emissions <ul style="list-style-type: none"> ➢ The Green Logistics Partnership Conference formulated and published guidelines for calculating CO₂ emissions, so that shippers and logistics operators can analyze the results of their activities, leading to effectiveness of CO₂-emission reduction.

(IV) Key points

- Open participation of shippers and logistics operators
 - Collaboration with shippers and logistics operators is the one of aims to promote green logistics at the Green Logistics Partnership Conference. There are no specific qualifications for participating. Any organization, company or individual interested in green logistics may participate openly.
- Commendations of the best practices and disseminating of the activities
 - The Green Logistics Partnership Conference recognizes and gives commendations for the best practices to reduce CO₂ emissions, such as commendations by the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism. And the best practices are introduced on the websites to promote awareness and disseminate the details of best practices.
- Providing a calculation method of CO₂ emissions
 - By providing the guidelines for calculating CO₂ emissions, the burden is lessened on logistics operators and shippers for calculating the effectiveness of their efforts.

(V) Effects

- Reducing CO₂ emissions by cooperating with shippers and logistics operators
- Secondary effects are the reduction of other environmental impacts (SO_x, NO_x, PM) and productivity improvements
- Promoting awareness of green logistics to any organization, company or individual ; disseminating of the activities for reduction of CO₂ emissions



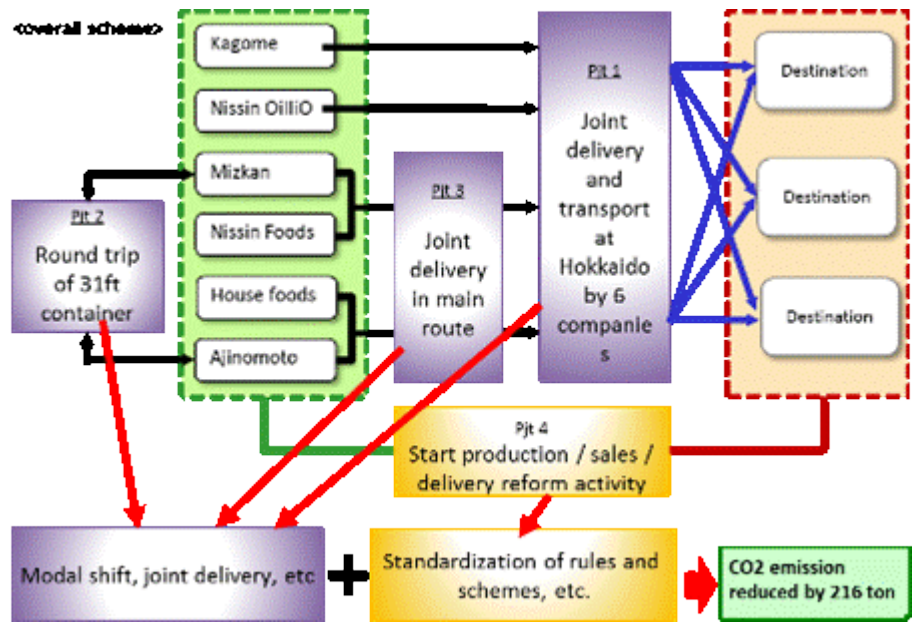
(VI) Supplemental explanation

[Commendations and presentations of best practices]

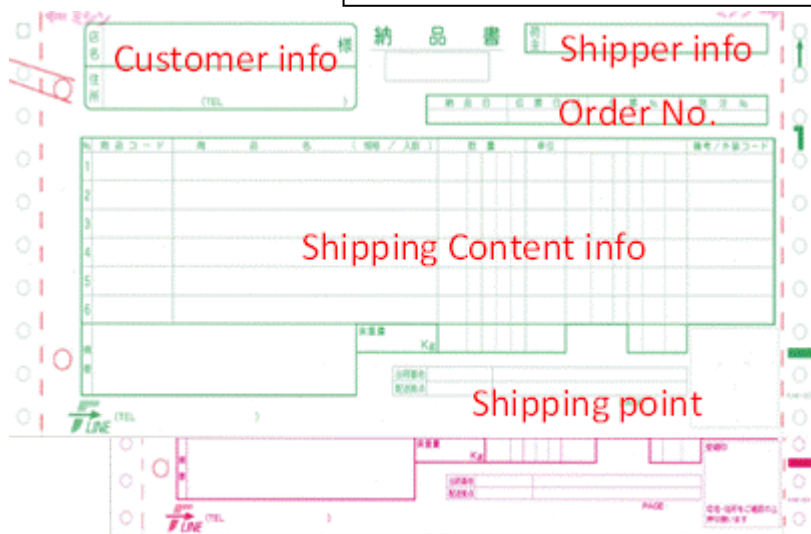
(Commendation) (Presentation of best practices)



(I) Title and category	Title	<ul style="list-style-type: none"> ● F-Line Project: Establishment of Logistics Platform towards realization of effective logistics in the Food Industry
	Category	(I) Modal shift (II) Joint transportation
(II) Project operators		(F-Line Project member) <ul style="list-style-type: none"> ● Ajinomoto Co., Inc. ● Kagome Co., Ltd. ● The Nisshin OilliO Group, Ltd. ● Nisshin Foods Inc. ● House Foods Group Inc. ● Mizkan Holdings Co., Ltd. (Logistics operators) <ul style="list-style-type: none"> ● Ajinomoto Logistics Corporation ● All Japan Express Co., Ltd. ● Japan Freight Railway Company ● Nippon Express Co., Ltd.
(III) Project overview		<ul style="list-style-type: none"> ● “F-Line Project” (a council which was formed by 6 major food industry companies) and logistics operators have worked together for the realization of joint transport & delivery, modal shift and consolidation of main routes for reduction of CO2 emission, improvement of operation efficiency, and improvement of productivity. In addition, further activities for reduction of waiting time upon delivery, as well as promoting the use of pallets are underway, through the rationalization of food logistics process covering from production to delivery to its sales.
(IV) Key points		<ul style="list-style-type: none"> ● CO2 emission reduced by 216 tons by joint transport & delivery in Hokkaido Prefecture, as well as modal shift to a round-trip use of 31ft container. ● Aim of the project is that to introduce a standardized scheme and regulation to the industry for rationalization of food logistics process from production ~ delivery ~ sales.
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 216.0 tons ● Percentage of CO2 reduction: 19.1%



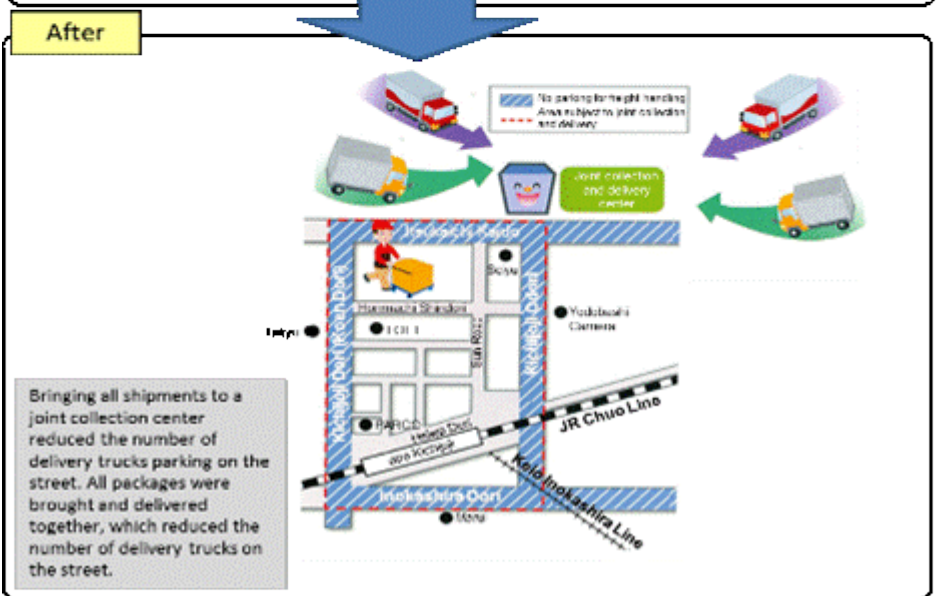
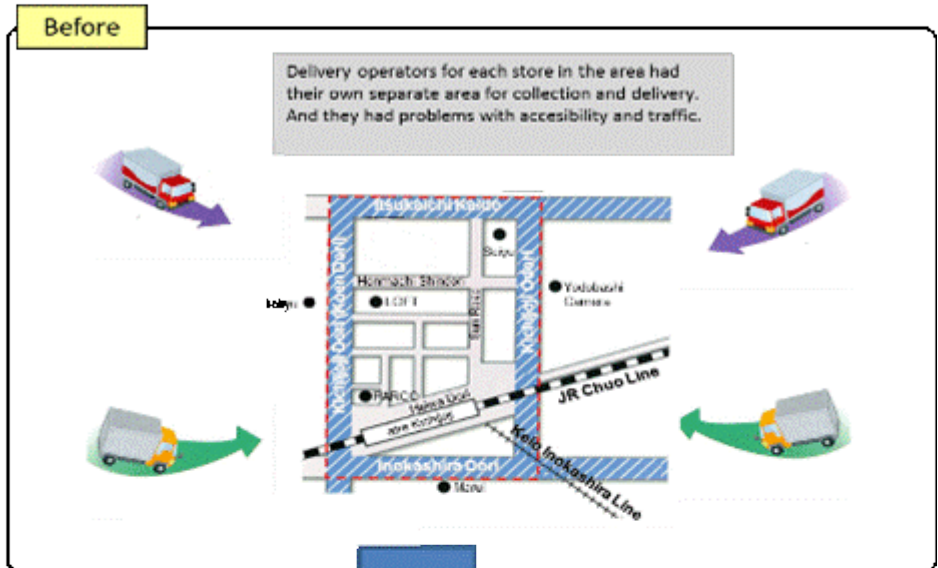
Example of joint delivery and transport



Example of standardization of invoice form

(VI) Supplemental explanation

(I) Title and category	Title	<ul style="list-style-type: none"> ● Distribution measures of Green Logistics in Kichijoji
	Category	(II) Joint transportation (III) Unification and relocation of cargo bases
(II) Project operators		<ul style="list-style-type: none"> ● Kichijoji Activation Council ● Collabo Delivery Co., Ltd. ● Times24 Co., Ltd. ● atre Co., Ltd. ● Toyohashi Sozo University ● City of Musashino
(III) Project overview		<ul style="list-style-type: none"> ● The objective of this project was to turn the shopping street in Kichijoji into a comfortable place for pedestrians by reducing the passage of delivery vehicles, street parking and loading & unloading on the street. The store association cooperated in taking on the following 4 measures, which successfully reduced vehicles parking and loading & unloading on the street and in reducing CO2 emissions. These measures has improved the cityscape and comfort for pedestrian. <p>(1)Joint transport and delivery system Established a joint transport and delivery center, from where all packages are delivered using hand carts.</p> <p>(2)A standard rule of delivering shipments in Kichijoji Established a standard rule of delivering shipments and reminded the rule by weekly. Also promotions through fliers and word-of-mouth were implemented.</p> <p>(3)Flat rate program for parking lots In collaboration with parking lots, Times24, delivery vehicles are given a card which is enable to use the parking lots with flat rate.</p> <p>(4)Cooperation with a large store to handle delivery shipments, “atre Kichijoji” increased their shipment sorting berths.</p>
(IV) Key points		<ul style="list-style-type: none"> ● Aiming to create a comfort town where people can enjoy walking, individuals involved in the shopping street cooperated and continued to work on the programs. ● The program has great potential to be applied to other shopping streets in Japan and can become a model case.
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 32 tons (32 tons→0 ton) ● Percentage of CO2 reduction: 100%



(VI) Supplemental explanation

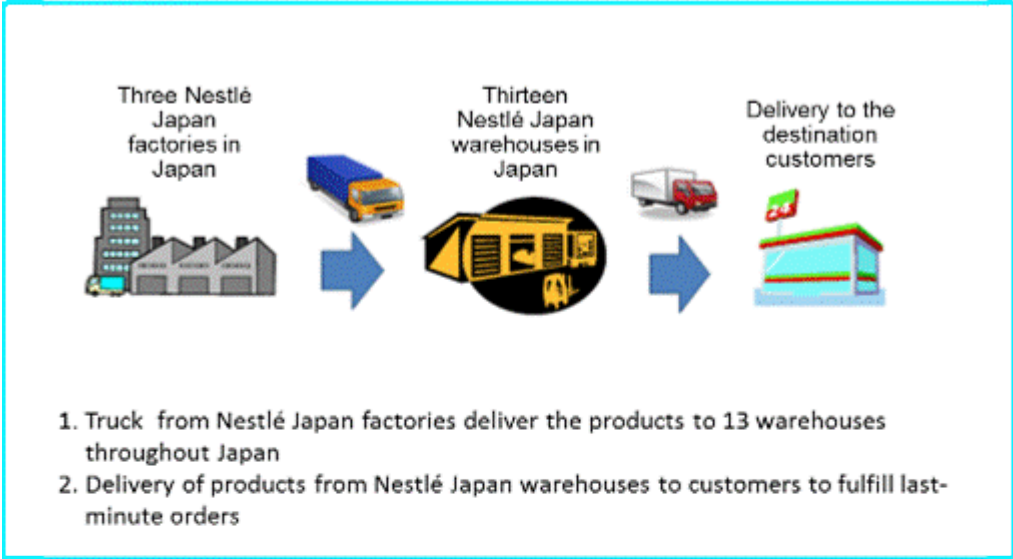


2-11 Japan Modal Shift to Rail and Shipping towards realization of Environmentally Friendly Deliveries to Customers -Green logistics in a partnership with retailers, makers and distribution businesses- Page 1

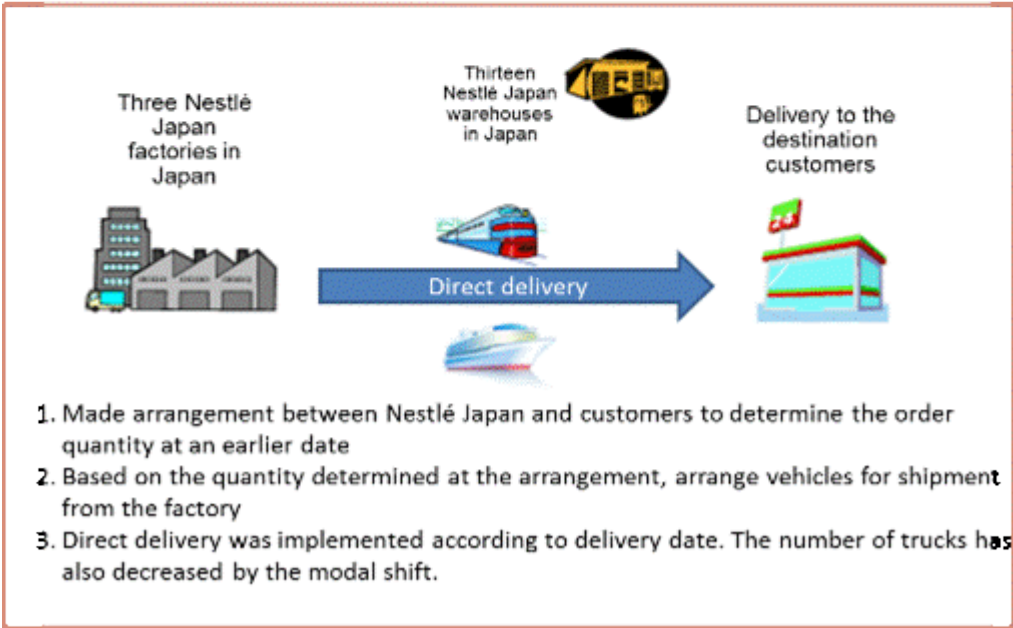
(I) Title and category	Title	<ul style="list-style-type: none"> ● Modal Shift to Rail and Shipping towards realization of Environmentally Friendly Deliveries to Customers -Green logistics in a partnership with retailers, makers and distribution businesses-
	Category	(I) Modal shift
(II) Project operators		<ul style="list-style-type: none"> ● Kobe Modal Shift Promotion Council ● Oji Transportation Co., Ltd. ● All Japan Express Co., Ltd. ● Japan Freight Railway Company ● Nestlé Japan Limited
(III) Project overview		<ul style="list-style-type: none"> ● Nestle Japan succeeded in significantly reducing CO2 emissions, from where delivered merchandise from its 3 main factories nationwide by modal shifting from truck shipping to rail and ship shipping.
(IV) Key points		<ul style="list-style-type: none"> ● Requested cooperation to customers to put in orders with a determined quantity as early as possible to enable delivery using rail and ship. ● Simultaneous with the modal shift, direct transport of products from the factory to customers achieved to reduce the number of delivery vehicles.
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 1,208.4 tons ● Percentage of CO2 reduction: 86.5%

(VI) Supplemental explanation

Before

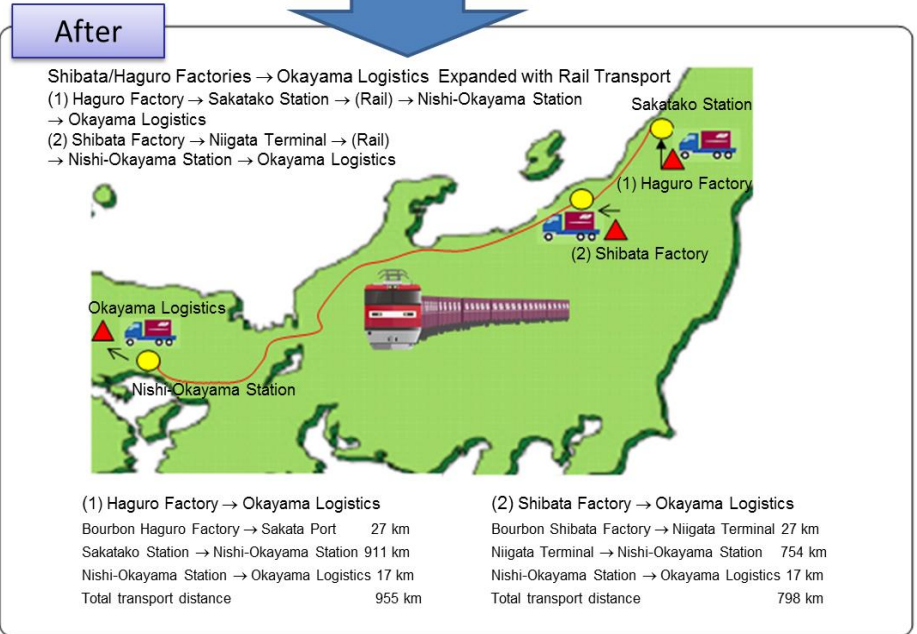
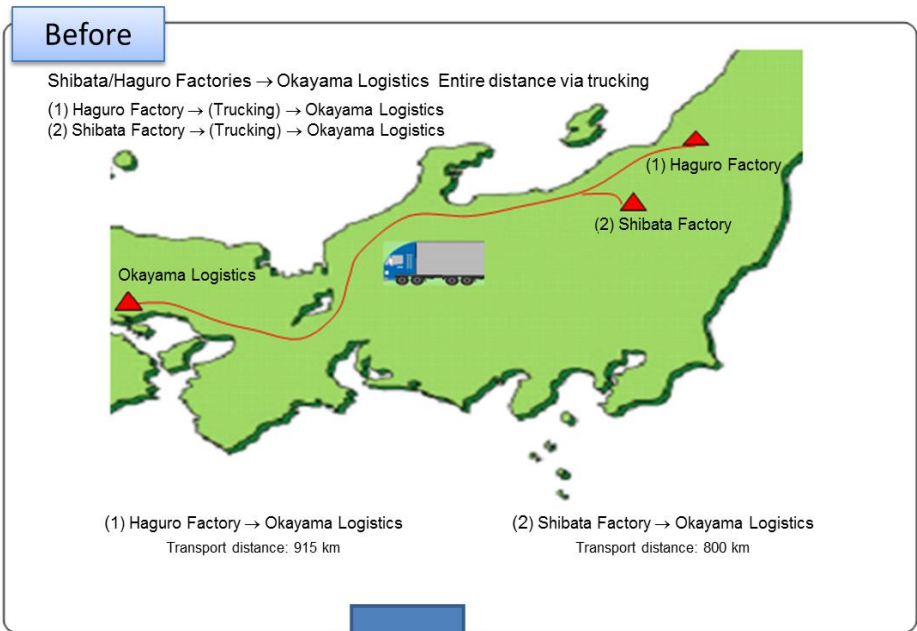


After

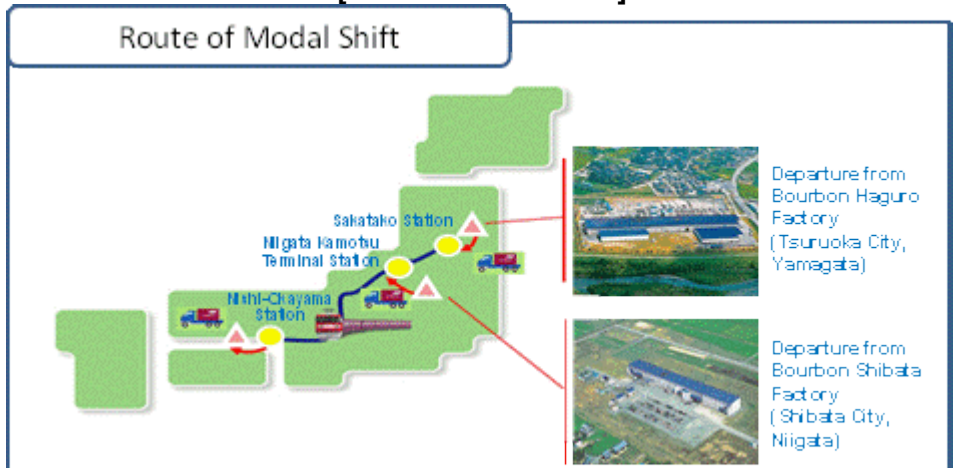


(I) Title and category	Title	<ul style="list-style-type: none"> ● Reduction of CO2 Emissions through Modal Shift from Truck to Rail way
	Category	(I) Modal shift
(II) Project operators		<ul style="list-style-type: none"> ● Bourbon Corporation ● Japan Freight Railway Company ● Maki Unso ● Sakata Kairiku Unso Co., Ltd.
(III) Project overview		<ul style="list-style-type: none"> ● The project reduced the amount of CO2 emissions by shifting transport from truck to container railway from the Shibata Factory in Niigata and the Haguro Factory in Yamagata to the Okayama Logistics Center.
(IV) Key points		<ul style="list-style-type: none"> ● Shifted means of transport from truck to container railway from the Bourbon Haguro Factory in Yamagata and the Shibata Factory in Niigata to the Okayama Logistics Center. ● Resulted in the reduction of CO2 emissions and cost due to escalating fuel prices. And it resolved the problem of insufficient truck drivers.
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 550.13 tons ● Percentage of CO2 reduction: 32.7%

(VI) Supplemental explanation

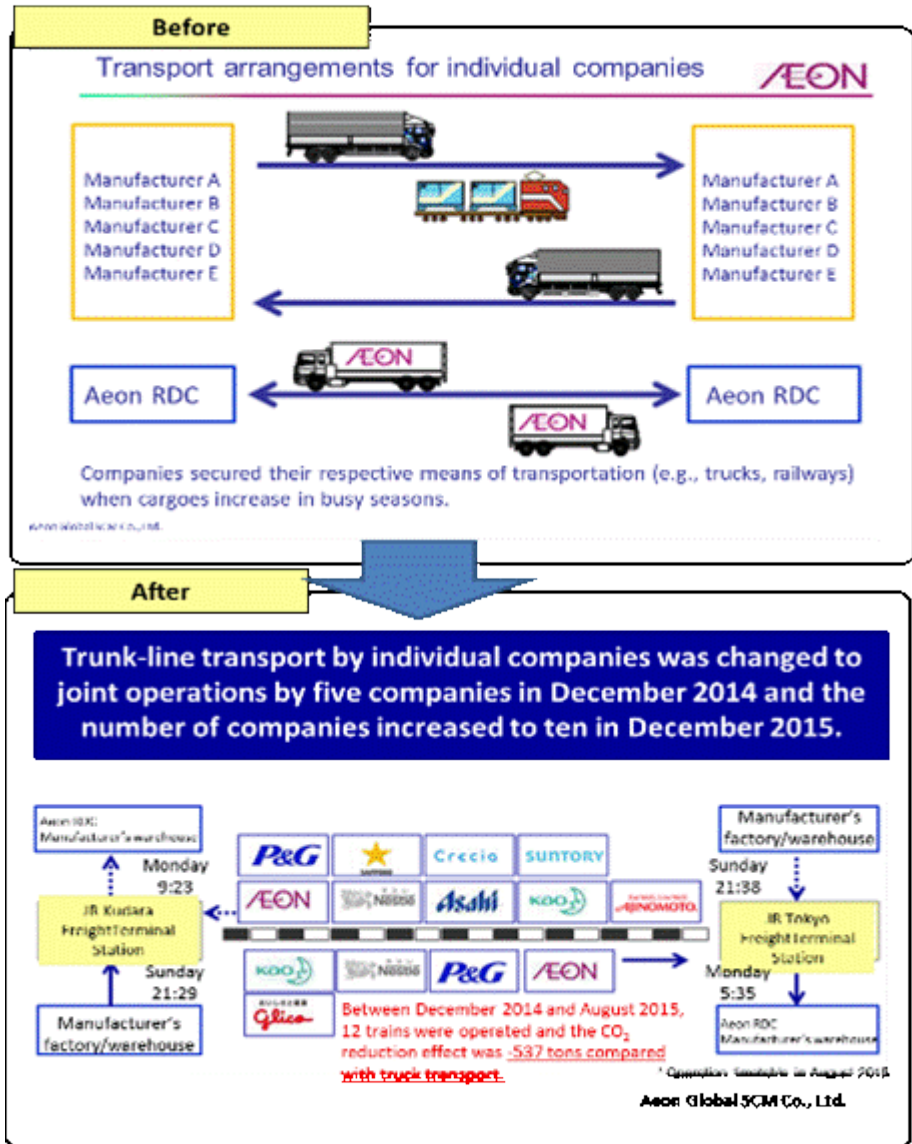


[Route of modal shift]



(I) Title and category	Title	<ul style="list-style-type: none"> ● Efforts for a low-impact on the environment by providing dedicated trains for AEON Global SCM Co., Ltd.
	Category	<ul style="list-style-type: none"> (I) Modal shift (II) Joint transportation
(II) Project operators		<ul style="list-style-type: none"> ● Aeon Global SCM Co., Ltd. ● Japan Freight Railway Co., Ltd. ● All Japan Express Co., Ltd.
(III) Project overview		<ul style="list-style-type: none"> ● This project has promoted a modal shift in transportation to freight trains for consignor in multiple industries including AEON Co., Ltd. to reduce carbon CO2 emissions. By running special freight trains utilizing railway schedules in which train services are suspended on Sundays, capacity of railway's transportation during the peak period was improved.
(IV) Key points		<ul style="list-style-type: none"> ● Utilization of trains that are not in service on Sundays ● Involvement of many consigners and make other adjustments to collect their shipments for Sunday operations ● Continuous efforts while gradually increasing participants of companies
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 537.0 tons (from 631 to 94 tons) ● Percentage of CO2 reduction: 85.1%

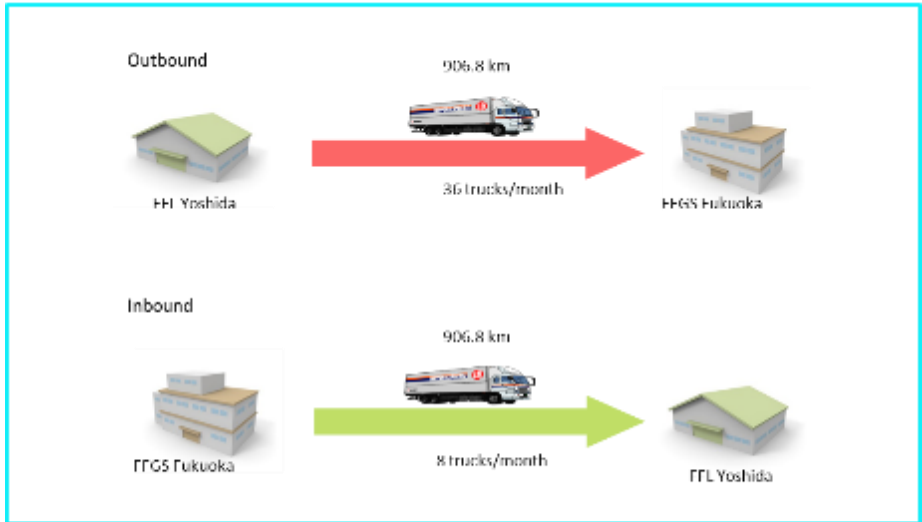
(VI) Supplemental explanation



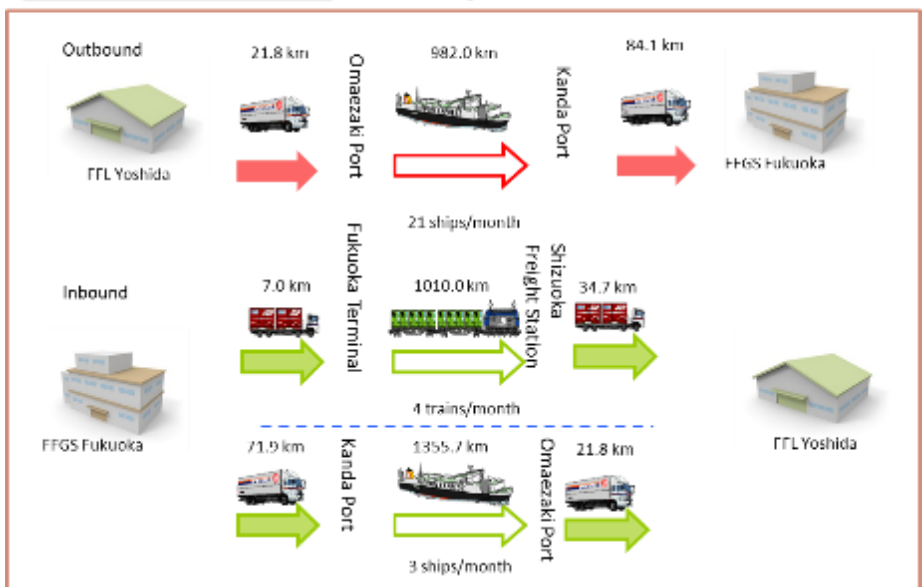
(I) Title and category	Title	<ul style="list-style-type: none"> ● Modal shift to ships and rail modes to reduce amounts of CO2 emission and upsizing trucks to deal with shortage of long-distance truck drivers.
	Category	(I) Modal shift (V) Infrastructure
(II) Project operators		<ul style="list-style-type: none"> ● Nippon Express Co., Ltd. ● Fujifilm Logistics Co., Ltd. ● MOL Ferry Co., Ltd. ● Japan Freight Railway Company
(III) Project overview		<ul style="list-style-type: none"> ● Truck transportation of Fujifilm's cargoes and materials was converted to ships and rails transportation to reduce CO2 emissions. In addition to the modal shift, the transport capacity was increased by using larger-size trucks and resolved shortage of long-distance drivers by reducing their driving distance.
(IV) Key points		<ul style="list-style-type: none"> ● CO2 emission reduction through modal shift to ships and railroad transportation ● Improvement in transport capacity by using larger-size trucks ● Resolution of shortage of long-distance drivers by reducing their driving distance.
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 483.8 tons ● Percentage of CO2 reduction: 70.8%

(VI) Supplemental explanation

Before



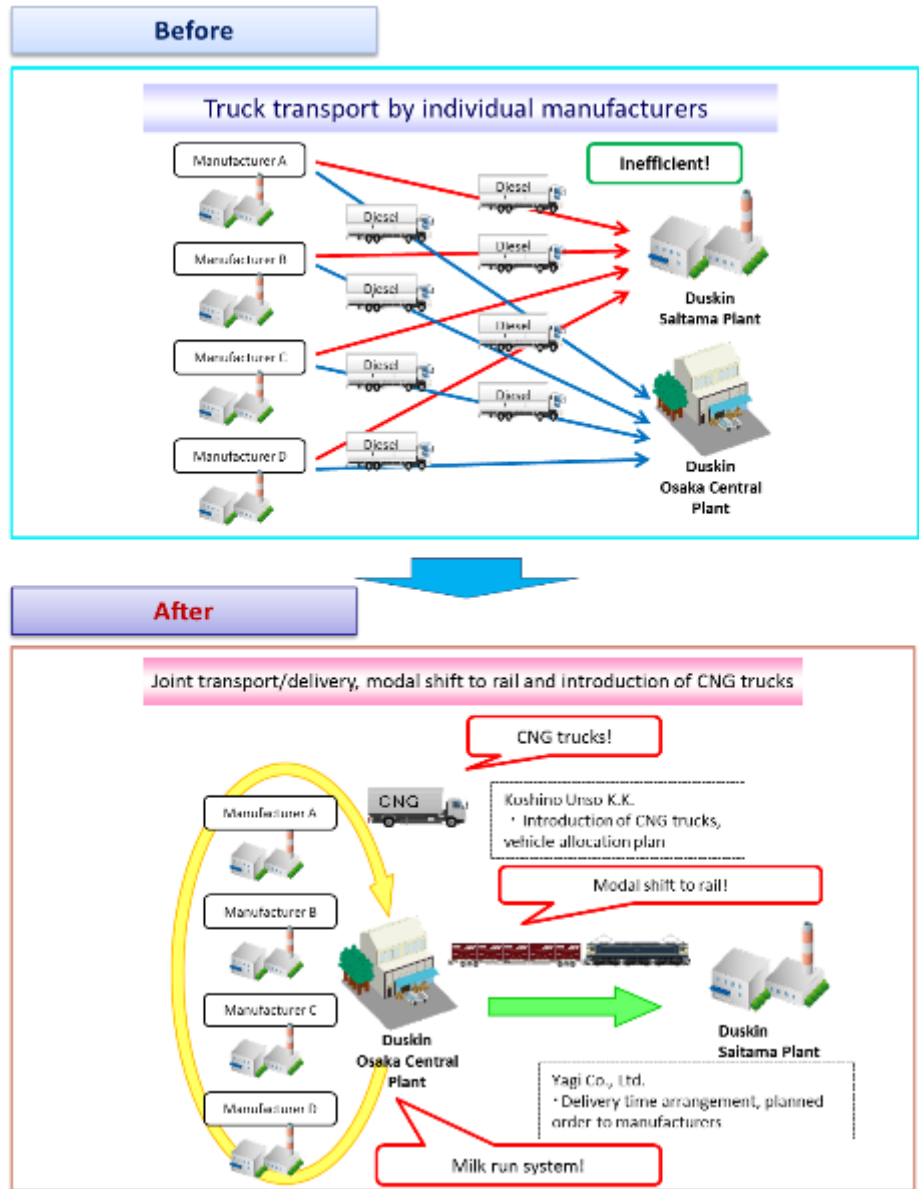
After



2-11 Japan Green logistics project with consideration to environmental conservation (for reduction of CO2 emissions, nitrogen oxides (Nox) and particulate matters (PM) through efficient loading by ordering the optimal quantities, the milk-run system and modal shift) Page 1

(I) Title and category	Title	<ul style="list-style-type: none"> Green logistics project with consideration to environmental conservation (for reduction of CO2 emissions, nitrogen oxides (Nox) and particulate matters (PM) through efficient loading by ordering the optimal quantities, the milk-run system and modal shift)
	Category	(II) Joint transportation (III) Unification and relocation of cargo bases (IV) Technologies
(II) Project operators		<ul style="list-style-type: none"> Koshino Unso K.K. Yagi Co., Ltd.
(III) Project overview		<ul style="list-style-type: none"> Four parties (consigners and manufacturers) achieved the following two activities to improve transport efficiency and reduce CO2 emissions. Unification of cargo collection and delivery by the milk-run system in the Kansai area and modal shift using railway for trunk-line transport to Saitama. For further reduction of environmental burden, introduced CNG trucks to eliminate Nox and PM.
(IV) Key points		<ul style="list-style-type: none"> Achievement of CO2 emissions reduction through introduction of CNG (natural gas) trucks for the milk run system and modal shift of trunk-line transport to rail transport.
(V) Effects		<ul style="list-style-type: none"> Reduced CO2 emissions: 64 tons/year (from 74 to 10 tons/year) Percentage of CO2 reduction: 86%

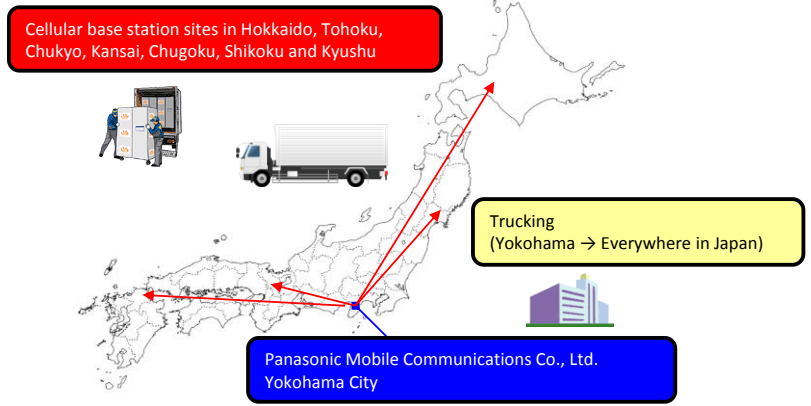
(VI) Supplemental explanation



(I) Title and category	Title	<ul style="list-style-type: none"> ● Energy-saving project on road-to-rail modal shift of cellular base stations by introducing vibration/shock isolators
	Category	(I) Modal shift (IV) Technologies
(II) Project operators		<ul style="list-style-type: none"> ● Nippon Express Co., Ltd. ● Panasonic Mobile Communications Co., Ltd. ● Panasonic Logistics Co.,Ltd. ● Nittsushoji Co., Ltd. ● Japan Freight Railway Company
(III) Project overview		<ul style="list-style-type: none"> ● Cellular base stations used to be mainly transported by trucks with air suspensions because of their vulnerability to vibration and shocks. The operators had already started to address the improvement of physical distribution efficiency and were required to further reduce CO2 emissions when the energy saving law was revised. ● Then, they discussed the possibility of modal shift and finally achieved the modal shift to rail by introducing vibration/shock isolators and carrying out test operations.
(IV) Key points		<ul style="list-style-type: none"> ● The road-to-rail modal shift for transportation of high-precision cellular base stations has been achieved by introducing privately-owned dedicated containers equipped with vibration/shock isolators.
(V) Effects		<ul style="list-style-type: none"> ● CO2 reduction: 120 tons/year (from 125 tons/year to 5 tons/year) ● CO2 reduction rate: 96%

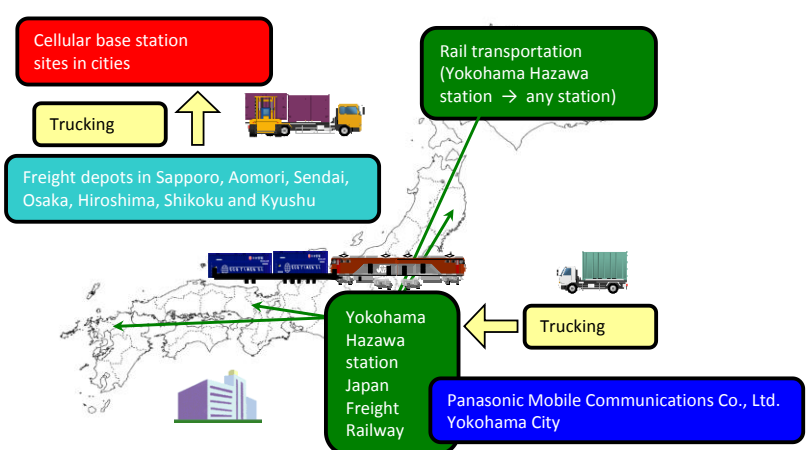
Before

Land transportation by trucks with air suspensions



After

Rail transportation with privately-owned dedicated containers



(VI) Supplemental explanation



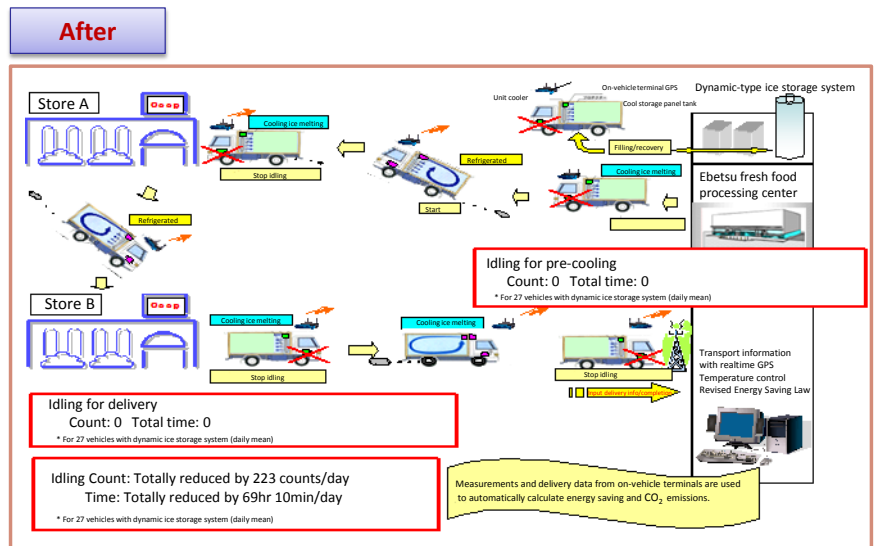
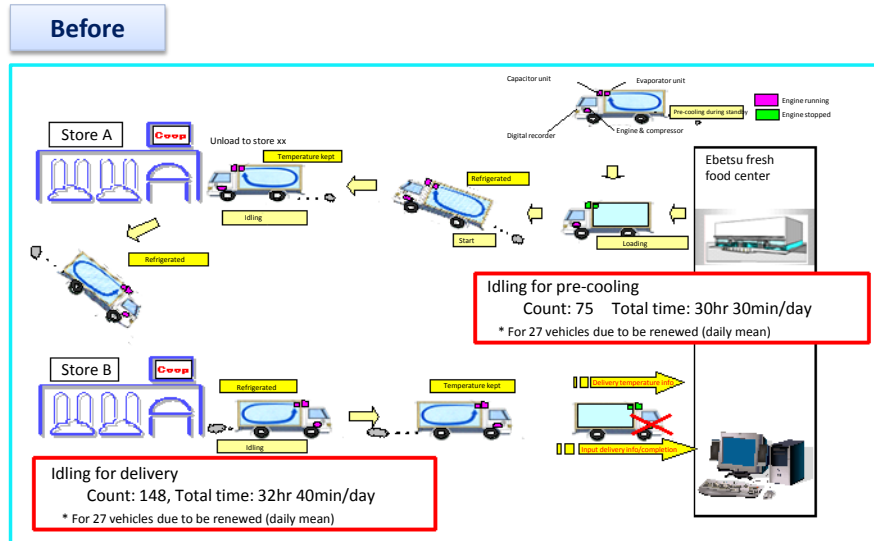
(Privately-owned dedicated container)



(Loaded container)

(I) Title and category	Title	<ul style="list-style-type: none"> ● Introduction of cooling system with Dynamic Ice (i.e; Ice thermal storage systems) into trucks for perishables to reduce CO2 emission.
	Category	(IV) Technologies
(II) Project operators		<ul style="list-style-type: none"> ● CO-OP Sapporo ● Maruko Doko ● IIT Corporation
(III) Project overview		<ul style="list-style-type: none"> ● The existing 4ton refrigerator trucks were replaced by those equipped with dynamic-type (regenerative type) ice storage system, instead of refrigerator. It achieved to improve fuel efficiency and reduce energy consumption and CO2 emissions by using CFC-free refrigerators.
(IV) Key points		<ul style="list-style-type: none"> ● With a focus on scheduled time and frequent delivery for perishable/chilled products, the project aims to improve fuel efficiency. ● Efficiency improvement was promoted by ensuring temperature control at 5°C and a linkage between the storage time by using the dynamic-type ice and the time of delivery to stores. ● Installing the dynamic-type ice brought promotion of the total system efficiency. The truck, equipped with the dynamic-type ice storage system is the new long-time serviceable vehicles and also achieves reduction of nitrogen oxides (NOx) and particulate matters (PM). ● CO2 reduction can be achieved in the transportation flow from perishable centers to stores. CO-OP Sapporo has also put efforts into constructing the eco store and achieved CO2 reduction as well. (Perishable center: Refrigeration facility, Ammonia refrigerant facility [CFC-free], Delivery trucks [CFC-free])
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 291.2 tons (2864.7tons→2573.5 tons) ● Percentage of CO2 reduction: 10.2% (Achievement ratio: 125.6%)

(VI) Supplemental explanation

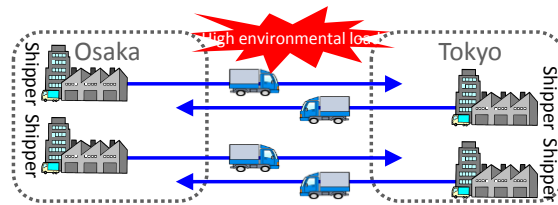


(I) Title and category	Title	<ul style="list-style-type: none"> ● "Super Green Shuttle Train" project by joint usage of 31ft containers
	Category	(I) Modal shift (II) Joint transportation (IV) Technologies
(II) Project operators		<ul style="list-style-type: none"> ● All Japan Railway-Freight Forwarders Association ● Japan Freight Railway Company ● Nippon Express Co., Ltd. ● All Japan Express Co., Ltd.
(III) Project overview		<ul style="list-style-type: none"> ● Under cooperation with Japan Freight Railway and freight forwarders, the project launched new services from March, 2006. It is called Super Green Shuttle Liner for 31ft containers and started to operate between Tokyo and Osaka, which is one of the major transport section in Japan. ● In recent years, as the 31ft wing container was developed to facilitate a modal shift from road to rail, many forwarders including top runners have started to promote the modal shift between Tokyo and Osaka. However, the services have been mainly used by large-volume shippers. ● The freight forwarding industry started to provide 31ft wing containers to be available for many users including midsize shippers and truck companies and to ensure new transportation capacity over the major transport section according to a convenient schedule. A joint operation system of the containers was also established so as to be able to be used by various shippers regardless of the frequency or volume of transportation. ● The project has attracted more users by reduction of CO2 emissions through the modal shift and effective use of the transportation capacity (to-and-from loaded services).
(IV) Key points		<ul style="list-style-type: none"> ● Under cooperation among related industries, utilization of the rail container transportation has been promoted. The project has established the new rail transportation system for promotion of the modal shift that can be participated from various midsize companies.
(V) Effects		<ul style="list-style-type: none"> ● Reduced CO2 emissions: 6,100 tons/year (7,500 tons/year→1,400 tons/year) ● Percentage of CO2 reduction: 81%

(VI) Supplemental explanation

Before

Trucking by individual shippers



After

Rail transport with joint operation system

