Green Freight and Logistics in Asia: Delivering the Goods, Protecting the Environment

WORKSHOP PROCEEDINGS

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by:
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

ADB

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Executive Summary

Freight and logistics are growing quickly along with economic development in Asia and the Pacific, but the region faces challenges in ensuring that goods move in an efficient, low emissions and low-impact fashion.

This largest-ever workshop on Green Freight and Logistics in Asia, co-organized by the Asian Development Bank (ADB) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) from 25-27 June, 2014 in Singapore, was held to promote peer learning and exchange among key stakeholders active in freight and logistics. Specifically, the workshop was designed to (i) foster discussion on the potential and benefits of green freight policies in the region; (ii) identify opportunities that can be developed into actions and projects; (iii) shape a broad work plan for national activities; and (iv) identify training needs according to select target groups (thus establishing a knowledge base in support of green freight and logistics programs in the region).

The workshop was successfully delivered over the three days with over 100 participants representing 17 countries and 30 organizations, including 12 ADB staff from various regional departments.

Through a participative training approach, participants identified 58 concrete measures for Asia's freight transport sector for saving costs, energy and emissions. Concrete project ideas for green freight and logistics were also developed for 13 countries that the ADB, GIZ and other development partners may pursue in the future.

1 Background to the Workshop on Green Freight and Logistics in Asia

The demand for freight and logistics in Asia and the Pacific is expected to grow significantly in the coming years, and it will continue to play a large role in driving economic growth and alleviating poverty in the region. Within the transport sector, freight and logistics account for a significant portion of total energy use – in many countries upward of 40% – and a correspondingly large share of CO2 emissions. The promotion of efficient, environmentally sustainable and safe freight transport is an issue of substantial importance and urgency.

Based on the need for countries across Asia and the Pacific to address this issue, the Asian Development Bank (ADB) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) organized this first regional workshop to take stock of best practices and systematic approaches towards efficient logistics and green freight. The event, held 25-27 June 2014 in Singapore, aimed to give recognition to and provide a platform for the exploration of the multiple initiatives currently being developed at different levels of governance (local, national, sub-regional and regional) and by actors from different sectors (public, private, NGOs).

The workshop was arranged as a mix of predefined presentations by global contributors to the green freight and logistics discussion, as well as through facilitated peer learning and exchanges among the key stakeholders active in freight and logistics. Specifically, it aimed to (i) to foster discussion on the potential and benefits of green freight policies in the region; (ii) to identify opportunities that can be developed into actions and projects; (iii) to shape a broad work plan for national activities; and (iv) to identify training needs according to select target groups (thus establishing a knowledge base in support of green freight and logistics programs in the region).

The outputs of the workshop will also provide inputs to the ASEAN Working Groups on Land Transport and Transport Facilitation as well as the United Nations Center of Regional Development (UNCRD)-led initiative to develop a Regional Framework on Green Freight and Logistics.

This document is meant to summarize the workshop, draw out the key messages from each session, and includes a short synopsis of the group work that was undertaken during the workshop. It also provides recommendations for future action, by ADB and GIZ.

2 Workshop Summary: Day 1, 25 June 2014

2.1 Welcome and Opening Remarks

The workshop was opened by key representatives of the two organizing parties, Mr. Ronald Antonio Butiong, Unit Head of the South Asia Subregional Cooperation and Operations Coordination Division at the Asian Development Bank, and Mr. Roland Haas, Program Director from GIZ.

After welcoming the guests, Mr. Butiong highlighted the importance of addressing the freight and logistics sector in Asia. He introduced the context of the workshop by noting that freight transport in Asia is growing more rapidly than Asia's gross domestic product, and that trucks make up less than 10% of the vehicle population in Asia, but emit more than 50% of road transport carbon dioxide emissions and air pollutants.

In developing countries, the ratio of logistics cost to GDP is almost twice that of developed countries. Yet as freight movements increasingly cross borders and continents, regional collaboration in the design and implementation of green freight programs creates unique opportunities for countries to share experiences and learn from each other. This would help ensure that green freight practices are adopted faster and more efficiently.

Mr. Butiong recognized that the ADB has a strong role to play in the development of freight and logistics in the region, and through related programs seeks to improve its operations and build an enhanced portfolio for sustainable transport, in railways and waterways and through other emission reduction projects at both national and regional levels. He also noted that the ADB is committed to pragmatic, results-driven and action-oriented freight development across modes, across borders, and overall across the Asia and Pacific region.

Mr. Roland Haas in his remarks emphasized that it was rare to see a financial assistance organization such as the ADB and a technical assistance organization such as GIZ to cooperate at such a deep level to address an emerging issue, highlighting the importance of partnerships in addressing freight emissions. In introducing GIZ's initiatives around green freight, Mr. Haas mentioned activities

around the world including in The People's Republic of China (PRC), India and Mexico, as well as the efforts of the Global Partnership for Sustainable Mobility. This workshop would be an important entrance into the development of national green freight plans in Asian countries.

The storyline of the workshop was then outlined by Mr. Haas, noting that the session would lead with the experience from the US and its SmartWay program, Europe and its numerous initiatives, then would lead to the experiences of Asian stakeholders, finally to be followed by break out session that would identify opportunities for development of training programs and national green freight programs across the region.

2.2 Keynote Speech by Vice Minister Bambang Susantono

The keynote speech by Vice Minister Bambang Susantono of the Ministry of Transportation, Republic of Indonesia, brought into focus the need to focus on freight and logistics in the near term. The key messages from his speech are as follows:

- Freight now accounts for 35% of the world's transport energy use. Yet in Asia, road freight is expected to increase 645% between 2000 and 2050. Road freight growth is outpacing rail freight growth, particularly in Indonesia where road freight grew 530.5% and the PRC, where road freight has grown 600% between 2000 and 2010. The growth of emissions is strongly linked to this increase in vehicle and freight movement.
- Booming cities are seeing doubling of their vehicle fleets in 5-7 years, and this increase in motorization is leading to emissions, pollution, congestion and fatalities: 531,000 premature deaths, 2-5% of GDP is lost to road congestion and 23% of GHG emissions are from transport in Indonesia, and 90% of those are road transport.
- Indonesia aims to reduce its GHG emissions by 26% through its own efforts by 2020, and 41% with international assistance. This will happen through the development and implementation of action plans, including acceleration of intermodal transport between road networks, marine and rail, all of which need improvement. In order to address this, Indonesia has developed a blueprint for a national logistics system and intermodal facilities.
- At the same time, a national logistics forum has been established, a collaboration between private sector and government to ensure transfer of technologies, creation of a fair market, and to undertake better infrastructure planning that will result in more affordable and environmentally friendly transport of goods. Support from international partners in the development of this forum will be key.

2.3 Participant Views and Expectations

A survey was undertaken at the beginning of the morning session to record the understanding by participants of green freight concepts, their interest, and comfort in discussing green freight with others.

- The survey revealed that of the participants, 29% were from the government sector, 25% from the private sector, 17% from civil society, and 29% from development agencies.
- Of the participants, 19% were completely familiar with the terms and concepts behind "green freight and logistics", while 48% were somewhat familiar, 27% had little understanding, and 6% expressed that they were not sure what these terms meant.
- 62% of participants were motivated by a mix of reasons for improvement of freight and logistics in their country, including cutting costs of business, improving customer satisfaction, promoting economic growth, improving transport conditions, and protecting the environment. 19% stated that they were mainly motivated by protecting the environment alone, with a mix of participants supporting the other motivations.
- The weakest link identified by 47% of participants in improving freight in Asia and the Pacific was government policy. This was followed by 21% identifying access to capital, 16% identifying access to know-how, 11% identifying lack of awareness by end customers, and only 5% identifying lack of awareness by freight operators.
- Optimization of logistics and implementation of technologies and measures to reduce fuel consumption of trucks were evenly identified as most effective in making freight and logistics more green, at 42% each. Shifting to rail was identified by 12% of participants, and shift to waterborne freight by 4%.
- Finally, at the beginning of the workshop, on a scale of 1 to 9 (not comfortable to very comfortable), participants were asked to rate their comfort level in discussing green freight with colleagues and counterparts. 42% selected 8-9, 31% selected 6-7, 14% selected 4-5, and 12% selected 1-3, indicating a moderate amount of comfort on average, amongst participants.

2.4 Panel session 1: Development of Green Freight and Logistics in US and Europe

The first panel discussion focused on the development of sustainable freight transport in Europe and the US and the triggers i.e. "What" triggered the move towards green freight and logistics, on "When" these changes took place (key events), and on "How" did the freight and logistics sectors become greener in these countries.

Ms. Sophie Punte, Executive Director of Smart Freight Centre, chaired the first session on green freight and logistics in the US and Europe. She set the stage for the discussion by noting that the role for government is to provide a secure environment for innovation, but private sector needs to take advantage of this to integrate climate and clean air into their core business areas. Finally, civil society must put climate and clean air on the agenda of governments and business, and keep raising the bar.

She introduced a solutions matrix which describes means of efficiency gains on the horizontal axis and the modes upon which the solution would be implemented on the vertical axis. Solutions in the lower left corner are viewed as more accessible for implementation, but are implemented at a finer scale. Solutions towards the right and top are larger-scale, systematic solutions.

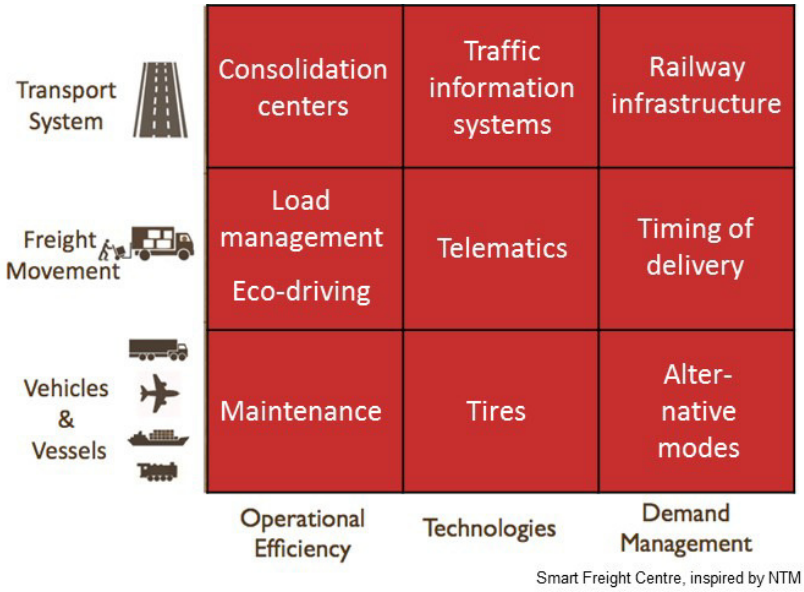

Figure 1: Smart Freight Solutions Matrix. Source: Smart Freight Centre

Mr. Buddy Polovick from the US Environmental Protection Agency (EPA) SmartWay Transport Partnership described the US SmartWay developmental history and operational mechanisms over its 10 years of operation in the US. The original impetus for the program was high energy prices, and higher awareness among shippers that led to increased demand for green freight partnerships among stakeholders.

Figure 2: SmartWay program Cycle. Source: Buddy Polovick, US EPA

Mr. Polovick's recommendations for Asia as the region moves ahead with green freight are:

- Utilize market mechanisms: Through benchmarking and reporting, shippers can apply pressure to carriers;
- Establish a credible, neutral 3rd party to help industry to undertake technology testing and verification so that there is clarity on which strategies and technologies really work;
- Provide a balanced approach and give solutions that actually work for business – not too technical, and not too burdensome;
- Develop supplemental value for business and industry such as recognition and awards that allow businesses involved to educate their customers and stakeholders about the efforts they are making.

Ms. Chantal van Schaik, from Green Freight Europe, described the EU Emissions Trading System as the main driver for change in Europe, but that it was companies that took initiative in order to stay ahead of regulation. Where for some shippers and logistics providers, 80% of road freight activity is subcontracted to smaller carriers; there is a need for information sharing between businesses. Green Freight Europe was established as a neutral platform that would allow sharing of data while ensuring compliance with anti-competition laws, and enabling companies to learn from each other on how to improve fuel efficiency and reduce emissions. Green Freight Europe today is a working program of nearly 130 member companies developing a recognition scheme for freight carbon footprint measurement and management, as well as a platform for sharing best practices and technology solutions, and government lobbying and cooperation.

Mrs. van Schaik's recommendations for Asia as it moves ahead with green freight are:

- Involve government early on and begin a dialogue as early on as possible;
- Draw more attention to green freight, and move quickly to establish a framework for green freight; and

- Develop a unified approach across geographical regions and modes to green freight and avoid confusion between different programs.

Next, **Ms. Andrea Dorothea Schön** of DB Schenker introduced the company's experience in implementing green freight. She noted that Europe had set emission reduction targets for the overall economy which were subsequently translated into national regulation. She made several key points:

- Innovation and sustainability are interlinked and trigger movement through the supply chain towards greater efficiency and emission reductions
- Pressure and regulation are only part of the green freight story. Industry collaborating through voluntary partnerships allows each part of the supply chain to meet their respective emission reduction targets, leading to multiple win-win relationships
- Fuels, new engines and vehicle retrofits are options. However, one particular technology now avoided is biofuels, because of their unknowable impacts on ecosystems and the climate through indirect land use change. Electricity has more potential as a sustainable energy source for transport.
- 20% of savings may be made through better driving practices, but a large proportion of road freight is subcontracted. Therefore, it is necessary for companies to train their own drivers as well as subcontracted drivers
- Better engine technology could provide up to 30% emission savings.

Mr. Hans-Dietrich Haasis, Institute of Shipping Economics and Logistics brought his experience in ports to bear. His key message was that green means more efficient, which means less money spent on fuel. "Why not save fuel?" he asked. He discussed the opportunities and challenges in realizing the road-sea shift, and noted the importance of teaching students advanced concepts in logistics efficiency so that they may carry on this mission in the future. He emphasized that cooperation, competition and communication is key to success in better logistics, and that "Logistics is like football – it's a team game".

The main lessons learned that he communicated to the workshop were:

- *Regulation can drive change*. Low sulfur content in diesel is causing discussions to occur in new engine and fuel concepts, including the potential of a switch to liquefied natural gas (LNG)
- *Cooperation and joint-learning activities* such as logistics clusters and meetings are necessary to improve the overall industry
- *Academics have a large contribution to make to better logistics*, not just in improving operations now, but also through educating youths and bringing better ideas forward into the future. He emphasized the equal importance of improving "hardware" (infrastructure) as well as "software" (knowledge and capacity).

Mr. Andreas Streubig from the Otto Group gave the last contribution to the organized part of the panel, and discussed advanced concepts from the perspective of freight shippers. He noted that while green freight is important, it is a small part of sustainable supply chains, and that supply chains stretch across and between nations. It is thus important to keep the efficiency of logistics in a particular context. Greater efficiencies will be gained through redesign of global supply networks. Mr. Streubig noted that at this time, nearly two-thirds of corporate emissions come from transport between source markets to sales markets including distribution logistics and warehousing.

A few suggestions for companies to consider as they develop their own initiatives included:

- Avoid trying to cover all sustainability issues at once. Identify some key ones related to your operations and build up a culture of sustainability thinking before moving on to broader issues.
- Look for ambassadors and promoters to drive sustainability internally as well as externally, including NGOs and customers.
- Link to others, and not just in your own supply chain – companies can learn best practices from each other. He noted that transforming economies into sustainable economies is really "that big". Cooperation is necessary.

Key discussion points

Through the panel discussion, there were questions about the approaches abroad for measuring and achieving greener freight. An important discussion evolved around the role of measuring CO2 instead of other pollutants, especially given that CO2 emission reduction often results in economic savings, while reducing emission

of other pollutants may not always lead to cost savings. Black carbon, in particular, is a large component of particulate matter emitted from diesel engines which has both a climate impact as well as a major health impact locally and globally, but reduction of black carbon emission at this time comes at a cost to carriers as they need to implement expensive technologies and incur ongoing costs. The panel noted that when the concept of green freight was first developed, climate change due to CO2 was the main topic of discussion, and was requested by industry and its clients – but that green freight is an evolving topic. Air pollution reduction is coming as a new "Scope III responsibility" for companies, but more needs to be done, specifically by governments and the private sector in recognizing efforts to reduce air pollutant emissions alongside CO2. Examples mentioned were making investment in new engines and technologies, developing new infrastructure such as greener ports and intermodal facilities to encourage railway and waterborne freight movement, and ultimately in the reorganization of the layout of supply chains.

Biofuels also arose in the discussion, because biofuel is perceived as a clean resource that is locally available in Asia. The panel responded that according to a JRC study in Europe, there simply won't be enough biofuels to meet demand, and that extra demand will cut into food systems and ecosystem services in ways that cannot even be managed. Biofuel was noted as an alternative fuel that is not a likely contributor to green freight, when taken from a whole lifecycle perspective.

The panel discussion ended with the idea that there is no one simple solution to reduce emissions from the freight. Driver training is a good way to start because it does not require hard capital costs and increases the awareness of drivers and fleet managers on the importance of greener freight. This understanding could eventually lead to the use of sustainable technologies and fuels in the mid-term, and implementation of multimodal and more efficient supply chains in the longer term. Mr. Streubig closed the session with the recommendation to just "start somewhere". Come up with projects. Nothing is perfect – but anything can be improved.

Key Concepts from the panel discussions:

1. *There is already enough pressure on Asian countries to reduce costs and externalities from freight transportation. Pressure includes high logistics costs, threats to energy security, and the threats related to climate change and air pollution.*
2. *In order to make freight more efficient, a step-wise approach is required with multiple strategies as there are no silver bullets.*
3. *There is a need to identify leaders, build the brand, raise awareness internally and of customers, and implement solutions with a partnership approach. Freight and logistics is too complex for any single stakeholder to solve in isolation.*
4. *While building solutions, involve NGO's and academic world for scaling up opportunities locally, nationally and regionally.*

2.5 Presentation: The Significance of freight transport for the economy and the environment by Professor Werner Rothengatter, Karisruhe Institute of Technology

"Transport doesn't fall from heaven – as soon as there is economic activity, there will be transport," formed the beginning of Professor Rothengatter's presentation. He emphasized that transport is a good thing that has a positive impact on GDP, and that transport is driven by trade, not by production, meaning that creating better transport systems should not cause concern from policy makers that production will move elsewhere – in fact, better development leads to economic growth and not just redistribution of activities. This reality was emphasized by an analysis of the economic benefits of high-speed rail from Stuttgart to Ulm, where effects will be seen across the region.

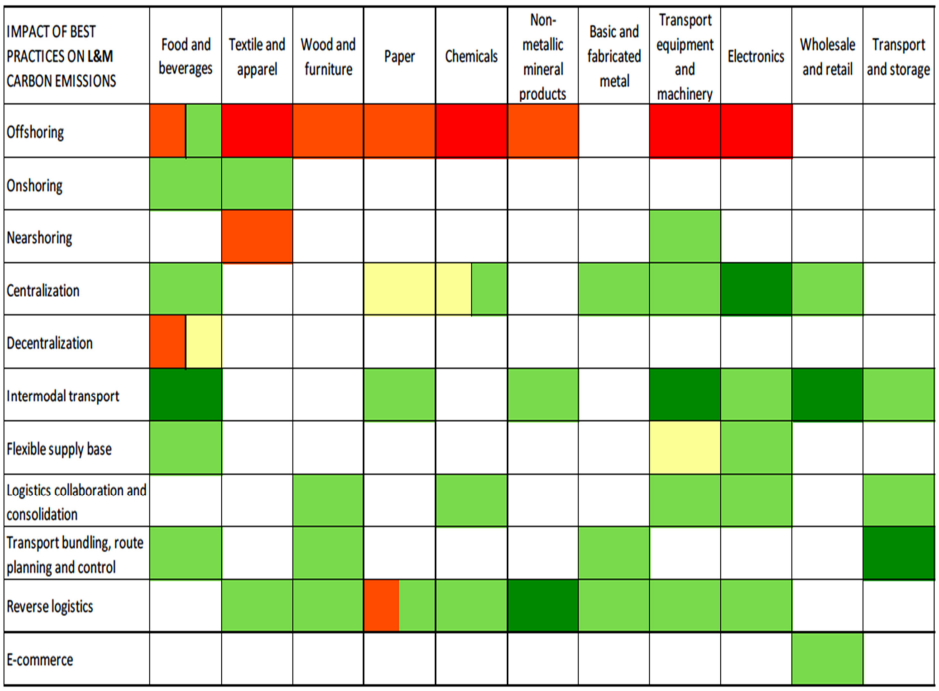

Figure 3: Implementing best practices in logistics and management has different impacts by industry. Many of these practices require not only collaboration and cooperation to implement, but also commitment to changes in production measures. Source: Professor Werner Rothengatter

More importantly, however, was the focus on changing production measures. Implementation of best practices in various logistics processes has varied impacts on climate change related to logistics and management, as noted by the LOGMAN approach in the figure above (Figure 3).

Professor Rothengatter's presentation concluded with some future approaches to green freight:

- Pricing is key to the development of transport services, and is the key tool that policy makers have for influencing the development of the industry
- Road trains, overhead electric trucks and high-speed rail are not necessarily recommended for freight because most freight is not so time-sensitive. Speed is only required for certain parts of the freight and logistics sector, so a careful evaluation must be made as to whether or not high-speed infrastructure is needed
- Carbon price has not been a motivator for greener freight because thus far, the carbon market has been identified by policy makers, meaning that the true price of carbon has so far not been high enough to motivate change in this sector.

The final message of the speech was that governments need to establish frameworks that make sense for the private sector to act. This requires a deep understanding of the freight and logistics needs of an economy, as well as the levers that this industry can actually use to become more efficient. This is the challenge for policy makers at this workshop.

2.6 Panel 2: Green freight and logistics in Asia: Current trends and future pathways

The second panel discussion built on the lessons learned from the first panel to describe the current state of affairs in green freight and logistics in Asia.

The panel was chaired by **Ms. Glynda Bathan**, Deputy Executive Director of Clean Air Asia, who set the stage by requesting panelists to describe steps taken by the stakeholders to make the freight and logistics sector greener, identify "What" are the key drivers that can facilitate this development; and on "Opportunities" and "Barriers".

The discussion began with a short speech by **Mr. Tran Anh Duong**, Deputy Director General of the Ministry of Transport, Viet Nam. He noted that emissions from transport are not well regulated in Asia in general, and Southeast Asia in particular. With around one million trucks in the country, monitoring stations indicate that levels of PM10 are 1.5 – 2 times greater along the ring road in Hanoi and Ho Chi Min City than legal standards permit. Viet Nam has designed a National Green Growth Strategy that highlights tasks for the freight sector in the coming years:

- Increase energy efficiency
- Utilize alternative or renewable fuels
- Implement coastal shipping and inland waterway transport.

Next, **Mr. Karmjit Singh**, Fellow and Chairman of the Chartered Institute of Logistics and Transport (CILT) Singapore, noted that even in Singapore, the industry is always learning. Singapore is a logistics hub that developed from nothing to become one of the most efficient airport and seaports ranking globally, not only serving regional but also global trade. In order to improve building energy efficiency, Singapore has implemented incentives for green buildings, with a goal of 80% of buildings being "green" by 2020. The city also needs to deal with new traffic patterns related to movement of the port by 2025, and terminal 5 of the airport constructed around the same time.

Mr. Singh concluded that there are challenges related to the human aspect of freight and logistics. Habits are hard to change, even with incentives. Furthermore, companies and governments look at freight as trucks moving, rather than as drivers driving trucks. Without recognizing the importance of drivers, they are unlikely to take a role in better driving and emissions reduction.

Mr. Thibodee Harnparasert, Executive Advisor of the Federation of Thai Industries (FTI) then described some of the green freight work being undertaken in Thailand. Thailand has about one million trucks, 140,000 buses, 6.5 million passenger cars, and 6 million diesel pickup trucks. Transport alone consumed 36% of energy in the country, 80% of that from inland transport. In order to deal with this situation, the FTI proposed to government an energy efficiency program in logistics and transport management, which trained over 2500 professionals from 240 companies in four areas:

- Management: e.g. standardizing maintenance, utilizing GPS and RFID, and shortening loading cycles and space utilization
- Engineering and technologies: e.g. tires can reduce fuel consumption 3-5% if tire pressure is managed
- Middle management: e.g. understanding what load is suitable for what trucks
- Driving: e.g. implementation of daily check sheets, idle time reduction, and being familiar with normal operating performance of the vehicle – not to mention being alert and sober.

The final effort discussed by Mr. Harnparasert was that by utilizing GPS and monitoring truck movement, and standardizing data for logistics, load optimization and back loading could increase significantly. Industry is generating data through this system for decision making by government.

The last speaker in the second panel was **Mr. Stephan Schablinski**, Executive Director of Green Freight Asia, who advocated that the private sector is not just part of the problem – rather, it can be an important part of the solution to freight emissions. He noted that 90% of trucks in Asia and the Pacific are owned by individual drivers, and only 0.1% are owned by big fleets. Most companies don't have the capacity to work in terms of GHG emissions and other global issues related to their work, and therefore economic incentives are necessary. Companies want to reduce costs and improve profits through more sustainable operations. At the same time, manufacturers would like to choose greener carriers, but they have little information on which carriers are greener.

Green Freight Asia aims to use a methodology to identify companies that are acting to improve their emission profiles, or have committed to act. The organization also aims to develop a clear-cut matrix of technologies for trucking companies that can help quickly identify which technologies are appropriate for their businesses.

Key discussion points

During the panel discussion, several key points were raised:

- Asian countries face a huge challenge in enforcement of fuel and vehicle standards. The reality is that governments need to become more committed to fuel quality standards enforcement, and need to financially support truck owners to upgrade their fleets. Singapore is leading in technology standards for trucks, aiming to shift to Euro VI emission standards by 2017, but challenges remain with cross-border traffic, in a context where each country has its own standards
- In order to promote its private sector backed green freight labeling scheme, Green Freight Asia requires assistance from intermediaries in each country, and in many cases needs help in providing balanced information in local languages on technologies appropriate for trucks
- While labels were questioned as being more supportive to large companies, the small companies need to be brought together to work more effectively so that they may use their combined scale to improve technologies and operations.

2.7 Study Visit: Agility International Logistics Facility

The workshop participants were taken in the afternoon to Agility International Logistics, where they were introduced to a transshipment and processing facility there. The warehouse is a green building, featuring large windows and free-flowing air to reduce need for air conditioning. Furthermore, electric forklifts are used in the building to ensure fresh air inside. An item of interest is that bonded goods and goods for domestic consumption are freely mixed inside the building, completely managed by Singapore's central database of import and customs.

Mr. Eddie Sng explaining green logistics measures undertaken by Agility International

3 Workshop Summary: Day 2, 26 June 2014

3.1 Presentation: UNCRD efforts on the promotion of green freight under the Regional EST Forum in Asia by Mr. Ganesh Raj Joshi, UNCRD

Mr. Joshi introduced UNCRD's regional approach. The United Nations has been leading the promotion and development of sustainable transport policies with Asian governments. Since 2005, the UNCRD in collaboration with the Ministry of the Environment, Government of Japan, has organized the annual 'Regional Environmentally Sustainable Transport (EST) Forum in Asia' (EST Forum) attended by senior government officials from environment and transport ministries from 22 Asian countries.

Since the 5th Regional EST forum in Bangkok in 2010, green freight has been a topic of growing interest.

There are many important reasons for this:

- Populations are growing rapidly, as well as Asian economies. Asia will be responsible for USD $148 trillion by 2050, 51% of global GDP
- Transport activity is growing at least 3.7% per year in Asian countries
- Freight already makes up 35% of the world's energy consumption
- Public health, road safety, working conditions, employment, driver insurance and energy security are all reasons.

In order to address these problems, the UNCRD is working with its 24 members and UNESCAP to develop a Regional Cooperation Agreement on Green Freight in Asia. National and local governments, international development agencies, banks, private sector and NGOs all have roles to play in the development of the agreement, and a specific support group has been developed. Finally, He invited all the workshop participants were invited to the Integrated Better Air Quality – Regional EST Forum to be held in Colombo, Sri Lanka 19-21 November, 2014.

3.2 Presentation: A systematic approach towards efficient logistics and green freight by Martin Schmied, INFRAS AG

Mr. Martin Schmied began his discussion noting that while Europe and Asia are very different, in fact there are some things that are quite the same, such as having a very diverse and disaggregated freight market with small companies and a need to improve communication. He followed by noting the importance of global logistics on climate change: 5-6% of GHG emissions are caused by logistics including warehouses, offices, transshipment points, rail, air ocean and road. Road accounts for about half of these emissions.

Mr. Schmied noted that logistics is more than the freight transport and a comprehensive green logistic strategy is required which should address all topics. In order to find solutions to emission from freight, the means of calculating GHG emissions should be examined:

- Emissions = weight x distance x emissions per ton-km for the mode

With this in mind, strategies for emissions reduction would be:

- Reduce the weight of shipping, e.g. packaging management
- Reduce distance travelled
- Reduce specific CO_2 emissions from vehicles: reduce empty trips, increase load factor, improve the efficiency of vehicles, utilize lower carbon fuels and drive trains
- Reduce empty trips.

Mr. Schmied then reviewed the importance of policies on reducing emissions from the freight sector, as outlined in the figure below. Policies have the indirect ability to reduce the length and frequency of trips, shift freight to more friendly modes of transport, and incentivize the use of cleaner vehicles and fuels. Regulatory measures fell in the areas of market access for trucks and freight, direct environmental regulations, economic measures such as taxes and road fees/discounts, finance for new infrastructure or expansion, integrated land use and transport planning, and subsidies. Mr. Schmeid concluded by introducing the topics of the breakout sessions, which are highlighted in the next section.

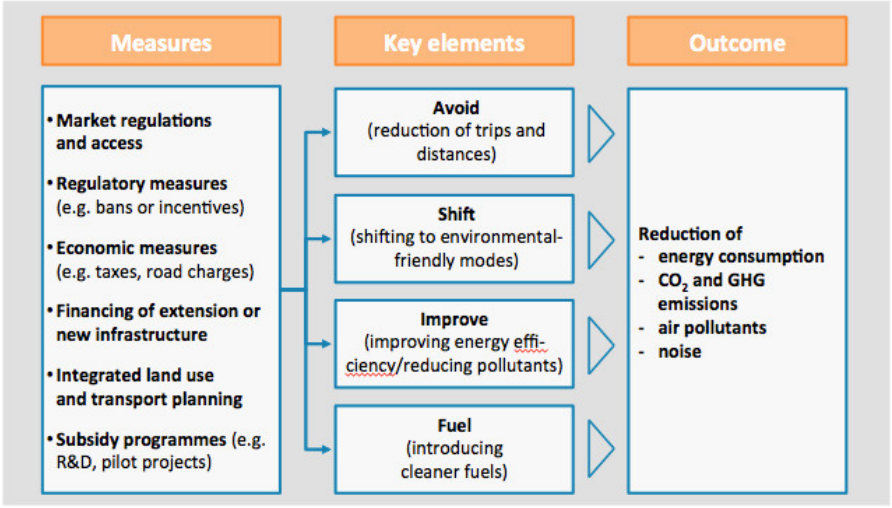

Figure 4: Categories of policy options for reducing emissions from freight transport. Source: INFRAS

3.3 Breakout Sessions: National Action Plan

In the first breakout session, workshop participants separated into four groups to analyze priority strategies, policies and actions. The main objective of this second breakout session was to identify key options that could be considered in national action plans for green freight and logistics in Asia and the Pacific region, and identify their barriers, policy actions to address these barriers, key stakeholders required for implementing such solutions and external support needed. The results are summarized in table format in **Annex C**.

Participants worked in the following groups:

1. Truck technologies: Tires and wheels and driver management
2. Logistics Optimization - Group 1
3. Logistics Optimization - Group 2
4. Modal Shift

In this exercise, 58 innovative measures that might be appropriate for green freight in the ASEAN region in particular were identified through expert consultation and the workshop groups (Table 1). Top measures, based on voting were separated by the following categories:

1. **Technologies:** Tires & wheels and driver management
2. **Logistics Optimization:** Freight consolidation, logistics information platform, traffic management system, load and network optimization, city logistics
3. **Modal Shift:** Organization of rail network, multimodal centers and information systems.

Objectives of Green Fright Strategies

While each type of approach had its specific issues, there was a large amount of commonality between each category. Participants across the different groups highlighted "*improving efficiency*" and "*reducing costs*" as main objectives for implementing any of these measures, making these reasons important aspects of green freight. Other highlighted objectives included time savings, better safety and security, improved loading, maximizing capacity, longer infrastructure lifespan, avoiding legislation, and reducing emissions (including CO_2, PM, BC and NOx), etc. These objectives can be considered as co-benefits of implementing these measures.

Main Barriers

On **truck technologies and practices**, top barriers for implementation of measures were awareness about technology, reliable standards and labeling of technologies, and literacy of drivers and managers. For **logistics optimization** and **modal shift**, the main barriers mentioned were infrastructure, lack of standards and regulations, lack of technology, fragmented industry, the need for tailor made solutions, lack of trust and lack of knowledge. Other barriers for specific solutions were: old trucks, lack of education, lack of partnership, lack of enforcement, lack of technology verification, institutional issues, lack of transparency and data, large investments and long rate of investment return. For some countries, lack of local capacity compared to that of larger neighbors was also of concern.

Solutions for Green Freight

In terms of addressing barriers, the main suggestions were: improving policies, regulations and standards; improving infrastructure; developing programs to build capacity; developing communication tools that are appropriate for the audience (for example, in areas where literacy rates are low); improving data and communication across supply chains; and developing labeling schemes and incentives.

A number of financing solutions were identified. For issues mainly related to technology implementation, microfinance schemes, provision of start-up capital, and investment in demonstration projects were discussed. For larger projects, development of PPP (Public-Private Partnership) schemes, investment in demonstration projects and tax incentives were suggested. International support in form of technical assistance for developing master plans, financing support, capacity building for government and private sector, development of international awards and exchange of best practices are required to implement the identified green freight measures.

Stakeholders and their Roles

Stakeholders in shaping green freight include shippers, truck manufacturers, consumers, truck operators, planners and regulators, development agencies, associations, and civil society.

Different stakeholders have different roles to play. Shippers provide goods and consumers consume them, intermediaries are the freight forwarders and operators who transport goods to the consumers.

Governments provide infrastructure and set rules under which freight distribution takes with the aim of satisfying multiple stakeholders. They also provide plans for economic development and regulations and standards for technology.

Development agencies are required for funding infrastructure, sharing of best practices, innovation and capacity improvement. Civil society organizations such as universities, research institutions and NGOs assist in data, research and capacity building. Each stakeholder has its own objectives role in green with green freight.

3.4 Study Visit: PSA Singapore Terminals

The workshop participants had a short briefing about PSA Singapore Terminals, the world's largest transshipment hub, which handled a record 32.24 million TEUs of containers in 2013. After the briefing, the participants had the macro view of the port from the 40th floor of the PSA Building. A tour of Pasir Panjang Terminal followed with two PSA staffs explaining the details of their operations, optimization techniques and green technologies to further streamline and make their business more efficient. The participants observed from the coaches the Flow-Through Gate system which clears incoming trucks in 25 seconds, automated guided vehicle (AGV) systems and a huge container ship unloading containers using a fully-automated yard crane system.

3.5 Green Freight Training Needs Analysis

As a part of the joint workshop on Green Freight and Logistics in Asia, a Green Freight Rapid Training needs Assessment Workshop was organized. The audience was made of 22 professionals that had a significant bearing on the quality of the outputs. Because of the limited time available the TNA only focused on Phases 1 to 3 of the TRAIN-X methodology (Phase 1: Problem Analysis, Phase 2: Job Analysis and Phase 3: Population Analysis).

Participants completed the problem analysis in groups using the data extracted from the TNA workshop participants' application questionnaire as a starting point. In continuation a target population analysis was carried out in the same groups. Each group identified the primary (need to know) and secondary (nice to know) target group for their selected problems.

Based on the results of the problem and target population analysis, two possible course topics were identified by training consultant. A first course could focus on increasing awareness of policy-makers in the field of freight and logistics on the options available for "greening" freight transport policies, and providing them with examples of best practices (and lessons learnt in cost/benefit aspects). A second course could target high-level officials in key ministries and provide them with skills and tools to improve policy drafting as well as better cooperate with industry so as to create win-win solutions. The full report of the TNA will be available at www.transportandclimatechange.org and will serve as a basis for course development.

4 Workshop Summary: Day 3, 27 June 2014

4.1 Presentation: Role of ICT – learning from Singapore's TradeXchange by Mr. Jonathan Koh, CrimsonLogic

TradeXchange was introduced by Mr. Jonathan Koh as an IT project initiated by Singapore Customs, Economic Development Board and the Infocomm Development Authority of Singapore which was developed, operated and maintained by CrimsonLogic Pte Ltd. TradeXchange is a facility that enables the exchange of trade information between commercial entities and multiple agencies involved in trade. Singapore rolled out this system in 2007 offering a "single electronic window" for integrated workflow, submissions and inquiries to the Sea Ports, Airport, Maritime Authorities, Customs and Competent Authorities. This promotes convenient services, information sharing and interoperability thus enhancing the trade competitiveness. It integrates trade permitting, marine cargo insurance and trade finance services to improve efficiency and decrease costs. Implementation of Single Window systems is also motivated by UN/CEFACT Recommendation No. 33, "Recommendations and Guidelines on establishing a Single Window" (2004). According to the World bank, 71 countries now have a single window.

Figure 5: Services linked to the TradeXchange platform. Source: CrimsonLogic

Some of the key services and benefits of the TradeXchange platform are as follows:

1. *Trade permit preparation* eliminates the need to send hard copy trade permit declaration forms and other documents such as invoices and packing lists to freight forwarders or declaring agents. Instead, this information is shared seamlessly across an electronic platform. This process eliminates delay in freight movement due to incorrectly-filled paper forms, increasing turnaround time by up to 50%;
2. Real-time submission and approval of marine cargo insurance applications and amendments reduces data entry requirements by the insurance

company, resulting in faster turnaround time, reduces costs and enabling self-printing of insurance certificates;

3. Trade finance services ensure that finance documents such as invoices are exchanged electronically and securely among the shippers, buyers and banks. This speeds up the process, lowers administrative costs and makes access to finance easier.

TradeXchange was developed as a type of Public-Private Partnership (PPP) called a "Special Purpose Vehicle" (SPV): a National Information Trusted Broker with a concession to collect user service fees for a minimum period of 5 years. It is essential to have optimal risk transfer which will enhance value for money. Mr. Koh stated that in trade management systems, ″risk is best taken by the party which is best placed to manage it″.

Mr. Koh concluded that inter-organization information exchange and collaboration platforms have become crucial for the competitiveness and compliance of trade. In the future, there will be greater movement towards development of a globally networked single window supporting international connectivity and data harmonization standards to achieve information exchange in global supply chains.

4.2 Breakout Sessions: Concrete Project Ideas

Based on the expert presentations and group deliberations on priority measures, DMC participants, ADB staff and experts worked together to formulate concrete project/investment ideas for green freight projects.

Participants worked in eight groups, namely:

- Group 1: Indonesia
- Group 2: Viet Nam
- Group 3: Thailand, Philippines
- Group 4: Singapore
- Group 5 Cambodia, Lao PDR, Myanmar
- Group 6: Bhutan, Nepal, India
- Group 7: Bangladesh, Maldives, Sri Lanka
- Group 8: PRC and Central and West Asia

These groups jointly explored the following questions in order to develop country specific investment/project ideas for next five years:

1. What are the main challenges faced by the DMCs in the group with regards to green freight?
2. Based on strategies discussed (logistics optimization, technologies and modal shift), what are the top investment and project priorities for the country?
3. For the investments and project ideas developed, what kind of external support may be required?

By the end of the workshop, specific project ideas were developed for each of the 13 participating DMCs. Group 8 participants were ADB staff and they jointly discussed how green freight could be initiated with investment across Central Asia region and the PRC.

The main challenges noted by participants are, ranked by their frequency across the DMCs (See Annex D for a full list):

1. Technology (including IT systems)
4. Awareness, capacity and data
5. Intermodal facilities including infrastructure of alternate modes
6. Road infrastructure
7. Old trucks, poor enforcement and Inspection and Maintenance (I&M)
8. Fragmented industry, overloading
9. Partnerships and access to finance
10. Institutional capacity

It is not surprising to note that all the challenges noted above are interlinked. Old trucks on roads are due to lack of access to finance to the operators in addition to poor regulations and enforcement. Old trucks with poor efficiency lead to low profit margins. Low profitability in the sector prevents industry overhaul and acts as a main driver for further fragmentation of industry i.e. high number of owner-driven trucks.

Since industry is fragmented, there is a lack of partnerships and engagement with policy makers. Due to institutional challenges, and since the logistics industry does not have a voice to demand better policies and infrastructure, the quality of infrastructure and intermodal facilities are often poor. This ensures poor efficiency and higher costs of freight transport. The operators are forced to sustain high empty trips and use overloaded trucks in order to compensate the loss. Overloaded trucks lead to further deterioration of infrastructure and vehicles.

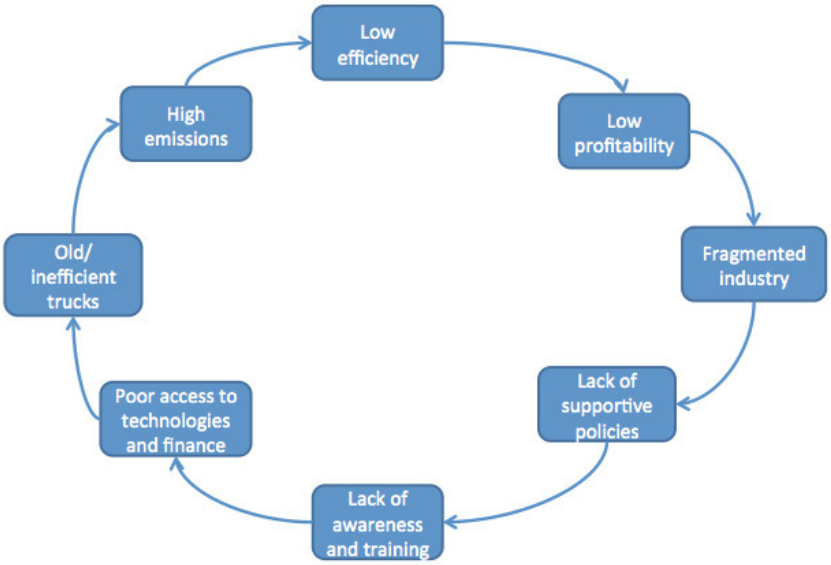

Figure 6. Interlinked challenges in the road freight sector (Source: Gota, Clean Air Asia, 2012)

Industry and policy makers fail to gauge the long-term implications of such inefficient movement due to lack of awareness, capacity and data. Operators and policy makers in general are not aware of technological and non-technological solutions to improve fuel efficiency and loading efficiency in freight sector. This ensures movement of inefficient old trucks.

Given that all the various issues were interconnected, the experts recommended a systems approach to making change. Such a systems approach was discussed in detail by participants in form of strategies and actions under the categories of logistics optimization, technologies and modal shift. Nearly twenty priority investments and project ideas were proposed. These twenty measures could be sub-categorized into: Logistics improvement – 6 measures; Modal Shift – 5 measures; and Technologies – 9 measures; and the primary investment ideas and projects proposed are ranked below by their frequency across the DMC among the strategies selected (a full list is available in **Annex D**):

1. Intermodal facilities
2. Telematics devices and systems
3. Waterways and ports, technology improvement in waterways and logistics information platforms
4. Traffic management systems
5. Railways
6. Consolidation centers
7. Engine replacement/improvement
8. Fleet optimization
9. Alternative fuel trucks, tire packages and dry ports
10. Aerodynamics, lightweight trucks and trailers, vehicle inspection and maintenance, city logistics and vehicle sizing

11. Logistics hubs and packaging solutions

Clearly, priority investments and projects selected could be traced back to challenges discussed earlier. Intermodal facilities improvement and telematics are considered as priority investments by many countries as they face significant challenge with regards to poor interconnections of road with rail and waterways as well as poor technologies and old trucks. Participants anticipated following needs for external support for implementing green freight projects (ranked below by their frequency across the DMCs):

1. Financing for infrastructure (particularly more efficient ports, dry ports, railways, intermodal facilities, and logistics hubs), technology, and capacity building
2. Developing IT solutions
3. Policy, master plan development and reviewing existing legislations
4. Driver training
5. Sharing best practices and accessing private sector finance
6. Incentive policy for technology adoption and development of truck scrappage scheme
7. Improving data, cross border initiatives, study tours, design of low finance loans or microfinance schemes

It is interesting to note the importance of capacity building, which is ranked as high as traditional finance. This reiterates demand for 'soft infrastructure' identified by participants earlier in group work. DMCs also require external support in developing IT systems which may require significant resources, development of master plans, reviews of policy and legislation, and data.

Generally, there is a lack of best practices in green freight, and hence communication of best practices around the world to policy makers and local experts on green freight. Participants also requested support in developing schemes like truck scrappage schemes, incentive policies for technology adoption and design of low-interest loans. These are often difficult to execute due to lack of awareness,

confidence on technologies and fragmented industry. Participants also advocated for cross border solutions as freight movement is often across borders.

4.3 Closing Remarks

The workshop was closed with remarks from Ms. Natasha Davis, Senior Planning and Coordination Specialist of the Asian Development Band, Mr. Roland Haas Program Director from GIZ, Mr. Beny Irzanto from the ASEAN Secretariat, and Mr. Mohinder Singh, Dean of the LTA Academy of the Land Transport Authority of Singapore (LTA).




Ms. Davis noted that there is now more comfort in working together, and that through this meeting, a momentum had been generated that will lead to the next steps – particularly through the development of communication materials and the promotion of investment projects. She particularly noted the ADB Transport Forum, which will be held in Manila, September 15-17 and will host 600 officials and experts to discuss all matters of transportation, including a session on cross-border transport from the perspective of the private sector.

Mr. Haas declared that the workshop had been a very successful event. Greener freight, he said, means reduced costs and environmental benefits for society, but which requires the right incentives from government, and the right skills in the private sector in order to succeed. He saw that cooperation is already bearing fruits in the region in the area of green freight, and that there will be more of this kind of collaboration, particularly through the development of training capacity on green freight in ASEAN and the region at large. He also said that the next steps were important, and that in the future, the project will go to 5 ASEAN countries to work with major emitters of CO2, and develop national green freight action plans.

Mr. Singh's closing comment included the notion that everyone had come together to learn about green freight from each other, and that because no country has a monopoly on knowledge, thus there is a need to learn together. He noted that the Land Transport Authority has an academy for collaboration and seeks to build capacity with international partners.

Finally, **Mr. Irzanto** stated that the workshop had been very useful, and that he hoped that this deep learning and networking would be maintained in the future as ASEAN countries would establish a sustainable, energy efficient and environment-friendly transport and logistics systems as noted in the ASEAN strategic transport plan 2011-2015.

5 Key Findings, Conclusions and Actions Moving Forward

By the end of the workshop, it was clear that a great deal had been learned by all in attendance. Not only had each participant become clearer on the current status of "green freight" around the world, even the most informed individuals a the workshop gained new insight into the evolution of green freight, especially as it applies to Asia and the Pacific.

5.1 Key findings and conclusions

Economic Activity Spurs Transportation; As Economies Grow, Transportation Must Become More Efficient

The freight and logistics sector is both a result of, and a driver of economic growth and prosperity in Asia and the Pacific. However, the sector faces challenges: logistics costs are high, environmental impacts are high (including air pollution, resource consumption and greenhouse gas emissions). "Freight vehicles comprise only 5% of vehicles on the road, yet they are responsible for 60% of emissions", said Bambang Susantono, Vice Minister for Transportation of Indonesia. It was also identified during the meeting that although rail and waterborne freight both make significant contributions to freight carriage across the region, the majority of domestic freight is carried by road.

In fact, growth in freight transport need not be directly coupled to economic growth, even though for the recent past, it has been. Solutions identified during the workshop for weakening the relationship between economic growth and polluting transport were many, but could be summarized as activities which:

- Optimize freight movements
- Shift freight towards less emission-intensive modes such as railways and waterborne transport
- Improvement of the environmental performance of vehicles, vessels, engines and fuels.

What is needed in achieving efficiency is a planned, systematic approach that incorporates the activities within and across entire economies. While individual actions may make certain aspects of freight and logistics lower in environmental impact, implementing a planned approach could see the effects multiplied rather than merely added.

Cooperation and Communication are Key

Researchers and private sector participants in the logistics sector are clear that logistics is a system that is not undertaken by any one institution or company. Mr. Hans-Dietrich Haasis of the Institute of Shipping Economics and Logistics likened

logistics to football, saying, “It’s a team game”. In this spirit, greening freight and logistics require cooperation between multiple parties:

- Between carriers and shippers
- Between shipper and other shippers
- Between carriers
- Between private sector and public sector
- Between logistics sector and the financiers
- Between experts, government, carriers and shippers.
- And others…

Key is that all these relationships must facilitate the private sector to become more efficient and drive change across supply chains.

Cooperating across borders

Another key conclusion of the workshop is that freight increasingly crosses borders and continents, and that in order to “green” this movement, there needs to be a harmonization of approaches to allow for efficiency to take root. Standards for equipment, data and trade facilitation need to be made not just at national levels, but between countries to ensure optimal movement of goods.

While countries learn and develop green freight domestically, they can also learn from each other, creating unique win-win opportunities for cross-border collaboration on greener freight and logistics. This learning can be facilitated through more regional dialogues such as this one.

5.2 Moving ahead

As Asia and the Pacific move forward to a greener freight future, several strategies and steps on a general level have emerged:

- While a great deal of knowledge already exists on improving freight efficiency, there is still a large need for capacity building in the region on strategies for designing and implementing cost-effective solutions that create true win-win situations in freight and logistics;
- There is an urgent need to strategically plan and improve both "soft" and "hard" infrastructure to allow countries and the region as a whole to become more efficient. Capacity building was one area of need, and infrastructure finance was another labeled as a priority;
- Utilizing labeling schemes could be a strategy for not only guiding the private sector on how to improve its operations in a fair, balanced way; financial incentives for the may also be critical in assisting companies and countries in making systematic changes to the way they work;
- Finally, best practices sharing across the region needs to continue and improve. Successful experiences and unsuccessful experiences should offer true opportunities to learn and move ahead more successfully as a region.

Opportunities to continue the regional dialogue are numerous, even over the coming year. A series of meetings will occur in 2014 and 2015 to finalize the UNCRD Regional Cooperation Agreement on Green Freight, which will be the premier means by which countries can learn from and assist each other in the development on green freight and logistics systems. While activities can be taken immediately in designing plans and programs, progress can be reported and adjusted through a series of meetings including the Asian Development Bank's Transport Forum in September, 2014, the ″Integrated Conference of BAQ 2014 and Intergovernmental 8th Regional EST Forum in Asia″ in Colombo, Sri Lanka in November, 2014, and a dedicated meeting on Green Freight and Logistics to be held in early 2015 by the UNCRD in Japan.

For the ADB, this workshop provides a new basis for exploring and expanding freight programs and projects in and between DMCs across Asia and the Pacific. With country-specific challenges and ideas for implementing improved freight technology, logistics efficiency and modal shift in hand, follow-up should be made through the regional departments, and particularly the regional programs such as the Greater Mekong Subregion (GMS), South Asia Subregional Economic Cooperation (SASEC), and Central Asia Regional Economic Cooperation (CAREC) programs to further develop realistic regional actions in partnership with DMC counterparts. Specific follow-up can be made with each of the DMCs in terms of developing project opportunities that arose out of the workshop.

The workshop has also solidified partnerships that the ADB may further engage in order to create an environment for the development of a regional agenda for green freight. Organizations present at the workshop, including co-organizer, GIZ, regional organizations including the UNCRD and Clean Air Asia, and national agencies such as the Singapore Land Transport Authority and the US Environmental Protection Agency offer opportunities and networks for cooperation on training, capacity building and knowledge sharing. Considering that the 'soft' component of logistics i.e. capacity building and training is considered a top priority by the participants across the DMC's, this largest–ever event on green freight and logistics in Asia has provided foundation for both ADB and GIZ and other partners to move forward on green freight and logistics, through capacity building and investment support.

6 Workshop Evaluation

The workshop's original objective was to promote peer learning and exchanges among key stakeholders active in freight and logistics. Specifically, the ambition was to (i) foster discussion on the potential and benefits of green freight policies in the region; (ii) to identify opportunities that can be developed into actions and projects; (iii) to shape a broad work plan for national activities; and (iv) to identify training needs according to select target groups (thus establishing a knowledge base in support of green freight and logistics programs in the region).

The workshop fully met each of these objectives through a combination of presentation sessions (given by resource persons having extensive industry knowledge), panel discussions, extensive facilitated group exercises and site visits.

A survey carried out before starting the technical sessions revealed that only 19% of participants were completely familiar with the terms and concepts behind "green freight and logistics", while 48% were somewhat familiar, 27% had little understanding, and 6% expressed that they were not sure what these terms meant. Based on the facilitated discussions, participants were able to successfully apply the newly acquired knowledge to determine the barriers, identify improvement proposals and formulate concrete project proposals in developing Asian countries.

A post-workshop survey of the participants was undertaken to assess the value of the workshop to improving the knowledge of participants. Survey shows that:

- 98% of participants were 'satisfied' or 'very satisfied' with the content of the program
- 91% of participants found training relevant to their work
- 80% of participants 'agreed' or 'fully agreed' that the stated objectives were achieved
- 95% of participants were completely familiar or somewhat familiar with the terms and concepts behind "green freight and logistics". This share was only 67% before the start of the event
- Nearly 94% of participants were 'satisfied' or 'very satisfied' with speakers and moderators
- 74% of participants "completely" or "almost completely" felt that the workshop provided the requisite knowledge, skills and attitudes
- 77% of participants rated the workshop experience as 'excellent' or 'very good'. Remaining 23% of participants rated this as good
- 98% of participants will recommend this kind of workshop to others.

7 Annexes

Annex A: Workshop Agenda

Day 1: 25 June 2014
Venue: Singapore Clarke Quay Novotel

8:30 – 9:00 **Registration**

9:00 – 9:10 **Welcome and opening remarks**
Ronald Antonio Butiong, Asian Development Bank (ADB)
Roland Haas, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

9:10 – 9:20 **Keynote speech**
Bambang Susantono, Vice Minister, Ministry of Transportation, Republic of Indonesia

9:20 – 9:40 **Participant views and expectations**

9:40 – 10:40 **Panel session 1**
Development of green freight and logistics in the US and Europe
Moderator: *Sophie Punte, Smart Freight Centre*
Panelists: *Andrea Dorothea Schön, DB Schenker; Andreas Streubig, Otto Group; Buddy Polovick, SmartWay Transport Partnership, US EPA; Chantal van Schaik, Green Freight Europe; and Hans-Dietrich Haasis, Institute of Shipping Economics and Logistics.*
The first panel will provide an overview of the development of sustainable freight transport in Europe and the US. It will focus on "What" triggered the move towards green freight and logistics, on "When" these changes took place (key events), and on "How" did the freight and logistics sectors become greener in these countries (steps taken by the stakeholders).

10:40 – 11:00 **Coffee break**

11:00 – 11:30 **Presentation**
Significance of freight transport for the economy and the environment
Prof. Werner Rothengatter, Karlsruhe Institute of Technology

11:30 – 12:30 **Panel session 2**
Green freight and logistics in Asia – current trends and future pathways
Moderator: *Glynda Bathan, Clean Air Asia*
Panelists: *Karmjit Singh, The Chartered Institute of Logistics and Transport; Stephan Schablinski, Green Freight Asia; Thibodee Harnprasert, Federation of Thai Industries; and Tran Anh Duong, Ministry of Transport, Viet Nam.*
The second panel discussion will build on the lessons learned from the first panel and outline the current state of affairs in green freight and logistics in Asia. It will focus on "How" the freight and logistics sectors are becoming greener in Asia today (steps taken by the stakeholders); on "What" are the key drivers that can facilitate this development; and on "Opportunities" and "Barriers".

12:30 – 13:30 **Lunch**
13:30 – 17:30 **Study visit: Agility International Logistics Facility**
19:00 – 21:00 **Reception dinner at Coriander Leaf Bistro**

Day 2: 26 June 2014
Venue: Singapore Clarke Quay Novotel

8:30 – 8:45 **Presentation**
UNCRD efforts on the promotion of green freight under the Regional EST Forum in Asia
Ganesh Raj Joshi, UNCRD

8:45 – 9:30 **Presentation**
A systematic approach towards efficient logistics and green freight
Martin Schmied, INFRAS

This session will thresh out the potential pathways under a systematic approach, cognizant of the multiple regional contexts and the expressed interests in many countries to pursue green freight and logistics. Countries in Asia and the Pacific have the opportunity to devise appropriate strategies while taking advantage of the experiences and lessons learned from the forerunner countries in this field. The session will explore what needs to be done in the elaboration of a comprehensive approach and how to implement the appropriate strategies. It will set the scene for the more detailed work in the breakout sessions that follow. Key topics:

- Logistics optimisation
- Modal shift
- Vehicle technologies

9:30 – 9:45 **Coffee break**

9:45 – 12:00 **Breakout sessions: Template action plans**

In small groups, the participants will discuss and develop "template action plans". These will outline the available options for a systematic "greening" of the freight and logistics sector, broadly divided in three clusters:

- Logistics optimisation
- Modal shift from road to rail and water
- Vehicle technologies to improve energy efficiency and environmental performance
- Key questions include:
- What are the barriers and opportunities to implement these options?
- What are the measures to be taken by public and private actors?
- What are the needs for technical and financial support?

12:00 – 12:30 **Plenary discussion of the breakout session**

- Reporting back the results of the group sessions
- Summary of findings and next steps

12:45 – 13:30 **Lunch**

13:30 – 17:30 **Study visit: PSA Singapore Terminals**

Alternative afternoon program (for up to 20 preselected participants)
14:30 – 18:30 **Training needs analysis**

19:00 – 21:00 **Dinner at The Square restaurant (Novotel Hotel)**

Day 3: 27 June 2014

9:00 – 9:30 Presentation
Role of ICT – learning from Singapore's TradeXchange
Jonathan Koh, CrimsonLogic Pte Ltd

TradeXchange is a neutral and secure trade platform that facilitates exchange of information by providing seamless inter-connectively among commercial and regulatory systems for the trade and logistics community in Singapore. Initiated by the government, it is the first IT project in Singapore to be implemented as a Public Private Partnership (PPP) with CrimsonLogic Pte Ltd.

- Overview of TradeXchange
- How the PPP functions
- Lessons so far – successes and shortcomings
- Innovations and future plans

09:30 – 11:00 Breakout sessions: Concrete project ideas

Building on the results of the second day, representatives from developing member countries and ADB staff will continue to work together to develop concrete project ideas based on the lessons learned from the previous sessions and discussions. Specifically, the role of key stakeholders in supporting green freight and logistics initiatives will be explored. Key topics:

- Role of governments (legal and institutional requirements)
- Role of financing organisations (e.g. ADB)
- Role of capacity builders (e.g. ADB, GIZ)
- Role of private sector actors and how to engage them
- Role of industry organisations, civil society and NGOs

11:00 – 11:15 Coffee break

11:15 – 12:15 Plenary discussion of the breakout session

- Reporting back the results of the brainstorming sessions
- Summary of findings and next steps

12:15 – 12:30 Closing remarks
Natasha Davis, Asian Development Bank (ADB)
Roland Haas, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Beny Irzanto, ASEAN Secretariat
Mohinder Singh, Land Transport Authority of Singapore (LTA)

12:30 – 14:00 Lunch

Annex B: List of Participants

Name	Country	Organization
Mr. Abdullah Faqih Ulumidin	Indonesia	Center Study of Partnership and Transportation Services (PKKPJT), MOT
Mr. Ahmad Azhar Setiawibawa	Indonesia	Center Study of Partnership and Transportation Services (PKKPJT), MOT
Mr. Ali Waheed	Maldives	Ministry of Transport and Communications
Ms. Andrea Dorothea Schön	Germany	Schenker AG
Mr. Andreas Streubig	Germany	Otto Group (Otto GmbH & Co KG)
Mr. Areg Barseghyan	Armenia	ADB
Ms. Arimbi Jinca	Singapore	TUM-Create
Mr. Ario Wicaksono	Indonesia	GIZ-CET
Dr. Axel Friedrich	Germany	Consultant
Mr. Bambang Susantono	Indonesia	Ministry of Transport
Mr. Bashirullah Khpalwan	Afghanistan	ADB
Mr Beny Irzanto	Indonesia	ASEAN Secretariat
Dr. Bin Arlis Batuah Nofrisel	Indonesia	Asosiasi Logistik Indonesia
Mr. Buddy Polovick	USA	Smartway Transport Partnership, US EPA
Mr. Chalermsak Karnchanawarin	Thailand	Thai International Freight Forwarders Association (TIFFA)
Dr. Chamnien Vorratnchaiphan	Thailand	IUCN Asia Regional Office
Ms. Chantal van Schaik	Europe	Green Freight Europe
Mr. Chanthy Sin	Cambodia	Cambodia Freight Forwarders Association (CAMFFA)
Mr. Cledan Mandri-Perrot	Singapore	The World Bank
Ms. Courtney Lutterman	Singapore	United Parcel Service
Mr. Danang Parikesit	Indonesia	Ministry of Public Works
Mr. Daniel Taras	Germany	GIZ
Mr. Darwin Marcelo	Singapore	The World Bank
Mr. Do Cong Thuy	Viet Nam	Ministry of Transport
Ms. Franca Sprong	Thailand/ ASEAN	GIZ-CET
Mr. Friedel Sehlleier	Thailand/ ASEAN	GIZ-CET
Mr. Ganesh Joshi	Japan	United Nations Commission for Regional Development (UNCRD)
Ms. Gloria Gerilla-Teknomo	Philippines	ADB
Ms. Glynda Bathan	Philippines	Clean Air Asia
Mr. H.S. Soewartono	Indonesia	ADB
Dr. Hans-Dietrich Haasis	Germany	Institute of Shipping Economics and Logistics
Mr. Harmesh Singh Dhillon	Singapore	Land Transport Authority
Mr. Heuan Chanphana	Lao PDR	Ministry of Natural Resources and Environment

Name	Country	Organization
Mr. Hong Wei Lee	Singapore	National Environmental Agency (NEA)
Mr. Ildefonso Jr. Patdu	Philippines	Department of Transport and Communication
Mr. Imam Hambali	Indonesia	Center Study of Partnership and Transportation Services (PKKPJT), MOT
Ms. Irene Lak	Singapore	IUBH
Mr. Jagir Rathore	Singapore	Smart Freight Centre
Ms. Jane Romero	Philippines	ADB Consultant
Ms. Jingzhu Li	PRC	GIZ
Mr. Jonathan Koh	Singapore	CrimsonLogic Ltd
Mr. Joseph Hui	Singapore	National Environmental Agency (NEA)
Mr. Joshua Loke	Singapore	DHL
Mr. Jurgen Sluitjer	Philippines	ADB
Mr. Karmjit Singh	Singapore	The Chartered Institute of Logistics and Transport (CILT)
Mr. Kartik Kumar	India	GIZ
Ms. Kerstin Kunze	Singapore	Schenker Asia Pacific Pte Ltd
Mr. Ki-Joon Kim	Philippines	ADB
Ms. Kim Le	Singapore	United Parcel Service
Mr. Ko Sakamoto	Philippines	ADB
Dr. Lynette Cheah	Singapore	Singapore University of Technology and Design (SUTD)
Ms. Ma. Virginita Capulong	Philippines	ADB
Dr. Malee Uabharadorn	Thailand	Office of Transport Policy and Planning (MoT)
Mr. Mangala Perera	Sri Lanka	Ministry of Environment and Renewable Energy
Mr. Marco Sprong	Thailand/ ASEAN	GIZ Consultant
Ms. Maria Dona Aliboso	Philippines	ADB
Ms. Maria Emperatriz C. Regis	Philippines	Philippine International Seafreight Forwarders Association, Inc.
Mr. Martin Schmied	Switzerland	INFRAS Consulting, Analysis & Research
Mr. Md Hasan Ali	Bangladesh	Bangladesh Land Port Authority
Mr. Mohan Niraula	Nepal	Ministry of Commerce and Supplies
Mr. Naresh Pradhan	Nepal	ADB
Ms. Natasha Davis	Philippines	ADB
Mr. Nay Myo Win Aung	Myanmar	Department of Transport (MoT)
Mr. Nguyen Cong Bang	Viet Nam	Department of Transport (MoT)
Ms. Nguyen Thi Thu Ha	Viet Nam	Ministry of Natural Resources and Environment
Mr. Nikola Stalevski	Thailand/ ASEAN	GIZ Consultant
Ms. Outi Annala	Viet Nam	ASSIST Asia Society for Social Improvement and Sustainable Transformation
Mr. Papondhanai	Thailand	GIZ-CET

Name		Country	Organization
	Nanthachatchavankul		
Ms.	Phung Thi Hoa	Viet Nam	Viet Nam Automobile Transportation Association
Mr.	Robert Earley	PRC	Clean Air Asia
Mr.	Roland Haas	Thailand/ ASEAN	GIZ-CET
Mr.	Ronaldo Antonio Butiong	Philippines	ADB
Mr.	Satish Singh	India	Ministry of Railways
Mr.	Sengsavang Phandanouvong	Lao PDR	Ministry of Public Works and Transport
Mr.	Shengyang Tan	Singapore	National Environmental Agency (NEA)
Mr.	Somphone Phasavath	Lao PDR	GMS Freight Transport Association
Mr.	Songchai Wongwatcharadamrong	Thailand	Thungsong Municipality Office
Ms.	Sophie Punte	Netherlands	Smart Freight Centre
Mr.	Sophin In	Cambodia	Linehaul Express (Cambodia) Co., Ltd.
Mr.	Stefan Bakker	Thailand/ ASEAN	GIZ-CET
Mr.	Stephan Schablinski	Singapore	Green Freight Asia Network Ltd.
Mr.	Sudhir Gota	India	Consultant
Mr.	Sumit Pokhrel	Thailand	ADB GMS-EOC
Mr.	Suven DasGupta	India	Ministry of Finance
Mr.	Sven Callebaut	Thailand/ ASEAN	GIZ consultant
Ms.	Tan Pang Jin	Singapore	DHL
Mr.	Thibodee Harnprasert	Thailand	Federation of Thai Industries
Mr.	Torben Niemeier	PRC	GIZ
Mr.	Tran Anh Duong	Viet Nam	Department of Environment (MoT)
Ms.	Tran Thi Van	Viet Nam	Ministry of Transport
Mr.	Uk Raksmey	Cambodia	Ministry of Public Works and Transport
Mr.	Ukrit Karoonkorn	Thailand	Freight Transport Bureau, Department of Land Transport
Ms.	Vanisara Musikamas	Thailand	GIZ-CET
Mr.	Vedant Shriniwas Goyal	India	GIZ
Mr.	Vilayphanh Sayavong	Lao PDR	Ministry of Public Works and Transport
Mr	Wah Loong Looi	Singapore	National Environmental Agency (NEA)
Mr.	Wen Zhang	PRC	ADB
Dr.	Werner Rothengatter	Germany	Karlsruhe Institute of Technology (KIT)
Mr.	Zecko Tachog	Bhutan	Ministry of Economic Affairs

Annex C: Measures to Promote Green Freight

Table 1.Identified technologies and strategies for logistics optimization and mode shift to promote green freight

Technology	Logistics Optimization	Mode Shift
A) Aerodynamics	Improved city logistics	**A) Technology**
10% reduction in drag	Route planning / optimization	1) Rolling stock, adjustment of rail cars to market needs
AFT box taper	Traffic management system	2) Propulsion, energy recycling
Boat tail	Vehicle size	3) Modern train control system
Box skirts		4) Longer trains, double deck container trains
Streamlining	Freight consolidation	**B) Infrastructure**
Full skirts	Network optimization	1) Removal of bottlenecks
Roof deflector	Package reduction	2) Dedicated freight tracks on heavily used relationships
Cab-box gap fairings	Drop and hook	3) Electrification
Full gap fairings	Backloading	4) Transshipment technology
B) Light Weighting	Logistics information platform	**C) Logistic Concepts**
Material substitution	Freight company consortium	1)Networks of multi-modal freight centers
C) Tires and Wheels	Load optimization	2) Synchronized service, e.g. line-based concepts
Automatic tire inflation on tractor/vehicle		3) Block trains, pallet flow systems
Automatic tire inflation on trailer		4) Concentration on railway affine market segments
Low resistance tires		**D) Public regulation and pricing policy**
Low resistance wide base tires		1) Taxation systems
D) Transmission-Driveline		2) Internalization of external costs
Aggressive shift logic and early lockup		**E) Removal of physical and organizational barriers**
Increased transmission gears		**F) Information systems /structures**
Transmission friction reduction		**G) Modernization of ports**
E) Engine efficiency		**H) Port coopetition**
Improved diesel engine		**I) Develop shipping networks**
F) Hybridization		**J) Port ICT**
Dual-mode hybrid		**K) Logistics concepts and shipping lines design**
Parallel hybrid		
Parallel hydraulic hybrid		
Series hybrid		
G) Management		
Predictive cruise control		
Training and feedback		
Route management		

Note: The ideas listed are a result of the workshop participants' informal brainstorming exercise and do not reflect any commitment on the part of the government or ADB/GIZ.

Annex D: Challenges and solutions for green freight in workshop DMCs

Table 1: Index of challenges faced by DMCs that could be resolved with green freight strategies

Major Challenges Matrix	Infrastructure - Roads	Intermodal &Other Infrastructure	Old Trucks	Technology	Poor Enforcement, I&M	IT	Capacity	Data	Fragmented Industry	Overloading	Institutional	Access to Finance	High Cost	Awareness	Urban Freight	Partnerships
Bangladesh		✓	✓		✓					✓				✓		
Bhutan	✓				✓	✓										
Cambodia	✓						✓									
India		✓	✓			✓									✓	
Indonesia	✓					✓	✓	✓		✓						✓
Lao PDR					✓	✓			✓							
Maldives		✓														
Myanmar				✓			✓	✓						✓		
Nepal	✓	✓		✓			✓	✓				✓		✓		
Philippines	✓	✓		✓										✓		
Sri Lanka														✓		
Thailand														✓		✓
Viet Nam			✓	✓					✓	✓		✓	✓	✓		
Central &West Asia (including PRC)	✓	✓		✓	✓	✓			✓		✓					

Note: The ideas listed are a result of the workshop participants' informal brainstorming exercise and do not reflect any commitment on the part of the government or ADB/GIZ.

Table 2: National actions proposed by workshop DMCs

Priority Projects Matrix	Bangladesh	Bhutan	Cambodia	India	Indonesia	Lao PDR	Maldives	Myanmar	Nepal	Philippines	Sri Lanka	Thailand	Viet Nam	Central and West Asia (including PRC)
Dry Ports	✓	✓							✓	✓				
Railways	✓			✓	✓				✓	✓		✓	✓	
Waterways and Ports	✓			✓	✓		✓			✓	✓	✓	✓	
Intermodal facilities	✓			✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Technology in Waterways and Railways		✓		✓	✓	✓		✓	✓	✓			✓	
Aerodynamic Technology	✓			✓										
Tires Packages					✓				✓	✓				
Telematics		✓		✓	✓	✓		✓	✓			✓	✓	✓
Lower Weight trucks				✓					✓					
Electric/LNG /LPG/CNG trucks				✓			✓					✓		
Engine Replacement/ improvement							✓		✓	✓	✓			
I&M		✓						✓						
Fleet Optimization	✓					✓			✓					
Traffic Management Systems	✓			✓		✓			✓		✓	✓		✓
Logistics Information Platform				✓		✓		✓	✓		✓	✓	✓	✓
City Logistics			✓					✓						
Consolidation Centers			✓			✓				✓		✓		✓
Logistics Hubs				✓										
Vehicle Sizing			✓						✓					
Packaging Solutions				✓										

Note: The ideas listed are a result of the workshop participants' informal brainstorming exercise and do not reflect any commitment on the part of the government or ADB/GIZ.

Annex E: List of Presentations

1. Day 1 Morning Session Outline:
http://www.scribd.com/doc/232076957/ADB-GIZ-Green-Freight-Workshop-Day-1-Morning-Sessions?secret_password=cYtvQc0njYq9gZxmSwa8

2. Professor Werner Rothengatter, Karlsruhe Institute of Technology: Significance of Freight Transport for the Economy and the Environment
http://www.scribd.com/doc/232077307/ADB-GIZ-Green-Freight-Workshop-Day-1-Werner-Rothengatther?secret_password=e0idC3hCt4ngifiwZd94

3. Mr. Ganesh Raj Joshi, United Nations Center for Regional Development: UNCRD Efforts on the Promotion of Green Freight under the Regional EST Forum in Asia
http://www.scribd.com/doc/232078621/ADB-GIZ-Green-Freight-Workshop-Day-2-Ganesh-Raj-Joshi?secret_password=3L9Xt3bRDaWs3xhVVkxl

4. Dr. Martin Schmied, INFRAS: A Systematic Approach Towards Efficient Logistics and Green Freight
http://www.scribd.com/doc/232078818/ADB-GIZ-Green-Freight-Workshop-Day-2-Martin-Schmied?secret_password=dNQVC5z7XOoc58Y0g8k0

5. Dr. Axel Friedrich: Day 2 Breakout Session – Fuel Consumption Reductions Through Various Freight Solutions
http://www.scribd.com/doc/232077427/ADB-GIZ-Green-Freight-Workshop-Day-2-Breakout-Friedrich-Trucks-Energy-saving?secret_password=NONjdb0uFIh02XBJKHAF

6. Dr. Hans-Dietrich Haasis: Day 2 Breakout Session – Modal Shift from Land to Water
http://www.scribd.com/doc/232077842/ADB-GIZ-Green-Freight-Workshop-Day-2-Breakout-Haasis-Modal-shift-water?secret_password=Cybz0dmp7tmPkKVPBIPY

7. Professor Werner Rothengatter: Day 2 Breakout Session – Modal Shift from Road to Rail
http://www.scribd.com/doc/232078256/ADB-GIZ-Green-Freight-Workshop-Day-2-Breakout-Rothengatter-Modal-shift-rail?secret_password=zKWnQHlcBbtc5sFe1UlR

8. Ms. Sophie Punte: Day 2 Breakout Session – Options for Logistics Operations Improvements
http://www.scribd.com/doc/232078082/ADB-GIZ-Green-Freight-Workshop-Day-2-Breakout-Punte-Logistics-management?secret_password=Xc7SL5hm3XVbQxOPsBdA

9. Day 3 Session Outline
http://www.scribd.com/doc/232078932/ADB-GIZ-Green-Freight-Workshop-Day-3-General-Sessions?secret_password=j16TKZUBqf0zVGdQfFCe

10. Mr. Jonathan Koh, CrimsonLogic: Role of ICT – Learning from Singapore's TradeXchange
http://www.scribd.com/doc/232079084/ADB-GIZ-Green-Freight-Workshop-Day-3-Jonathan-Koh?secret_password=jAhEQ2ySToe6dIZ3jOal