

GREEN HARBOURS II
Greening the Global Supply Chain:
Exploring partnerships to reduce marine
emissions in the PRD

Stakeholder Workshop Summary Report

Thursday, 17 June 2010



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Civic Exchange is a non-profit public policy think tank that helps improve policy and decision-making through research and analysis.

The opinions expressed in this report represent those of the speakers and participants and do not necessarily represent those of Civic Exchange. This summary is based on the presentations and discussions on the workshop held on 17 June 2010.

EXECUTIVE SUMMARY

Building on stakeholder communities created in previous Green Harbours work,¹ Civic Exchange has continued to engage the government as well as the ship, cargo and port sectors to discuss ways to reduce emissions from ships in Hong Kong and the Pearl River Delta region. On 17 June 2010, 35 participants from these sectors came together to discuss voluntary measures to do this.

The workshop's major outcome is that major shipping lines verbally committed to draft a voluntary agreement that ships use distillate fuel while at berth in Hong Kong waters (distillate fuel is substantially less polluting than typical marine bunker fuels). The shipping lines are willing to do this with the expectation that the Hong Kong SAR Government introduce legislation making this switch mandatory within two years. One shipping line has agreed to lead this initiative with the target of announcing it, with other participating shipping lines, later this year. Other stakeholders, such as shippers and ports, can support this initiative by offering preferential treatment to those companies participating in the fuel switch.

This initiative is an important first step in reducing the marine sector's contribution to Hong Kong's air pollution. However, the gains made from this initiative must be extended throughout the Pearl River Delta region through continued cooperation amongst the government and private sector stakeholders. The relevant Hong Kong government departments must continue to communicate effectively with their counterparts in Guangdong to pave the way for coordinated policy addressing emissions from these sources. Any regulation, as well as the voluntary fuel switch, must be in line with international regulation (in this case following the EU model) to ease operations for compliant shipping lines.

The discussions also covered diverse topics including:

Regulation: Regulation remains the most effective way to reduce emissions from these sources. The private sector prefers regulation, as it ensures that all competitors face the same costs. All ports in the PRD must have the same regulation to ensure equal competition.

Competition & Cost: In such a competitive industry with tight margins, any increase in cost is examined closely. However, cargo shippers are willing to accept some increase in cost, as this cost is ultimately passed on to the end consumer. Larger shipping companies may have less difficulty in absorbing these costs than smaller shipping lines.

Fuel Supply: With an adequate supply, as demand for cleaner fuel increases, its price will decrease. Currently, there is an inadequate supply of cleaner fuel in the PRD. Fuel suppliers would need notification of any increase in demand in order to produce sufficient distillate fuel. Switching to cleaner fuels is the most effective way of reducing emissions from ships.

Recognition: Recognition programmes are powerful drivers for improvement. A green

¹ See, Veronica Galbraith, Lynne Curry & Christine Loh (2008), *Green Harbours: Hong Kong and Shenzhen – Reducing Marine and port-related emissions*, www.civic-exchange.org/en/live/upload/files/200806_Gports.pdf; Previous Green Harbours workshop summaries: September 2009: www.civic-exchange.org/en/live/upload/files/090929GHreport.pdf; February & March 2008: www.civic-exchange.org/en/live/upload/files/200806_gportsws.pdf

labeling programme through which ships are publicly recognized for participating in greener practices is motivation for ships to comply with such programmes.

BACKGROUND

The Hong Kong-Shenzhen-Guangzhou region has the highest concentration of shipping and port-related activities, and some of the highest population densities and levels of marine air emissions in the world. Unlike Europe and North America, there are currently no controls on marine emissions in this region. Ships that switch to cleaner fuels elsewhere continue to burn highly polluting bunker fuel in the Pearl River Delta (PRD) region. Recent research has revealed that while many shipowners and manufacturers have broad sustainability goals and environmental policies, these are principally focused on reducing greenhouse gases rather than toxic pollutants which directly impact the health of communities living close to ports.

In order to ensure a level playing field amongst PRD ports and to tackle the emissions in a comprehensive way, regulation for ships should span the PRD. However, regulation is complicated by the jurisdictional boundary between Hong Kong and Mainland China. Inter-governmental coordination is necessary, but it is unclear when this Hong Kong-Guangdong government coordinated regulation would come into effect. In anticipation of this regulation, the private sector can expedite the regulatory process by leading the way and showing that they are aware of the negative health impact of their industries on surrounding communities, and are willing to take appropriate steps to mitigate these effects.

Civic Exchange held a targeted workshop to explore the possibility of developing partnerships between environmentally-responsible shipping lines, ports and manufacturers, with the aim of reducing marine air pollution and associated public health impacts.

Civic Exchange's presentation briefly outlined the current knowledge on the public health impacts and regulation of marine emissions worldwide, before Tim Smith of Maersk Line outlined a fuel switch programme his company has implemented in North America. The aims of the workshop were to foster:

- a better understanding of how reducing emissions might impact the costs, margins and competitiveness of different stakeholders;
- matchmaking opportunities for manufacturers seeking to clean up their supply chain with ports and shipowners who are eager to lead the way in reducing emissions; and
- a discussion of how early adoption of voluntary measures could help to prepare shipowners for tighter regulation in the future.

WORKSHOP SUMMARY

Towards Healthier Shipping

Veronica Booth, Civic Exchange

Emissions from ships are increasing in absolute terms as well as in proportion to other sources. The health effects from these emissions are proven, and are quite harmful. The Hong Kong Government recognizes this and is moving to improve Hong Kong's air quality.

Ships are an efficient way to move goods and materials around the world and a huge amount of global shipping traffic passes through Asia's waterways. Emissions from this volume of traffic negatively affects public health. A 2007 study shows the effect of emissions on population near coastlines and port cities in particular, with 60,000 people dying prematurely each year due to emissions from ships. The projected growth of shipping is expected to result in an increase in mortalities.

Hong Kong, Shenzhen and Guangzhou are among the top 10 busiest container ports in the world, handling some 12% of global container throughput. This is an enormous amount of traffic in a region with ineffective regulation and high population density. These factors combine to make the PRD region the place where shipping emissions may have the strongest effect on public health in the world.

Because ports are often located in cities, emissions from ships are inhaled at higher concentrations than emissions from other sources, such as power generation. Therefore ship emissions may affect public health more than emissions from power generation because there is less opportunity for dispersal. The relative exposure levels of ship emissions are proven, particularly in children, the elderly and the sick.

Marine emissions are increasing in absolute terms and in proportion to other emission sources. Emissions from power plants will reduce by about 90% in the next few years due to desulphurization technologies, while emissions from road transport will remain stable. With increasing port activity, marine emissions have no significant regulation to keep levels from increasing further. Indeed as other sources decrease, the relative significance of marine sources will rise. In fact, in the areas closest to the port, emissions from ships make up a significant part of roadside emissions: it's not just the traffic that's affecting you at roadside, it's also the ships.

The Hong Kong SAR Government is putting greater focus onto the public health effects of poor air quality. It is addressing local sources of pollution, and the public health agenda will become more obvious in the next few years. There has also been more regional planning across the PRD. Guangdong and Hong Kong have an agreement to reduce marine pollution,² and a proposed PRD "Bay Area" conceptualizes the PRD region as a high quality of life centre for China. This pan-PRD planning includes greener planning, and with ports projected to grow further this means that greener ports are necessary.

² Legislative Council, Panel on Environmental Affairs, *Framework Agreement on Hong Kong/Guangdong Co-operation, Environmental Protection and Ecology Conservation*, 24 May 2010, www.legco.gov.hk/yr09-10/english/panels/ea/papers/ea0524cb1-1923-5-e.pdf.

Internationally, Emission Control Areas (ECA) as described in the International Maritime Organization's marine pollution regulation MARPOL Annex VI have been effective in reducing the amount of emissions in specific areas. The North Sea-Baltic Sea-English Channel area ECA has seen SO₂ emissions drop by 42% since its introduction. The next ECA to come into force will surround the North American continent out to 200 nautical miles from the shore. Other governments have implemented initiatives that affect ships while in territorial waters. For example the recently implemented EU Directive on clean fuel has meant that ships at berth and in territorial waters must use fuel with 0.1% sulphur content or less.

Carbon is also an issue, especially for cargo producers. Companies must examine co-benefits of reducing air pollution and carbon, as both are pressing and interrelated issues. Nationally, it is Chinese policy to reduce carbon emissions.

Maersk Line's Fuel Switch Experience **Tim Smith, Maersk Line**

Since 2006, Maersk Line has conducted fuel switch operations in several European and North American ports to achieve air emissions reductions. This involves switching to low sulphur diesel oil (LSDO) for both the Auxiliary Engines as well as Main Engines for the period of time that the vessel is in port or within an agreed distance of the coast. In Europe, 0.1% fuel was used, while in the US, 0.2% fuel was used.

This fuel switching has been both a voluntary initiative of Maersk Line, and a response to mandatory regulation, depending on the port. To date, Maersk Line has successfully made over 1,500 fuel switch operations globally.

Maersk Line wishes to be at the forefront of its industry in responding to the environmental challenge. It does this by gaining experience and working with other stakeholder groups in anticipation of actual or potential legislation to control marine emissions. Maersk Line has found that fuel switching offers the following advantages in addressing environmental impact from shipping:

- It is a mobile solution;
- It can be implemented rapidly;
- No expensive shore infrastructure is required;
- It does not shift emissions to other power sources or locations; and
- There is a low safety risk.

Significant emissions reductions have been achieved through this fuel switch initiative. In California, where the fuel switch occurred 24 nautical miles from the shore, this translates to a reduction of approximately 2400 tons of emissions in an 8-month period. Specifically, particulate matter (PM) was reduced by 86%, while SO_x decreased by 95%. Each fuel switch uses 29.4MT of LSDO.

In implementing a fuel switch, there is no capital investment required on the part of the vessel or port. Vessels are equipped with separate service tanks for distillate fuel. Furthermore, a fuel switch can be implemented quickly, in weeks rather than years, and there are no personnel safety or training issues.

However, the fuel cost differential is substantial: the cost of the programme to Maersk Line is over US\$ 20 million in the US alone. Low sulphur distillate fuel is typically 40-70% more

expensive than heavy fuel oil. For example, the cost differential was about US\$180/tonne between the fourth quarter of 2009 and the first quarter of 2010. Depending on the current cost of fuel oils, and the place of purchase, the cost of fuel has at times been much higher. At current prices, the cost differential of switch fuel at California's ports is about US\$5,400.

Internationally, some governments have been subsidizing fuel switch programmes, as at the ports of Vancouver, Seattle and Houston. The Ports of LA/Long Beach also subsidised fuel costs before the low sulphur emissions regime became mandatory

Also, the fuel switch must be done carefully, as there are some fuel pump leakage issues. In case of longer running, manufacturers suggest change over to a cylinder lubrication oil with a lower base number. Timely data collection was especially challenging in the early months, and still represents a challenge.

Maersk Line has not encountered problems in sourcing good quality distillate in the US. In Europe and Japan, distillate is available, but expensive. Distillate is difficult to source in Singapore and Hong Kong. However, vessels calling in Europe and the US west coast and then coming to China will already carry LSDO on board.

Looking to South China and the PRD, given the number of ports and large number of vessel calls in proximity to high concentrations of population, the region would be an obvious location to operate a fuel switch regime. Such a scheme could make a meaningful difference in total air emissions for the area. However, it would also be very costly to operate, and consequently requires collaboration from government, transport users and other stakeholders to make it viable. A voluntary scheme initially funded by government grant and/or reduction in port dues might be a good way to test practical application in the area and start building support from transport users and the general population.

As stakeholders in the region begin to consider implementing fuel switching, some issues need to be addressed such as: identifying who will pay for the higher cost of using LSDO; establishing reliable and cost effective supplies of LSDO for South China ports; ensuring that no port in South China suffers a competitive disadvantage due to stricter regulation; including all maritime operators (not just the international liner shipping operators) within the scope of emissions reductions programmes; and bringing the ports and landside operations of the liner industry within the scope of emissions reductions programmes.

EXPERT COMMENTARY

Regulation, Competition and Cost:

- Regulation affects everyone. It raises the bar with no cost to competitiveness.
- A fuel switch program is workable, as is passing on the costs so that the 'polluter pays'.
- An initial voluntary fuel switch programme that fosters collaboration rather than undermines competition between ports would give government support that stakeholders are willing to be regulated.
- The competitive element of Hong Kong's ports cannot be ignored. Terminals are at a disadvantage if too-strict regulation is implemented.
- Subsidies are a useful way to encourage cleaner practices initially. However, all ports in the PRD region must offer these subsidies for maximum effect.
- Using cleaner fuel may lead to a competitive disadvantage for ships. While economies of scale may translate the increased cost to US\$5,400 for large ships, smaller ships do not have this advantage and may have to pay up to US\$10,000 for the switch.

- Stakeholders must assess if cost is in fact a barrier. In an industry where costs fluctuate greatly irrespective of fuel prices, the increased cost of fuel may be an artificial barrier.
- This price difference may drive the lower-performers out of the PRD region to other areas with less strict regulation.
- Ultimately the end consumer will pay for the increase in cost.
- Some question remains regarding who will cover the initial cost increase. This could be done through a government subsidy, or through a voluntary initiative in which stakeholders collaborate to all use cleaner fuel.
- Based on the reduction of the quantity of pollutants from vessels, fuel switching is very effective. However, a cost/benefit analysis has not been completed to assess the economic aspect of this switch.

International Regulation:

- All shorelines should be protected through a global standard requiring distillate fuel for all ships all the time.
- Countries that wish to apply for an Emission Control Area under the International Maritime Organization's MARPOL Annex VI must produce background research proving ships are a major source of pollution. This would not be the case if regional governments designate a Low Emission Zone (LEZ) independently from the IMO.
- Such locally-formed policies would need to be in line with international regulation to simplify operations for ships that call at multiple ports. Ships are willing to carry two grades of fuel on board.
- IMO can't do anything within territorial waters (12 miles out)
- Currently In the PRD, there are no incentives and no regulation that effects ocean going vessels.
- ECAs must be implemented with great care, as issues of competitive distortion can arise. Some manufacturers located along the shores of the northern European ECA have found they're at a disadvantage because of the more expensive fuel used: factories outside of the ECA zone with access to train lines have been benefiting from the increase in cost.
- There is opportunity for voluntary initiatives powered by incentives while regulation is being thoughtfully developed.

Using Cleaner Fuels – Efficacy & Supply:

- Among all measures, the best way to decrease emissions is to use low sulphur fuels.
- Stakeholders can draw useful information from Maersk's experience and extrapolate what can happen in the PRD.
- Ships are willing to reduce marine emissions but are reluctant to do so voluntarily. These stakeholders want regulation, and support on cost.
- Fuel price and availability are major concerns. Fuel suppliers and users must coordinate to ensure that there is no sudden demand.
- Fuel suppliers need time to upgrade the refineries to meet increasing demand. It takes approximately five years to install desulphurization facilities at a refinery.
- Fuel suppliers need communication with regulators in order to ensure adequate supply.

Other technologies:

- Many port-side emission reduction solutions exist, with varying levels of infrastructure and investment required, such as: LNG power sources, very effective marine diesel technology, particulate traps, and Euro V engine equipment for port equipment.
- New terminals should have shore power – electricity produced may be cleaner.

SMALL GROUP DISCUSSIONS

Following the experts' opinions, the stakeholders divided into smaller groups to discuss the issues that are most relevant to them as they consider reducing their emissions, with an emphasis on exploring voluntary means.

Cost:

- Certain increases in cost are not really an issue for cargo producers. These buyers want to ship from Hong Kong and other ports in the PRD for reasons other than absolute cost, such as reliability and speed. Even so, they will fight every cent of price increase even when prices can swing 30-40%.
- The cost of the fuel switch from 24 nautical miles from shore is about US\$10 per box, though some stakeholders wished to see further estimates.
- Making a fuel switch at berth may cost US\$1 per box for larger shipping lines.
- However, a fuel switch to LSDO is less expensive for larger shipping companies than smaller ones, due to economies of scale.
- Terminals in Hong Kong are already more expensive than others in the region.
- Stakeholders should share the extra cost.
- Any cost increase should be gradually implemented through time.
- Any cost increase should be implemented carefully to avoid threatening Hong Kong's competitiveness.

Regulation:

- Regulation is fundamental to reducing emissions from shipping and port activities.
- Private sector stakeholders feel that government should form regulation so that the private sector can plan ahead. However, government may want the private sector to take voluntary actions to begin with as an interim measure. It may be easier for the government to legislate and promote regional change once regional operators have stated their intent to use LSDO.
- The private sector will want to know the public benefits of a fuel switch, as well as the policy direction that government intends to take, when developing a voluntary fuel switch initiative.
- The Hong Kong government must work with other administrations in the PRD region so that the regulation will be uniform region-wide. Regional plans such as the Pearl River Delta "Bay Area" concept are the backdrop for such agreements.
- Focusing on regulation in Hong Kong may be the best first step that this stakeholder group can make.
- An at-berth fuel switch using LSDO is an achievable target for Hong Kong.
- Once this regulation has happened, it will act as an example to other regional ports on ways to address these issues.
- Regulation is the most effective way of guaranteeing a level playing field across the PRD. This is critical to maintaining ports' competitiveness.
- The government may be unwilling to subsidize profitable activities such as shipping, although subsidies may be an effective way of introducing new initiatives that could lead to policy change.
- Fuel switching is very efficient because it reduces emissions where bunker fuel has the most negative impact on the population.
- The Hong Kong Government should announce a medium term regulation, and in anticipation of this regulation the private sector could implement its own voluntary fuel switch.

- Shipping companies are dependent on international regulations. International regulation means smoother operations, particularly when factors such as fuel quality and infrastructure fixes like those needed for shoreside power are concerned.
- Details surrounding a fuel switch will need to be developed, such as the distance from shore at which ships will be required to conduct the fuel switch.

Fuel supply:

- From the perspective of the fuel suppliers, a fuel switch programme for Hong Kong alone would not create sufficient demand for clean fuel sources here.
- With increased demand would come increased availability.
- Fuel providers are hesitant to commit to building additional refineries or transporting LSFO to supply the PRD region unless the shipping lines show that they are committed to purchasing the fuel and are able to estimate their consumption ahead of time.
- Technical discussions are still important at this point. For example, it may be possible for ships to use low sulphur automotive diesel oil (LSADO) instead of low sulphur fuel oil (LSFO). If it is easier to supply LSADO, it might be more beneficial for ship lines to use LSADO instead of LSFO. Hong Kong ferry lines have tested out switching to LSADO without technical problems, although some experienced increased costs aside from the fuel from purchasing lubricants needed to use with the LSADO.
- Making temporary fuel switches will increase the ship's operational complexity. Smaller shipping companies may not currently have the engineering expertise to make the fuel switching at sea, and will require supplementary training to do this safely.
- If demand for LSFO increases before refineries are properly equipped to supply increased volumes of the fuel, the cost for LSFO actually may increase, affecting the competitiveness of Hong Kong.

Recognition, Public Relations & Citizen Awareness:

- There is business value in being a green port.
- Shipping companies that raise industry norms will lead by example, and this may be an effective way of encouraging the shipping lines to improve their environmental performance.
- Pressure from consumers and citizens is another way to drive improvements. Ports in the US and Europe were able to drive regulation largely because of citizen pressure in seeking justice and demanding that the government regulate and companies use cleaner fuel. Hong Kong citizens need to be further educated about the health effects from ship and port activities in order to push the Hong Kong government to be more concerned about this issue.
- A "Green Label" programme that recognizes ships using cleaner technologies can give the ship lines a voluntary reason to begin fuel switching. This public recognition is very motivating for shipping lines. Shipping lines with high brand consciousness may feel more pressure to acquire such a "Green Label" to maintain or improve businesses as consumer pressure builds up, as has been the case in US and European ports.
- A "Green Label" could be rolled out by a public organization first, and through education, highlight the significance of the "Green Label" to the public and increase public's attention on this issue.
- Based on recent surveys, Hong Kong citizens are approaching a "tipping point" where they will begin to demand the government for improvements to the environment. This may help echo successes that citizens in Europe and the US have seen in improving air quality.

Pollution:

- The Mainland's priority is reducing emissions from power plants and land-based vehicles first, but reduction of ship emissions are already within their scope.
- Currently, retailers are working on the environmental effects of their manufacturing processes, and on carbon. PM and SO₂ typically fall between the cracks. Emissions from ships are conceptually farther removed from the end consumer than carbon emissions.
- There may be a public relations benefit from a fuel switch programme, but that such a programme should be done carefully so as not to chase away customers.
- Ultimately, the public will prefer companies with good environmental performance.
- More research needs to be done to quantify the emission improvement found due to fuel switching.

PLENARY DISCUSSION

The stakeholders reconvened following the small group discussions. The following is a summary of the ensuing discussion:

FUEL SWITCH AT BERTH IN HONG KONG

- Shipping representatives volunteered to draft a voluntary initiative to use distillate fuel at berth in Hong Kong waters.
- The EPD will move to introduce regulation within two years and prepare to convince the government about the benefits it will have on the public.
- By having the private sector and government working to take this next step, everyone has a role to play.
- Working with stakeholders across the PRD will be extremely important in order to simplify future regulation across the PRD, and as such not significantly harming Hong Kong's competitiveness.
- What happens in Hong Kong will be closely observed by Mainland ports, and may also be replicated there. Therefore some care must be taken to think through any such regulation.

OTHER ISSUES DISCUSSED**Recognition programs**

- Use "Green Labels" to, on one hand, incentivize ship lines to voluntarily begin fuel switching, and, on the other hand, educate and incentivize consumers to present pressure to companies.

Consumer & Citizen education

- A stronger civil society aware of the public health effects associated with emissions from ships would help government and the private sector to clean up operations.

Ports' efforts

- Regional ports are willing to work collectively to improve their environmental performance, with the understanding that government will create the regulation in this area.

Shipping lines

- The shipping lines want international regulation, or regional regulation that mimics international regulation in order to simplify operations.
- Standardization is a major concern, particular in relation to shoreside power and fuel standards.
- Public recognition of voluntary efforts is important.

Cargo Producers

- Cargo producers are willing to support a fuel switch, as the associated price increase will be passed on to the end consumer. Furthermore, because of the large volume of goods being transported, the increased fuel cost is negligible.

Fuel suppliers

- Current market demand for cleaner fuel in Hong Kong is currently too small to be profitable, but as demand increases, fuel suppliers can deliver. If shipping lines work together to increase demand, then the fuel suppliers would be able to support this movement.

CONCLUSIONS

This workshop ended with a groundbreaking verbal commitment by major shipping lines to work together to produce a voluntary initiative to use distillate fuel at berth in Hong Kong. This agreement will be drawn up over the next few months and announced to the public when completed.

While this agreement focuses on ships, other stakeholders have a role to play in ensuring the success of this initiative. The shipping lines are willing to draft this initiative with the understanding that regulation from Hong Kong will follow within no more than two years of the fuel switch coming into effect. Ports can also help encourage ships to use cleaner fuels, by voluntary initiatives of their own, such as “green label” recognition programmes and offering preferential treatment to these vessels, such as priority berthing. Cargo producers can also incentivize shipping lines to make the fuel switch by choosing participating shipping lines over others that decline to participate in the fuel switch.

The stakeholder group surrounding the shipping and port industries is diverse. This workshop has not focused on the pollutants emitted from other sources, such as local craft (eg, tug boats, barges, and other mid-stream operators), trucks, and cargo handling equipment. While certain regulations and programmes are in place to reduce emissions from these sources, there is still scope for further improvements.

Overall, this voluntary initiative is an excellent first step in improving Hong Kong’s air quality. It will be critical to leverage the momentum put in place by this initiative and extend the gains throughout the PRD region. This initiative will be in line with international regulation, to ease the transition to such agreements when eventually implemented in the region. Hong Kong is in an excellent position to use its strengths in monitoring, enforcement and implementation to show regional leadership on this issue.

Appendix I: Programme & Participating Organizations

SESSION 1: Introduction

2.00 Welcome: Christine Loh, CEO, Civic Exchange

SESSION 2: Leadership & Challenges

2.05 Towards Healthier Shipping: Veronica Booth, Researcher, Civic Exchange

2.15 Maersk Line's Fuel Switch Experiences: Tim Smith, Chief Executive, North Asia, Maersk Line

2.30 Q&A

2.40 Expert Responses

3.00 Q&A

SESSION 3: Anticipating regulation: Building a level playing field

3.30 Small group breakout session

4.15 Report back to plenary

4.30 Next Steps

SESSION 4: Summing Up

5.20 Summing up, thanks & close

Participating Organizations

BMT Asia
 BSR
 Carbon War Room, Virgin Management
 China Merchant Holdings
 Environmental Protection Department
 Exxon-Mobil
 Hamburg Sud Hong Kong Limited
 Hong Kong Container Terminal Operators Association
 Hongkong International Terminals
 Hong Kong Shipowners' Association
 Hong Kong University of Science and Technology
 Maersk
 Marine Department
 Modern Terminals
 MOL Asia Limited
 NYK
 OOCL
 Li & Fung Group
 Yantian International Container Terminals