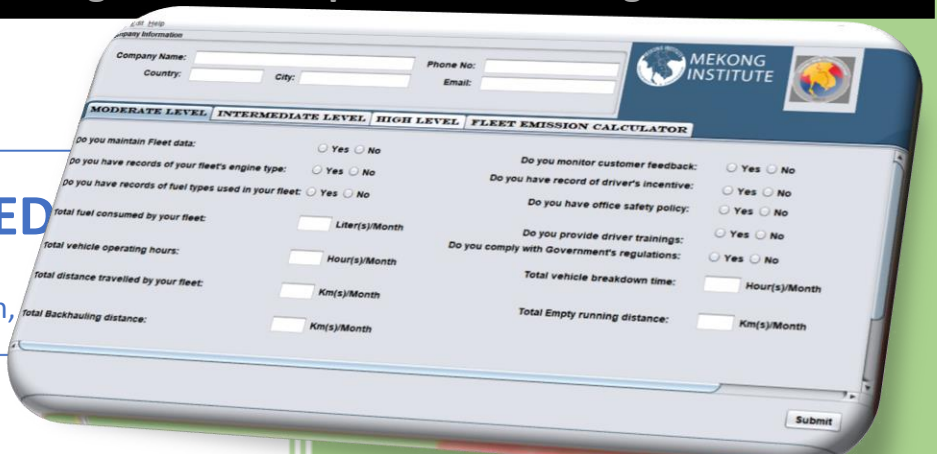
National Workshop on the Introduction of Green Logistics Quality Standard Software in Cambodia, Lao, Myanmar, Vietnam and Thailand

The Project on "Green Freight and Logistics Development in Mekong countries"

WORKSHOP PROCEED

August 29th to December 14th,



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Trade and Invest Facilitation (TIF) Department

Mekong Institute

December 2018

Executive Summary

As a part of the Project on “Green Freight and Logistics Development in Mekong countries”, five country workshops were held in the CLMVT countries namely Cambodia, Lao, Myanmar, Vietnam and Thailand starting from August 29th to September 14th, 2018. The workshops were held to introduce the Green Logistics Quality Standard software, developed in the Mekong Institute (MI).

The software, which introduces the Green Logistics Service Quality Standard (“Green Mark”) is integral part of the “Green Freight and Logistics Development in Mekong countries”, funded and supported by the Republic of Korea under the Mekong-ROK Cooperation Fund (MKCF).

The first workshop was organized in Phnom Penh, Cambodia on the 29th of August, 2018 in collaboration with the Ministry of Public Works and Transport, particularly the Genearl Department of Logisitcs. It was followed by the workshop in Vientien, Lao on 6th of September, 2018 supported by the Lao National Chamber of Commerce and Industry (LNCCI), which was followed by workshop in Myanmar at the office of the Myanmar International Freight Forwarders' Association (MIFFA) on the 7th September 2018 and finally in Thailand the workshop was organized at the office of Hazardous Substances Logistics Association (HSLA) on 14th September 2018. Similarly the last workshop was concluded in Directorate of Roads of Vietnam (DRVN) on the 14th of December 2018, which was supported by the DRVN and was held in their meeting hall with participants from the related departments and the Vietnam Automobile Transportation Association (VATA).

The workshop was mainly intended to introduce the Green Logistics Service Quality Standard (GLSQS) Auditor software. Which is a desktop application for that can be run in Windows, Linux, and Mac Operating Systems. It is a simple and easy software that facilitates self-assessment for the logistics providers in the CLMVT countries with their operational efficiencies in green logistics sector, and hence in general the Green Logistics and Freight practices.

The uniqueness of this approach is the assessment in various fields of company operations, like Organization, Procurement, Yard Waste Management, Fleet Operations and giving a holistic approach to the green service practices.

At the end of the workshop feedback and suggestions were collected from the participants which were in turn incorporated in the updated version of the software which in turn were given to the participants to further publicize the concept and the product.

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Background

Freight transportation is critical to businesses, consumers and the world economy. The freight sector moves vast volumes of goods, commodities, materials and food domestically and globally and is primary factor in economy and growth. But a goods movement comes with an impact on the global environment. It contributes a significant portion of air pollution and its contribution is expected to grow significantly in the coming years. Globally, carbon dioxide (CO) emissions from freight transport are growing more quickly than those from passenger vehicles. In particular, heavy duty vehicles are expected to be the largest emitter of CO2 from all transport modes by 2035.

Transport accounts for at least one fourth of total energy consumption in Asian countries and other parts of the world. Freight transport is also the major consumer of oil, of which most comes from freight transport. The significant impact freight transport has on environment has led to several initiatives by governments and private companies.

As the Asian economy continues to grow at a rapid pace, an increase in freight transport activity is also expected. It is estimated that by the year 2050, medium and heavy freight trucks worldwide will consume 1,240 billion liters of fuel, which is estimated at 138% more than 2000 levels. The global share of trucks operating within Asian countries is expected to increase from 19% in 2000 to 34% in 2050.

Some of the challenges that Asian countries must overcome to effectively address sustainability issues of the freight and logistics sector are policies and institutional arrangements, characteristics of the freight sector, technology and financing mechanism. Green freight has been included in the ASEAN strategic Transport plan 2016-2020. In May 2015, the UN Climate and Clean Air Coalition (CCAC) released Global Green freight Action Statement and Plan with the aim to enhance the environmental and energy efficiency of goods movement in ways that significantly reduce climate, health, energy and cost impacts of freight transport around the world.

With this backdrop, the Mekong Institute (MI) is implementing a three-year project on "Green Freight and Logistics Development in Mekong countries' funded by the Republic of Korea through the Mekong - Korea Cooperation Fund (MKCF). The long-term objective of the project is to reduce the cost of logistics and transport to improve economic performance in the five countries in Cambodia, Lao PDR, Myanmar, Vietnam and Thailand (CLMVT). This will eventually aid the transport sector to increase its contribution to economic development in the Mekong countries as well reduce its carbon footprint.

The long-term objective of the project is to reduce cost of logistics and transport for improvement in economic performance in the Mekong countries. This will eventually aid the transport sector to increase its contribution to economic development in the Mekong countries as well reduce its carbon footprint.

The short-term objectives of the project are to:

- Introduce 'green mark' standards in logistics service operations through building capacities of national agencies in the public and private sector;
- Design, develop and field test curriculum on green freight and logistics development;
- Build capacities of the Logistics Services Providers (LSPs) on green freight and logistics to comply with the 'green mark' certification;

- Create database on green technologies in logistics to access information by LSPs for a networking platform;
- Provide a regional platform for the Government agencies and Private sector involved in logistics development for collective action to promote green logistics in the Mekong countries.

Mekong Region

The Greater Mekong Subregion (GMS) Economic Cooperation Program has driven the development of cross border road infrastructure in the subregion. Between 1992 and 2015, more than $17 billion was invested in enhancing regional economic cooperation, of which 78% was dedicated to improving connectivity and development of road infrastructure. Improved logistics has become an increasing focus of transport policy in the Mekong region due to the strong link between logistics and economic performance.

An improved transport infrastructure has a direct impact on trade and logistics sector. The trade between countries in the Mekong region has seen an increasing trend over the past decade due to the opening up of Cambodia, Laos, Myanmar and Vietnam (CLMV) to trade through improved infrastructure and development cooperation among the Mekong countries. The freight and logistics sector have expanded significantly in the last two decades, largely due to rapid increases in exports in the Mekong region as a whole. In the last decade decades, the growth rate of merchandized exports in the region averaged 11% per annum, while that of merchandized imports was recorded at 9% per annum. Intra-regional trade has also increased –in 2015, total border/transit trade between Thailand and CLMV reached 566.1 billion baht.

In spite of the improvements in investments in infrastructure and improved trade, logistics costs in the Mekong region continues to be higher than other parts of the world—about 17% of the gross domestic product (GDP) in Thailand and 25% of GDP in Viet Nam, in contrast to less than 10% in most Organisation for Economic Co-operation and Development (OECD) countries. The transport infrastructure in the GMS has spurred an increase in transport and traffic and a corresponding increase in Greenhouse gas (GHG) emissions. The number of vehicles registered in the last 5 years has almost doubled and transport is responsible for 22% of energy related GHG emissions in the region.

With road transport continuing to dominate the logistics sector in the Mekong region, advanced logistics solutions and supply chain management are in demand among logistics companies looking for greater cost efficiency. Whereas inventory and holding costs have been decreasing year on year causing the overall cost of logistics to reduce, analyses of trends show that the cost of transport continues to grow.

Problem Statement

In the Mekong region, freight transport plays a crucial role in the expansion of trade and economic development. Within transport, freight transport is also a major emitter of GHG that cause climate change. More than 80% of goods are transported by roads in the GMS, mostly by truck fleets run by local service providers (LSP). Fuel costs are the major operating cost for these enterprises and contribute to logistics costs in the region being much higher than in other parts of the world. Fuel costs often account for 40% to 60% of the overall operating costs for road freight transport companies in the GMS[1].

The economic competitiveness and environmental performance of road freight LSPs is constrained by a number of issues. These include the predominance of truck fleets that are aged and fuel inefficient, inadequate logistics management capacity, low safety standards and weak driver training, and a lack of access to financial capital.

Another most common problem of logistics in the Mekong countries is the lack of knowledge on the sustainable logistics services. Service quality of LSPs is often low and at times unpredictable. In general, logistics companies offer only a limited service range and lack international network and competitiveness. Given this situation, it is difficult for LSPs to provide competitive logistics service even within their respective domestic market, not to speak in the regional or global markets. Implementation of WTO market access commitments has put further pressure on local LSPs in the Mekong countries to improve service quality and be more responsive to logistics standards requirements.

The logistics performance (i.e. the Logistics Performance Index) shows that Lao PDR, Thailand and Viet Nam were ranked at 118th, 35th and 53rd of 155 countries in terms of overall logistics performance, respectively. Thailand and Viet Nam received their lowest scores with respect to timeliness of logistics whereas quality of logistics service score was the weakest for Lao PDR. Logistics performance is directly related to the cost and efficiency of transport services.

In a study conducted by MI in collaboration with Asian Development Bank- Environmental Operations Centre (ADB-EOC)[2], observed that the modes of transport used for freight and logistics have a direct impact on efficiency. In terms of tonnage, the largest share of freight volumes is carried largely by road transport – around 79%, 84% and 71% of freight tonnage in Lao PDR, Thailand and Viet Nam respectively. Improvements in transport infrastructure in the GMS have spurred an increase in transport and traffic and a corresponding increase in GHG emissions. The number of vehicles registered in the last 5 years has almost doubled and transport is responsible for 22% of energy related GHG emissions in the subregion[3]. The adoption of

[1] Green Freight in the Greater Mekong Region- ADB-EOC 2015

[2] Carbon Neutral Transport Corridors: Reducing emissions from freight and forestry in the EWEC: ADB TA-6289 REG: Core Environment Program and Biodiversity Conservation Corridors Initiative in the Greater Mekong Subregion, 2012

[3] Green freight in the Greater Mekong Subregion, EoC ADB at http://www.gms-eoc.org/uploads/resources/685/attachment/Green%20Freight%20in%20the%20GMS.pdf

cleaner technologies is vital for the Mekong countries as many trucks especially in Laos, Myanmar, Vietnam and Cambodia are old and poorly maintained.

Objectives and Expected Outcomes

Objectives

In the Mekong countries the demand for freight and logistics will grow significantly in the coming years, and continue to play a significant role in driving economic growth through a strong linkage with trade and investment and thus contributing to poverty reduction in the region. Freight and logistics within the transport sector account for a significant portion of total energy use, which result a large share of CO2 emissions. Therefore, promotion of efficient, environmentally sustainable and safe freight transport is a development issue drawing attention from development partners, governments and business communities.

Green freight and logistics development programs in the Mekong countries can help address many of these issues, helping LSPs to become more competitive, and in doing so aiding the transport sector to increase its contribution to economic development in the subregion as well as reduce its carbon footprint.

The overall objective of the workshop is to:

- Introduce the Green Logistics Service Quality Standard '**Green Mark**' standards to project stakeholders in the government and private sector.
- Field testing the Green Logistics Service Quality Auditor (GLSQA) software the government agencies and the transport and logistics companies associated with the core logistics services such as, Freight, Warehouse, Cold Chains, Container Depots, Inland Container Depots, Trucking Companies, etc.
- Obtain feedback to improve upon the devised standard and the auditing software to incorporate in the final version of the system.
- Provide a complete set of requirements for the Green Logistics Service Quality Standards based on the devised Key Performance Indicators (KPI) in the software.
- A trial run of the software system by each participant and understanding its outputs.

Expected Outcomes

The workshop along with all its anticipated outcomes is expected to produce the following expected outcomes,

- A clear understanding of the various Key Performance Indicators (KPIs) for each level of quality standard by the concerned ministries and line agencies.
- A clear understanding of the various Key Performance Indicators (KPIs) for each level of quality standard by the transport and logistics companies associated with the core logistics services such as, Freight, Warehouse, Cold Chains, Container Depots, Inland Container Depots, Trucking Companies, etc.
- All the necessary requirements and feedback by the concerned government agencies, Logistics and Transport association and companies shared and collected to be incorporated in the final version of the software.

Participants

Five national workshops in Cambodia, Lao, Myanmar, Vietnam and Thailand was attended by 150 participants from the Governments, respective line ministry of land transport, autonomous ports, private companies including the Truck operators, Logistics company, Freight forwarders, and the respective associations the FNCCI in Lao, Myanmar International Freight Forwarder's Association (MIFFA), Ministry of and Transport and Communication, Myanmar Highway Freight Transportation Services Association and Myanmar Container Truck Association, in Myanmar. Similarly, in Vietnam…… In Thailand ….


Cambodia


Myanmar


LAO PDR

Workshop Summary

The country workshop was conducted with the intention of introducing the Green Logistics Service Quality Standard (GLSQS) Auditor software. Which is a desktop application for that can be run in Windows, Linux, and Mac Operating Systems. It is a simple and easy software that facilitates self-assessment for the logistics providers in the CLMVT countries with their operational efficiencies in green logistics sector.

The country workshops were carried in the CLMT countries starting from 29 August, 2018 starting from Cambodia to 14 September 2018 in the Thailand. The one-day workshop consisted of three sessions, starting with the Introduction to Green Logistics Service Quality Standards "Green Mark". Giving the background, objectives, benefits of setting or complying with the standard and the current situations and standards prevalent in the GMS regions.

Then the session was followed by the introduction to Key Performance Indicators (KPIs), validation of draft KPIs and the categories that were set by the standards, namely

- Organization
- Procurement
- Yard Waste Management
- Fleet Operations

Ms. Parichart would present the first session starting with the concept of how being green related to fuel efficiency. A number of scenarios shown to point out a difference between effective and ineffective fleet. Ms. Parichart, then, summarized that the more fuel consumed, the more greenhouse gas emitted. That is to be greener freight is to be more fuel-efficiency which leading to the concept of save fuel, save energy, save money, to ultimately save the planet.

Next, she introduced 6 major factors need to be considered for transport operation in order to being fuel efficiency; consisting of, route planning and scheduling, route compliance, vehicle utilization, vehicle maintenance, driver behavior, and monitoring and measurement. More details of each factor provided for more understanding on fleet management for fuel efficiency. On the other hand, Ms. Parichart explained that we can assess green logistics performance measurement to see how well we can apply those 6 factors to fleet. The assessment is divided into 5 topics which are yard operation, transport operation, maintenance, procurement and organization. Ms. Parichart presented the 5 topics in details and highlighted on how these are important to green freight operation. After that Ms. Parichart introduced Green Mark as Green Logistics Service Quality Standards (GLSQS). She highlighted a number of benefits of being Green Mark member. Green Mark' certification is classified into 3 levels; intermediate, moderate, and high. These levels will reflect level of performance of each fleet in 5 areas of management which Ms. Parichart presented.

Finally, Ms. Parichart provided case study scenarios for attendees to practice on transport operation KPIs. After case study session, she provided more details in KPIs and Green Mark measurement each level. She finally identified that the Green Mark certification, not only benefits to better environment, but also can lead to Carbon credit claim to the organization.

The second session was delivered by Mr. Saurav Dahal, software developer from the Mekong Institute. He introduced the audience about the software, how to install it, how to use it, its various modules namely, Organization, Procurement, Yard Waste Management, Fleet Operations and Vehicle Emission

Calculator. He should users what KPIs are available in each module and what each of them meant and what kind to values were to be inserted in each. Mr. Saurav also demonstrated how to generate Green Mark report and the GHG Emission summary report from respective modules and how to interpret the results. Mr. Saurav then walked the participant through the installation process to filling each module and generating report and saving it in their computer.

The third session was also facilitated by Mr. Saurav and consisted about the feedback/requirements/customization on each module of the software. Each participant was asked for their feedback on additional features and report requirements, how easy or hard they felt using the software. What were the additional features they require or and any addition/deletion of KPIs which are not relevant to specific country and also if the KPIs were many or hard to understand, etc. All of the feedbacks were collected along with the post- assessment form by the MI officers and were integrated in the update of the software program to build the GLSQSA2.0.0.

The Software program is uploaded in the website of the Mekong Institute along with the user manual, which can be downloaded following the procedures described in the Appendix 4 of this report.

Workshop in Cambodia

On August 29th, 2018 the country workshop was conducted in the Cambodia, at the General Department of Logistics, Ministry of Public Work and Transport (MPWT), Phnom Penh. The workshop supported by the Department of General Logistics, took place in the meeting hall of the department. The chief guest His Excellency Director General of the directorate, Mr. Chhieng Pich opened the training formally among the 40 participants from different sectors, logistics, transport, port, government, etc. He emphasized the involvement more from public and private sector including Ministry of Environment, Custom office, Ministry of Commerce and Industry, Bus Association and Trucking Association (CAMTA). GDL may facilitate to contact those lines of ministries and associations.

The first session was started by Ms. Parichart, who introduced Green Mark and fuel efficiency approach for logistics company by pointing out that being green freight relating to fuel efficiency. Ms. Parichart presented all the 32 attendees the difference of being well managed fleet with planned route, light traffic, full-load truck, completed delivery to customer and less fuel consumed fleet, comparing to the poor one. This is directly connected between consuming less fuel, the less CO2 emitted. Ms. Parichart suggested the concept of save fuel, save energy, save money, to ultimately save the planet.

Ms. Parichart described six major factors leading to fuel efficiency for transport operations; consisting of route planning and scheduling, route compliance, vehicle utilization, vehicle maintenance, driver behavior, and monitoring and measurement. She presented route planning and scheduling in detail on how it can help fleet better in optimizing distance for customer delivery, especially multiple-drop. Ms. Parichart hinted good tips to achieve effective route planning. Next, Ms.

Parichart explained the rest factors; route compliance, vehicle utilization, vehicle maintenance, driver behavior and transport operation monitoring and measurement.

Next, Ms. Parichart summarized those six factors on fuel efficiency that can be grouped into 5 topics for green logistics performance measurement, which are yard operation, transport operation, maintenance, procurement and organization. Ms. Parichart presented the 5 topics in details and highlighted on how these are important to green freight operation.

Ms. Parichart introduced Green Mark as Green Logistics Service Quality Standards (GLSQS). She highlighted a number of benefits of being Green Mark member. Green Mark' certification is classified into 3 levels; intermediate, moderate, and high. These levels will reflect level of performance of each fleet in 5 areas of management which Ms. Parichart presented. Then Ms. Parichart showed example of measurement forms in each area which determined in 3 levels. In conclusion, Ms. Parichart presented the importance of fuel efficiency which is a fundamental to all transport operation practice and will lead to green freight.

Mr. Saurav, introduced and explained the use and how to operate the GLSQS software in five areas of company operations, namely, yard management, transport operation, maintenance, procurement and organization along with the KPI related to it and how to fill them and generate a report with three levels of the Green Logistics Service Quality Standard, and also the Green House Emission (GHG), emissions from each vehicle they have and how to generate the summarized report of the total emissions, viz., CO2, CO, CH4, NOx, Vox, PM, etc. GLSQS software was presented to all attendees. Installation method was shown how it is easily installed and user friendly. Company information would be collected and assessed to the 3 different levels; intermediate, moderate, and high. An example of assessment form by each level was presented to attendees. The program also contained fleet emission calculator for company to evaluate current performance. The company can refer to this result to improve to higher level of transport operation and definitely, level of Green Mark which will result in Carbon credit claim.

The following points were concluded at the end of the last session by the participants and the organizers.

- The reality that most of the logistic operator in Cambodia is SMEs and lack of human resource ability should also be taken into consideration when introducing the software.
- Policy to give incentives to private sectors actively doing improvement should also be formulated by government.
- Some of the indicators/measurements in the software program are complex and technical in nature and the companies are not able to fill it or quite understand it. With regards to this problem, MI software developer will modify according to the participant's suggestions, to make it simpler and more understandable.
- Some participants are also willing to know, what next after the output of the software program are being created. Will MI issue the certification "Green Mark" to the company?
- The software program might need to be customized as per country specific requirements.
- Since most of the transport companies are family based and are working or managing their day to day activities with pencil and paper, it is complicated for them to use the software at one. Hence, they want need some time to organize the basic information asked by the software, like number and kinds of fleet according to the fuel used and engine types, idling time, breakdown hours, backhauling distances, etc.
- Since the concept of green logistics is pretty new for these SMEs, they need some time to comprehend the concepts and realize the importance and usability of the software.
- Some government authorities like the Port Authorities are confused about the various standards used to benchmark their performances and want to work on establishing their own standards according to the condition of their country.

Workshop in Laos

The workshop in Lao was organized at Vientiane on the September 5th, 2018 in the Lao National Chamber of Commerce and Industry (LNCCI). There were 17 participants in total from the public sector and private sector including Department of Transport (MPWT), state-owned company like the LAO airlines and private enterprises.

The training started with an opening remark from Mr. Robby of MI welcoming and explaining the objective of the workshop to the participants. The second session started with Ms. Parichart introducing Green Mark and fuel efficiency approach for logistics company by pointing out that being green freight relating to fuel efficiency. Ms. Parichart shown all the attendees the difference of being well managed fleet with planned route, light traffic, full-load truck, completed delivery to customer and less fuel consumed fleet, comparing to the poor one. This is directly connected between consuming less fuel, the less CO2 emitted. Ms. Parichart suggested the concept of save fuel, save energy, save money, to ultimately save the planet.

Ms. Parichart described six major factors leading to fuel efficiency for transport operations; consisting of route planning and scheduling, route compliance, vehicle utilization, vehicle maintenance, driver behavior, and monitoring and measurement. She presented route planning and scheduling in detail on how it can help fleet better in optimizing distance for customer delivery, especially multiple-drop. Ms. Parichart hinted good tips to achieve effective route planning. Next, Ms. Parichart explained the rest factors; route compliance, vehicle utilization, vehicle maintenance, driver behavior and transport operation monitoring and measurement.

Next, Ms. Parichart summarized those six factors on fuel efficiency that can be grouped into 5 topics for green logistics performance measurement, which are yard operation, transport operation, maintenance, procurement and organization. Ms. Parichart presented the 5 topics in details and highlighted on how these are important to green freight operation.

Ms. Parichart introduced Green Mark as Green Logistics Service Quality Standards (GLSQS). She highlighted a number of benefits of being Green Mark member. Green Mark' certification is classified into 3 levels; intermediate, moderate, and high. These levels will reflect level of performance of each fleet in 5 areas of management which Ms. Parichart presented. Then Ms. Parichart showed example of measurement forms in each area which determined in 3 levels.

The second and last session was facilitated by Mr. Saurav introduced and explained the use and how to operate the GLSQS software in five areas of company operations, namely, yard management, transport operation, maintenance, procurement and organization along with the KPI related to it and how to fill them and generate a report with three levels of the Green Logistics Service Quality Standard, and also the Green House Emission (GHG), emissions from each vehicle they have and how to generate the summarized report of the total emissions, viz., CO2, CO, CH4, NOx, Vox, PM, etc. GLSQS software was presented to all attendees. Installation method was shown how it is easily installed and user friendly.

Company information would be collected and assessed to the 3 different levels; intermediate, moderate, and high. An example of assessment form by each level was presented to attendees. The program also contained fleet emission calculator for company to evaluate current performance. The company can refer to this result to improve to higher level of transport operation and definitely, level of Green Mark which will result in Carbon credit claim. However, most of attendees are from local logistics companies in SME level. The companies are not well formally organized and designed, therefore, they should mainly focus on collecting data and setting the right KPIs for reforming. This will help company to reorganize operation base and finally lead to green fleet.

The following points were concluded at the end of the last session by the participants and the organizers.

- Policy to give incentives to private sectors actively doing improvement should also be formulated by government.
- Some of the indicators/measurements in the software program are complex and technical in nature and the companies are not able to fill it or quite understand it. With regards to this problem, MI software developer will modify according to the participant's suggestions, to make it simpler and more understandable.
- The software program might need to be customized as per country specific requirements.

- Since the concept of green logistics is pretty new for these SMEs, they need some time to comprehend the concepts and realize the importance and usability of the software.
- The manager of the airport authority of Lao, was excited about the software and was very happy to know that he could use it to track the emission of each shuttle-bus, and other support vehicles used in the airport and easily calculate the various GHG emissions produced by these vehicles.
- The SMEs and the governmental officials alike liked the new concept of the KPIs in the various managerial and operational sectors of the logistics development. But also, were interested that the government in future would devise some standard that is based on the ground condition so the Lao PDR.

Workshop in Myanmar

Workshop on GLSQS software introduction was attended by 21 participants from public sector and private sector including Road Transport Department (MOTC), Highway Truck Association, Container Truck Association and private enterprises, at the Myanmar International Freight Forwarders' Association

Mr. Robby delivered welcoming remarks and explained the objective of the workshop (MIFFA) among the participants and then the concept of Fuel Efficiency Approaches for Logistics Companies was introduced to the attendees. 6 main factors need to be considered for transport operation in order to achieving green freight. Ms. Parichart explained six major factors leading to fuel efficiency for transport operations; consisting of route planning and scheduling, route compliance, vehicle utilization, vehicle maintenance, driver behavior, and monitoring and measurement. She went through details each factor and also hinted good tips to achieve effective route planning.

Ms. Parichart led to next part of performance assessment. She explained that we can evaluate fleet performance through 5 areas of operations; yard operation, transport operation, maintenance, procurement and organization. Ms. Parichart presented the 5 topics in details. She pointed that housekeeping is important rule for yard operation to keep things well organized to smoothly and safely support efficient transport activities. Transport operation seems to be the most important part which operation cost is mainly generated from area. Lastly, Ms. Parichart introduced Green Mark as Green Logistics Service Quality Standards (GLSQS). She highlighted a number of benefits of being Green Mark member as follows; getting a partnership program, which evaluates, assess, benchmarks performance and seeks for point of improvement, and definitely, a guideline to cost efficiency for fleet operation.

Ultimately, attendees were interested in the software and seeking opportunity for more financial benefit. The concept of fuel efficiency leads to cost efficiency and green environment, which can attract attendees to participate the Green Freight program. The second session started with Mr. Saurav introducing and explaining the use and how to operate the GLSQS software in five areas of company operations, namely, yard management, transport operation, maintenance, procurement and organization along with the KPI related to it and how to fill them and generate a report with three levels of the Green Logistics Service Quality Standard, and also the Green House Emission (GHG), emissions from each vehicle they have and how to generate the summarized report of the total emissions, viz., CO2, CO, CH4, NOx, Vox, PM, etc.

The third session was also facilitated by Mr. Saurav and consisted about the feedback/requirements/customization on each module of the software. Each participant was asked for their feedback on additional features and report requirements, how easy or hard they felt using the software. What were the additional features they require or and any addition/deletion of KPIs which are not relevant to specific country and also if the KPIs were many or hard to understand, etc. All of the feedbacks were collected along with the post- assessment form by the MI officers and were integrated in the update of the software program to build the GLSQSA2.0.0.

The following points were concluded at the end of the last session by the participants and the organizers

- Some indicators in the software program are not understandable for some participants, as they are quite technical in nature and focused mainly to the Truck operators. So, they would like to simplify the KPIs used in the software.
- Also, the KPIs are too many as it deals with technical nature of the operations and trucking serv ices, it is hard for general trucking manager, or owner to understand them all and most of the time due to the small nature of the business is not possible to capture it.
- Some of the indicators/measurements in the software program are not fully comply with the company condition. With regards to this problem, MI software developer will modify according to the participant's suggestions.
- The software program might need to be customized as per country specific KPIs, which should be developed by the government authorities in the respective countries, according to the road

conditions, the types of road, fuel used and the other environmental factors as per the country conditions.

Workshop in Thailand

Workshop in Thailand was organized in Bangkok at the office of Hazardous Substances Logistics Association (HSLA) on September 14th, 2018. There were 15 participants in total, from logistics sector, trucking companies, freight forwarders, representative from the Department of Land Transport and Department of Industrial Work and Dangerous Goods experts.

The opening remark was delivered by the director of the Department of Industrial Work, Mr. Prasart Rakpanichsiri, he highlighted on the importance of standardization, the Q-Mark in Thailand and the concept of KPI, which is quite new and interesting to explore.

The first session was started by Ms. Parichart introducing the Green Mark and fuel efficiency approach for logistics company by pointing out that being green freight relating to fuel efficiency. Ms. Parichart shown the difference of being well managed fleet with planned route, light traffic, full-load truck, completed delivery to customer and less fuel consumed fleet, comparing to the poor one. This is directly connected between consuming less fuel, the less CO2 emitted. Ms. Parichart suggested the concept of save fuel, save energy, save money, to ultimately save the planet.

Ms. Parichart explained six major factors leading to fuel efficiency for transport operations; consisting of route planning and scheduling, route compliance, vehicle utilization, vehicle maintenance, driver behavior, and monitoring and measurement. Route planning and scheduling can help fleet better in optimizing distance for customer delivery, especially multiple-drop. Effective planning also can shorten lead time by consolidating and analyzing traffic data. Route survey, additionally, is important to scheduling to pre-alert on road condition and route updated. In order to achieve this, customer coordination is required to wasting time getting to customer's site and to shorten time spent at customer's site by reducing idling, loading/unloading and waiting time.

Ms. Parichart hinted good tips to achieve effective route planning as following; always being full-truck loaded, getting the right tracking system, managing less distance per drop, per trip, per nominal load, and keep communicating between you and your customers. Next, Route compliance is to ensure that the plan is correctly followed, however, it is important to review route criteria from time-to-time such as payload allowed each route both outer and inner city, payload each vehicle in fleet, map updated, new ship-to, etc. Then Ms. Parichart described another widely used transport KPI which is vehicle utilization. It is what need be done since the first start on transport business. It is crucial to select the right type and size of vehicle to your transport operation. Payload, dimension, physical condition, type of parcel/item, and so on are information relating vehicle selection which will bring about efficiency transport operation as they must be match to nature of business or that transport activities.

Completed preventive maintenance as planned is the core of vehicle maintenance to increase vehicle reliability. In higher level of competitive fleet, type of refrigerant, lubrication oil and greases relate to environmental impact. Selecting an environmentally-friendly type can reduce greenhouse gas emission. In addition, good tire maintenance can avoid breakdown and increase fuel efficiency. According to the U.S. Department of Energy, for every one PSI drop of tire pressure in all four tires under the recommended number, gas mileage can worsen .3 percent. Driver behavior is contributing to higher fleet efficiency as safety behavior can avoid unnecessary loss both financial and life. Also, there are some tips for fuel save driving which driver can follow to reduce fuel consumed. Lastly, transport operation Monitoring and

Measurement is to check your fleet's health by select the right KPIs and setting the right target on them, assess your daily performance and keep monitoring to seek rooms of improvement.

Next, Ms. Parichart summarized those six factors on fuel efficiency that can be grouped into 5 topics for green logistics performance measurement, which are yard operation, transport operation, maintenance, procurement and organization. Ms. Parichart presented the 5 topics in details. She pointed that housekeeping is important rule for yard operation to keep things well organized to smoothly and safely support efficient transport activities. What needs to be considered are waste management; waste from maintenance, consumable spare parts; engine oil, vehicle fluid, tire, including waste from office, water treatment, etc. Transport operation is the largest part because it seems to be the most impact to the strategy as majority of CO2 emission is from transportation activities. Operational process should be compliance to the green strategy. Performance should be monitored on regular basis and evaluated for improvement. So, this is mostly related to fleet current process and its KPIs. As Ms. Parichart highlighted in vehicle maintenance. 100% completed preventive maintenance plan, not only increases safety performance of that vehicle, but also extend life cycle with lower vehicle break down possibility. This can result in lower wasting energy and unnecessary mileage of that vehicle. Measurement in Procurement and Organization can prove the level of green strategy implemented in an organization as a whole. This will mainly focus in high level of green mark only because this takes a coordination of all employees for example, total energy consumption including electricity for office, office waste management, CSR programs, etc.

Ms. Parichart introduced Green Mark as Green Logistics Service Quality Standards (GLSQS). She highlighted a number of benefits of being Green Mark member as follows; getting a partnership program, which evaluates, assess, benchmarks performance and seeks for point of improvement. 'Green Mark' can be used as a tool to improve transport operation for higher certified level. Getting attention and earning public recognition on 'Green Mark' certification. Becoming a member will receive news and information from international sources and also invitation to related activity, seminar, workshop and development programs from Mekong Institution on logistic industry. Green Mark' certification is classified into 3 levels; intermediate, moderate, and high. These levels will reflect level of performance of each fleet in 5 areas of management which Ms. Parichart presented. Then Ms. Parichart showed example of measurement forms in each area which determined in 3 levels. She provided more details in KPIs and Green Mark measurement each level. She finally identified that the Green Mark certification, not only benefits to better environment, but also can lead to Carbon credit claim to the organization.

Mr. Saurav, introduced and explained the use and how to operate the GLSQS software in five areas of company operations, namely, yard management, transport operation, maintenance, procurement and organization along with the KPI related to it and how to fill them and generate a report with three levels

of the Green Logistics Service Quality Standard, and also the Green House Emission (GHG), emissions from each vehicle they have and how to generate the summarized report of the total emissions, viz., CO2, CO, CH4, NOx, Vox, PM, etc. GLSQS software was presented to all attendees. Installation method was shown how it is easily installed and user friendly. Company information would be collected and assessed to the 3 different levels; intermediate, moderate, and high. An example of assessment form by each level was presented to attendees. The program also contained fleet emission calculator for company to evaluate current performance. The company can refer to this result to improve to higher level of transport operation and definitely, level of Green Mark which will result in Carbon credit claim.

In the last session of walkthrough and discussion and feedbacks were collected by Mr. Saurav. He also presented the importance of fuel efficiency which is a fundamental to all transport operation practice and will lead to green freight. Attendees were from both private and public organization. A representative of Department of Transportation agreed on relation between Fuel Efficiency and Saving energy with cost reduction which leading to Green Mark. The private organizations were both SMEs and large companies. Feedback from this group of attendees are focusing on fleet management tools for performance evaluation. A simple program for SMEs, while, a software for analytical level for larger companies. The attendees, moreover, suggested that it would benefit more if the software can analyze data and provide analytical graph. The attendees also added more opinions in this session, for example, Certificate for participants of Green Mark program, Manual for Carbon credit calculation, and a support or subsidiary by the Government on Green Freight participant. Mekong Institute will apply Green Mark software to assess level of the company into intermediate, moderate, and high which will help the company collecting required data and information. However, there are feedback on the implementing different benchmark to different countries due to a difference in industry standard. In addition, those KPIs could be more specific by business activities in the logistic industry.

The following points were concluded at the end of the last session by the participants and the subject experts,

- The software program might need to be customized as per country specific requirements, that is the KPIs are based on the US or Euro standards, however due to the very specific nature of the country conditions they need to be devised by the concerned government authorities in each country.
- The participants find that the software program is user friendly and easy to use.
- Since the logistics operator in Thailand are quite well organized and large operatives as compared to the other CLMVT countries it is easy for them to gather all the KPIs presented in the software.
- The logistics providers in the Thailand also have their own software with huge databases like Oracle and a full-fledge tracking system, they would like to see a web-based system where they can store the KPIs for each month and analyze them and make graphical representation of them and track their improvement in various indicators.
- Some of the logistics and dangerous goods expert who attended the workshop were happy to see the new approach of green efficiency tracking through KPIs, however they suggested that the KPIs should be dig deeper to give more insight into the performance and also devising our own KPI standard by factorizing with some offsets according to the respective countries.
- In addition, Mr. Prasart Rakpanichsiri the director of the DLW, Thailand said he was impressed by the concept of KPIs assessment and would like to discuss it with his department on how to incorporate it into the Q-Mark standard assessment in the future.

- Some of the participant suggested that the "Green Mark", should be sustainable, and so some regulatory authority should give the mark as like the Q-Mark from department of Land Transport.
- Participant also suggested that in order to motivate the entrepreneur to participate on Green Logistics standard, it should have clear tangible benefit that the company can get once they comply to the green standard in the future.

Workshop in Vietnam

Workshop on GLSQS software introduction was attended by 15 participants from public sector and private sector including the Ministry of Transport: Transport department, Environment Department and Information Technology Center. Also, in the participants were members from the Viet Nam Register Administration/DRVN, Head of the VATA association, Deputy head of Foreign Affairs VATA, etc.

Ms. Nguyen Thi Nguyet Nga of DRVN delivered a welcoming remark and welcomed participants while the opening remarks were delivered by Mr. Nguyễn Văn Quyền, the head of VATA association and former directory of DRVN. After that a welcome and thanks speech was delivered on behalf of the Mekong Institute by Mr. Saurav Dahal, who also explained about the project by the MKCF cooperation fund the objectives of the program and the software. It was followed by a short introduction of Ms. Parichart, a consultant of MI among the participants.

The first session was started then, with Ms. Parichart introducing among the participants the concept of Fuel Efficiency Approaches for Logistics Companies. Six main factors need to be considered for transport operation in order to achieving green freight. Ms. Parichart explained six major factors leading to fuel efficiency for transport operations; consisting of route planning and scheduling, route compliance, vehicle utilization, vehicle maintenance, driver behavior, and monitoring and measurement. She went through details each factor and also hinted good tips to achieve effective route planning.

Ms. Parichart led to next part of performance assessment. She explained that we can evaluate fleet performance through 5 areas of operations; yard operation, transport operation, maintenance, procurement and organization. Ms. Parichart presented the 5 topics in details. She pointed that housekeeping is important rule for yard operation to keep things well organized to smoothly and safely support efficient transport activities. Transport operation seems to be the most important part which operation cost is mainly generated from area. Lastly, Ms. Parichart introduced Green Mark as Green Logistics Service Quality Standards (GLSQS). She highlighted a number of benefits of being Green Mark member as follows; getting a partnership program, which evaluates, assess, benchmarks performance and seeks for point of improvement, and definitely, a guideline to cost efficiency for fleet operation.

Ultimately, attendees were interested in the software and seeking opportunity for more financial benefit. The concept of fuel efficiency leads to cost efficiency and green environment, which can attract attendees to participate the Green Freight program. The second session started with Mr. Saurav introducing and explaining the use and how to operate the GLSQS software in five areas of company operations, namely, yard management, transport operation, maintenance, procurement and organization along with the KPI related to it and how to fill them and generate a report with three levels of the Green Logistics Service Quality Standard, and also the Green House Emission (GHG), emissions from each vehicle they have and how to generate the summarized report of the total emissions, viz., CO2, CO, CH4, NOx, Vox, PM, etc.

The third session was also facilitated by Mr. Saurav and consisted about the feedback/requirements/customization on each module of the software. Each participant was asked for their feedback on additional features and report requirements, how easy or hard they felt using the software. What were the additional features they require or and any addition/deletion of KPIs which are not relevant to specific country and also if the KPIs were many or hard to understand, etc. All of the feedbacks were collected along with the post- assessment form by the MI officer.

The following points were concluded at the end of the last session by the participants and the organizers

- Some indicators in the software program are not understandable for some participants, as they are quite technical in nature and focuses mainly on the Truck operators. So, they would like to simplify the KPIs used in the software or for the time being they can focus on the relevant ones.
- Some of the KPIs are the outcomes of final calculation of values, so it was general consensus of the participants that those KPI were to be calculated separately by them before they can input it into the software system.
- Also, the KPIs are too many as it deals with technical nature of the operations and trucking serv ices, it is hard for general trucking manager, or owner to understand them all and most of the time due to the small nature of the business is not possible to capture it.
- The participant found the software system very useful in calculating the actual GHG emissions for all of their vehicle.
- However, there are few KPIs which are not tracked by the business owners as yet, so they need to track those KPIs in the future if they wanted to work on the software.
- The software program might need to be customized as per country specific KPIs, which should be developed by the government authorities in the respective countries, according to the road conditions, the types of road, fuel used and the other environmental factors as per the country conditions.
- The emission factors used in the software are based on the US and the EU standards so can they be directly relevant to the conditions of the GMS countries was a concern of some government participants.
- The participants also pointed a need by their respective government to identify and set a threshold level of emission relevant for their own country.
- Also, the participants especially the government sector wanted to see how the other GMS countries are implementing their green initiatives, so that they can learn and replicate it according to their own conditions.
- The Vietnamese participants, particularly the DRVN participants suggested that more workshops like these should by organized by the local authorities and the transportation associations so that the concept of green logistics would be spread to a wide range of audience.

Pre-Post Workshop Evaluation

Cambodia

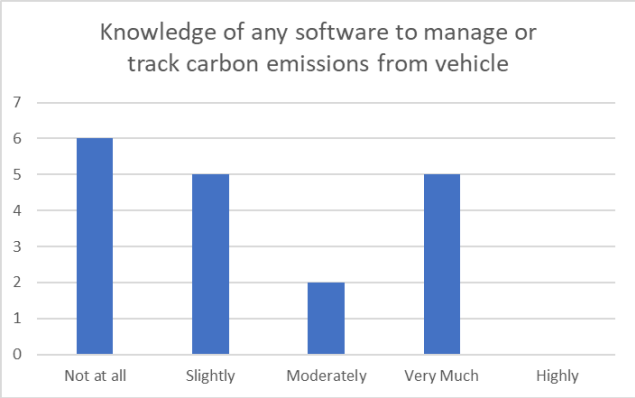
Country	Cambodia	
Date	29-Aug-18	
Venue	Ministry of Public Works and Transport, Directorate of General Land Transport	
Total Participants	30	

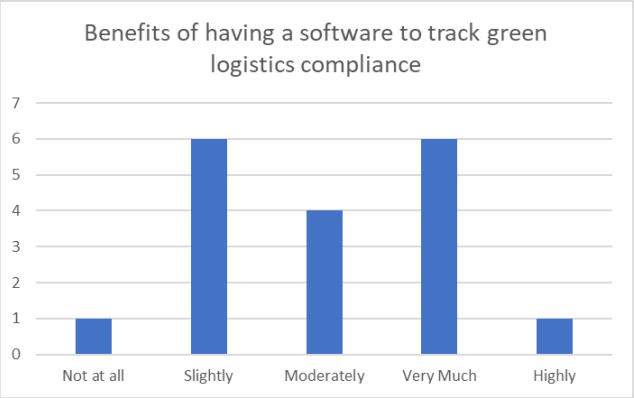
Respondent Types	Includes
Government	Department of Logistics
	Department of Logistics Information
	Ministry of Public works and transport
	General Department of Land Transport
	Railway Department
Ports	Phnom Penh Autonomous Port
Logistics Company	Private Logistics, Freight, Trucking, etc. companies

Pre-Evaluation

Pre Assessment						
Respondent Type	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**
Government	2	3	4	3	4	3
Government	3	4	4	4	5	5
Logistics Company	1	2	3	3	4	1
Logistics Company	2	2	2	2	3	3
Government	3	3	3	3	3	3
Logistics Company	1	3	3	3	3	3
Logistics Company	1	1	1	1	4	2
Government	1	2	2	2	4	5
Ports	4	4	4	3	4	3
Logistics Company	2	2	2	2	2	2
Logistics Company	1	2	2	2	3	5
Government	2	3	3	3	3	3
Logistics Company	4	4	3	3	4	4
Logistics Company	4	4	4	4	4	5
Ports	1	2	1	1	3	2
Government	4	4	4	4	3	4
Ports	4	4	4	4	3	3
Logistics Company	2	5	3	2	5	1
Government	3	4	3	3	3	3
Logistics Company	2	3	3	2	3	3

Result Q1-Q6


Knowledge of any software to manage or track carbon emissions from vehicle
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
7
6
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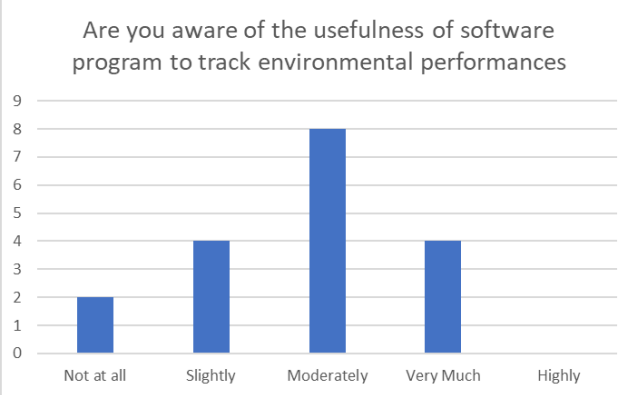
Not at all
Slightly
Moderately
Very Much
Highly


Are you aware of the usefulness of software program to track environmental performances
9
8
7
6
5
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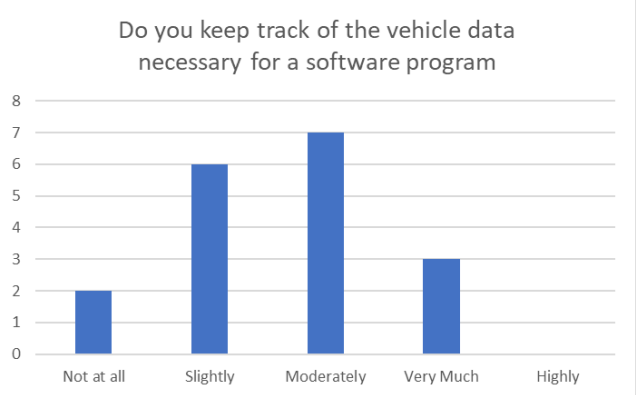
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
8
7
6
5
4
3
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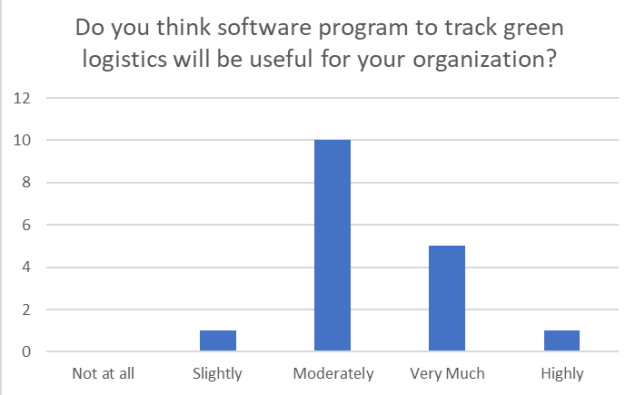
Not at all
Slightly
Moderately
Very Much
Highly


Do you think software program to track green logistics will be useful for your organization?
12
10
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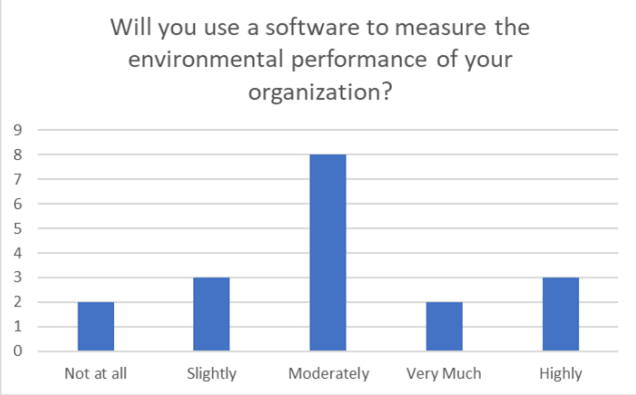
Not at all
Slightly
Moderately
Very Much
Highly


Will you use a software to measure the environmental performance of your organization?
9
8
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3
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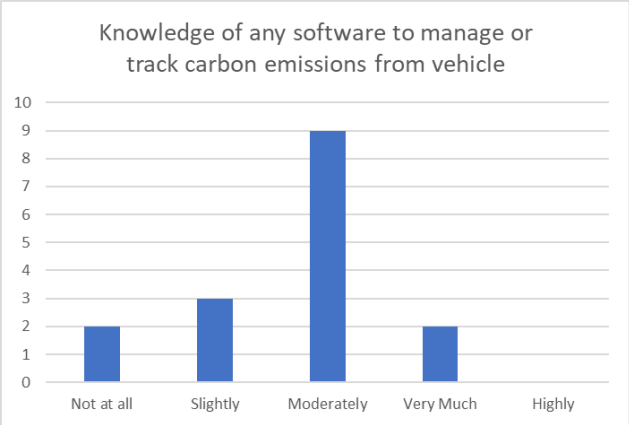
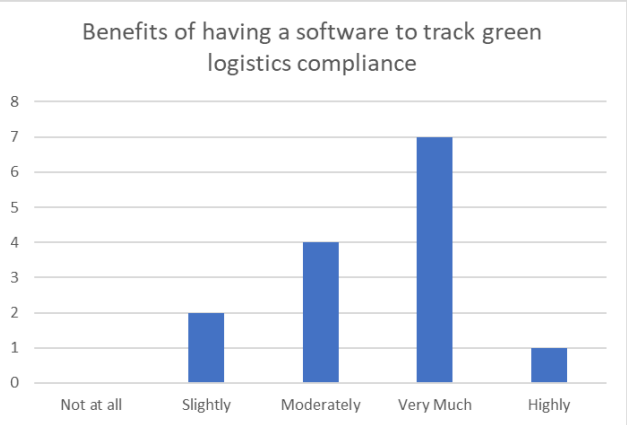
1
0
Not at all
Slightly
Moderately
Very Much
Highly

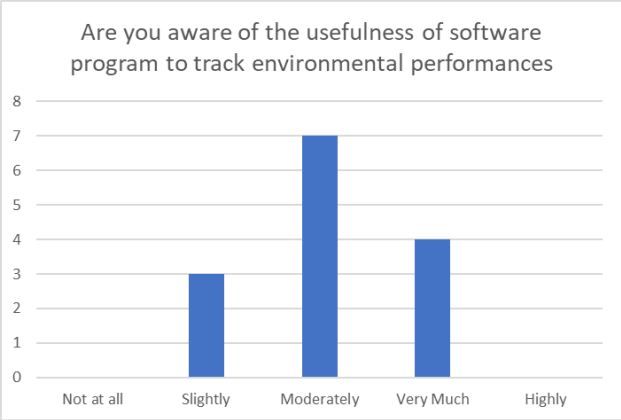
Post-Evaluation

Post Assessment						
Respondent Type	**Q1.**	**Q2.**	**Q3.**	**Q4.**	**Q5.**	**Q6.**
Logistic Company	3	4	3	4	3	2
Logistic Company	3	4	4	4	4	4
Logistic Company	1	2	2	1	1	1
Logistic Company	1	3	3	3	3	3
Logistic Company	4	4	4	4	3	4
Logistic Company	2	3	3	3	3	4
Logistic Company	3	5	3	4	3	3
Logistic Company	3	4	3	4	4	3
Government	3	4	4	3	4	4
Government	3	4	3	4	3	3
Government	2	4	4	3	3	4
Government	3	3	3	3	3	3
Ports	3	4	2	2	3	3
Ports	4	4	4	4	3	3
Logistic Company	3	3	3	3	3	3
Ports	3	2	2	3	2	2

Result Q1-Q6






Are you aware of the usefulness of software program to track environmental performances
8
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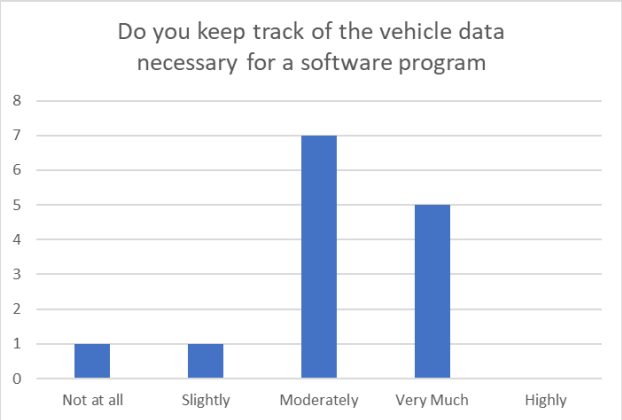
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
8
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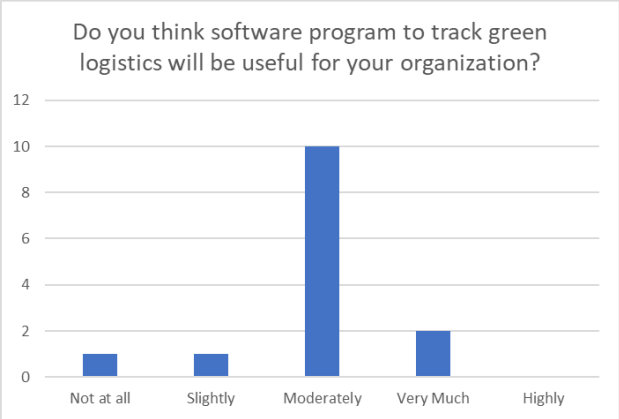
Not at all
Slightly
Moderately
Very Much
Highly


Do you think software program to track green logistics will be useful for your organization?
12
10
8
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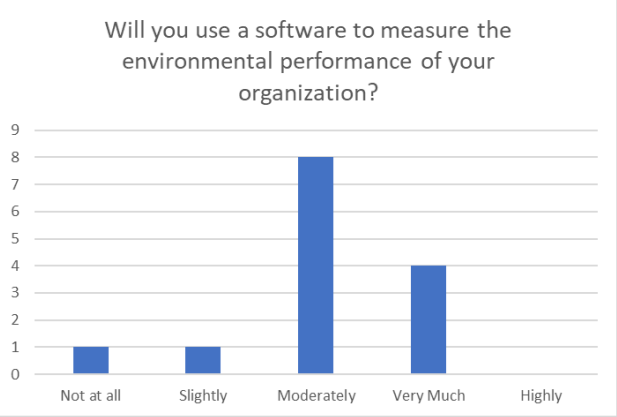
Not at all
Slightly
Moderately
Very Much
Highly


Will you use a software to measure the environmental performance of your organization?
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Not at all
Slightly
Moderately
Very Much
Highly

Laos

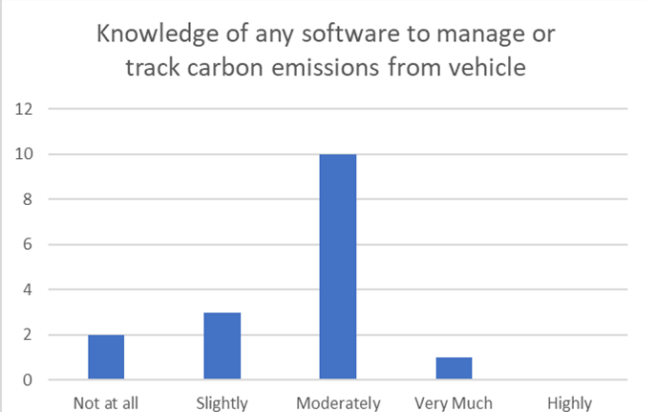
Country	Lao PDR
Date	6-Sep-18
Venue	Lao National Chamber of Commerce and Industry (LNCCI)
Total Participants	17

Respondent Types	Includes
Government	Lao Logistics State Enterprise
	Lao Airlines
	Department of Transport, MPWT
Ports	
Logistics Company	Private Logistics, Freight, Trucking, etc. companies

Pre-Evaluation

Pre-Assessment						
Respondent Type	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**
Logistics Company	2	2	3	4	5	5
Government	1	2	4	4	4	4
Government	2	3	3	4	3	4
Freight Forwarders	3	4	3	2	4	4
Logistics Company	3	4	2	2	4	4
Trucking Company	3	4	3	4	4	4
Government	3	4	4	3	4	4
Government	3	4	4	3	4	4
Logistics Company	3	3	4	4	4	4
Government	4	4	4	4	5	4
Logistics Company	3	2	4	1	4	1
Government	3	4	3	4	5	3
Government	2	3	2	2	3	3
Government	2	3	2	2	3	3
Government	3	4	4	4	4	4
Logistics Company	3	4	4	3	4	4
Logistics Company	1	3	4	3	4	3

Result Q1-Q6


Knowledge of any software to manage or track carbon emissions from vehicle
12
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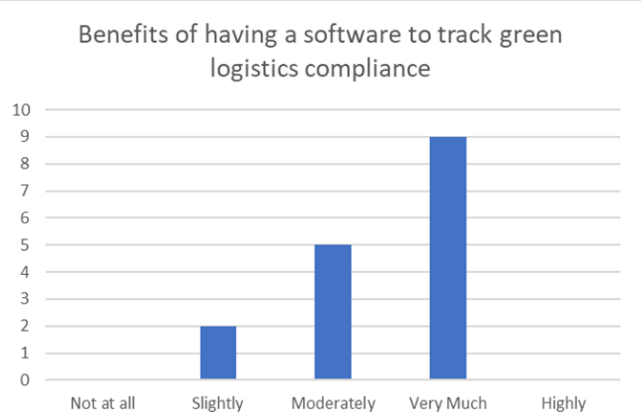
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
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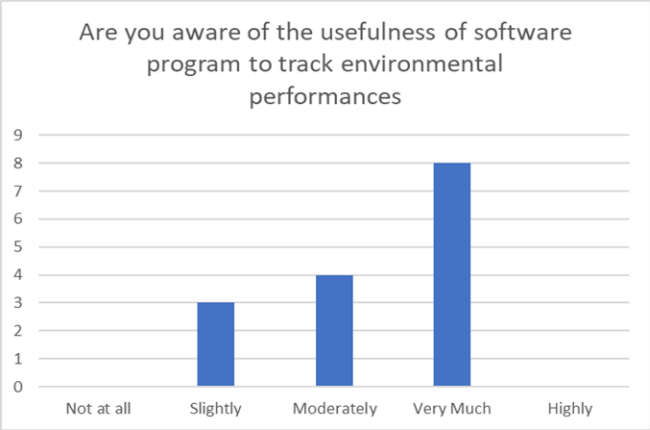
Not at all
Slightly
Moderately
Very Much
Highly


Are you aware of the usefulness of software program to track environmental performances
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Not at all
Slightly
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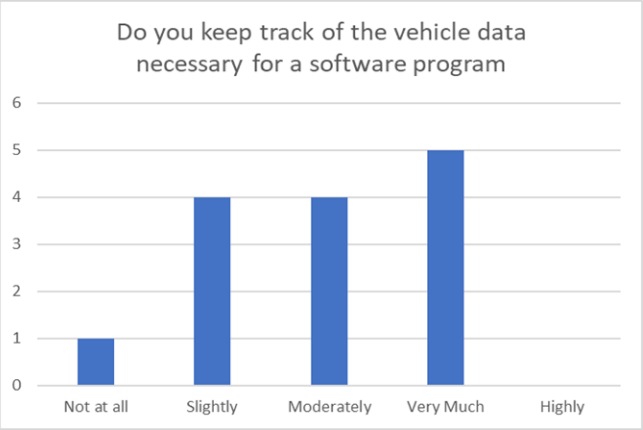
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
6
5
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3
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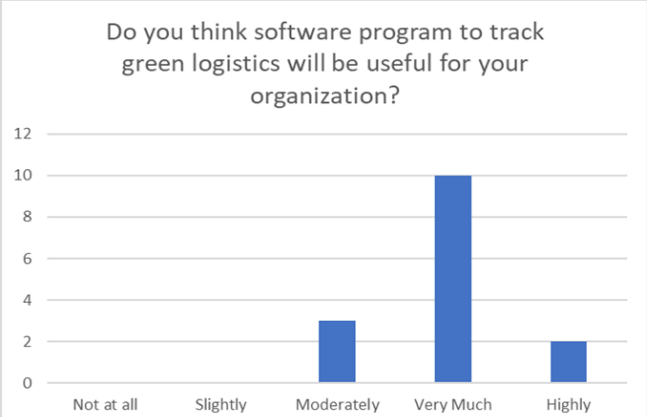
Not at all
Slightly
Moderately
Very Much
Highly


Do you think software program to track green logistics will be useful for your organization?
12
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6
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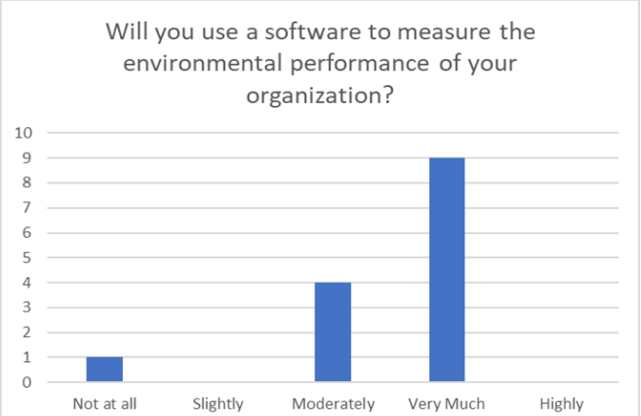
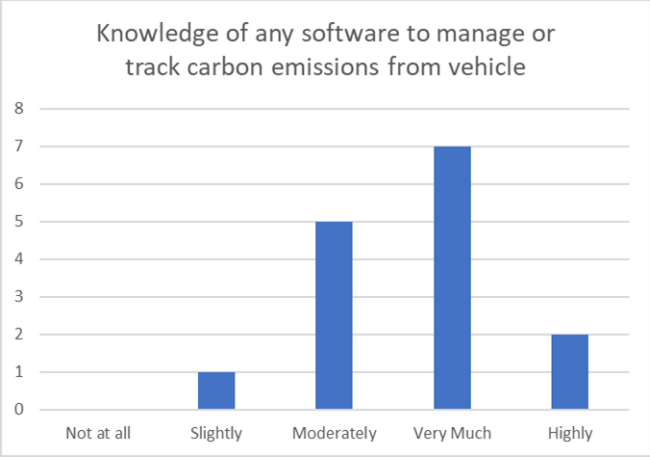
0
Not at all
Slightly
Moderately
Very Much
Highly

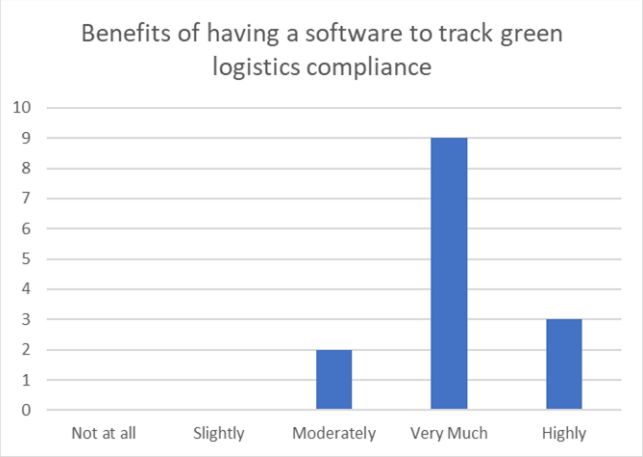

Will you use a software to measure the environmental performance of your organization?
10
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

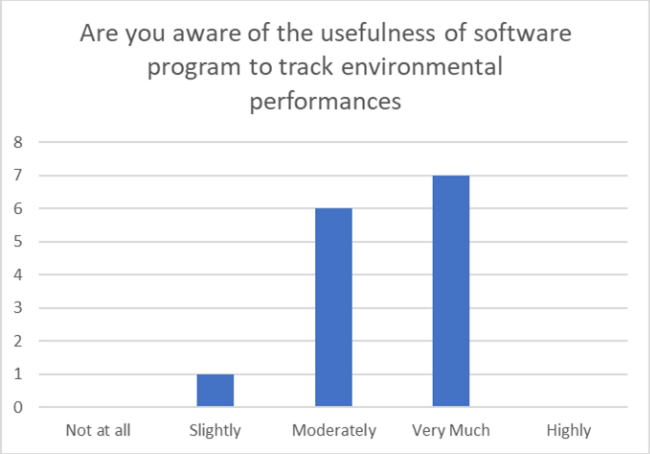
Post-Evaluation

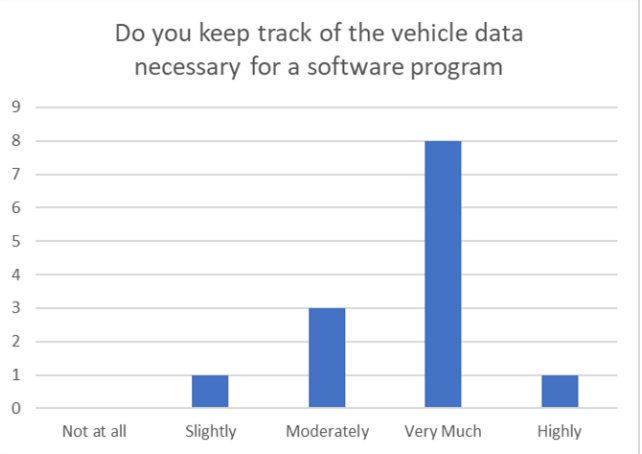
Post Assessment						
Respondent Type	**Q1.**	**Q2.**	**Q3.**	**Q4.**	**Q5.**	**Q6.**
Logistics Company	3	4	3	4	4	4
Freight Forwarders	3	4	4	4	4	4
Logistics Company	3	3	3	4	4	4
Logistics Company	3	4	3	3	3	3
Government	4	5	4	5	5	4
Government	4	4	4	4	4	4
Government	3	4	3	4	4	3
Freight Forwarders	4	4	4	4	4	4
Government	4	4	4	4	4	4
Government	4	4	4	4	4	4
Logistics Company	5	5	4	4	4	4
Government	3	4	3	4	5	3
Trucking Company	4	5	2	4	5	4
Logistics Company	4	4	4	2	3	3
Freight Forwarders	3	4	3	3	4	4
Freight Forwarders	2	3	3	3	4	4

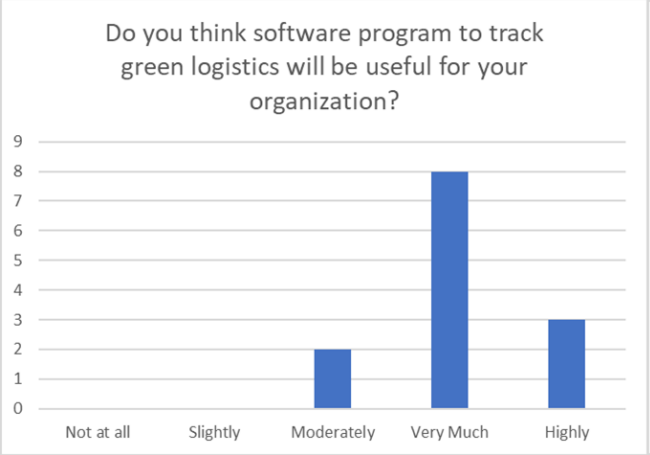
Result Q1-Q6

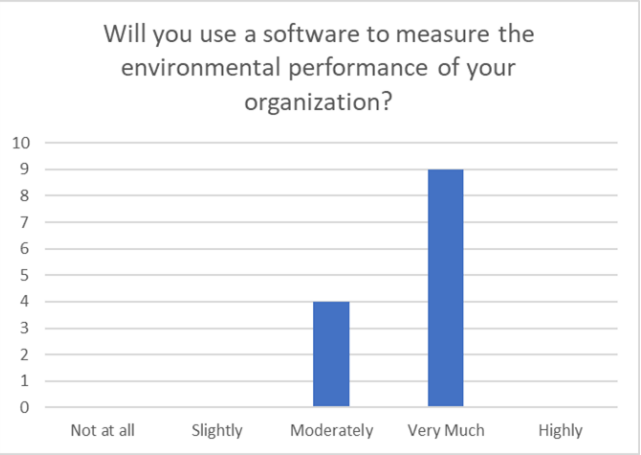

Knowledge of any software to manage or track carbon emissions from vehicle
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
10
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Are you aware of the usefulness of software program to track environmental performances
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you think software program to track green logistics will be useful for your organization?
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Will you use a software to measure the environmental performance of your organization?
10
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

Myanmar

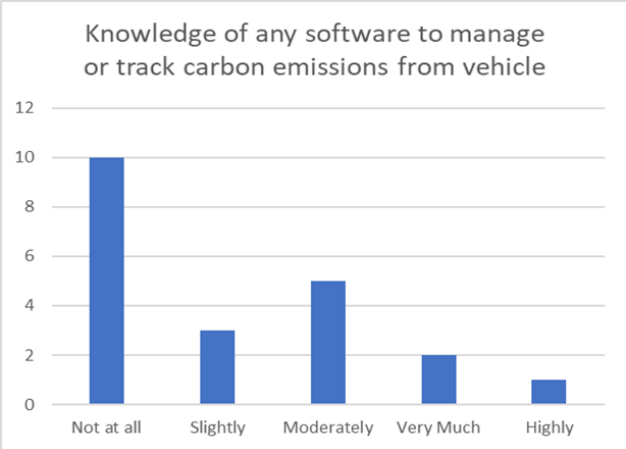
Country	Myanmar	
Date	7-Sep-18	
Venue	Myanmar International Freight Forwarders' Association (MIFFA)	
Total Participants	21	

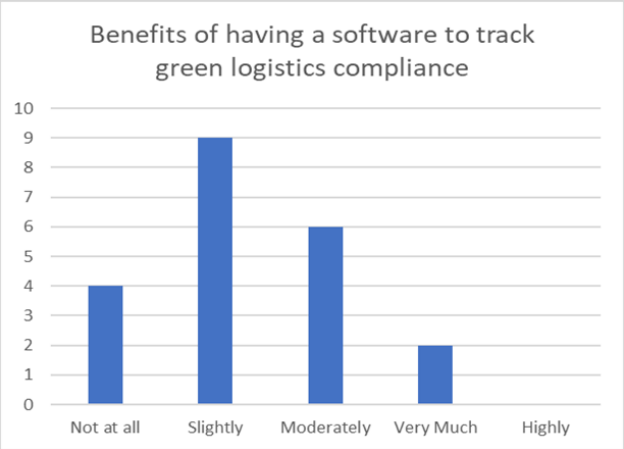
Respondent Types	Includes
Government	Road Transport Administration Department
Ports	Myanmar Port Authority
Logistics Company	Private Logistics, Freight, Trucking, etc. companies and Associations

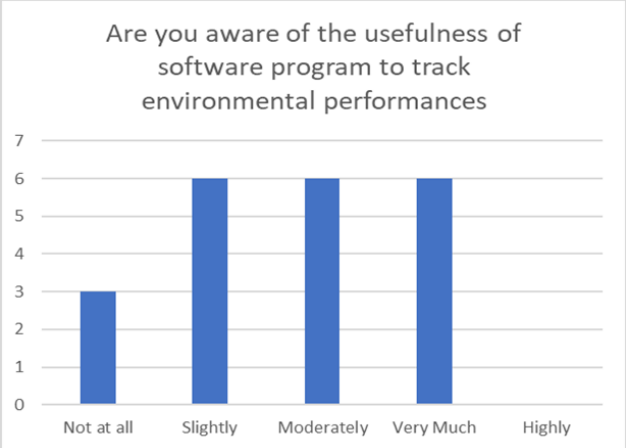
Pre-Evaluation

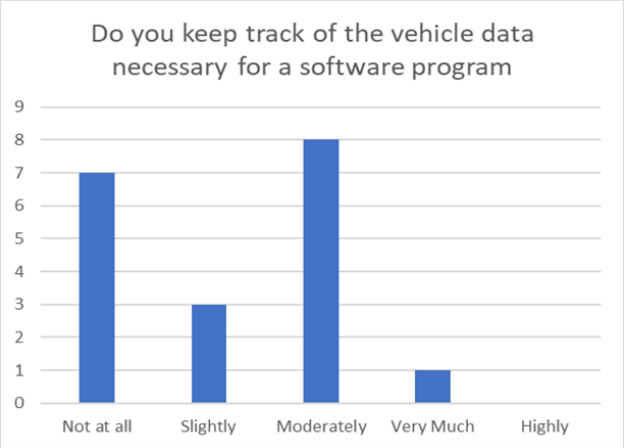
Pre Assessment						
Respondent Type	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**
Government	1	2	4	3	3	4
Freight Forwarders	5	4	4	4	5	3
Freight Forwarders	3	1	2	4	3	4
Freight Forwarders	2	4	4	4	5	5
Logistics Company	1	3	4	2	4	4
Logistics Company	1	2	2	1	2	1
Trucking Company	1	2	3	1	4	4
Logistics Company	1	2	2	3	3	2
Logistics Company	1	2	2	1	4	2
Government	1	2	1	1	2	3
Logistics Company	1	1	1	1	3	3
Trucking Company	3	3	3	3	3	3
Government	4	2	4	2	3	2
Government	4	3	4	2	4	3
Government	2	2	2	3	3	2
Logistics Company	3	3	3	3	4	4
Ports	1	1	2	1	3	3
Logistics Company	3	3	3	3	3	3
Freight Forwarders	1	1	1	1	1	1
Trucking Company	3	3	3	3	3	3
Trucking Company	2	2	3	3	4	3

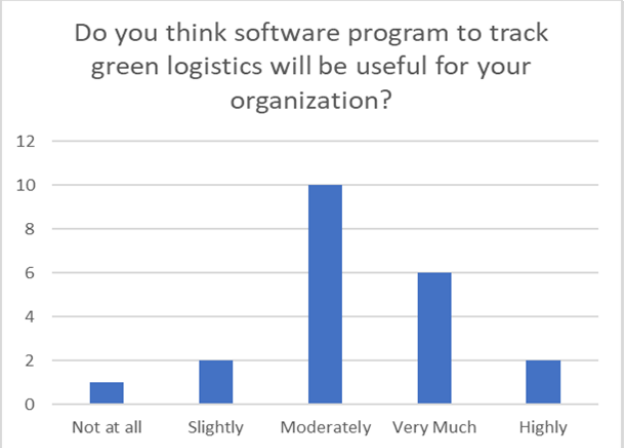
Result Q1-Q6

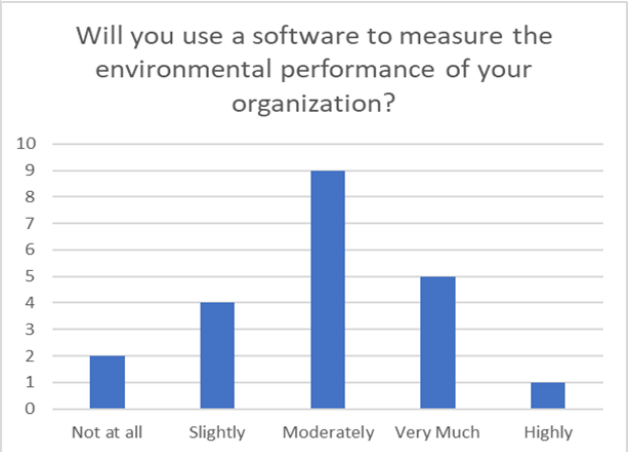

Knowledge of any software to manage or track carbon emissions from vehicle
12
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
10
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Are you aware of the usefulness of software program to track environmental performances
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

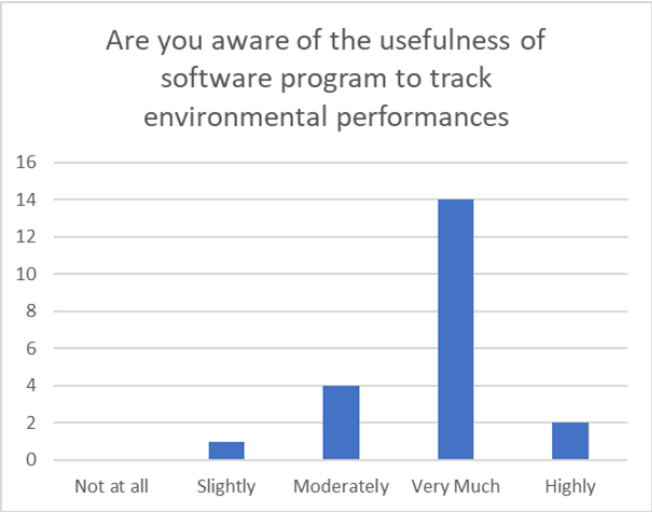

Do you think software program to track green logistics will be useful for your organization?
12
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly

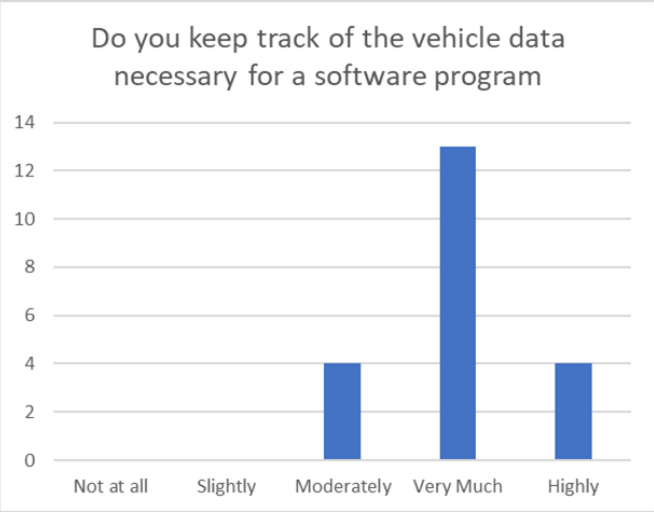

Will you use a software to measure the environmental performance of your organization?
10
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

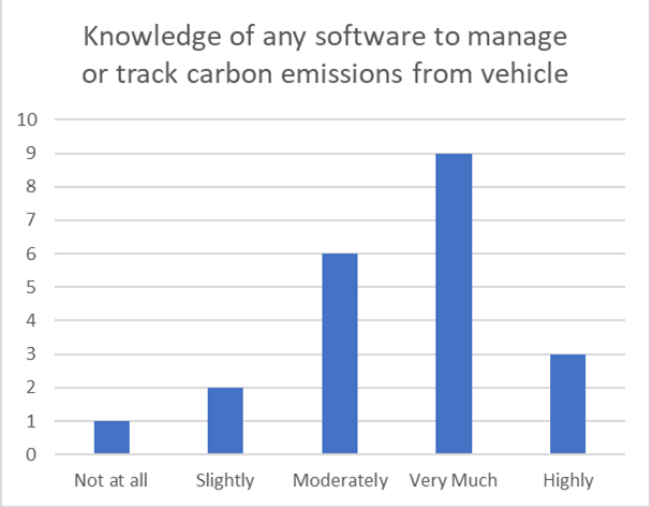
Post-Evaluation

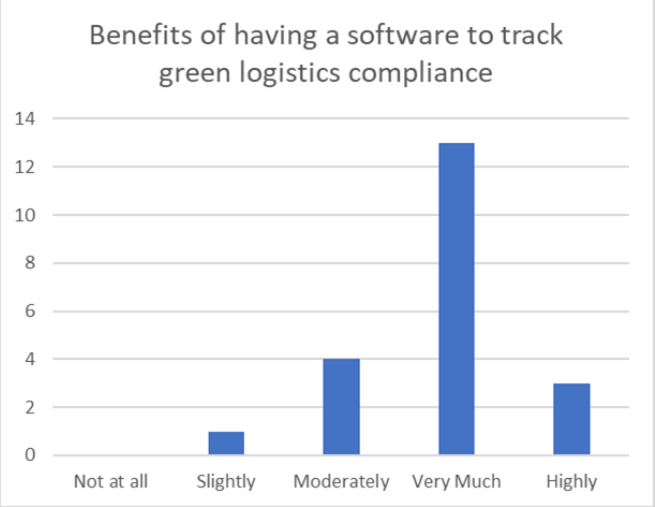
Post Assessment						
Respondent Type	**Q1.**	**Q2.**	**Q3.**	**Q4.**	**Q5.**	**Q6.**
Logistics Company	4	4	4	4	3	3
Logistics Company	5	5	4	5	5	5
Freight Forwarders	3	4	4	4	4	3
Freight Forwarders	3	4	4	4	4	3
Trucking Company	4	4	4	4	4	4
Logistics Company	2	3	3	5	3	2
Logistics Company	2	3	3	3	4	4
Trucking Company	4	4	4	4	4	4
Freight Forwarders	4	4	5	3	5	4
Freight Forwarders	3	4	3	4	2	3
Logistics Company	4	2	4	3	4	3
Ports	3	3	4	4	4	3
Logistics Company	5	4	3	4	4	3
Logistics Company	1	3	2	3	2	2
Logistics Company	4	5	4	4	3	5
Freight Forwarders	3	4	4	4	4	4
Logistics Company	4	4	4	4	4	4
Trucking Company	4	4	4	4	4	4
Logistics Company	4	4	4	4	4	4
Freight Forwarders	5	5	5	5	5	5
Logistics Company	3	4	4	5	4	5

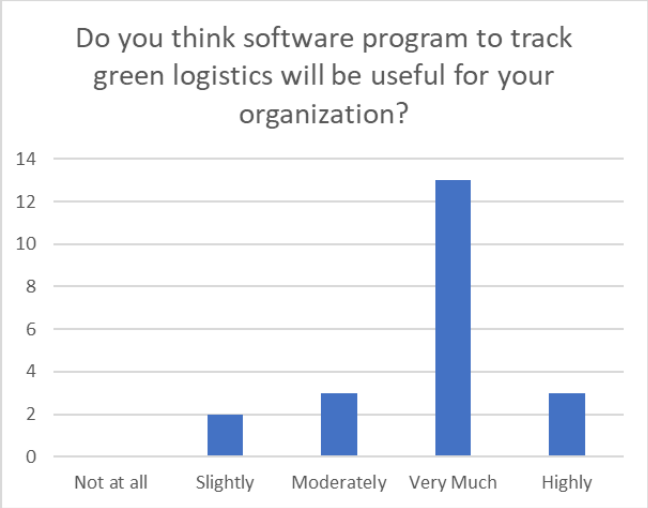
Result Q1-Q6

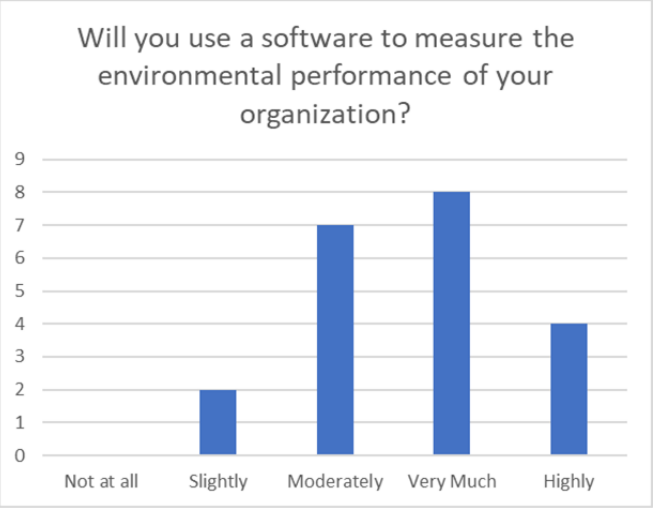

Are you aware of the usefulness of software program to track environmental performances
16
14
12
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
14
12
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Knowledge of any software to manage or track carbon emissions from vehicle
10
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
14
12
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you think software program to track green logistics will be useful for your organization?
14
12
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Will you use a software to measure the environmental performance of your organization?
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

Thailand

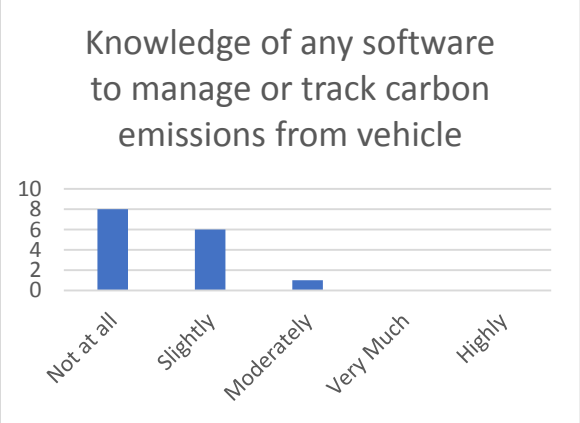
Country	Thailand	
Date	14-Sep-18	
Venue	Hazardous Substances Logistics Association (HSLA)	
Total Participants	15	

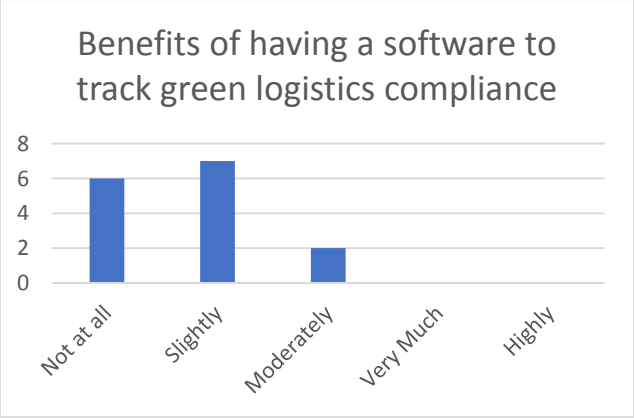
Respondent Types	Includes
Government	Department of Land Transport and Department of Industrial Work
Ports	None
Logistics Company	Private Logistics, Freight, Trucking, etc. companies and Associations

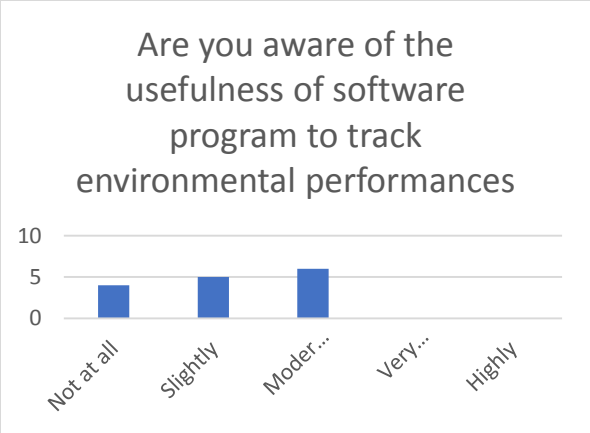
Pre-Evaluation

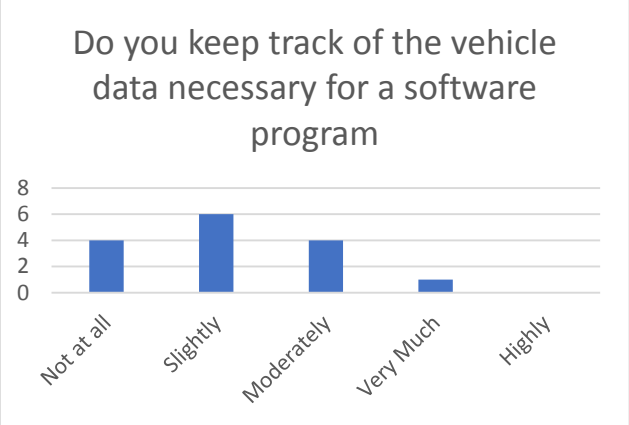
Pre Assessment						
Respondent Type	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**
Logistics Company	1	1	1	1	5	1
Logistics Company	3	3	3	3	4	4
Government	1	1	2	1	1	1
Freight Forwarders	2	2	3	2	2	2
Logistics Company	1	1	1	2	3	2
Trucking Company	1	1	1	1	1	1
Trucking Company	2	2	3	3	3	1
Logistics Company	1	2	3	3	3	2
Logistics Company	1	2	3	2	3	2
Trucking Company	2	3	3	4	4	4
Trucking Company	2	2	2	2	2	2
Trucking Company	1	2	1	2	2	2
Government	1	1	2	1	3	1
Government	2	2	2	2	2	1
Government	2	1	2	3	1	1

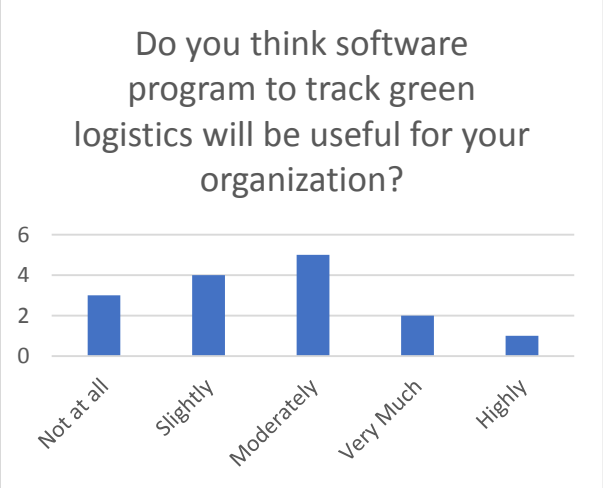
Result Q1-Q6

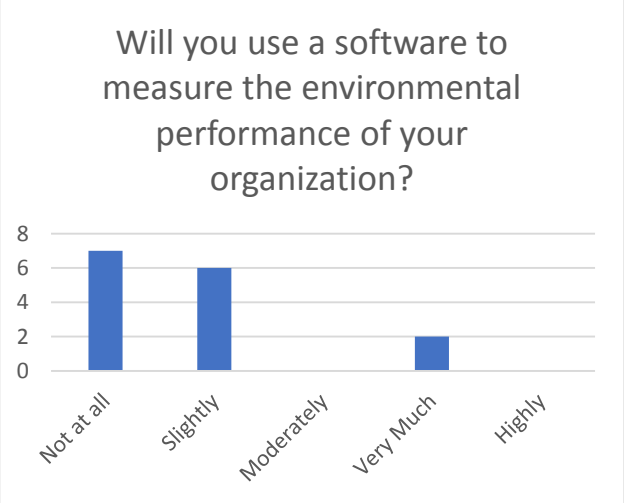








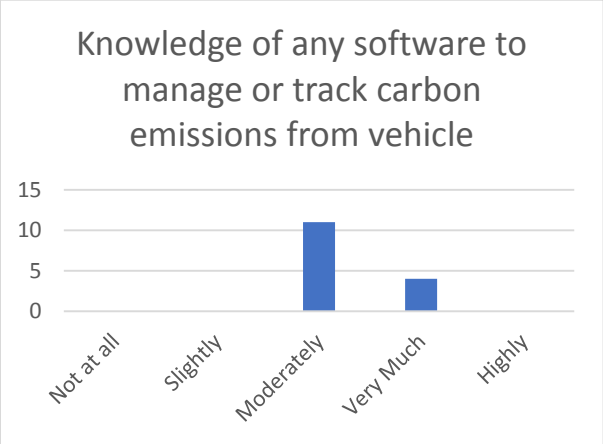


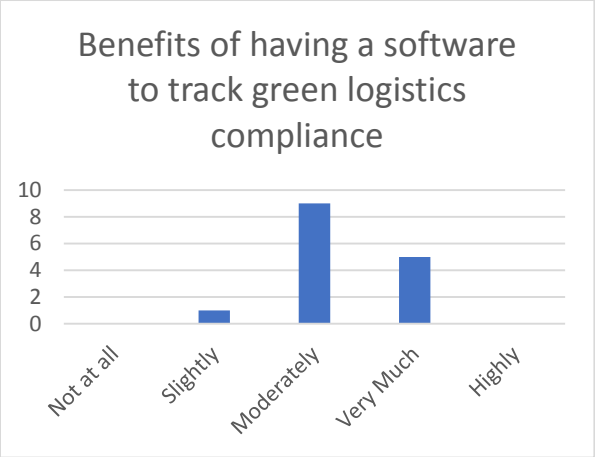


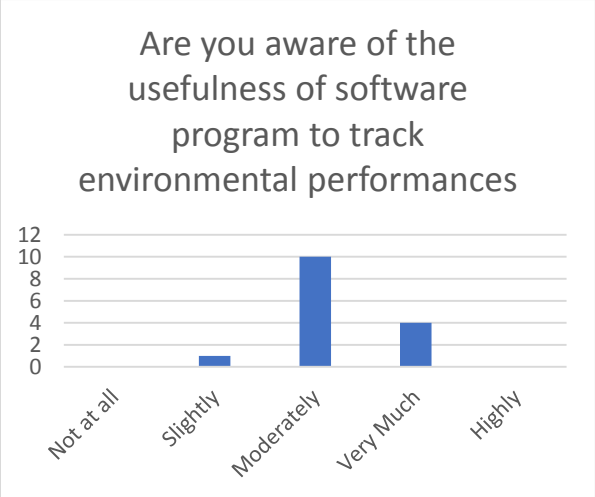
Post-Evaluation

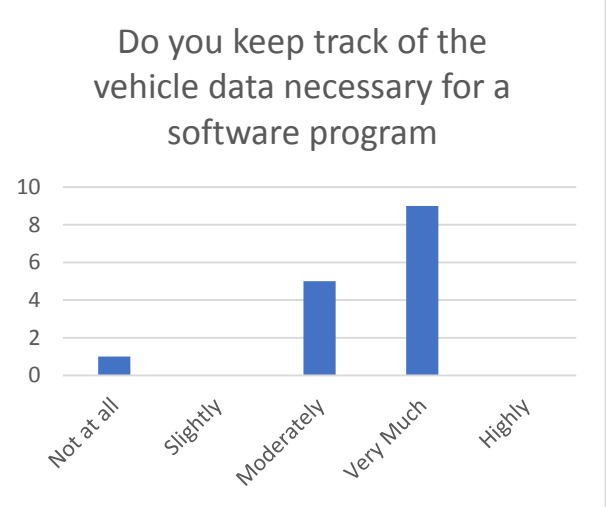
Post Assessment						
Respondent Type	**Q1.**	**Q2.**	**Q3.**	**Q4.**	**Q5.**	**Q6.**
Logistics Company	4	4	4	4	4	4
Logistics Company	3	3	3	4	4	4
Trucking Company	3	3	3	4	4	3
Trucking Company	3	3	3	4	3	3
Trucking Company	3	3	3	3	3	3
Logistics Company	3	4	3	3	4	4
Logistics Company	3	3	4	3	3	3
Trucking Company	3	2	2	3	3	3
Freight Forwarders	4	4	4	4	5	5
Freight Forwarders	4	4	3	1	3	4
Logistics Company	4	4	4	4	4	4
Government	3	3	3	4	4	4
Logistics Company	3	3	3	4	4	3
Logistics Company	3	3	3	4	3	3
Logistics Company	3	3	3	3	3	3

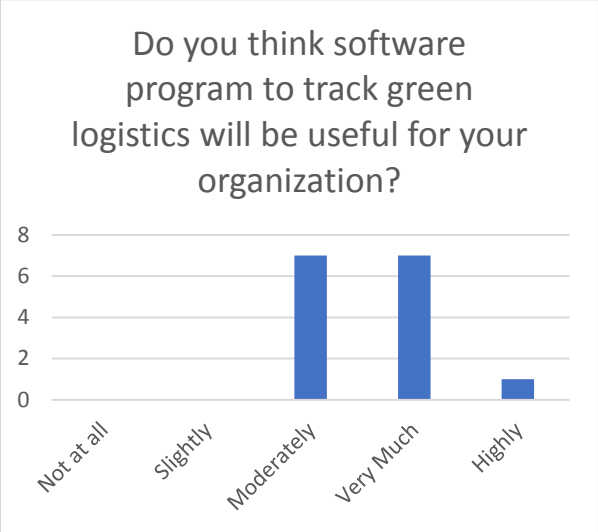
Result Q1-Q6

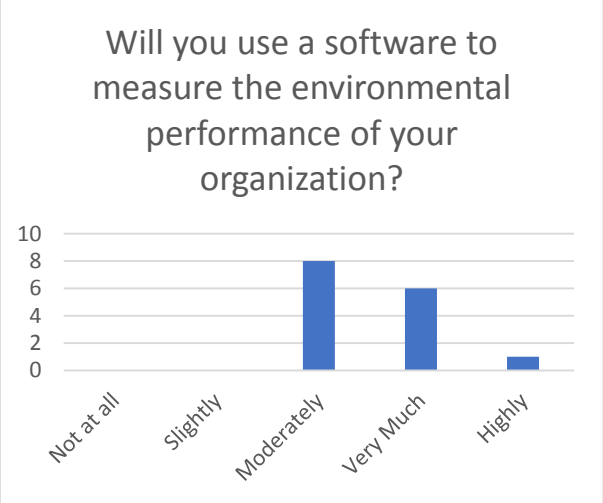

Knowledge of any software to manage or track carbon emissions from vehicle
15
10
5
0
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Are you aware of the usefulness of software program to track environmental performances
12
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you think software program to track green logistics will be useful for your organization?
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Will you use a software to measure the environmental performance of your organization?
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly

Vietnam

Country	Vietnam	
Date	14-Dec-18	
Venue	Directorate of Roads of Vietnam (DRVN), DRVN Building, D20, Ton That Thuyet, Yen Hoa, Cau Giay, Hanoi, Vietnam	
Total Participants	15	

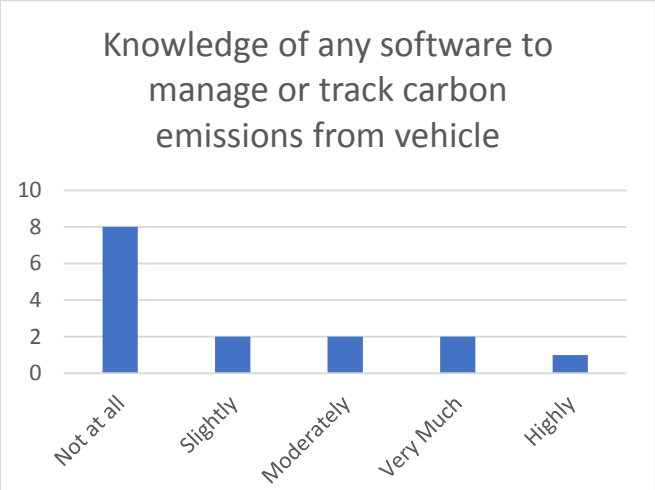
Country	Vietnam
Date	14-Dec-18
Venue	Directorate of R
Total Participants	15

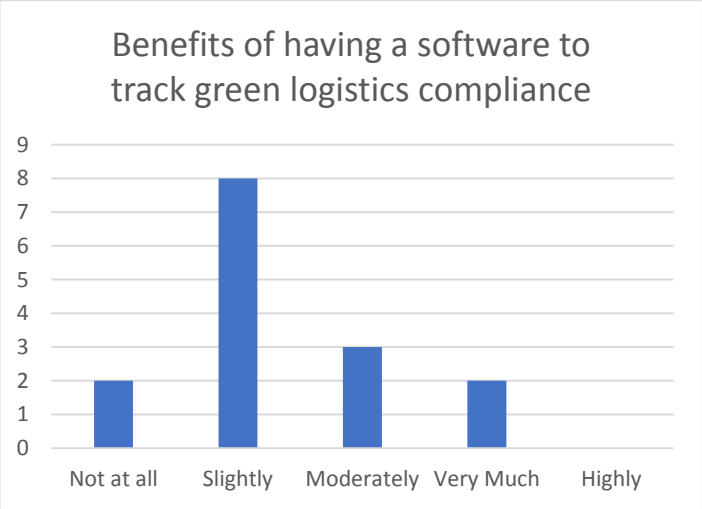
Respondent Types	Includes
Government	Ministry of Transport: Transport department
	Environment Department
	Information Technology Center
	Viet Nam Register Administration
Associations	Vietnam Automobile Transportataion Association (VATA)
Logistics Company	Private Logistics, Freight, Trucking, etc. companies and Associations

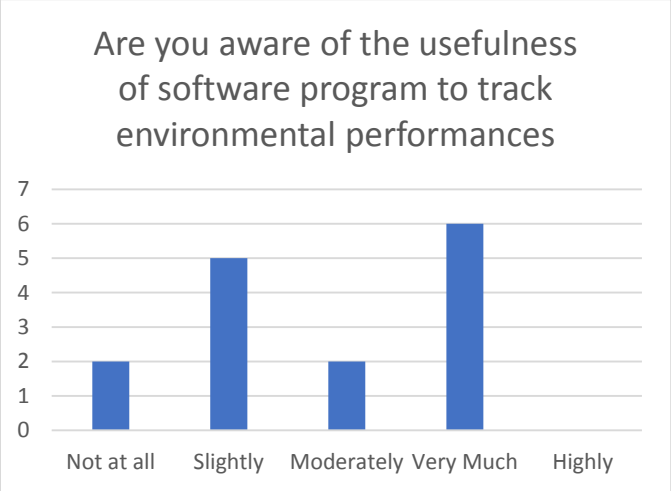
Pre-Evaluation

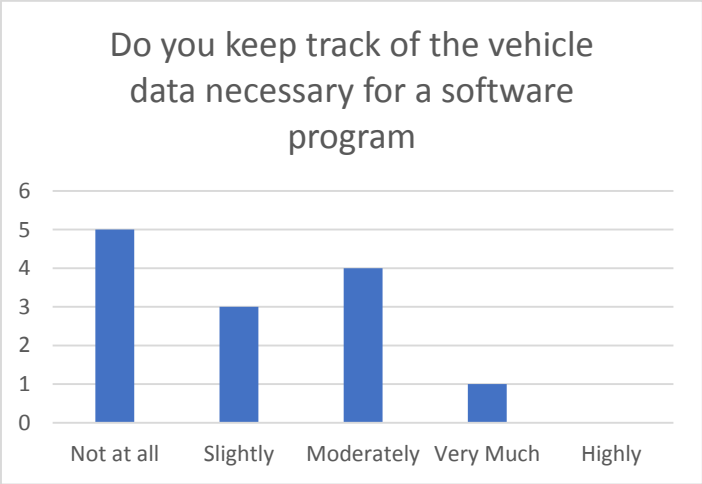
Respondent Type	Q1	Q2	Q3	Q4	Q5	Q6
Government	1	2	4	3	3	4
Freight Forwarders	5	4	4	4	5	3
Freight Forwarders	3	1	2	4	3	4
Freight Forwarders	2	4	4	4	5	5
Logistics Company	1	3	4	2	4	4
Logistics Company	1	2	2	1	2	1
Trucking Company	1	2	3	1	4	4
Logistics Company	1	2	2	3	3	2
Logistics Company	1	2	2	1	4	2
Government	1	2	1	1	2	3
Logistics Company	1	1	1	1	3	3
Trucking Company	3	3	3	3	3	3
Government	4	2	4	2	3	2
Government	4	3	4	2	4	3
Government	2	2	2	3	3	2

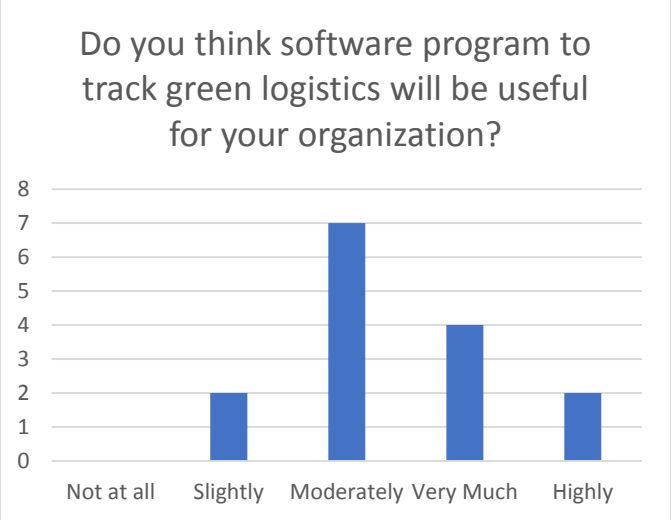
Result Q1-Q6

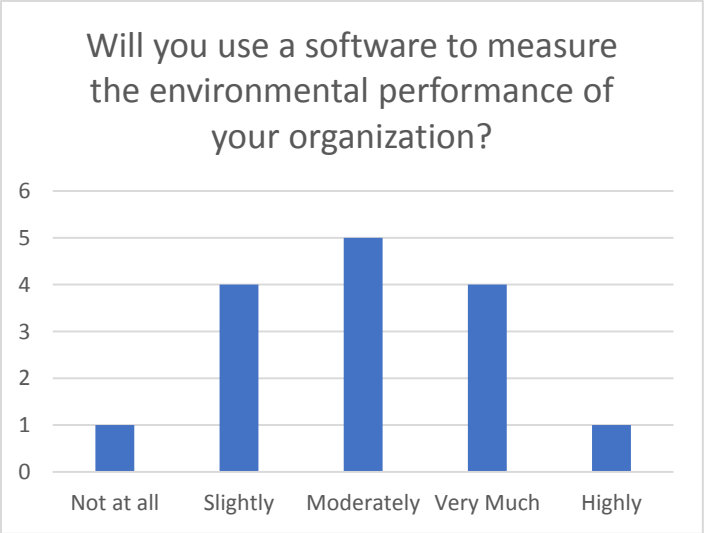

Knowledge of any software to manage or track carbon emissions from vehicle
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
9
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Are you aware of the usefulness of software program to track environmental performances
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

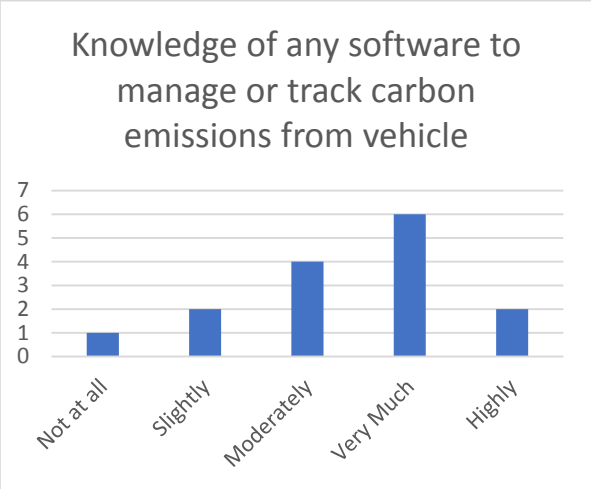

Do you think software program to track green logistics will be useful for your organization?
8
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

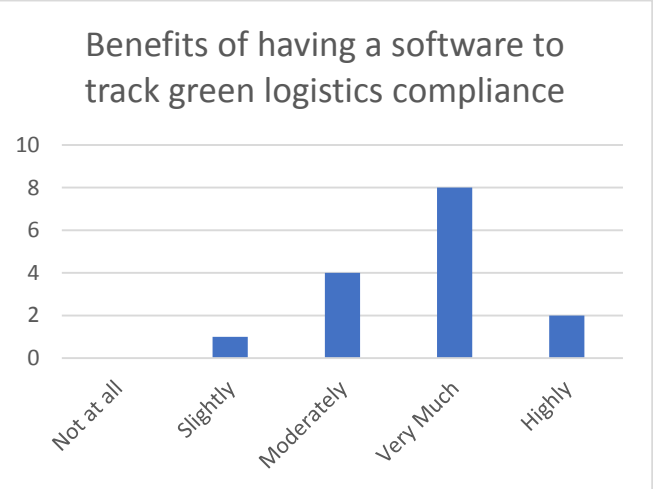

Will you use a software to measure the environmental performance of your organization?
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly

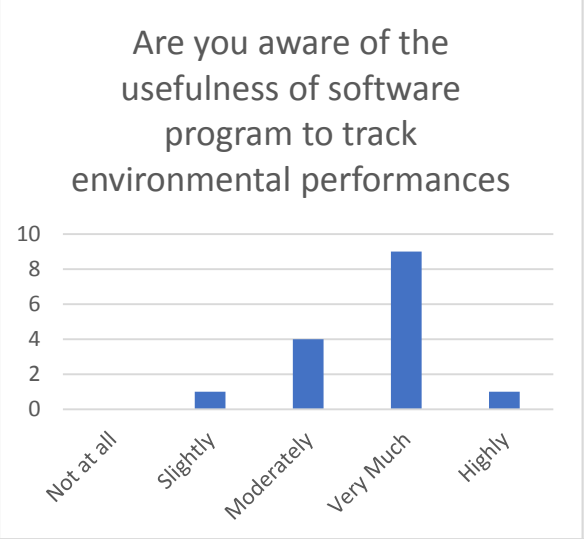
Post-Evaluation

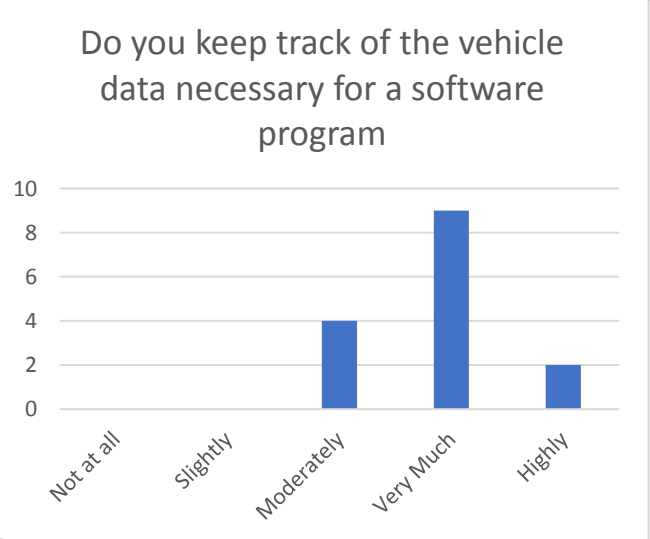
Respondent Type	Q1.	Q2.	Q3.	Q4.	Q5.	Q6.
Logistics Company	4	4	4	4	3	3
Logistics Company	5	5	4	5	5	5
Freight Forwarders	3	4	4	4	4	3
Freight Forwarders	3	4	4	4	4	3
Trucking Company	4	4	4	4	4	4
Logistics Company	2	3	3	5	3	2
Logistics Company	2	3	3	3	4	4
Trucking Company	4	4	4	4	4	4
Freight Forwarders	4	4	5	3	5	4
Freight Forwarders	3	4	3	4	2	3
Logistics Company	4	2	4	3	4	3
Government	3	3	4	4	4	3
Logistics Company	5	4	3	4	4	3
Logistics Company	1	3	2	3	2	2
Logistics Company	4	5	4	4	3	5

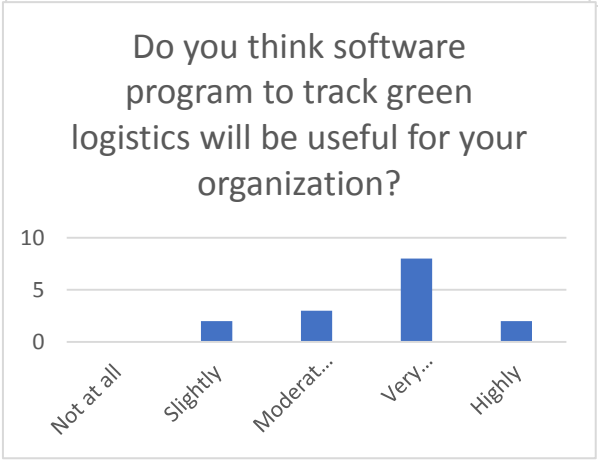
Result Q1-Q6

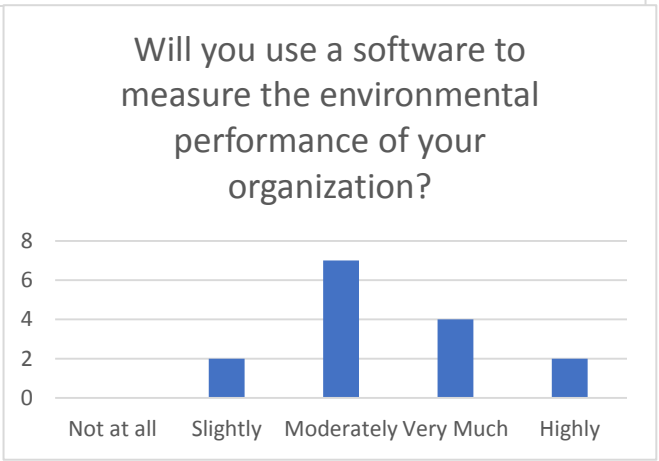

Knowledge of any software to manage or track carbon emissions from vehicle
7
6
5
4
3
2
1
0
Not at all
Slightly
Moderately
Very Much
Highly


Benefits of having a software to track green logistics compliance
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Are you aware of the usefulness of software program to track environmental performances
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you keep track of the vehicle data necessary for a software program
10
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly


Do you think software program to track green logistics will be useful for your organization?
10
5
0
Not at all
Slightly
Moderat...
Very...
Highly


Will you use a software to measure the environmental performance of your organization?
8
6
4
2
0
Not at all
Slightly
Moderately
Very Much
Highly

Appendix 1: Application Form

Workshop on Use and Application of the Software Program on Green Logistics Service Quality Standard

Title	**Family Name** (as shown in passport/ID)	**Given Name** (as shown in passport/ID)
☐Mr ☐Ms ☐Dr		

Company / Work Address (include department or section as relevant)	**Contract Number**
Title of your position:	Phone:
Name of company/organization:	Fax:
Department:	Mobile:
Address:	Email:
	Website:

Education Background
Education Degree: ……..., Graduate Year: ……..., Major: ……
Education Degree: ……..., Graduate Year: ……..., Major: ……

Work History
1. Company/Organization Name: Location: Department/Division: Position: Period: from to
2. Company/Organization Name: Location: Department/Division: Position: Period: from to

Kindly note that, the training will be delivered in English, your English proficiency should be accurately indicated

Languages Capacity	Read			Write			Speak		
	Excellent	Good	Fair	Excellent	Good	Fair	Excellent	Good	Fair
English									
Other ------[PLEASE SPECIFY]------									

Please provide the brief description on your company/organization (size, services, partners etc.) and your responsibilities. (max 200 words)

Please provide your work experience in transport/logistics business/software application and/or cross border trade.

Expectations: Please describe how you will utilize the knowledge from this workshop back in your company / organization

I certify that

☐ **I** will maintain effective coordination with the MI coordinator. ☐ **I** will commit to fully attend all the activities of the workshop.
Candidate I certify that my statements in this application are true, complete and correct to the best of my knowledge and belief. **Signature:** ..... **Date:** .....

Appendix 2: Concept Note

1.Background

Freight transportation is critical to businesses, consumers and the world economy. The freight sector moves vast volumes of goods, commodities, materials and food domestically and globally and is primary factor in economy and growth. But a goods movement comes with an impact on the global environment. It contributes a significant portion of air pollution and its contribution is expected to grow significantly in the coming years. Globally, carbon dioxide (CO) emissions from freight transport are growing more quickly than those from passenger vehicles. In particular, heavy duty vehicles are expected to be the largest emitter of CO_2 from all transport modes by 2035.

As the Asian economy continues to grow at a rapid pace, an increase in freight transport activity is also expected. It is estimated that by the year 2050, medium and heavy freight trucks worldwide will consume 1,240 billion litres of fuel, which is estimated at 138% more than 2000 levels. The global share of trucks operating within Asian countries is expected to increase from 19% in 2000 to 34% in 2050.

The Mekong Institute (MI) is implementing a three-year project on “Green Freight and Logistics Development in Mekong countries’ funded by the Republic of Korea through the Mekong - Korea Cooperation Fund (MKCF). The long-term objective of the project is to reduce the cost of logistics and transport to improve economic performance in the five countries in Cambodia, Lao PDR, Myanmar, Vietnam and Thailand (CLMVT). This will eventually aid the transport sector to increase its contribution to economic development in the Mekong countries as well reduce its carbon footprint.

2. Objective of the Workshop

The workshop aims to:

- Introduce the Green Logistics Service Quality Standard ‘***green mark***’ standards to project stakeholders in the government and private sector.
- Field testing the Green Quality Auditor software the government agencies and the transport and logistics companies associated with the core logistics services such as, Freight, Warehouse, Cold Chains, Container Depots, Inland Container Depots, Trucking Companies, etc.
- Obtain feedback to improve upon the devised standard and the auditing software to incorporate in the final version of the system.
- Provide a complete set of requirements for the Green Logistics Service Quality Standards based on the devised Key Performance Indicators (KPI) in the software.
- A trial run of the software system by each participant and understanding its outputs.

3. Expected Outcomes

- A clear understanding of the various Key Performance Indicators (KPIs) for each level of quality standard by the concerned ministries and line agencies.
- A clear understanding of the various Key Performance Indicators (KPIs) for each level of quality standard by the transport and logistics companies associated with the core logistics services such as, Freight, Warehouse, Cold Chains, Container Depots, Inland Container Depots, Trucking Companies, etc.
- All the necessary requirements and feedback by the concerned government agencies, Logistics and Transport association and companies shared and collected to be incorporated in the final version of the software.

4. Methodology

A one-day workshop will be conducted in the project countries (CLMVT), as to introduce the Green Logistics Service Quality Standards (Green Mark) and the auditing software and obtain feedback to customize the software as per the county specific requirements. MI team acquaint the workshop participants on the standards and the related Key Performance Indicators (KPIs) and hands on application of the software.

Target Group:

The expected number of participants is 20 for the country workshop. The expected participants are:

- Mid-level officials (preferably IT division) from the Ministry of Transport
- Members of the Freight Forwarders Associations, Automobile Transportation Associations, Logistics Associations, Warehouse Associations, etc.
- Medium to large companies involved in the core logistics services such as, Freight, Warehouse, Cold Chains, Container Depots, Inland Container Depots, Trucking Companies, etc.

Expected outcomes

The result and feedbacks of the workshop will be incorporated in the software. The near final version of the software will be introduced in the Modular training on Green Freight and Logistics Management scheduled on September 17 -21 at Mekong Institute. The finalized software will be incorporated in the modular training action plan by participants of each countries to localize and training/introduced to target companies. The software will also be introduced for discussion and feedback at the TWG members for adoption in the countries.

5. Agenda

Session / Time	Activity
Session 1 09.00-10.30	Introduction to Green Logistics Service Quality Standards “Green Mark” ➢ Background, objectives, benefits of setting or complying with the standard ➢ Current situations and standards in GMS Introduction to Key Performance Indicators (KPIs), validation of draft KPIs and the categories ➢ Organization ➢ Procurement ➢ Yard Waste Management ➢ Fleet Operations ➢ Vehicle Emission Tracking
10.30-10.45	Coffee break
Session 2 10.45-12.15	Introduction of Green Logistics Service Quality Standards (GLSQS) Software ➢ Installation ➢ Training on each module ➢ User manual distribution

12.15-13.30	Lunch

Session 3
13.30-15.00
	Group Work
	➢ Feedback/requirements/customization on each module
	  ⊕ Organization
	  ⊕ Procurement
	  ⊕ Yard Waste Management
	  ⊕ Fleet Operations
	  ⊕ Vehicle Emission Tracking
	➢ Feedback on additional features and report requirements
	➢ Addition/Deletion of KPIs which are not relevant to specific country

6. Contact Details

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Fax: (+66) 43 343 131

Email :saurav@mekonginstitute.org

Appendix 3: Pre and Post Evaluation Form

Name: ..... Country: ..... ☐ Pre ☐ Post Assessment

Organization: ..... Gender: Male [ ] Female [ ]

Assessment Form

Workshop on Introduction of Green Logistics Service Quality Standards Software

August- September, 2018

Please tick ✓ in the most appropriate box bellow to indicate the level of your awareness, knowledge and/or skill on each of the following topics

Topics	Rating Scale				
	Not at all	Slightly	Moderately	Very much	Highly
How much do you know / understand the following topics?	1	2	3	4	5
• Software to manage or track carbon emissions from vehicle?					
• Benefits of having a software to track green logistics compliance					
• Are you aware of the usefulness of a software program to track environmental performances					
• Do you keep track of the vehicle data necessary for a software program?					
• Do you think software program to track green logistics will be useful for your organization?					
• Will you use a software to measure the environmental performance of your					

organization?					
Total Rating Average					

Please provide comments / suggestions for the improvement or additional feature required for the **Green Logistics Service Quality Standards Software and the features in the software,** if any:

.....

.....

.....

.....

.....

.....

.....

Appendix 4: GLSQS Software Manual

Green Logistics Service Quality Standard Auditor (GLSQSA) 2.0.0

END USER MANUAL

Version 1.0

October 8, 2018

The Mekong Institute

Khon Kaen, Thailand

1. Software background

Freight transportation is critical to businesses, consumers and the world economy. The freight sector moves vast volumes of goods, commodities, materials and food domestically and globally and is primary factor in economy and growth. But a goods movement comes with an impact on the global environment. It contributes a significant portion of air pollution and its contribution is expected to grow significantly in the coming years. Globally, carbon dioxide (CO) emissions from freight transport are growing more quickly than those from passenger vehicles. In particular, heavy duty vehicles are expected to be the largest emitter of CO_2 from all transport modes by 2035[4].

Transport accounts for at least one fourth of total energy consumption in Asian countries and other parts of the world. Freight transport is also the major consumer of oil, of which most comes from freight transport. The significant impact freight transport has on environment has led to several initiatives by governments and private companies.

As the Asian economy continues to grow at a rapid pace, an increase in freight transport activity is also expected. It is estimated that by the year 2050, medium and heavy freight trucks worldwide will consume 1,240 billion litres of fuel, which is estimated at 138% more than 2000 levels. The global share of trucks operating within Asian countries is expected to increase from 19% in 2000 to 34% in 2050[5].

With this backdrop, the Mekong Institute (MI) is implementing a three-year project on "Green Freight and Logistics Development in Mekong countries' funded by the Republic of Korea through the Mekong - Korea Cooperation Fund (MKCF). The long-term objective of the project is

- To reduce the cost of logistics and transport to improve economic performance in the five countries in Cambodia, Lao PDR, Myanmar, Vietnam and Thailand (CLMVT).
- This will eventually aid the transport sector to increase its contribution to economic development in the Mekong countries as well reduce its carbon footprint.

[4] How to develop a green freight program: a comprehensive guide and resource Manual, United States Environmental Protection Agency Office of Transportation and Air Quality, Washington, 2014

[5]Sophie Punte and Yan Peng 'Achieving Green Freight in Asia' at https://www.lta.gov.sg/ltaacademy/doc/J11Nov-p52Sophia_Achieving%20Green%20Freight%20in%20Asia.pdf

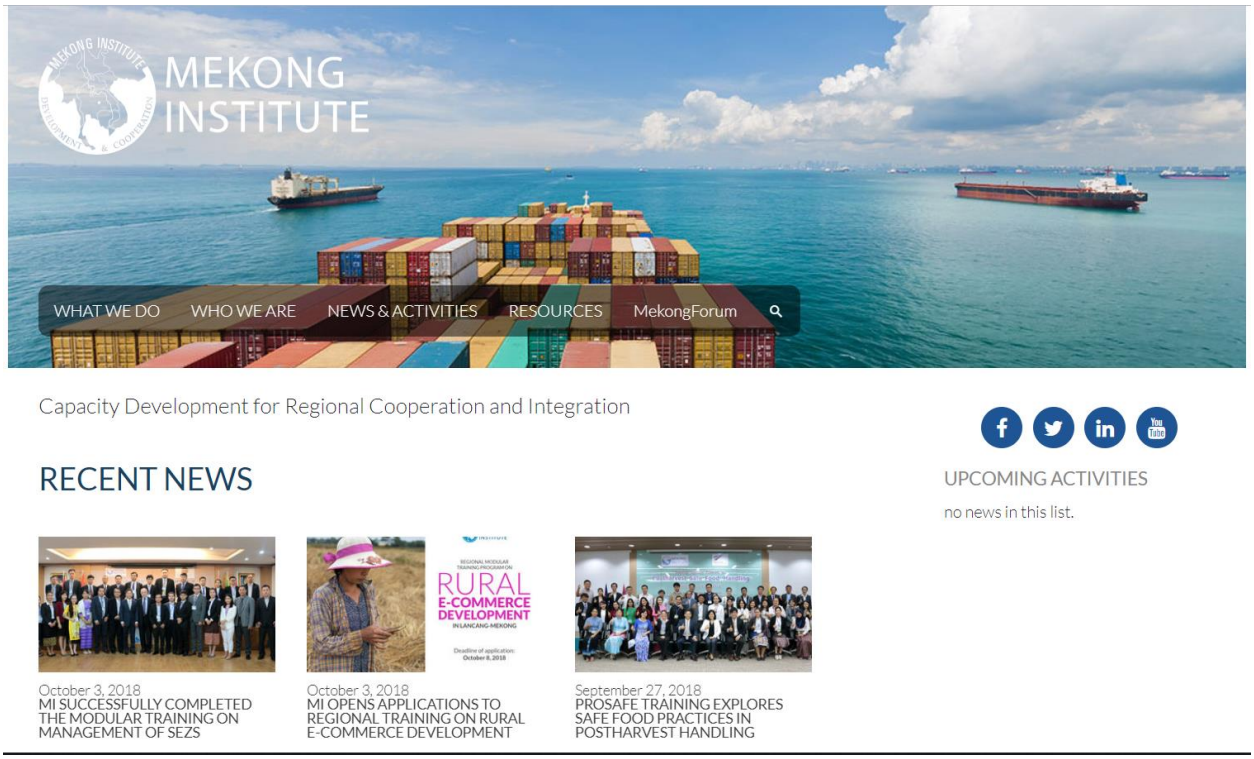
This software is a part of the project and is introduced to promote logistics companies to reduce their carbon emissions and energy use from goods transits by improving performances in fuel-efficiency, effective transport operations, clean waste management and responsible and accountable organizational management practices. This software can be applied to a logistics service provider or an industrial or manufacturer with in-house logistics activities.

2. Download the Software

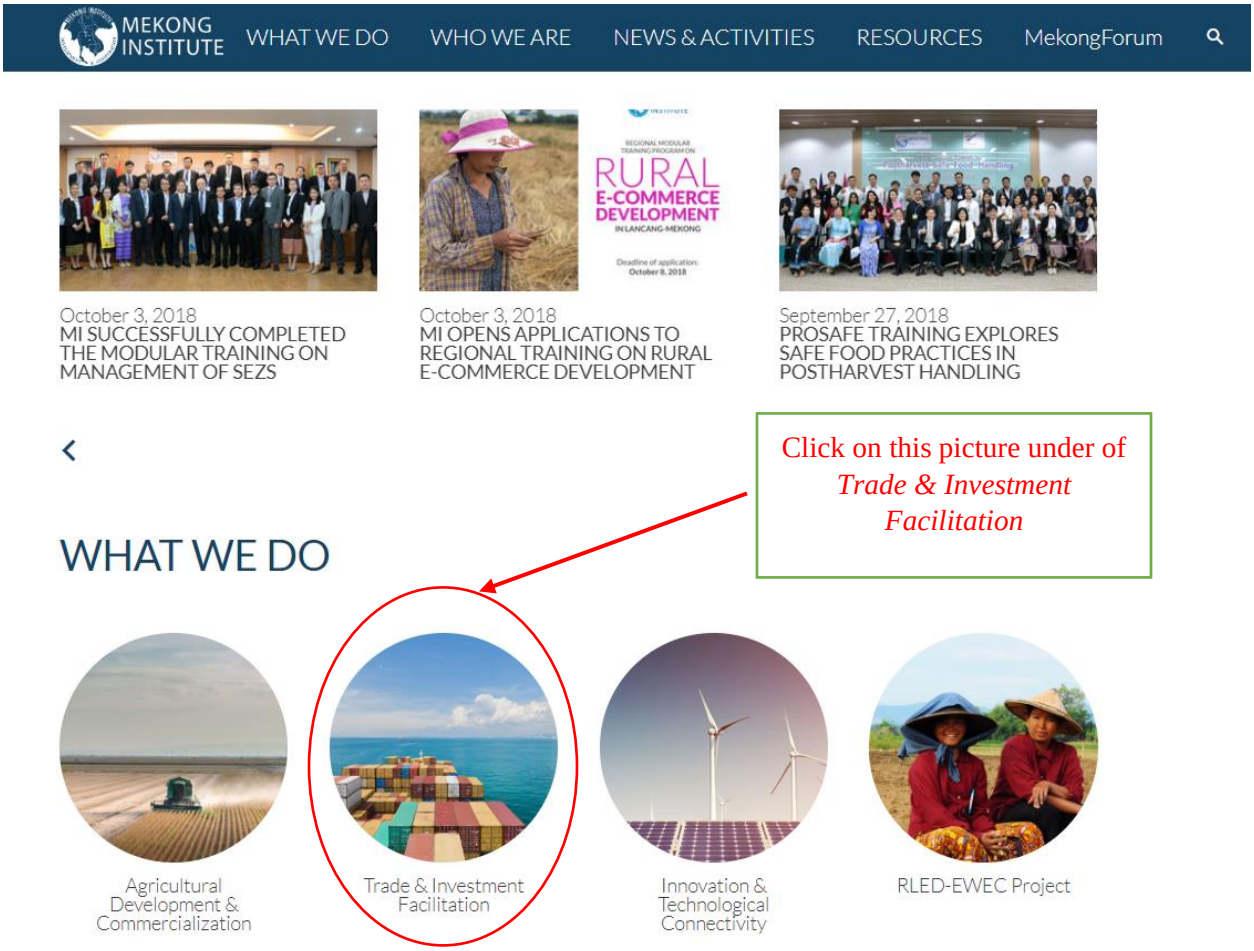
In order to download the software and this user manual visit the Mekong Institute site, at the following address:

http://www.mekonginstitute.org/

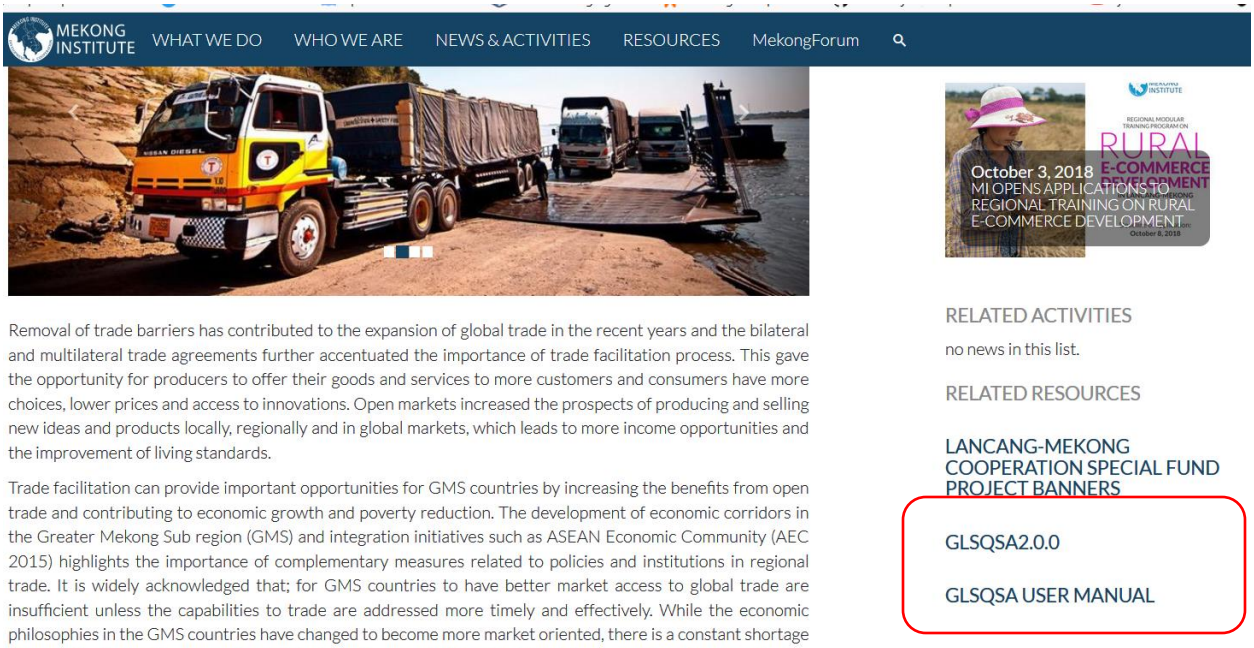
Once you go to the above address, you will be greeted by the screen as shown below:



The home page, scroll down at this level,



You will be greeted by the following screen:

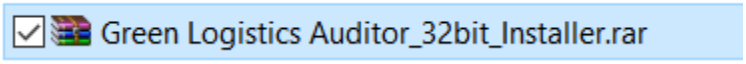


Removal of trade barriers has contributed to the expansion of global trade in the recent years and the bilateral and multilateral trade agreements further accentuated the importance of trade facilitation process. This gave the opportunity for producers to offer their goods and services to more customers and consumers have more choices, lower prices and access to innovations. Open markets increased the prospects of producing and selling new ideas and products locally, regionally and in global markets, which leads to more income opportunities and the improvement of living standards.

Trade facilitation can provide important opportunities for GMS countries by increasing the benefits from open trade and contributing to economic growth and poverty reduction. The development of economic corridors in the Greater Mekong Sub region (GMS) and integration initiatives such as ASEAN Economic Community (AEC 2015) highlights the importance of complementary measures related to policies and institutions in regional trade. It is widely acknowledged that; for GMS countries to have better market access to global trade are insufficient unless the capabilities to trade are addressed more timely and effectively. While the economic philosophies in the GMS countries have changed to become more market oriented, there is a constant shortage of capacities in the Government and Private sector organizations involved in trade and investment promotion activities to meet with the requirements of up adequate knowledge and information to participate effectively in the globalization process.

On the right-hand side of the page, you will see a section called, RELATED RESOURCES, as depicted in the figure above,

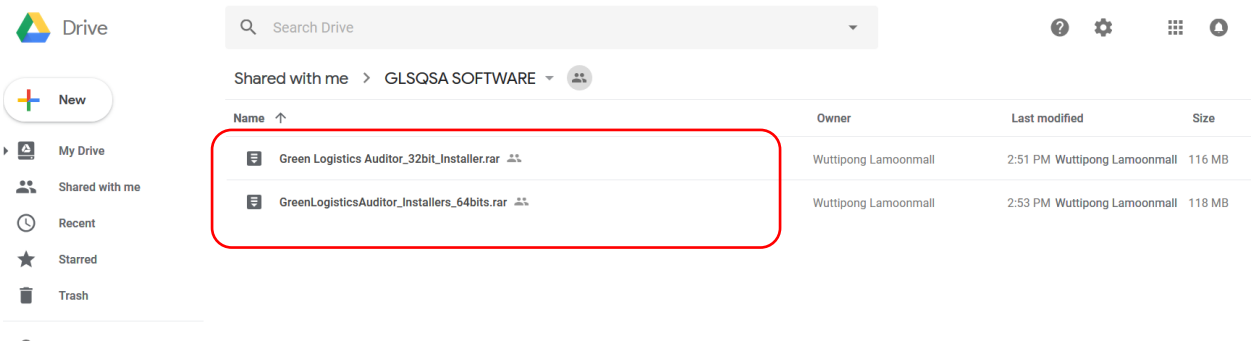
Find the link to the software named as, *GLSQSA2.0.0*



And this user manual named as, GLSQSA User Manual

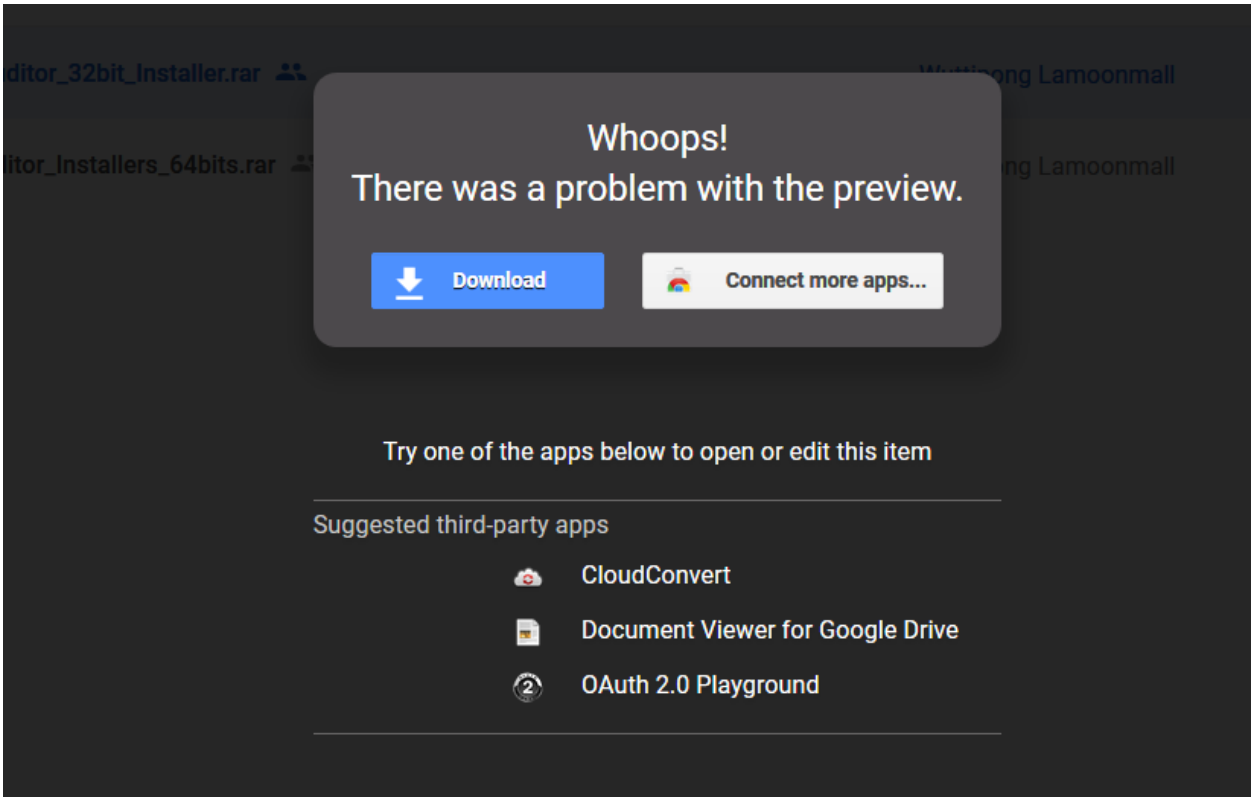
Click on each to download the materials.

After you have clicked the *GLSQSA2.0.0*, you will be directed to the Google Drive page as shown below,

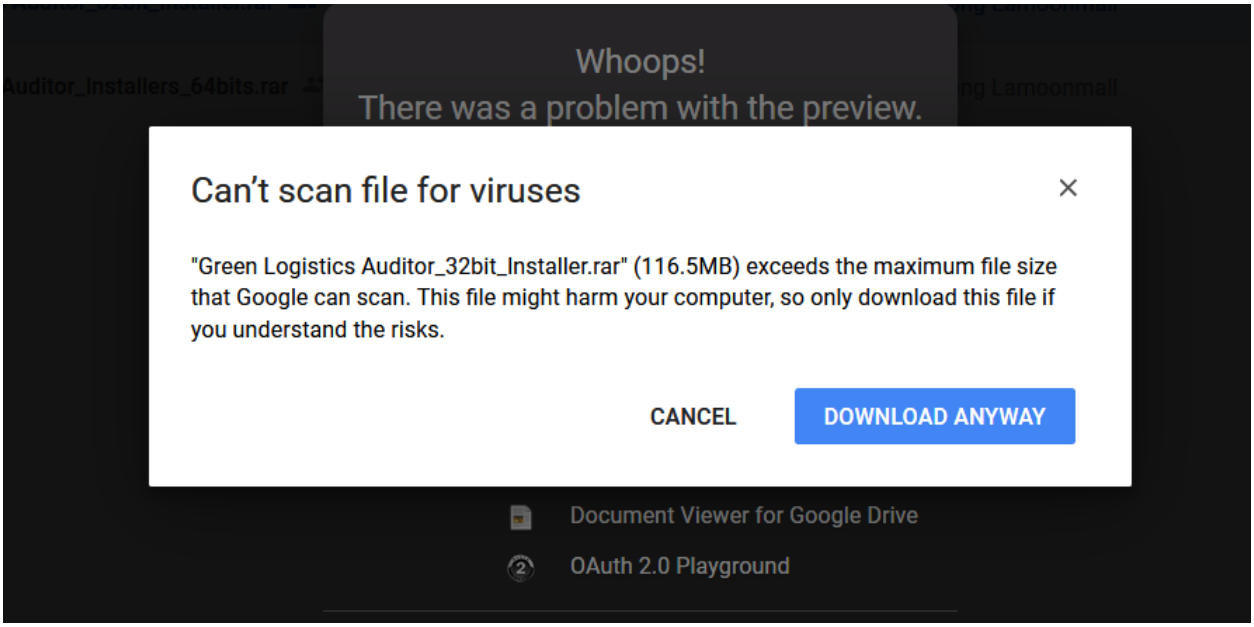


You will see the 32-bit and 64-bit installer as shown in the figure above, click as appropriate for your computer version.

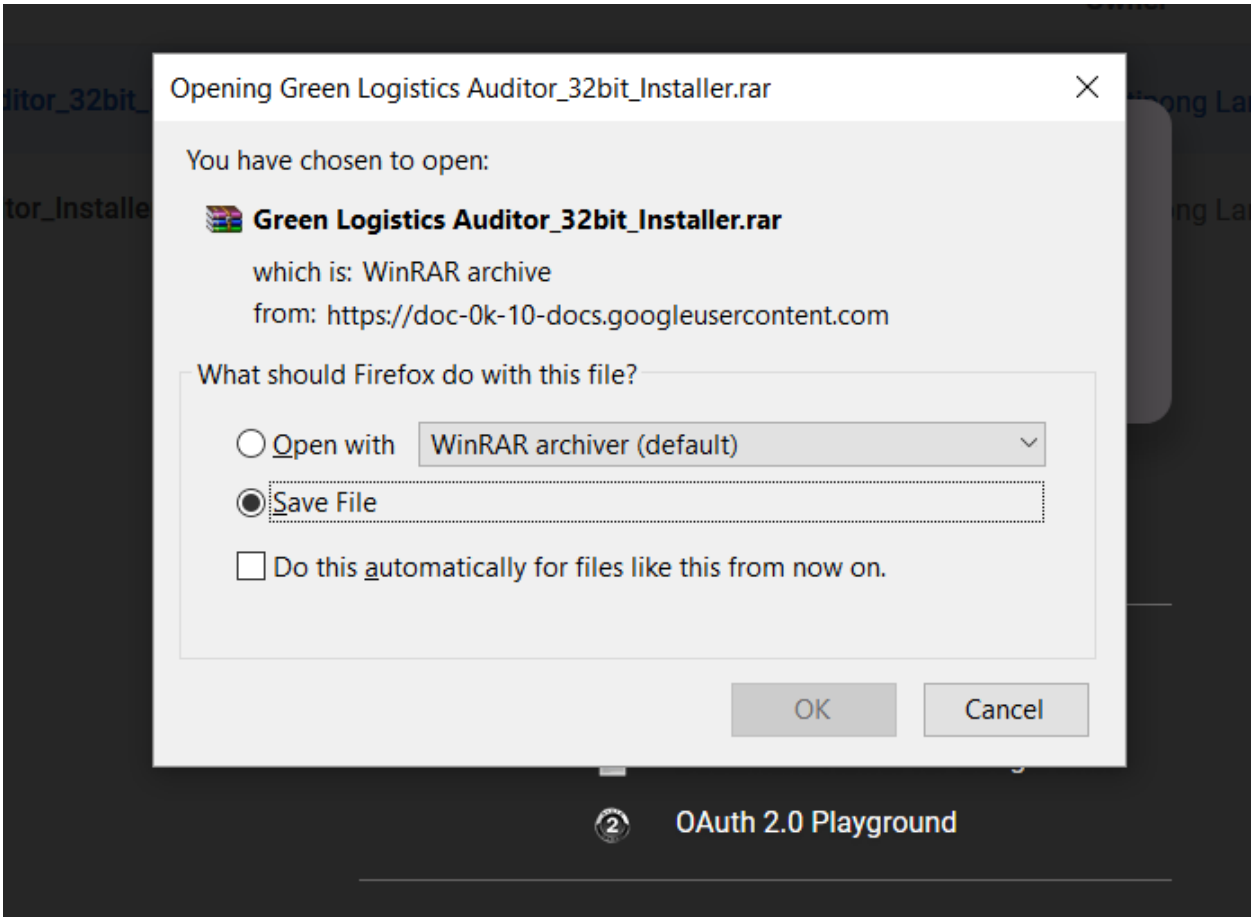
After you click you will get the following screen,



Click Download, and you will see the following screen,

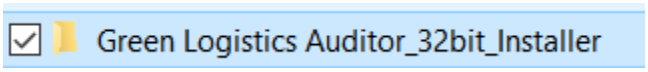


Click the Download Anyway, button and you will see the following screen,

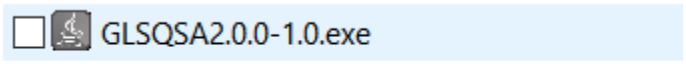


Select to save the file as appropriate for you in your computer and click OK,

Unzip the *.rar* file to get the following folder in your computer,



Double click the folder to get the installation file, as shown below,

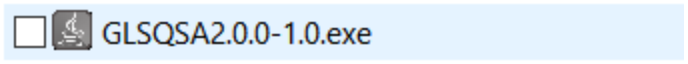


For downloading the User Manual, simply click over the GLSQSA USER MANUAL, you will be greeted by the following screen,

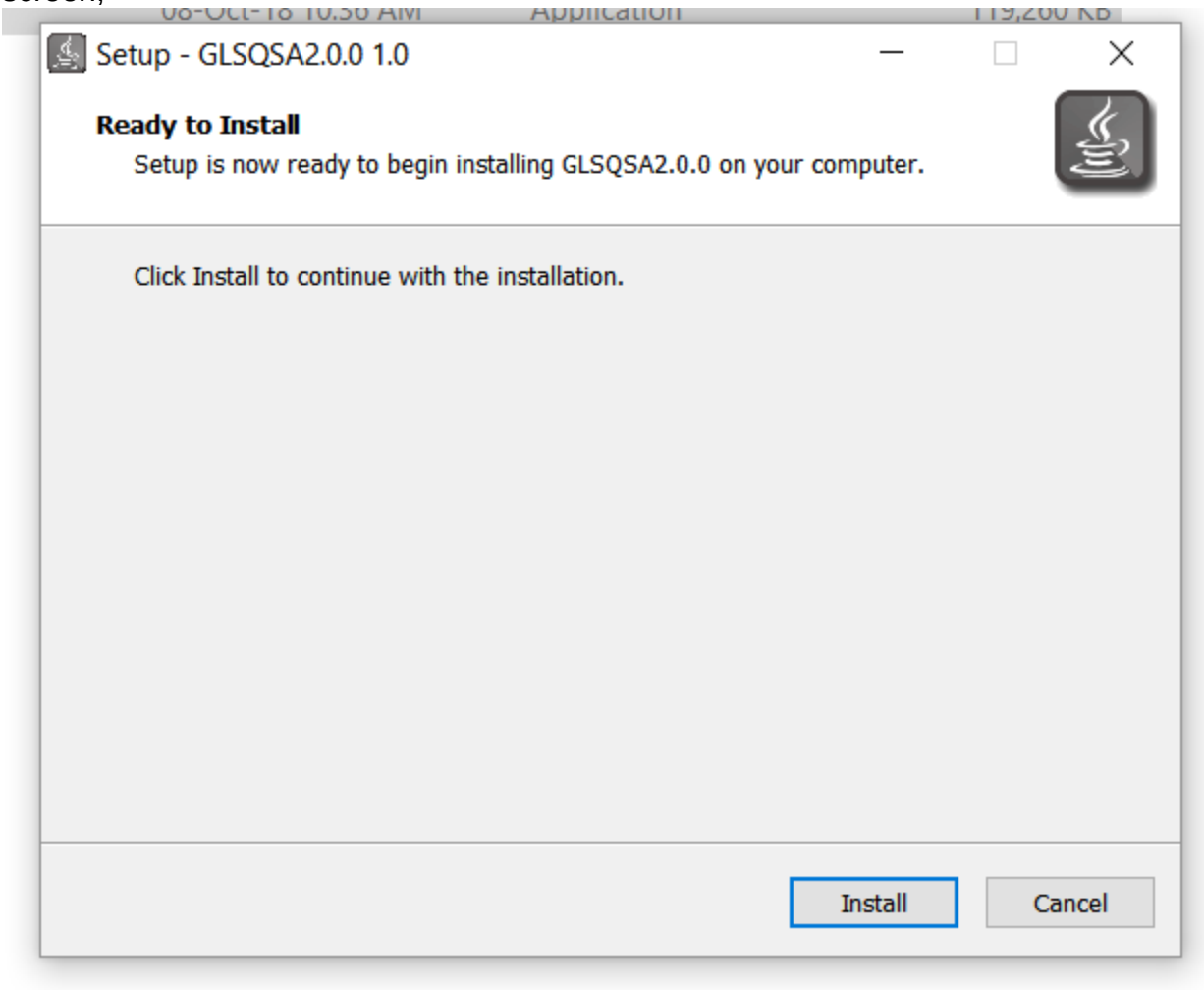
Click the icons highlighted by the red circle in the figure above to either print or save it into your computer.

3. Installing the software

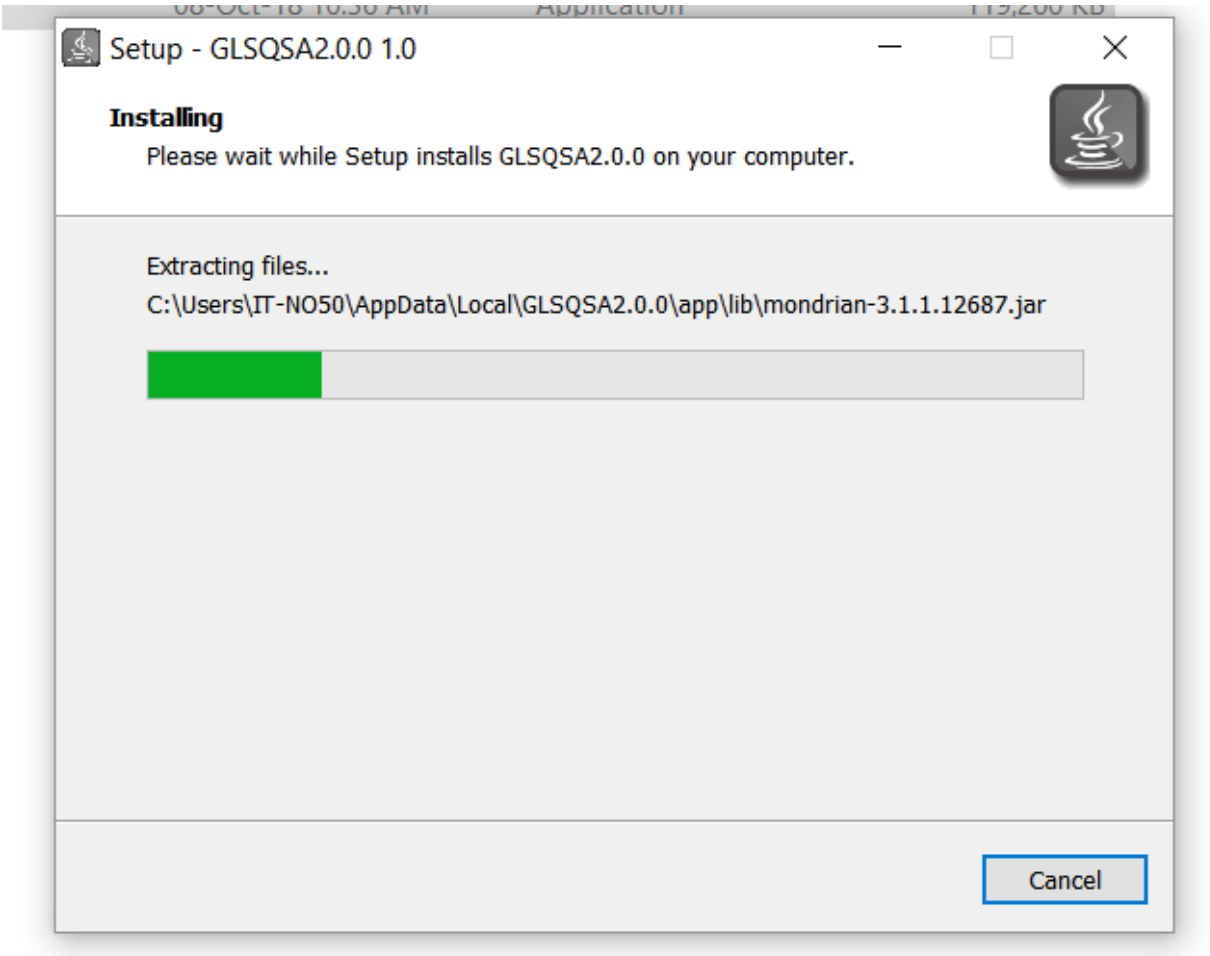
Installation of the GLSQSA2.0.0 is very easy, just double click on the icon



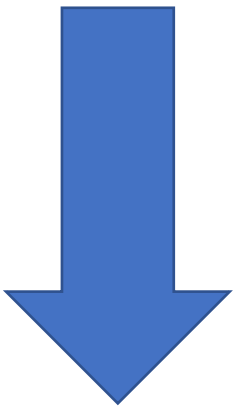
and you will see the following screen,

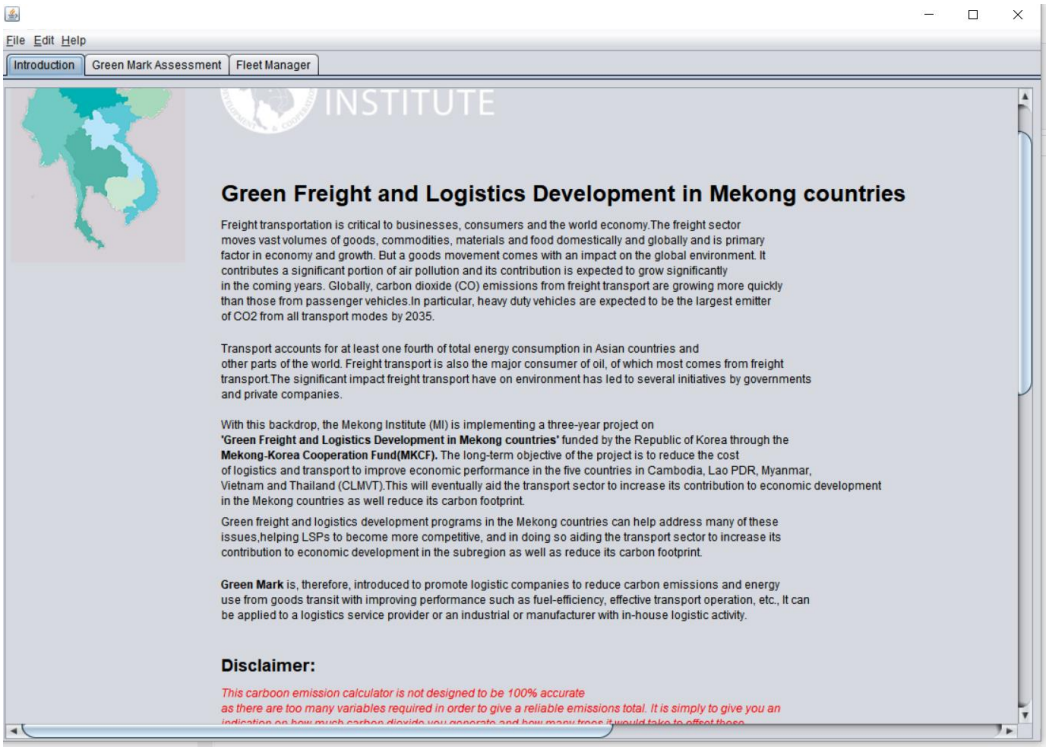


Click Install in the above shown screen and you will further see this screen,



After the installation completes you will be greeted by the following screen, which is the main interface of the GLSQSA2.0.0 program.

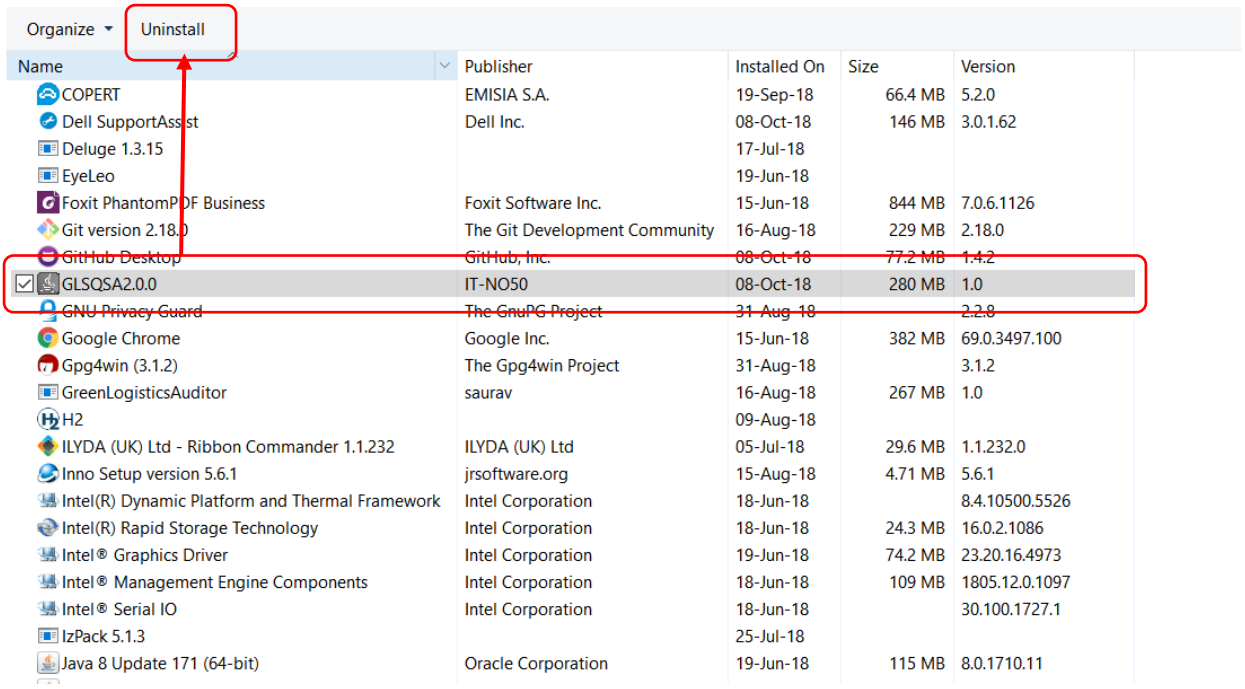


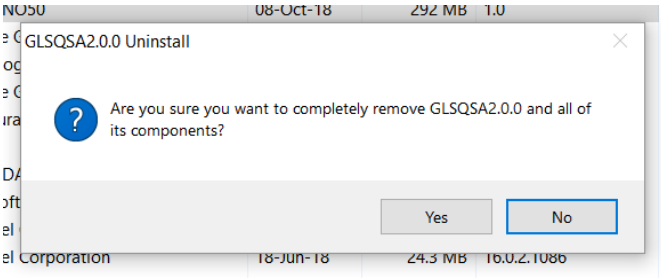


You can find it in the list of your programs when you click the Windows icon and All Program.

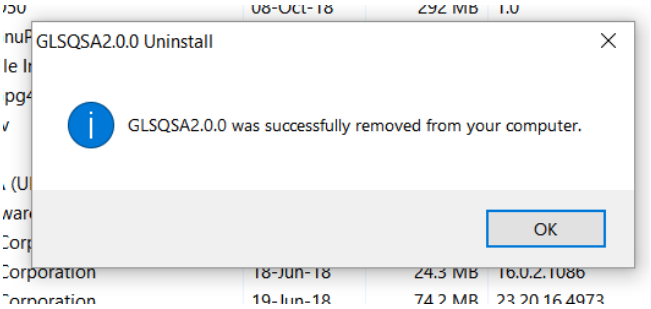
4. Uninstalling the software

The software can be simply uninstalled by going to the Control Panel and clicking the software name and clicking the uninstall button.





Once you click the Yes, button as in the adjacent figure you will uninstall the software from you machine and will get the confirmation pop as shown below,



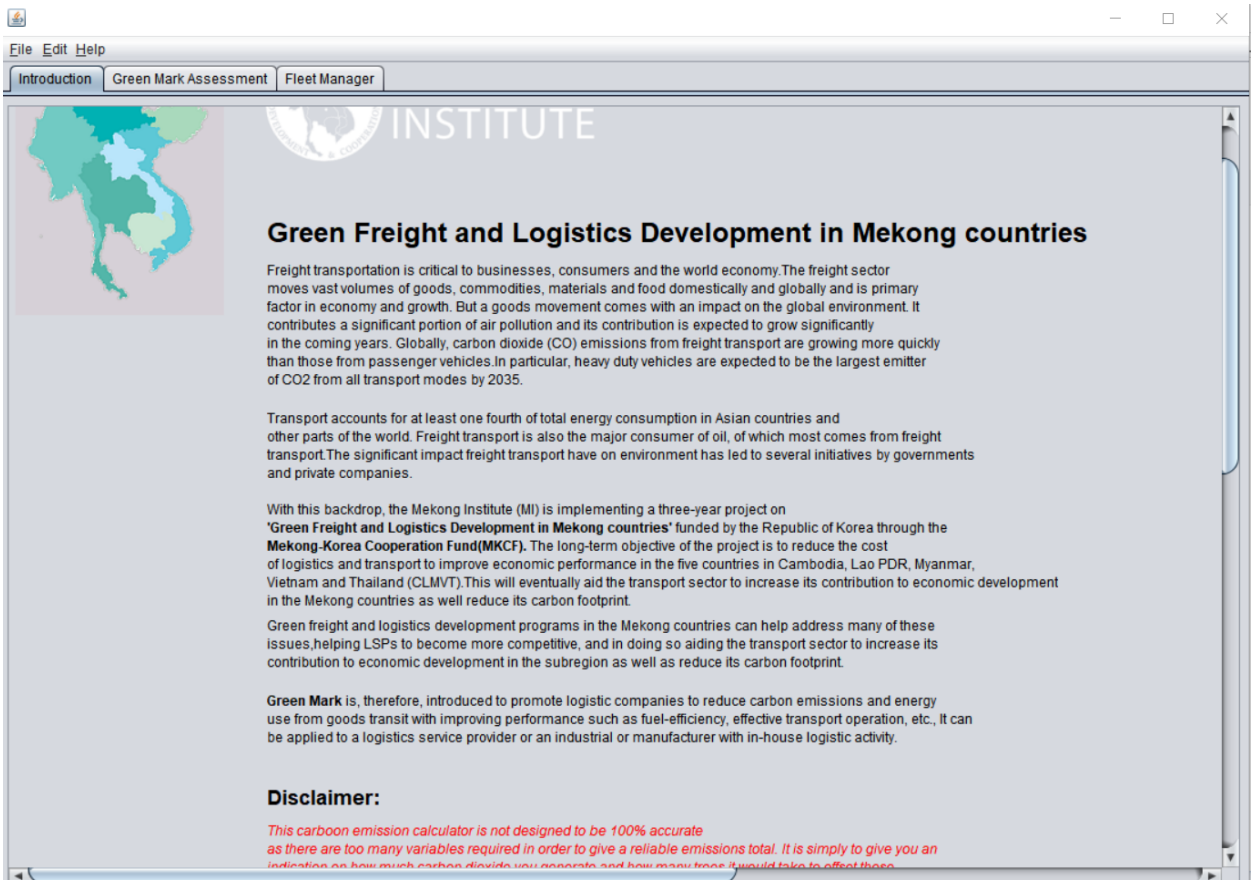
5. Software Interface

The software has three tabbed panes, namely,

1. Introduction
2. Green Mark Assessment

3. Fleet Manager

Initially you are greeted by the Introduction tab as shown below,



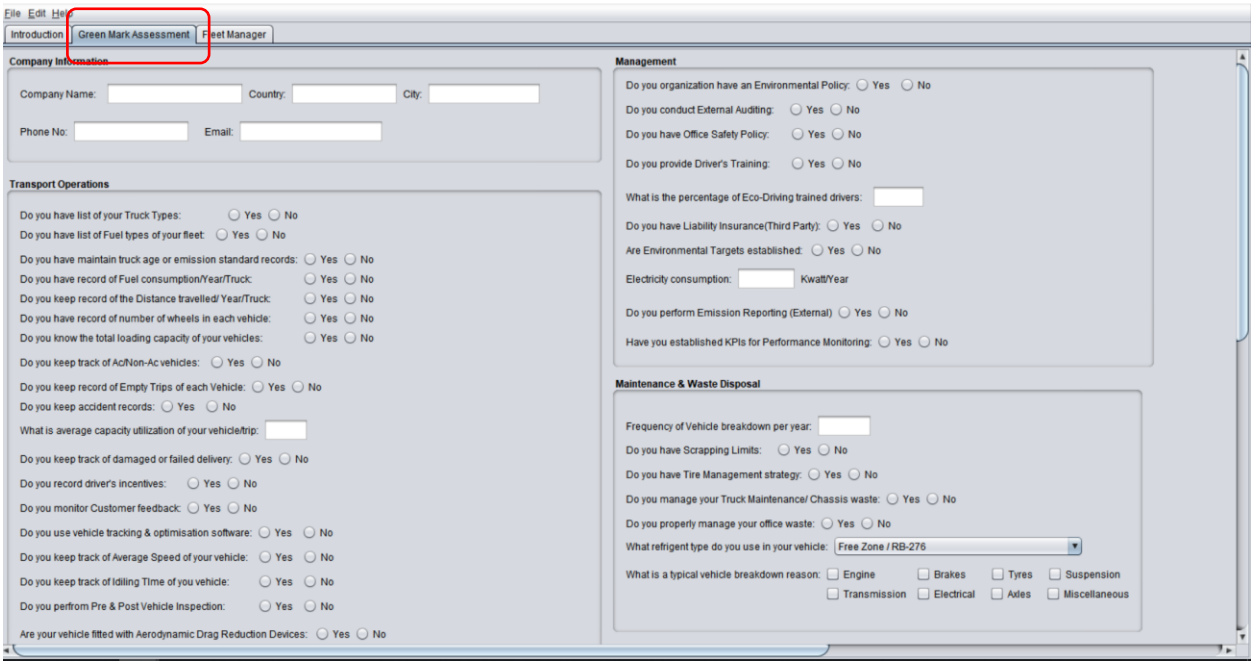
This pane introduces the user with the project that this software is part of and the intended users of this software.

It also gives some Disclaimers and the sponsor of the project, which is the Republic of Korea (ROK) and the partners in this project, which are, namely,

- Ministry of Public works and Transport, Cambodia,
- Ministry of Public works and Transport, Lao PDR,
- Ministry of Transport and Communication, Myanmar,
- Ministry of Transport of Socialist Republic of Vietnam, and
- Ministry of Transport of Thailand.

You can hover over the icons to get the tool tips.

6. Green Mark Assessment



As depicted in the figure above the second tabbed panel named, Green Mark Assessment, is where we should be focused on, if we want to assess our green efficiency,

This panel has four, sub-panel named,

- Company Information
- Transport Operations
- Management
- Maintenance & Waste Disposal

In order to access the level of green efficiency your organization has, you need to fill in the information as required in all of the four sub-panel in this tabbed panel.

First start with the Company Information:

As shown in the figure above this panel, asks for your organization basic information,

Company Name:

Country:

City:

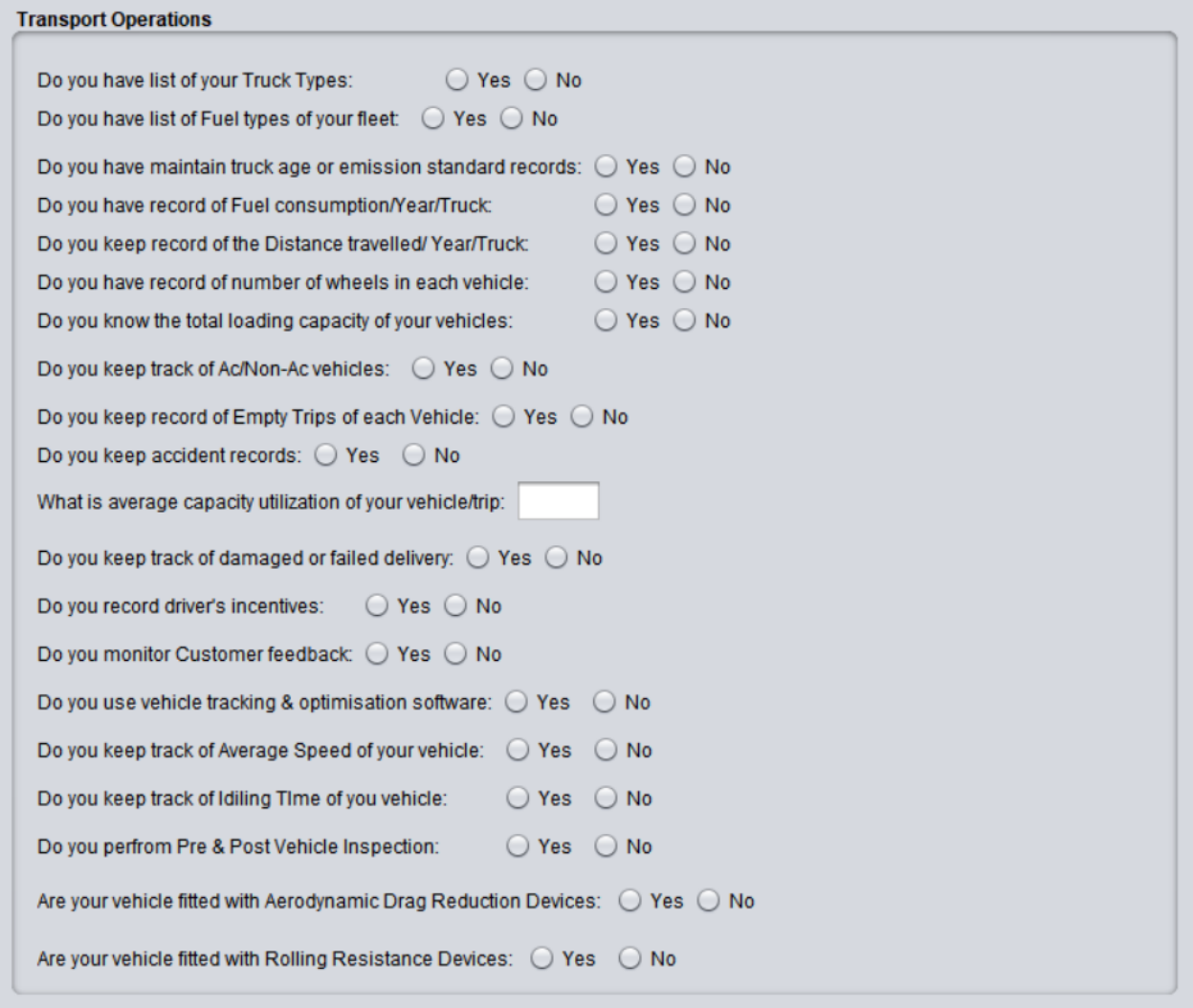
Phone No: (Please input only numbers in this field or you will not be able to generate certificate when clicking SUBMIT)

Email:

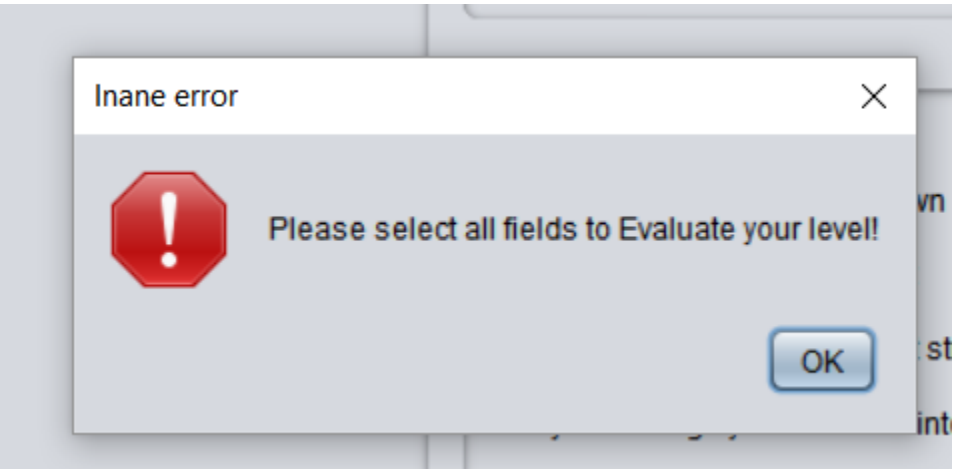
and please note that each field needs to be selected, or you will be greeted with an Inane error message as shown below:

After you fill the Company Information, you move ahead to fill the next panel, i.e., the Transport Operations.

The Transport Operations panel has 20 Key Performance Indicators (KPIs), 19 of them 'Yes'/'No' question and one field to input the actual value, the Average Capacity Utilization of your vehicle/trip, as depicted in the figure below.



Select the answers as appropriate to your organization as honestly as possible and please note that each field needs to be selected, or you will be greeted with an Inane error message as shown below:

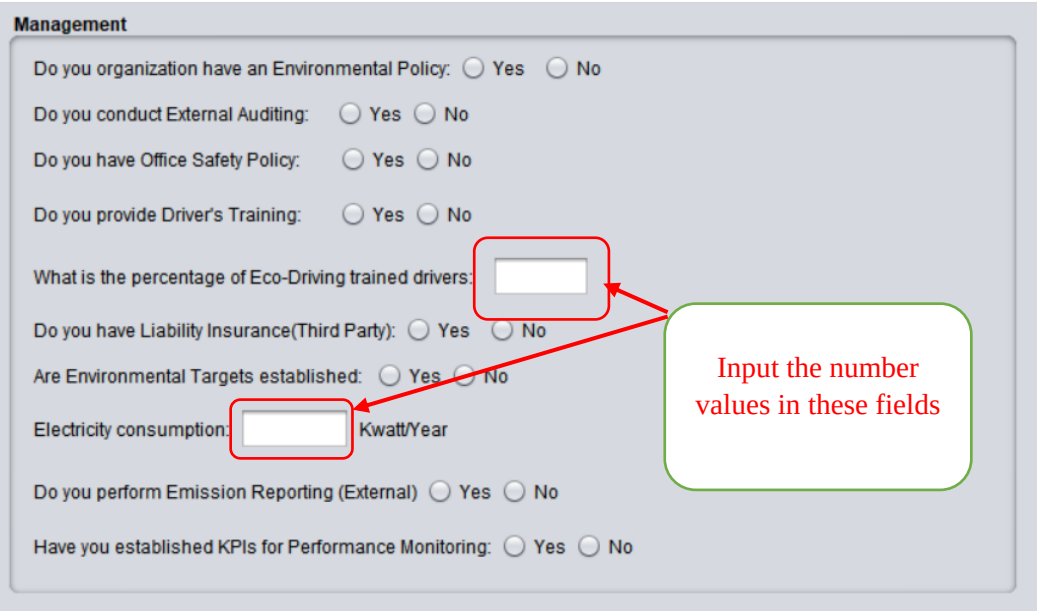


After you completely answer the questions under the Transport Operations, you can move to the other group of KPIs which is the Management.

This group of tab panel have the KPIs related to the management operation in your organization. There are ten KPIs in this panel, all except for the,

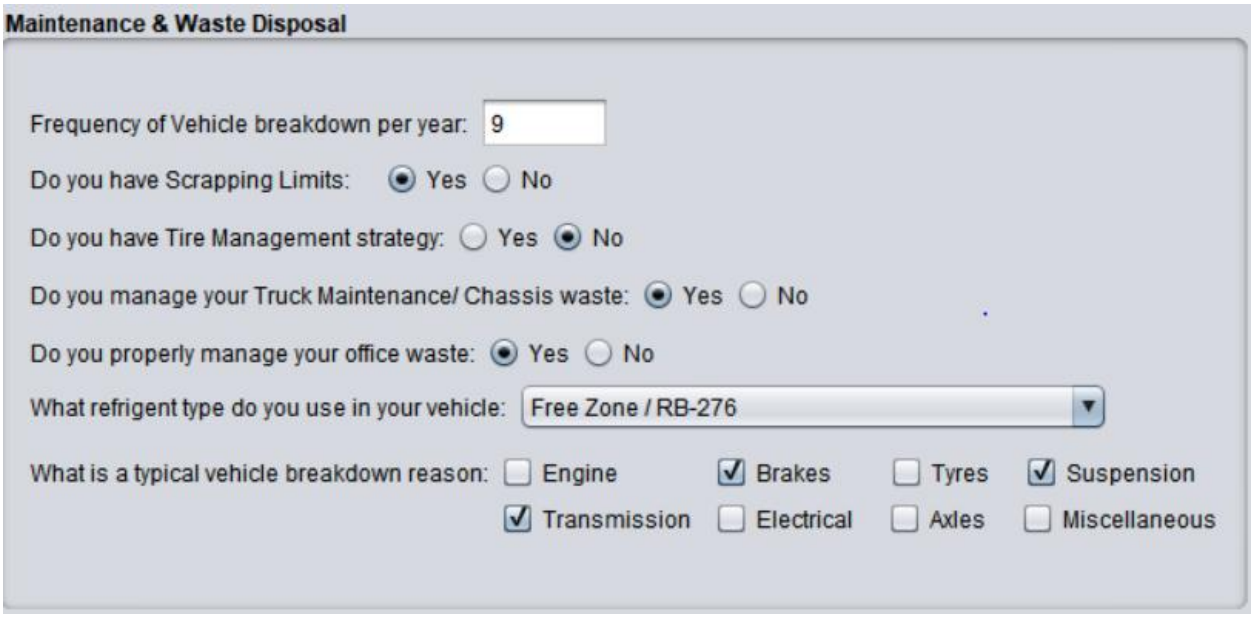
- Percentage of Eco-driving trained drivers, and
- Electricity Consumption per year

Is where you have to input the actual values in number, which is shown as below,



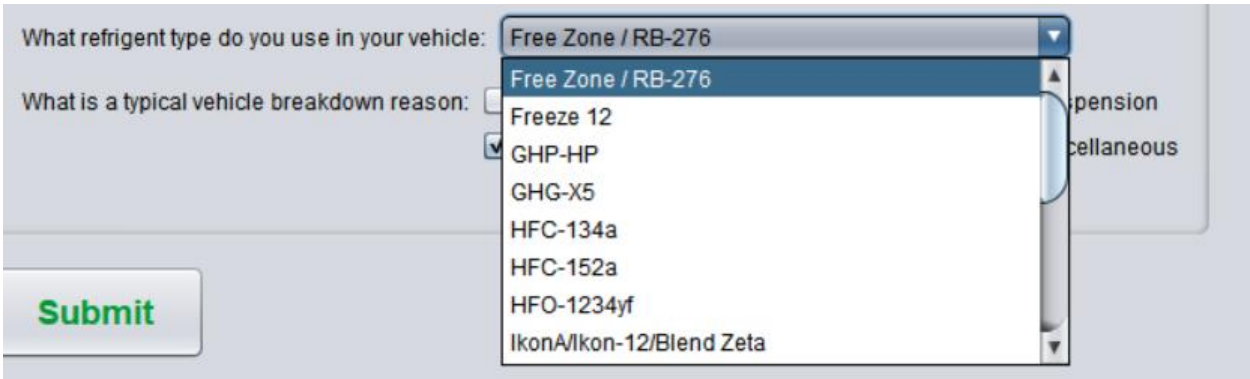
After you complete Management Panel, you can move ahead to the last panel, which is the Maintenance & Waste Disposal Pane, here you will see seven KPIs.

Among the 7 KPIs, one field is where you have to fill the actual numerical values, Frequency of vehicle breakdown per year. As depicted in the figure below,



The refrigerant type specifies the refrigerant that a Vehicle manufacturer have used two different refrigerants in automotive A/C systems. Most pre-1994 model year vehicles used CFC-12 (also called R-12; most people know it by its most popular brand name, Freon™). It is not the type of refrigerant used in most cars today. You should use the term refrigerant not the brand name when referring to this gas. 1995 and up model year vehicles use HFC-134a refrigerant, also referred to as R-134a.

Many (but not all) older systems that were designed to operate with CFC-12 can be retrofitted to use HFC-134a.

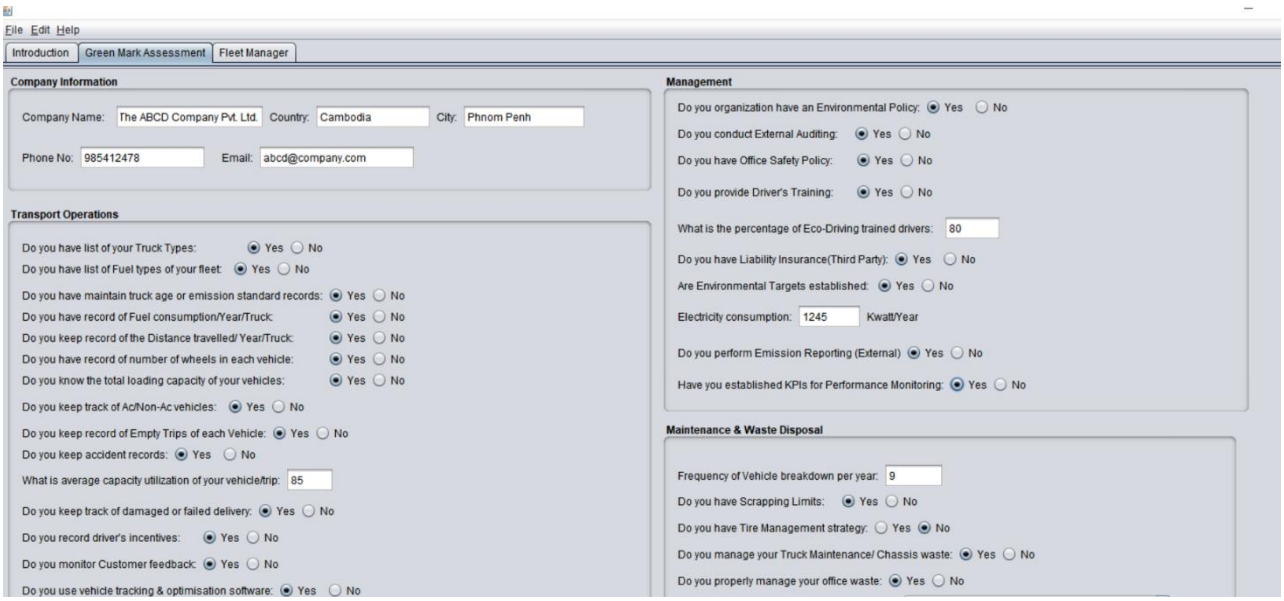


As you can see in the figure above, the drop-down combo box next to refrigerant types displays a list of refrigerants used in most vehicles today. The table below shows, which types are acceptable and which are unacceptable in terms of health risks, including factors such as ozone depletion potential, global warming potential, toxicity, flammability and exposure potential.

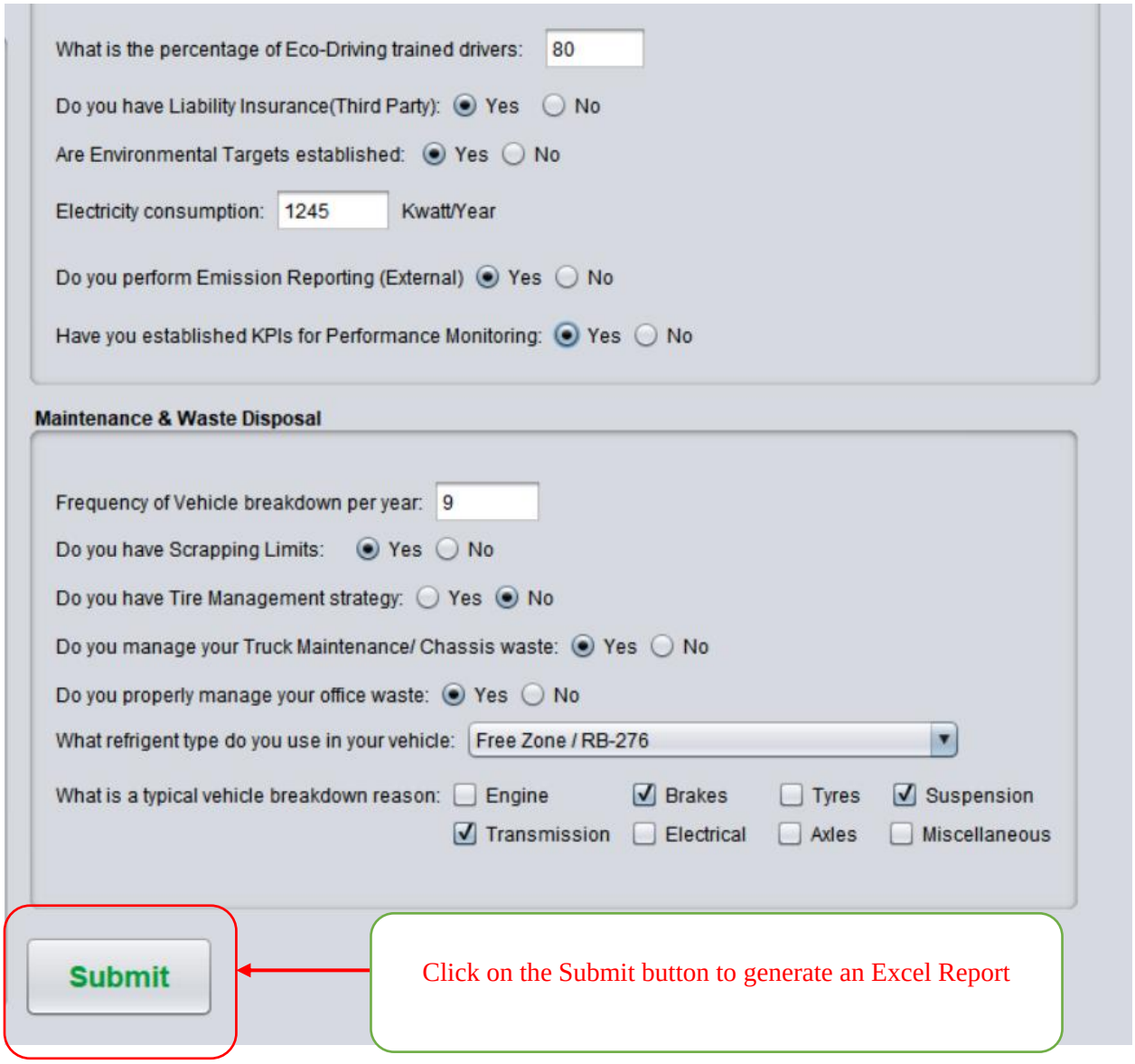
Refrigerant Type	Listing Status
Free Zone / RB-276	Acceptable
Freeze 12	Unacceptable
GHP-HP	Unacceptable
GHG-X5	Unacceptable
HFC-134a	Acceptable
HFC-152a	Acceptable
HFO-1234yf	Acceptable
IkonA/Ikon-12/Blend Zeta	Acceptable
R-401C	Acceptable
R-406A(GHG)	Unacceptable
R-414A (GHG-X4, HCFC, Blend Xi, Autofrost, Chill-it)	Unacceptable
R-416A (FRIGC FR-12, HCFC Blend Beta)	Unacceptable
R-426A(RS-24)	Unacceptable
R-744	Acceptable
RS-24	Acceptable
SP34E	Unacceptable
Stirling Cycle	Acceptable

7. Generating the Green Report

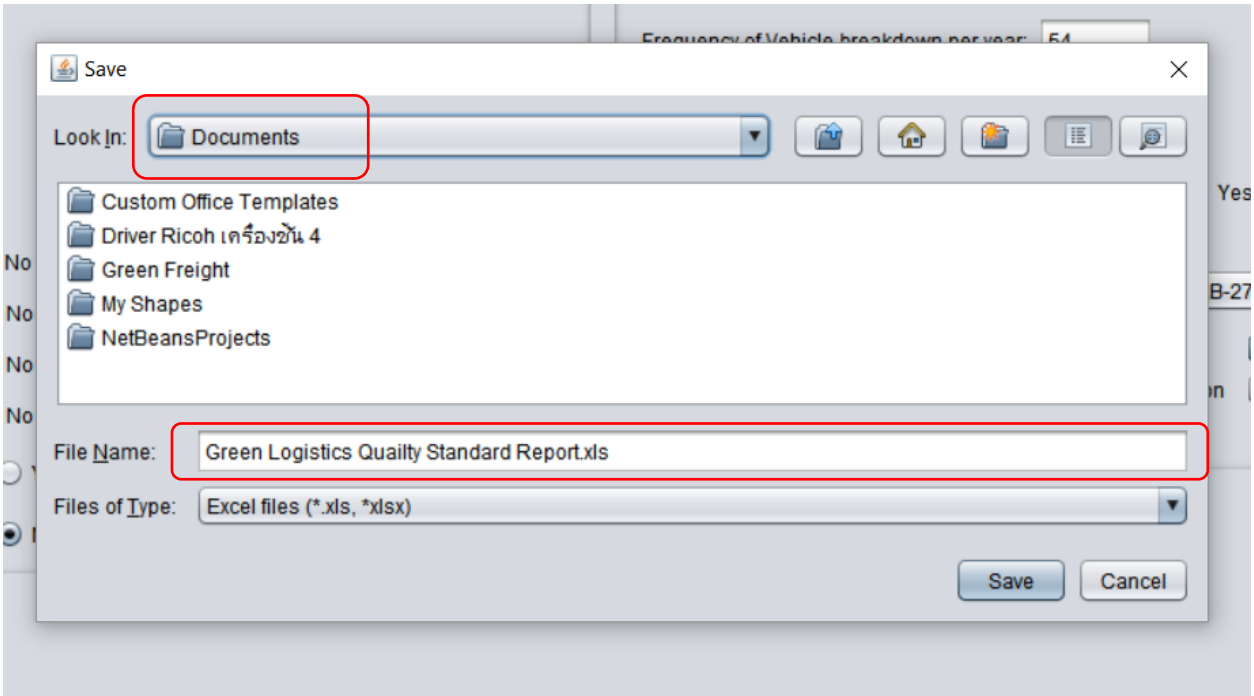
After filling all the panel, we will get a view like shown in the figure below, and now we are ready to generate our Green Mark Report,



Click on the Submit button that is below the Maintenance & Waste Disposal panel as shown in the figure below,



Once you click the Submit, you will be greeted by the screen below,



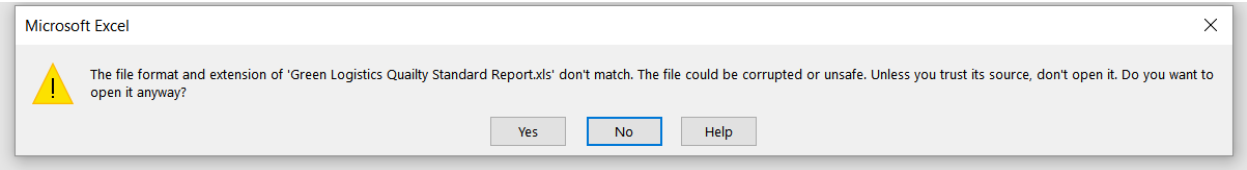
The screen above allows you to save the *Green Logistics Quality Standard Report. xls*, a report generated by accessing your greenness from the answers to the KPIs you provided.

The pop-up is allowing you to save the report in your desired location in your computer.

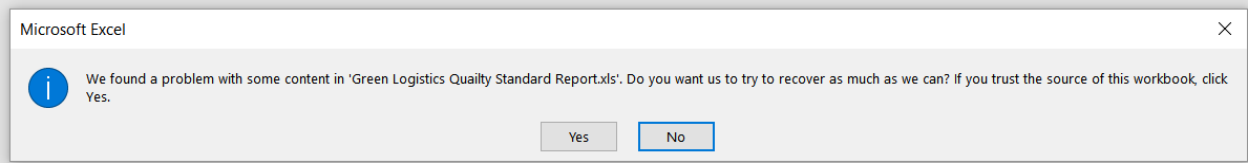
8. The Green Mark Certificate

Click the Save, button to save it in Documents folder. Now you have a .xls Excel file as shown below, inside your Documents folder.

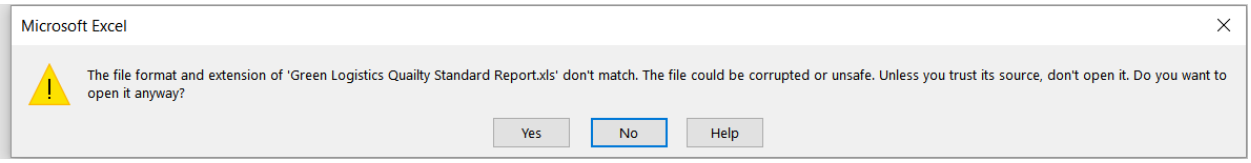
Double click on the file to view the certificate,



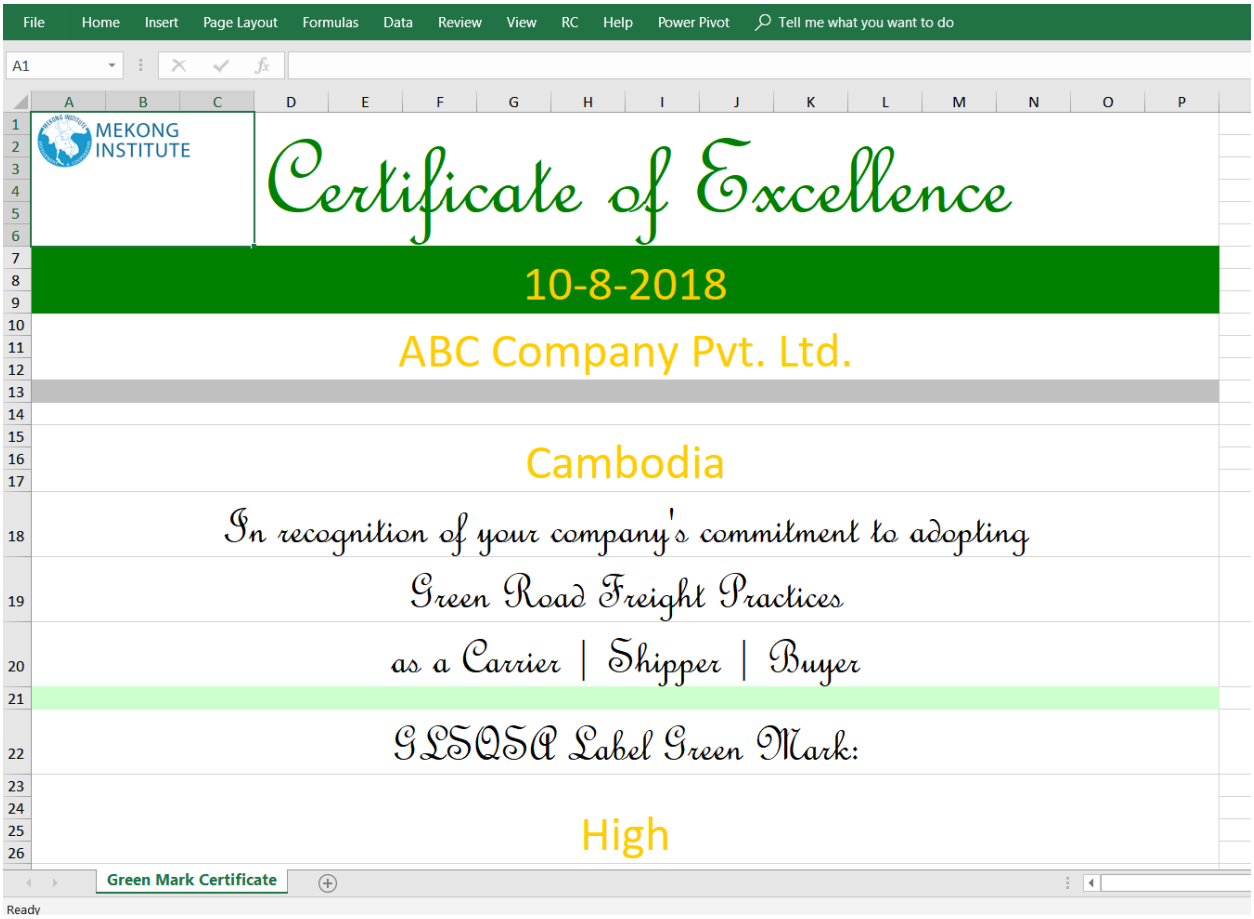
You will be greeted by the pop-up as shown above, click Yes.



Again, you will be greeted by the pop-up as shown above. Click Yes, again.



Again, a warning message appears, click Yes, this time also and you will finally get a screen as shown below,



An Excel file titled, *Certificate of Excellence*, appears in the top, the second row shows the current date in the format mm/dd/yyyy.

The following line after date is the Company name, here for instance we have put the ABC Company Pvt. Ltd., as our company name.

Similarly, the fourth line shows the country name, here for instance Cambodia.

The certificate states,

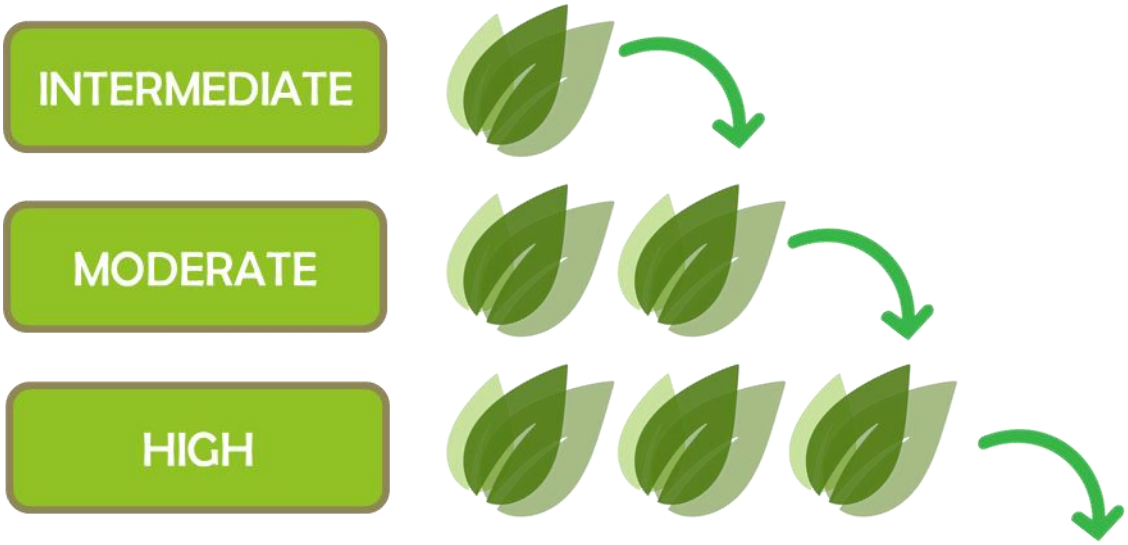
"*In recognition of your company's commitment to adopting green road freight practices as a Carrier or Shipper or Buyer*

GLSQSA Label Green Mark:

High"

On the left top corner is the Mekong Institute logo as seen in the above picture.

The GLSQSA software rates you in three categories, and generates the GLSQSA Label, as depicted in the figure below,



If you have all the KPIs in the software you are labelled as the High, similarly if you don't have some, especially in the areas of the Transport Operations and Management, then you are at the Moderate level and if you only have the basic information or KPIs, then you are at the

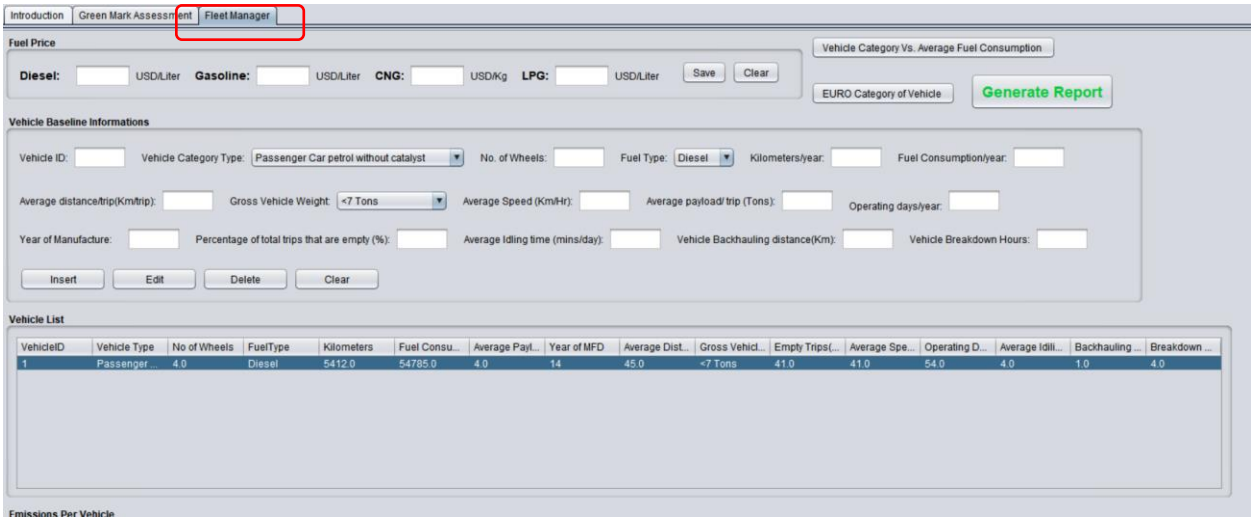
Intermediate level of certification.

All the KPI as used in the software are listed as under,

	Area of Managem		Key Performance Indicator
1	Transport Operation	No of Trucks	
2		Information for each Truck/Year	Type of Truck
3			Type of Fuel
4			Truck Age and/or Truck Emission Standard
5			Fuel consumption / Year/Truck
6			Distance travelled/year
7			Number of wheels
8			Total Loading Capacity
9			Ac/ Non-Ac
10			Total Loading
11			Empty Trips
12			Accident record
13			Capacity Utilization of the vehicle/Trip
14			Damaged or Failed delivery
15			Record for drivers' incentive
16			Customer feedback monitor
17			Use of Vehicle Tracking & Optimisation Software
18			Average Speed
19			Idling time
20			Pre and post vehicle inspection
21			Technology (Aerodynamic Devices)
22			Technology (Rolling Resistance)
23	Maintenance and Waste Disposal	Information/Fleet	Vehicle breakdown /Year
24			Scrapping Limit Set
25			Tire management
26			No of Breakdown/Year
27			Management of waste from maintenance truck / chassis
28			Management of waste from office
29			Refrigerant type
30			Vehicle Breakdown Reason (engine, transmission, brakes, electrical, tyres, axles, suspension, misc)
31	Management	Information/Company	Environment policy
32			Auditing (external)
33			Safety policy (safety office)
34			Driver Training Policy
35			Share of Eco-driving trained drivers
36			Liability insurance (third party)
37			Environment Targets established
38			Electricity Consumption/Year
39			Emission Reporting (External)
40			KPI's established for Performance Monitoring

9. Vehicle Manager Panel

The last tabbed panel in the software is dedicated to the management of fleet list and is named as the Fleet Manager, as shown in the figure below,

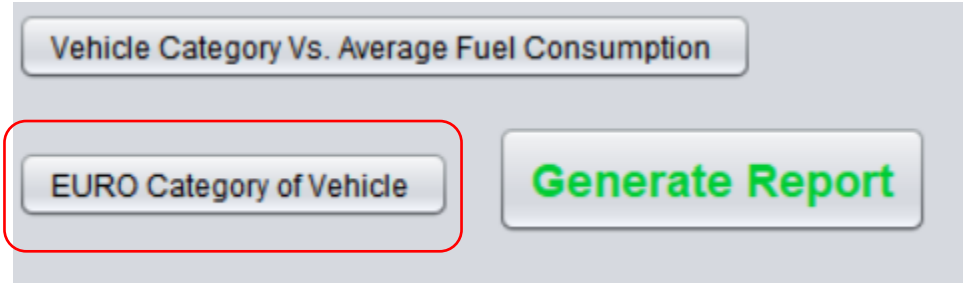


In this panel you will be able to save the price of the fuels used in your vehicle, as shown below

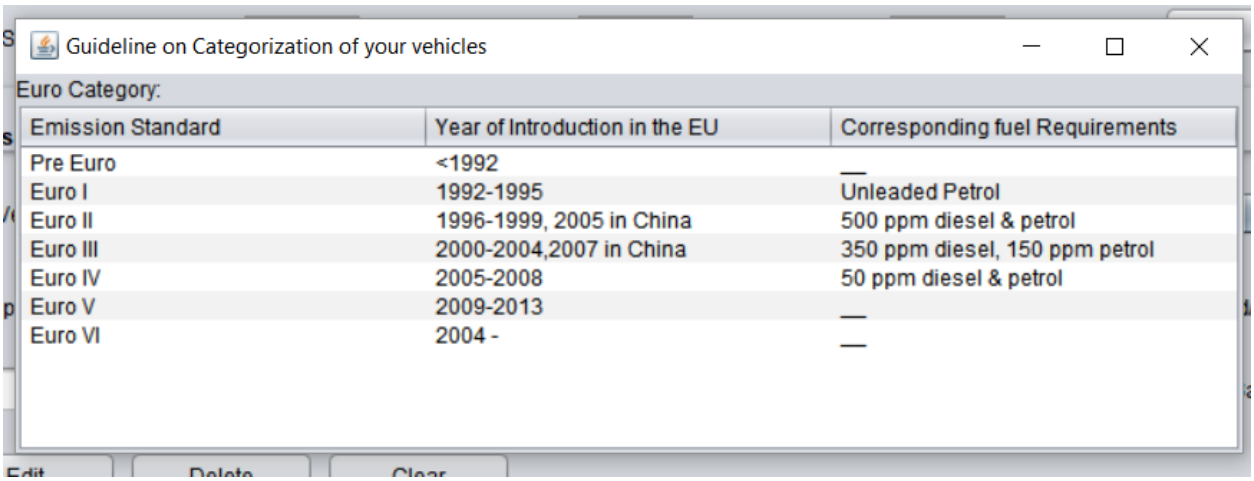
We have put the prices of the Diesel as 10 USD, Gasoline as 12 USD, CNG as 15 USD and LPG as 25 USD.

Click Save to save the prices to the software database, so that it can be used to calculate the saving by switching your various vehicles to from the lower efficient to highly efficient fuel.

Similarly, on the right of the Fuel Price, panel are three buttons, as shown below,



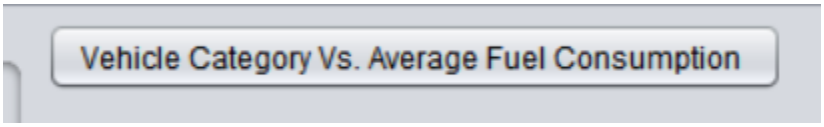
The EURO Category of Vehicle, button when clicked displays a pop-up menu as shown below.



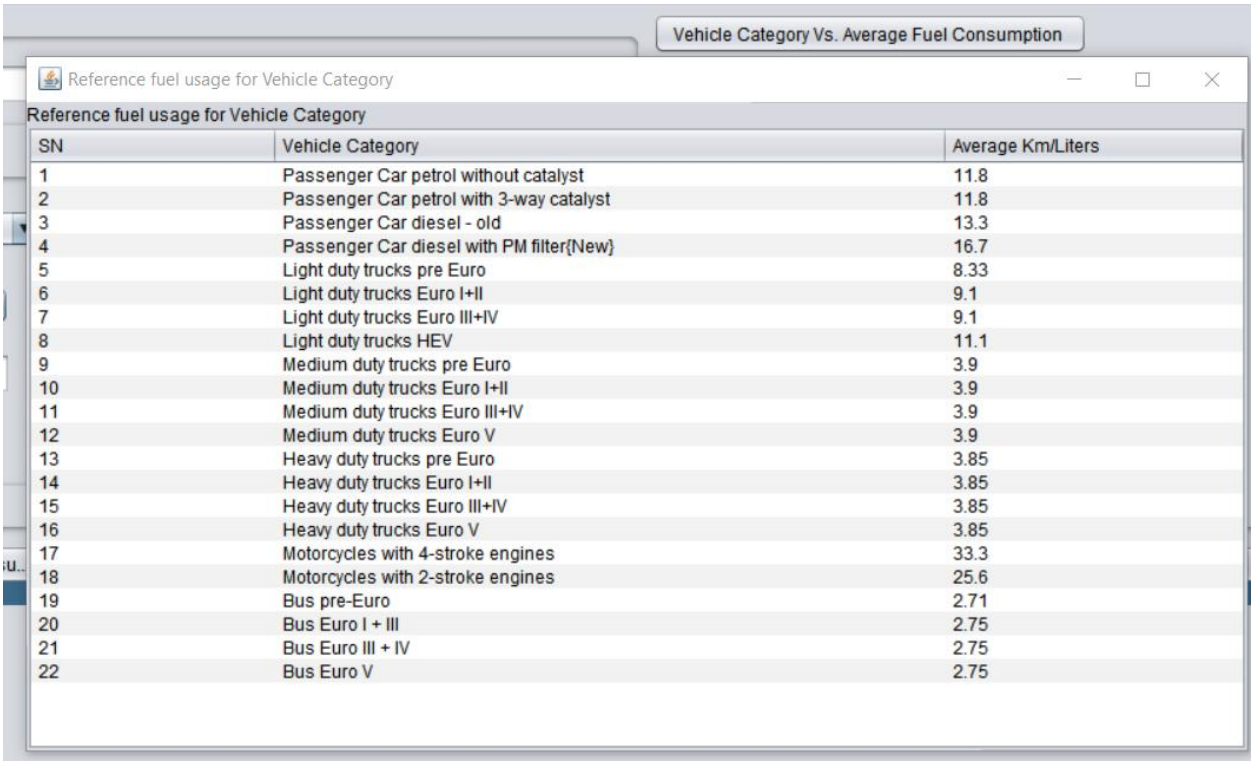
The menu above shows how to categorize your vehicle into different EURO categories ranging from Pre Euro to Euro I, Euro II, Euro III, Euro IV, Euro V to Euro VI

The column on the right most side also shows the Corresponding fuel requirements.

Similarly, the other button above named, Vehicle Category Vs. Average Fuel Consumption, which is depicted as under,



The button when clicked displays another pop-up as shown below,

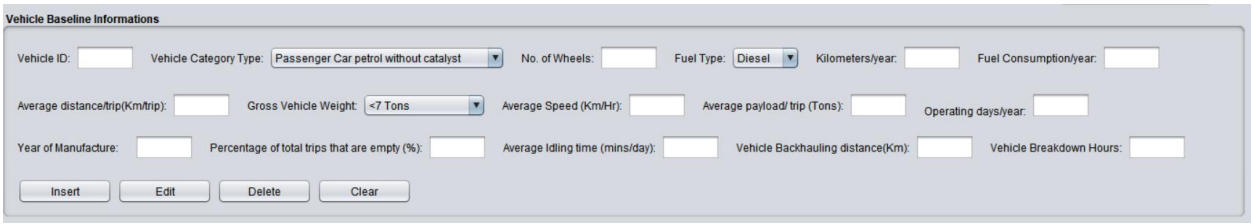


SN	Vehicle Category	Average Km/Liters
1	Passenger Car petrol without catalyst	11.8
2	Passenger Car petrol with 3-way catalyst	11.8
3	Passenger Car diesel - old	13.3
4	Passenger Car diesel with PM filter{New}	16.7
5	Light duty trucks pre Euro	8.33
6	Light duty trucks Euro I+II	9.1
7	Light duty trucks Euro III+IV	9.1
8	Light duty trucks HEV	11.1
9	Medium duty trucks pre Euro	3.9
10	Medium duty trucks Euro I+II	3.9
11	Medium duty trucks Euro III+IV	3.9
12	Medium duty trucks Euro V	3.9
13	Heavy duty trucks pre Euro	3.85
14	Heavy duty trucks Euro I+II	3.85
15	Heavy duty trucks Euro III+IV	3.85
16	Heavy duty trucks Euro V	3.85
17	Motorcycles with 4-stroke engines	33.3
18	Motorcycles with 2-stroke engines	25.6
19	Bus pre-Euro	2.71
20	Bus Euro I + III	2.75
21	Bus Euro III + IV	2.75
22	Bus Euro V	2.75

The figure above shows the different vehicle categories, categorized according to the Euro standards and their corresponding Average Km/Liters fuel mileages.

If your organization only keeps track of the fuel consumption by each vehicle, then you can use this table to generate the total distance in Kilometers travelled by the respective vehicle and put it in, during emission calculation.

Below the Fuel Price, panel there is another panel called the Vehicle Baseline Information, panel which is as depicted under,



We have the following parameters to input into this panel, for each vehicle you can input the following data:

Vehicle ID: this can be any number as an identification of the vehicle.

Vehicle Category Type: drop down list, where different categories of vehicle are listed according to the EURO standards

No. of Wheels: provide the number of wheels in your vehicle

Fuel Type: select from the Diesel, Gasoline, CNG, LPG, LNG, as used in your vehicle.

Kilometers/year: distance travelled by a particular vehicle in a month or a week or a year, whatever you want to access.

Fuel Consumption/year: the total fuel consumed by a particular vehicle in a month or a week or a year as synchronized to the earlier field Kilometers/year.

Average distance/trip (Km/trip): as the name depicts, the average distance travelled by a particular vehicle in a trip

Gross Vehicle Weight: select between less than 7 tons (< 7 Tons), between 7 Tons to 16.5 Tons and greater than 16.5 tons (>16.5 Tons)

Average Speed (Km/H): as the name specifies, put the average speed for a particular vehicle.

Average payload/trip (Tons): this field you provide the average weight of the goods carried by your vehicle in a typical trip

Operating days/year: this is the number of days that your vehicle operates

Year of manufacture: here you put the year in which your vehicle was manufactured, e.g., 1999, 2005, etc.

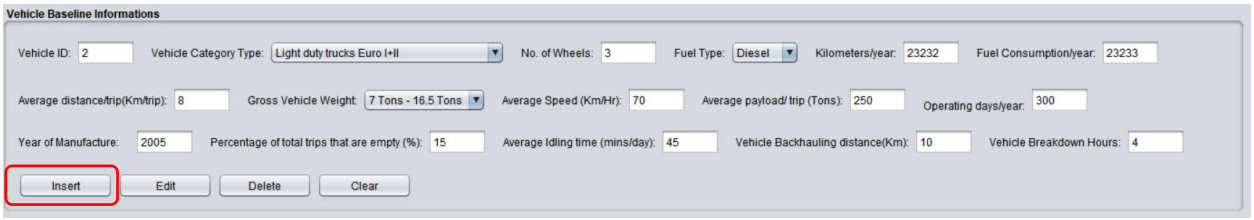
Percentage of total trips that are empty (%): as the name suggests input the percentage that your vehicle has travelled empty, for instance if your vehicle A is empty 2 trips a day then calculate the average per month for this vehicle may be if your vehicle A travels 4 trips then its 50% of time is empty.

Average idling time (mins/day): the idling time in mins per day, Idle time is unproductive time on the part of vehicle caused by management or as a result of factors beyond their control. Idle time is the time associated with waiting, or when a vehicle is not being used but could be.

Vehicle Backhauling distance (Km): In trucking, a backhaul is a hauling cargo back from point B to the originating point A. Since it costs almost as much time to drive empty as fully loaded. This makes economic sense, since it helps to pay for the operating expenses for the trip back to the originating point A for the trucking company and/or trucker.

Vehicle Breakdown Hours: A vehicle breakdown is the mechanical failure of a motor vehicle in such a way that the underlying problem prevents the vehicle from being operated at all, or impedes the vehicle's operation so much, that it is very difficult, nearly impossible, or else dangerous to operate. Input the total hours for a particular vehicle you are considering in this panel.

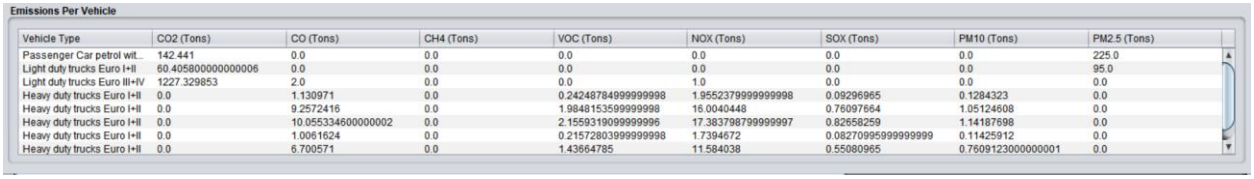
Once we fill all the 16 fields in this panel, your screen will be as following,



Click the Insert button below to create a list as in the Vehicle List panel as shown below,

You can input all of your vehicle information here and generate a list as shown in the figure above.

Simultaneously to the generation of the Vehicle List, the software generates an Emission per Vehicle list, which is the table below the Vehicle List table as shown below,



Emissions Per Vehicle

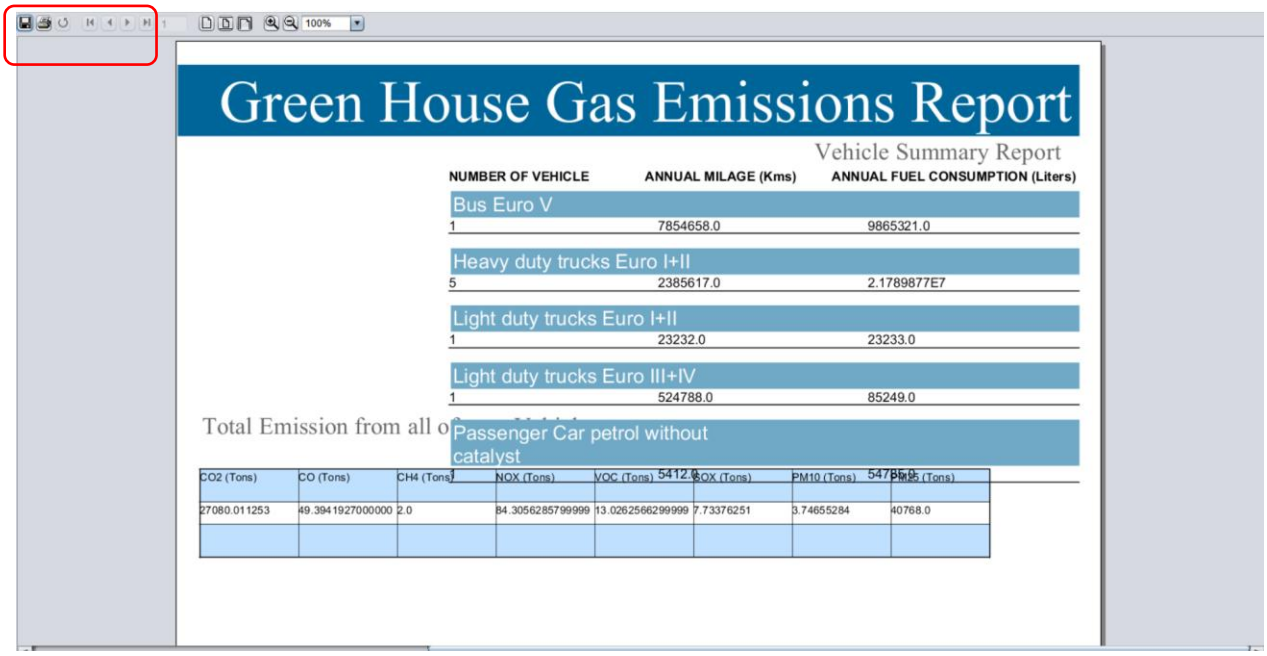
Vehicle Type	CO2 (Tons)	CO (Tons)	CH4 (Tons)	VOC (Tons)	NOX (Tons)	SOX (Tons)	PM10 (Tons)	PM2.5 (Tons)
Passenger Car petrol wit...	142.441	0.0	0.0	0.0	0.0	0.0	0.0	225.0
Light duty trucks Euro I+II	60.405800000000006	0.0	0.0	0.0	0.0	0.0	0.0	95.0
Light duty trucks Euro III+IV	1227.329853	2.0	0.0	0.0	1.0	0.0	0.0	0.0
Heavy duty trucks Euro I+II	0.0	1.130971	0.0	0.24248784999999998	1.9552379999999998	0.09296965	0.1284323	0.0
Heavy duty trucks Euro I+II	0.0	9.2572416	0.0	1.9848153599999998	16.0040448	0.76097664	1.05124608	0.0
Heavy duty trucks Euro I+II	0.0	10.055334600000002	0.0	2.1559319099999996	17.383798799999997	0.82658259	1.14187698	0.0
Heavy duty trucks Euro I+II	0.0	1.0061624	0.0	0.21572803999999998	1.7394672	0.08270995999999999	0.11425912	0.0
Heavy duty trucks Euro I+II	0.0	6.700571	0.0	1.43664785	11.584038	0.55080965	0.7609123000000001	0.0

As you can see in the figure above, the table displays Vehicle Type, CO_2, CO, CH_4, VOC, $NO_{x,}$ $SO_{x,}$ PM10 and PM2.5, the most important Green House Gas (GHG), all in Tons per Year.

10. Generating Emission Report

As you can see each individual vehicle GHG emissions in the tabulated form in the software itself, however you can generate a summarized report by clicking the Generate Report button on the right top of the software with the green color text, which is as depicted below,

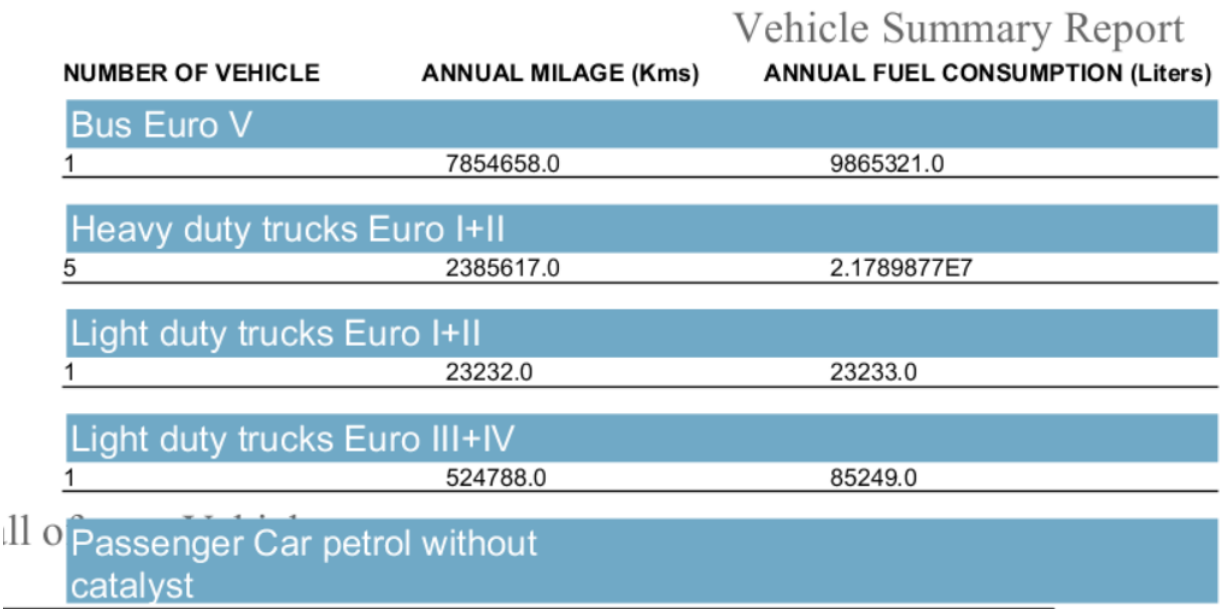
Click the button and you will be greeted by the following screen,



You can save or print  by clicking these buttons on the top left corner of the generated report.

The report has two parts a Vehicle Summary Report, as shown below, which summarizes number of vehicles according to the various Euro categories and their corresponding total mileage, and annual fuel consumption in liters. So, in the figure below, we can see that the Bus Euro V is 1 in number,

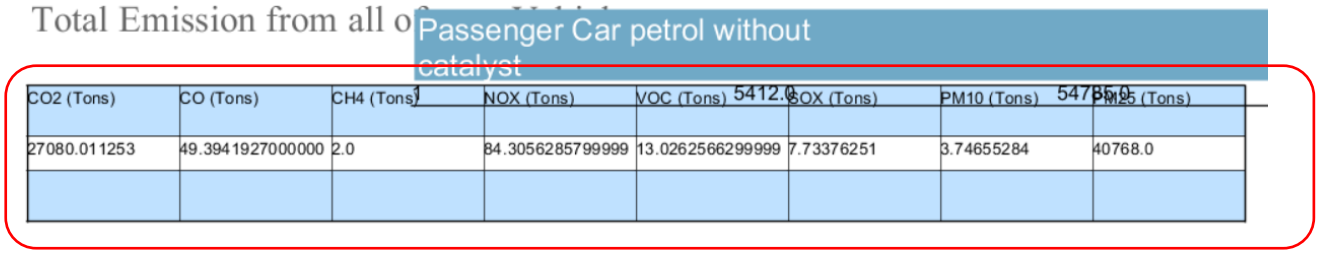
Heavy duty trucks Euro I+II are 5 in number, Light duty trucks Euro I +II 1 in number and so on along with their respective annual mileage and annual fuel consumptions.



Vehicle Summary Report

NUMBER OF VEHICLE	ANNUAL MILAGE (Kms)	ANNUAL FUEL CONSUMPTION (Liters)
Bus Euro V		
1	7854658.0	9865321.0
Heavy duty trucks Euro I+II		
5	2385617.0	2.1789877E7
Light duty trucks Euro I+II		
1	23232.0	23233.0
Light duty trucks Euro III+IV		
1	524788.0	85249.0
Passenger Car petrol without catalyst		

The other category is the Total Emission from all of the Vehicle, as depicted in the picture below you can see the total of the various GHG emissions in Tons generated by your vehicle.



Total Emission from all o

Passenger Car petrol without catalyst

CO2 (Tons)	CO (Tons)	CH4 (Tons)	NOX (Tons)	VOC (Tons)	SOX (Tons)	PM10 (Tons)	PM25 (Tons)
27080.011253	49.3941927000000	2.0	84.3056285799999	13.0262566299999	7.73376251	3.74655284	40768.0

1 5412.0 54785.0

The Carbon Dioxide (CO_2), is the most dangerous among these emissions and we need to reduce it as much as possible, for each ton of CO_2 produced we need to plant at least the equal number of or twice the number of trees every year to compensate for the damage done to the environment.