Green Freight and Logistics Policy Development in the Philippines:

Assessing Freight Transportation in Support of a National Green Freight Program

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This report was written by Clean Air Asia consultants, Dr. Jane Romero and Ms. Pia May Agatep, EnP.

This document was reviewed by Ms. Hannah Ebro, Mr. Friedel Sehlleier and Mr. Tali Trigg of GIZ. Contributors to this report include Mr. Alan Silayan (Clean Air Asia), Ms. Cristina Villaraza, Ms. Kathleen Dematera and Mr. Mark Tacderas (Clean Air Asia).

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Green Freight and Logistics Policy Development in the Philippines:

A Green Freight Assessment Study

Jane Romero and Pia May Agatep

The Project Context

The GIZ Programme on Cities, Environment and Transport (CET) in ASEAN seeks to reduce emissions from transport and industry by providing co-benefits for local and global environmental protection. The CET Project 'Energy Efficiency and Climate Change Mitigation in the Land Transport Sector in the ASEAN region' (Transport and Climate Change (TCC) www.TransportandClimateChange.org) aims in turn to develop strategies and action plans for more sustainable transport.

As presented to the ASEAN Land Transport Working group, TCC's regional activities are in the area of fuel efficiency, strategy development, green freight, and Nationally Appropriate Mitigation Actions in the transport sector. At the national level the project supports relevant transport and environment government bodies in the Philippines, Thailand, Vietnam, Malaysia and Indonesia, for the development of national action plans and improvement of policy monitoring systems. The project is funded by the German Federal Ministry for Economic Cooperation and Development.

Table of Contents

List of Acronyms

ASEAN	Association of South East Asian Nations
ASPBI	Annual Survey of Philippine Business and Industry
ATOME	Anti Truck Overloading Mobile Enforcement
BBB	Build Build Build Program
BMZ	Germany's Federal Ministry for Economic Cooperation and Development
CAA	Clean Air Asia
CALABARZON	Cavite, Laguna, Batangas, Rizal Quezon
CO	Carbon monoxide
CoA	Certificate of Accreditation
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
CTAP	Confederation of Truckers Association of the Philippines
DOTr	Department of Transportation (formerly DOTC)
DOTC	Department of Transportation and Communications (now DOTr)
DTI	Department of Trade and Industry
DTI-SCLMD	Supply Chain and Logistics Management Division
EO	Executive Order
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GVW	gross vehicle weight
ITS	intelligent transport system
IFC	International Finance Corporation
JICA	Japan International Cooperation Agency
Km	Kilometer
KLTSP	Kuala Lumpur Transport Strategic Plan
KTOE	kiloton of oil equivalent
LEI	Logistics Effectiveness Index
LGU	Local Government Unit
Lm	Linear Meter
LPI	Logistics Performance Index
LTFRB	Land Transportation Franchising and Regulatory Board
LTO	Land Transportation Office
MIMAROPA	Mindoro, Marinduque, Romblon, Palawan
MSME	Micro, small and medium enterprise
MVUC	Motor Vehicle User's Charge
MTCO2	Metric tons of carbon dioxide equivalent
NCR	National Capital Region
NESTS	National Environmentally Sustainable Transport Strategy
NGO	Non-government organizations
NIP	Philippine National Implementation Plan on Environment Improvement in the Transport Sector
NLMP	National Logistics Master Plan
NO_X	Nitrogen oxides
PDP	Philippine Development Plan
PM	Particulate matter
PSA	Philippine Statistics Authority
RORO	Roll on/Roll off

SEC	Securities and Exchange Commission
SM	Shoe Mart
SME	Small-Medium Enterprise
TCC	Transport and Climate Change
TESDA	Technical Education and Skills Development Authority
TITL	Transport Infrastructure, Trade and Logistics
TRAIN	Tax Reform for Acceleration and Inclusion
TSC	transportation, storage and communications
UNCRD	United Nations Centre for Regional Development
VOC	Volatile organic compound
WB	World Bank
WEF	World Economic Forum

Executive Summary

In recent years, freight and logistics are growing steadily alongside the Philippine economy. However, majority of the freight and logistics activities in the country are road-based. This consequently increases greenhouse gas (GHG) emissions from the transport sector, hence, taking initiatives in improving the overall efficiency, especially mitigating negative environment impacts, of the sector is imperative. Greening freight transport logistics can help decouple transport impacts from economic growth. This is crucial to ensure that goods move in an efficient, low emissions and low impact manner.

This study provides an overview of the freight and logistics sector in the country, laying out the foundation on why and what are the next steps necessary to develop a green freight and logistics program in the Philippines (Sections 1 and 2). A review of existing policies in the freight transport sector, other relevant development plans and discussions among concerned government agencies and partners and the roles each stakeholder plays to advance the improvement of freight and logistics are elaborated in Section 3.

Noting that road transport is the dominant mode of moving goods in the country, the study focused on understanding the trucking industry including the structure of the freight sector and particular needs of the stakeholders. There is a need to know how the industry operates, its structure, the relevance of the modes, the characteristics of the vehicles, and the operational characteristics of freight travel, among others. The study recognizes that available and disaggregated trucking data are limited, so surveys and consultations were conducted with truckers, freight forwarders and logistics service providers. This effort was done in close coordination with the Department of Trade and Industry (DTI). The green freight survey was structured to gather information on the following aspects: (i) profile of respondent companies; (ii) fleet characteristics; (iii) trucking operations; (iv) vehicle fleet management and maintenance practices; (v) fuel-saving technologies and strategies; (vi) emissions reporting, and; (vii) institutional framework and green freight program planning. The discussion and findings of the survey and focus group consultations are presented in the latter part of the study in Section 4.

Finally, the study provides a list of specific recommendations in Section 5 focusing on increasing efficiency of trucks and improving the trucking industry that the government and private sector could implement through coordinated actions. Recommendations include: 1) improving trucking data collection, monitoring and reporting framework; 2) professionalizing the logistics industry; 3) improving truck efficiency; 4) consolidating SMEs in the trucking industry; 5) reducing empty miles; 6) decongesting Manila and improve efficiency and performance of freight operations in other urban areas; 7) enhancing multimodal freight transport connectivity; 8) establishing public-private partnerships through green freight programs; 9) participating in regional and international initiatives, and; 10) establishing an interagency coordination for freight and logistics sector to ensure that coordinated actions and policies are observed.

Ultimately, the study recommends the establishment of a Green Freight Program in the Philippines that includes an action plan that will identify different actions and initiatives to be done to improve the overall efficiency of the freight and logistics sector.

1. Introduction

1.1. Background

The Philippines is a rapidly growing emerging economy with an expanding freight transport and logistics industry that facilitates the nation's economic development. This industry is not only a major employer but also has a significant and increasing environmental footprint. To address the latter, mitigation actions are necessary and environmental as well as socio-economic sustainability need to be embedded in the country's relevant sectoral strategies and plans.

The concept of "green freight and logistics" (see definition below) has arrived in the policy and corporate agendas in Asian countries in recent years, driven by a number of factors including climate change mitigation, the need to improve logistics performance, technological advancements, demand by multinational shippers and logistics service providers, and the interest of companies in opportunities to become more efficient and cut costs. However, compared to other emerging economies in the region, the Philippines has seen little discussion or initiative on Green Freight and Logistics thus far.

The Philippines became a signatory to the Global Green Freight Action Plan in 2013. It is a voluntary, multi-lateral, multi-stakeholder, global partnership that aims to facilitate collaboration to enhance the efficiency of global goods movement in ways that significantly reduce climate, health, energy, and economic impacts. In 2016, the ASEAN Transport Ministers developed the Kuala Lumpur Strategic Transport Plan (ASEAN Transport Strategic Plan) 2016-2025 which also highlights the role of green freight and logistics in the region. While the Philippine Development Plan 2017-2022 as well as the National Logistics Master Plan 2017-2022 prioritises the improvement of transport and logistics services in the country, there is limited coverage on the implications arising from increasing freight and logistics and on how to green the sector. This report is a first milestone to assess the status quo and lay the foundation to move from intention to action by working across ministries to include sustainability in the planning process of freight and logistics.

In a nutshell, a green freight and logistics program intends to assist governments and businesses to promote trade in a cost-efficient way thereby improving people's quality of life while preserving the environment. It is an important strategic pillar for a sustainable transport system and for improving logistics performance of countries and their economies. A report by GIZ (2017) found that such policies and measures can produce a myriad of co-benefits and thereby contribute to the achievement of 13 of the 17 Sustainable Development Goals.

Such goals of green freight and logistics can be realised by following the *avoid-shift-improve*[1] strategies wherein *avoid* strategies generally reduce the number of trips and the travel distance of road vehicles, *shift* strategies move freight activities towards more energy-efficient and environment-friendly transport modes, and *improve* strategies ensure the energy efficiency in road transport vehicles and systems through operational and technological enhancements. Close cooperation among governments, businesses, academe, NGOs and other key stakeholders is necessary to ensure a cohesive and successful implementation of green freight initiatives.

[1] Sustainable Urban Transport: Avoid- Shift-Improve. GIZ. http://www.sutp.org/files/contents/documents/resources/E_Fact-Sheets-and-Policy-Briefs/SUTP_GIZ_FS_Avoid-Shift-Improve_EN.pdf

What is green freight and logistics?

A set of strategies, policies, practices and standards…

…targeted at the movement of goods via road, rail, marine, inland waterways and air…

…aiming to:

- reduce the environmental, climate and public health impacts through reduced air pollution and greenhouse gas emission intensity;
- improve social conditions, including road safety, and health and working conditions of people involved in freight movement; and
- enhance economic development through improved energy efficiency, fuel security, and efficiency and competitiveness of the freight and logistics sector overall;

…developed and implemented by government, the private sector and other stakeholder groups jointly or individually.

(Source: UNCRD, 2014)

1.2. Objectives and Scope of the Green Freight Assessment

The main objectives of this report are the following:

- Assess the state-of-affairs relating to elements that are necessary to establish a green freight program; and,
- Propose policies, measures and institutional mechanisms to develop a green freight and logistics program in the Philippines.

The assessment focuses on land transport as freight activity is dominated by road transport, carrying 58% of cargo traffic in the Philippines (water: 41.95%; air: 0.06%), and mostly by truck fleets owned by small and medium enterprises.[2] Desk research was done to understand the status of freight transport in the Philippines and review the current policy framework. This was augmented by primary data gathering through surveys and focus group discussions with key stakeholders since disaggregated data is scarce to gauge the status of truck fleets and their operating characteristics. Discussions and analyses delved more on environmental performance linked with energy and operational efficiency, with minor details on social impacts due to limited data availability.

The recommendations developed are based from the collective research, analysis of survey results and insights from consultation workshops aimed at supporting the Department of Transportation (DOTr) and Department of Trade and Industry (DTI) to come up with regulations and policies, and the private sector to thresh out 'low-hanging actionable fruits' to mainstream efforts on green freight and logistics.

[2] ADB. 2012. Transport Sector Assessment, Strategy, and Road Map.

This report is a product of the cooperation between DOTr, DTI, Clean Air Asia (CAA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) 'Energy Efficiency and Climate Change Mitigation in the Land Transport Sector in the ASEAN Region' Project (in short, 'Transport and Climate Change' or TCC) with funding from Germany's Federal Ministry for Economic Cooperation and Development (BMZ). GIZ support is linked to the agency's assistance to transport ministries of its partner countries, such as Philippines, in developing sustainable transport strategies and action plans aligned to the ASEAN Kuala Lumpur Transport Strategic Plan (KLTSP) 2016-2025.

1.3. Philippine Country Profile

Demography and Geography

The Philippines is an archipelago made up of about 7,641 islands stretching to an area of 300,000 square kilometres bordered by the waters of Bashi Channel to its north, Sulu and Celebes Seas to its south, the Pacific Ocean to its easts, and South China Sea to its west. Luzon, Visayas and Mindanao are the three groups of islands. The country's population is estimated at 103.3 million based on 2016 census data of the Philippine Statistics Authority (PSA). With a population still increasing at a rate of 1.89% per year, about 48.8% of the total population live in urban areas in 2011 following a 2.16% rate of urbanization in the last 5 years. Major urban areas include Metro Manila (12.88 million), Davao (1.63 million), Cebu (0.92 million) and Zamboanga (0.88 million).

The Philippine's archipelagic setting and increasing urban population highlight the need for improved accessibility and mobility to support the people's needs and the country's economic growth. The islands need to be linked by a seamless transport infrastructure network to enable cost-efficient movement of people, goods and services within the country to achieve inclusive growth.

Economy

The country's GDP annual growth rate averaged 3.68 percent from 1982 to 2017 making Philippines one of the fastest growing economies in the world over the last three decades.[3] The economy grew 6.9 percent in the third quarter of 2017. Industry players are projecting that the logistics sector could even grow faster than the economy.[4]

In 2016, PSA indicated that transportation, storage and communications (TSC) sector posted a 5.4% growth. The growth of TSC benefited from positive contributions of the subsectors: land transport, 1.9%; water transportation, 1.4%; air transportation, 6.7%; and storage and services incidental to transport, 8.5%.

Latest available data from 2014 Annual Survey of Philippine Business and Industry (ASPBI) showed that there are 1,108 establishments with 20 or more employees each engaged in transport and storage sector in the Philippines. Many trucking operators are small-scale enterprises with less than 20 employees. They are captured in the primary survey conducted in partnership with DTI's Supply Chain and Logistics Management Division (DTI-SCLMD). Support activities for transportation such as warehousing and logistics services topped the sector with 445 establishments or 40%. This was

[3] https://www.forbes.com/sites/panosmourdoukoutas/2017/06/20/dutertes-philippines-is-the-10th-fastest-growing-economy-in-the-world/#375f28d65887
[4] https://www.bloomberg.com/news/articles/2017-05-29/billionaire-sy-s-group-counts-on-logistics-for-growth-ceo-says

followed by industries engaged in other land transport and transport via buses with 287 establishments (26% and 151 establishments (14%), respectively, as shown in Figure 1.

At the regional level, more than half (54.9%) of the number of establishments were in the National Capital Region (NCR) comprising 608 establishments. CALABARZON followed with 125 establishments (11.3%), and Central Visayas came in third with 94 establishments (8.5%).

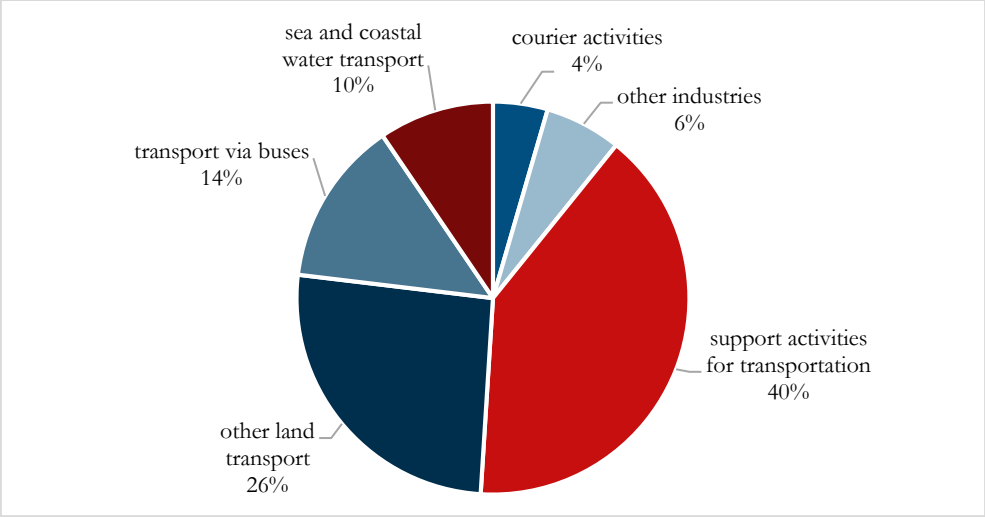


Figure 1. Percentage distribution of establishments by industry group (Source: ASPBI, 2014)

The employment generated for the sector was recorded at 138,573. Of the total, 99.0% were paid employees (137,251) and the rest were unpaid workers[5].

Among industries, support activities for transportation provided the largest number of employees with 50,921 or 36.7%. Transport via buses ranked second employing 30,001 or 21.6% and other land transport came in third with 17,120 or 12.4%. Figure 2 shows the distribution of employment by industry group.

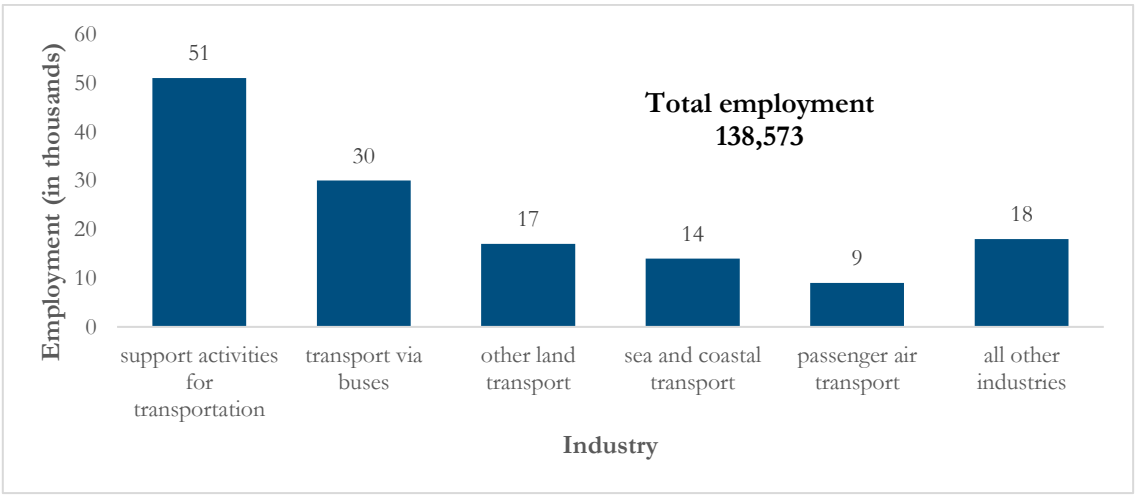


Figure 2. Distribution of employment of transport and storage establishments with total employment of 20 and over by industry group in the Philippines (Source: ASPBI, 2014)

[5] Unpaid workers are mostly family members or apprentices and learners without regular pay who work for at least one-third of the working time normal to the establishment.

By region, NCR was the highest employer with 81,266 employees (58.6%). CALABARZON came in second with 11,051 employees (8.0%) and closely followed by Central Visayas with 9,704 employees (7.0%).

Value added for the sector was estimated at PHP155.3 billion. Support activities for transportation contributed more than half (55.6%) of the total value added or PHP86.3 billion. Both sea and coastal water transport and passenger air transport industries followed with value added of PHP18.5 billion or 11.9%. On the other hand, inland water transport generated the least with PHP148.6 million. Figure 3 shows the distribution of value added for the sector.

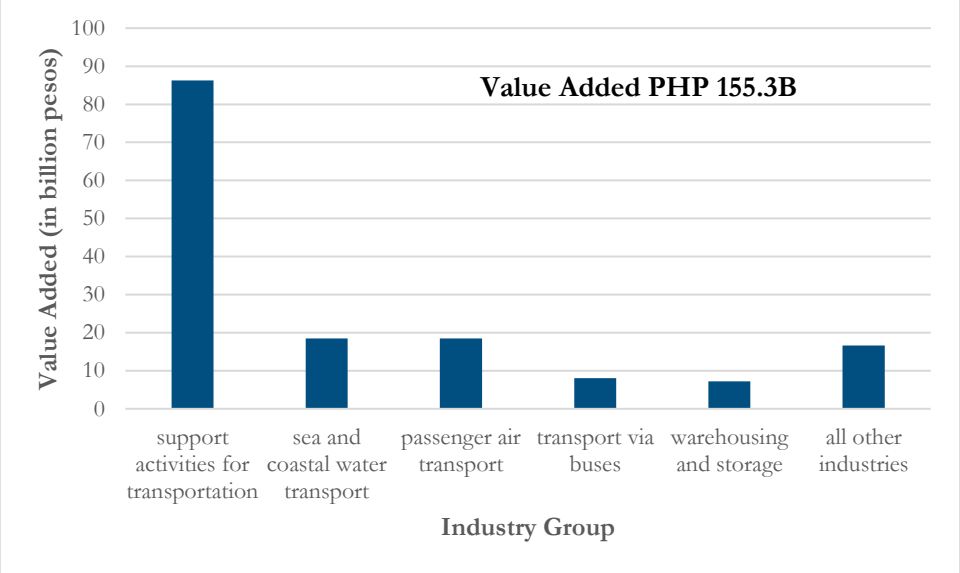


Figure 3. Value Added for Transportation and Storage Establishment with Employment of 20 and Over by Industry Group in the Philippines (Source: ASPBI 2014)

2. Freight and Logistics in the Philippines

This section discusses in detail the logistics performance and challenges in the Philippines, and existing transport infrastructure and future expansion plans.

2.1. Logistics Performance and Challenges

The country's Logistics Performance Index (LPI), as monitored by the World Bank, has been deteriorating over the past 6 years. The Philippines ranked 44 out of 155 countries in 2010 and 71 out of 160 countries in 2016. Details of its LPI performance from 2010 to 2016 is shown in Table 1 while a comparison among selected ASEAN countries based on 2016 LPI is shown in Table 2.

Table 1. Philippine LPI Scores 2010-2016 (Source: World Bank, 2016)

Year	LPI Rank	LPI Score	Customs	Infra-structure	International Shipments	Logistics Competence	Tracking and Tracing	Timeliness
2016	71/160	2.86	2.61	2.55	3.01	2.70	2.86	3.35
2014	57/160	3.00	3.00	2.60	3.33	2.93	3.00	3.07
2012	52/155	3.02	2.62	2.80	2.97	3.14	3.30	3.3
2010	44/155	3.14	2.67	2.57	3.40	2.95	3.29	3.83

Note: Scores are out of 5 (5 being the perfect score).

Table 2. LPI Scores of Select ASEAN countries (Source: World Bank, 2016)

Country	LPI Rank (out of 160)	LPI Score	Customs	Infra-structure	International Shipments	Logistics Competence	Tracking and Tracing	Timeliness
Philippines	71	2.86	2.61	2.55	3.01	2.70	2.86	3.35
Singapore	5	4.14	4.18	4.20	3.96	4.09	4.05	4.40
Malaysia	32	3.43	3.17	3.45	3.48	3.34	3.46	3.80
Thailand	45	3.26	3.11	3.12	3.37	3.14	3.20	3.56
Indonesia	63	2.98	2.69	2.65	2.90	3.00	3.19	3.46
Vietnam	64	2.98	2.75	2.70	3.12	2.88	2.84	3.50
Brunei	70	2.87	2.78	2.75	3.00	2.57	2.91	3.19

The worsening traffic congestion problem in the country is reflected in low scores on timeliness, tracking and tracing, and logistics competence. Logistics costs, although not explicitly shown as an indicator, are high in the Philippines, accounting to about 24% to 53% of product cost.[6] The recent consolidation of logistics companies and entry of big players such as SM Investments, Chelsea Logistics, among others, can improve logistics competence which was characterized before as fragmented and dependent on small enterprises.

[6] DTI addresses issues on Transportation and Logistics Services. More details at: www.investphilippines.gov.ph

Reliability is also a challenge as it is exacerbated by poor transport infrastructure and cumbersome processes managed and/or regulated by different government agencies in an uncoordinated manner. Table 3 shows an improvement in infrastructure index between 2012-2013 and 2015-2016 although overall, it is low compared to scores of other ASEAN countries. The latest report of the World Economic Forum (WEF) Global Competitiveness Report (2016-2017) placed the Philippines 8th among ASEAN countries, outpaced by Vietnam, Lao PDR, and Cambodia.

Table 3. Infrastructure Index (Source: WEF Global Competitiveness Report)

Infrastructure index	2012-2013 Rank	2015-2016 Rank
Quality of roads	87	97
Quality of railroad infrastructure	94	84
Quality of air transport infrastructure	112	98
Quality of port infrastructure	120	103

Within the country, the World Bank surveyed the manufacturing logistics performance in selected provinces in collaboration with DTI in 2016 to better understand the granularity of varying transport and logistics costs and find ways to decrease it.[7] They found out that average logistics costs in the Philippines is 27.16% of sales, higher than Thailand (11.11%), Vietnam (16.3%) and even Indonesia (21.40%). Some of the key components of the costs are transport (10.71%), warehousing (5.20%), inventory carrying (8.78%) and logistics administration (2.47%). Further examination of logistics cost/sales by region showed the large difference in logistics costs of cargoes from Mindanao and Visayas compared to those from within Luzon as shown in Table 4. Total logistics cost/sale in Visayas and Mindanao are 43% and 73% higher than in Luzon. Shippers in Metro Manila even consider shipping to Hong Kong or Taiwan as less expensive than sending their cargoes to some parts of Visayas and Mindanao.

Table 4. Logistics cost/sales by region (Source: World Bank, 2016)

Logistics Costs/Sales	Region	Average
Transport and cargo handling cost (including transport packaging)	Luzon	7.78%
	Visayas	9.40%
	Mindanao	10.93%
Warehousing (cost of running own warehouse or buying the service)	Luzon	3.94%
	Visayas	3.80%
	Mindanao	5.79%
Inventory carrying cost (including cost of capital tied in inventory)	Luzon	4.17%
	Visayas	9.60%
	Mindanao	10.85%
Logistics administration (10% of above costs)	Luzon	1.59%
	Visayas	2.28%
	Mindanao	2.76%
Total Logistics Cost/ Sales	Luzon	17.48%

7 World Bank and DTI. 2016. Manufacturing Logistics Performance in the Philippines.

	Visayas	25.08%
	Mindanao	30.32%

2.2. Transport Infrastructure

As of 2015, 97.19% (31,242 km) of national roads, 61.80% (15,377 km) of city roads, and 28.65% (31,075 km) of provincial roads were paved and 347,160 lineal meter (lm) bridges along national roads were made permanent along with the opening of new alternative routes. Road-based transport infrastructure remained a key point of convergence with other productive sectors, but the quality remains inadequate. The country's civil aviation sector met its overall target in 2015, but air traffic congestion remains an issue among the major airports. The lack of night-time flying capabilities in other airports adds to the day-time airport congestion. Cargo transported through the country's port system increased from 166.40 million metric tons in 2010 to 223 million metric tons in 2015. The country's port system benefitted from a number of projects, but infrastructure quality and operational efficiency still need to be improved. Overall, gaps in connectivity remain. A network perspective must be adopted in mobilizing the government's PHP 9 trillion (USD 180 billion) Build, Build, Build Program to develop not only the landside, airside and portside facilities but also access roads.

The PDP 2017-2022 intends to enhance the efficiency of the transport sector to sustain economic growth and increase competitiveness by providing adequate, accessible, reliable, and safe access for people and goods across the country, neighbouring regions, and the world by implementing the following strategies:

- Physically link production areas to markets through road and rail-based transport, inter-island water transport and logistics systems.
- Improve backbone services, such as financial, telecommunications, distribution, transport, and logistics services to facilitate the movement of people, goods, services, knowledge, and ideas as well as link firms, especially MSMEs, to domestic and global markets.
- Improve the business climate by implementing structural reforms to create a more open, well-functioning, transparent, and competitive markets, which includes creating a competent national body for multimodal transport.
- Provide adequate infrastructure and logistical support to achieve connectivity, ensure efficient flow of goods and services domestically and internationally, and lower the cost of production and delivery.

Chapter 19 of PDP 2017-2022 focuses on addressing transport issues mentioned above recognizing the inadequacy of current transport systems vis-à-vis the growing demand despite previous efforts to improve and expand the transport network as additional roads and bridges were constructed and upgraded, and new alternative routes were opened in support of major economic sectors. In the short-term, road-based transport will be improved by addressing traffic congestion through "engineering, enforcement, and education," but the road network will ultimately be upgraded and expanded to the highest quality standards in the long run. The government will exhaust all possible means to improve the operational efficiency of airports and to address constraints to optimal capacity utilisation. Port facilities will be improved to ensure that inter-island shipping, including a stronger RORO network, will remain a viable option for transporting people and cargo.

The government also plans to enhance trade facilitation and strengthen linkages and connectivity, review and implement laws, rules and regulations to reduce the cost to exporters and importers as well as facilitate and streamline procedures for engaging in trade.

2.3. Climate Change and Energy Demand

The Philippine's per capita GHG emissions are relatively low at 1.6 tons of carbon dioxide equivalent (CO2e) emissions in 2012 compared to the global average of 6.5 tons. However, the trend is increasing with 4% annual growth rate between 2006 and 2012. The country's GHG inventories show an increase in transport emissions in absolute terms and as a sectoral share from 1994 to 2000, see Figure 4.

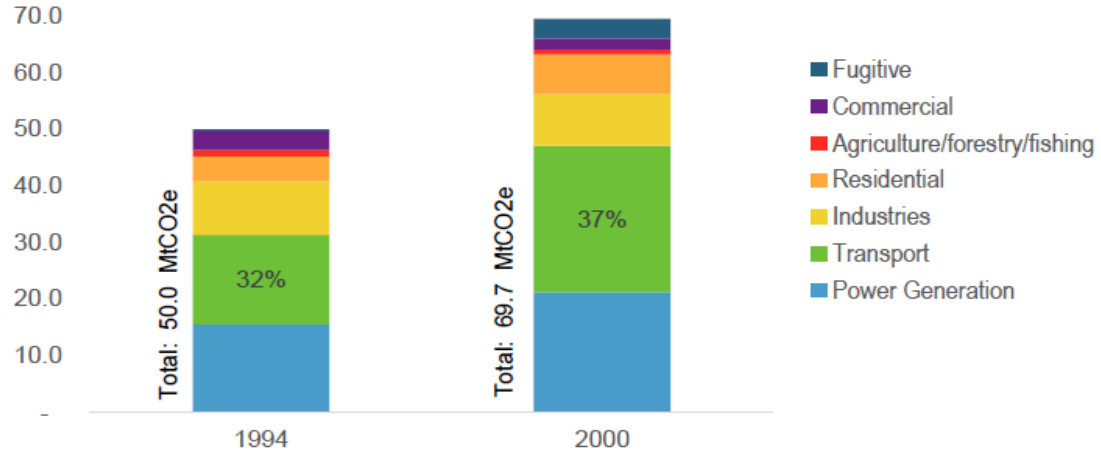


Figure 4. GHG emissions from energy sector for 1994 and 2000, in MtCO2e (Source: DENR and Manila Observatory, 2010)

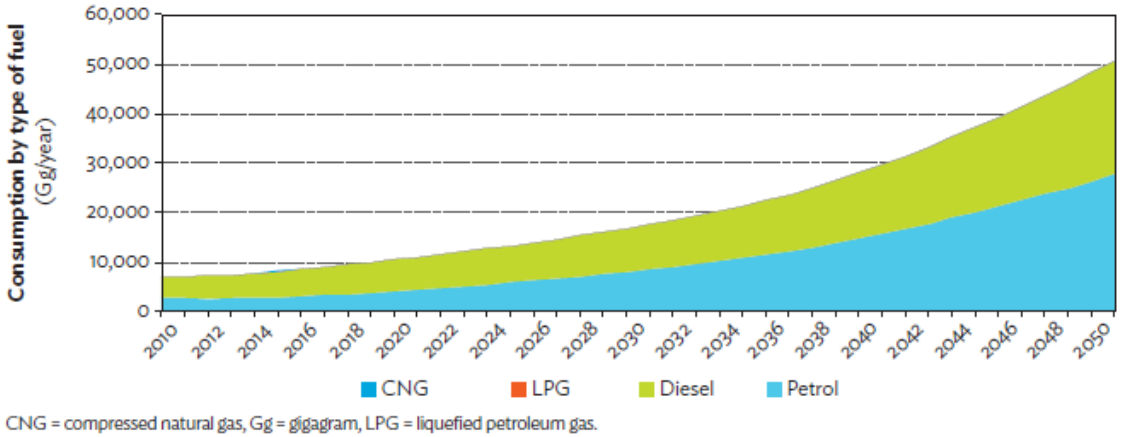


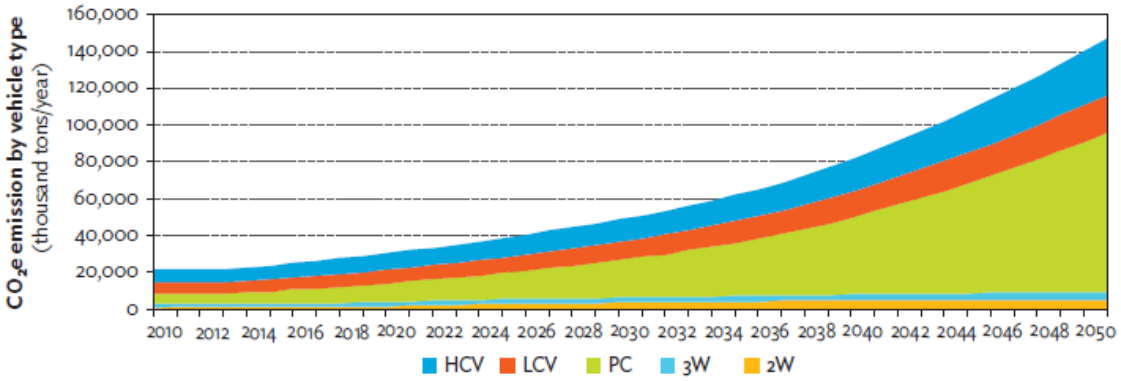
Figure 5. Projected fuel consumption of the road transport sector (Source: ADB, 2017)

Transport consumed the largest share of energy demand at 36.8% or 9,063 ktoe in 2010, which emitted about 15% of the total emissions amounting to 23.5 million metric tons of carbon dioxide equivalent (MtCO2e).[8] Almost 80% of energy consumed by the transport sector was from road vehicles. Using

[8] Source: Department of Energy. Key Energy Statistics 2010. https://www.doe.gov.ph/key-energy-statistics-2010.

2010 data as baseline, the 2017 ADB study on "Pathways to Low-carbon Development for the Philippines" projected the fuel consumption of the land sector up to 2050 as shown in Figure 5. The projection shows that the demand for gasoline will be higher than diesel due to projected increase in private cars. Gasoline consumption is projected to increase by 900% while diesel consumption by 400% from 2010 to 2050.

According to the same ADB study in 2017, the corresponding annual emissions from road transport are expecting a seven-fold increase to 139.9 MtCO2e by 2050 wherein trucks account for 19% of total emissions as shown in Figure 6. The 19% share of emissions from trucks is significant given that its share on total number of vehicles in only about 5%.



2W = two-wheeler, 3W = three-wheeler, CO_2e = carbon dioxide equivalent, HCV = heavy commercial vehicle, LCV = light commercial vehicle, PC = passenger car.

Figure 6. Projected carbon dioxide equivalent emissions of the road transport sector (Source: ADB, 2017)

2.4. Vehicle profile

The average share of trucks to total vehicle population from 2007 to 2013 is about 5% but it is the second most increasing type of vehicles, behind motorcycles and tricycles, with 4.1% annual average growth rate from 2007 to 2013 based on data from the Land Transportation Office (LTO) shown in Table 5.

Table 5. Number of registered vehicles (Source: DOTC and LTO, 2007-2013)

Vehicle class	2007	2008	2009	2010	2011	2012	2013	AAGR
Cars	744,830	755,108	776,155	804,825	824,829	849,047	868,148	2.6%
Utility Vehicle	1,788,625	1,790,518	1,865,575	1,961,703	2,032,154	2,081,541	2,140,968	3.1%
Buses	30,113	29,703	33,006	34,909	34,434	33,564	31,665	1.0%
Trucks	281,128	296,121	311,496	317,774	329,309	341,505	358,445	4.1%
Motorcycle and tricycles	2,647,263	2,982,296	3,200,961	3,482,139	3,881,449	4,116,682	4,250,667	8.3%

Note: AAGR= annual average growth rate

Source: Department of Transportation and Communications and LTO. Registered motor vehicles by classification and region (2007-2013).

The 2017 National Logistics Master Plan (NLMP) estimates that as high as 80% to 90% of current truck population is more than 15 years in age. It is not surprising that in the 2007 study by the Department of Energy (DOE), almost 70% of the total vehicle emissions were from trucks and utility vehicles. Similarly, trucks and utility vehicles are also the main sources of air pollution. Mobile sources account for a significant portion of particulate matter (PM), carbon monoxide (CO), nitrogen oxides (NO_X), and volatile organic compounds (VOCs).

The average loading by type of truck based on a JICA study in 2010 on "Study on Master Plan of High Standard Highways" is shown in Table 6. Empty trucks are excluded in the counts. The same study found out that about 16% of trucks are overloaded.

Table 6. Average loading type of truck (in kg) (Source: JICA, 2010)

Type of truck	Agriculture, Fishery, Forestry	Mining, Construction	Manufacturing	Gross Average Loading*	Net Average Loading**
2-axle truck	5,840	5,060	3,589	4,917	2,401
3-axle truck	14,069	13,990	11,509	13,323	6,943
Truck-trailer	16,067	18,197	11,911	15,663	8,294
Delivery van	3,370	2,960	1,760	2,573	1,559
Weighted Mean Truck	7,667	10,694	5,033	7,413	4,008

Notes: *Empty trucks are excluded
**Empty trucks are included

While overloading is a problem as it induces premature damage to the road network and compromises road safety, empty haul is also a problem in terms of efficiency. As high as almost 80% of outbound trips are empty trips as reported by Castro, J.T. in Table 7. It is one of the drivers of high freight transport costs in the Philippines as shippers are likely charged for two-way trips.

Table 7. Percentage Empty miles (Source: Castro, undated)

Type of truck	Inbound (in %)	Outbound (in %)
2-axle trucks	39.4	No disaggregated data available
3-axle trucks	62.4	
Trailer trucks	79.4	
Over-all	56.1	79.4

For city logistics, a study on "Establishing of City Logistic Concept in Improving the Freight Distribution in Metro Manila" collected data on vehicle types used, vehicle weight and fuel consumption as summarised in Table 8.

Table 8. Vehicle types and fuel consumption (Source: Cueto, et al., 2015)

Vehicle Type/Application	Gross weight range (lbs)	Empty weight range (lbs)	Typical Payload Capacity max (lbs)	Typical fuel economy range in 2007 (mpg)	Typical Fuel Consumed (gal / 1000 tonne-miles)
Large pick-ups, UV, multi-purpose, minibus, step van	8,501-10,000	5,000-6,300	3,700	10-15	38.5
UV, multi-purpose, minibus, step van	10,001-14,000	7,650-8,750	5,250	8-13	33.3
City delivery, parcel delivery, large walk-in, bucket, landscaping	14,001-16,000	7,650-8,750	7,250	7-12	23.8
City delivery, parcel delivery, large walk-in, bucket, landscaping	16,001-19,500	9,500-10,800	8,700	6-12	25.6
City delivery, school bus, large walk-in, bucket	19,501-26,000	11,500-14,500	11,500	5-12	20.4
City bus, furniture, refrigerated, refuse, fuel tanker, dump, tow, concrete, fire engine, tractor-trailer	26,001-33,000	11,500-14,500	18,500	4-8	18.2

3. Policies and Stakeholders

This section briefly describes the relevant stakeholders for freight and logistics efforts in the Philippines, highlighting their roles and responsibilities and their interests in transport development. The section also examines relevant policies and initiatives.

3.1. Stakeholders

Several institutions play an important role in the freight and logistics sector in the Philippines. Table 9 lists the key actors from government institutions, the private sector (including associations) and civil society and outlines their roles.

Table 9. Stakeholders in Green Freight and Logistics in the Philippines

	Roles and responsibilities in relation to freight
Government agencies	
Department of Transportation (DOTr)	The DOTr is the primary policy, planning, programming, coordinating, implementing and administrative agency to promote, develop and regulate a dependable and coordinated transport network in the country. It is recently designated as the competent national body to accredit and supervise Philippine multimodal transport operators through the planned creation of the DOTr-Office of Multimodal Transport and Logistics (DOTr-OMTL), which will place all freight forwarders under the jurisdiction of a single agency.
Land Transportation Office (LTO)	The LTO is the attached agency of the DOTr responsible for the inspection, licensing of drivers and conductors, and registration of all private and public vehicles nationwide.
Land Transportation Franchising and Regulatory Board (LTFRB)	The LTFRB is the attached agency of the DOTr responsible for regulating routes and issuing franchises that authorizes the operation of public transport services. Relevant to freight activity, the LTFRB, as a regulatory entity, determines restrictions on equipment usage, vehicle rental, and fleet size as requirements for a franchise. Moreover, the LTFRB conducts screening procedures in order to grant franchises to trucks.
Philippine Ports Authority (PPA)	The PPA is an attached agency of the DOTr and is the lead executing and regulatory agency in the planning, development, financing, operation, supervision, and maintenance of ports and port districts in the country. As part of its developmental function, the PPA prescribes rules and regulations that govern the operation of ports or any structure within a port district, formulates a comprehensive Port Development Plan to program priority port development projects, and provides and assists in the provision of training programs and training facilities for port operators and users. Granted with financial autonomy, regulatory functions also include setting and collecting of administrative fees for port operations and services.
Maritime Industry Authority (MARINA)	The MARINA is the attached agency of the DOTr responsible for the registration and licensing of vessels, rationalisation of routes, zones or areas of operations, and the setting of safety and operational standards for vessels. Moreover, the MARINA inspects all vessels to ensure compliance with regulations, ensures the financial capacity of operators to provide passenger and cargo service, and determines the impact of new services to a locality.

Department of Trade and Industry (DTI)	The DTI is the primary coordinating, promotive, and regulatory agency responsible for the trade, industry, and country investment activities, which include the logistic sector as an identified key investment area. The DTI collaborates with the United Port Users Confederation and Procurement and Supply Institute of Asia for the development of a comprehensive national multimodal transport and logistics development plan. Broadly, the DTI is responsible in effectuating reforms and mechanisms to address gaps in the logistics chain, such as, adopting and implementing port promotion packages, and providing inputs in marketing and pricing strategies to increase utilisation of ports. The DTI also promotes the establishment of new local-based trucking, freight forwarding and logistics consolidation centers and inland container depots.
Supply Chain and Logistics Advisory Council (SCLAC)	The SCLAC is a high-level inter-agency advisory council established by the DTI that oversees and monitors the implementation of the National Logistics Master Plan through the Trade Infrastructure Transport Logistics Working Group. The SCLAC functions as a joint committee between the National Competitiveness Council and Export Development Council, each having respective transport and logistics committees. Composed of the DOTr, DOF, DOT, DPWH, NEDA, DOST, DA, MMDA, DILG, and representatives from various industry associations, the SCLAC is envisaged to conduct regular meetings to advance action plans and submit policy recommendations and other program-specific actions to the Cabinet Economic Cluster. Included in the focus areas of the SCLAC are the modernisation of selected domestic ports into regional hubs and the adoption of climate change-resilient infrastructure.
Supply Chain and Logistics Management Division (SCLMD)	The SCLMD, which is under the DTI Competitiveness and Ease of Doing Business Group (CEODBG), is responsible for the drafting of the National Logistics Master Plan that aims to lower logistics costs, address challenges that affect the logistics industry, such as lack of infrastructure, and create a unified strategy to streamline the process of trade and logistics. The SCLMD functions as the secretariat to the SCLAC. SCLMD also formulates policies and measures pertinent to supply chain, trade facilitation, and logistics to support exporters, importers and traders. Moreover, the SCLMD supports traders through ensuring competitive rates and equitable terms and conditions.
Export Development Council (EDC)	EDC is a public-private partnership that is responsible in overseeing the implementation of the Philippine Export Development Plan and advocates policy reforms that would strengthen national exports, such as imposing and removing tariff measures and other regulatory measures that affect the movement of goods and delivery of services. The EDC also plays a key role in providing inputs to adopt and implement port promotional and incentive packages and in marketing and pricing strategies to increase port utilisation. The EDC forms part of the SCLAC, which highlights its dominant role in the implementation of the National Logistics Master Plan.
National Competitiveness Council (NCC) – Infrastructure Working Group (IWG)	The NCC-IWG forms part of the SCLAC, which highlights its dominant role in the implementation of the National Logistics Master Plan. The NCC-IWG is composed of members from the government agencies, such as the DPWH, DOTr, DTI, FTEB, EDC, SCMAP, and foreign and local business chambers. A priority activity of the NCC is the promotion of a logistics hub in Luzon.
Fair Trade Enforcement Bureau (FTEB)	The FTEB, under the DTI, is responsible for the implementation of restrictions on both government and private cargoes, which are all required to be loaded on Philippine vessels. In addition, the FTEB is responsible for the accreditation of maritime freight forwarders
Department of Environment and	The DENR is the lead agency in the overall implementation of the Philippine Clean Air Act, which provides the policy framework for air quality management of the country and which addresses air pollution from the transport sector. The DENR is a

Natural Resources (DENR)	focal agency on issues relating to climate change mitigation and partnered with DOTr in the promotion and streamlining of EST activities. Included in the jointly developed National Environmentally Sustainable Transport Strategy (NEST) is the development of freight transport policies.
Department of Public Works and Highways (DPWH)	The DPWH provides and manages quality of infrastructure facilities and services, provides design guidelines criteria and standards for public highways, and is committed to road planning activities pertinent to establishing the connectivity to the port areas. In addition, the DPWH is responsible for determining and regulating vehicle weight limits. To synchronise weighing operations and limits for each vehicle type, the DPWH coordinates with other agencies and stakeholders.
Department of Finance (DOF) - Bureau of Customs (BOC)	The BOC is mandated to assess and collect all tariff and customs dues, supervision and control over the entrance and clearance of import and export cargoes, landed or stored cargoes in piers, airports, terminal facilities, container yards, and freight stations. The BOC also implements technology for customs management and is directed towards an agenda of undertaking the automation of lodgement entries, payments, cargo release, accreditation of importers, provision of IT support facilities and equipment, and capacity building.
Metro Manila Development Authority (MMDA)	The MMDA is the government regulatory and supervisory authority that is responsible for the delivery of services, which includes transport and traffic management, within Metro Manila. Specifically, on traffic management, the MMDA is responsible for the enforcement of traffic operations, including the Truck Ban Ordinance, which prohibits the operation of cargo trucks on assigned times of the day in Metro Manila.
Philippine Economic Zone Authority (PEZA)	The PEZA is tasked to promote investments, extend assistance, register, grant incentives, and facilitate the operations of economic zone facilities that provide warehousing and logistics services
Freight associations	
Philippine International Seafreight Forwarders Association, Inc. (PISFA)	PISFA is a recognized association of the freight forwarding industry composed of private and government entities that promotes exchanges on freight forwarding practice and management. The PISFA also initiated the development of the Philippine Multimodal Transport and Logistics Roadmap that identifies key challenges and gaps in the logistics industry and provides recommended activities and strategies for the sector. PISFA also conducts training courses on freight forwarding.
Confederation of Truckers Association of the Philippines (CTAP)	CTAP is an organisation of truckers that allows its members to freely negotiate trucking rates and is active in the discussions with government on the plan for refleeting to phase out old trucks that exceed 15 years old.
Association of International Shipping Lines, Inc. (AISL)	AISL is a leading international container shipping industry in the country that influences and provides policy inputs on shipping operations. AISL also introduces reforms in shipping and port operations that would enhance the efficiency of cargo movement to meet international standards. An integrated system implemented by the AISL involves a web-based 24-hour integrated truck dispatching, appointment, and booking system to retrieve empty containers is designed to interconnect shipping lines, truckers and depots.

Private sector, government-recognised groups	
International Container Terminal Services, Inc. (ICTSI)	ICTSI is a port management company in the Philippines responsible for the management, operation and development of container terminals and directly operates the Manila International Container Terminal. Responsibilities include port management, operations, administration, port development and construction including planning and programming the supply of all equipment.
Philippine Chamber of Commerce and Industry (PCCI)	PCCI is the local business chamber that is recognised by the government and international institutions that partners with government, other business chambers and organisations through providing technical inputs on efforts and initiatives that affect competitiveness. PCCI leads the PCCI INVEST initiative that includes advocating and monitoring developments in the logistics and transportation sector. Jointly with the SCMAP and the FEDFAP, the PCCI implements the Certified Logistics Master Plan (CLMP), a comprehensive practitioner-oriented certification program that professionalizes the logistics industry. The PCCI is also actively engaged with the DTI-NCC-IWG in discussing issues in infrastructure, transportation and logistics.
Development agencies, multilateral institutions, banks	
Japan International Cooperation Agency (JICA)	JICA extended loans for a logistics infrastructure development project that involves the provision of distribution infrastructure to optimise maritime and intra-island transportation. The project covers terminal systems, roll roads, LGU roads, and maintenance equipment, packaging, distribution facilities. JICA also conducted the Masterplan on High Standard Highway Network Development that established cargo movement patterns.
United States Agency for International Development (USAID)	USAID, through the COMPETE project, submitted a comprehensive study on a National Logistics Master Plan for enhancing the Philippine logistics sector and includes key actions for implementation in the short and medium-term (2016-2022).
International Finance Corporation - World Bank (IFC-WB)	IFC-WB implements the Logistics Efficiency Indicator (LEI) Project, which aims to create a logistics database that can be used for decision making and policy development. LEI will identify at least 3 to 5 key significant logistics indicators (e.g, Customs dwell time, logistics cost, among others).
Other stakeholders	
Academic institutions	Academic institutions such as the University of the Philippines - National Center for Transportation Studies (UP-NCTS), UP National College of Public Administration and Governance (UP-NCPAG), and De La Salle University (DLSU) have played a key role in research on urban goods movement, commodity flow, transport measures, and effects of policies. Data gathered could be used to assess trends in the transport and logistics industry.
External Engagement and Participation	DTI-SCLMD participated and required engagement in various supply chain and logistics international technical working groups meetings, conferences and related events where the Philippines has an international commitment (e.g. ASEAN-IMO, APEC, UNESCAP-ICT Logistics, among others).

3.2. Policies and Initiatives

Recent discussions among relevant government agencies have identified DOTr as the competent national body to accredit and supervise Philippine multimodal transport operators. The Executive Order to formalize the creation of the DOTr-Office of Multimodal Transport and Logistics (DOTr-OMTL) is in the pipeline for signature. The Executive Order will place all freight forwarders under the jurisdiction of a single agency, the DOTr-OMTL. Under the current setup, sea freight forwarders are accredited and supervised by the DTI-Fair Trade Enforcement Bureau (DTI-FTEB) while air freight forwarders are under the jurisdiction of DOTr-Civil Aeronautics Board (DOTr-CAB). DOTr-OMTL will also accredit and supervise operations of cargo and delivery vehicles, which is currently being undertaken by the Land Transportation Franchising and Regulatory Board (LTFRB).

Logistics Services

The freight forwarding industry is not highly regulated. The primary regulatory requirement for service providers wanting to enter the market is accreditation by the Philippine Shippers' Bureau, a unit under the DTI. A firm cannot operate a freight forwarding business without a Certificate of Accreditation that is valid for two years. Prices are not regulated, and entry and exit are dictated by market forces.[9]

A major investment restriction in the logistics industry is the 60:40 rule on Filipino equity-foreign equity mix that also applies to foreign investments in domestic freight forwarding business in accordance with the Corporate Code of the Philippines. DTI is spearheading the Project Repeal to repeal/amend the Public Service Act to delist transport and logistics from the list of public services enumerated in the Act requiring the 60:40 Filipino equity-foreign equity mix.[10] It is aimed that the opening of the logistics industry to foreign players will (i) provide consumers with alternative transport service providers that can meet their consumption preferences, (ii) increase positive pressure for transport service providers to improve their services amidst competition from foreign entities, and (iii) drive down consumption costs for both cargo shippers and passengers.

Land Transportation

For land transport services supporting the logistics supply chain (e.g. trucking services), the LTFRB was set up under Executive Order (EO) 202 series of 1987 as the economic regulator. Economic regulation covers regulation of routes and franchises to operate vehicles. The LTFRB also examines the appropriateness of the vehicle before granting approval of the franchise (e.g. if the cargoes would be perishable goods or liquefied petroleum gas, the trucks to be used by the applicant should be technically equipped to handle such items). The LTFRB also regulates the maximum age of utility vehicles (maximum of 15 years from date of manufacture) but this is not yet being implemented.

Vehicle age

DOTr issued Department Order (DO) 2017-09, which reinforces DO 2002-030 on the mandatory 15-year age limit for buses- and trucks-for-hire covered by CPC. Enforcement of DO 2017-09 will require truckers to submit a certificate of date of manufacture from the original manufacturer, such as sales

9 Llanto, G.M. et al. 2013. Border and behind-the-border restrictions in logistics and trade facilitation in the Philippines: Some results of regulatory dialogues. PIDS Policy Notes No. 2013-13. Makati City: Philippine Institute for Development Studies.

10 Project Repeal is a systematic way of studying rules, regulations, regulations and laws that have outlived their relevance or have been overtaken by developments. It is an initiative to clean up regulations and legislation by repealing provisions or rules that are no longer necessary or may be detrimental to the economy.

invoice or other competent document, to prove the age of a motor vehicle. As per DO-2002-030, a unit that exceeds the minimum age, as specified by the time of expiration of the covering CPC, cannot file a new application for franchise, for extension of the validity of CPC, for substitution of unit, and for increase in the number of units. A joint memorandum circular (JMC) from LTO and LTFRB is supposed to be issued within 30 days of effectivity of DO 2017-09 to implement the mandate of the policy. However, the JMC remains unreleased as DOTr is still mulling on "roadworthiness" as possible main criterium and not vehicle age in determining truck performance as advocated by trucking associations.

Overloading

DPWH and DOTr through the Land Transportation Office (LTO) enforce the anti-overloading law with the operation of 24/7 weighbridge stations and portable weighing machines at strategic locations through Anti Truck Overloading Mobile Enforcement (ATOME) along national roads, and imposition of penalties on overloading vehicles. The anti-overloading policy is pursuant to the provisions of Republic Act 8794 otherwise known as "An Act Imposing a Motor Vehicle Users Charge on Owners of all Types of Motor Vehicle and for Other Purposes", which aims to promote motorist safety and prevent early deterioration of roads cause by overloading. Under the law, overloaded trucks are fined with 25% of the amount of their motor vehicle user's charge (MVUC), applicable to the vehicle at the time of infringement.

The implementation of maximum allowable gross vehicle weight (GVW) for Code 12-2 or truck, semi-trailer with 3-axles at motor vehicle and 2-axles at trailer for a total of 18 wheels and Code 12-3 or truck semi-trailer with 3-axles at motor vehicle and 3-axles at trailer for a total 22 wheels will be 41,500 and 42,000 kilograms respectively starting January 1, 2018. Its previous deadline from June 30, 2017 was moved as per requests from the Confederation of Truckers Association of the Philippines (CTAP).

DPWH issued DO-22 series of 2011 on minimum pavement thickness and width of national roads to upgrade the design standards of national roads in order to avoid early deterioration of pavement due to uncontrolled overloading. The agency is also looking at the possibility of using intelligent transport system (ITS) for contactless apprehension and at the same time, is being more proactive in creating awareness among truckers the extent of damage subjected to the road by overloading.

Emission standards

The Euro 4 emissions standard took effect on January 1, 2016. However, DENR gave 2 years for manufacturers to phase out existing Euro 2 models. Beginning January 1, 2018, the DENR no longer accepts Euro 2 Certificate of Conformity (COC) as basis of initial registration with the LTO. New vehicles, including trucks, which have not been registered and do not meet Euro 4 emission standards cannot be registered any more. All other vehicles purchased on or after January 1, 2018 will have to be Euro 4 emissions compliant to pass the mandatory emissions test. Pursuant to Republic Act 4136, motor vehicles, including heavy duty, are required to register annually at LTO. Requirements include Certificate of Emission Compliance (CEC) which is secured from private emission testing centres. The veracity of the results of the emission tests are in question as there are reported cases of falsification for profit of private emission testing centres. This issue can be rectified once a government controlled and owned motor vehicle inspection system is in place.

Clean Air Act

The Clean Air Act of 1999 is a comprehensive air quality management policy and program which aims to achieve and maintain healthy air for all Filipinos. It outlines the government's measures to reduce

air pollution and incorporate environmental protection into its development plans. However, until now, it has not been fully enforced. The Clean Air Act sets the national total suspended particulate matter (TSP) target of 90 μg/Ncm[11] but recorded data has exceeded it. Incidentally, there is a growing awareness of the health impacts of air pollution to health, estimated at USD 2.5 billion or about 1.55% of GDP in 2009[12], which is pushing the urgency to find low emission and low carbon transport alternatives including those for handling freight and logistics.

Intended Nationally Determined Contribution (INDC)

The Philippines' INDC to the Paris Agreement on Climate Change pledges to reduce emissions by 70% relative to business-as-usual by 2030, if sufficient international financial and technical support is provided. The 70% goal is among the highest reduction values pledged by a country but the Climate Change Commission (CCC) is currently consolidating inputs from various sectors in order to harmonise with the country's development agenda and timeline.

Other relevant policies and projects related to transport and logistics

Table 10 below shows a summary of current and future policies and projects, which are not limited to road transport, as envisioned by respective agencies. It also shows the status and plan of action of the different initiatives.

Table 10. Future Policies and Plans on Freight and Logistics

Policy / Plans	Description	Status	Responsible agency
Improvement of freight transportation complex, truck terminals and physical distribution centers	Broadly outlined as a future priority action listed in the Philippine National Implementation Plan on Environment Improvement in the Transport Sector (NIP)	Future plan of action	DoTr
Regulatory reforms to improve shipping services	Includes the removal of opportunities for incumbents to object to the granting of a certificate of public conformance; removal of dry dock requirements and repair of domestic ships exclusively in the Philippines; facilitating of the chartering of foreign vessels to operate in domestic routes by clarifying tax liabilities; replacement of PPA share of cargo handling fees with a fixed rate to reduce conflict of interest; providing more information	Proposed reform	DoTr, MARINA, PPA

11 Department of Energy. 2010. Issues and challenges in the Transport Sector: Formulation of a national environmentally sustainable transport strategy for the Philippines.
12 World Bank.2009. Philippines – country environmental analysis. Washington, DC: World Bank.

	on cargo flows and passenger services to the public		
MMDA Resolution No. 3, s.2015: Reimplementing of uniform truck regulation in Metro Manila	Covers cargo trucks that are identified through license plates, includes lorries, vans, tankers or other delivery vehicles, whether loaded or empty, having a gross capacity weight of more than 4.500 kilos are not allowed to pass along 10 major routes and total truck ban is implemented in EDSA except on Sundays and holidays; Violation of the Truck Ban Ordinance is subject to a fine of PHP500-2000 (approx. USD 10-40) or imprisonment of 7-30 days	Implemented	MMDA
RA 9295 Domestic Shipping Development Act of 2004	Lays out investment incentives, deregulation of the shipping industry and authority of MARINA, setting of cargo rates, shipbuilding and ship repair	Implemented	DoTr, MARINA
Certification system for low carbon companies	International certification standards on environmental management systems is adopted in the Philippines as a national standard. The Philippine Environment Partnership Program (PEPP), pursuant to DENR Administrative Order No. 2003-14 encourages establishments to adopt mandatory self-monitoring and compliance to environmental standards by awarding those with superior environmental performance with DENR Official Seal of Approval	Implemented	DENR
Tax incentives for efficient vehicles	Executive Order No. 396 of 2004 reduces import duties for hybrid and CNG vehicles; EO no. 397 of 2004 reduces the rates of import duties on completely knocked-down parts and components for assembly of low engine displacement and hybrid vehicles; several bills have also been submitted on incentivizing alternative fuel vehicles	Implemented	DOE, Bureau of Customs

National Logistics Master Plan (NLMP)	Focuses on infrastructure development (countryside development via logistics corridors, roads and bridges development), capacity enhancement of agencies in planning and regulation and policy implementation, transport regulation, and logistics resiliency; creation of an advisory committee that will oversee and monitor the implementation of the roadmap	Final draft available, awaiting launching of NLMP	DTI - Supply Chain and Logistics Management Division
Philippine Multimodal Transportation and Logistics Industry Roadmap	Private sector roadmap that is recognised by DoTr's NIP and DTI's NLMP; lines up strategies in a phased approach to address issues on the logistics sector. This includes: capacity building (phase 1), capacity extension and efficiency enhancement (phase 2), integrated multimodal logistics (phase 3)	Launched	Philippine International Seafreight Forwarders Association
Executive Order 170, series of 2003 **Promoting private sector participation and investment in the development and operation of the road Roll-on/Roll-off (RO-RO) Terminal System**	Promotes collaboration between private sector and local government units (LGUs) in the establishment of RORO links as part of the national highway network. Vehicles that can be moved by their own power and passing through such links shall not be burdened by transport procedures and costs, unless otherwise provided by law.	Implemented	DOTr (PPA, MARINA) & Cebu Ports Authority (CPA)
Public-Private Sector Task Force **Under EO 372 (Oct 2006)**	Among the task forces created by this policy, a Task Force on Logistics was established. This task force envisions the Philippines as becoming a world-class logistics hub. To attain the task force's goal, it focuses on the consolidation of logistics services especially in automotive, appliance, food, and electronics sectors	Implemented	DTI, NEDA, DoF, Tariff Commission, Bureau of Customs

4. Road Freight Sector Assessment

Road transport is the predominant mode of moving cargoes in the Philippines. Roads carry 58% of cargo traffic in the Philippines (water: 41.95%; air: 0.06%), and freight is mostly by truck fleets owned by small and medium enterprises.[13] It also links other modes, particularly ports and airports. As commercial activities multiply as a result of enhanced economic growth, logistics and last-mile distribution will become even more critical. A JICA study in 2010 revealed that truck trips per day are estimated to reach 1 million by 2030, of which 60 percent will be in Metro Manila. In 2013, 53 percent of all trucks in the Philippines operated in Luzon.[14]

There are opportunities to minimise the impact of road freight transport and "green" the logistics sector by shifting road freight transport to other modes such as rail and water transport. However, this assessment will focus only on road freight transport, specifically on trucks, to identify actionable short- and medium-term opportunities to green freight and logistics in the country.

Availability of disaggregated data on truck fleets is scarce. A primary survey was conducted for this study to gather a decent sample size to be able to characterize the logistics industry that uses trucks, understand current operations, and identify potential measures to improve its overall performance.

4.1. Freight assessment survey for trucking companies

In consultation with DOTr, DTI and GIZ, CAA partnered with DTI's Supply Chain and Logistics Management Division (DTI-SCLMD) to conduct surveys, focus group discussions (FGDs), and workshops in 8 cities including La Union (Region I), Tuguegarao (Region II), Balanga (Region III), Tagaytay (Region IVA), Puerto Princesa (Region IVB), Bacolod (Region VI), Zamboanga (Region IX) and Manila (NCR). The said workshops were conducted between September to December 2017.

The green freight survey was conducted on the side lines of DTI-SCLMD roadshows wherein DTI-SCLMD and the World Bank (WB) shared results and validated information gathered for the Logistics Effectiveness Index (LEI) study which was administered by DTI-SCLMD supported by the WB in 2016. Complementing the LPI monitored by WB, the LEI study intends to pinpoint specific indicators that make logistics cost in the Philippines relatively high compared to other ASEAN countries and to explore measures on how it can be lowered.

While the LEI-related discussions delved more on trade facilitation aspects, the green freight component provided a venue to focus on transport related problems enriching the depth of FGDs and/or workshops with invited SME representatives and local policymakers. The FGDs and workshops engaged a wider audience composed of SME representatives from various industries, government officials, local policymakers, academe and local NGOs. The discussions often revolved around inadequacy of available transport infrastructure, lax enforcement of rules, regulations and standards, lack of funding, and spatial concerns affecting locations of key logistics facilities. It also provided an open venue to raise awareness about the importance of greening the freight industry. It is valuable that trucking and logistics companies understand, embrace, and appreciate efforts to shift to green freight, and to prefer green freight services if available.

[13] ADB. 2012. Transport Sector Assessment, Strategy, and Road Map.
[14] LTO. 2013. Registered motor vehicles by classification by region.

The green freight survey was structured to gather information on the following aspects: (i) profile of respondent companies; (ii) fleet characteristics; (iii) trucking operations; (iv) vehicle fleet management and maintenance practices; (v) fuel-saving technologies and strategies; (vi) emissions reporting, and; (vii) institutional framework and green freight program planning.

4.1.1. Profile of respondent companies

Demographics of respondents

A total of 75 respondents from 10 regions were surveyed during the 8 roadshows conducted. (Note: respondents from some regions joined workshops in neighbour regions respectively.) This sample size represents about 5% of truck operators nationwide. In 2014, LTFRB received 33,000 applications from truck operators, of which 2,145 have port-related operations. About 1,634 applications for CPC for trucks-for-hire were approved wherein some franchises cover applications for more than one truck unit.[15] The archipelagic nature of the country is captured by a well distributed sample size wherein 29% of respondents were from island-provinces, 4% from Mindanao and 67% from Luzon as shown in Figure 7.

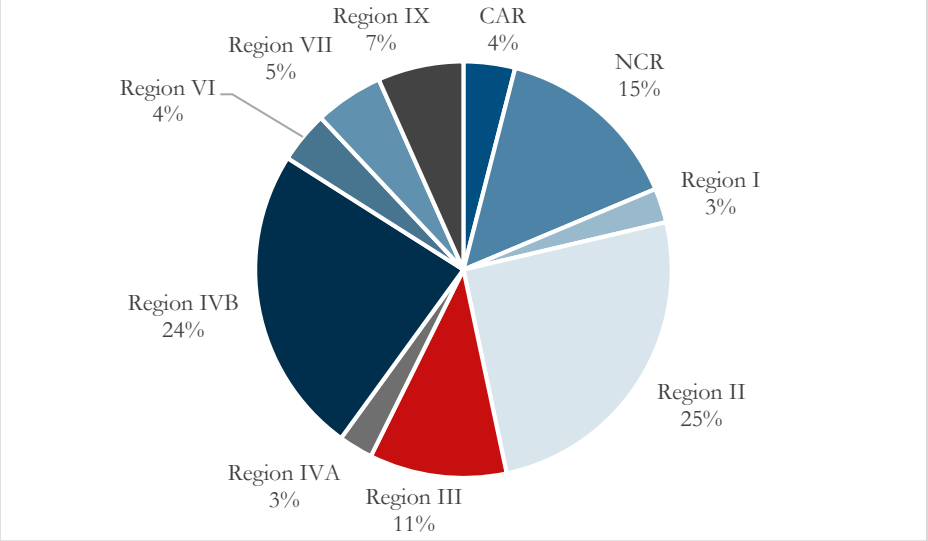


Figure 7. Demographics of the green freight survey respondents

Profile of respondents

Figure 8 shows that out of 75 respondents, 88% are engaged in trucking services, 25% are freight forwarders, 8% are third party logistics providers and 25% are truck owners engaged in businesses such as hardware, *palay* (unhusked rice grain) trading and supplier of farming supplies. Note that some of the companies offer dual services, as trucks-for-hire and as trucking service of their own businesses. It is also important to highlight that a company may have multiple nature of business, e.g. a company may be a freight forwarder and a 3PL among others. Seasonal demands also trigger companies to engage in more than one type of business.

[15] https://www.portcals.com/ltfrb-approves-more-than-1600-truck-franchise-applications/

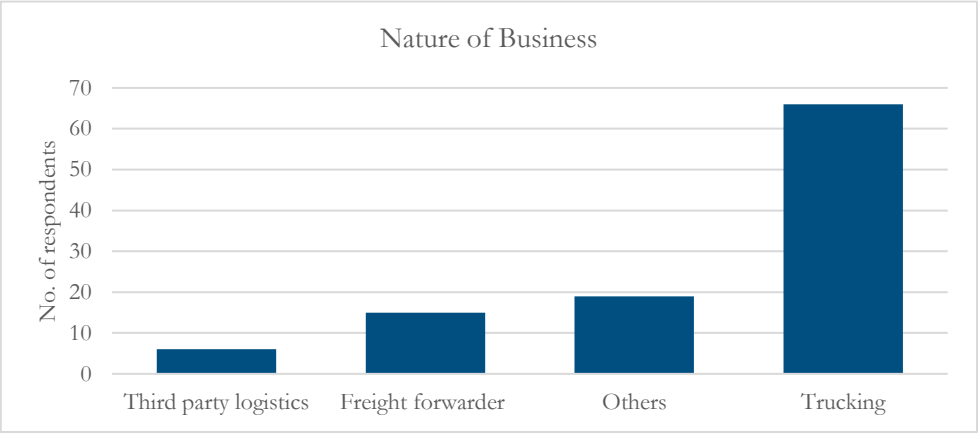


Figure 8. Number of companies vis-à-vis nature of business

The respondents are mostly SMEs wherein 43 out of 75 companies are under sole proprietorship with their businesses registered under DTI while 27 companies are corporations registered under Securities and Exchange Commission (SEC). Five respondents did not specify the status of their business.

Types of goods transported

Most of the companies transport agricultural products, both raw and processed, as shown in Figure 9. Other dominant cargoes are construction materials and manufactured items. The profit margin of those transporting raw agricultural products is tight so transport cost is often squeezed resulting to overloading and use of old and dilapidated trucks.

Those transporting manufactured items usually have negotiated time schedule for delivery of goods, so time and reliability are of essence to them as they may pay penalty for delays. Few companies follow just-in-time delivery operations, but it is becoming more popular for delivery of high-value products such as medicines and other pharmaceutical supplies.

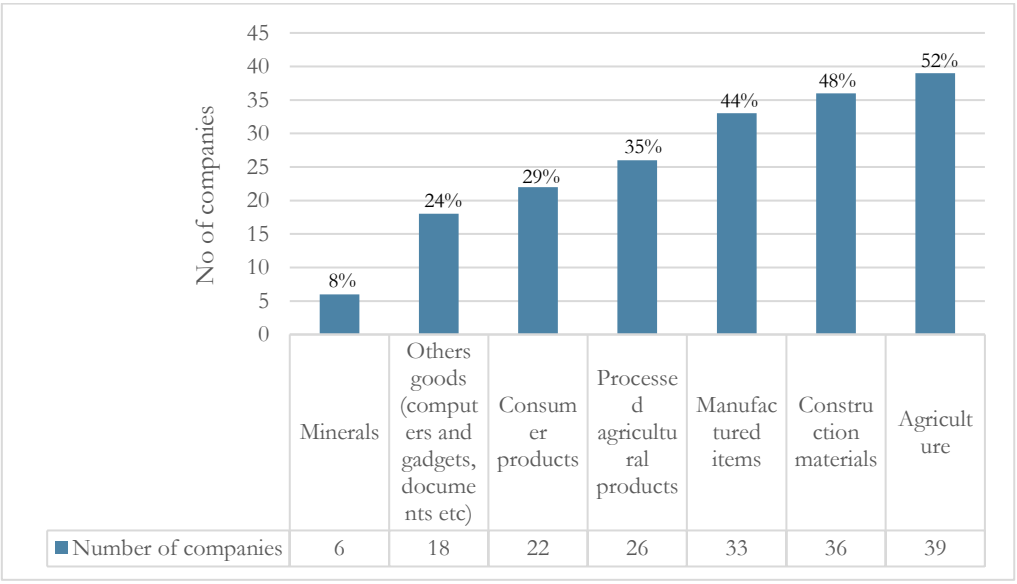


Figure 9. Types of goods transported

Truck delivery routes and frequency of trips

Most trucks are registered to operate to any point of Luzon. However, as shown in Figure 10, only 17% said that they operate on a national scale where they transport goods from one region to another. About 42% have regional operations that cover inter-provincial transport of goods (e.g. Cagayan to Isabela or Palawan to Romblon) while 21% of the companies have provincial operations that covers inter-city or inter-municipality route delivery (e.g. Quezon City to Makati City, or Meycauayan to Guiguinto, Bulacan). There are also those that operate at a city level or short distances for delivery purposes.

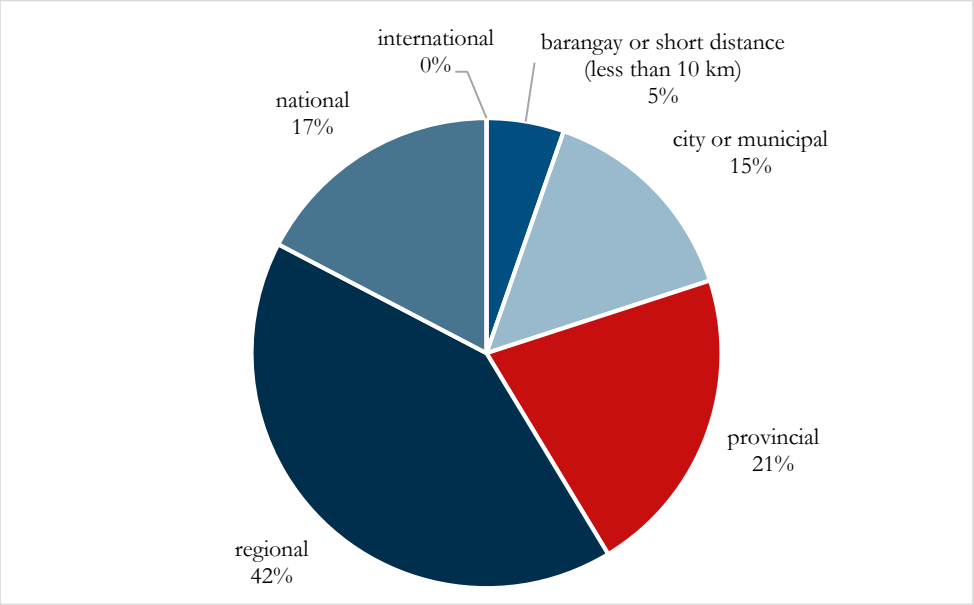


Figure 10. Truck delivery routes

About a quarter of the respondents indicated average monthly trips in the range of 1 to 10 trips for those operating at a national scale while 17% of respondents have 11 to 20 trips per month. About 8% usually do 21 to 40 trips per month while those operating on short-distances, 11% of respondents, said their trips range from 41 to 80 trips per month.

Profile of employees

As mostly SMEs, more than half of the respondents have 1 to 10 drivers, administrative staff, mechanics and other staff. Other staff include laborers (full-time and/or seasonal), *'kamaderos'*[16] and checkers. Some respondents do not employ an in-house mechanic and only seek their services during routine maintenance and/or engine breakdown. Figure 11 shows the breakdown of employees.

Demand for trucking services is seasonal especially in agricultural regions. One respondent from Region II, who is a *palay* (unhusked rice grain) trader, shared that they usually employ more staff during harvest seasons, usually from April to May, and October to November.

16 *Kamaderos* (n). Tagalog word for a person who organizes and loads goods in the trucks. It is from its root word 'kamada' or an orderly pile of goods.

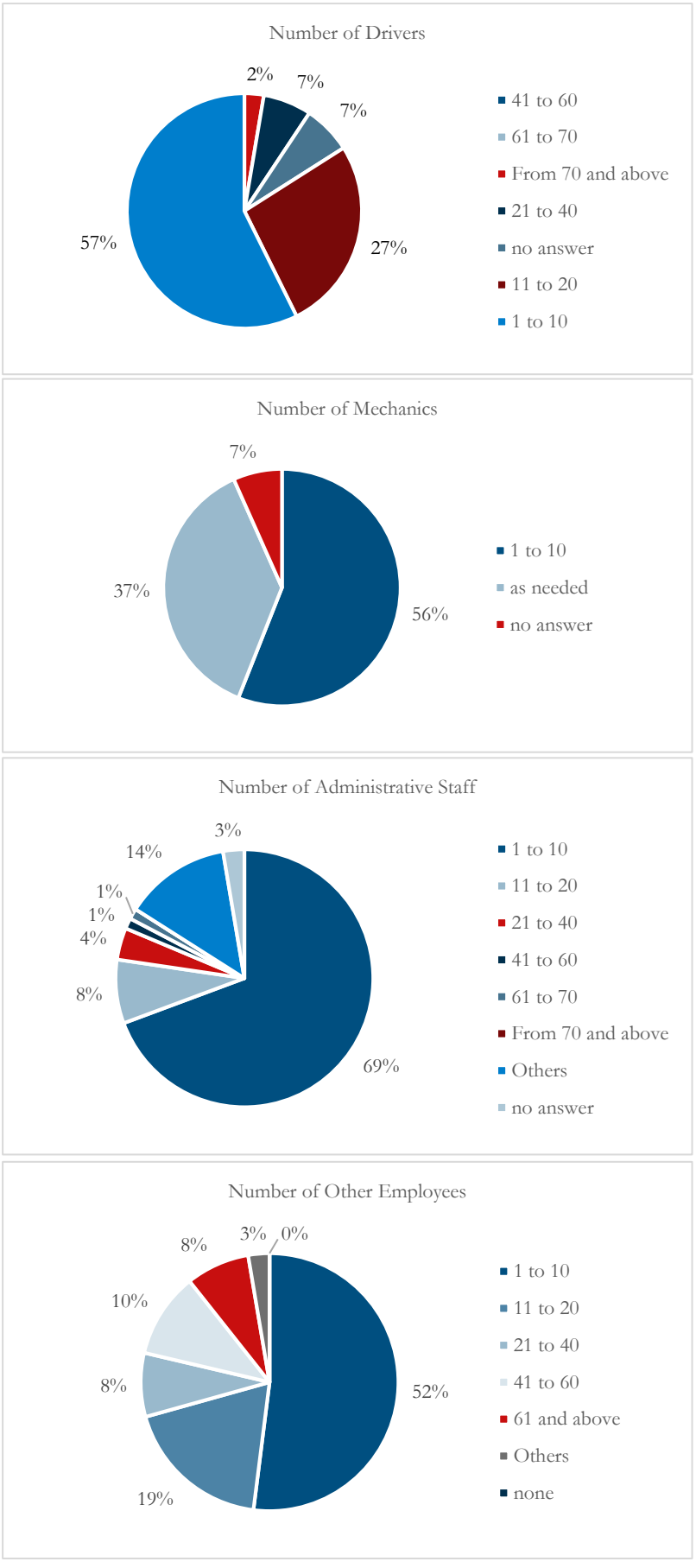


Figure 11. Number of employees

4.1.2. Fleet characteristics

Table 11 shows that the enterprises use both articulated and rigid trucks.[17] Most of them use trucks for dry, general goods wherein 57 percent is rigid with tonnage that range from 15 to 50 tons and 43 percent is articulated that ranges from 25 to 50 tons. Results also show that the use of light commercial vehicles is widely used especially for deliveries up to 5 tons.

Table 11. Types of trucks used by type of goods

Type of goods	Rigid/ articulated	No of trucks/unit	Percentage per type	Average tonnage
Dry, general goods	R	251	57%	15 to 50 tons
	A	186	43%	25 to 50 tons
Refrigerated goods	R	81	19%	5 to 30 tons
	A	335	81%	5to15tons
Flatbed transport	R	69	27%	25 to 50 tons
	A	187	73%	25 to 50 tons
Liquid or bulk goods	R	19	63%	5 to 40 tons
	A	11	37%	-
Re-use/recycle	R	12	67%	5 to 50 tons
	A	6	33%	-
Specialty or others	R	6	50%	-
	A	6	50%	-
Light commercial		389	100%	Up to 5 tons
Container chassis	A	61	100%	-

Majority of respondents (85%) indicated that their vehicle fleets are composed of trucks with manual transmission. They preferred this type of transmission because of its lower price. Some of the respondents also said that trucks with manual transmission have more available parts in the market and can be repaired more easily compared to trucks with automatic transmission. Only 10% of the respondents said that they selected automatic transmission vehicles for the convenience of the driver, resulting to faster turnover for deliveries especially in long hauls.

[17] A rigid truck is a vehicle with two axle sets, a driver's position, a steering system, motive power and a single rigid chassis while an articulated truck is a vehicle which has a permanent or semi-permanent pivot joint in its construction, allowing the vehicle to turn more sharply.

Vehicle age especially for trucks is a contentious issue. Often, owners consider counting vehicle age after their purchase of the vehicle which is inaccurate for second-hand vehicles that may have already been used for a number of years, and yet they are packaged as refurbished vehicles, some even claiming as good as brand new, without disclosing its prior length of service before selling in the second-hand market. As shown in Figure 12, 30 companies said that their fleets have average age of 4-6 years, while 23 companies have fleets that are 7 to 10 years old. 11 companies answered that their fleets are relatively new at 1 to 3 years old. 9 of the companies answered that their fleets are 11- 15 years old. It is interesting to note, however, that only 1 company said that its fleet ages over 15 years.

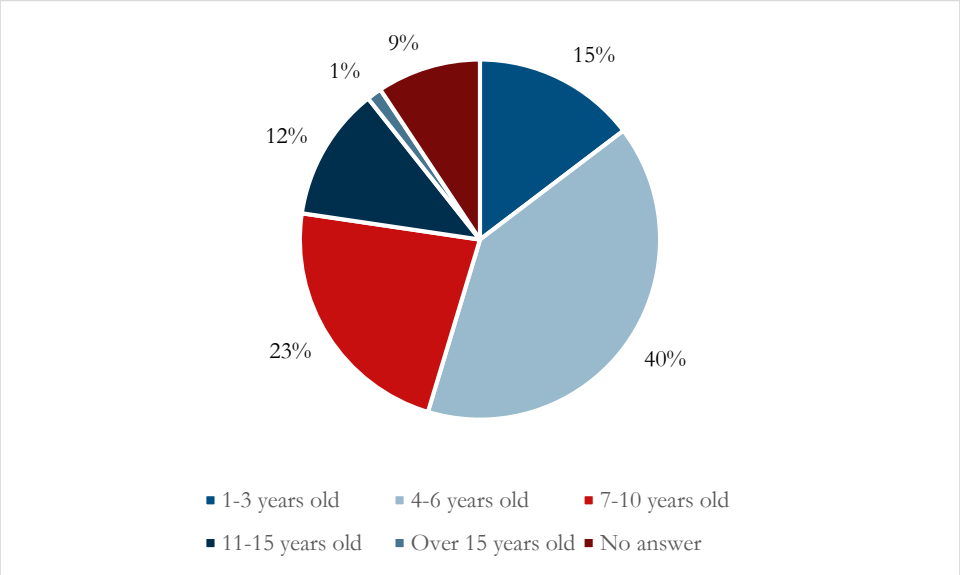


Figure 12. Average age of truck fleet

4.1.3. Trucking operations

Monitoring empty miles

Freight efficiency can be determined through the amount of freight hauled per liter of fuel used. Hence, optimal load of the truck or trailer should be determined to improve overall efficiency. Dead mileage or empty miles is when a truck or trailer operates without carrying cargo. It is important to monitor empty miles to limit fuel wastage and increase freight efficiency. Figure 13 shows that more than half of the companies or 59% said that they monitor, while 28 companies or 37% said otherwise. Three of the respondents did not provide an answer.

Out of the 44 companies that monitor their empty miles, 50% said that empty miles consist of 21 to 30% of their total trips while 5 companies (11%) said about 1 to 10% and 11 to 20% percent of their trips run empty.

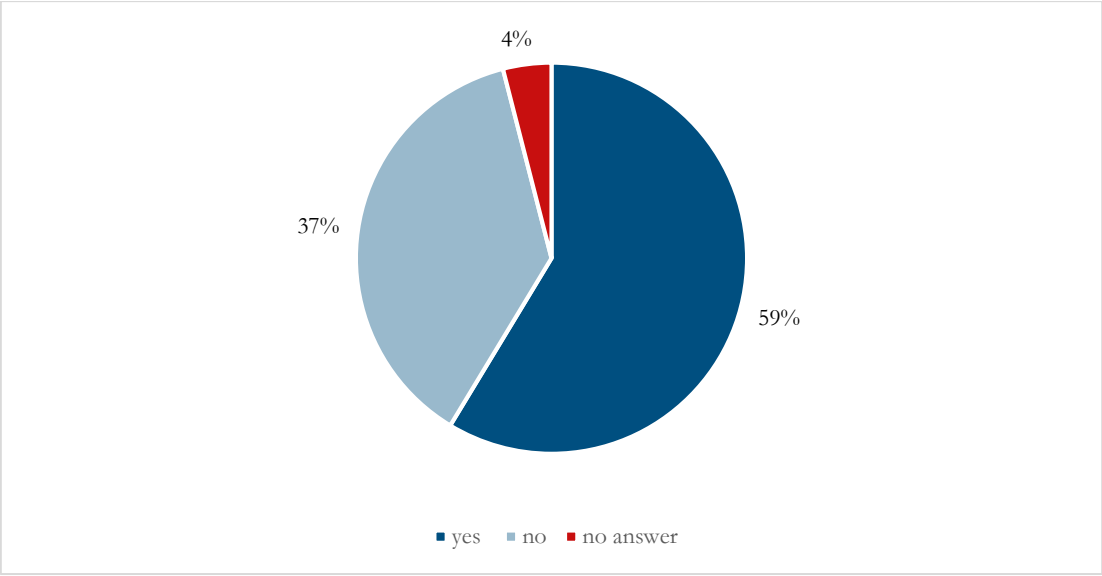


Figure 13. Responses of companies when asked if they monitor empty miles

Allocation of operating expenses

Figure 14 shows that on operational expenses, 48% or 36 of the respondents said that around 21 to 30% of their expenses is on fuel costs while 14 or 19% of the respondents said fuel expenses is around 31 to 40%. Seven respondents or 9% said that as high as 51% to 60% of their operational expenses goes to fuel costs. On the average, fuel costs accounts for about one-third of their operating expenses.

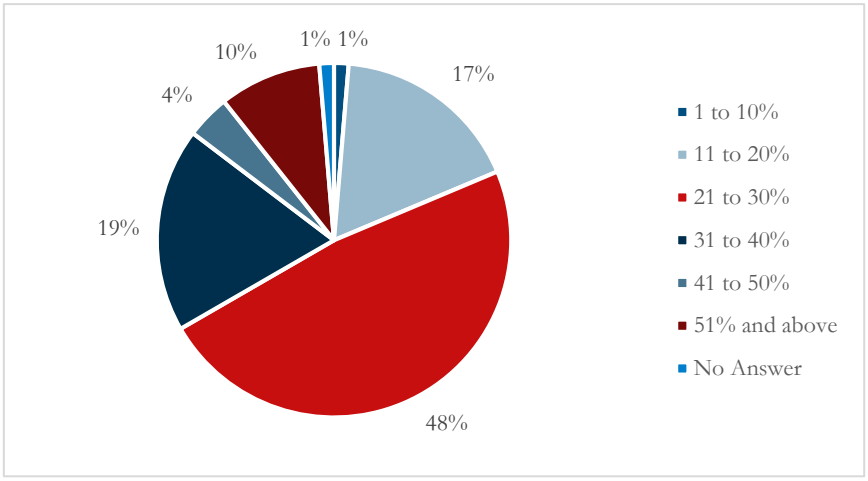


Figure 14. Distribution of respondents based on how much they allocate for fuel costs out of the total operational costs

On maintenance costs, 42 respondents or 56% said that around 11 to 20% of operational expenses is allotted to maintenance costs of their fleets, shown in Figure 15. This includes change oil, brake maintenance, parts replacements and repair, repainting among others. Four respondents said that they reach up to 50 percent of operational expenses on maintenance. When asked further, they responded that some of the units in their fleets are old, hence, more repairs and rigid maintenance are needed. One also indicated that they purchased cheap trucks with low quality which would need more repairs over time.

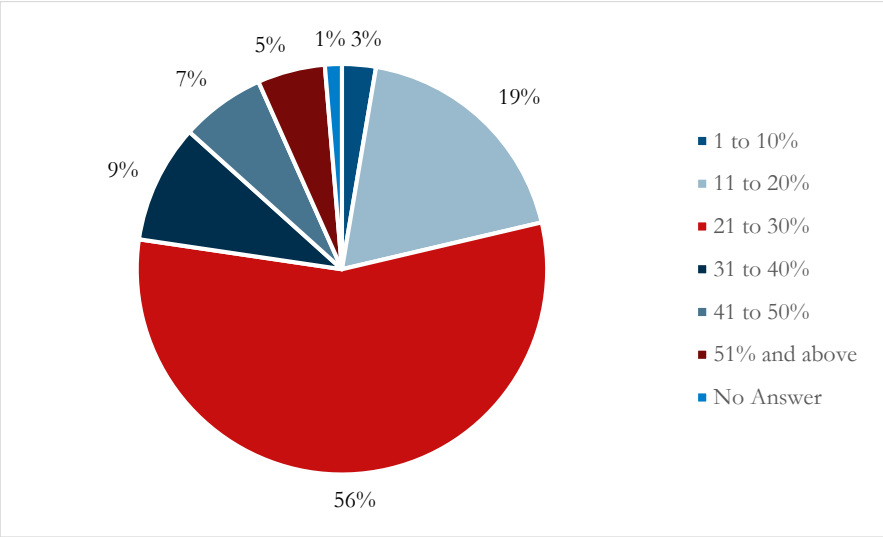


Figure 15. Distribution of respondents based on how much they allocate for maintenance costs out of the total operational costs

Depicted in Figure 16 are the responses of companies regarding salaries and other benefits for their employees. A total of 44 respondents (59%) said that up to 30% of their operational expenses goes to salaries of their employees while 17 respondents (23%) indicated that salaries of their employees cover up to 20% of their operational expenses. These are

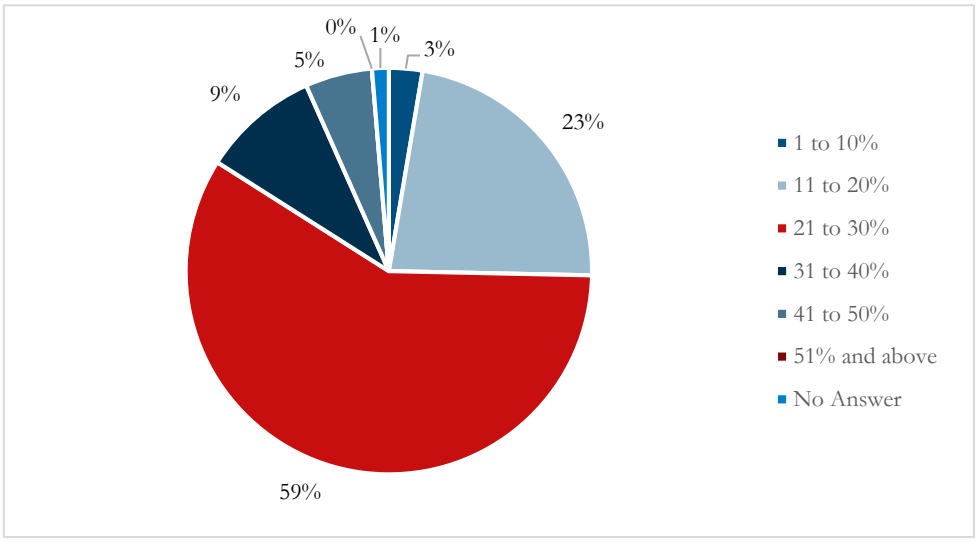


Figure 16. Distribution of respondents based on how much they allocate for salaries and compensation out of the total operational costs

Other operational expenses include registration fees, business permits, fees for truck stickers, *"lagay"* or under-the-table payments, overhead expenses, food of employees, insurance, among others. About 24 of the respondents (32%) said that around 20% of their operational expenses go to the aforementioned payments and 2 of the respondents or 3% said that they go beyond 50% of their operational expenses due to unexpected payments especially when their trucks are reprimanded for truck ban or are towed.

Based on the results, fuel expenses consist of 1/3 of the overall operational expenses and this has an equal share of expense with salaries (30%). While, up to 1/5 goes to maintenance costs and same goes to other operational expenses.

Measures to maximize fuel efficiency

When asked about what measures to maximize fuel efficiency they are familiar with, 87% (65 out of 75) of the respondents said that they use different measures to maximize fuel efficiency of their fleets with the hope of reducing their expenses on fuel and increasing the longevity of their trucks. The remaining 13% said that they have not availed of any measures to maximize fuel efficiency. When asked why these companies were not using measures, answers range from lack of technical knowledge on new technologies, cost for these measures are high and belief that these measures will not have much impact on fuel efficiency.

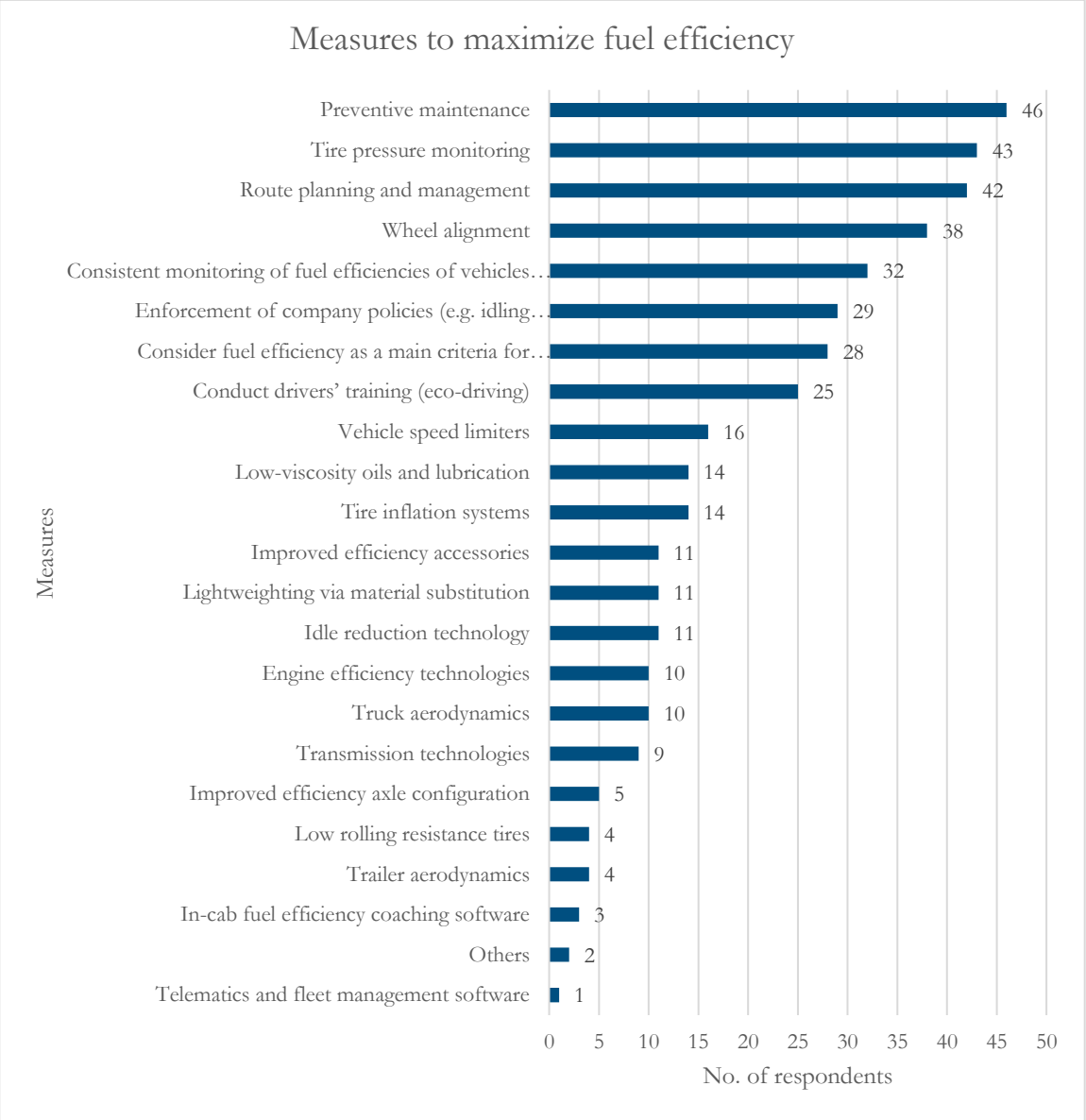


Figure 17. Measures to maximize fuel efficiency

For the respondents who are using measures to maximize fuel efficiency, preventive maintenance tops the list with 61% of 65 respondents doing it followed by tire pressure monitoring at 57%, route planning and management at 56%, and wheel alignment checks at 51% as shown in Figure 17.

According to the respondents, the top 4 answers are the most practical measures to be employed without much additional investment. They also said that those measures are required to properly maintain their fleets. Some respondents shared that they are not familiar with some measures listed and are interested to know more about them.

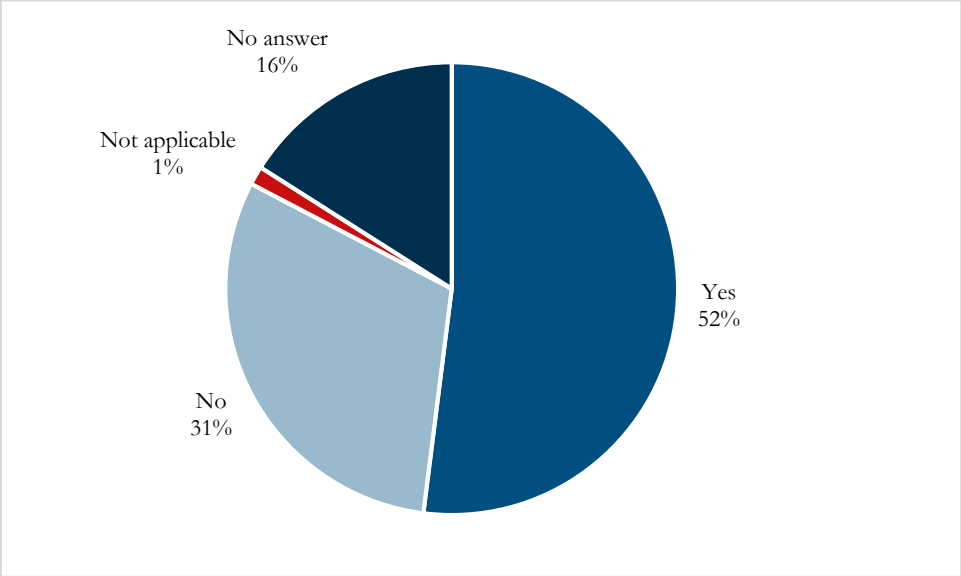


Figure 18. Monitoring fleet's fuel efficiency

On monitoring their fleet fuel efficiency, more than half or 39 companies (52%) said that they measure their fleet's fuel efficiency, as shown in Figure 18. Some of the respondents use downloadable mobile applications that compute fuel usage and evaluate driving performance, while some of the respondents use logbook to monitor fuel consumption and manually compute against distance travelled. Some more advanced companies use scan gauge to keep track of everything from fuel cost to distance travelled. However, some truck owners said that this kind of technology requires additional investments for the fleet.

Of the 39 companies that answered the question on measuring fuel-saving effectiveness of a new technology or feature that they invested in, 16 of the respondents said that they measure or monitor the effectiveness of a technology after buying or investing on it while 24 of the respondents skipped the question. When asked about their motivation to measure, they answered to know whether their investment is worth it and to know better technologies that they should invest more in. However, 35 of the respondents said that they do not measure the effectiveness of the technology or feature. Respondents that answered 'no' said that they are yet to design a monitoring and evaluation mechanism to evaluate the effectiveness of the measures they have invested in.

4.1.4. Vehicle fleet management and maintenance

The respondents were asked to rank the factors they consider when buying a truck with 1 as the highest priority and 8 as the least priority, as shown in Figure 19. Results show that cost of unit is the highest priority with an average ranking of 1.84 followed by fuel efficiency at 1.95 while companies ranked aftersales service and country of origin as their least priorities at 5.46 and 4.76, respectively.

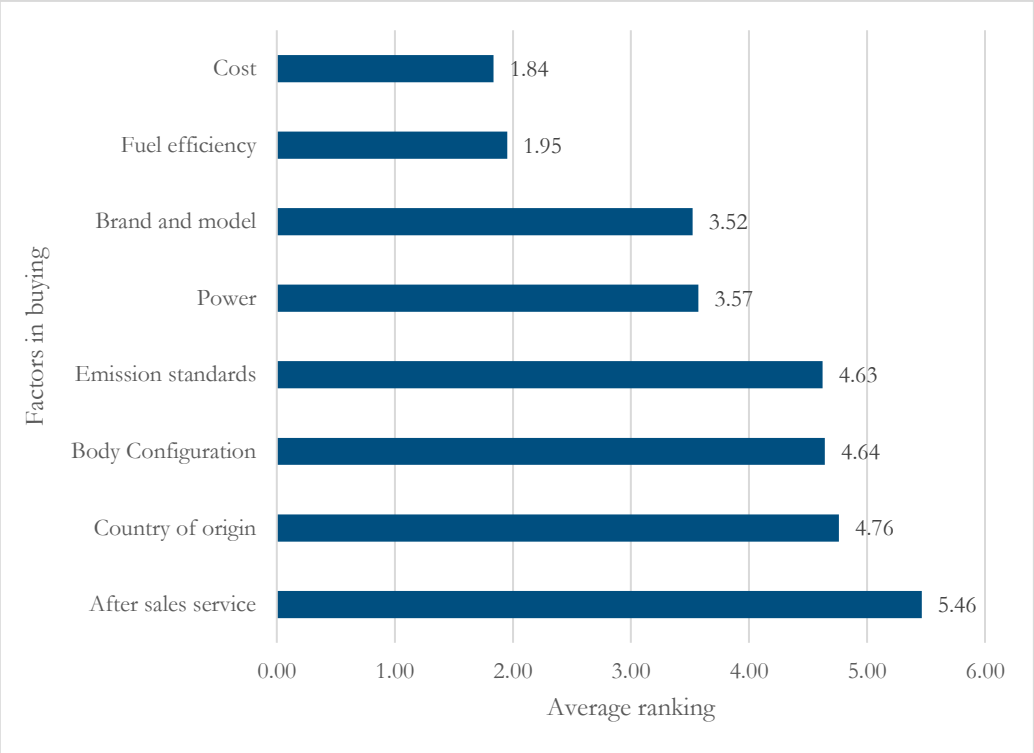


Figure 19. Average ranking of parameters considered when buying a truck (scale: 1-highest, 8-lowest)

When buying a truck, 32% said that they prioritize investing on a brand-new unit to ensure quality and will not have to worry for repairs in the next 3 years. About 27% of the respondents said that they usually invest on second-hand vehicles. Some of the respondents who prioritize buying second-hand said that they usually have mechanics to check whether the units are still in good condition or will only require minor repairs since second-hand units are much cheaper. Interestingly, 31% of the respondents said that they usually invest on a mix of brand new and second-hand units depending on the need or situation.

When asked if the claims of manufacturer on fuel efficiency of their products affect their preference or decision in buying a truck, 45% said yes while 16% said no and 39% had no answer. some of the respondents who answered yes said that they usually consider what the manufacturer's claim about their trucks so that they will have a basis on whether they should invest more in the brand or not. They also said that they consider fuel efficiency features of the trucks for long term consideration of their fleet.

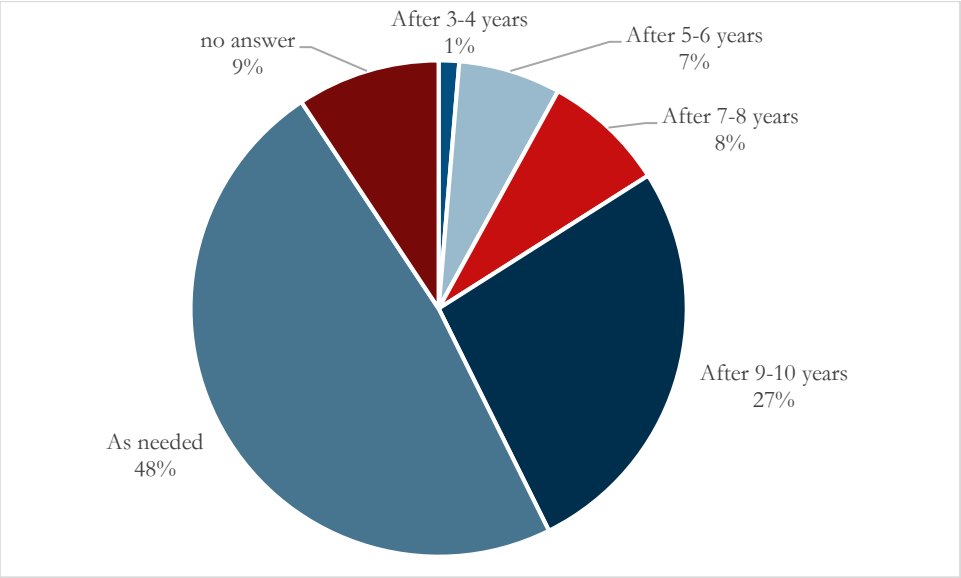


Figure 20. Number of years considered by companies when re-fleeting/replacing units

Respondents were asked how often they replace their units. Based on Figure 20, about 36 (48%) of companies said that they replace their trucks as needed. They said that it is more practical to invest when it is needed rather than having a fixed plan for investing in new units. While 20 companies (27%) said that they usually replace their units after 9-10 years. Those who answered that they replace units 9-10 years are usually the ones who answered that they prefer buying brand new units with consideration on the brand, performance and durability.

Figure 21 shows that many respondents (63%) said that they have a fixed schedule for maintenance to increase the longevity of their units (either monthly, quarterly, semi-annually or annually). The respondents who also answered this question are usually the ones operating in long distances that answered that their areas of operations are provincial, regional or national scale. They said that they are motivated to have a fixed maintenance schedule for safety and reliability of their units while 11% said that they do not have fixed schedule for maintenance.

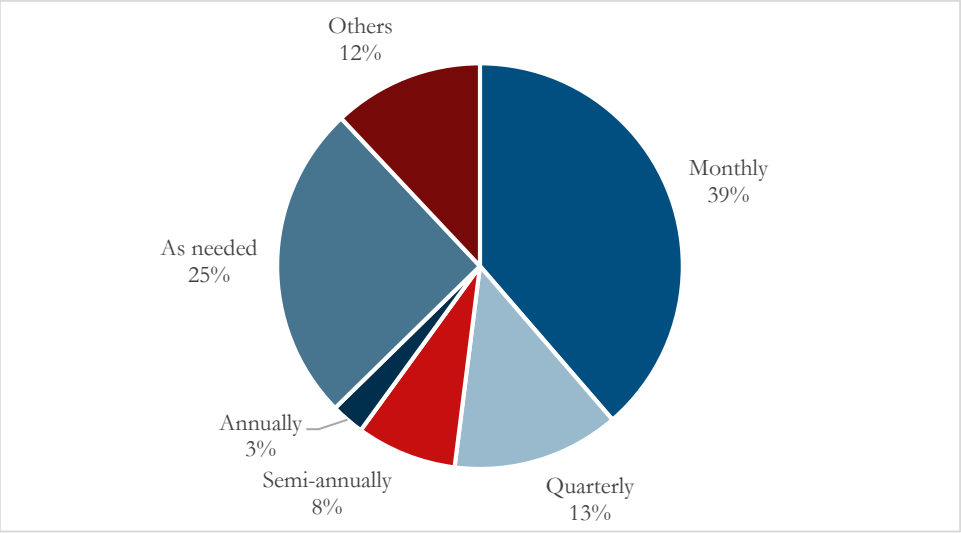


Figure 21. Frequency of inspection and maintenance of fleet

Other than those with fixed schedule of maintenance, 25 percent of the respondents said that they only check as needed. Some of those who answered, "as needed," said that they check their vehicle before every trip and some answered only when necessary in case of repairs or breakdowns. Others (12%) answered that they do weekly check-ups, or check the vehicle every two months. Listed in Figure 22 are the types of maintenance measures normally performed by the respondents to their fleet.

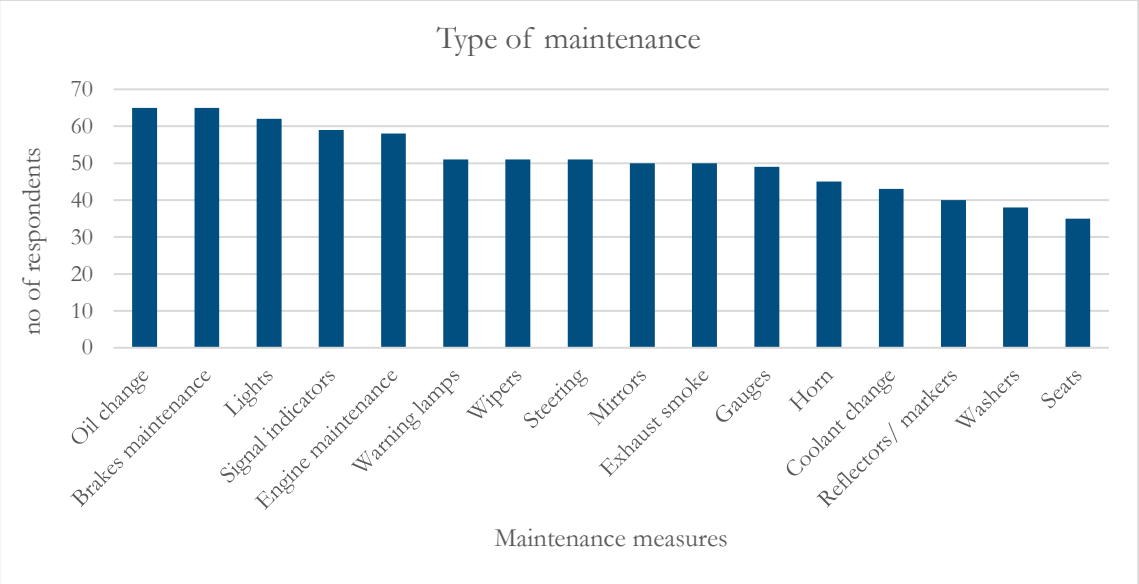


Figure 22. Types of maintenance measures

4.1.5. Fuel saving technologies and strategies

The respondents across the board showed high level of awareness about new technologies related to vehicles and fuels as shown in Figure 23. The main sources of information are through internet and television followed by newspaper and word-of-mouth. Conferences and networking activities and through organisations are at the bottom of the list. Some respondents shared during FGDs that there are not many locally accessible conferences for the freight sector and that trucking associations need to be more empowered and exposed to new technologies and strategies for fuel savings.

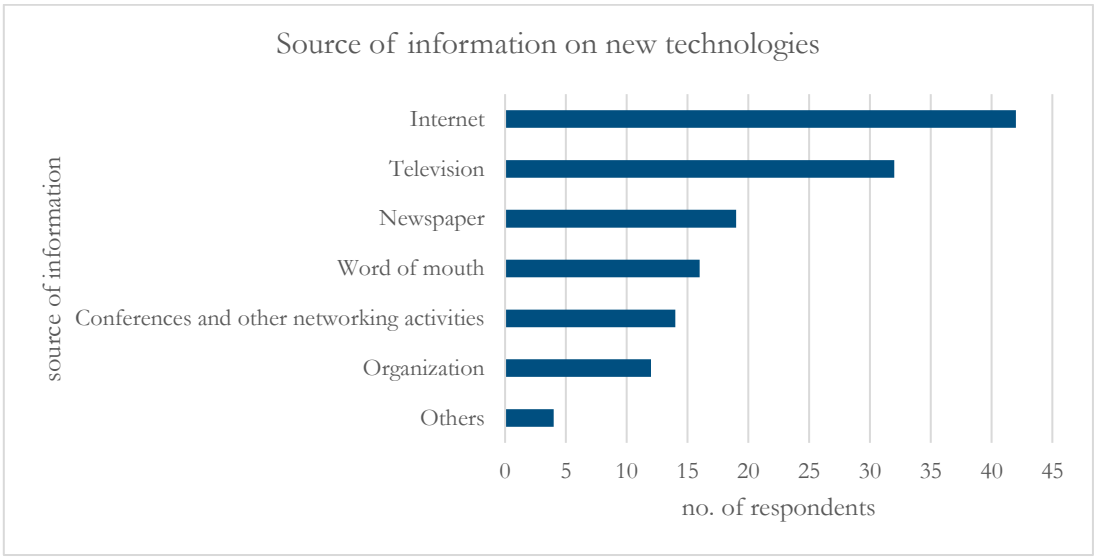


Figure 23. Source of information on new vehicle and fuel technologies

Results show, as listed in Table 12, that, among the main considerations of companies in making investment decisions on fuel-saving technologies and operational strategies, are cost in operations and durability of the technology for the adoption of new technologies. Among the strategies related to operations, they said that skills needed to adopt fuel saving technology is equally important, otherwise, the initiative will be useless. On adoption of technologies, estimated fuel savings is more important than its underlying cost.

Table 12. Considerations in making investment decisions on fuel-saving technologies and operational strategies

Parameter	Number of companies			
	Irrelevant	Not so important	Somewhat important	Very Important
Strategies related to operations				
Cost		1	1	43
Estimated fuel consumption benefits			3	31
Negative disruptions to overall operations		3	10	21
Time needed for implementing the strategy	1		13	25
Manpower/skills needed	1	2	10	30
Others (please specify)				
Adoption of technologies				
Cost	1		4	30
Estimated fuel consumption benefits			8	37
Reliability			6	34
Durability			5	46
After sales service	1		12	22
Maintenance requirements (skills, etc..)		1	5	32
Warranties		1	4	29

About 60% of the respondents said that they calculate the payback period of their investment on fuel saving technologies. They said that this helps them monitor if they will need to invest more on this type of technology. About 20% said that they do not calculate payback period while another 20% did not provide answer.

Figure 24 shows that those who monitor the payback period found out that it is possible to recover the costs as early as only after 1-2 years (12%) up to usually 4-5 years. They also expressed importance in knowing the features of the technology to maximize the benefits, otherwise, payback period is much longer. About 34% of the companies did not answer because either they do not calculate this or are unsure of their calculations.

When asked how much they are willing to invest on fuel-saving technologies, 57% of the respondents said over PHP 200,000 as shown in Figure 25. This is quite a significant amount indicating an openness to explore new technologies that eventually will yield them fuel savings. The breakdown of the responses is shown in Figure 23 with 19% saying up to PHP 50,000, 12 percent said up to PHP 100,000 and 7% said to 200,000 worth of fuel saving technologies.

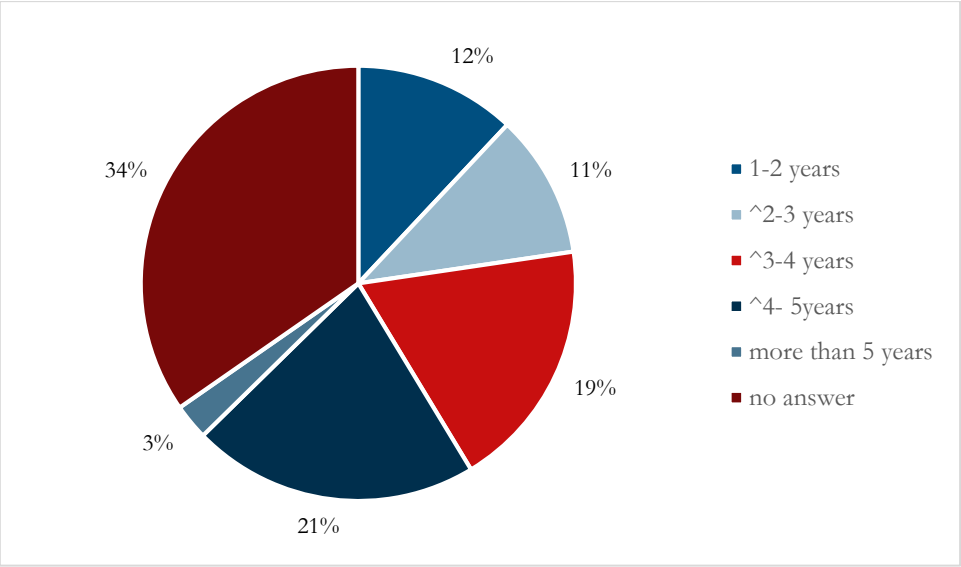


Figure 24. Distribution of respondents based on their calculated payback period of investment

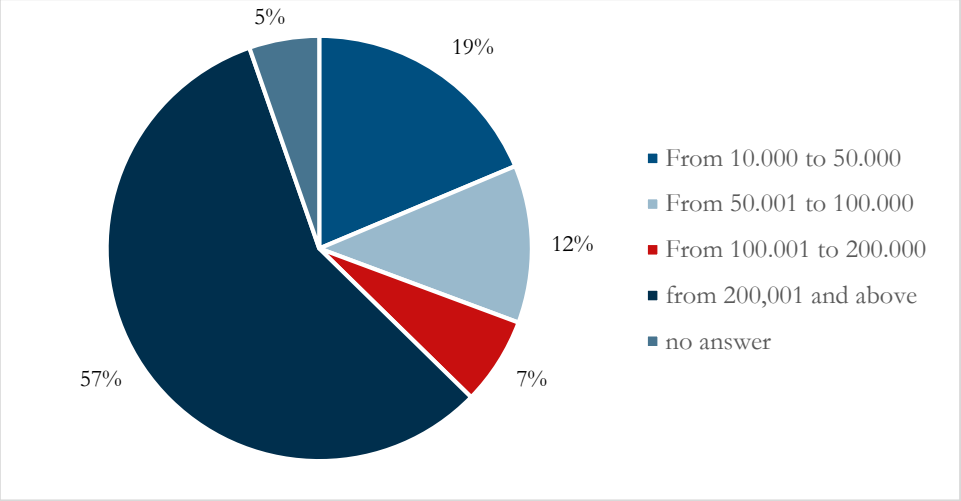


Figure 25. Amount (in PHP) the companies are willing to invest on fuel saving technologies

4.1.6. Emissions reporting

About half of the companies indicated that they have carbon emissions reporting mechanism while 27% said they do not have and 17% did not provide answers. It is interesting to note that 35% report and share their carbon emissions data externally while 17% keep it internally as detailed in Figure 26. While the LTO requires yearly carbon emission reporting to renew the truck registration, compliance and enforcement is quite low so it is commendable that almost half of the respondents do it while about 48% do not report their emissions data.

One trucking company in Palawan said that they do carbon emissions reporting internally by computing the fuel consumption of their fleets and its equivalent emission.

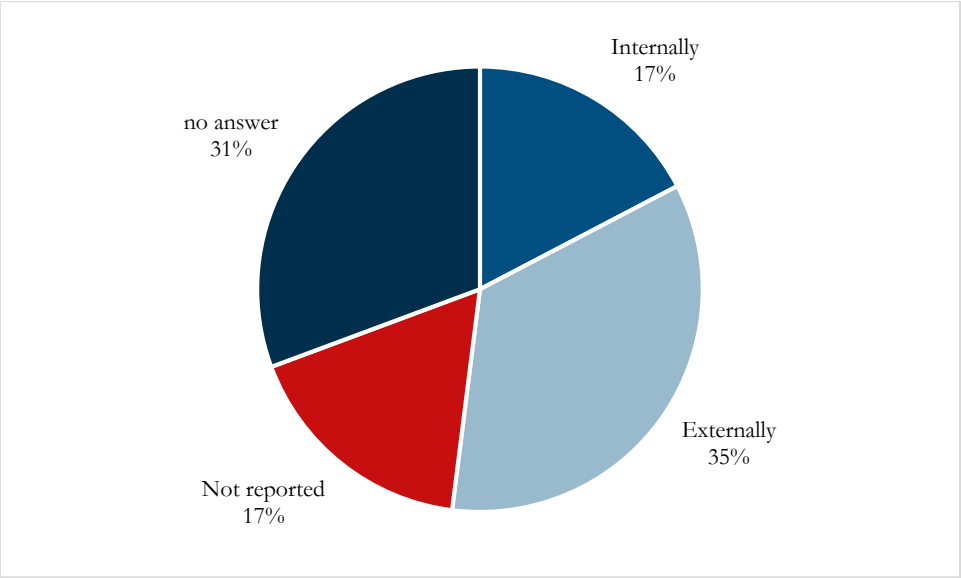


Figure 26. Carbon emissions reporting

On their awareness on any initiatives (either private or public) on the freight sector that address environmental issues, 48% of the respondents said that they are aware while 49% said they are not aware. When asked further, respondents said that the concept of green freight was new to them and has never been discussed or mentioned before. They also added that they usually have local initiatives through locally formed trucking associations in different areas in the country and may have promoted green freight related measures but were not labelled as such.

4.1.7. Institutional framework and green freight program planning

Almost all respondents share the same sentiment that better transport infrastructure is important to improve fuel efficiency and reduce GHG emissions from the freight sector. About 83% of the respondents also highlighted that closer collaboration between government and private sector would be critical to improve fuel efficiency and environmental performance of the trucking sector in the country. During one of the roundtable discussions held in Tuguegarao City in November 2017, it was discussed that poor infrastructure affects the quality of goods and turnover of deliveries. Overloading is also quite rampant causing cyclic damage to roads in the mountainous areas. The heavy dependence on road transport since ports in Cagayan are underutilized poses road safety concerns in traversing the steep terrain and sharp curves between Nueva Ecija and Nueva Vizcaya.

Another issue that was repeatedly raised in Palawan and Bacolod was the need to transport goods to Port of Manila first before it can be exported to other countries. While this is a common practice to consolidate cargo first in Manila before exporting, island province-based exporters are looking for ways to lessen the holding time so as not to increase transport costs and ensure faster delivery of their cargo exports.

Many deliveries from Manila to the provinces return empty. The clients are charged two-way transport costs making the rates expensive. Some logistics companies like Air21 are offering discounted rates to haul back cargo from the provinces to lessen the empty miles. This initiative is beneficial to SMEs in the province that normally balk on the high transport costs. A mechanism to consolidate cargo in the province facilitated by a good freight matching mechanism for supply and demand would be a win-win solution to help SMEs as well as decrease empty miles and fuel wastage.

Table 13 shows the responses of the companies when asked of their views about various strategies in improving the efficiency and environmental performance of the trucking sector.

Table 13. Responses of companies regarding improvement of efficiency and environmental performance of the trucking sector

Parameters	Number of companies					
	Irrelevant	Not so important	Somewhat important	Very important	Total responses	No. of respondents that did not respond
Closer collaboration between government and private sector	0	0	10	62	72	3
Government incentives for energy efficient fleets	0	0	13	43	56	19
Increased access to reliable information about available technologies in the market	0	0	18	30	48	27
Better matching of freight supply and demand	0	1	9	65	75	0
Better transport infrastructure	0	0	3	71	74	1
Capacity building on green practices and technologies	0	0	15	35	50	25

Note: Multiple answers were allowed in this question

Other critical factors include provision of government incentives for energy-efficient fleets, which was suggested to be discussed at a stakeholders' consultation meeting between relevant government agencies and the private sector. The respondents also emphasized the need for capacity building on green practices and technologies which include eco-driving, use of technologies, among others. About 40% of the respondents said that it is "very important" to have an increased access to reliable information on available technologies in the market through expos, exhibits, and conferences.

Figure 27 shows that majority of the respondents (69%) expressed their support to have a mechanism to monitor fuel consumption and improve their fleet's fuel efficiency in return for incentives. While 17% of the respondents did not answer the question, none of the companies said that they are not supportive of the idea. This is important when seeking support from the government to assist in re-fleeting old trucks.

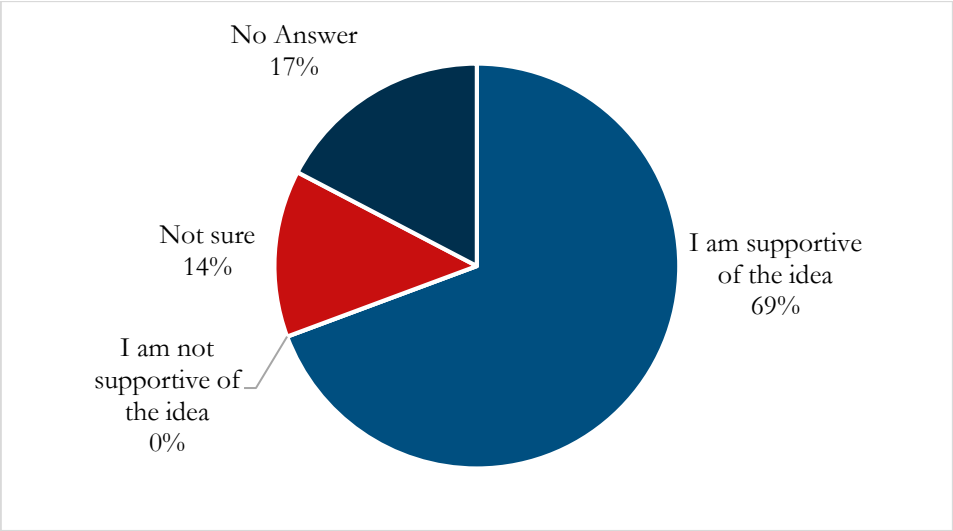


Figure 27. Opinions regarding having a mechanism to monitor fuel consumption and improve fleet efficiency

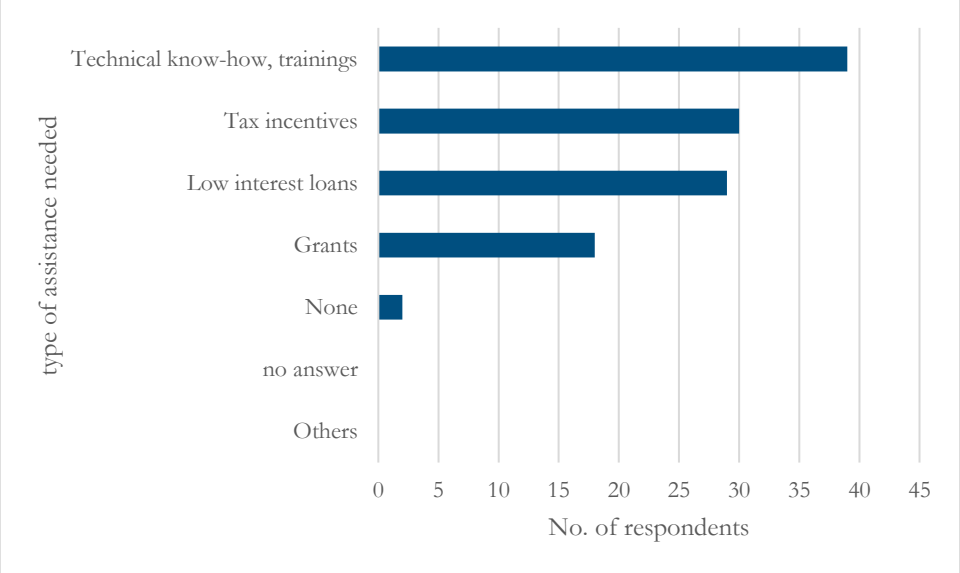


Figure 28. Assistance needed by companies

When asked about the assistance needed by their companies, more than half (52%) of the respondents answered that they will be needing trainings to enhance technical capacity and know-how on different technologies and strategies and measures on green freight. It is notable that requests for capacity building is a higher priority than financial assistance wherein 40% of the respondents said that the government should provide tax incentives to increase the use of fuel-saving technologies. In addition, 38% and 24% said that the government should provide access to low interest loans to avail these types of technologies and measures and provide grants, respectively. Only 2% of the respondents said that they do not need any assistance from the government.

Overall, the feedback from the respondents are positive and open in adopting green freight measures to increase fuel efficiency and enhance the environmental performance of the transport and freight sector in reducing air pollution and carbon emissions.

5. Recommendations and Conclusion

Greening freight and logistics in the Philippines requires multitude of efforts and resources among various stakeholders. As a start, this chapter provides ten (10) recommendations focusing only on increasing efficiency of trucks and improving the trucking industry based on the assessment of existing road transport and logistics' institutional and regulatory framework, complemented by on-the-ground insights gathered from surveys and consultations. These actions can assist in providing adequate infrastructure and logistical support to achieve connectivity, ensure efficient flow of goods and services domestically and internationally, and lower the cost of production and delivery, ultimately achieving reduction in GHG emissions from road freight transport.

While many of these actions need the government to initiate and scale efforts to address the identified deficiencies in infrastructure, incentives, policies and data, some measures are gaining momentum as introduced by the private sector. For example, a growing number of truckers see the value of using fuel efficient trucks as they deem it to be more cost effective in the long run especially with the implementation of the Tax Reform for Acceleration and Inclusion (TRAIN) starting January 2018 wherein previously excise tax-free products, such as diesel fuel, is now subject to a new levy – PHP 2.50 in 2018, PHP 4.50 in 2019 and PHP 6.00 in 2020 per gallon. Cost of vehicles also increased although trucks are exempted from excise tax.

5.1. Recommendations for Greener Freight and Logistics in the Philippines

Improve trucking data collection, monitoring and reporting framework

Trucks account for only about 5% of total vehicle population but its share of GHG emissions is almost four folds. Available data is limited and not disaggregated depending on purpose, size and weight. With the government's future plan to introduce a re-fleeting program for trucks, an inventory is necessary to come up with an appropriate design. Below are suggested activities to facilitate this.

- For LTO to enhance data collection process for new and old vehicles. It is important to note that the current system does not disaggregate the fleet age of the trucks as well as the fuel technology of the fleet. This can be a data sufficiency layer that can be added in the demographics of vehicles secured in the registration process. This can serve as basis and allow building on an enhanced tax schemes or tax incentives for trucking companies.
- Create a Logistics Observatory that can consolidate data harvested from different agencies to serve as repository of transport and logistics database. a sustainability plan should be designed and established on how the database can be continuously built between and among agencies. For example, enhancing data collection system thru including relevant data on the existing business registration system of DTI such as including number of fleets, type of trucks and technologies used in the registration for trucking companies or other related businesses
- Establish a feedback loop mechanism utilizing the data available from the logistics observatory to design and establish dynamic green freight policies. This will enable progressive adoption of relevant and apt policies.

– Use improved freight transport data for monitoring, reporting and verification (MRV) of transport GHG emissions as an input to the overall GHG accounting framework. This can also be a tie up with the establishment of a motor vehicle inspection system which should be a requirement for annual registration of vehicles. MVIS will be the basis for road worthiness. The data gathered from the established MVIS should be the officially recognized data for renewal of vehicle registration and franchise.

Professionalize the logistics industry

The logistics industry, including trucking operations, has good growth potential but it needs to formalize its workforce and operations. Truck drivers are well compensated but only few companies have permanent drivers, most hire on a per delivery basis. There is also a high potential for truck drivers to work abroad. For other workers in the industry, the skill sets needed in other jobs are less defined so to ensure a stable and professional workforce, the following have to be done.

– Skills mapping is necessary to identify and match appropriate skills to specific job requirements. This can be a collaborative effort with the Department of Labor and Employment.

– Partner with TESDA and other institutions to provide continuing trainings on various topics such as eco-driving, truck maintenance, troubleshooting for truck mechanics, book keeping, etc.

– Include eco-driving in LTFRB's Driver Academy curriculum to ensure all drivers gain the knowledge and know-how to drive efficiently

– Encourage the private sector to strengthen their associations by offering joint trainings and seminars to update the skills of their employees as well as sharing of best practices

Improve truck efficiency

As previously mentioned, the NLMP estimates that as high as 90% of trucks on the road in the Philippines are 15 years old or more. There is rampant importation of second-hand trucks since it is cheaper and spare parts are also readily available. Previous decisions in buying trucks are mainly based on its costs. This will have to change as all vehicles purchased on or after January 1, 2018, will have to meet Euro 4 emission standards, and truck operators need financial assistance to acquire Euro 4-compliant trucks. Another aspect that has to be minimized to improve truck efficiency is overloading. The government should facilitate the transition of re-fleeting trucks through the following measures.

– Introduce fleet management mechanisms to institutionalize measures to increase truck efficiency (e.g. periodic maintenance, blow bag technique, establish maintenance schedule)

– Study policy measures to stimulate truck fleet renewal, e.g. a government-subsidised loan scheme with lower interest rates

– Develop policy assessments in the areas of truck and fuel efficiency, including technology options (e.g. telematics, low resistance tyres, aerodynamics) as a basis for improved vehicle standards

– Develop national standards for logistics that would enhance reliability and credibility of the trucking sector.

– Access climate finance to assist in financing truck fleet renewal

– Apply effective measures against overloading

Consolidate SMEs in the trucking industry

The trucking industry is dominated by SMEs so scaling up of operations is limited. There are some few big players that have resources to operate nationwide and it is important to facilitate complementary arrangements with local SMEs. To be efficient and remain competitive with big companies, consolidating SMEs is a viable option to avoid a fragmented market. Learning from the lessons of consolidating the public utility vehicle (PUV) operators, the following could be implemented.

- Develop a policy paper to explore the potential of promoting consolidation and/or forming trucking cooperatives
- Improve the licensing system to facilitate consolidation within the industry, e.g. by prescribing the minimum number of trucks and average truck age

Reduce empty miles

In the Philippines, high transport costs are due to empty miles. Backhaul to Manila and other logistic centres are often empty, wasting fuel and money while SMEs in the provinces are not able to afford transport costs for their products to reach the market in urban centres. To reduce empty miles,

- Conduct further research and analysis on empty trips, including an analysis of O-D survey data and a study of empty trip patterns and the root causes on selected corridors
- Create an online platform for freight exchange to encourage wider use of available logistics management solutions
- Implement pilot logistics management activities in certain areas and/or with several companies

Decongest Manila, improve the efficiency and performance of freight operations in other urban areas

There is heavy traffic congestion in the roads of Metro Manila and other neighbouring cities. Port of Manila and Ninoy Aquino International Airport are operating beyond their capacity while the Ports of Batangas and Subic as well as Clark International Airport are underutilised. Decision makers often lack relevant information and knowledge needed to make informed decisions on city logistics, e.g. setting truck bans in their locality. To remedy the situation,

- Conduct an assessment whether it is necessary to develop logistics centres in other urban areas. NLMP is also suggesting to utilize the Ports of Batangas and Subic as well as Clark International Airport.
- Conduct further assessment on feasibility of developing urban consolidation centres. This is important not only for efficiency gains but also to reduce empty miles.
- Conduct a study on potential dedicated truck routes.
- Coordinate truck bans and collection of passing through fees of different LGUs.

Enhance multimodal freight transport connectivity

Improving connectivity is a priority item in PDP 2017-2022. It is important since logistics support services are lacking in other ports and airports. Also, upcoming rail projects can contribute in freight distribution. Increasing impact of transport in climate change would be minimised because of seamless multimodal freight transport. This recommendation is also included in the NLMP and the Philippine Multimodal Transportation and Logistics Industry Roadmap.

- Ensure freight transport connectivity is considered in the implementation of infrastructure projects included in the Build, Build, Build Program.
- Connectivity aspects should be included in the forthcoming National Transport Master Plan - design policies to address barriers in conjunction with developing a multimodal transport action plan
- Conduct a pilot project to implement policies related to multimodal freight transport along freight corridors between major cities.

Establish public-private-partnerships through green freight programs

The global trend is to move towards more environmentally friendly practices. Private sector is interested but still waiting for guidance from government. Some activities leading to enhancing PPPs to potentially reduce logistics costs in an environment-friendly manner are to

- Strengthen the close working relationship between the government and private sector.
- Fast-track the creation of DOTr Office of Multimodal Transport and Logistics Office that will serve as the agency that will consolidate operation from all modes of transport.
- Build capacity and offer guidance regarding development of joint programmes to promote fuel efficiency and integrate initiatives, actions and measures towards a more comprehensive and coherent approach to green freight and logistics.
- Establish a voluntary standard and label scheme to give recognition to companies taking action. Learn from best practices from other countries that can adopted and localized in the Philippine context (e.g. green freight labelling and performance recognition program)

Participate in regional and international initiatives

Many participants in the consultation meetings from the private sector and LGUs asked about conferences and trainings that they can attend to be up to date on the technology and policy trends in the industry. Their participation in such initiatives will increase their knowledge and enhance competitiveness. Such exchanges will provide opportunity to learn lessons and share experiences concerning green freight policies, programmes and activities.

- Involve various stakeholders in developing a Green Freight Action Plan in the Philippines to ensure that all interests and inputs are incorporated and considered in the process.
- Encourage companies to join green freight initiatives and be exposed to green freight labelling programs.
- Join international green freight networks to learn from best practices and be exposed to the progress made in other countries. This will also increase awareness and understanding on the experiences in other regions.

Establish an interagency coordination for freight and logistics sector to ensure that coordinated actions and policies are observed.

Currently, there is an existing technical working group on Transport Infrastructure, Trade and Logistics (TITL). However, a more active partnership between and among agencies such as DOTr, DTI, DOE and DENR is imperative as each agency has a different role to play in improving the overall efficiency of the freight sector.

- Identify and delineate specific roles of each agency and identify activities and initiatives that require collaborative efforts in improving the overall efficiency of the sector
- Widen the scope of the NLMP to include the roles of other agencies in improving the overall efficiency in the freight and logistics sector.

5.2. Conclusion

This assessment presented an overview of the freight and logistics sector in the Philippines and proposed recommendations to develop a green freight and logistics program in the country. In line with the Global Green Freight Action Plan, the program of the Philippine government should be designed to help freight sector players (carriers and shippers) to modernize and optimize their operations in a way that saves fuel, cuts costs and reduces negative externalities such as GHG emissions. The program should also facilitate collaboration between government agencies, private sector, and key stakeholders. As experienced in other countries[18], a green freight program should include green freight actions and initiatives such as testing and recognition of technologies to increase efficiency, freight data collection for policy and industry development, performance benchmarking and reporting mechanisms from the different modes of freight transportation. An important element for such program is to identify a funding mechanism to ensure consistency and sustainability of the program. Most importantly, green freight targets should be clear from the onset so that the program will set a strategic direction leading to the development of a roadmap for implementation. Ultimately, the Philippine green freight and logistics program should promote economic growth for enterprises, while minimising the negative impact of the industry's development to the environment and human well-being.

[18]Climate and Clean Air Coalition (2015). Global Green Freight Action Plan http://www.globalgreenfreight.org/GreenFreightActionPlan_May2015.pdf

Annex: Freight Assessment Survey for Trucking Companies

FREIGHT ASSESSMENT SURVEY FOR TRUCKING COMPANIES ESTABLISHING A CASE FOR THE DEVELOPMENT OF GREEN FREIGHT PROGRAM IN THE PHILIPPINES

I. COMPANY PROFILE

1. Name of Company: _____
2. Nature of business:
   - ☐ Trucking
   - ☐ Freight forwarder
   - ☐ Third party logistics
   - ☐ Other

3. Ownership
   - ☐ Sole proprietorship
   - ☐ Corporation
   - ☐ State-owned
4. Number of employees

Drivers	
Mechanics	
Administrative staff	
Other employees	

5. Types of goods transported (check all that apply):
   - ☐ Agriculture
   - ☐ Construction materials
   - ☐ Processed agricultural products
   - ☐ Manufactured items
   - ☐ Consumer products
   - ☐ Minerals
   - ☐ Others, please specify:

6. For companies with constant fixed service routes, what ***routes*** do you cover?

From	To	Number of trips per month

For companies with constantly varying routes, what ***areas*** do you cover? (For example, Metro Manila to any point of Luzon)

II. FLEET CHARACTERISTICS

1. Please specify the number of units and average gross weight of your fleet

**Please refer to the guide sheet found at the end of the survey*

	Number of units	Average gross weight
Dry, general goods		
Rigid		
Articulated		
Refrigerated goods		
Rigid		
Articulated		
Flatbed transport		
Rigid		
Articulated		
Liquid or bulk goods		
Refuse, recycling		
Rigid		
Refuse, recycling		
Specialty		
Rigid		
Container Chassis		
Articulated		
Specialty or others		
Articulated		
Rigid		
Light commercial		

2. What is the common transmission type in your fleet?
   - ☐ manual transmission
   - ☐ automated manual transmission
   - ☐ automatic torque-converter transmission
3. What is the average age of your fleet?

%	Age range
	1-3 years
	4-6 years
	7-10 years
	11-15 years
	More than 15 years

III. TRUCKING OPERATIONS

1. Do you know the empty miles percentage of your operations? If yes, kindly indicate the estimate.

	Yes
	If yes, kindly indicate the %
	No

2. In terms of operational expenses, kindly provide the estimated % proportions for the following items:

%	
	Fuel costs
	Maintenance costs
	Salaries

	Others
100%	TOTAL

3. What measures do you use to maximize the fuel efficiency of your operations?
   - ☐ None
   - ☐ Use of technologies (please check all that apply)
     - ☐ Truck aerodynamics
     - ☐ Trailer aerodynamics
     - ☐ Low rolling resistance tires
     - ☐ Tire inflation systems
     - ☐ Idle reduction technology
     - ☐ Vehicle speed limiters
     - ☐ Low-viscosity oils and lubrication
     - ☐ Telematics and fleet management software
     - ☐ In-cab fuel efficiency coaching software
     - ☐ Engine efficiency technologies
     - ☐ Transmission technologies
     - ☐ Light-weighting via material substitution
     - ☐ Improved efficiency accessories
     - ☐ Improved efficiency axle configuration
   - ☐ Strategies employed (please check all that apply)
     - ☐ Consider fuel efficiency as a key criteria for purchasing vehicles
     - ☐ Consistent monitoring of fuel efficiencies of vehicles and drivers
     - ☐ Conduct drivers' training (eco-driving)
     - ☐ Enforcement of company policies (e.g. idling regulations, etc…)
     - ☐ Tire pressure monitoring
     - ☐ Wheel alignment
     - ☐ Preventive maintenance
     - ☐ Route planning and management
   - ☐ Others

Please specify:

4. Does your company evaluate its fleet's fuel efficiency?
   - ☐ Yes
   - ☐ No

   4.1 If yes, why? What are your motivations?

   4.2 And, can you tell us more about how your company evaluates the fleet's efficiency (what devices, methods are used, how regular, etc)? If no, why not?

5. Do you measure the fuel-saving effectiveness of a new technology or feature?
   - ☐ Yes
   - ☐ No

   If yes, how? If no, why not?

IV. VEHICLE FLEET MANAGEMENT AND MAINTENANCE

1. What factors do you consider when buying a truck?

Scale (please check one for each parameter)				Parameter	Rank in terms of priority (1-highest priority, 2, 3…)
Irrelevant	Not so important	Somewhat important	Very important		
				Cost	
				Fuel efficiency	
				Emission standards	
				Brand and model	
				Country of origin	
				Power	
				Body Configuration	
				After sales service	
				Others (please specify)	
				Others	
				Others	

2. When you are purchasing a vehicle, do you usually:
   - ☐ Buy a new one
   - ☐ Buy a second-hand one.
   - ☐ Combined (brand new and second-hand). Please specify how many % of your fleet are:
     i. Brand new: _____
     ii. Locally-sourced: _____
3. How do you value manufacturer's claims about the fuel efficiency of their products?
   - ☐ Yes
   - ☐ No
   - ☐ Others: Please explain further

4. After how many years do you normally replace your trucks?
   - ☐ After 3-4 years
   - ☐ After 5-6 years
   - ☐ After 7-8 years
   - ☐ After 9-10 years
   - ☐ As needed
   - ☐ Others
5. Do you have a fixed schedule for the maintenance for your vehicles?
   - ☐ Yes
   - ☐ No
6. How often are vehicles inspected and serviced?
   - ☐ Monthly
   - ☐ Quarterly
   - ☐ Semi-annually
   - ☐ Annually
   - ☐ As needed
   - ☐ Other

Please specify

7. What types of maintenance do your vehicles normally undergo?
   - Oil change
   - Coolant change
   - Engine maintenance
   - Gauges
   - Warning lamps
   - Signal indicators
   - Washers
   - Wipers
   - Horn
   - Mirrors
   - Seats
   - Steering
   - Exhaust smoke
   - Brakes maintenance
   - Lights
   - Reflectors/ markers

V. FUEL-SAVING TECHNOLOGIES AND STRATEGIES

1. What are your sources of information for new technologies related to vehicles/fuels?
   - Newspaper
   - Internet
   - Conferences and other networking activities
   - Television
   - Organization
   - Word of mouth
   - Others
2. What are your considerations in making investment decisions on fuel-saving technologies and operational strategies?

Scale (please check one for each parameter)				Parameter
Irrelevant	Not so important	Somewhat important	Very important	
Strategies related to operations				
				Cost
				Estimated fuel consumption benefits
				Negative disruptions to overall operations
				Time needed for implementing the strategy
				Manpower/skills needed
				Others (please specify)
Adoption of technologies				
				Cost
				Estimated fuel consumption benefits
				Reliability
				Durability
				After sales service

				Maintenance requirements (skills, etc..)
				Warranties
				Others (please specify)

3. Do you utilize a payback calculation to estimate how long it will take a technology to pay for itself in terms of fuel savings?
   - ☐ Yes
   - ☐ No
4. If so, what are typical upper bounds that you utilize for the payback time?
   - ☐ 1 year
   - ☐ 2 years
   - ☐ 3 years
   - ☐ 5 years
   - ☐ Others
5. What challenges and obstacles do you envision to encounter in using new technologies?
   - ☐ Knowledge on using these technologies
   - ☐ Sustainability (funding and manpower)
   - ☐ Lack of skills for maintenance
   - ☐ Others

6. How much additional capital are you willing to spend on upcoming fuel saving technologies?

7. Are there any technologies that you know of that you'd like to see offered on new vehicles that are not available or are too expensive in the market?

VI. EMISSIONS REPORTING

1. Does your company have carbon emissions reporting mechanism?
   - ☐ Yes
   - ☐ No
2. How are your carbon emissions reported?
   - ☐ Internally
   - ☐ Externally
   - ☐ Not reported
3. Are you aware of any initiatives (either private or public) in your sector on environmental issues?
   - ☐ Yes
   - ☐ No

VII. INSTITUTIONAL FRAMEWORK AND GREEN FREIGHT PROGRAM PLANNING

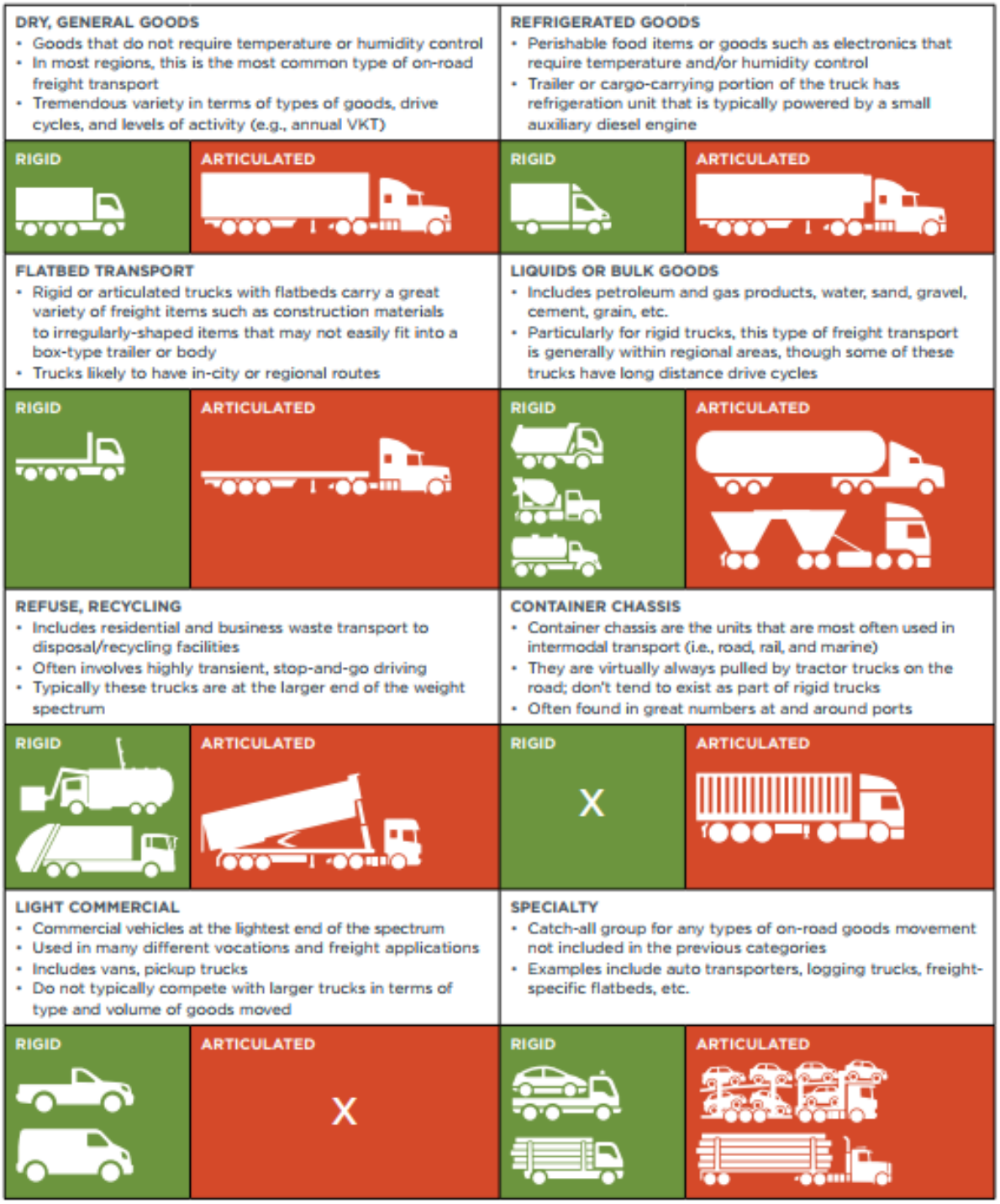
1. How do you feel about the following strategies, in terms of improving the efficiency, and environmental performance of the trucking sector in Philippines?

Scale (please check one for each parameter)				
Irrelevant	Not so important	Somewhat important	Very important	
				Closer collaboration between government and private sector
				Government incentives for energy efficient fleets
				Increased access to reliable information about available technologies in the market
				Better matching of freight supply and demand
				Better transport infrastructure
				Capacity building on green practices and technologies

2. How do you feel about a mechanism where the government partners with private trucking companies who are willing to monitor their fleet's fuel consumption, and commit to improving their fleet's efficiencies, in return, being provided incentives?
   - ☐ I am supportive of the idea.
   - ☐ I am not supportive of the idea.
   - ☐ Not sure.
3. What support does your company need to increase the use of fuel saving technologies?
   - ☐ None
   - ☐ Tax incentives
   - ☐ Low interest loans
   - ☐ Grants
   - ☐ Technical know-how, trainings
   - ☐ Others, please specify:

Reference for item 2.1

Types of Freight Trucks



Source: Freight Assessment Blueprint. Accessed from: http://www.ccacoalition.org/sites/default/files/resources/2017_Freight-Assessment-Blueprint_CCAC-ICCT.pdf

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List of Figures

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Lake Rajada Office Complex
(16th floor)
New Ratchadapisek Road, Klongtoey,
10110 Bangkok
www.TransportAndClimateChange.org

Partner:
Clean Air Asia
Unit 3505 Robinsons Equitable Tower
ADB Avenue, Pasig City, 1605 Philippines
Tel +632 6311042
Fax +63 2 6311390
center@cleanairasia.org
www.cleanairasia.org

Authors:
Dr. Jane Romero and Ms. Pia May Agatep, EnP.

Editors and contributors:
Mr. Tali Trigg, Mr. Friedel Sehlleier, Mr. Alan Silayan, Ms. Hannah Ebro,Ms. Cristina Villaraza, Ms. Kathleen Dematera and Mr. Mark Tacderas

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Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Sitz der Gesellschaft
Bonn und Eschborn

Dag-Hammarskjöld-Weg 1-5
65760 Eschborn/Deutschland
T +49 61 96 79-0
F +49 61 96 79-11 15
E info@giz.de
I www.giz.de