How to cite this article: Noisena, A., & Choomrit, N. (2026). Decision-making process for Selecting the Type of Container Truck Case Study International Vessel Agent. *Journal of Logistics and Supply Chain Operations, 12*(1), 27-37. https://doi.org/10.53848/jlsco.v11i3.279686

Received:	July	07, 2024
Revised:	October	20, 2025
Accepted:	October	23, 2025

Decision-making process for Selecting the Type of Container Truck Case Study International Vessel Agent

Atidtaya Noisena[1]* and Ninlawan Choomrit[2]

Abstract

The objective of this research was to examine the viability of utilizing electric-powered container trucks. It served as a tool for determining whether to utilize a new truck model for a scase study, an international vessel agent. Currently, the company has gasoline-powered trucks and natural gas-powered trucks. The route under examination was from Ladkrabang Port in Bangkok to Laem Chabang Port in Chonburi, Thailand. This research employed both quantitative and qualitative approaches (mixed methods) and used purposive sampling from experts in companies with over 10 years of experience for 5 people with a structured interview. The research began with collecting data on both types of trucks and electric trucks to be compared with costs and greenhouse gas (GHG) emissions. It was determined that a gasoline-powered truck has an annual cost of 8,225,858 baht and emits 723,751 kg of CO2. A natural gas-powered truck costs 5,289,363 baht per year and emits 592,587 kg of CO2, while an electric truck costs 3,183,088 baht annually and emits 288,580 kg of CO2. Then the study of electric trucks was done and analyzed data on the payback period, internal rate of return, and net present value. The study found that the cost-effectiveness of electric-powered trucks revealed that the time required to recover an initial investment was 3 years and 1 month, the present value of cash flows was 6,392,239 baht, and the project's rate of return was 18.52%. Feasibility analysis indicated that investing in electric-powered trucks gave positive future returns, which made the investment worthwhile and proposed as alternative options for decision-making within the company's case study.

Keywords: Container truck, Electric-powered truck, Vessel agent, Greenhouse gas emissions
Type of Article: Research Article

*Corresponding author
[1] Graduate of Bachelor of Engineering (Program Logistics Engineering), Faculty of Engineering, Srinakharinwirot University, E-mail: atidtaya.noisena@outlook.com
[2] Professor of Department of Industrial Engineering, Faculty of Engineering, Srinakharinwirot University, E-mail: ninlawan@g.swu.ac.th

ผ่านการรับรองคุณภาพจากศูนย์ดัชนีการอ้างอิงวารสารไทย (TCI.) อยู่ในกลุ่ม 2 สาขามนุษยศาสตร์และสังคมศาสตร์

การตัดสินใจเลือกประเภทของรถบรรทุกตู้คอนเทนเนอร์ กรณีศึกษาบริษัทตัวแทนการขนส่งทางเรือระหว่างประเทศ

อาทิตยา น้อยเสนา[1]* และ นิลวรรณ ชุ่มฤทธิ์[2]

บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาความเป็นไปได้ในการใช้รถบรรทุกตู้คอนเทนเนอร์แบบพลังงานไฟฟ้าเป็นตัวช่วยในการตัดสินใจใช้รถบรรทุกแบบใหม่ให้กับบริษัทกรณีศึกษาที่เป็นตัวแทนการขนส่งทางเรือระหว่างประเทศ ปัจจุบันทางบริษัทมีรถบรรทุกแบบใช้น้ำมันเชื้อเพลิงและรถบรรทุกแบบใช้ก๊าซธรรมชาติ เส้นทางที่นำมาศึกษาคือท่าเรือลาดกระบังไปยังท่าเรือแหลมฉบัง เป็นการวิจัยเชิงปริมาณและเชิงคุณภาพ (วิธีการวิจัยแบบผสม) และเลือกกลุ่มตัวอย่างแบบเจาะจงจากผู้เชี่ยวชาญในบริษัทที่มีประสบการณ์ 10 ปีขึ้นไปจำนวน 5 ท่าน ด้วยการสัมภาษณ์แบบมีโครงสร้าง การดำเนินงานวิจัยเริ่มด้วยการรวบรวมข้อมูลของรถบรรทุกทั้งสองแบบและรถบรรทุกแบบใช้พลังงานไฟฟ้าเพื่อนำมาเปรียบเทียบต้นทุนและปริมาณการปล่อยก๊าซเรือนกระจกในอากาศ พบว่ารถบรรทุกแบบใช้น้ำมันเชื้อเพลิงมีต้นทุนต่อปี 8,225,858 บาท และปริมาณการปล่อยก๊าซเรือนกระจกในอากาศต่อปี 723,751 kg CO2 รถบรรทุกแบบใช้ก๊าซธรรมชาติมีต้นทุนต่อปี 5,289,363 บาท และปริมาณการปล่อยก๊าซเรือนกระจกในอากาศต่อปี 592,587 kg CO2 และรถบรรทุกแบบใช้พลังงานไฟฟ้ามีต้นทุนต่อปี 3,183,088 บาท และปริมาณการปล่อยก๊าซเรือนกระจกในอากาศต่อปี 288,580 kg CO2 จากนั้นศึกษาความเป็นไปได้ของการใช้รถบรรทุกแบบพลังงานไฟฟ้าและวิเคราะห์ข้อมูลของระยะเวลาคืนทุน อัตราผลตอบแทนภายใน และมูลค่าปัจจุบันสุทธิ ผลการศึกษาพบว่าความคุ้มทุนของรถบรรทุกแบบพลังงานไฟฟ้า ระยะเวลาคืนทุนอยู่ที่ 3 ปี 1 เดือน มูลค่าปัจจุบันสุทธิอยู่ที่ 6,392,239 บาท และอัตราผลตอบแทนภายในอยู่ที่ 18.52% การใช้รถบรรทุกแบบพลังงานไฟฟ้าให้ผลตอบแทนในอนาคตเป็นบวกซึ่งทำให้เกิดความคุ้มค่าในการลงทุน และได้เสนอเป็นทางเลือกในการตัดสินใจให้กับทางบริษัทกรณีศึกษาต่อไป

คำสำคัญ: รถบรรทุกตู้คอนเทนเนอร์, รถบรรทุกพลังงานไฟฟ้า, ตัวแทนขนส่งทางเรือ, การปล่อยก๊าซเรือนกระจก

ประเภทบทความ: บทความวิจัย

*ผู้รับผิดชอบงานหลัก

[1]บัณฑิตหลักสูตรวิศวกรรมศาสตรบัณฑิต สาขาวิศวกรรมโลจิสติกส์ คณะวิศวกรรมศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ, อีเมล: atidtaya.noisena@outlook.com

[2]อาจารย์ภาควิชาวิศวกรรมอุตสาหการ คณะวิศวกรรมศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ, อีเมล: ninlawan@g.swu.ac.th

ผ่านการรับรองคุณภาพจากศูนย์ดัชนีการอ้างอิงวารสารไทย (TCI.) อยู่ในกลุ่ม 2 สาขามนุษยศาสตร์และสังคมศาสตร์

1. Introduction

Reducing greenhouse gas emissions from the transportation sector can be approached through various strategies. For instance, using environmentally friendly alternative energies such as electric vehicles (EVs) and implementing eco-friendly logistics management practices are key avenues. In Thailand, there is an increasing adoption of EVs in the transportation sector to curb carbon dioxide emissions from exhaust pipes, thereby reducing the amount of greenhouse gases that contribute to atmospheric degradation. This not only helps mitigate air pollution but also leverages electricity as a relatively cost-effective energy source compared to traditional fuels, thereby potentially reducing transportation costs. Green Transportation innovation is one approach supporting Thailand's goal to reduce greenhouse gas emissions by 40% by 2030. This target requires the energy and transportation sectors to collectively reduce emissions by 266 million tons from current levels (ONEP, 2023).

The case study is an international vessel agent who served as the operator at the port of departure and port of destination on behalf of the ship owner. To facilitate domestic transportation, containers are loaded onto trucks and there are two categories of trucks that the company currently operates: gasoline-powered and natural gas-powered trucks. One possible strategy for enhancing competitiveness within the transportation industry, this company decides to study the feasibility of investing in electric-powered container vehicles to reduce costs and air pollution to comply with the Green Port policy. As a result, the objective of this research is to compare the use of each type of container truck and examine the feasibility of adopting electric-powered container trucks.

2. Research's objective

1. To study costs and greenhouse gas (GHG) emission of gasoline-powered truck, natural gas-powered truck, and electric-powered truck.

2. To examine the viability of utilizing electric-powered trucks for an international vessel agent company.

3. Conceptual framework

Data of a case study company are gathered and compared on costs and greenhouse gas emissions of gasoline-powered, natural gas-powered and electric-powered container trucks. Then the feasibility study of employing electric-powered container trucks was evaluated by those involved in transportation activities of the company and was measured with economic indicators: Payback Period (PB), Internal Rate of Return (IRR), and Net Present Value (NPV). Conceptual framework is presented in Figure 2. The research results will be used as a guideline for deciding on changing the type of container truck in the future.

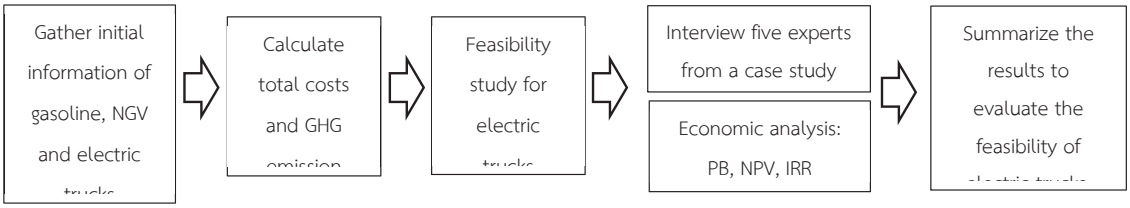

Figure 1 Conceptual framework

4. Literature review

Transportation feasibility studies involve a variety of research categories, including financial worthiness and technical investment studies. Namsri (2023) studied the feasibility of investment in trucks by analyzing payback period (PB), internal rate of return (IRR), net present value (NPV) and benefit-cost ratio (BCR). Schettino et al. (2018) conducted an economic and financial feasibility analysis regarding the distance and productivity of light and medium-sized vehicles. Kinjal et al. (2021) assessed greenhouse gas (GHG) emission and implement strategies for building green transportation systems. To determine the total quantity of GHG emissions generated throughout the entire life cycle of a road project, Albuquerque et al. (2020 employed a life-cycle approach. Saifuddin et al. (2019) conducted a comparison of GHG emission levels and put up several strategies for reduction, including opting for smaller vehicles over larger ones, utilizing alternative fuels, and adopting electric vehicles. Vijayagopal and Rousseau (2021) and Burke et al. (2022) assessed multiple factors and analyzed the total ownership cost (TCO) for electric trucks in relation to battery and fuel expenses.

5. Methodology

5.1 Research method

In this research, we employ a mixed methods approach, combining quantitative research and qualitative research.

5.2 Population and sample

This research involves 5 informants selected purposively from a total of 30 employees within the company engaged in international maritime transportation activities. All informants have a minimum of 10 years of work experience.

5.3 Research instruments

Examine and compare the costs and greenhouse gas (GHG) emissions of gasoline-powered trucks, natural gas-powered trucks, and electric-powered trucks. Subsequently, conduct a structured interview divided into four aspects: 1) Environmental 2) Technical 3) Economic and 4) Social. Evaluate the quality of the questionnaire by assessing its content validity through consultations with experts. Perform an economic analysis to assess the adoption of electric-powered container trucks, focusing on long-term investments and anticipated future returns using three metrics: Payback Period, Net Present Value, and Internal Rate of Return.

5.4 Data collection

Primary data is collected from statistical information obtained through operational practices in the current workflow, specifically related to expenses associated with trucks transporting goods from Ladkrabang Port to Laem Chabang Port.

Secondary data is compiled from publicly available sources, such as the Environment Energy Policy and Planning Office (EPPO) website concerning fuel prices, and the Thailand Greenhouse Gas Management Organization (TGO) website regarding greenhouse gas emissions coefficients (emission factor).

5.5 Data analysis

The factors utilized in analyzing and comparing gasoline-powered, natural gas-powered, and electric-powered container trucks include

Costs: fuel cost, maintenance, tires, tax and insurance, depreciation

Greenhouse gas emissions: fuel consumption rates, emissions coefficients

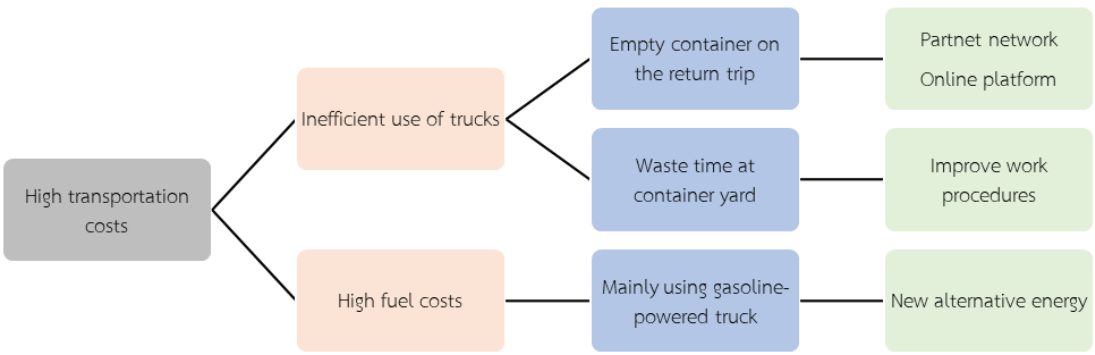

Figure 2 Why–why analysis of high transportation costs

6. Results

The research began with finding causes of high transportation costs using why-why analysis. Figure 2 shows two main reasons for the inefficient use of trucks and high fuel costs. Possible solutions can be setting partner networks or utilizing an online platform to connect between transporters and product owners, improving operational procedures at container yards and offering new alternative energy for container trucks. After proposing solutions to the senior executives, the feasible one is the new truck with other alternative energy due to green port policies.

6.1. Cost and Greenhouse Gas Emissions Analysis

6.1.1 Gasoline-powered Truck

Cost Analysis:

• cost of 10-wheel truck, model HINO FM1AK1B-SHT(T/S), 344 horsepower 2,875,000 baht

• 40-foot container semi-trailer 432,000 baht

• general maintenance cost 5,000 baht per month

• cost of container truck tires, model

BRIDGESTONE 11R22.5 R157 each tire is 9,150 baht. The truck uses 10 tires for an amount equal to 91,500 baht per year

- vehicle tax and compulsory motor insurance 7,810 baht per year
- truck insurance is 27,620 baht per year
- depreciation expense was calculated from the salvage value of 50 percent of the vehicle price (Namsri, 2023) 2,875,000 x 0.5 = 1,437,500-baht, lifetime of 10 years, calculated using the Straight-Line method, so annual depreciation is equal to (2,875,000–1,437,500) /10 = 143,750 baht
- fuel cost for one trip, round trip distance 240 kilometers, average fuel consumption is 150 liters per one trip, number of transport 6 trips, round trip distance 1,440 kilometers, total distance is 421,920 kilometers per year. Total fuel costs are 7,895,178 baht per year (diesel price (EPPO, 2024)

Summary of fixed costs of 330,680 baht per year, fuel costs of 7,895,178 baht per year, therefore total costs equal to 8,225,858 baht per year.

Greenhouse Gas Emissions Analysis: The amount of fuel used is 150 liters per trip, running a total of 6 trips per day. In 2023, there are 293 working days. The greenhouse gas emissions coefficient (Emission Factor) is equal to 2.7446 kg CO2eq per liter (TGO, 2023). Annual greenhouse gas emissions equal to 150 x 6 x 293 x 2.7446 = 723,751 kg CO2 per year.

6.1.2 Natural Gas-powered Truck

Cost Analysis:

- cost of 10-wheel truck, model HINO FM1AK1B-SHT(T/S), 344 horsepower 2,875,000 baht
- natural gas installation costs 650,000 baht
- 40-foot container semi-trailer 432,000 baht
- general maintenance costs 7,000 baht per month
- cost of container truck tires 91,500 baht per year.
- vehicle tax and compulsory motor insurance 7,810 baht per year
- truck insurance is 27,620 baht per year
- depreciation expense was calculated from the salvage value of 50 percent of the vehicle price 2,875,000 + 650,000) x 0.5 = 1,762,500-baht, lifetime of 10 years, so annual depreciation is equal to (3,525,000–1,762,500)/10 = 176,250 baht
- average natural gas consumption is 150 kilograms per one trip, number of transport 6 trips, round trip distance 1,440 kilometers, total distance is 421,920 kilometers per year. Total cost of natural gas is 4,902,183 baht per year (natural gas price is 18.59 baht per kilogram as of December 2023) (EPPO, 2024)

Summary of fixed costs of 387,180 baht per year, natural gas cost 4,902,183 baht per year, therefore total costs equal to 5,289,363 baht per year.

Greenhouse Gas Emissions Analysis: The amount of natural gas used is 150 liters per trip, operating a total of 6 trips per day. In 2023, there are 293 working days. The greenhouse

gas emissions coefficient (Emission Factor) is equal to 2.2472 kg CO2eq per liter (TGO, 2023). Annual greenhouse gas emissions equal to 150 x 6 x 293 x 2.2472 = 592,587 kg CO2 per year.

6.1.3 Electric-powered Truck

Cost Analysis:

• CP Foton's car model Auman EST iBlue 280, large tractor truck with battery capacity of 282 kilowatts (Autospinn, 2023) 5,990,000 baht

• semi-trailer carrying a 40-foot container, 432,000 baht

• general maintenance costs 2,500 baht per month

• cost of container truck tires 91,500 baht per year.

• vehicle tax and compulsory motor insurance 7,810 baht per year

• truck insurance is 27,620 baht per year

• depreciation expense was calculated from the salvage value of 50 percent of the vehicle price (5,990,000) x 0.5 = 2,995,000-baht, lifetime of 10 years, so annual depreciation is equal to (5,990,000–2,995,000)/10 = 299,500 baht

• cost of charging battery is in units of 5.5 baht per kilowatt (off peak price as of December 2023) (EPPO, 2024). The charging time is 1 hour and can run 200-300 kilometers. The total distance is 421,920 kilometers per year. The battery charging cost is 282*5.5*6*293 = 2,726,658 baht per year

Summary of fixed costs of 456,430 baht per year, battery charging cost is 2,726,658 baht per year, therefore total costs equal to 3,183,088 baht per year.

Greenhouse Gas Emissions Analysis: The amount of electricity used is 282 kilowatts per trip. In 1 day, truck operation data is equal to 6 trips. In 2023, there are 293 working days. The greenhouse gas emissions coefficient (Emission Factor) is equal to 0.5821 kg CO2eq per kWh (TGO, 2023). Annual greenhouse gas emissions data is 282 x 6 x 293 x 0.5821 = 288,580 kg CO2 per year.

Comparison of annual costs and greenhouse gas emissions were shown in Table 1. Therefore, with concern concerning both economic and environmental results in Figure 3, the electric-powered trucks are the suitable option to invest in the future for this company. The next stage is to examine the viability from the perspectives of professional judgement and financial analysis.

6.2 Feasibility Analysis of Electric-powered Truck

A feasibility assessment is conducted by a structured interview with five individuals who are directly involved in the transportation unit. Those are a port terminal operation manager with 15 years of experience, an equipment maintenance manager with 10 years of experience, a transportation dispatcher with 15 years of experience, a customer service with 15 years of experience, and an accounting manager with 10 years of experience. The four criteria for consideration are as follows.

Table 1 Comparative results of the three types of trucks

Items	Gasoline-powered	Natural Gas-powered	Electric-powered
A Semi-trailer Truck Price	3,307,000 baht	3,957,000 baht	6,422,000 baht
Annual Depreciation Cost	143,750 baht	176,250 baht	299,500 baht
Annual Maintenance Cost	60,000 baht	84,000 baht	30,000 baht
Annual Fuel Cost	7,895,178 baht	4,902,183 baht	2,726,658 baht
Annual GHG Emission	723,751 kg CO_2	592,587 kg CO_2	288,580 kg CO_2

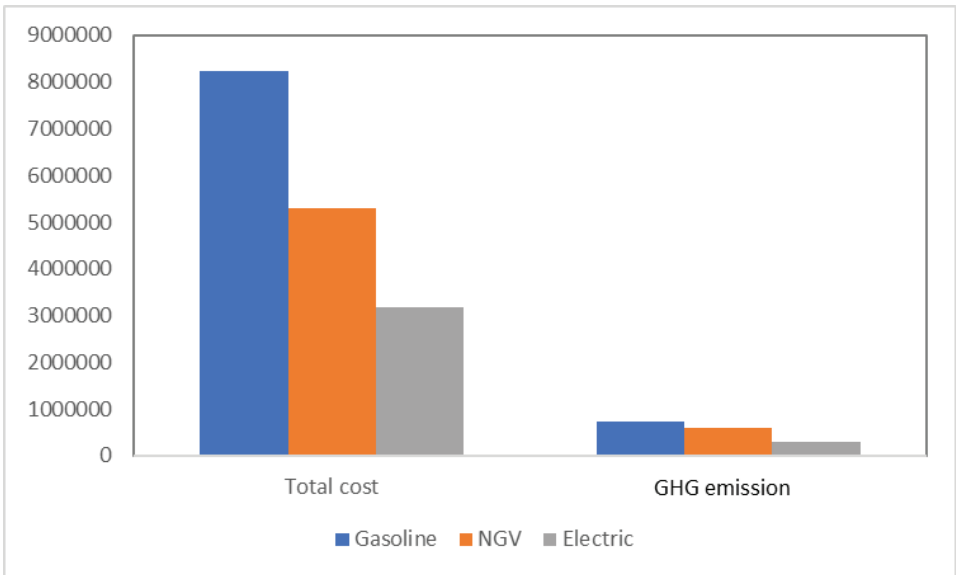

Figure 3 Comparison in Total cost and GHG emission of three types of trucks

1. Environmental criteria include the reduction of carbon dioxide emissions and environmental pollution

2. Technical criteria cover electrical safety, battery efficiency, and the reliability of electric vehicles

3. Economic criteria consist of initial investment costs, annual expenses, taxes, energy costs and useful life

4. Social criteria concern the advantages to society and social approval

In interviews, experts are asked to assess the importance of each dimension. The evaluation findings indicate that the economic criteria are the most probable choice, with an average score of 4.32. Meanwhile, the environmental criteria, technical criteria, and social criteria demonstrate a high likelihood, with average scores of 4.20, 4.13, and 4.10, respectively. It can be seen from the case study's evaluation results that electric-powered trucks are highly practical.

The economics of employing electric-powered container trucks are being explored in terms of long-term investments and expected future returns. Three metrics are utilized to compute the returns and aid this company in making investment decisions as outlined below.

1. Payback Period (PB) is the length of time an investment reaches a breakeven point. The initial investment of the electric-powered truck is 6,422,000 baht. Calculate cash outflows from maintenance costs, depreciation expenses, tire costs, tax and insurance, battery charging costs and average employee salary is 3,423,188 baht per year. The average annual cash inflow of 5,500,000 baht according to the interview, thus the average annual net return is 5,500,000 – 3,423,188 = 2,076,812 baht.

PB = Initial investment÷Annual net return (1)

= 6,422,000 ÷ 2,076,812 = 3.092

Therefore, payback period is 3.092 years (3 years 1 month).

2. Net Present Value (NPV) is an economic measurement that computes the change between the current worth of incoming and outgoing cash flows over a defined timeframe.

$$NPV = CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \cdots + \frac{CF_n}{(1+r)^n} \quad (2)$$

Where CF_0 = initial investment, CF_t = net cash flow in year t, r = discount rate. In this research, the value of r is 10% (Ottovonschirach, 2023).

NPV = (–6,422,000) + 1,931,738 + 1,748,688 + 1,582,203 + 1,430,853 + 1,293,945 + 1,169,540 + 1,057,061 + 954,900 + 863,850 + 781,462 = 6,392,239 baht

It was found that the net present value was equal to 6,392,239 baht, with the net present value (NPV) being greater than 0, indicating that it approves the project concept and finds the investment worthwhile.

3. Internal Rate of Return (IRR) helps assess the profitability of an investment by indicating the discount rate that renders the present value of future cash flows equivalent to the initial capital outlay, thereby making the NPV zero.

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+IRR)^t} = 0 \quad (3)$$

NPV = (–6,422,000) + 1,629,836 + 1,244,812 + 950,275 + 725,067 + 553,216 + 421,880 + 321,714 + 245,202 + 187,154 + 142,845 = 0

According to Microsoft Excel's calculations using the IRR function, the internal rate of return (IRR) that equates the net present value (NPV) to zero is determined to be 18.52%. This IRR value specifies that the predictable earnings are higher than the discount rate of 10%, suggesting a potentially profitable investment opportunity. Thus, it can be inferred that the investment is worthwhile and evaluate the possible investments' 18.52% return.

7. Discussion and conclusions

The case study offers container shipping services on an international level via sea, in addition to truck-based land transportation. This study will examine the transportation of

trucks between Lat Krabang Port and Laem Chabang Port, covering a total distance of 240 kilometers for a round trip. Upon analyzing the statistics of all three categories of trucks, it is evident that gasoline-powered trucks exhibit the lowest capital investments, however they incur the largest fuel expenses and generate the highest levels of greenhouse gas emissions. An advantageous aspect is the abundance of petrol stations and the convenient accessibility of replacement components. An inherent drawback arises when the engine is antiquated, resulting in elevated fuel consumption. The installation of NGV gas storage tanks leads to a greater initial expenditure for natural gas-powered trucks. The benefit lies in the fact that the cost of natural gas is one time cheaper than the cost of diesel (as of December 2023). The drawback lies in the requirement for frequent maintenance, leading to increased expenses. Electric-powered trucks have a somewhat high initial cost, but their battery charging expenses are lower compared to other fuel expenditures. Additionally, they produce the lowest amount of greenhouse gas emissions.

The feasibility study of electric-powered trucks is deemed extremely feasible based on the evaluation conducted by senior executives of this company. The economic analysis indicates favorable outcomes, including a payback period of 3 years and 1 month, a net present value of 6,392,239 baht, and an internal rate of return of 18.52%. These figures demonstrate that the investment is worthwhile and attractive for the future.

8. Recommendation

8.1 Recommendations for implementing

This research analyzes cost-related transportation data and calculates greenhouse gas emissions for the case study company, aiming to provide guidance for managerial decision-making regarding operational changes aligned with government policies aimed at reducing national greenhouse gas emissions.

8.2 Future research direction

Energy trends, environmental and social impacts, and total cost of ownership (TCO) analyses for multiple models of electric-powered trucks should be considered for future research.

References

Albuquerque, F. D. B., Maraqa, M. A., Chowdhury, R., Mauga, T., & Alzard, M. (2020). *Greenhouse gas emissions associated with road transport projects: Current status, benchmarking, and assessment tools*. *Transportation Research Procedia, 48*, 2018–2030.

Burke, A., Miller, M., Sinha, A., & Fulton, L. (2022). *Evaluation of the Economics of Battery-electric and Fuel Cell Trucks and Buses: Methods, Issues, and Results*. UC Davis Research Reports.

ผ่านการรับรองคุณภาพจากศูนย์ดัชนีการอ้างอิงวารสารไทย (TCI.) อยู่ในกลุ่ม 2 สาขามนุษยศาสตร์และสังคมศาสตร์

CP FOTON electric truck. (2023). Retrieved 20 October 2023, From: https://www.autospinn.com/2021/11/cp-foton-truck-ev-84882.

Energy policy and planning office (EPPO), Ministry of Energy, Retrieved 5 January 2024 From: https://www.eppo.go.th/index.php/th/.

Kinjal, J.S., Shu, Y.P., Ingyu, L., Hyunook, K., Zhaoyang, Y., Jian, M.Z., & Pen, C.C. (2021). Green Transportation for Sustainability: Review of Current Barrier, Strategies, and Innovative Technologies. *Journal of Cleaner Production*, *326*.

Namsri, S. (2020). *A Feasibility Study of Investment in Purchasing Truck Instead of Hiring Out-Sourcing: A Case Study of Freight Forwarder Company*. Thesis of the Degree of Master of Science in Logistics and Supply Chain Management. Chon Buri, Burapha University.

Saifuddin, M., Diana, M.A., & Karim, M.R. (2019). Addressing GHG Emissions from Land Transport in a Developing Country. *IOP Conf. Series: Earth and Environmental Science*, *373*, 1–12.

Schettino, S., Minette, L.J., Schettino, C.F., & Reboleto, I. D. (2018). Feasibility Analysis of the Use of Light and Medium Trucks in Timber Transport in Rural Properties. *Revista Arvore*, *42*(6), 1–9.

Thailand greenhouse gas management organization (TGO), Ministry of Natural Resources and Environment, Retrieved 25 November 2023, From: http://conference.tgo.or.th/download/tgo_or_th/Article/2018/GHG_LPA.pdf.

Thailand greenhouse gas management organization (TGO), Ministry of Natural Resources and Environment. (2019). *Emission Factor*. Retrieved 25 November 2023, From: http://localcfo.tgo.or.th/uploads/docs/20200311130041.pdf.

The Office of Natural Resources and Environmental Policy and Planning (ONEP), Ministry of Natural Resources and Environment. (2023). *As of June 1, 2023, how far has Thailand progressed with its plan to reduce greenhouse gas emissions?*. Retrieved 25 November 2023, From: https://www.onep.go.th/1-June-2023-Plan to reduce emissions/.

Vijayagopal, R., & Rousseau, A. (2021). Electric Truck Economic Feasibility Analysis. *World Electric Vehicle Journal*, *12*(2), 1–10.

What is an appropriate discount rate for NPV?. Retrieved 30 November 2023, From: https://ottovonschirach.com/what-is-an-appropriate-discount-rate-for-npv/.