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Legal Transplantation and Funding for Public Electric Vehicle Charging Stations in Achieving Zero Emissions

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Abstract: In order to support the use of electric vehicles as a step towards reducing greenhouse gas emissions, adequate and accessible Public Electric Vehicle Charging Stations (Stasiun Pengisian Kendaraan Listrik Umum/SPKLU in Bahasa Indonesia) are required. However, the public still faces difficulties in finding SPKLU. This is due to the absence of specific regulations determining the mandatory distance for the construction of SPKLU and the lack of funding for their development. The research method used is normative juridical, through legislative, conceptual, and comparative approaches. The study utilized secondary data with primary and secondary legal materials. The authors found that the Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 on the Provision of Electric Vehicle Charging Infrastructure does not specifically regulate the distance for SPKLU establishment, necessitating legal transplantation from European Union regulations. Furthermore, the issue of insufficient funding can be addressed through a green bond issuance scheme involving a consortium of State-Owned Enterprises and Private Enterprises.

Keyword: Electric Vehicle, Legal Transplantation, Green Bond.

INTRODUCTION

Electrification in the transportation sector plays a crucial role in mitigating environmental damage, such as global warming, due to the widespread use of fossil fuels, particularly in the industrial and transportation sectors (Acharya, 2020). Greenhouse gases (GHGs) in the transportation sector are largely produced by motor vehicles, such as trucks, passenger cars, and motorcycles. In 2018, GHG emissions from the energy sector reached 595 million tons of CO₂ equivalent, with 28% of that total coming from the transportation sector (Nur, 2021).

High levels of GHGs also impact public health. To fulfill the public's right to a good and healthy environment as stipulated in Article 28H of the 1945 Constitution, and to adhere to Kranenburg's welfare state theory, where the state is obliged to ensure the welfare of its citizens, a transition from fossil fuel-based vehicles to electric vehicles is necessary. In this context, the state is tasked with providing adequate and accessible Public Electric Vehicle

Charging Stations (Stasiun Pengisian Kendaraan Listrik Umum/SPKLU in Bahasa Indonesia).

The establishment of an electric vehicle ecosystem, as outlined in the seventh point of the National Medium-Term Development Plan (RPJMN) 2020-2024, has not yet been achieved. Research by the Institute for Essential Services Reform (IESR) shows that 71.2% of the public struggles to find SPKLU, thus failing to meet Article 33, paragraph (2) of the 1945 Constitution (Santika, 2023). The sectors controlled by the state, as stated in Article 2, paragraph 2 of Law No. 30 of 2009 on Electricity, have not yet prospered the people. The source of the problem stems from the Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 on the Provision of Electric Vehicle Charging Infrastructure.

Another issue lies in the high funding risk faced by PT PLN in accelerating the electric vehicle sector. This is evident in the Roadmap for the Development of Electric Vehicle Infrastructure by PLN 2020-2024 (Asaad, 2020). As a State-Owned Enterprise (SOE), PT PLN, in carrying out special assignments, can collaborate with other state-owned enterprises and/or private enterprises in providing SPKLU infrastructure. Other enterprises can assist PLN in providing infrastructure that meets the specifications of electric vehicles from electric car manufacturing enterprises, as well as create opportunities for PT PLN to secure funding.

One alternative funding solution for companies implementing sustainable economies is outlined in Article 42, paragraph 1 of Law No. 32 of 2009 on Environmental Protection and Management, which pertains to the development of environmental economic instruments. One such instrument is the use of green bond, as regulated in the Financial Services Authority Regulation No. 60/POJK.04/2017 on the Issuance and Requirements of Environmentally Friendly Debt Securities (Green Bond). A consortium consisting of PT PLN and private enterprises engaged in the provision of electric vehicle charging infrastructure, in collaboration with foreign companies, can issue green bond as a funding instrument.

Research on the provision of SPKLU has been conducted by Iva Zie Priscillia and Dedi Kusuma Habibie (Priscilla & Habibie, 2023). Their research focused on describing the role of PLN as well as the strengths and weaknesses of PLN's main unit in Riau and the Riau Islands. The similarity of this research lies in discussing the role of PLN in providing public electric vehicle charging stations. The second study was conducted by Asrul Ibrahim Nur and Andrian Dwi Kurniawan (Nur & Kurniawan, 2021). The similarity of this research is in discussing the development of the electric vehicle industry ecosystem. This study also compares regulations with those in the European Union.

The difference in this study lies in discussing the role of PLN as a provider of SPKLU using legal analysis. This study does not address the strengths and weaknesses of PT PLN's role. The state of the art in this research is the examination of the expansion of SPKLU construction by conducting legal transplantation from the European Union and creating a green bond funding scheme for the massive development of SPKLU, involving collaboration between PT PLN and private enterprises. Moreover, this research compares total area between European and Indonesia and road length between Poland and Indonesia. Based on the background provided, the authors present the following research questions:

1. How can legal transplantation optimize Public Electric Vehicle Charging Stations to reach the public and achieve net zero emissions?
2. What is the green bond funding scheme for Public Electric Vehicle Charging Stations to reach the public and achieve net zero emissions?

METHOD

The research method used in this study is normative juridical. The research approach includes a legislative approach, examining regulations related to the provision of SPKLU and green bond. A conceptual approach is employed to describe the green bond scheme as a funding method for SPKLU projects. A comparative approach is used to compare the

European Union's Regulation on the deployment of Alternative Fuels Infrastructure Regulation (AFIR), the number of Public Electric Vehicle Charging Stations in Poland and Indonesia, the area and road length in Poland and Indonesia, and green bond projects in Georgia. The theories used in this research include Alan Watson's legal transplantation autonomy theory, which posits that law does not need to evolve from societal development but can be adapted for use in other countries when needed, and the modernization theory by Roy Harrod and Evsey Domar, which links economic growth with investment.

The data used in this research are secondary data, utilizing primary legal materials such as Law No. 19 of 2003 on State-Owned Enterprises, Law No. 30 of 2009 on Electricity, Presidential Regulation No. 107 of 2015 on the Acceleration of the Implementation of Infrastructure and Facilities for High-Speed Rail between Jakarta and Bandung, Presidential Regulation No. 55 of 2019 on the Acceleration of the Battery Electric Vehicle Program, Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 on the Provision of Electric Vehicle Charging Infrastructure, Financial Services Authority Regulation No. 60/POJK.04/2017 on the Issuance and Requirements of Environmentally Friendly Debt Securities (Green Bond), and the Ministry of Public Works and Public Housing Decree No. 430/KPTS/M/2022 on the Designation of Road Sections in the Primary Road Network According to Their Function as Primary Arterial Roads (JAP) and Primary Collector Roads-1 (JKP-1). The secondary legal materials include journal articles, books, and internet articles that discuss issues related to the provision of SPKLU.

RESULTS AND DISCUSSION

Legal Transplantation of Public Electric Vehicle Charging Stations

The construction of SPKLU is classified as a type of electricity supply business for public interest, as stipulated in Article 10, paragraph (1) of Law No. 30 of 2009 on Electricity. According to Article 23, paragraph (1) of Presidential Regulation No. 55 of 2019 on the Acceleration of the Battery Electric Vehicle Program, the provision of battery electric vehicle charging infrastructure can be carried out by State-Owned Enterprises (SOEs) in the energy sector or by other enterprises. In this context, private enterprises can assist the government in the construction of SPKLU to accelerate its development across Indonesia. Enterprises are required to possess one of the two licenses mentioned in Article 11, paragraph (1) of the Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 on the Provision of Electric Vehicle Charging Infrastructure: an Integrated Electricity Supply Business License (Izin Usaha Penyediaan Tenaga Listrik/IUPTLU in Bahasa Indonesia) or an Electricity Supply Business License for Sales (IUPTLU Penjualan).

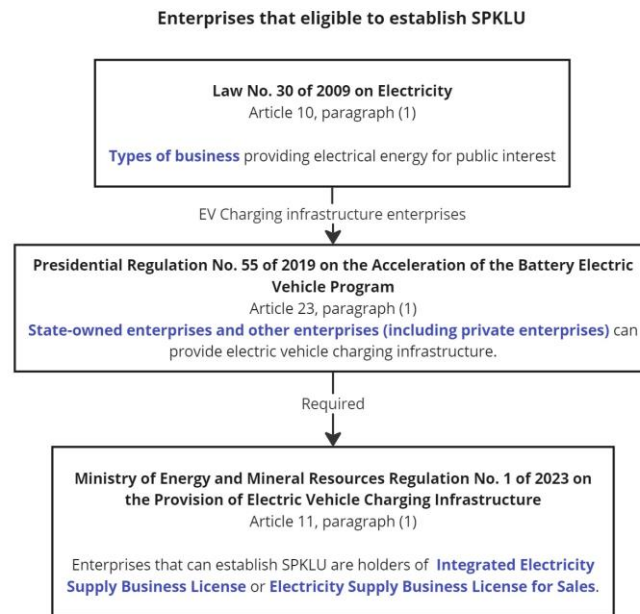


Fig. 1. Enterprises that eligible to establish SPKLU

The role of PLN in providing SPKLU is based on Article 23, paragraph (2) of Presidential Regulation No. 55 of 2019 on the Acceleration of the Battery Electric Vehicle Program. PT PLN (Persero) was initially assigned the task of implementing the provision of battery electric vehicle charging infrastructure. This is further stipulated in Article 24, paragraph (1) of the Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 on the Provision of Electric Vehicle Charging Infrastructure, which assigns PT PLN (Persero) the responsibility of providing charging infrastructure for battery electric vehicles. This assignment is in line with Article 66 of Law No. 19 of 2003 on State-Owned Enterprises, which states that SOEs can be given special assignments by the government to perform public utility functions (Paramita, 2023). In this context, PT PLN (Persero) is tasked with the construction of SPKLU as a step towards accelerating the adoption of electric vehicles.

Assignment of electric vehicle charging infrastructure provision to PT PLN

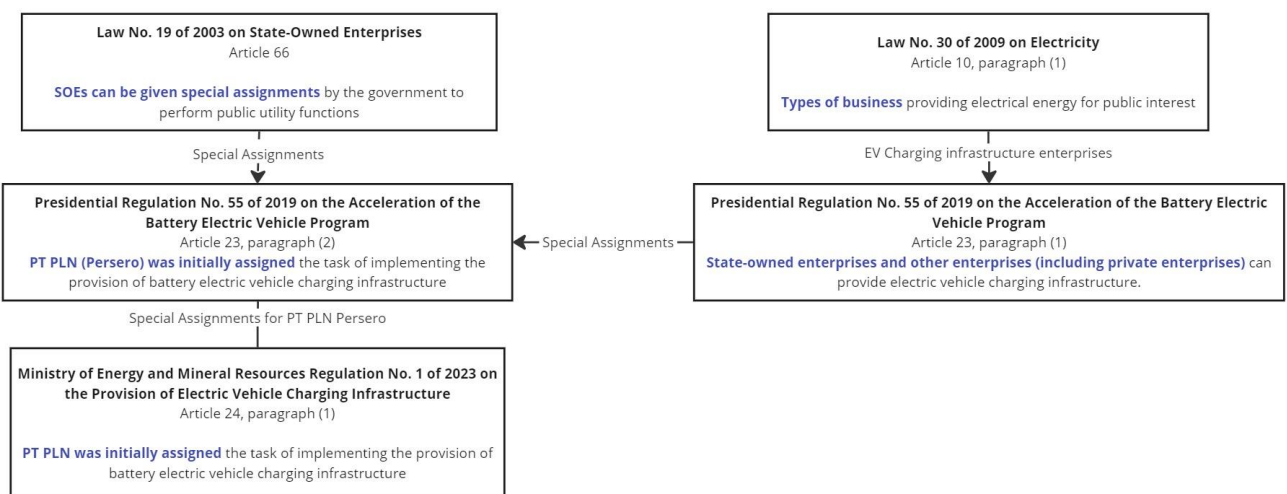


Fig. 2. Assignment of electric vehicle charging infrastructure provision to PT PLN

Through Article 4 of the Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 on the Provision of Electric Vehicle Charging Infrastructure, the government has mandated SPKLU enterprises to provide SPKLU at one or more locations according to the mapping specified in Appendix 2. However, this regulation does not provide specific information on the distance or kilometers at which SPKLU should be placed on each road. Appendix 2 of the Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 only states that SPKLU enterprises are required to build at least one unit of fast charging technology installed near arterial roads.

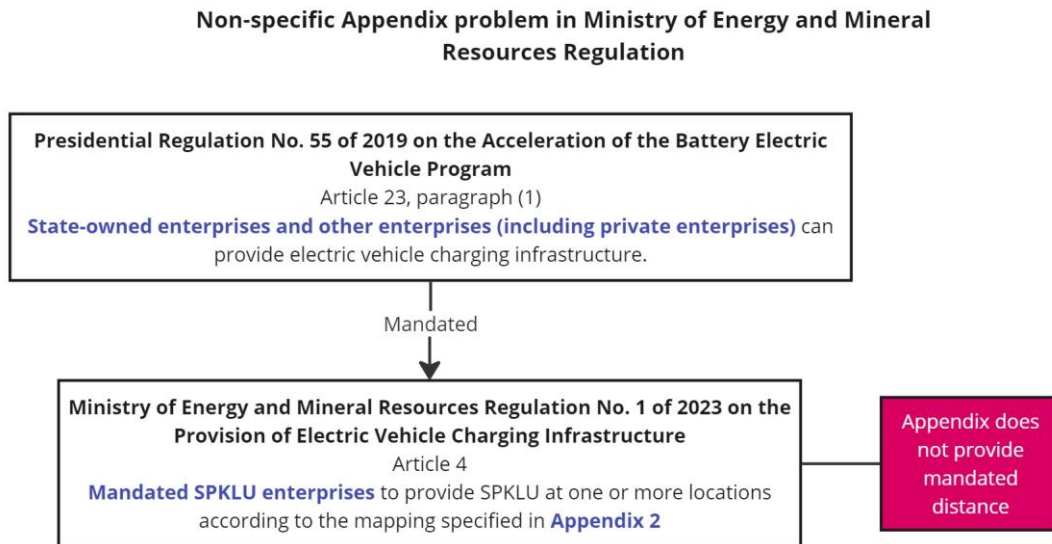


Fig. 3. Non-specific Appendix problem in Ministry of Energy and Mineral Resources Regulation

Referring to the European Union's Regulation on the Deployment of Alternative Fuels Infrastructure Regulation (AFIR), publicly accessible recharging pools for electric vehicle mapping is based on road kilometers (Council, 2023). EU countries mandate that publicly accessible recharging pools for electric vehicle be placed every 60 km on the Trans-European Transport Network (TEN-T) (Beedham, 2023). Regulating the placement of SPKLU by kilometer on each road can increase the number of SPKLU in various locations. The absence of such a regulation regarding the kilometer placement of SPKLU results in a legal gap that reduces legal utility.

The TEN-T (Roads) Network, according to Article 9 of Decision 661/2010/EU, consists of high-quality motorways and roads connecting important routes (Pettersson et al., 2020). In Indonesia, this can be compared to the National Roads. According to Article 26 of the Government Regulation on Roads, national roads consist of Primary Arterial Roads (JAP) that connect national activity centers; Primary Collector Roads (JKP-1) that connect provincial capitals; Toll Roads; and National Strategic Roads. National Roads are further divided into National Non-Toll Roads (JAP and JKP-1) and National Toll Roads (Toll Roads).

The total area of the 27 EU member countries reaches 4 million km² (Eurostat, 2024). Poland, as one of the EU member countries, has an area of 311,928 km² (Eurostat, 2024). In comparison, the land area of Indonesia is 1.9 million km² (BPS, 2021). Given Indonesia's larger area, the installation of SPKLU should be more extensive than in Poland, especially on National Roads.

The TEN-T road network in Poland spans 7,501 km (Mazur et al., 2024). In Indonesia, the length of National Non-Toll Roads is 47,017.27 km, consisting of 18,149.93 km of Primary Arterial Roads (JAP) and 28,867.34 km of Primary Collector Roads (JKP-1).

Additionally, the National Toll Roads in Indonesia measure 2,093 km (Bina Marga, 2023). Thus, the total length of National Roads in Indonesia is 49,110.27 km, which is significantly longer than the TEN-T road network in Poland. However, Poland has a higher number of SPKLU compared to Indonesia, with Poland having 2,460 SPKLU in 2022 (Pawlowski, 2023), whereas Indonesia had only 1,081 SPKLU owned by PLN or private entities operational in 2023 (PLN, 2023).

If we were to apply the European Union's policy of requiring SPKLU placement every 60 km in Indonesia, several provinces would exhibit disparities in SPKLU placement. One province that can be used as a reference is Lampung. To determine the length of Primary Arterial Roads and Primary Collector Roads in each province, we can refer to the Minister of Public Works and Public Housing Decree No. 430/KPTS/M/2022 on the Designation of Road Sections in the Primary Road Network According to Their Function as Primary Arterial Roads (JAP) and Primary Collector Roads-1 (JKP-1) (Ministerial Decree on JAP and JKP-1).

According to the appendix of the Ministerial Decree on JAP and JKP-1, Lampung has a total length of National Non-Toll Roads of 1,298.41 km, consisting of 819.23 km of JAP and 479.18 km of JKP-1. The longest JAP in Lampung is the Bengkunat - Sanggi segment, which is 64.11 km long. If the total length of JAP and JKP-1 in Lampung is divided by 60 km, there should be at least 14 SPKLU installed on JAP and 8 SPKLU on JKP-1.

However, according to the General Manager of PLN UID Lampung, out of the 20 SPKLU locations established, only 3 SPKLU are located outside toll roads, specifically at Jalan Soekarno Hatta Bandar Lampung in Els Coffee and Roastery, SPKLU at PLN UP3 Tanjung Karang Office, and SPKLU at PLN UID Lampung Office. The remaining 17 SPKLU are placed in toll road rest areas (Sukarta, 2024). Therefore, there is a need for legal transplantation from the EU's AFIR regulation to the Ministry of Energy and Mineral Resources Regulation No. 1/2023.

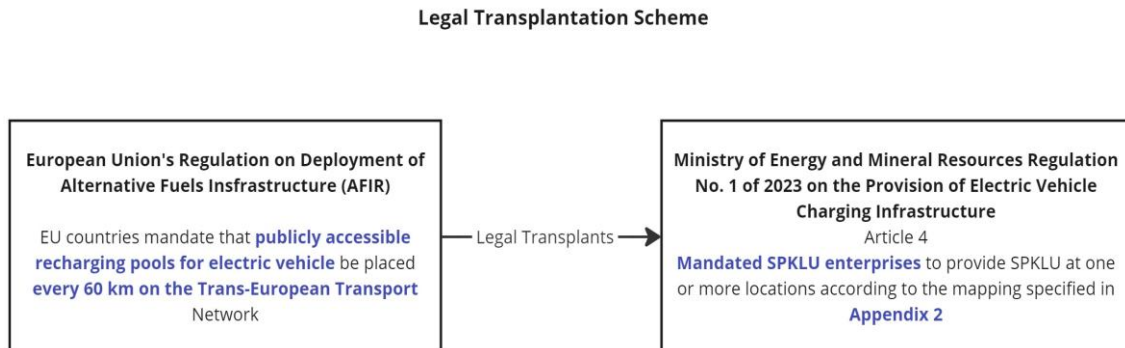


Fig. 4. Legal transplantation scheme

Alan Watson, a pioneer in the theory of legal transplantation, posits that legal change is a process of transplanting rules from a donor jurisdiction to a recipient jurisdiction (Dean, 2011). This legal transplantation will align with Mochtar Kusumaatmadja's concept of developmental law, which sees law as a tool to harmonize and drive changes in society based on social changes or social engineering, and the law should be adapted to contemporary societal needs. In this case, Indonesia can undertake legal transplantation following the EU's AFIR regulation to address the public's need for more SPKLU.

However, for a successful legal transplantation, like a human organ, the transplanted regulation must grow in its new environment and become part of the system. To increase the likelihood of successful transplantation of the AFIR regulation, additional funding for SPKLU construction through a Green Bond scheme is necessary. This is due to the high funding risks faced by PT PLN in accelerating the electric vehicle sector. This can be seen in

the Roadmap for the Development of Electric Vehicle Infrastructure by PLN 2020-2024 (Asaad, 2020).

Green Bond Scheme as a Funding Solution for Public Electric Vehicle Charging Station Projects

As a bridge between investors and companies or government agencies, the Capital Market facilitates the trading of long-term instruments (Asikin, 2020). One of the latest long-term instruments in the Indonesian capital market is environmentally-friendly debt securities (Green Bond). The issuance of green bond can only be done to finance or refinance Environmentally Friendly Business Activities (KUBL) (Cendikiawan & Firmansyah, 2024).

Green bond are governed by both national and international legal frameworks and standards. Nationally, green bond are regulated by the Financial Services Authority Regulation No. 60/POJK.04/2017 on the Issuance and Requirements of Environmentally Friendly Debt Securities. The Financial Services Authority (OJK) also plays a role in overseeing and promoting the development of green bond as a sustainable financial instrument in Indonesia. Internationally, the green bond principles from the International Capital Markets Association (ICMA) provide guidelines on the issuance process, use of proceeds, project evaluation and selection, management of proceeds, and reporting (Corporation, 2022). The primary source of green bond stems from the 2015 Paris Climate Agreement.

Compared to conventional financial instruments, green bond offer competitive interest rates compared to other types of bonds, a managed risk profile supported by government policies, an easy issuance process, and are suitable for funding costly green investments (Shah, 2024). However, the challenge with the green bond scheme is that investors who have invested in these securities find it difficult to trade them (lack of liquidity) because the green bond market is not yet large enough..

The funding of SPKLU projects qualifies as a project that can be funded by Green bond. This is stipulated in Article 4 of the Financial Services Authority Regulation (POJK) on green bond, which states that SPKLU projects are related to pollution prevention and control, and environmentally friendly transportation. In this context, State-Owned Enterprises (SOEs) and Private Enterprises (BUMS) involved in the provision of public electricity (PTLU) can issue green bond as a sustainable strategy to raise funds for SPKLU project.

The funding scheme through green bond can be executed by the government by assigning a consortium led by PT PLN (Persero). This consortium would consist of a combination of SOEs and BUMS operating in the field of electricity supply and electric motor vehicles. The formation of this consortium can be facilitated through a Presidential Regulation. Private companies involved in electricity supply include PT Adaro Power, PT Indika Energy Tbk, PT Arkora Hydro Tbk, United Tractors, and PT TBS Energi Utama (TOBA) (Anantama, 2023).

A precedent for the formation of such a consortium was set during the construction of the Jakarta-Bandung High-Speed Railway under Presidential Regulation No. 107 of 2015 on the Acceleration of the Implementation of Infrastructure and Facilities for High-Speed Rail between Jakarta and Bandung. This consortium consisted of four SOEs and was led by PT Wijaya Karya (Persero) Tbk, comprising PT Kereta Api Indonesia (Persero) Tbk, PT Jasa Marga (Persero) Tbk, and PT Perkebunan Nusantara VIII. This consortium was established as a joint venture company named PT Pilar Sinergi BUMN Indonesia, or PSBI for short (Harinowo et al., 2019).

There are several green bond funding schemes outlined in the ICMA Green Bond Principles, including the Standard Green Use of Proceeds Bond, Green Revenue Bond, Green Project Bond, and Green Securitised Bond (Corporation, 2022). The most suitable scheme for SPKLU projects, particularly those involving solar panels, is the Green Project Bond, which

is used to finance one or more specific green projects (Association, 2021). The consortium can issue green bond on the Indonesia Stock Exchange (IDX). The funds collected after issuance are allocated directly to the SPKLU project, allowing for cost savings and increased efficiency in fund usage. The consortium, led by PT PLN (Persero), is responsible for repaying the green bond's principal to the holders, including the agreed-upon lower interest rate.

This scheme also receives government support through incentives from the Financial Services Authority (OJK) as stated in Article 17 of OJK Regulation No. 60/POJK.04/2017 on the Issuance and Requirements of Environmentally Friendly Debt Securities, which includes the participation of issuers in human resource development programs and the awarding of the Sustainable Finance Award. Additionally, there are fiscal incentives, subsidies, and pro-green investment policies provided by the government (OJK, 2016). These facilities and incentives are intentionally offered to investors, making it a competitive advantage and enhancing the location's attractiveness for investment (Rahmah, 2020).

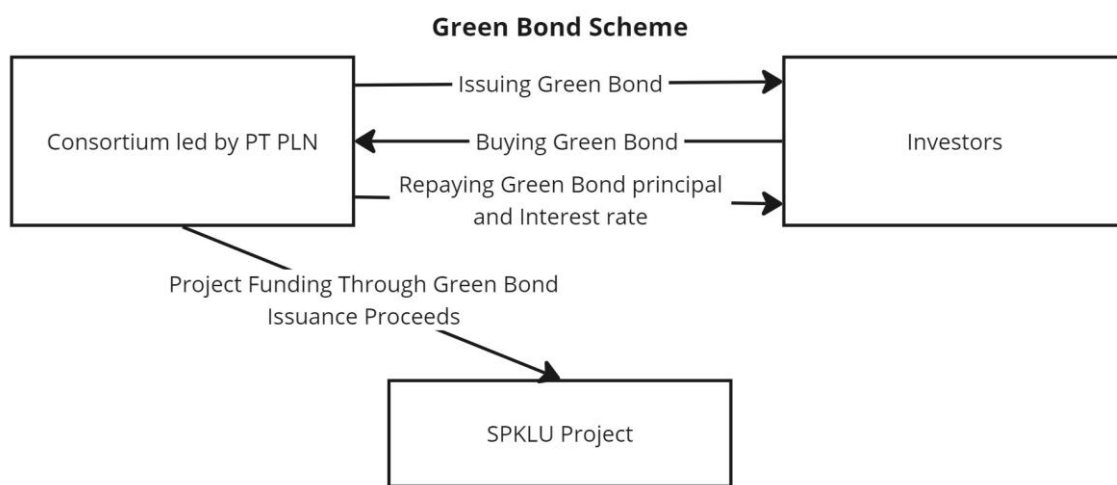


Fig. 5. Funding scheme through Green Bond

The use of Green Project Bonds using an integrated business model as an alternative for SPKLU infrastructure project funding has been implemented in Georgia. The Asian Development Bank (ADB) invested USD 7.6 million in Tegeta Motors Limited Liability Company (Tegeta), which will establish up to 70 public electric vehicle charging station (ADB, 2023). The green bond issued by Tegeta is listed on the Georgian Stock Exchange (ADB, 2023). The green bond project is named the “Tegeta Green Vehicle Bond Project”. The establishment of public electric vehicle charging station is on land owned by Tegeta Motors or other commercial entities, such as gas stations, parking lots, and public roads approved by Tegeta for the establishment of public electric vehicle charging station (ADB, 2023).

The key stakeholders in the Tegeta Green Vehicle Project include Tegeta's management and the government, which play roles in normative and strategic aspects; employees, who play roles in resource aspects; contractors and landowners/tenants with lawful ownership of the land, who play roles in network aspects; and electric vehicle consumers, who play roles in market and customer aspects (ADB, 2023). In addition to the stakeholders noted in the Tegeta Green Vehicle Project, the involvement of universities as network and resource contributors in the development of public electric vehicle charging station technology is necessary for the Green Project Bond SPKLU in Indonesia.

This aligns with Lawrence Lessig's Pathetic Dot Theory, which posits that individuals are simultaneously regulated by: Law, Norms, Market, and Architecture (Lessig, 1998). In this context, adequate regulatory provisions governing SPKLU are necessary to support the development of the electric vehicle ecosystem. The existence of regulations enhances market perceptions in Indonesia, making electric vehicles more attractive. Regarding architecture or technology, green bond funding is required to support the construction of SPKLU.

The implementation of the green bond scheme aligns with modernization theory by Roy Harrod and Evsey Domar, which links economic growth with investment (Bahri, 2023). In this case, economic growth in the electric vehicle industry will expand when investment is provided in the form of green bond funding. Proper funding will have a positive impact on the construction of SPKLU and contribute to economic development oriented toward green development.

CONCLUSION

In addressing the issue of public difficulty in locating Public Electric Vehicle Charging Stations (SPKLU), the government can adopt the AFIR regulation from the European Union. The adoption of AFIR can be implemented in Article 4 of the Ministry of Energy and Mineral Resources Regulation No. 1 of 2023 on the Provision of Electric Vehicle Charging Infrastructure by adding provisions regarding the distance requirements for establishing SPKLU. The regulation on the kilometer distance for SPKLU can be applied to Primary Arterial Roads and Primary Collector Roads, considering the Ministerial Decree on JAP and JKP-1. This adoption can be carried out in accordance with Alan Watson's theory of legal transplantation in applying regulations from one country to another.

In terms of obtaining additional capital for expanding SPKLU construction, PT PLN can form a consortium with private enterprises in the electric energy sector to raise capital through a green bond scheme. Subsequently, the consortium issues green bond on the Indonesia Stock Exchange. The capital raised from the issuance of green bond will be used for SPKLU projects. Thereafter, the consortium repays the green bond value to bondholders at a lower interest rate. The implemented scheme follows the issuance of green bond by Tegeta Motors in Georgia.

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