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Cash Waqf Scheme for Equitable Energy Transition in Indonesia's Transport

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Abstract

Indonesia has significant challenges in funding its energy transition, which requires around US$30 billion over the next eight years. One of the main obstacles is the low government budget and human resource competency in realizing renewable energy to achieve affordability amid rising global energy prices. Islamic financing, particularly cash waqf from Sharia-based institutions, is thought to provide a potential solution. Cash waqf, in line with Islamic principles, generates up to IDR 180 trillion per year and supports the equitable use of renewable energy, especially in transportation. This study utilizes a qualitative descriptive method, through triangulation and comparative techniques. The findings highlight the important role of cash waqf in reducing costs and increasing accessibility to renewable energy for the community. Mechanisms that include cash waqf-based subsidies and innovative financing schemes can be tailored to the transportation sector. By integrating these approaches, Indonesia can reduce reliance on conventional subsidies while promoting inclusive participation in the energy transition. This research underscores cash waqf as a transformative tool, offering a scalable and Sharia-compliant strategy to advance sustainability and equity for policymakers to leverage Islamic finance in achieving a just energy transition, and engaging the role of human capital in managing its sustainability.

Keywords: Innovative Funding, Cash Waqf, Transition Energy, Equitable energy, Transportation Sector

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INTRODUCTION

Indonesia is engaged in a significant energy transition process to ensure the transition is equitable and inclusive and does not leave any population group behind. This necessitates the backing of all sectors to facilitate the creation of opportunities that will enable this to occur.

The concept of achieving an equitable energy transition, particularly within the energy and transportation sectors, is predicated on the understanding that vehicle pollution across Indonesia represents the most significant contributor to greenhouse gas emissions compared to others. It is necessary to consider several approaches to facilitate a transition from the conventional system of driving vehicles that rely only on fossil fuels to an alternative sustainable system.

These include the involvement of the application of biofuel-based transportation or bioenergy based on crude palm oil (CPO), electric vehicles, and hydrogen-powered transportation, as well as the development of various sources of alternative raw materials and other supporting infrastructure, especially in the transportation sector. It is therefore anticipated that the implementation of equitable energy will have the most significant impact at the community level (Azrai *et al.*, 2021).

The transportation sector plays a pivotal role in economic growth. It is anticipated that this will benefit the local economy and contribute to a reduction in poverty levels. The government has employed a variety of strategies to facilitate energy transition.

One such strategy is the development of sustainable energy sources for the transportation sector by utilizing alternative raw materials, particularly those derived from waste. These include cooking oil, used fish wash water, coffee grounds for biodiesel, sustainable aviation fuel (SAF), hydrotreated vegetable oil (HVO), marine fuel oil (MFO), and a diversification policy that will ensure the sustainability of energy sources through the availability of diverse raw materials to meet national bioenergy needs and energy sustainability in the transportation sector (Mukherjee *et al.*, 2023).

Despite Indonesia's endeavours to facilitate an energy transition in transportation, mitigating the effects of the climate crisis remains a formidable challenge. Realizing Indonesia's ambition to build the economy and achieve the goal of reducing carbon emissions will require a significant financial investment. Furthermore, the financial outlay required to procure all the raw materials needed to be processed into alternative raw materials is considerable.

To accelerate this process, it is necessary to implement an innovative approach to financing. One potential innovation is the implementation of cash-waqf-based financing schemes (Ab Shatar et al., 2021). This concept combines traditional values with contemporary requirements, creating novel avenues for supporting the energy transition while maintaining social and environmental principles. Because energy is a strategic socio-political commodity for fulfilling social needs across all demographic groups, social policy must be a primary consideration in implementing an equitable energy transition (Deonisia Arlinta, 2024). Providing clean and equitable energy sources will facilitate a cleaner environment for all regions of Indonesia, including urban and rural areas.

Numerous potential financial sectors can be used to finance renewable energy projects. The Indonesian financial sector has significantly expanded in recent years, particularly in the banking, stock, and bond markets.

The notable growth in the value of conventional banking assets, stock market capitalization, and total bonds outstanding evidence this. The expansion of Indonesia's financial sector offers a promising avenue for securing financing for developing low-carbon energy sources.

An equitable energy transition process must consider economic issues and social and environmental aspects. Implementing this process must ensure genuine inclusion and justice for all societal groups, including those from the lower socioeconomic strata (Deonisia Arlinta, 2024), and in alignment with the values espoused by the concept of equitable energy. The most significant obstacle to realizing infrastructure is the dearth of financing to facilitate the development of solutions that can accommodate the diverse needs of a broad population.

Providing adequate transportation infrastructure is conducive to the smooth functioning of social order and the seamless operation of economic processes, thereby enhancing community productivity and the prospects of a prosperous and equitable society.

Moreover, no community must be left behind in receiving development benefits. One of the government's key initiatives has been to address the need for renewable energy transition and facilitate an energy transition that is felt by all levels of society (Azrai *et al.*, 2021).

Researchers have proposed various solutions, including implementing a cash waqf scheme to address the issue through innovative financing strategies. In addition to cash waqf, which has significant financing potential in Indonesia (Azrai *et al.*, 2021), cash waqf is also regarded as a potential solution to the limited funds available, particularly regarding the issue of limited financing for infrastructure investment financing (Che *et al.*, 2018).

This has prompted the government to explore alternative sources of financing derived from the potential of economic growth (Nizami *et al.*, 2017), including financing sources derived from cash waqf (Ab Shatar *et al.*, 2021; Azrai *et al.*, 2021; Nour Aldeen *et al.*, 2022).

Other literature serves to reinforce the notion of composing this paper. Managing cash waqf can facilitate increased social activities directly from social cash waqf and indirectly from productive cash waqf (Ascarya & Masrifah, 2023). Other literature indicates that cash waqf, a form of charitable donation within Islamic finance, has the potential to provide substantial support for energy transition initiatives.

Using innovative financial models allows for allocating cash waqf towards renewable energy projects, infrastructure development, and social protection mechanisms, thereby contributing to sustainable economic growth and environmental sustainability. The following section investigates the diverse models and strategies that may be employed to leverage cash waqf in energy transition (Mukherjee *et al.*, 2023).

Some of these studies show an excellent collaboration map in research on cash waqf utilization, as shown in Figures 1, 2, and 3.

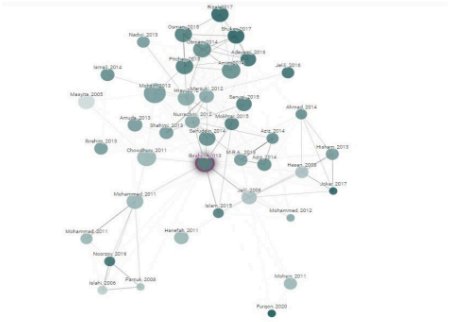

Figure 1. Distribution of Cash Waqf Utilization Research in Indonesia 2012-2024

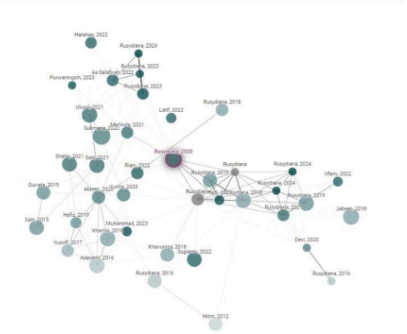

Figure 2. Distribution of research on the use of cash waqf for development

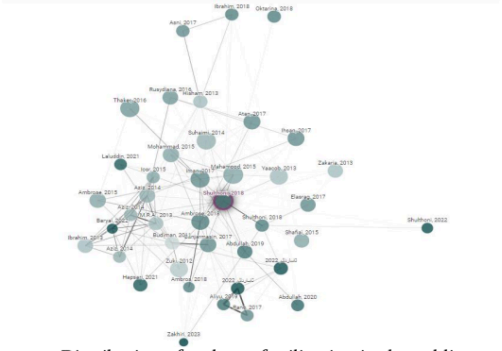

Figure 3. Distribution of cash waqf utilization in the public sector.

Figure 1 shows the research spread from 2012–2024 related to cash waqf utilization in Indonesia. Figure 2 is a spread of research related to using cash waqf for Development and economic improvement figure 3 scatters research on using cash waqf for renewable energy.

This paper will examine the feasibility of implementing this scheme, the potential challenges it may face, and its possible impact on the future of transportation in Indonesia. Given the substantial financing and investment required for energy transition policy, this is a crucial area of investigation. In this context, optimizing energy transition financing can be achieved by implementing Sharia-based financing mechanisms, given that sustainable finance principles are fundamentally aligned with those of Sharia finance.

Islamic financial policies and practices regulate the legal aspects of human life and protect the public interest and welfare. One of the fundamental principles of Islamic law is the responsibility to preserve the environment, which is regarded as a human obligation in this worldly life (Ab Shatar *et al*., 2021).

Accordingly, the sustainable energy transition is consistent with Shariah principles, facilitating the implementation of Shariah-compliant financing schemes to attain this objective (Azrai *et al*., 2021).

Indonesia has considerable potential for developing cash waqf as it is a Muslim-majority country. The percentage of the population in Indonesia who adhere to a particular religion is as follows: Islam (87.2%), Protestantism (6.9%), Catholicism (2.9%), Hinduism (1.7%), Buddhism (0.7%), and Confucianism (0.05%). As documented by the Indonesian Waqf Board (BWI), the total value of cash waqf collected up to 2020 reached IDR 391 billion. In light of the encouraging advancement of Islamic economic principles in Indonesia, it is reasonable to anticipate that implementing waqf will benefit the economy (Nofianti *et al*., 2024).

There is considerable potential for developing sukuk (Islamic bonds) to raise public funds for energy transition financing. Consequently, enhancements in the innovation of Sukuk products and more efficacious promotional initiatives are imperative to augment public demand for this instrument. Moreover, implementing project financing mechanisms following Sharia principles may be a viable alternative for financing energy transition projects.

Indonesia requires a minimum of US$ 30 billion to fund the energy transition over the next eight years. The transition to a new energy paradigm will occur organically when the cost of energy derived from renewable sources becomes more competitive.

However, a significant challenge persists in the form of considerable government budget allocation for energy subsidies, particularly to maintain purchasing power, especially in the context of global energy commodity increases. To overcome the challenges related to the sources of financing, it is necessary to draw upon Islamic financing mechanisms provided by Sharia-based financial institutions. One avenue for optimizing Islamic financing is the utilization of cash waqf. In 2018, the Indonesian Waqf Board estimated the potential of cash waqf in Indonesia to reach IDR 180 trillion annually.

Considering the considerable estimated potential, it is recommended that waqf funds be utilized for religious activities such as mosque construction and other purposes that will benefit humanity and the sustainability of life in the future. As an illustration, waqf funds may be directed towards financing new renewable energy (EBT) projects or advancing sustainable energy.

The government's commitment to achieving net zero emissions by 2060 or sooner is supported by international cooperation. Following the roadmap, the government has

devised a strategy for incorporating approximately 600 GW of renewable energy into the national energy mix. This strategy encompasses various energy sources, including solar, hydro, marine, geothermal, and hydrogen.

The ongoing evolution of global architectural structures should not hinder the transition to clean energy in the future. Indonesia's commitment to achieving net zero emissions will provide a robust foundation for the continued implementation of energy transition programs in each country. This objective can be attained by deploying innovative financing mechanisms, such as using cash waqf, which will prove instrumental in facilitating the realization of this goal.

A report by the Asian Development Bank (ADB) indicates that the Asia-Pacific region requires approximately US$1.7 trillion in infrastructure investment annually until 2030 to maintain sustainable economic growth, address poverty, and adapt to climate change. Nevertheless, a significant challenge remains the infrastructure investment gap, which represents the discrepancy between the necessary investment levels and the current levels of investment.

Closing this gap necessitates allocating financial resources through public finance reform, private sector financing, and the investigation of novel sources of financing. One notable example of an innovative source of financing is land value capture (LVC), also known as value capture financing. The fundamental premise of LVC is the monetization of the positive externalities produced by infrastructure investments, with the generated proceeds then utilized to finance the infrastructure project in question.

To assist DMCs in implementing this option, ADB published a 2019 report titled "Sustaining Transit Investment in Asia." The document serves as an initial examination of the potential of LVCs in financing transit infrastructure investments in urban areas, drawing on global experience.

The report provides detailed strategies for major Southeast Asian cities, including Bangkok, Jakarta, and Manila, to achieve positive outcomes associated with LVCs through land value enhancement associated with investments in public mass transit. The report, entitled "Innovative Infrastructure Financing through Value Capture in Indonesia," reflects the progress made by ADB in the field of knowledge regarding value-based infrastructure financing.

The initiatives presented in this document aim to support the Government of Indonesia in establishing a national framework for value coverage. This will be achieved by facilitating the development of innovative concepts and formulating new regulations and taxation frameworks incorporating substantial components. Nevertheless, the extant framework is inadequate for successfully implementing the proposed initiatives.

It is therefore necessary to elaborate a map of short- and medium-term action plans to ensure the optimal realization of the potential of value capture. Infrastructure financing based on value capture presents a novel avenue for fostering a value-benefit cycle in the future, whereby value creation and financing for subsequent infrastructure development can be mutually reinforcing.

It is anticipated that Indonesia's adequate human resources will prove instrumental in facilitating the implementation of the energy transition roadmap. This support encompasses not only the advancement of renewable energy but also the exploitation of mineral resources, including nickel, copper, bauxite, and manganese, which are vital for producing electric vehicle batteries and energy storage, as well as renewable energy-based power generation.

Implementing this comprehensive strategy is anticipated to increase the proportion of renewable energy in the national energy mix, accelerate the transition to sustainable transportation, and support fair and equitable economic progress.

METHOD

This research employs a qualitative method with a descriptive approach. In conclusion, the descriptive-qualitative approach represents a research method that employs a qualitative approach with an inductive flow (Al-Ababneh, 2020).

The inductive flow of inquiry entails the initial observation of a specific process or event, giving rise to generalizations that serve as conclusions derived from these observations(Snyder, 2019). This approach allows researchers to develop hypotheses iteratively. Qualitative research theory is constructed based on findings derived from the data, which are then subjected to further analysis and testing through appropriate research instruments (Habsy, 2017).

The data collection techniques employed in this study were based on a review of the relevant literature. Creswell (2014) defines a literature study as a written summary of journal articles, books, and other documents that explain theories and information, both past and present, and organize the literature into relevant topics and documents (Habsy, 2017). By this methodology, the research data is derived from journal articles, books, and documents that address the subject of cash waqf.

A triangulation analysis method was employed to guarantee the accuracy and reliability of the data presented in this study. According to Creswell (2017), triangulation is employed to establish consistency in the information obtained, thereby enhancing the accuracy and reliability of the findings and thus reinforcing the study's validity (Alfansyur & Mariyani, 2020).

In this study, triangulation is employed as a method of data validation through three main approaches. First, data triangulation is conducted by integrating various sources, including in-depth interviews with experts in economics, energy, and disaster management from Universitas Islam Negeri Ar-Raniry and Universitas Syiah Kuala Banda Aceh, as well as policy documents and financial reports related to cash waqf.

Second, researcher triangulation is applied by involving multiple researchers in the data analysis process to minimize subjective bias and enhance the objectivity of the research findings. Third, participatory action research is carried out to assess the role of cash waqf in accelerating an equitable energy transition, particularly in Indonesia's transportation sector. By combining these three approaches, this study aims to produce a comprehensive and reliable analysis while providing relevant recommendations for developing cash-waqf-based energy transition strategies.

Furthermore, this research employs a comparative analysis, contrasting the findings with relevant perspectives and contexts. By employing a combination of triangulation and comparative analysis, this research not only enhances the reliability of the data but also offers a more profound understanding of cash waqf-based financing schemes to accelerate the energy transition in Indonesia.

To provide a more detailed overview of the research process, the researchers have created a visual representation of the research scheme in the form of a diagram, as shown in Figure 4.

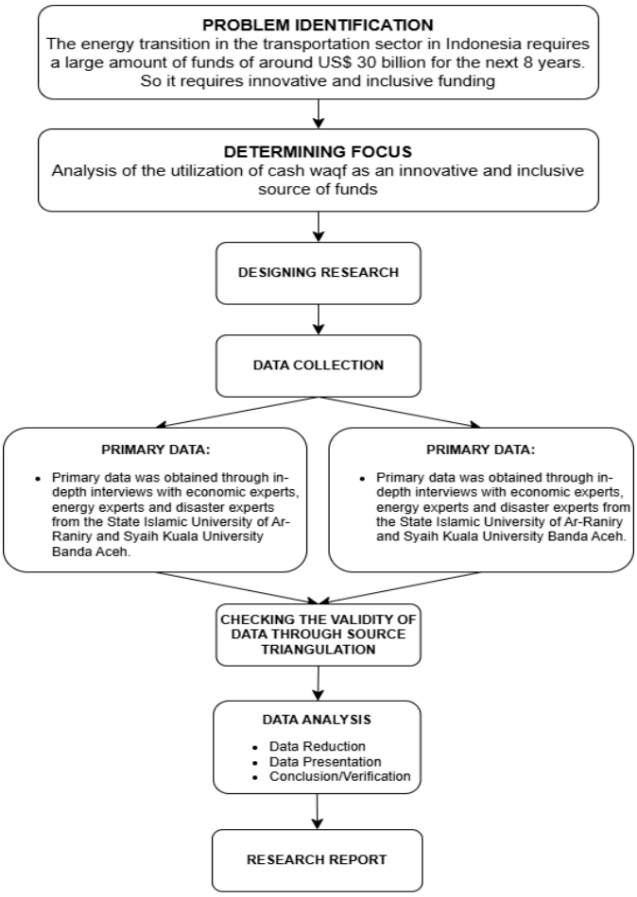

Figure 4. Research Scheme

RESULTS AND DISCUSSION

Cash waqf is a fund generated by the *nazir* (waqf manager) through the issuance of cash waqf certificates, which the general public can purchase (Suganda, 2014). This certificate model adapts the concept of the cash waqf certificate, as introduced by M. A. Mannan in Bangladesh. However, it should be noted that, in general, cash waqf is often considered to be waqf done in the form of money. This is, in fact, an erroneous assumption. Cash waqf involves investing in Islamic financial instruments (Lis Sulistiani, 2022). To ensure the optimal productivity of these financial instruments, it is essential to manage them effectively. The resulting proceeds are then utilized to benefit the designated *mauquf 'alaih*.

In practice, cash waqf remains closely associated with modern waqf asset management, which is generated for various investment purposes, including real estate and the construction of mosques, schools, and hospitals. The waqf asset management is exemplified in **Figure 5**.

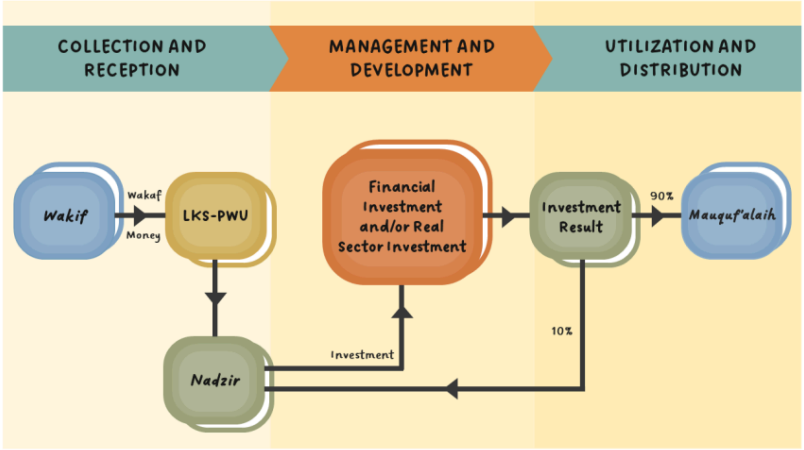

Figure 5. Cash Waqf Management Scheme

As a nation founded upon the rule of law, the governance of cash waqf is overseen by a distinct set of regulatory guidelines. Establishing this regulatory framework evinces the government's enthusiasm and concern for managing cash waqf. Given that cash, waqf constitutes a public fund managed by the Nazir, the existence of such regulations are paramount to safeguard the fund and guarantee its prudent and responsible administration while preventing any potential diminution or loss of value.

The legal basis governing cash waqf in Indonesia includes Law No. 41 Year 2022 on Waqf and Government Regulation No. 25 Year 2018. The latter is a revision of Government Regulation No. 42 the Year 2006 on implementing Law No. 41 the Year 2004. These regulations explicitly regulate the provisions of cash waqf. Furthermore, the Minister of Religious Affairs Regulation No. 4/2009 on Guidelines for the Management of Cash Waqf provides additional technical regulation regarding implementing cash waqf (Lis Sulistiani, 2022).

Sukuk are long-term securities based on Sharia principles (Winarto *et al.*, 2021). As an Islamic financial instrument that is analogous to bonds in the conventional financial system, it can be seen that there are notable differences between sukuk and bonds.

The distinction lies in its foundation: Sukuk does not adhere to the practice of interest (*riba*); instead, it is based on profit-sharing or profit-sharing on the assets that serve as the basis for Sukuk issuance. Sukuk represents the investor's ownership of specific assets or

projects, with the profits derived from the income generated by these assets or projects.

Regarding issuance, Indonesian sukuk can be classified into two distinct categories. The first category of sukuk comprises those issued by the government. These are known as state sukuk, or more commonly, State Sharia Securities (SBSN). Secondly, corporate sukuk are those issued by companies in their capacity as issuers.

Sukuk issued by the Government of Indonesia is covered by the State Sharia Securities Law No. 19 of 2018. In contrast, corporate sukuk have previously had a legal basis, namely the Capital Market Law No. 8 of 1995 and the National Sharia Council Fatwa Number: 32/DSN-MUI/IX/2002 (Faiza, 2019).

In the context of SBSN, several different contact structures underpin the Sukuk, as illustrated in Table 1.

Tabel 1. Structure of State Sharia Sukuk

Structure	SBSN Ijarah Sale and Lease Back	SBSN Ijarah Al-khadamat	SBSN Ijarah Asset to be Leased	SBSN Wakalah
Description	Sukuk issued under the sale and leaseback mechanism (Fatah, 2011)	Sukuk was issued based on Sharia principles as proof of ownership of part of SBSN assets in the form of services that are the object of ijarah.	Sukuk was issued based on Sharia principles as proof of ownership of part of SBSN assets that are the object of ijarah, both existing and future.	Sukuk is issued based on Sharia principles as proof of ownership of a share of assets in investment activities managed by the SBSN issuing company as a representative of SBSN holders.
DSN-MUI Fatwa	Number 72/2008	Number 9/2000	Number 76/2010	Number 95/2014
Underlying Asset	BMN land/building	Hajj service project	Project and BMN land/building BUM land/building	BMN tanah/bangunan (51%) & Proyek (49%)
Rewards	Rental fee (*ujrah*) fixed coupon	Rental fee (*ujrah*) fixed coupon	Fees rent (*ujrah*) fixed coupon	*Ujrah*/margin/fee fixed coupon
Tradability	*Tradable*	*Non-Tradable*	*Tradable*	*Tradable*
Issuance Document	1. *Ba'I* deed 2. *Ijarah* agreement 3. Sale undertaking purchase undertaking	1. *Wakalah* agreement 2. *Ijarah* agreement 3. Minutes of handover (BAST) of Hajj service	1. Order letter 2. Wakalah agreement 3. *Ijarah* asset to be leased agreement 4. SBSN asset management agreement 5. Sale undertaking purchase undertaking	1. Declaration of trust 2. Purchase agreement 3. Procurement Agreement 4. Lease Agreement 5. Servicing agency agreement 6. Substitution undertaking 7. Transfer undertaking 8. Purchase undertaking 9. Costs undertaking 10. Agency Agreement
State Sukuk Series	IFR, SR, SNI	SDHI	PBS, SR	SNI

Source: (Faiza, 2019)

To achieve an equitable energy transition project, it is estimated that a minimum of US$ 30 billion (equivalent to IDR 450 trillion) will be required over the next eight years. Accordingly, the researchers have provided a comprehensive breakdown of the financial resources required for the transition project. Further details are described in Table 2.

Table 2. Details of Funds Required (trillion)

Structure	Electric Vehicle Infrastructure	Development and Application of Biofuel	Development of Renewable Energy-Based	Campaign and Education	Research and Development	Government Subsidy
Description	1. Development of public electric vehicle charging stations (45) 2. Procurement of electric vehicles for public transportation (60) 3.Development of supporting infrastructure (batteries, electricity networks) (45)	1.Development of local biofuel industry (40) 2. Subsidies for vehicle conversion to biofuel (30) 3.Development of biofuel distribution infrastructure (30)	1.Development of mass transportation systems (60) 2.Development of non-motorized transportation (36) 3.Modernization of other public transportation systems (24)	1. National campaign on energy transition (12) 2.Training and skills development (8)	1. Research and innovation in renewable energy technology (17) 2.Collaboration with universities or research institutions (13)	1. Subsidies for electric vehicles and biofuel users (20) 2. Incentive for industries that contribute to the energy transition (30)
Cost Details (IDR) In trillions	150	100	120	20	30	50
Total Costs (IDR) In trillions	450					

Source: Data processed by the authors

In the context of Indonesian laws and regulations, financing of energy transition projects in the transportation sector must comply with related procedures and regulations. The following are details of the regulations in Indonesia.

1. Compliance with Regulations and Laws
   a. Law No. 30 of 2007 concerning energy. This legislation provides the legal framework t
   b. To guarantee that all energy projects, including the energy transition in the transportation sector, are aligned with the principles of sustainable energy management and the efficient utilization of energy sources.
   c. Law No. 41 of 2004 concerning Waqf. Suppose a cash waqf scheme is utilized for financing purposes. In that case, the project must adhere to the stipulations about waqf management, including those concerning deploying waqf funds for objectives consistent with Sharia principles.
   d. Law No. 19 of 2008 concerning State Sharia Securities (SBSN). Suppose a project is to be financed through the issuance of sukuk or sharia securities. In that case, the project in question must comply with the relevant provisions governing the issuance and use of SBSN.

e. PP No. 79 of 2014 concerning National Energy Policy. It establishes the direction of national policy in the development and use of energy, which must be adhered to in the planning and implementation of energy transition projects.
f. PP No. 55 of 2019 about battery-based electric motor vehicles for road transportation. It establishes policies related to the development and implementation of electric vehicles, including incentives, technical standards, and other policies.

2. Approval and Licencing
   a. Business permits and environmental permits. Energy transition projects must obtain appropriate business permits from relevant agencies, such as the Ministry of Energy and Mineral Resources (ESDM) or the Ministry of Transportation. Following Law No. 32 of 2009 concerning Environmental Protection and Management, environmental permits are required to ensure the project meets strict environmental requirements.
   b. Development plan and feasibility analysis. The project must prepare a development plan and feasibility study approved by relevant agencies, such as the National Development Planning Agency (Bappenas) and the Ministry of Transportation, to ensure that the project is feasible and by the social development plan.
3. Financing and Financing Scheme
   a. State financing management. Suppose government funds or public financing schemes are utilized. In that case, the project must adhere to the stipulations outlined in Law No. 17 of 2003 concerning State Finance and the regulations about administrating the state budget and expenditure.
   b. Sukuk and Sharia Financing Regulation. If the project employs Sukuk or Sharia financial instruments, it must adhere to the stipulations outlined in Law No. 19 of 2008 and its associated implementing regulations. Furthermore, the project must align with the fatwa issued by the National Sharia Council (DSN-MUI).
4. Monitoring and Evaluation
   a. Audit and monitoring. The projects must undergo regular audits and monitoring to ensure the fund's utilization follows the established regulations and achieves the anticipated results. This encompasses adherence to state financial management regulations and monitoring by relevant institutions, such as the Financial and Development Supervisory Agency (BPKP).
   b. Reporting and evaluation. The project must prepare regular reports on the progress of the project, how the funds are being utilized, and the impact of the project. The relevant authorities will then evaluate these reports to ensure transparency and accountability.

Infrastructure financing through the issuance of state sukuk has been implemented since 2010, specifically with the issuance of the State Sukuk with the Project-Based Sukuk (PBS) series. The mechanism employed utilizes government projects enumerated in the APBN, with the underlying asset of state Sukuk.

Moreover, the government serves as the primary catalyst for the completion of infrastructure projects, facilitating a transparent and accountable process. Nevertheless, a novel approach has emerged whereby waqf is utilized as a financing asset for sukuk issuance through cash waqf (Fauziah & Nurwahidin, 2020).

The CWLS model, which serves as a source of Sharia-based financing to accelerate the equitable energy transition in the transportation sector in Indonesia, is illustrated in Figure 6.

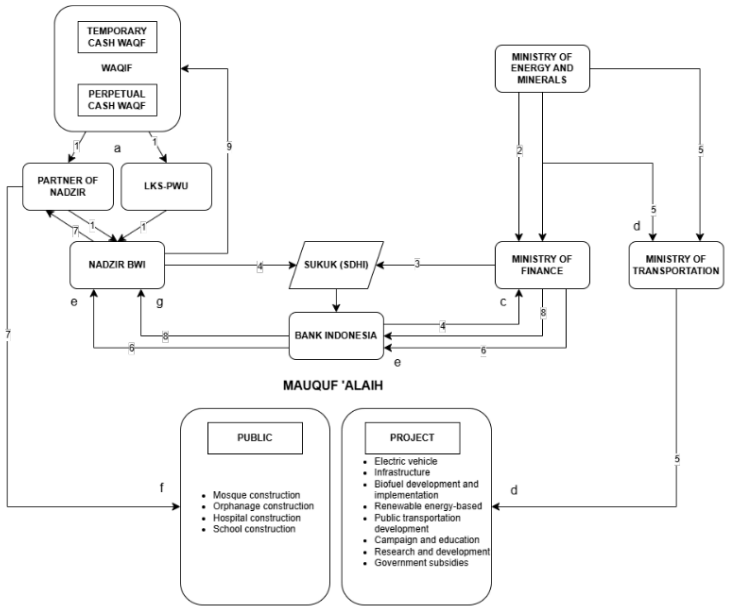

Figure 6. CWLS-Based Financing Scheme

The following is an explanation of the CWLS-based financing scheme:

1. Fund Transfer
   a. The *wakif* transfers the waqf funds, whether in a temporary or perpetual form, to LKS-PWU and the *nazir* partner. Then, LKS-PWU and the *Nazir* partner enter a contractual agreement, commonly called a memorandum of understanding (MoU). Once an agreement has been reached, the funds collected from both LKS-PWU and the *Nazir partner will be placed with BWI in its capacity as the waqf Nazir*.
   b. The Ministry of Energy and Mineral Resources presents an energy transition project proposal to the Ministry of Finance for consideration.
   c. The Ministry of Finance issues sukuk waqf (SDHI) for the energy transition project submitted by the Ministry of Energy and Mineral Resources. The sovereign sukuk with the SDHI series issued by the Ministry of Finance is non-tradable, as it is backed by funds from the community in the form of waqf. It is designed to be used exclusively for the intended purpose.
   d. BWI purchases the sukuk waqf, issued by the Ministry of Finance, using cash waqf, which LKS-PWU and Nazir Partners collected.

e. The Ministry of Finance provides sukuk funds to the Ministry of Transportation, which is responsible for implementing the energy transition project in the transportation sector in Indonesia. The project resulting from the development of this sukuk is classified as state property (BMN).

f. The Ministry of Finance periodically provides coupons for the sukuk waqf to BWI within a specified tenor period through Bank Indonesia, which serves as the custodian bank.
g. The proceeds from the sukuk wakaf coupons are distributed by BWI to the nazir partners, who then distribute them to the mauquf 'alaih.
h. Upon the conclusion of the waqf sukuk tenor period, the Ministry of Finance remits the sukuk capital in its entirety to BWI.
i. The waqf sukuk funds, which are temporary, shall be returned to the wakif upon reaching maturity. The nominal amount returned must be the initial nominal amount. Nevertheless, perpetual (eternal) waqf funds returned to BWI assets may be utilized once more to purchase waqf sukuk.

To facilitate the energy transition, it is estimated that an investment of approximately US$30 billion (equivalent to IDR 450 trillion) will be required over the next eight years, as illustrated in Table 2. This substantial financial commitment is likely to present a significant challenge for the government, particularly in implementing the energy transition in the transportation sector in Indonesia.

Islam provides a promising avenue for philanthropic endeavors, namely cash waqf, which is estimated to accumulate approximately Rp180 trillion annually. This substantial potential demonstrates that cash waqf can serve as a pivotal solution in addressing funding challenges, particularly given that the primary objective of waqf is to advance social welfare. In this context, the transition to renewable energy sources in the transportation sector can be regarded as a means of promoting welfare.

Given the potential of cash waqf to reach IDR180 trillion per year and the necessity of funds for government subsidies, which currently represent 27.78% of the total potential for annual cash waqf, it can be reasonably assumed that if only 20% of this value is realized, cash waqf will be capable of covering the cost of government subsidies for a period exceeding five years. Furthermore, this fund of IDR36 trillion can cover up to 72% of the total costs required for government subsidies.

Given these considerations, cash waqf has significant potential as a sustainable funding source to accelerate a just energy transition in the Indonesian transportation sector.

Nevertheless, the collection of cash waqf in Indonesia remains relatively low compared to the existing potential. As stated by the Vice President of the Republic of Indonesia, Ma'ruf Amin, the total cash waqf successfully collected in 2023 was only IDR2.3 trillion. This signifies a considerable obstacle in optimizing the aggregation of accessible cash waqf resources.

The potential for cash waqf in Indonesia is considerable, yet its implementation remains suboptimal. From the presentation of this paper, it can be conveyed that several challenges have thus far impeded the optimal development of the innovative cash waqf scheme.

In addition to the challenge of lack of literacy, some challenges include technical competency gaps, unsupportive regulations, lack of collaboration between actors, and

funding. For this reason, the role of human resource actors is needed, through training. The role of the government, and private sector in investment and innovation, academics in research, local communities in socialization, and Islamic financial institutions for cash waqf are also very important.

The importance of human resources can be explained through the ability to adapt technology, innovation, project management, and socialization to the community. Their roles can be read in Table 3.

Table 3. The Role of Human Resources

No	Actor	Role
1	Government	1. Design technical training programs and establish cooperation with relevant institutions such as the Ministry of Energy and Mineral Resources and State Electricity Company (PLN) 2. Strengthen the regulation of tax incentives for green industry 3. Through philanthropic institutions encourage people to give waqf such as waqf Rp. 10,000 for the green industry. Especially through the government's SKPA
2	Private Sector	1. Investment in R&D of low-emission transportation technologies. 2. Open internship program for renewable energy engineering students.
3.	Academia/University	1. Develop a curriculum based on energy transition (e.g., electromobility). 2. Collaborative research with industry for biofuel optimization. 3. Seek strategies to increase cash waqf literacy
4	Local Community	1. Socialization of cash waqf schemes to fund green public transportation. 2. Involvement of MSMEs in the supply chain of EV components.
5	Islamic Financial Institutions (LKS)	1. Save/collect waqf funds and be able to design cash waqf instruments, especially for sustainable transportation projects...
6	Ministry	1. Design cash waqf instruments specific to sustainable transportation projects (e.g., purchase of electric buses for remote areas).

In addition, strengthening human resources is also needed in some strengthening in the renewable energy transition, especially in the field of transportation. Strengthening can be done in ***(1)***. Accelerating the Adoption of Competent HRD Technology accelerates technology integration such as smart grids for Electric vehicle charging stations, ***(2).*** Accelerating Sustainable Innovation Local experts can create contextual solutions, such as modifying diesel engines to sustainable palm-

based biodiesel, ***(3).*** Strengthening Effective Project Management

Human resources trained in green project management ensure green transportation projects are completed on time and within budget, ***(4).*** Increased Public Participation HR with effective communication skills can raise public awareness of the benefits of low-carbon transportation through creative campaigns. This can also be minimized through massive training: Use digital platforms for crowdsourcing training of EV technicians, funded by cash waqf schemes.

Penta-Helix Collaboration: The integration of all actors as shown in Figure 8 in the renewable energy transportation pilot project needs to continue, such as developing special competency certification to ensure the quality of human resources in the sustainable transportation sector.

The transition to renewable energy in the transportation sector in Indonesia faces various challenges, one of which is the development of human resources (HR). Highlighting HR readiness is critical to support the shift from fossils to renewable energy, especially in the face of the complexities inherent in the transportation and industrial sectors.

In addition, there is a need for mapping and government intervention in sustainable HRD development. This includes creating supportive regulations and policies to enable workers to transition to the renewable energy sector with adequate skills. Stakeholders are expected to collaborate on training programs that can prepare the workforce to adapt to new technologies.

Cooperation between the government and the private sector is also crucial to encourage investment in education and training focused on green technology and renewable energy. With effective human capital development, Indonesia can be more competitive in a global market that is increasingly focused on sustainability and green technologies, thus contributing to the achievement of broader energy transition targets. Like creating a market orientation (Adam & Syahputra, 2016) and business culture to improve performance, human resources must be managed well (Adam *et al*., 2016, 2020; Adam & Gunawan, 2015)

Overall, the challenges in Indonesia's renewable energy transition for the transportation sector require a synergy between improving the quality of human capital, the availability of relevant education, and the support of stable and inclusive government policies. Without such a holistic approach, Indonesia may struggle to capitalize on its abundant renewable energy potential and reduce its dependence on fossil energy sources.

There is a paucity of public knowledge regarding social investment, and similarly, public awareness of cash waqf remains limited. The latest data from the Financial Services Authority (OJK) indicates that the level of Sharia financial literacy among the general public is 9.14%. In comparison, the level of Sharia financial inclusion is only 12.12%.

The most significant challenge is the necessity for relevant parties to conduct extensive and targeted educational initiatives at all potential levels of society. Indeed, the government could establish a collaborative framework to enhance this literacy rate through centralized seminars with community organizations, mosques, and university-level education as a hub for highly educated human resources.

It is also necessary for Sharia financial institutions to prepare to maximize public awareness of cash waqf. This can be achieved by providing an accessible narrative that illustrates the simplicity of investing, and the minimal risk associated with waqf.

Once the conditions have been met, the innovative financing scheme, which is already operational, needs supervision and monitoring.

This is because the financing in question utilizes community funds.

This finding also presents a potential avenue for implementing cash-waqf-based financing models in other sectors that necessitate sustainable investment.

Accordingly, one of the strategic recommendations in this study is to utilize cash waqf as a funding source for initiatives that can enhance community well-being.

The paper highlights that an innovative financing scheme based on cash waqf can effectively accelerate the energy transition in Indonesia's transportation sector, offering valuable insights into cash waqf-based financing schemes.

It emphasizes the importance of developing sukuk to raise public funds for energy transition financing and implementing project financing mechanisms following Sharia principles.

The study suggests that cash waqf has the potential to cover government subsidies for a significant period, making it a sustainable funding source for an equitable energy transition in the Indonesian transportation sector.

The paper discusses challenges such as the limited public knowledge and awareness of cash waqf, with Sharia financial literacy at 9.14 and financial inclusion at 12.12, necessitating extensive educational initiatives.

The low collection of cash waqf in Indonesia, with only IDR 2.3 trillion collected in 2023, poses a significant obstacle to optimizing available resources.

The substantial investment required for energy transition, estimated at US$30 billion over the next eight years, presents a significant challenge for the government in implementing the transition in the transportation sector.

The need for enhanced financial resources through public finance reform and private sector financing to bridge the infrastructure investment gap is highlighted as a challenge.

CONCLUSION

An innovative financing scheme based on cash waqf can effectively accelerate the energy transition in Indonesia's transportation sector, utilizing cash waqf funds to issue state Sukuk for financing assets.

The study highlights the potential of developing Sukuk to raise public funds for energy transition financing, emphasizing the importance of enhancing Sukuk products and promotional initiatives.

The research concludes that cash waqf-based financing schemes can significantly benefit the transportation sector in Indonesia, providing valuable insights despite limitations in empirical data and scope.

The paper discusses developing a strategy for accelerating an equitable energy transition in Indonesia's transportation sector through cash waqf, aiming to benefit the general public, particularly in transportation, by generating IDR 180 trillion per year through cash waqf financing. It presents innovative strategies and schemes for using cash waqf to accelerate the energy transition in Indonesia's transportation sector.

The research highlights the potential of cash waqf financing to facilitate an equitable energy transition in Indonesia, emphasizing the importance of innovative financing schemes derived from cash waqf to support renewable energy acquisition and introduce novel financing mechanisms.

Future research areas include the development of sustainable energy sources for the transportation sector utilizing alternative raw materials like cooking oil, coffee grounds for biodiesel, and sustainable aviation fuel.

Another area is the implementation of innovative financing approaches, such as cash

waqf-based financing schemes, to supp-ort the energy transition while maintainning social and environmental principles.

Research on the establishment of a national framework for value coverage in Indonesia through innovative concepts and new regulations to foster a value-benefit cycle in infrastructure financing.

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