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Economic Analysis of Law in Indonesia's Sustainable Aviation Regulatory Framework

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ABSTRACT

This artide examines Indonesia's aviation regulatory framework through the perspective of Economic Analysis of Law in the context of sustainable air transport governance. The study argues that sustainability in aviation law cannot be assessed solely through environmental compliance or the formal existence of legal norms, but must be evaluated through the ability of regulation to create efficient incentives, distribute costs proportionally, and maximize social welfare. Using doctrinal legal research with conceptual and statutory approaches, this artide analyzes international aviation standards, Indonesia's aviation law, tariff regulation, pioneer air services, environmental standards, carbon economic value instruments, and biofuel policy. The discussion shows that Indonesia has adopted several instruments relevant to sustainable aviation, induding tariff control, national ownership requirements, pioneer air transport services, aircraft noise and emission standards, and early regulatory support for biofuel and carbon economic value. However, these instruments remain fragmented and have not yet formed a coherent regulatory design. The artide finds that economic sustainability requires stronger economic oversight beyond tariff administration; environmental sustainability requires a more specific aviation decarbonization framework, particularly for Sustainable Aviation Fuel (SAF), green financing, and carbon cost internalization; while social sustainability requires accessible and indusive air transport, especially for remote and commercially unattractive regions. The artide condudes that Indonesia's aviation law should move toward sustainable air transport governance by integrating economic, social, and environmental sustainability into one coherent regulatory framework.

Keywords: Aviation Law; Economic Analysis of Law; Regulatory Framework; Sustainability.

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INTROCUCTION

The aviation sector has a strategic function in supporting regional connectivity, economic growth, and national integration. Indonesia, as an archipelagic state, seeks to understand aviation not only as a means of transportation, but also as an important instrument in the equitable distribution of development between regions. This indicates that regulation to be formulated by policymakers should not only be based on aspects of safety, security, and the smooth flow of air traffic, but also on its ability to create efficient and sustainable governance conditions.

The challenges of aviation regulation have become increasingly complex because this sector lies at the intersection between the need for economic efficiency, social accessibility, and environmental responsibility. The aviation industry faces a high cost structure, as reflected in fuel costs, maintenance, aircraft leasing, airport charges, and compliance with safety standards. On the other hand, aviation regulation is confronted with high ticket prices, limited competition, and unequal connectivity, which may reduce public access to air transportation. At the same time, aviation activities also generate environmental costs, particularly greenhouse gas emissions, noise, fuel consumption,

and ecological pressure around airports. This shows that sustainability in the aviation sector should not be understood merely as an environmental agenda, but must be understood as a governance issue that connects economic efficiency, access justice, and the internalization of environmental costs.

Economic Analysis of Law offers an analytical framework for assessing whether law produces efficient resource allocation and optimal social benefits. This approach does not only examine whether a regulation is normatively valid, but also how that regulation shapes incentives, distributes costs, and influences the behavior of legal subjects. In the aviation sector, this approach is relevant for assessing whether rules concerning tariffs, operational costs, safety standards, environmental standards, business competition, the development of sustainable fuel, and public service obligations have produced a balance between industrial sustainability, public access affordability, and environmental protection.

The perspective of Economic Analysis of Law attempts to place efficiency in Indonesian aviation law not narrowly as cost efficiency for airlines or administrative efficiency for regulators. Efficiency needs to be placed within the framework of social welfare, so that aviation regulation is assessed based on its ability to generate the greatest benefit for society with proportionate social costs. Regulation that allows the industry to continue operating, but imposes high prices on consumers, narrows interregional access, or neglects environmental impacts, cannot be said to be sustainable. Conversely, regulation that merely suppresses prices without taking into account safety, the economic viability of airlines, and ecological costs also does not reflect sustainable efficiency.

The relationship between the aviation sector and sustainability has been discussed in several previous studies, particularly in the context of international law, safety, financing, and environmental policy. Studies on environmental regulation of aviation provide an overview of legal and policy instruments in controlling the environmental impacts of the aviation sector, including through the European Union Emissions Trading Scheme. However, such studies have not specifically explained how a state, including Indonesia, forms a national legal design capable of connecting environmental interests with economic efficiency and social interests. Research on the legal aspects of aviation safety in Indonesia has examined safety and regulatory compliance based on Law Number 1 of 2009 on Aviation and its implementing regulations, but it still tends to remain within the normative-descriptive realm, without further linking it to the efficiency, incentives, and behavioral impact of those regulations. Meanwhile, studies on sustainable aviation finance assess the role of green financing instruments in supporting the transition of the aviation sector toward sustainability, but focus more on financial aspects and market policy.

Previous studies still tend to discuss environmental, safety, financing, price, or access aspects separately. There remains room for inquiry to read Indonesia's aviation regulation as a legal design that shapes economic incentives, distributes social costs, and determines the direction of aviation sector sustainability in an integrated manner. This article fills that gap by analyzing Indonesia's aviation regulatory framework through the perspective of Economic Analysis of Law. The discussion focuses on how aviation regulation can be interpreted and evaluated based on three sustainability indicators, namely economic sustainability, social sustainability, and environmental sustainability. Accordingly, this article places efficiency not as a narrow objective for industry or regulators, but as an instrument for assessing the capacity of Indonesian aviation law to support sustainable air transport governance.

RESEARCH METHOD

This research adopts a doctrinal legal research method. The study focuses on legal doctrines understood as structured combinations of rules, principles, norms, and interpretative guidelines, and is conducted through the identification of relevant legal sources and their textual interpretation and analysis. From a normative perspective, the research examines legal principles, the systematic arrangement of aviation regulation, and the level of regulatory synchronization by applying both conceptual and statutory approaches. Doctrinal research in this study involves careful analysis and analytical synthesis, including linking different doctrinal elements and deriving general legal principles from primary legal materials. Through a combined deductive and inductive reasoning process, conceptual legal analysis and doctrinal synthesis are used to formulate legal propositions relevant to the discussion. This article examines Indonesia's aviation regulatory framework in relation to

sustainability, with Economic Analysis of Law employed as an analytical perspective to assess regulatory design and coherence.

RESULT

1. Sustainable International Aviation Regulation and Indonesian Aviation Regulation

Aviation regulation at the international level focuses on a combination of technical standards, economic oversight, market mechanisms, and long-term decarbonization targets. The International Civil Aviation Organization (ICAO) explicitly places environmental sustainability, reliable and accessible mobility, and economic development as part of its strategic objectives. Through Annex 16 of the Chicago Convention, ICAO establishes International Standards and Recommended Practices related to environmental protection, which include:

a. Aircraft noise
b. Aircraft engine emissions
c. Aeroplane CO_2 Emissions
d. CORSIA

In the context of CORSIA, or the Carbon Offsetting and Reduction Scheme for International Aviation, this instrument is designed as a market-based mechanism for controlling emissions from international aviation. CORSIA is designed as a global scheme that requires international aircraft operators to monitor, report, and verify CO_2 emissions, as well as to offset emissions growth through the purchase and cancellation of eligible emission units. Under this model, CORSIA does not operate as a direct prohibition on aviation activities, but rather as an economic mechanism that encourages the internalization of carbon costs in international aviation activities. From the perspective of Economic Analysis of Law, CORSIA can be read as an example of how international law shapes economic incentives to influence the behavior of aircraft operators.

The direction of international aviation decarbonization was then strengthened through the adoption of the long-term global aspirational goal of net-zero carbon emissions by 2050 at the 41st ICAO Assembly. However, this target was not constructed as a uniform obligation imposed identically on all states. ICAO affirms that each state's contribution to the Long-Term Aspirational Goal must take into account national circumstances, level of development, maturity of the aviation market, the sustainable growth of international aviation, a just transition, and each state's national priorities. This affirmation is important because it shows that the decarbonization of international aviation must still be pursued by taking social, economic, and environmental sustainability into account simultaneously.

Another benchmark can be seen from the European Union's approach. Through ReFuelEU Aviation, the European Union requires fuel suppliers to gradually increase the share of Sustainable Aviation Fuel at European Union airports, starting from 2% in 2025 and increasing to 70% by 2050. This policy shows that the transition toward sustainable aviation is not carried out only through emission standards or offset mechanisms, but also through a mandate for the supply of low-carbon fuel that provides demand certainty for the SAF market. Within the framework of Economic Analysis of Law, this approach demonstrates how regulation can be used to shape market incentives, direct investment, and change the behavior of industry actors.

Indonesia, as an ICAO member state, has adopted part of the environmental protection standards for aviation into its domestic regulations. In the aspect of noise, this regulation is reflected in Regulation of the Minister of Transportation Number PM 62 of 2021 concerning Civil Aviation Safety Regulation Part 36 on Noise Standards for Type Certification and Airworthiness of Aircraft. Meanwhile, the emissions aspect is regulated separately through Regulation of the Minister of Transportation Number PM 15 of 2021 concerning Civil Aviation Safety Regulation Part 34, which covers requirements for fuel venting, exhaust emissions for turbine-engine aircraft, and aircraft CO_2 emissions.

Indonesia, as an ICAO member state, has adopted part of the environmental protection standards for aviation into its domestic regulations. In the aspect of noise, this regulation is reflected, among others, in Regulation of the Minister of Transportation Number PM 62 of 2021 concerning Civil Aviation Safety Regulation Part 36 on Noise Standards for Type Certification and Airworthiness

of Aircraft. Meanwhile, the emissions aspect is regulated separately through Regulation of the Minister of Transportation Number PM 15 of 2021 concerning Civil Aviation Safety Regulation Part 34, which covers requirements for fuel venting, exhaust emissions for turbine-engine aircraft, and aircraft CO_2 emissions.

The existence of these technical standards does not in itself show that Indonesia's legal framework has formed sustainable aviation governance in a complete manner. From the perspective of Economic Analysis of Law, the main issue is not only whether Indonesia has adopted international standards, but whether such adoption has created effective incentives for regulators, airlines, airport operators, fuel producers, and consumers. Therefore, the analysis of national regulation needs to proceed by examining the relationship between environmental standards, cost structures, tariffs, competition, accessibility, and the economic instruments available in Indonesian aviation law.

2. Efisiensi and economic sustainability

When viewed through the perspective of Economic Analysis of Law, economic sustainability in Indonesian aviation law cannot be measured merely by the continuity of airlines. This issue must be measured by the ability of law to balance three matters at once, namely business viability, affordability for users, and a market structure that is sufficiently competitive to prevent excessive gains resulting from weak competition. Article 127 of the Aviation Law has in fact reflected this line of thought, because the upper tariff limit must take into account consumer protection and the protection of business entities from unfair competition. Nevertheless, this design becomes vulnerable when the state relies too heavily on price administration without building deeper economic oversight over cost structures, avtur supply, airport charges, and market concentration.

Indonesia's policy in 2026 shows that the Government maintained the increase in domestic economy-class ticket prices within the range of 9 to 13 percent in response to the surge in avtur prices. The adjustment of the fuel surcharge shows that avtur is a strategic input that significantly affects airline operating costs. The Government also prepared mitigation instruments in the form of government-borne VAT for domestic economy-class tickets and exemption from import duties on aircraft spare parts. From the perspective of Economic Analysis of Law, this policy shows that the domestic aviation pricing regime remains highly reactive to cost shocks, while more fundamental efficiency issues, such as input cost structures, transparency of airport charges, and market concentration, have not yet been fully addressed through long-term regulatory design.

Airfares have a negative impact on Indonesia's economic growth through a decline in demand for aviation services. In addition, the aviation industry environment, airline operational costs, and airport service fees influence the price elasticity of demand, with implications for airline performance, tourism, and aviation services. Accordingly, tariffs should not be read merely as ticket sales figures, but as the result of an incentive structure shaped by law and aviation sector policy.

The Aviation Law requires national ownership in national commercial air transport business entities, including the single majority principle, and also requires control over a certain number of aircraft for holders of scheduled commercial air transport business licenses. Normatively, these provisions can be justified to ensure safety, service continuity, operational capacity, and the protection of national interests. However, from the perspective of Economic Analysis of Law, these provisions also contain regulatory costs because they may increase barriers to entry for new actors, strengthen the position of existing actors, and reduce competitive pressure in the aviation market. Therefore, the issue is not whether these provisions should be abolished, but whether their justification remains proportionate to the social benefits produced. If entry barriers are too high and are not balanced by strong economic oversight over dominant actors, law risks maintaining structural inefficiency in the aviation industry.

Economic sustainability in Indonesian aviation law should move from mere tariff control toward a more comprehensive mechanism of economic oversight. Tariff control can indeed function as an instrument of consumer protection, but it is insufficient to address efficiency problems if cost structures and market structures are not supervised transparently. The principles of economic oversight in the aviation sector emphasize the importance of non-discrimination, cost-relatedness, transparency, consultation with users, protection of end-users, and the prevention of anti-competitive practices. In the Indonesian context, the direction of regulatory reform needs to be placed on

transparency of cost components, periodic evaluation of airport charges and fuel supply, more open consultation with service users, and closer coordination between the aviation regulator and the competition authority.

Furthermore, when linked to the green transition, this sustainability issue will not be economically viable if its financing is left to be borne entirely through ticket prices. Green bonds, sustainability-linked loans, green loans, and carbon offset programmes can play a role in bridging the investment needs for aviation sector decarbonization. Transition financing needs to be viewed as part of legal design and public policy, not merely as an airline business matter. Regulation that promotes a transition toward low-carbon aviation without providing adequate financing schemes risks transferring decarbonization costs to consumers. If this occurs, environmental policy may weaken economic sustainability and narrow public access to air transportation. Further discussion of this matter will be addressed in the sub-section on environmental sustainability.

3. Environmental Sustainability and Environmental Cost

In the environmental dimension, the main problem is not a legal vacuum, but rather the form of law that remains scattered and has not yet fully created comprehensive decarbonization incentives. Indonesia already has Government Regulation Number 22 of 2021 concerning environmental approvals, air quality, supervision, and administrative sanctions; Government Regulation Number 32 of 2021, which incorporates the preservation of the airport environment into the aviation regime; and Regulation of the Minister of Transportation Number PM 62 of 2021, which adopts noise standards for type certification and aircraft airworthiness. In addition, Presidential Regulation Number 110 of 2025 has established national carbon economic value instruments, while Regulation of the Minister of Energy and Mineral Resources Number 4 of 2025 has connected the administration of biofuel with price, safety, environmental management, incentives, and carbon economic value. This means that the normative foundation for the internalization of environmental costs has in fact begun to take shape.

The problem lies in the fact that Indonesia has not yet fully matured as an aviation decarbonisation regime. ICAO has established the Long-Term Aspirational Goal of net-zero 2050 and CORSIA as the first global market-based scheme for the international aviation sector. The European Union has gone further by combining the intra-European EU ETS and the SAF supply mandate through ReFuelEU. In Indonesia, the development of SAF is indeed real, including the government's recognition that domestic bioavtur has met national quality standards and international standards, as well as the planned gradual implementation of SAF blending. However, the mandatory blending policy itself is still in the process of formulation, so the incentives and obligations in this sector are not yet as clear as international benchmarks. From the perspective of Economic Analysis of Law, this transitional stage means that environmental costs have not yet been fully internalized and green investment has not yet been fully guided by legal certainty.

SAF becomes an important example for assessing whether Indonesian law has moved from mere normative recognition toward an operational design of decarbonization incentives. SAF should not merely be positioned as a symbol of energy transition in the aviation sector, but must be understood as a regulatory-economic instrument that is only effective when supported by sustainability standards, certification mechanisms, supply certainty, and adequate financing incentives. ReFuelEU requires the supplied SAF to meet sustainability criteria and greenhouse gas emissions saving criteria. Indonesia has opened regulatory space for biofuel through Regulation of the Minister of Energy and Mineral Resources Number 4 of 2025 and has begun to show progress in domestic bioavtur production. However, its long-term success will be greatly determined by the quality of incentive design, clarity of certification, reliability of the supply chain, and consistency in the implementation of carbon economic value. Otherwise, SAF risks becoming merely an expensive demonstrative project. From the perspective of Economic Analysis of Law, good law is not law that merely commands the use of green fuel, but law that makes compliance with the transition economically rational and environmentally measurable.

At this point, the principle of efficiency must be read and applied carefully. Environmental regulation that is too lenient allows the impacts sought to be avoided, such as emissions, noise, and ecological pressure around airports, to continue being socialized to society. Conversely, regulation

that is too strict but without financing support and a reasonable transition period may transfer all costs to ticket prices, reduce connectivity, and worsen social burdens. Policy analysis must consider objectives, efficiency, and enforcement measures, while green financing instruments are equally important for managing the uncertainty of the decarbonization pathway. This shows that efficient environmental sustainability is only possible when law combines environmental targets, economic incentives, and implementation capacity.

4. Social Sustainability and Regional Accessibility

Social sustainability concerns who can enjoy the benefits of aviation. In an archipelagic state, this question is very fundamental because air transportation does not only function as a commercial service, but also as an instrument of regional connectivity. The 2025 pioneer air transport programme is officially positioned as an instrument to maintain connectivity for remote, frontier, disadvantaged, and border areas in order to narrow gaps, reduce price disparities, and promote equitable development. In principle, Indonesian aviation law has recognized that regional connectivity constitutes a public value. Within the framework of Economic Analysis of Law, this policy can be read as a correction to market failure, because if air connectivity is left entirely to market mechanisms, many routes will not be adequately served.

This understanding is also reflected in Articles 104 and 106 of the Aviation Law. In addition to requiring the provision of pioneer air transport, the state also provides compensation in the form of granting routes other than pioneer routes, operational cost assistance, and/or assistance for fuel transportation costs. The combination of the legal basis for compensation, technical regulation through ministerial regulations, and annual tariff determination for pioneer routes shows that regional accessibility is treated as a legitimate policy objective. Therefore, social sustainability in Indonesian aviation law should not be equated with cheap tickets on all routes, but rather with a legal design that ensures that communities in areas that are not yet commercially viable continue to obtain minimum air mobility access that is reliable and safe.

Nevertheless, social sustainability does not stop at pioneer air transport. Fair access may also be disrupted when major commercial routes become too expensive for households and local economic actors. The 2026 tariff policy shows that even when the state seeks to maintain purchasing power, part of the burden of increasing input costs may still potentially be transferred to consumers through the price mechanism. Studies on the price elasticity of domestic flight tickets also show that price changes have implications for tourism performance. From the perspective of Economic Analysis of Law, regulation that only maintains the continuity of the industry but fails to maintain reasonable access for society cannot be called socially sustainable.

The social dimension also touches upon physical accessibility and the principle of non-discrimination. Article 118 of the Aviation Law requires air transport operators to serve prospective passengers fairly without discrimination based on ethnicity, religion, race, inter-group affiliation, as well as economic and social strata. In addition, aviation law also recognizes the right to services and special facilities for persons with disabilities, sick persons, elderly persons, and children. This is important because social sustainability in air transportation is not only a matter of territorial connectivity, but also of inclusive mobility. If air access is only available for certain routes, certain groups of users, or certain tariff classes, then the objective of social welfare becomes unequal. Ultimately, social sustainability requires Indonesian aviation law to have indicators that are not merely the number of routes opened or the amount of the upper tariff limit set, but whether the law truly expands people's capability to move, conduct business, obtain public services, and participate in national development through air transportation.

5. Reform toward Sustainable Air Transport Governance

Based on the discussion of economic sustainability, environmental sustainability, and social sustainability, Indonesian aviation law needs to be directed toward sustainable air transport governance that places efficiency as an instrument of social welfare. Legal reform is not sufficient if it is carried out merely by adding sectoral norms, but must connect tariff regulation, market structure, pioneer services, environmental standards, and transition financing into one coherent regulatory design. Accordingly, efficiency in aviation law is not identical with cheaper airline operations or lower ticket prices in the short term, but rather with the ability of law to generate the greatest social benefit

through a healthy market, fair air access, and proportionally internalized environmental costs. This efficiency can be categorized as follows:

a. Indonesian aviation regulation needs to strengthen the principle of economic oversight. The control of upper tariff limits remains important as an instrument of consumer protection, but it is insufficient if it is not accompanied by transparency in cost structures, assessment of cost-relatedness for airport charges and related services, consultation with users, and supervision of practices that may be anti-competitive. In this context, economic oversight functions to ensure that ticket prices are not only controlled administratively, but are also shaped by efficient cost structures and market structures.
b. The strengthening of social sustainability needs to be carried out through a more measurable design of public service obligations. Pioneer air transport programmes remain important as a correction to market failure, especially for areas that are not yet commercially viable. However, their evaluation should not stop at the number of routes or the amount of subsidies, but must be directed toward real distributional outcomes, such as service continuity, reduction of regional disparities, access affordability, and benefits for communities in remote, frontier, disadvantaged, and border areas.
c. Indonesia needs to establish a more specific aviation decarbonization regime. The existence of environmental standards, carbon economic value instruments, and biofuel regulation shows that a normative foundation has begun to take shape, but it has not yet fully become a sectoral architecture for low-carbon aviation. Therefore, the reform agenda needs to include regulatory certainty regarding SAF blending, fiscal incentives and green financing, monitoring, reporting, and verification mechanisms, as well as certification and supply chain designs that make the green transition economically rational and environmentally measurable. In this regard, what is needed is not only environmental compliance, but environmental cost governance.

The discussion of Economic Analysis of Law clarifies that the sustainability of Indonesian aviation law depends on the state's ability to integrate economic sustainability, social sustainability, and environmental sustainability into one regulatory design. Regulation that maintains the industry but narrows public access, or regulation that encourages mobility but postpones ecological costs, is equally inefficient in terms of social welfare. The efficiency relevant to sustainable aviation law is efficiency that keeps the industry viable, keeps society connected, and prevents environmental costs from continuing to be socialized to the public.

CONCLUSION

This article concludes that the main challenge in Indonesia's aviation regulation is not the absence of legal norms, but the fragmented character of its regulatory design. Indonesia has adopted various instruments concerning tariffs, market structure, pioneer air services, environmental standards, carbon economic value, and biofuel development. However, these instruments have not yet been fully integrated into a coherent framework capable of simultaneously supporting industrial viability, public accessibility, and environmental responsibility. Through the perspective of Economic Analysis of Law, efficiency in aviation law should be understood as a means to maximize social welfare, not merely as cost reduction for airlines or administrative simplification for regulators. Sustainable aviation regulation therefore requires the integration of economic sustainability, social sustainability, and environmental sustainability. In this sense, Indonesia's aviation law should move toward sustainable air transport governance that ensures a viable aviation industry, equitable access to air transport, and proportional internalization of environmental costs.

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