Research Paper

Addressing The Importance of Financed Emissions to The Indonesian Financial Sector

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Abstract

Business trends, including the disclosure of financed emissions, drive more precise sustainability reporting. Financed emissions are greenhouse gas emissions from activities or projects sponsored by financial institutions, such as banks, insurance firms, pension funds, and other financial institutions. This concept emerges from an examination of the function of a financial service institution in distributing capital to companies that emit emissions or have a high carbon footprint. This study aims to examine the phenomenon of financed emissions and formulate policy recommendations to disclose financed emissions in Indonesia. Employing a systematic literature review approach, this study discovered various emission accounting standards, including the GHG Protocol, PCAF, and new standards developed by the ISSB and TCFD. The issuance of green bond instruments, sustainable loans, and the formation of carbon exchanges all contribute to Indonesia's emission accounting reporting regime. Policy recommendations include the development of environmentally sound KYC policies for financial services institutions, the synchronization of business classification according to the Green Taxonomy or KUBL, and proposals for investment emission intensity taxation in Indonesia. However, hurdles to financed emission disclosure include data quality, complexity of the finance transaction structure's complexity, the technology's equivalency, and incomplete standard setting.

Keywords: *Financed Emissions; Financial Sector; Sustainability; Economic Growth; Green Taxonomy*

INTRODUCTION

Sustainable development has been defined as development that meets current needs without jeopardizing future generations' ability to meet their own (Scoones, 2007). This way of thinking requires diverse commercial entities to assess their operations' economic, environmental, and social repercussions (Emmanuel & Gina, 2018). Companies have recently recognized the importance of producing sustainability reports to disclose the impact of their operations on environmental, social, and governance aspects (Anderson, 2023). Sustainability reporting rules also control the measurement of emissions from direct and indirect business activities, the intensity of greenhouse gas emissions, and the entity's emission reduction efforts.

The development of the actual business sector today is inextricably linked to access to cash from the financial sector. According to Schumpeter (1934), a well-functioning financial sector will promote the rise of the real sector, which will fuel economic growth. The financial sector will supply liquidity in various instruments that the real sector can use. According to the business sector, finance will be used to execute business expansion or capital investments. However, the financial industry can no longer aggressively channel credit supply to sectors whose business operations are considered environmentally unfriendly and unsustainable.

According to the most recent data on investment performance in Indonesia (Ministry of Investment, 2023), there was a capital inflow of IDR678.7 trillion in the first semester of 2023, consisting of IDR315.4 trillion in domestic investments and IDR363.3 trillion in foreign investments. The basic metal, metal goods, non-machinery, and so on industries received IDR89 trillion; the transportation, warehouse, and telecommunications industries received IDR79.1 trillion; the mining industry received IDR71.4 trillion; the housing, industrial estate, and office

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industries received IDR58.3 trillion; and the chemical and pharmaceutical industries received IDR48.1 trillion. Based on the statistics above, the financial sector can be pushed to prioritize greener industries to support beneficial environmental consequences and establish a more sustainable economy.

In response to these conditions, the Financial Services Authority of the Republic of Indonesia (OJK) published the Sustainable Finance Roadmap and Green Taxonomy documents for 2021-2025. The Sustainable Finance plan is the second phase, focusing on seven components: policies, products, market infrastructure, ministerial/institutional coordination, nongovernmental support, human resources, and awareness (Financial Services Authority, 2021). Meanwhile, the Green Taxonomy categorizes economic activities to support efforts to protect and manage the environment, as well as to aid in the implementation of funding distribution to the green sector and to prevent greenwashing (Financial Services Authority, 2022). The Green Taxonomy is one of the roadmap's primary targets, serving as the foundation for long-term finance and investment in Indonesia.

All institutions in the financial services sector are directed to implement sustainable finance principles, submit sustainable finance action plans, and present sustainability reports to the public as the primary embodiment of the Green Taxonomy's issuance (Financial Services Authority, 2022). Regarding sustainability reporting, POJK Regulation Number 51/POJK.03/2017 concerning implementing Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies has already addressed this aspect. The KPMG (2022a) Survey of Sustainability Reporting discovered that most corporations use the GRI criteria as guidance when creating sustainability reports. However, the sustainability reporting standards used by Indonesian financial institutions are guided not only by GRI standards but also by MSCI index standards, the Sustainability Accounting Standard Board (SASB), and the Task Force on Climate-Related Financial Disclosures (TCFD).

Concerning the above-mentioned problem, the phrase financed emissions is also being created. Financed emissions are those caused by projects or activities funded by financial institutions, such as banks, insurance companies, pension funds, and other financial service organizations. This idea stems from financial institutions' significant role in providing money to sectors that emit greenhouse gases or have a high carbon footprint. Publishing relevant publications has brought the understanding of financed emissions to the attention of numerous global financial institutions and management consulting organizations. Deloitte (2021), KPMG (2022a), Luz et al. (2022), National Australia Bank (2022), Pathzero (2023), and PwC (2023) reports, for example. In reality, there is no comprehensive understanding of the practice of financed emissions in Indonesia. Financial services institutions have not yet secured additional provisions in channeling money to the emission industrial sector, this has the potential to produce a reality that is not in line with the principles of sustainable development. As a result, it would be useful to examine the attention of prior global institutions to finance emissions in Indonesian financial service institutions.

In addition, previous research has assessed the allocation of funding for reducing environmental problems. Abubakar and Handayani (2020) examined the use of green sukuk as an ecologically friendly financing instrument; Mishchuk et al. (2021) highlighted procedures that can be adopted to finance environmentally-based actions. Thompson (2021) examined corporate payments for environmental services; Rendall (2021) explained the use of public debt instruments to finance climate change mitigation; Bese et al. (2021) showed that emissions financing in India is primarily from foreign debt; Manych et al. (2021) argued that banks and institutional investors dominate CPP financing practices; and Donnelly et al. (2023) proposed the application of taxes to emission-intensive industries. This study aims to analyze the phenomenon of financed emissions

contextually and offer policies that might be applied in Indonesia to regulate the practice of financing high-emission industrial sectors.

Unlike earlier studies, this study focuses on financial mechanisms that can be offered to promote environmentally friendly investment operations. Meanwhile, this article will look from the government's perspective as a public organization with the authority to create laws and regulations regarding finance for the emission-producing sector. This paper discusses the most recent global and national sustainable finance regulations, shifting patterns through the issuance of green financing instruments, and policy implications and proposals for financed emissions that can be implemented in Indonesia. This study is expected to contribute to the literature on sustainability accounting, raise government awareness of financed emissions, and stimulate the development of laws and regulations related to sustainability issues in Indonesia's financial sector.

LITERATURE REVIEW

Financial Sector

The financial sector is frequently called the "lifeblood" of the economy. According to Ika et al. (2021), the financial sector context includes companies that provide financial services to commercial and retail consumers, such as banks, investment fund companies, and insurance companies operating in the financial services industry. Meanwhile, Patrick (1966) noted that the relationship between the financial sector and a country's economic growth can be supply-leading or demand-following. Economic growth driven by supply and resource allocation to productive sectors is known as supply-leading. Demand following refers to a situation in which economic growth stimulates demand for an expanding financial service industry. According to Patrick (1966), the two relationships above can alternate depending on economic development; the initial development stage will lead to supply-leading, followed by the concept of demand following as a country's economy grows.

According to Global Financial Development data (World Bank, 2023), Indonesia's financial sector assets have expanded over the last five years, reaching 41.26% of total national GDP in 2021. Unfortunately, this figure remains quite low compared with those of other ASEAN-5 countries, specifically the Philippines (77.74% of GDP), Malaysia (122.59% of GDP), Thailand (135.63% of GDP), and Singapore (144.2% of GDP). To address this issue, the government passed Law No. 4 of 2023 on Financial Sector Development and Strengthening aims to strengthen the financial sector's role in the national economy through institutional strengthening, governance improvement, long-term investment, consumer protection, and increasing financial sector literacy, inclusion, and innovation (Haryadi, 2023).

Emissions and Economic Growth

Economic growth analysis is expanding with the inclusion of environmental quality considerations. The core theory of the Kuznets curve, which has been changed to the Environmental Kuznets Curve, can be used to study the analysis. Bekun et al. (2021) and Elfaki and Heriqbaldi (2023) proposed an inverted U-shaped link between environmental harm and economic growth. It is also assumed that economic growth will gradually mitigate the negative environmental effects of its early stages of development by shifting from fossil energy sources to renewable energy, which is expected to maintain or scale up production while reducing emissions (Yu et al., 2022).

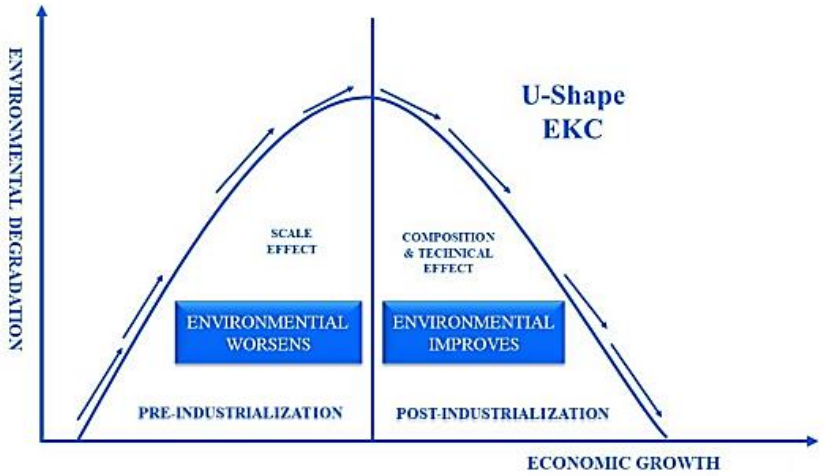

Figure 1. Environmental Kuznets Curve

Furthermore, Government Regulation No. 22 of 2021 on the Implementation of Environmental Protection and Management defines emissions as air pollutants originating from human activities that enter and/or are introduced into the air, have the potential to pollute the air, and/or do not have the potential to pollute the air. According to Ekawati (2018), greenhouse gases such as carbon dioxide (CO2), sulfur dioxide (SO2), nitrogen monoxide (NO), nitrogen dioxide (NO2), methane gas (CH4), and chlorofluorocarbons (CFCs) are examples of emissions. Indonesia is now working to attain an emission reduction target of 31.89% by 2030 with its efforts and 43.2% with international aid (UNFCCC, 2022). The following are the emission reduction targets for priority sectors.

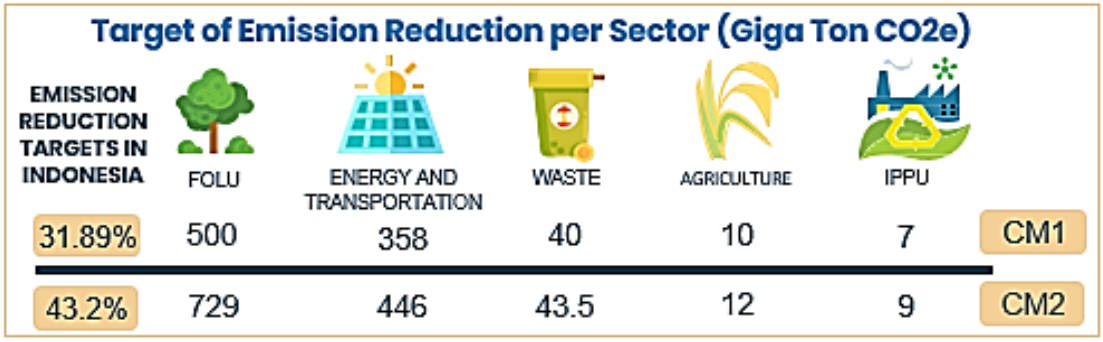

Figure 2. Priority Sector Emission Reduction Goals

Financed Emissions

Financed emissions are defined as greenhouse gas emissions caused by financial institutions' involvement in providing capital or financing to companies that emit greenhouse gases (Azoulay et al., 2022; KPMG, 2022b; Luz et al., 2022; Pathzero, 2023; PwC, 2023). Typically, financed emissions are examined alongside facilitated emissions in the form of underwriting, securitization, and management advice services (KPMG, 2022b; Luz et al., 2022). Indirect emissions from the carbon footprint of financed enterprises are projected to account for 75% of the total emissions of financial service institutions and are 700 times greater than the average direct emissions released by financial institutions. Measuring financed emissions is thus expected to provide benefits, such as climate change integration into financial institutions' business models, regulatory compliance (applicable in the United States and the European Union), increased transparency to investors, and risk management efforts (PwC, 2023).

RESEARCH METHOD

This paper's methodology is a systematic literature review that focuses on gathering and analyzing numerous papers, reports, and data related to the issue of financed emissions. This methodology was chosen because the author has criteria for literature themes and specific writing aims to provide assessments and interpretations as a basis for providing appropriate policy suggestions (University College London, 2023). The authors explored relevant literature sources using an autonomous search engine based on the Publish or Perish and Google Scholar tools. As an outcome, the author retrieved 53 Scopus-indexed works on financed emissions published between 2021 and 2023. Then, in the descriptive analysis step, the development of policy solutions connected to financed emissions in various financial sectors worldwide is explored and explained. An argumentative analysis is offered to support the proper implementation of policies on financed emissions in Indonesia.

FINDINGS AND DISCUSSION

The GHG Protocol is the primary accounting standard for reporting greenhouse gas emissions and serves as the foundation for reporting financed emissions in the indirect and derived emissions categories (PwC, 2023). The GHG Protocol reporting scope criteria include the following:

- Scope 1: direct emissions from owned and controlled entities, such as fuel combustion in machinery and transportation equipment.
- Scope 2: indirect electrical, heating, and cooling power purchase emissions.
- Scope 3: Other indirect emissions that occur in the value chain of the firm, such as investment activities, customer and supplier services, and business and employee travel.

Scope 3 includes financed emissions operations in the context of the GHG Protocol as a substantial component of the corporate value chain (Luz et al., 2022). Recently, the Partnership for Carbon Accounting Financials (PCAF), a group of European banks, established a global standard for measuring and reporting financed emissions (Pathzero, 2023). PCAF divides asset types into seven categories: stock market equities and bonds, business loans and non-stock exchange equities, project finance, commercial real estate, mortgages, car loans, and public debt (PwC, 2023). PCAF's financed emissions reporting standard has also been updated to include a methodology for attributing emissions to each holder of a public debt instrument, a methodology and standards for eliminating carbon emissions from investment activities, and increased comparability of emissions attribution.

Several affluent countries, including the United States, the United Kingdom, the European Union, Australia, and New Zealand, are considering enacting financed emissions disclosure regulations (Pathzero, 2023). The Securities and Exchange Commission (SEC), a US capital market regulator, is developing disclosure standards for emissions and environmental hazards and a plan for listed businesses to achieve net zero emissions. The SEC's actions are consistent with the ISSB's climate accounting framework, established as part of IFRS. In the United Kingdom and New Zealand, regulations on reporting climate risks associated with corporate activities based on the Task Force on Climate-associated Financial Disclosure (TCFD) standards have been implemented for more than 1,500 significant firms and financial institutions. Similarly, laws in the European Union mandated disclosures connected to energy transition and environmental hazards, including financed emissions, beginning in December 2023 through the European Banking Authority. In addition, the Australian Federal Government has released an environmental risk disclosure framework that aligns with current global practices.

In addition to the aforementioned standards, the GRI G4, SASB and MSCI guidelines govern the application of sustainability disclosure standards relevant to financial service institutions. The

author uses the example of one of Indonesia's top banks, which has committed to applying some of these requirements. The GRI G4 standard has established the FS5 criterion for interactions with clients, investors, and business partners regarding environmental and social risks and opportunities, as well as the FS10 criterion for the percentage and number of companies in the institution's portfolio with which the reporting organization interacts on environmental or social issues. The SASB standard then includes a sub-discussion on incorporating governance, social, and environmental concerns in credit analysis, which includes credit clearance by industry and techniques to incorporate environmental, social, and governance factors into credit analysis. This provision is also governed by the MSCI Index, which highlights the main aspects of credit policies aimed at biodiversity, energy consumption, mining, oil and gas, and due diligence.

Financed emissions are also inextricably linked to funding sources accessible in developing countries. In the example of India, following the global financial crisis in 2008, substantial amounts of foreign loans were utilized to establish government investments that might increase the labor market, allowing financing to flow to industries with high emissions (Bese et al., 2021). This study also establishes an inverted U-shaped relationship between exhaust emissions and economic development, following the Environmental Kuznets Curve idea proposed. Furthermore, Manych et al. (2021) revealed that coal-fired power plant building is widespread in Asia, with most of the money coming from banks and investment companies. This analysis discovered that financed emissions from the construction of coal-fired power stations in Indonesia were 1.4 GtCO2, with a total funding of US$23.4 billion. This demonstrates the importance of strategic policy recommendations for achieving sustainable development goals.

In response to previous financing regulations that were less environmentally conscious, green financing products, such as securities or green bonds, are now being optimized in the financial sector. The Financial Services Authority Rule Number 60/POJK.04/2017 of 2017 on the issue and Requirements of Environmentally Sound Debt Securities (Green Bonds) is a major rule in Indonesia that has enabled the issuance of green bonds. This rule will be the cornerstone of organizations that issue environmentally responsible debt financing. This regulation then conforms to the concept advanced by Rendall (2021) and Puspitasari and Indriastuty (2023) that the issuance of debt-based financing instruments are the most adequate and feasible solution to support projects that can mitigate the effects of climate change, such as the provision of renewable energy-based infrastructure.

In light of recent developments in Indonesia, government and private sector entities have successfully issued several green bond instruments. According to Pahlevi (2022), the government raised US$4.3 billion, or roughly IDR62 trillion, by issuing green bonds throughout the 2018-2021 timeframe, based on the Climate Bonds Initiative report. In the meanwhile, at least Bank Mandiri, Bank BRI, PT SMI, PT PLN, and Pertamina Geothermal Energy have issued green bond instruments to the capital market to support investments in renewable energy assets (Climate Bonds Initiative, 2022; Yogatama, 2023). Furthermore, sustainable loans disbursed by the country's four largest banks have reached Rp290 trillion, or roughly 10% of overall credit (Ayuningtyas & Pradana, 2023). This demonstrates that access to financial sources and responsibility pledges to deliver green initiatives have gotten critical attention.

Not to mention, in September 2023, the Indonesian government will establish a carbon exchange. The implementation of Presidential Regulation Number 98 of 2021 regarding the implementation of carbon economic value will be realized with the introduction of the carbon exchange in Indonesia. Carbon trading transactions in Indonesia are expected to total approximately $1–15 billion annually (Intan, 2023). Although the government is still waiting for OJK regulations on the supervision and implementation of the carbon exchange, the government

remains optimistic that the carbon exchange will absorb up to 400 GtCO2 through reduced emissions in the oil and gas sector (Heriyanto, 2023). Because private businesses will be incentivized and feel legitimate in seizing cash prospects from emissions trading, the great economic potential of carbon exchanges may induce more intensive emissions reporting. It moves the importance of reporting emissions from stakeholders or regulatory compliance to self-preservation and economic opportunity (Deegan, 2014).

The carbon trading exchange will function by buying and selling carbon credits to enterprises that emit carbon emissions that exceed legal limits (Asqolani, 2023). A carbon credit is a privilege granted to a firm to emit carbon or greenhouse gas emissions in its industrial activities, equivalent to a reduction of 1 ton of CO2. Indonesia has a large forest area, an advantage that must be capitalized on through carbon exchange. According to a study conducted by the Coordinating Ministry for Economic Affairs, Indonesia's carbon economy potential is estimated at US$565.9 billion, or more than Rp8,000 trillion, with the proportion of carbon credits utilized from tropical forests (22.22%), mangrove forests (29.16%), and peatlands (48.62%). Pertamina Geothermal received Rp11 billion in revenue from carbon credits from the Ulubelu and Karaha Geothermal Power Plant, decreasing carbon emissions equivalent to 1.7 million tons of CO2 (Santi, 2023).

Given the economic benefits businesses can achieve by implementing the carbon economy in Indonesia, the government can further restrict the laws on emissions disclosure, excluding financed emissions. According to Deloitte (2021) and Azoulay et al. (2022), reporting emissions from entity operations sponsored by financial institutions can be evaluated using a six-step reduction plan. The first step is to assess the financed emissions baseline, which includes the sector being measured, asset class, entity's business value chain, greenhouse gases being measured, emissions scope, measurement duration, legal justification, and adequate data. The measurement is followed by a projection of the momentum of a specific case, the selection of a reference scenario, the determination of how to achieve the plan and capture the opportunity, the setting of the financed emissions target based on the selected reference scenario, and the execution and creation of opportunities at the financial services institution. The following figure depicts the method for measuring financed emissions.

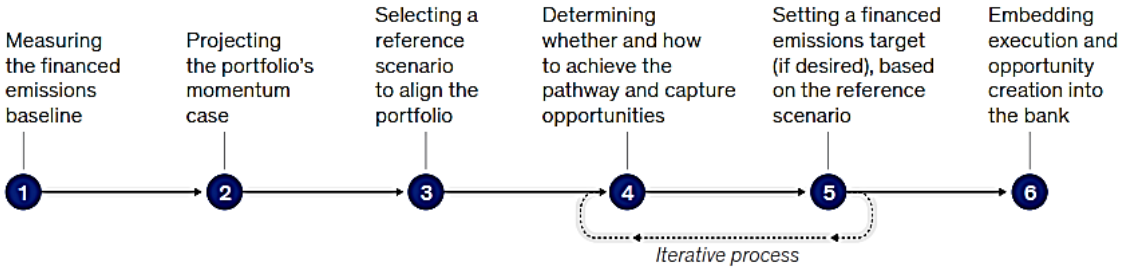

Figure 3. Measurement Process of Financed Emissions

Given the developments and recommendations in the preceding discussion paragraphs, numerous policy ideas for financed emissions can be adopted. The proposed policies listed below have been updated for relevance to the current situation, readiness, and repercussions if enacted in Indonesia.

First, the Indonesian Financial Services Regulator, primarily the OJK and the Ministry of Finance, can develop further regulations for the disclosure of emissions from the commercial activities of businesses sponsored by financial institutions and the Indonesian capital market. Government, Presidential, or related OJK Regulations may govern this norm. The reporting standard will supplement sustainability reports, which may be presented with or independently

from the entity's annual report. Early-stage emissions reporting should refer to and adopt the PCAF, GHG Protocol, and TCFD standards. The relevance of the three scopes of emissions reporting, namely Scope 1 (direct emissions), Scope 2 (indirect emissions from power/fuel purchases for industrial activities), and Scope 3 (indirect emissions from the industrial value chain, including financed emissions), should also be prioritized. Regulations on emissions reporting would further enhance POJK Number 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies.

Second, each Indonesian financial service institution should begin to establish an internal financing policy that is more geared toward projects that balance concern aims and environmental considerations. This policy can be applied through each financial service institutions know-your-customer (KYC) policy. This policy may also include references to the GRI 4 standard, MSCI, and the SEOJK Index Number 16/SEOJK.04/2021. GRI Standard 4 emphasizes the environmental and business components influenced by company operations, risk management, and monetary value measurement of the entity's products and services.

The MSCI identifies ESG risks by evaluating financial services institutions' due diligence processes, including target debtors, creditworthiness analysis, and willingness to be supervised during the credit duration. Furthermore, MSCI increases financial services institutions' commitment to the importance of sustainable business activities as a target for lending, financing, and investing. Finally, the SEOJK Index governs the provision of environmentally friendly products, energy use, emission intensity measurement and reduction efforts, and commitment to biodiversity preservation. The three aforementioned references are a full package that may be integrated to help financial service institutions improve their KYC policies.

McKinsey, a worldwide consulting firm, offers more recommendations on KYC issues (Azoulay et al., 2022). A loan scenario analysis matrix representing the Y-axis as the responsiveness and ambition of financial service institutions to green financing initiatives and the X-axis as the expected speed of a country's green energy transition can be used to build financial service institutions' disbursement strategies. The report also suggests examining the economic implications of emissions, assessing the danger of financed enterprises' involvement in emissions production, and focusing financial service institutions on business growth and optimizing the momentum of carbon credit trading. The risk assessment matrix is presented below.

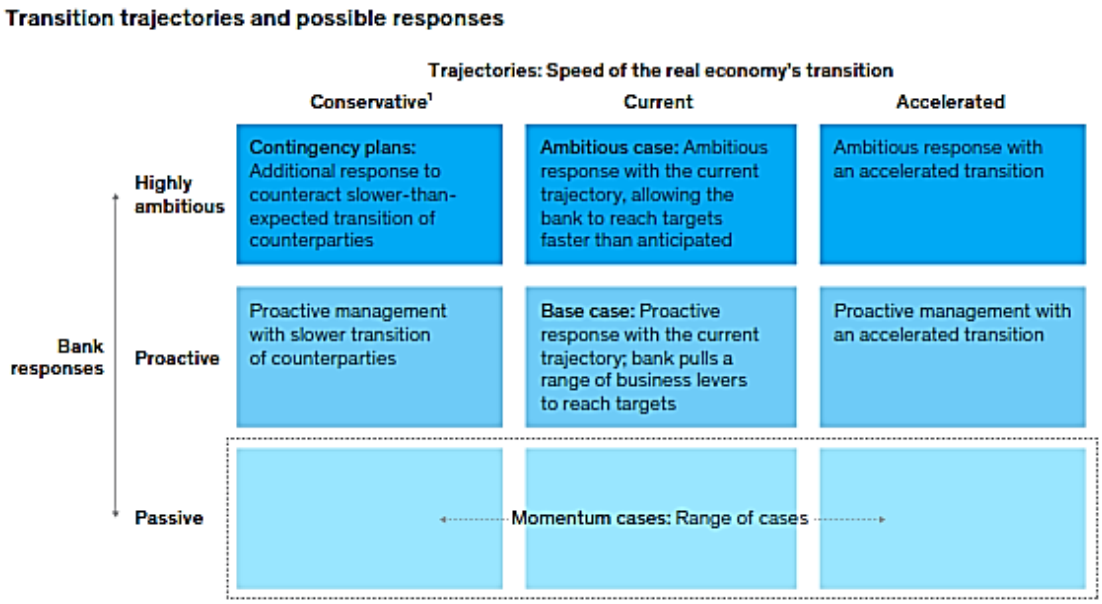

Figure 4. Scenario Analysis of Financial Institution Financing distributions

Furthermore, according to the Deloitte (2022), financial service institutions can introduce new financial products and service policies through mitigation methods to reach carbon neutrality targets. Exclusion, which is the exclusion of companies that do not meet the "green" criteria; engagement, which is the agreement between the financial services institution and the debtor to commit to environmentally friendly industrial activities; introduction of new products and services by financial services institutions relevant to green financing; and divestment of sectors that are not in line with the environmental insights that. The mitigation plan matrix is shown in the following figure.

Figure 5. Emissions Mitigation Strategy Matrix

Third, financial service institutions can be directed by the Green Taxonomy provided by OJK (2022), which includes the Indonesian Standard Industrial Classification (KBLI) as a structural basis for prioritizing finance distribution. The Green Taxonomy has 2,733 subsectors, 919 of which have been classified. Meanwhile, 15 subsectors qualified as green categories, and up to 904 subsectors cannot be classified directly into green sectors. The Green Taxonomy is anticipated to aid financial service institutions in categorizing green activities to develop financial services-related products and services.

Previously, based on POJK Regulation Number 60/POJK.04/2017 of 2017 concerning the Issuance and Requirements of Environmentally Sound Debt Securities (Green Bond), the provisions of 11 Environmentally Sound Business Activities (KUBL) that aim to protect, repair, and/or improve the quality or function of the environment were regulated. Renewable energy activities, energy efficiency, pollution prevention and control, sustainable management of biological resources and land use, conservation of land and water biodiversity, environmentally friendly transportation, sustainable water and wastewater management, climate change adaptation,

products that reduce resource use and pollution, environmentally sound buildings, and other environmentally sound activities are all covered by the KUBL. The two guidelines published by the OJK can also be used as a supplement by financial service companies when developing a comprehensive KYC strategy.

Fourth, as fiscal authority, the government or the Ministry of Finance can investigate the imposition of taxes on investment activities that create high emission intensity. This idea adapts Donnelly et al. (2023). Taxes will be levied on entities that own investment funds (investment emission intensity taxation/IEIT) with investment portfolios of activities/projects emitting emissions above a particular level. This tax is intended to reduce the emission intensity of investment activities or financing directed toward high-emission businesses. The tax policy is projected to improve investors' commitment to reaching net-zero emissions, and it aims to supplement carbon trading instruments and move the private finance paradigm toward low-carbon investments.

However, in addition to the numerous opportunities and policy ideas that are appropriate for implementation in Indonesia, there are some problems that financial sector authorities in Indonesia must examine in the context of financed emissions. First, financial service institutions face data quality difficulties when quantifying emissions from their investment and financing activities. Investment firms may have hundreds of finance and banking portfolios with millions of customers in many industries, making calculating emissions from these portfolios problematic (Pathzero, 2023). A comprehensive emission analysis must also consider the intensity of the specific asset class or activity financed by each portfolio (PwC, 2023). Given these limitations, PCAF has worked to create a data hierarchy and scorecard for entities to utilize in understanding, tracking, and developing strategies to enhance the quality of their emissions data.

Second, the funding mechanism provided by financial service institutions makes accounting for the emissions emitted by a portfolio challenging (Pathzero, 2023). Current finance systems can be multi-tiered, making it difficult for financial service institutions to obtain credible carbon emissions data and must rely on data maintained by investors with whom they have direct contact. Even if it exists, the data's authenticity may be questioned. As a result, measuring financed emissions necessitates structured collaboration among multiple financial sector stakeholders to create more trustworthy emissions data management.

Third, technology issues, such as integration and automation, can create obstacles, making measuring emissions data more complex. Fourth, as a result of the COP26 summit, the calculation of financed emissions is truly an agenda (goal setting), so the commitment to support the attainment of net zero emissions is not necessarily the same issue for all participants in the financial services business, including Indonesia. At this point, financial services institutions must agree that achieving global decarbonization targets cannot be divorced from the contribution of the investment/financing portfolio developed (PwC, 2023).

Furthermore, the measurement of financed emissions, particularly based on the PCAF standard, has limits (Luz et al., 2022). For example, PCAF provides rules for computing emissions for only six asset classes. Furthermore, the PCAF does not yet provide measurement parameters for emission reduction initiatives or the advantages that might be obtained from financing the transition away from emitting. Another factor to consider is that the success of financed emissions must be supported by the energy transformation strategies of the industries receiving funding. Financed emission analysis is not the only indicator for assessing an institution's portfolio of environmental risks. Other measures could look at emissions production per unit of activity, such as megawatt hours in the power generation sector, tons of coal in the coal mining sector, and square meters in the real estate sector.

Finally, changes in investor appetite have boosted knowledge and attention to information about industry sectors' greenhouse gas emissions. Disclosure of emissions from financial services institutions' investment and financing portfolios is required to provide a broader understanding of the risks and possibilities associated with decarbonization activities (Luz et al., 2022). Disclosure of financed emissions may lead to the creation of expectations and investment decisions. The emission production for a company can also be compared to the inherent risk that is kept to a minimum. In other words, just as with risk management, the important thing to do is to minimize and enhance the commitment to reducing emissions (Azoulay et al., 2022; Pathzero, 2023; PwC, 2023).

CONCLUSIONS

The demand for disclosure of financed emissions by enterprises in the financial service sector drives the creation of sustainability reporting requirements. Financial institutions' provision of finance to high-emitting businesses has resulted in the establishment of emissions accounting standards such as the GHG Protocol and PCAF and the initiation of standards by ISSB and TCFD. Previously, sustainability disclosure requirements such as GRI G4, SASB, and MSCI were employed. According to recent advances in Indonesia, an ecosystem that promotes implementation of climate accounting is now established by issuing green bonds, sustainable loans, and introducing carbon exchanges. The resulting economic potential is projected to encourage company engagement in disclosing the value of emissions created, notably for financial service institutions in the context of financed emissions.

Relevant policy proposals include requiring emissions disclosure for business activities that receive financial service institutions' financing, implementing environmentally sound KYC policies for financial service institutions, shifting focus to activities that follow the Green Taxonomy or KUBL guidelines, and investigating the possibility of taxing the emission intensity of investment activities. However, hurdles to reporting financed emissions must be overcome, such as data quality difficulties, the complexity of current financing structures, technology integration, and regulatory gaps in existing standards. In general, reporting emissions output can be equivalent to risk mitigation efforts undertaken by any company.

LIMITATION & FURTHER RESEARCH

One of this study's weaknesses is the scarcity of scientific literature that expressly evaluates emission management, particularly financed emissions. Since the financed emissions are a novel concept; thus, the extant literature is restricted to reporting, news, or brief essay articles. As a result, the author must compile available sources into a comprehensive scientific literature narrative. Furthermore, because this research is still limited to a systematic literature review, it is still dominated by the author's viewpoint on the topic presented based on the literature study results.

Future research is intended to investigate more thorough analyses, including case study methodologies and quantitative calculations on financed emissions, to quantify the impact of emissions on the financial industry, both nationally, regionally, and worldwide. The goal is to estimate the value of financed emissions more clearly and quantitatively within the financial sector. Nonetheless, the author thinks that financed emissions will inspire policy conversations among Indonesian financial sector authorities, such as the OJK and the Ministry of Finance, to issue reliable emission regulation laws. Furthermore, this research aims to promote public and investor understanding of the phenomenon of financed emissions concerning the choice of an environmentally friendly economic sector.

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