

SUSTAINABLE FINANCING MODEL FOR FINANCIAL SERVICE INDUSTRY (BANK) ON CARBON TRADING IN INDONESIA

Overview

Climate change and global warming are influenced by the amount of carbon emitted into the atmosphere. The rate at which carbon emissions are causing environmental damage, including an increase in the earth's surface temperature, global climate change, rising sea levels, and even disruptions in the food supply chain, is far quicker than scientists projected (Zhu et al., 2013). Indonesia has ratified the Paris Agreement; thus, the government has to implement a Nationally Determined Contribution (NDC) strategy immediately. The Nationally Determined Contributions (NDCs) are the pledges of each state signatory to the Paris Agreement and describe the efforts Indonesia must take to strengthen environmental protection over the period 2015-2019 in order to achieve more ambitious targets beyond 2020.

The Article 2.1(c) of the Paris Agreement states that the financial sector is essential for facilitating the transition to zero-carbon energy (UNFCCC 2018; Whitley et al., 2018; Chenet et al., 2019). With low-carbon development, the financial sector plays an important role in promoting and accelerating the transition to a green economy. This is because financial markets serve as a source of capital for economic activity, which can have both good and negative effects on the environment. Therefore, Indonesia must take strategic moves toward a low-carbon and climate-resilient future to fulfil its transitional goals for future development.

Methods

This research employs a quantitative methodology since the produced data are numerical and are examined using a statistical method or model (Bungin, 2008). This research employs cause-and-effect thinking, which is reduced to certain variables, hypotheses, and research questions. This study will also investigate the application of sustainable finance theory to the carbon trading system. Climate change is a global challenge to human society's sustainable growth. If the impact is not contained, it can endanger various human lives, including economic, social welfare, and the environment. High greenhouse gas (GHG) emissions, particularly carbon by-products, are the primary factor attributable to human activity in this occurrence (Rafieisakhaei et al., 2017). The financial sector's involvement in environmental protection is essential for addressing the dynamics of hazards posed by extremely complicated climate change (emission reduction). The issue of sustainable finance in carbon trading is dynamic and intricate (there is feedback between variables) since it involves considerable sectors and parties; thus, it must be tackled comprehensively.

Results & Discussions

The mental model is built on the relationship between variables based on a review of the literature and the results of interviews with informants. Figure 1 shows the Causal Loop Diagram, which is a diagram that describes the causal (cause and effect) relationship between one variable and another and forms feedback.

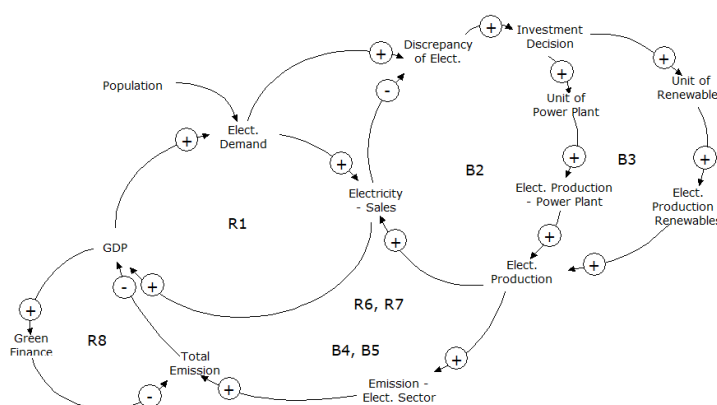


Figure 1. Causal Loop Diagram Model

The purpose of this modelling is to simulate the role of the financial services industry in reducing greenhouse gas emissions through sustainable financial instruments in carbon trading transactions. Electricity is an example of a case selected to examine the connections between economic activities that generate emissions and the financial services sector. The electricity sector was chosen as an illustration because this industry is one of Indonesia's leading emitters. The behaviour of GDP and population growth affects the fluctuating electricity consumption needs. Based on the data of reference available for this research, the production of electricity and the current emissions situation in Indonesia is expected to increase until

2030. In the absence of preventative action (particularly in the energy or electricity sector), emissions will continue to rise after 2023. In this study, we intend to implement two interventions that are anticipated to substantially impact reducing carbon emissions in Indonesia, as shown in Figure 2 and Figure 3.

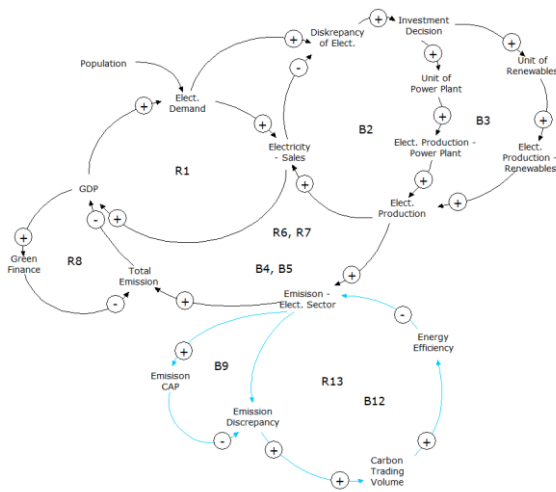


Figure 2. Intervention 1 – Implementation of carbon trading

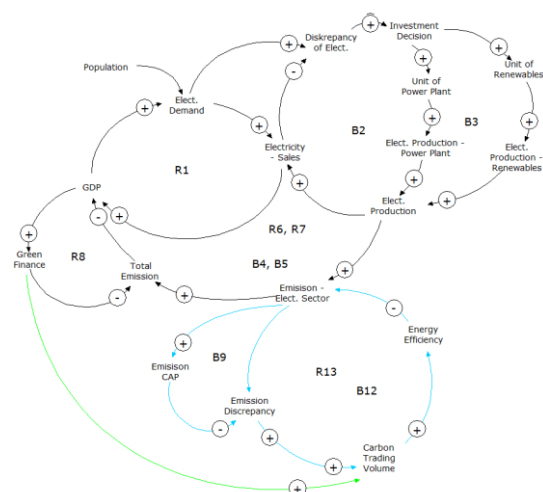


Figure 3. Intervention 2 – Implementation of carbon trading with the assistance of sustainable financing

The volume of carbon trading is depicted as the entity's capacity (indicated in this case by the company's capital allocated to purchase carbon credits). The greater the allocation of capital, the greater the volume of carbon trading. The emission gap (the difference between the electricity sector's emissions and the carbon trading volume) will widen, resulting in even greater emission reductions.

In addition, this study defines sustainable financing as efforts or contributions made or provided by financial service institutions to encourage investment in low-carbon initiatives and accelerate green transitions. In this instance, the contribution is implemented through the distribution of Sustainable Business Activity (KKUB) Loans. The authors predict that the need for adequate funding to support low-carbon initiatives will be one of the most significant obstacles to reducing emissions. Sustainable finance can assist in overcoming this barrier by providing suitable financing options, such as green bonds, sustainable loans (credit), and venture capital that explicitly target carbon-reduction projects.

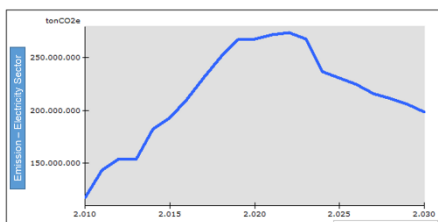


Figure 4. The results of intervention 1 – Implementation of carbon trading

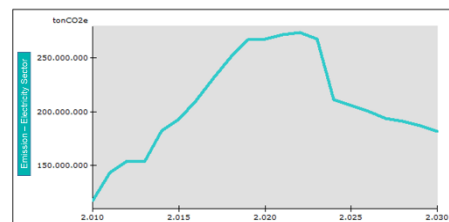


Figure 5. The results of intervention 2 – Implementation of carbon trading with the assistance of sustainable financing

From the simulation results of first intervention, *i.e.*, the implementation of carbon trading, it is evident that there is an increase in the volume of carbon trading, resulting in a decrease in emissions in the electricity sector. However, by implementation of carbon trading with the assistance of sustainable financing from financial services institutions (as shown in the second intervention), it has resulted in more effective (high) emission reductions in the electricity sector, as evidenced by an increase in sustainable financing from financial services institutions.

Conclusions

Appropriate allocation of sustainable financing can incentivize low-carbon investment, broaden access to green finance, and increase the adoption of sustainable business practices to reduce greenhouse gas emissions. Financial institutions play an essential role in society by facilitating transactions, providing liquidity, and building capacity. In the carbon market, their functions should be identical. These key features will help convert the voluntary carbon market, currently dominated by over-the-counter trading, into a more liquid, transparent, and widely accessible market with a reasonable price. As a consequence of increased regulation, financial institutions will be able to participate in carbon trading through various means.