



# Contemporary Accounting Case Studies

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Volume 3, Nomor 2, September 2024

Article 10

## ANALYSIS OF CARBON TAX IMPLEMENTATION READINESS ON COAL-FIRED POWER PLANT COMPANY IN INDONESIA

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# ANALYSIS OF CARBON TAX IMPLEMENTATION READINESS ON COAL-FIRED POWER PLANT COMPANY IN INDONESIA

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## ABSTRACT

Climate change due to the increase in the earth's temperature is an increasingly serious threat to mankind and planet earth. To overcome climate change and its negative impacts, Indonesia as one of COP21 participants has committed to reducing GHG emissions by 29% on its own and 41% with international support by 2030. Following up on this, the government in article 13 UU HPP agreed to impose carbon tax starting April 1, 2022 for the coal-fired power plant sector with a cap and tax scheme. However, carbon tax implementation is postponed until 2025. Technical rules for carbon taxes and carbon market mechanisms are not yet ready. Collecting carbon taxes in coal-fired power plants is administratively complicated and expensive. On the other hand, 66% of electricity production in Indonesia still comes from coal-fired power plants. The imposition of carbon tax on coal-fired power plants have domino effects. The results of previous research suggest that the carbon tax be levied at upstream sources where the tax collection method is administratively easier and more efficient. Furthermore, Government must pay attention to time appropriate to implement a carbon tax by looking at the readiness of the industry. This study aims to analyze the design of carbon tax collection and evaluate the readiness of coal-fired power plant companies in implementing carbon tax. By using documentation and interview techniques, the research results show that the uncertainty of carbon tax regulations, the government and coal-fired power plants' unpreparedness, have resulted in delays in the implementation of carbon tax.

**Keywords:** *Carbon Tax, Coal-Fired Power Plant, Company's Readiness, Implementation Postponed.*

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## 1. INTRODUCTION

Climate change due to the increase in the earth's temperature is an increasingly serious threat to humanity and the planet earth. Climate change is a natural event that can be explained scientifically and is considered a natural thing. However, after the industrialization era, climate change became a very important issue. As the result of the Intergovernmental Panel on Climate Change (IPCC) report, the climate change process is moving faster and the impacts of climate change are being felt more and more widely in various aspects of people's lives and are increasingly being felt by human beings in various parts of the world.

To address climate change and its negative impacts, world leaders through the United Nations Climate Change Conference (COP21) in Paris agreed to the Paris Agreement on 12 December 2015. Indonesia as a participant at COP21 has committed to reducing greenhouse gas (GHG) emissions by 29% by own capabilities and 41% with international support by 2030.

Following up on this, the government in article 13 of the Law on Harmonization of Tax Regulations (UU HPP) agreed to impose a tax of at least IDR 30 per kilogram of carbon dioxide equivalent (CO<sub>2</sub>e) for carbon emission contributors starting April 1, 2022.

For the initial stage, the carbon tax is applied in a limited manner to the coal power plant sector over 100 MW. According to Dyarto and Setyawan (2021), the coal industry and power generation companies that use coal as fuel are large carbon-intensive industries. The carbon tax is implemented in a limited way in coal-fired power plants because this sector is considered more controlled, making it easier to implement carbon tax policies. Furthermore, 32 coal power plants have undergone voluntary carbon trading trials (cap, trade, and offset) in March – August 2021.

However, the government eventually postponed implementing the carbon tax until 2025 (CNBC, 2022). According to a tax researcher, Fajry Akbar, the implementation of the carbon tax which is targeted to be implemented in 2022 is not quite right. This is because energy commodity prices are still very high. Furthermore, the delay in implementing carbon taxes until 2025 indicates that the government is not yet ready to implement carbon taxes. Bearing in mind, the carbon tax was not prepared properly from the start and seemed to have suddenly been included in Law Number 7 of 2021 (CNBC, 2022). Furthermore, the rules regarding carbon trading were not previously mentioned in the draft law.

Previous research conducted by Ratnawati (2016) has suggested that carbon taxes be imposed on upstream sources where the tax collection method is administratively easier and more efficient than the imposition of carbon taxes on downstream sources, but this study has not examined industry readiness in the context of implementing carbon taxes. Meanwhile, based on the press conference of

the Ministry of Finance (2021), a carbon tax will be implemented for the initial stage in the coal power plant sub-sector with a cap and tax scheme, where research conducted by Sutartib and Purwana (2021) states that the cap and tax scheme is basically a combination implementation of the NEK by using a carbon trading scheme (cap and trade) as well as a taxation scheme (carbon tax) with a direct emission approach which is administratively more complicated and expensive. However, the cap and tax implementation scheme in this study was only carried out based on a documentation study. Furthermore, research on the readiness of companies in implementing carbon taxes was conducted by Ciptaningrum (2022), but this research was only limited to steel companies.

Based on the background that has been described, this study attempts to analyze the design of carbon tax collection in Indonesia. Furthermore, this study also evaluates the company's readiness, the obstacles encountered, and alternative solutions to the obstacles encountered in preparing for the implementation of a carbon tax on coal-fired power plants in Indonesia as a sub-sector subject to carbon tax at an early stage. Thus, this research can draw a common thread from the regulatory and corporate side regarding delays in implementing carbon taxes and in the end this research can provide recommendations based on best practice from countries that have implemented carbon taxes.

## **2. LITERATURE REVIEW**

### **2.1. CARBON TAX DESIGN**

Carbon taxes can be imposed through two approaches, namely the direct emission approach and the fuel approach. The direct emissions approach levies carbon taxes based on the activity that generates emissions, while the fuels approach levies carbon taxes based on fossil fuels. Different approaches have different carbon tax designs. The design should specify which sectors, subsectors or economic activities to target. This is broader than the type of fuel, emissions, or facilities covered.

Based on the United Nations (2021), the following are the main elements in the design of a carbon tax. (1) The tax base defines what will be taxed and determines the different approaches to carbon taxation. In the case of the Direct Emissions Approach, the tax base is emissions, usually CO<sub>2</sub>, but can be extended to other GHG emissions. In the case of the Fuel Approach, the tax base is the fuel that emits CO<sub>2</sub> when burned. (2) The tax rate refers to the rate or cost price of carbon emissions to be set. (3) Taxpayers are economic agents who pay taxes. Taxpayers must be clearly identified and regulated. In the case of the Direct Emission Approach, the taxpayer is the facility that generates emissions. In the case of the Fuel Approach, there may be some flexibility as to who can become a taxpayer. (4) The tax administration

authority is a public body in charge of administering taxes or supervising its administration. Usually the tax authorities are responsible for taxation, but in the case of the Direct Emissions Approach, the role of environmental agencies will be critical in verifying and controlling the emissions data submitted by the responsible taxing authorities.

## **2.2. INDUSTRY READINESS ASSESSMENT BASED ON THE ERIA FRAMEWORK**

The ERIA Industry 4.0 Readiness Assessment for the Circular Economy framework was developed by the Economic Research Institute for ASEAN and East Asia, which is an international organization established through an agreement between sixteen countries in the East Asia and ASEAN regions to carry out research activities and make policy recommendations for more economic integration. further in East Asia and ASEAN. This framework is a series of indicators to assess company operational policies related to business readiness in implementing a circular economy. The core values of the circular economy are achieving efficient use of resources, making the most of resources, and avoiding external externalities.

Circular economy assessment has been widely used as an effective tool to improve energy efficiency and resource utilization rates, especially in waste systems (Michelini et al. 2017; Sanzes et al., 2017; EPU, 2016). Circular economy aims to reduce resource input and emission output. This presents a new pattern of economic operation built on the concept of reduction, reuse and recycling (3R) which offers great opportunities to improve energy efficiency and resource utilization as well as reduce CO2 emissions (Heshmati, 2016).

ERIA (2020) has evaluated the readiness of industry 4.0 and circular economy in Indonesia at PT Siemens Indonesia and textile companies. In this study, the ERIA framework is used because it can assess the level of readiness in terms of a circular economy, where the collection of carbon taxes is one of the efforts to create a circular economy. Ciptaningrum (2022) uses the ERIA framework to evaluate the level of readiness of steel companies for implementing carbon taxes.

There are several determinants in the ERIA framework for assessing industrial readiness, namely organizational strategy, plant and equipment, information technology systems, human resources, finance and investment, and energy management.

### **3. RESEARCH METHODS**

This research uses a case study research method with a qualitative method approach, where the research strategy of this method usually emphasizes words rather than quantification in data collection and analysis (Bryman, 2012). The case study in this research is a single case study, where the object of the case study in this research is PT ABC. Furthermore, the research was conducted by collecting data sourced from primary data by conducting semi-structured interviews and secondary data using documentation techniques. Meanwhile, the analysis technique used in this research is to use thematic and content analysis. For determinants and criteria based on the ERIA Industry 4.0 Readiness Assessment framework for the Circular Economy, refer to previous research conducted by Ciptaningrum (2022). Each determinant has specific criteria for assessing readiness from a scale of 0 to 4. Each criterion has a maximum value of 4. With 7 criteria in this study, the total maximum score is 28, with an assessment category 0-7 = not ready; 8-14 = less ready; 15-21 = ready; 22-28 = very ready.

### **4. ORGANIZATION PROFILE**

PT. ABC is a State-Owned Enterprise that takes care of all aspects of electricity in Indonesia. One of PT ABC's business activities, namely the exploitation or operation of coal-fired Steam Power Plant (PLTU) centers. Based on the Regulation of the President of the Republic of Indonesia Number 71 of 2006 dated 5 July 2006 which was later amended by Regulation of the President of the Republic of Indonesia Number 59 dated 23 December 2009, the Government assigned PT ABC to build coal-fired power plants in 42 locations in Indonesia, covering 10 power plants with a total capacity 7,490 MW in Java - Bali and 32 power plants with a total capacity of 2,769 MW outside Java - Bali.

Until the end of 2020, PT ABC controls, owns and operates around 70% of Indonesia's electricity generation capacity. PT ABC is also the sole buyer of electricity produced by private companies (IPP), including electricity from renewable energy. In total, PT ABC operates power plants with a capacity of more than 63,336 MW (Company Profile PLN, n.d.). Furthermore, the coal-fired power plant operated by PT ABC produces around 66% of PT ABC's total electricity production.

In addition, in March - August 2021, the Ministry of Energy and Mineral Resources has conducted a trial of carbon trading between 32 coal-fired power plants with the aim of introducing carbon trading to stakeholders with the concept of cap, trade and offset. Of the 32 coal power plant units that are conducting carbon trading trials, 26 coal power plant units belong to PT ABC.

The department that is the object of research is the department of energy transition and sustainability, where the department is the department that pilots carbon trading and carbon taxes at PT ABC.

## **5. RESULT AND DISCUSSION**

### **5.1. DESIGN OF CARBON TAX COLLECTION FOR COAL POWER PLANTS IN INDONESIA**

- Tax Rate

Based on article 13(9) of Law no. 7 of 2021, the carbon tax rate is set at a minimum of IDR 30.00 (thirty rupiah) per kilogram of carbon dioxide equivalent (CO<sub>2</sub>e) or an equivalent unit. According to Simatupang et al (2021), the tax rate set by the Indonesian government of IDR 30 per kg CO<sub>2</sub>e or US\$ 2.13 per tonne CO<sub>2</sub>e is one of the lowest carbon tax rates in the world. Meanwhile, a study conducted by Strand (2020) states that the estimated effective carbon tax rate for Indonesia is around US\$ 21 to US\$ 42. Meanwhile, according to Ratnawati (2016), the carbon tax rate at the initial determination is IDR 80,000 per tons of CO<sub>2</sub> and increased 5% per year to reach IDR 300,000 per tonne of CO<sub>2</sub>. Indonesia is still very dependent on fossil fuels so that the low carbon tax rate collected at the initial stage aims to build awareness among business actors to switch to environmentally friendly technologies. Therefore, revenue generation is not the main goal of a carbon tax.

- Tax Base

The carbon tax will be imposed on coal-fired power plants above 100 MW at an early stage. This is in line with article 7(3) of Presidential Regulation No. 98 of 2021 whereby the power generation sub-sector is a priority sub-sector which is the target for implementing climate change mitigation. Furthermore, this sub-sector is the most prepared sub-sector where this sub-sector has conducted regular GHG emission inventory reports since 2018. On the other hand, coal-fired power plants have conducted voluntary carbon trading trials in March – August 2021.

There are differences of opinion regarding the basis for imposing a carbon tax based on activities that produce carbon emissions which will be applied in a limited manner to coal-fired power plants over 100 MW. Based on a press conference held by the Ministry of Finance in October 2021, carbon tax is imposed on the difference in emissions that cannot be compensated for by purchasing emission permit certificates (SIE) or emission reduction certificates (SPE). However, based on findings in the field, the basis for imposing a carbon tax is imposed on the difference between the actual emissions released and the permitted emission limits. Meanwhile,

the purchase of additional emissions or carbon credits is used as a deduction from the carbon tax owed.

- Tax Payer

Carbon tax payers are units and individuals who directly emit CO<sub>2</sub> into the environment from consuming fossil fuels (Soares et al., 2010). Taxpayers for activities that generate carbon emissions are direct emitters. However, according to the United Nations (2021), in the case of a carbon tax, the incidence of the tax depends on whether the entity that is obligated to pay the tax can pass it on to consumers. If the entity can increase the price of the product to compensate for the amount of tax incurred, the incidence of the tax falls entirely on the consumer. However, if the producer cannot increase the price of the product, then the producer will bear the full tax.

In terms of the carbon tax that will be imposed on coal-fired power plants in the early stages, it is the government that will bear the carbon tax. This is because the carbon tax is a component of the cost of production which is planned to be included in the subsidy calculation. Subsidies provided by the government will become a burden on the state budget which will burden the government. The lack of APBN funds that will be allocated to the swelling electricity subsidy due to the carbon tax will eventually become the government's unpreparedness to implement a carbon tax.

- Tax Administration Authority

In the Direct Emissions Approach where carbon taxes are imposed on activities that generate carbon emissions, the role of environmental agencies will be very important in verifying and controlling emission data submitted by responsible taxing authorities (United Nations, 2021). However, using this approach is quite complicated and can incur large administrative costs.

Based on article 66 of Presidential Regulation No. 98 of 2021, reporting on the implementation of Climate Change Mitigation Actions and NEK is recorded in the PPI SRN as the basis for verification. Furthermore, article 68 of Presidential Regulation No. 98 of 2021 explains that the validation and verification of reporting on the results of measurement and monitoring of the implementation of Climate Change Mitigation Actions, Climate Change Adaptation Actions, and NEK which are reported and recorded in the PPI SRN are validated by the relevant ministry. However, for businesses and/or activities implementing NEK related to Carbon Trading, it is mandatory to include the results of the validation and verification carried out by independent validators and verifiers. However, the unpreparedness of the carbon trading system as well as the complicated and expensive administration



of carbon tax collection at coal-fired power plants can result in delays in the implementation of the carbon tax.

## **5.2. COMPANY READINESS ASSESSMENT BASED ON ERIA FRAMEWORK**

Based on calculations carried out based on the ERIA framework – Industry 4.0 Readiness Self-Assessment Tool for Circular Economy, PT ABC received a total score of 14. This concluded that PT ABC was in the "less ready" category to implement a carbon tax. The results of the company's readiness assessment are in appendix 1.

Even though PT ABC has voluntarily participated in a carbon trading pilot in March – August 2021 and made regular GHG emission inventory reports to the relevant ministries, and committed to increasing the renewable energy mix by 23% by 2025, this cannot prove that PT ABC are in the “highly prepared” category. This is because coal-fired power plants that use non-renewable resources cannot be completely replaced with renewable energy in the near future. PT ABC projects that the coal energy mix in 2030 will still be around 59.4%. There is oversupply in Java and Bali, the large investment required for renewable energy, and the difficulty in developing EBT due to Indonesia's geographical conditions which cannot guarantee the security of electricity supply, has prevented PT ABC from using renewable energy as a whole. Furthermore, coal plays a very important role for national energy security at this time.

## **6. CONCLUSION AND RECOMMENDATION**

PT ABC's lack of readiness to implement a carbon tax is due to the fact that most of the electricity supply still depends on coal-fired power plants. This can result in a high carbon tax that will be borne by PT ABC which can disrupt the company's financial performance. Even though the carbon tax burden is a component of the Cost of Provision which is planned to be the basis for calculating government subsidies, this will have an impact on company cash flow which can hinder investment in EBT development. This is because there is a significant time difference, namely PT ABC must deposit the carbon tax to the state treasury in advance compared to the time it receives from the Government for additional subsidies and compensation. Furthermore, the increase in government subsidies due to carbon taxes will ultimately burden the state budget.

On the other hand, the cap and tax scheme that will be applied in collecting carbon taxes at coal-fired power plants has a complicated administrative system. Furthermore, carbon trading, which was not previously included in the draft law, has now become an issue on the basis of the imposition of a carbon tax. Moreover,

carbon tax and carbon trading are applied at the same point of source. The system's unpreparedness, regulatory ambiguity, and sectors that are not ready to be subject to a carbon tax ultimately lead to delays in the implementation of a carbon tax. Chile took 3 years to implement a carbon tax. Switzerland implements carbon trading and carbon taxes for different sectors. Therefore, in order to achieve the emission target, carbon trading and carbon taxes should be imposed on different sectors in accordance with the best practices of countries that have implemented them. So that the carbon tax rules that have been issued do not become a discourse.

## **ACKNOWLEDGEMENT**

Acknowledgement is contained individuals who assisted with the study should be listed here (e.g., providing language help, writing assistance, or proofreading the article, etc.). Also, each author must disclose all funding sources for the research reported in the article. This information includes grant name, number, and description of each funder. If a grant has nothing to do with the article, then the author does not have to list it.

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## APPENDIX

### Appendix 1. Company Readiness Assessment Based On ERIA Framework

No	Determinant	Score	Description
1	Strategy and Organization	2	Company as operator only, planning is made by Ministry of Energy and Natural Resources
2	Plant and Equipment	3	producing electricity from waste management through co-firing program by mixing coal with biomass
3	Information Technology System	2	The resulting emissions are monitored in real time to take corrective action if needed using CEMS
4	Human Resources	1	lack of employee understanding to support an environment-based approach
5	Finance and Investment		
	Financial Availability	2	the amount of available funds owned by company for investment in innovative projects is limited
	Budget for Renewable Energy	3	encourage investment in power plants that use new renewable energy sources
6	Energy Management	1	adopting ultra-supercritical technology (clean coal technology) for 1,000 MW class coal-fired power plant in the Java-Bali
	<b>Total</b>	<b>14</b>	