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Quantification Of The Impact Of Climate Change In Financial Reports: An Ambition Towards Net Zero Emissions

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ABSTRAK

Perubahan iklim merupakan salah satu permasalahan besar yang dihadapi dunia. Laporan khusus tentang Pemanasan Global sebesar 1,5°C menunjukkan bahwa pencapaian emisi nol pada pertengahan abad adalah hal yang penting untuk dilakukan. Pentingnya penanganan perubahan iklim mendorong kerja sama global yang berujung pada penandatanganan Perjanjian Paris tahun 2015. Menutup kesenjangan antara kebijakan mitigasi perubahan iklim saat ini dan kebijakan yang diperlukan untuk mencapai target suhu Perjanjian Paris memerlukan peningkatan ambisi kebijakan yang signifikan. Artikel ini berpendapat bahwa tindakan kebijakan yang bertujuan untuk mencapai tingkat emisi nol dapat dilakukan dengan penetapan harga karbon efektif, relevansi dan matearilitas isu perubahan iklim dalam laporan keuangan, serta mengetahui strategi kuantifikasi isu perubahan iklim dalam laporan keuangan.

Kata kunci: laporan keuangan, ner zero emission

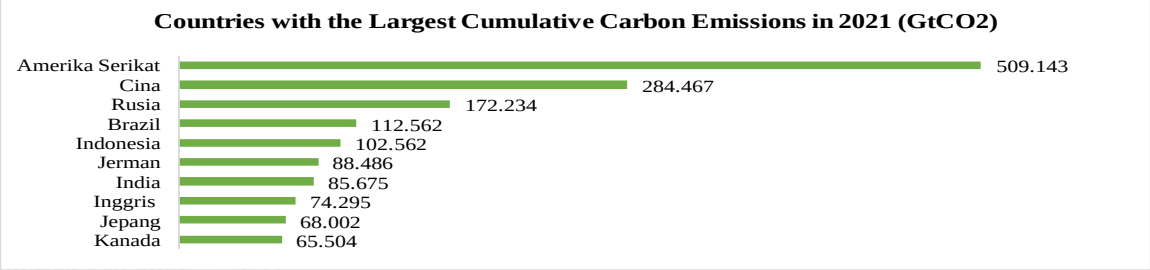
ABSTRACT

Climate change is one of the big problems facing the world. The special report on Global Warming of 1.5°C shows that achieving zero emissions by mid-century is an important thing to do. The importance of addressing climate change drove global cooperation that led to the signing of the Paris Agreement in 2015. Closing the gap between current climate change mitigation policies and the policies needed to achieve the Paris Agreement temperature targets requires a significant increase in policy ambition. This article argues that policy actions aimed at achieving zero emission levels can be carried out by setting an effective carbon price, the relevance and materiality of climate change issues in financial reports, as well as knowing the strategy for quantifying climate change issues in financial reports based on applicable SAK.

Keywords: *financial reports; net zero emission*

INTRODUCTION

Climate change is one of the big problems facing the world. The special report on Global Warming of 1.5°C shows that achieving zero emissions by mid-century is an important thing to do. The importance of dealing with climate change encouraged global cooperation which culminated in the signing of the Paris Agreement in 2015. Implementation of the Paris Agreement was carried out through an annual conference, namely the Conference of Parties (COP). The latest COP implementation was the 26th COP held in Glasgow, England in November where it was agreed that there was a need for financial support from developed countries to developing countries to help reduce carbon emissions.



Source: Databooks, 2021

Indonesia, as one of the 10 largest carbon contributing countries in the world, needs capital to develop new and renewable energy technology (EBT) to achieve net zero carbon conditions by 2060. To meet the large capital needs, it not only requires contributions from the government but also financial contributions from private sector. This condition is stated in Article 2(c) of the 2015 Paris Agreement concerning global agreements related to climate change management which stipulates the need to create a consistent flow of funds with a development direction that is low in greenhouse gas emissions and climate resilient.

Although climate change isimportant issues that affect human life, this is often ignored by investors when allocating capital. From an economic point of view, the risks associated with climate change remain negligible despite affecting the capitalization of public companies. In another study, it was found that of the 50 largest companies in Europe, only 10% disclosed climate change issues in their financial reports . This situation has the potential to cause investors not to consider climate change in their capital flows, resulting in failure to achieve their EBT investment goals. The National Accounting Standards Board (International Accounting Standards Board) has clarified that investors can expect climate change disclosures in financial reports.

Disclosure of climate change problems in financial reportsdoes not just describe the potential impact of climate change on the company's future operations and financial condition. However, ideally this disclosure also quantifies the impact of climate change issues on company operations. This quantification is necessary for investors to evaluate the company's finances in the future, when the impact of climate change will affect the company's financial situation. For example, what and how significant the impact of climate change is on the productivity of agribusiness companies' harvests. This information is useful for investors to assess the impact of climate change on their ability to continue running their business in the future. It is difficult to measure the impact of climate change on the business world because there are many variables that play a role in climate change. Under these conditions, it is necessary to carry out scenario analysis to explore and understand the impact of climate change on business operations based on certain assumptions. However, a lack of understanding regarding the application of scenario analysis to climate change issues means that only a few companies disclose information.

So that investors can consider the impact of climate change on company operations, accountants must disclose climate change issuesin their financial reports. This information will measure the impact of climate change on company operations. To measure this impact, accountants must understand the issue of climate change and its impact on business operations. In these conditions, accountants play an important role in internalizing issues related to climate change in financial reports. In fact, accounting is in a strategic position to identify risks related to climate change and assess their impact on the strategic, operational and financial aspects of a business. Until now, the level of understanding regarding climate change is still low and it is still difficult to measure the impact of climate change on business activities. Increasing interest among international institutions, academics, and private sector actors in developing a methodology for estimating carbon prices imposed through instruments that change the marginal cost of carbon emissions without targeting emissions or fuel carbon content directly (implicit carbon pricing). Examples of these “unconventional” carbon pricing policies are fuel taxes and subsidies on fossil fuel consumption. Governments can use these methodologies to focus their climate action on meeting a minimum level of effective carbon price, namely the sum of the implicit carbon price and the explicit carbon price (explicit carbon prices are carbon prices imposed through carbon taxes and emissions trading schemes (ETS).

Table 1. Top Five Risk Rankings Based on Damage Probability and Impact

Rating	Based on the Probability Level of Events	Based on Damage Impact
1	Extreme weather	Epidemic of a disease
2	Failure to handle climate change issues	Failure to handle climate change issues
3	Environmental damage caused by humans	Loss of biodiversity
4	Epidemic of a disease	Extreme weather
5	Loss of biodiversity	Natural resource crisis

Source: World Economic Forum, 2021

Disclosing the issue of climate change requires the application of the concept of materiality to determine whether the issue has the potential to change investors' economic decisions towards capital. If climate change is truly a major issue, it must be integrated into corporate strategy. This integration is not just a statement, but must be integrated into company operations and become a consideration factor in management decision making. In other words, an integrated strategy is needed so that climate change issues are reflected in operational and management decisions. Another consequence if climate change becomes a material issue is that this must also be disclosed in financial reports. The initial disclosure process can be explored by examining the impact of climate change on current SAK. The SAK which are considered related to climate change issues include SAK 68 Paragraph 9, SAK 48 Paragraph 12 (b), SAK 14 Paragraphs 40 and 9, SAK 16 Paragraph 31, SAK 19 Paragraphs 75 and 104, SAK 48 Paragraph 134, SAK 46 Paragraph 34.

RESEARCH METHODS

This research uses an exploratory type of research. Exploratory research is research used to investigate problems that are not clearly defined. Regarding the issue of climate change which is the theme of this research, many parties consider this issue to be a complex issue. The complexity of the issue of climate change is motivated by the variety of variables that drive climate change. The consequences of this complexity make it difficult to predict climate change in financial reports. If this disclosure occurs, there will be inconsistencies between companies because there are no standards regarding disclosure of the impact of climate change on companies' operational and financial conditions.

The application of the exploration method was carried out to find out which SAK provisions would be affected by climate change conditions. Climate change will clearly have an impact on all sectors, although the magnitude of the impact will still vary from one sector to another. The application of exploratory methods to see how climate change will also affect the company's financial position is carried out by the Climate Disclosure Standards Board (CDSB). CDSB explored several provisions of International Reporting Standards (IFRS) and analyzed the potential impact of climate change on several IFRS provisions. However, before exploring how climate change affects the implementation of SAK, this research will make the argument that the issue of climate change is an important and relevant issue for users of financial reports. Determining materiality is very importantpreparation of financial reports because this information will be presented in the financial reports. If climate change is truly a material problem, then accountants must think about how to disclose this in financial reports.

RESULTS AND DISCUSSION

Implicit, Explicit and Effective Carbon Prices

There is no consensus on what policies should be seen as implicitly setting carbon prices (Word Bank, 2019a). The approach taken in this article, namely focusing on fuel taxes and fossil fuel subsidies, is in line with the definition adopted by the OECD. According to the World Bank (2019a) and the IMF (2019), the effective carbon price is defined as the sum of the explicit and implicit carbon prices. In recent years, the OECD and the IMF have developed methodologies for estimating effective carbon prices. Both agencies include in their estimates an explicit carbon price implemented through a carbon tax and ETS. The OECD adds an implicit carbon price implemented through fuel taxes. This implicit price is estimated by dividing the fuel tax rate per unit of fuel or energy by the carbon content of the fuel. The IMF follows a similar method to estimate the implicit carbon price applied through fuel taxes, but subtracts the negative implicit carbon price applied through fossil fuel subsidies and considers the effectiveness of different instruments (e.g. ETS) to produce emissions reductions compared to a hypothetical carbon tax applied to the entire economy.

Further estimates of the effective carbon price may be available as a result of implementing specific carbon limit adjustment (BCA) mechanisms. Mehling et al., (2019) recently discussed the possibility of implementing a BCA mechanism that provides credit against the effective carbon price applied in exporting countries. In line with this, US Treasury Secretary Janet Yellen suggested designing a BCA mechanism that supports a broader set of policies than explicit

carbon prices alone. Implementation of a BCA mechanism that credits effective carbon prices requires estimates of effective carbon prices in import and export jurisdictions to determine adjustment levels. Therefore, further estimates of effective carbon pricing may be available if such a BCA mechanism is implemented. The methodology for estimating effective carbon prices enables policy actions focused on increasing effective carbon prices. Examples of policy actions focused on increasing effective carbon pricing include: (1) a country's unilateral commitment (e.g., including in a government plan or a nationally determined contribution) to achieve and maintain a minimum level of effective carbon pricing and implementation policies aimed at fulfilling commitments (i.e. the implementation of explicit and/or implicit carbon pricing); and (2) the establishment of an effective carbon pricing group multilaterally where member countries commit to implementing an effective carbon price at a minimum level and implementing the policy that fulfills the group's goals.

Ideally, the minimum effective carbon price level is determined by considering the price required to achieve mitigation outcomes or temperature targets. Setting an effective carbon price level that provides mitigation outcomes requires estimating the dollar amount of implicit carbon prices (e.g., fuel taxes) required to provide mitigation outcomes equivalent to a given level of explicit carbon prices (e.g., carbon taxes). When explicit and implicit carbon prices can be substituted, it will be possible to identify combinations of implicit and explicit carbon prices that provide mitigation outcomes.

Relevance and Materiality of Climate Change Issues in Financial Reports

Accounting is a profession whose role is to record and publish financial reports and has a strategic role in helping achieve the goals of the Paris Agreement. The role of accountants is clear in Article 2(c) of the Paris Agreement, which sets out the role of capital flows in achieving the global goal of limiting global temperatures. The external conditions of climate change that have occurred to date can be prevented by accountants by quantifying climate change issues in financial reports. Accountants should include information that has predictive value so that users of financial reports can analyze future business conditions. In relation to the issue of climate change, this information is very relevant for users of financial reports, especially in sectors that are highly impacted by changes in the environmental ecosystem due to climate change. Other industries that are not directly related to the environmental ecosystem, such as the financial sector, may also be affected by climate change issues. It is for this reason that the TFCD recommends that all companies disclose climate change risks and opportunities in their financial reports. Relevance is also closely related to the capabilities of the information available in financial reports. Relevant information will be useful as data that can be used to estimate future business conditions. Relevance is also determined when information can confirm or change previously made estimates. The relevance of climate change issues to be internalized in financial reports can also be determined based on the needs of investors as users of their financial reports. The existence of a demand for disclosure shows that the issue is relevant because it is included in the information reported. With the disruption to the situation in several sectors due to decarbonization efforts, investors are interested in knowing the potential disruption to the company's situation in the future.

The relevance of information to users of financial statements is also determined based on its ability to confirm previous estimates. Many studies have confirmed the impact of climate change on environmental changes in ecosystems. Climate change also has an impact on melting ice in the Arctic, which then submerges several small islands and eliminates coastal areas. A rise in sea levels of two meters due to melting ice in the North Pole could threaten the homes we live inr 200 million people in 2100. In addition, in 2100 it is estimated that around 46% of world property values will be affected by rising sea levels because they are located in coastal areas with a height of less than 10 meters above sea level. This rise in levels can also cause sea water to enter agricultural areas, causing crop failure and potentially causing flooding, damaging infrastructure. Increasing CO2 levels can also increase the acidity of sea water, thereby threatening marine ecosystems. Currently, several impacts of climate change on environmental ecosystems are being felt, such as an increase in extreme weather on the American continent in the form of an increase in the frequency of tornadoes. Apart from that, the European continent has also experienced many heat

waves in the last decade. The impact of climate change on melting Arctic ice has also resulted in an increase in sea levels. The impact of this change is systemic, meaning that all industries will be affected, although in different ways. Based on research findings on the impact of climate change on environmental ecosystem conditions and based on natural phenomena that occur on the American and European continents, it can be concluded that information related to the impact of climate change on financial reports will be relevant for users or investors. This relevance can be seen when investors determine how the company will be affected by climate change and determine how to assume resilience or business continuity in preparing financial reports.

The nature of the relevance of financial information is closely related to the concept of materiality. Accounting applies the concept of materiality to determine whether information should be presented in financial statements. Information is considered material if the omission of the information could influence the decisions of users of the financial statements. However, it is not easy to link the materiality of information with the relevance of the information for users of financial reports because of the diverse interests of users of financial reports. This then has an impact on the difficulty of determining what information should be disclosed and determining the materiality of each information. In these conditions, management must identify users of financial reports who have a significant impact on which information must be disclosed and determine the level of materiality of each information. In this condition, management must identify users of financial reports that have a significant impact on the company's capacity to increase value in the short, medium and long term. If this identification is successful, a framework will be formed in the process of determining the level of materiality for reporting information.

The process and criteria for determining the materiality of information must be clearly disclosed. Ideally, determining materiality related to climate change issues is the same as determining materiality for other issues faced by the company. If there are differences between the process and criteria for determining materiality between climate change issues and other issues, then these differences must be disclosed. Generally, these differences occur due to differences in the period when climate change issues occur and when other issues occur. The issue of climate change occurs in the long term and involves one or several variables with a clear cause and effect relationship. This long period results in intervals or distances in assessing the impact of climate change on financial conditions and means that company operations do not have to be carried out in the short term, such as quarterly or semi-annually.

Every industry will of course be affected by climate change, but what makes the difference is the level of impact on each industry. The industries that will be significantly affected are the moving industriesk in the field of or related to fossil energy, because its largest asset is in the form of asset reserves with high carbon content (such as coal, oil and natural gas), so disclosing information regarding the impact of climate change issues on the condition of its business sustainability is a material matter. Apart from that, industries that depend on climate stability (such as the agricultural, livestock and fishing industries) will also have a material impact on climate change. The financial industry also has the potential to be indirectly affected by climate change through transmission that is different from the fossil energy industry or the agricultural and plantation industries. The influence or impact felt by the financial industry is through its availability in providing financial facilities to industries that are vulnerable to being affected by climate change. For example, the insurance industry must provide protection to the fossil energy industry which will face an increase in claims due to the potential for increased demands from non-governmental organizations for company products that have damaged the environmental ecosystem. An increase in claims will also affect the health of the insurance industry, which is reflected in a decrease in the Risk Based Capital ratio. The banking industry that provides credit facilities to the fossil energy industry will also be affected by reducing consumption of fossil fuels as an energy source, which will then reduce cash flow and affect the company's ability to repay the debt or credit that has been given.

The materiality of the issue of climate change for investors can be seen in the risks contained in climate change, namely transition risk and physical risk. Transition risks occur due to the implementation of carbon taxes and carbon trading. The implementation of these two policies will have an impact on increasing fossil energy prices, which will encourage people to reduce fossil

energy consumption and start developing EBT during the transition period, with the aim of reducing the impact of this increase. The price of fossil fuels is economical, so the price of EBT can be lower than the price of fossil energy because of the large amount of EBT that can be used as an energy source. This situation will lead to a decrease in fossil energy consumption, making fossil fuel extraction operations unprofitable and resulting in abandoned assets. Meanwhile, physical risks arising from extreme weather are the impact of climate change. The occurrence of extreme weather conditions can shorten the life of machinery, damage infrastructure and disrupt agricultural cycles. The impact of transition risk and physical risk will be very relevant for investors considering capital flows, because it will impact the company's operational capability and its accounts. Disclosure of the impact of climate change on a company's situation will improve the quality of information in financial reports and help investors be more effective in relation to their management, valuation, exercise of voting rights and capital allocation. This disclosure will also help investors direct funds to the EBT sector, as outlined in Article 2(c) of the 2015 Paris Agreement. Based on this, it appears that the issue of climate change is very relevant for investors.

SAK 1 provides guidance for periods in considering future information that affects business continuity, espYes, at least 12 months from the end of the financial reporting period. Under these conditions, SAK 1 can answer climate change questions so that they are reflected in financial reports. If management cannot determine the impact of climate change on company operations, then management must reveal obstacles in determining the impact of climate change. If there is any doubt regarding the decision to make a disclosure, management should take precautions and provide information about the nature of the uncertainty inherent in climate change. It has been mentioned previously that the impact of climate change on industry is uneven. Some industries will be significantly impacted by climate change, but in others the impact may be negligible. For industries that are heavily impacted by climate change, the risks posed will be very large and affect the company's financial position. Users of financial reports expect management not only to disclose climate change issues but also to quantify climate change issues in financial reports as a serious impact of climate change. This condition will lead to the second discussion in this research, namely strategies for quantifying climate change issues in financial reports.

Strategy for Quantifying Climate Change Issues in Financial Reports

The issue of climate change is different from other issues because it occurs over the long term and involves various variables. The occurrence of climate change will trigger new risks that company management may not currently consider, such as the risk of lawsuits that will force the company to change its approach in handling climate change issues. These various demands will influence business continuity assumptions which are important in preparing financial reports. Under these conditions, handling risks related to climate change requires the same governance as handling other issues, such as the risk of currency exchange rate movements, commodity prices and geopolitical risks. After there is a strategy for handling climate change issues, what is relevant to the accounting profession is how to quantify climate change issues so that they can be revealed in financial reports. This quantification process will utilize the applicable SAK provisions by considering which side the company will be affected by climate change.

The issue of climate change is a long-term issue whose process involves many variables. This condition creates a high level of uncertainty in the issue of climate change, making it difficult to predict what will happen in the future. However, these difficulties should not prevent management from disclosing climate change issues in financial reports. The problem of climate change has a significant impact on business continuity, therefore management must be able to estimate the impact of climate change by quantifying the impacts and quantitative results in financial reports in accordance with SAK provisions. Task Force on Climate-related Financial DisclosuresTFCD has formulated steps that can be used to integrate climate change issues into financial reports. The first step is the commitment of business leaders to integrate the issue of climate change as a factor influencing business activities. The commitment of leaders will create the impression of the importance of governance in identifying, estimating, measuring, managing and reporting climate change issues in financial reports. This commitment will signal to employees the importance of addressing climate change. In order to obtain support from company leaders,

leaders must first raise awareness and understanding regarding various climate change issues, starting from the drivers of climate change, risks and opportunities, to the impact on financial position. Moreover, the role of leadership is very necessary in monitoring and managing the risks of climate change. The effectiveness of monitoring and managing climate change risks requires and is part of realizing commitment from direct leadership.

The second step is collaboration between functions which will facilitate the implementation of the third step in the form of estimating climate change risks in financial reports. As previously explained, climate change involves two risks, namely physical risks and transition risks. The physical risks of climate change relate to the potential for damage to ecosystems and environmental infrastructure due to rising sea levels, increasing earth surface temperatures, or increasing the frequency of other extreme weather phenomena. For many companies, physical risks can disrupt supply chains, damage production assets, and increase production costs. At the same time, transition risks are associated with efforts to reduce dependence on fossil fuels. This risk must be faced in line with every country's efforts to achieve net zero emissions, where every carbon emission that occurs can be processed naturally by the carbon cycle so that it does not result in a buildup of carbon in the atmosphere.

The third step is an estimate of the impact of climate change on financial reports. Users of financial reports need clarity regarding the company's climate change strategy as well as the opportunities and risks of climate change that can impact business sustainability. Understanding how and communicating climate change issues well in financial reports will help investors and financial service providers make decisions regarding cash flow. Considering the high uncertainty of climate change due to the many variables involved, the use of scenario analysis can be used to help estimate the impacts of climate change. In the fourth step, scenario analysis can be used to estimate the impact of climate change on financial statements. Scenario analysis is the process of identifying and estimating the potential outcomes of future events under conditions of uncertainty. The analysis allows companies to explore how climate change will affect business operations. Many organizations now provide guidance on how to use scenario analysis. By running analysis scripts, companies can apply the analysis to a group of assets (e.g. machines and plants) before moving on to analysis at the company and group industry operations level.

The fifth step is to integrate climate change into risk management at the company level (Enterprise Risk Management). This integration will enable companies to estimate the impact of climate change on business continuity and strategy. Input from users of financial reports is also important, as explained in the section on the relevance of climate change issues in financial reports. The sixth step receives input from financial report users. Input from users of financial reports is also very important, as explained in the section on the relevance of climate change issues in financial reports. In the seventh step, the company can communicate with financial report users about the types of information that are relevant to financial report users when analyzing future business prospects. The eighth step is to encourage company management to consider guidelines issued by a number of organizations that can help disclose climate change issues in financial reports. Apart from the TFCD, a number of organizations have also published guidelines that can be used by businesses, such as the CDSB Framework and SASB Standards. The CDSB framework is a framework that further applies TFCD by focusing on integrating climate change issues into company financial reports. Meanwhile, SASB Standards are standards that focus on various important factors that specifically influence financial reporting. The ninth step is to obtain quality assurance related to climate change that is of comparable quality to other information contained in the financial reports. To ensure the same quality of disclosure, companies can implement internal control processes and quality assurance from independent external parties (such as accounting firms and advisors). Obtaining external guarantees can increase the level of information disclosure regarding climate change issues.

In order to link the objectives of disclosing the issue of climate changewhich is one of the sustainability issues with the company's external parties understanding the purpose of the disclosure, it is very important to make the issue of climate change a part of management's way of thinking and acting. In other words, these disclosures are not just declarations, but can also be integrated into operations and management decision-making processes. After presenting strategies

that can be applied to disclose climate change issues in financial reports, the discussion in this section will focus on the potential for quantifying climate change issues based on the provisions in the applicable SAK. One of the standards in SAK that plays an important role in the quantification process is SAK 68. Paragraph 9 of SAK 68 defines fair value as the price that would be received to sell an asset or the price that would be paid to transfer a liability in an orderly transaction between market participants on the measurement date. The application of fair value is the opposite of the application of historical value because fair value is based on current prices. Although the application of fair value ideally requires transaction frequency, SAK 68 still allows the application of fair value even if there are no frequent transactions. Apply fair value without ordinary transactions by using input data to evaluate the fair value of assets and liabilities. The application of SAK 68 influences many other provisions in SAK, of which closely related to SAK 68 is SAK 48. The provisions in SAK 48 paragraph 12 (b) require that an entity must consider various external factors in assessing the fairness of an asset. These external factors include changes in the economy, technology and legal scope. Even though paragraph 12 does not explicitly mention the issue of climate change, the existence of transition risks and physical risks from climate change can be relevant for management to consider in determining whether there is an impairment of asset values in accordance with SAK 48.

Table 2. Fair Value Measurement Approach

Approach	Market	Income	Cost
Assessment method	Earnings and book value ratio	Discounted cash flow	Replacement cost or net asset value
Inputs	▪ Revenue (e.g. EBITDA, net profit, sales, etc) ▪ Book value ▪ Market ratio (transactions or trades)	Profit and loss and cash flow predictions (except CapEx) ▪ Discount rate ▪ Final growth rate	▪ Costs to replace or expand an asset ▪ Functional and economic obsolescence
How climate risks can affect inputs	Climate risks may affect revenues (e.g. lower volumes or prices) and/or cost base (additional maintenance, fines, emissions taxes, etc.) Market ratios are derived from traded companies or comparable transactions. However, it may not be clear whether/how climate risks are reflected by those in comparison. Careful consideration should be given to the subject of the assessment given the asset-specific nature of climate risk.	Climate risks can affect the cash flows used to support these calculations by a combination of reducing cash flows (lower volume or prices), and/or increasing cash outflows (additional maintenance, emissions tax penalties, CapEx, etc.) Alternatively, if cash flows are not adjusted for climate-related risks, the discount rate can be adjusted instead (via a risk premium or relevant discount). The long-term prospects of the asset/business can be	Greater obsolescence may occur as a result of technological substitution (transition risk). The asset in question may be redundant for a future green business

Approach	Market	Income	Cost
		impacted. Therefore, an adjusted final growth rate may be applied or an alternative approach to calculating the final value. Given the uncertainty in climate events, an expected value approach or simulation of multiple scenarios may be necessary.	

Source: Climate Disclosure Standard Board, 2021

In addition to the transition and physical risks presented in Table 1, changes in consumer tastes and changes in government regulations can be factors that reduce the value of product assets. Changes in consumer tastes occur due to increasing public awareness of the dangers of CO2 emissions, so consumers choose products that have a low carbon footprint. Changes in consumer tastes can reduce a company's growth rate and cash flow from sales. In addition, the discount rate may increase as physical conditions improve due to climate change. This condition will reduce the value of assets based on cash flow assessments as shown in Table 2. Changes in government regulations are closely related to the policies that the government will take to reduce carbon emissions, such as implementing a carbon tax and carbon trading.

The first type of asset that will be impacted by climate change is real estate investments. SAK 14 concerning Investment Property in paragraph 40 states that assessing the fair value of investment property requires companies to ensure that the fair value reflects current rental income from the real estate. When it comes to the fair valuation method for an asset according to Table 2, the value of real estate investment can be determined in two ways, first through physical damage. The increasing frequency of extreme weather events and natural disasters can endanger the physical condition of assets if they are located in disaster-prone areas, such as on the coast. beaches, on small islands or in deltas, as well as places prone to flooding. Tourism businesses with property in coastal areas can experience physical damage due to rising sea levels, which is one of the consequences of climate change. In terms of reduced income, climate change will also likely reduce income from property due to physical damage to property. Potential physical damage and reduced income can reduce asset values if fair value is applied to investment properties. A decrease in asset value can also occur through a reduction in the asset's useful life (which causes an increase in depreciation costs) and an increase in the level of risk (which causes an increase in the asset value), as well as the discount rate when calculating the present value of future income.

The second type of asset that will be impacted by climate change is inventory, although the impact will not be as great as real estate investments because inventory has a short useful life. Because useful lives tend to be shorter, the impact of climate change on supply is generally lower. However, some industries also have long-lived inventory, such as the real estate sector (in the form of homes and departments) which may be under the control of the development company for several years, which will also increase the growth potential. Some supplies will be affected by the risk of damage from physical risks of climate change, such as housing and apartments located in coastal areas. The perception of physical risks from climate change means people will avoid owning property in coastal areas. This situation will ultimately lead to a decline in property inventory prices. The rules regarding inventory value are regulated in SAK 14 to paragraph 9 which states that inventory valuation is measured based on acquisition cost or net realizable value, whichever is lower. Net realizable value is the selling price of inventory minus selling costs. Based on this provision, inventory value can be formulated if the net realizable value is lower than the acquisition value. This reduction will be recorded as an expense on the income statement.

The third type of asset affected by climate change is fixed assets. Fixed assets are different from real estate investments, fixed assets are owned for use in the production process, while fixed assets are owned to obtain profits through price increases or dividends. Based on the provisions of SAK 16 paragraph 31, it is stated that fixed assets are valued based on fair value if they can be measured reliably. The possibility of a decrease in the value of capital assets occurs because capital assets operate in conditions characterized by a high frequency of extreme events (solar waves, heavy rain and long droughts), where these conditions can reduce the useful life of fixed assets. To overcome extreme weather conditions, it is necessary to incur adaptation costs so that assets remain resistant to extreme weather conditions. The reduced useful life of fixed assets and adaptation costs cause an increase in the value of depreciation expenses. In addition, fixed assets that operate in adverse weather conditions may also experience a decrease in their residual value at the end of their useful life.

The fourth type of asset affected by climate change is intangible assets. Intangible assets can provide future economic benefits by generating income and/or reducing costs. Changes in the value of intangible assets can occur when government regulations (such as policies limiting carbon emissions) and changes in public tastes, as previously explained. In this regard, SAK 19 paragraph 75 states that recognition of intangible assets is based on fair value minus the value of accumulated depreciation and accumulated impairment losses on assets. Furthermore, paragraph 104 states that the amortization of the value of intangible assets must be revised when significant changes are expected in the consumption pattern of the economic benefits of the assets. Regarding impairment of intangible assets, the provisions of SAK 48 paragraph 134 regulate that an entity must disclose the value of goodwill or other intangible assets that have an unlimited useful life. This information includes, among other things, the events that caused the impairment, the amount of the impairment, and the amount that can be recovered.

The fifth type of asset affected by climate change is deferred tax assets, which may arise from taxes currently payable. Deferred tax assets may also arise from operational losses used to recover current taxes from previous periods (to the extent permitted by government regulations). Depending on the nature of the asset that may have a future economic impact, a deferred tax asset is an asset because it may provide future economic benefits. It is stipulated in SAK 46 paragraph 34 that deferred tax assets can be recognized for accumulated tax losses and tax incentives. This is possible where it can be estimated that there is a high probability that in the future taxable profits will be available and can be utilized. Under this provision, natural deferred tax assets depend on the possibility of earning profits in the future.

CONCLUSION

Climate change is one of the big problems facing the world. Handling the issue of climate change requires cooperation from various parties because this issue is so complex. The 2015 Paris Agreement Article 2(c) states the need to create a consistent flow of funds with a development direction that is low in greenhouse gas emissions and climate resilient. Directing the flow of funds requires the role of accountants by quantifying climate change issues in financial reports in three steps. first determine an imprecise, explicit and effective carbon price, relevance. An effective carbon price level could narrow the gap between current climate policies and the policies needed to achieve the temperature targets set out in the Paris Agreement. This will also help create synergies and build capacity to design and implement climate policies among government departments, including through collaboration with the finance ministry. Second, it describes the materiality of climate change issues in financial reports. Third, outlining strategies for quantifying climate change issues in financial reports. Even though the issue of climate change is not explicitly regulated in SAK, based on the previous explanation, the provisions contained in SAK can accommodate climate change issues so that they can be included in financial reports. Climate change has a systemic impact that will affect all corporate entities so that information regarding the company's strategy in dealing with climate change in the future and its impact on the company's assets and liabilities is material information for investors.

REFERENCES

Bachus, K., & Gao, P. (2019). The use of effective carbon rates as an indicator for climate mitigation policy. In M. Villar Ezcurra, JE Milne, H. Ashiabor, & M.S. Andersen (Eds.), Environmental fiscal challenges for cities and transport (pp. 226–240). Edward Elgar Publishing.

Bartling, H. (2017). Climate policy and leadership in a metropolitan region: Cases from the United States. Http://Dx.Doi.Org/10.1177/0269094217707278, 32(4), 336–351.https://doi.org/10.1177/0269094217707278

Bradford, M., Earp, J. B., & Williams, P. F. (2017). Understanding sustainability for socially responsible investment and reporting. Journal of Capital Markets Studies, 1(1), 10–35. https://doi.org/10.1108/JCMS-10-2017-005

Carattini, S., Carvalho, M., & Fankhauser, S. (2018). Overcoming public resistance to carbon taxes. Wiley Interdisciplinary Reviews: Climate Change, 9(5), e531. https://doi.org/10.1002/WCC.531

Chen, M. F. (2020). The impacts of perceived moral obligation and sustainability self-identity on sustainability development: A theory of planned behavior purchase intention model of sustainability-labeled coffee and the moderating effect of climate change skepticism. Business Strategy and the Environment, 29(6), 2404–2417. https://doi.org/10.1002/BSE.2510

Cho, C.H., Kim, A., Rodrigue, M., & Schneider, T. (2020). Towards a better understanding of sustainability accounting and management research and teaching in North America: a look at the community. Sustainability Accounting, Management and Policy Journal, 11(6), 985–1007. https://doi.org/10.1108/SAMPJ-08-2019-0311/FULL/XML

Climate Disclosure Standards Board. (2021). Accounting for climate Integrating climate-related matters into financial reporting.

Databooks, & Mutia, A. (2022). 10 Countries Contributing to the Largest Carbon Emissions in the World, There is Indonesia!https://databoks.katadata.co.id/datapublish/2022/11/10/10-negara-penumbang-emisi-carbon-terbesar-di-dunia-ada-Indonesia

Financial Accounting Standards Board, & Indonesian Accountants Association. (2009). PSAK 48 Impairment of Asset Value. www.iaiglobal.or.id

Financial Accounting Standards Board, & Indonesian Accountants Association. (2013). PSAK 68 Fair Value Measurement.

Financial Accounting Standards Board, & Indonesian Accountants Association. (2008). PSAK 14 Inventory.

Financial Accounting Standards Board, & Indonesian Accountants Association. (2011). PSAK 16 Fixed Assets. www.iaiglobal.or.id

Financial Accounting Standards Board, & Indonesian Accountants Association. (2009). PSAK 19 Intangible Assets.

Dutta, P., & Dutta, A. (2021). Impact of external assurance on corporate climate change disclosures: new evidence from Finland. Journal of Applied Accounting Research, 22(2), 252–285. https://doi.org/10.1108/JAAR-08-2020-0162

Grdic, Z. S., Nizic, M. K., & Gregorić, M. (2019). Investigating the Influence of Tourism on Economic Growth and Climate Change-The case of Croatia. https://doi.org/10.5709/ce.1897-9254.302

MAInternational Monetary Fund. (2019). IMF POLICY PAPER FISCAL POLICIES FOR PARIS CLIMATE STRATEGIES-FROM PRINCIPLE TO PRACTICE. http://www.imf.org/external/pp/ppindex.aspx

Mahardika, KPD (2020). REVIEWING THE ROLE OF ACCOUNTANTS IN ADDRESSING CLIMATE CHANGE ISSUES.

Mäkelä, H. (2021). Roles of Accounting for the Contested Terrain of Social Enterprises. Social and Environmental Accountability Journal, 41(3), 150–171. https://doi.org/10.1080/0969160X.2021.1872397

Mehling, M.A., Van Asselt, H., Das, K., Droege, S., & Verkuijl, C. (2019). Designing Border Carbon Adjustments for Enhanced Climate Action. American Journal of International Law, 113(3), 433–481. https://doi.org/10.1017/AJIL.2019.22

Moretti, M., Vanschoenwinkel, J., & Van Passel, S. (2021). Accounting for externalities in cross-sectional economic models of climate change impacts.

Nguyen, L.-U. (2019). The construction of accountant identity in a transitioning economy: The case of Vietnam. https://doi.org/10.1111/acfi.12470

Nuari, C. (nd). PSAK 46 (Income Tax). Retrieved October 29, 2023, from https://www.academia.edu/10379100/PSAK_46_Pajak_Pembesaran_

Organization for Economic Co-operation and Development (OECD). (2018). Effective Carbon Rates 2018. https://doi.org/10.1787/9789264305304-EN

Organization for Economic Co-operation and Development (OECD). (2021). Effective Carbon Rates 2021. https://doi.org/10.1787/0E8E24F5-EN

PSAK 1 Presentation of Financial Statements. (nd). Retrieved October 26, 2023, from http://iaiglobal.or.id/v03/standard-akuntansi-keuangan/pernyataan-sak-7-psak-1-penyajian-report-keuangan

Quayle, B., Sciulli, N., & Wilson-Evered, E. (2020). Accountable to who, to whom, for what and how? Unpacking Accountability in Local Government Response to Climate Change. https://doi.org/10.14453/aabfj.v14i3.5

Siddiqui, J., Mehjabeen, M., & Stapleton, P. (2021). Emergence of corporate political activities in the guide of social responsibility: dispatches from a developing economy. Accounting, Auditing and Accountability Journal, 34(5), 1137–1162. https://doi.org/10.1108/AAAJ-07-2019-4087

Task Force on Climate-related Financial Disclosures (TFCD). (2017). Final Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) Help Companies Disclose Climate-related Risks and Opportunities Efficiently and Effectively | Task Force on Climate-Related Financial Disclosures. https://www.fsb-tcfd.org/press/final-recommendations-of-the-task-force-on-climate-related-financial-disclosures-tcfd-help-companies-disclose-climate-related-risks- and-opportunities-efficiently-and-effectively/

The World Bank. (2019). Finance Ministers Join Forces to Raise Climate Ambition. https://www.worldbank.org/en/news/press-release/2019/04/13/coalition-of-finance-ministers-for-climate-action

US Department of the Treasury. (2021). Remarks from Secretary of the Treasury Janet L. Yellen at the G20 Finance Ministers and Central Bank Governors Meeting's High Level Symposium on International Tax. https://home.treasury.gov/news/press-releases/jy0266

Vivid Economics & Overseas Development Institute. (2019). Estimating Effective Carbon Prices: Accounting for Fossil Fuel Subsidies.

Word Bank. (2019). State and Trends of Carbon Pricing 2019. State and Trends of Carbon Pricing 2019. https://doi.org/10.1596/978-1-4648-1435-8

World Economic Forum. (2021). The Global Risks Report 2021 16th Edition. World Economic Forum.