

# The Role of Environmental Management Accounting on the Effect of Energy Efficiency on Renewable Energy Commitments: An Empirical Study of the Hospitality Industry in Indonesia

Made Sudarma<sup>1</sup>, Lely Kumalawati<sup>2</sup>

## Abstract

*The purpose of this research is to examine the relationship between energy efficiency and renewable energy, as well as the role of environmental management accounting in this influence. The issue of renewable energy is a new thing that requires commitment from all levels of society and business people. The hospitality business is one of the service industry sectors that is in the spotlight regarding the use of energy and environmental protection. This research empirically examines the effect of energy efficiency on renewable energy through environmental management accounting in the hotel industry in Bali, Indonesia. The research technique was carried out by survey, which used a questionnaire as a data collection tool. The sampling technique used was a census, in which the entire population was used as a sample, totaling 380 4 and 5 star hotels in Bali. The research instrument was developed from previous research and modified according to the needs of researchers. The results of the study found that energy efficiency affects the development of renewable energy in hotels. Also, environmental management accounting acts as a mediator of energy efficiency towards renewable energy commitments. The research implications are aimed at stakeholder theory by adopting stakeholder pressure in the form of energy efficiency. Practically, the results of this study reinforce the massive application of environmental protection and energy conservation regulations in the hotel industry.*

**Keywords:** *energy efficiency, renewable energy, environmental management accounting, energy conservation, energy sustainability*

## 1. INTRODUCTION

The commitment to use renewable energy in the hotel industry is actually an obligation, because hotels are one of the largest contributors of waste and use the highest groundwater in Indonesia. Based on a study by Saputra et al. (2022) stated that hotels in Bali are very high in terms of using underground water so that it has an impact on the environment, such as tidal flooding (rising of sea water to the surface). Another study from Saputra et al. (2023) also stated that the hotel industry is a contributor to hazardous waste. Based on these studies, the hotel industry's commitment is needed to start using renewable energy with the goal of energy efficiency.

Energy efficiency has a role in creating a green economy, where the use of less energy will make it possible to reduce greenhouse gas emissions, but does not cause a decrease

---

<sup>1</sup> Faculty of Economics and Business, University of Brawijaya, Indonesia, 2Madiun State Polytechnic, Indonesia.

<sup>2</sup> Faculty of Economics and Business, University of Brawijaya, Indonesia, 2Madiun State Polytechnic, Indonesia, lely@pnm.ac.id

in the company's income level (Saputra et al., 2023a). There are many motivations for increasing energy efficiency (Omune et al., 2021). Reducing energy use, reducing energy costs and can generate financial savings for consumers if these energy savings do not exceed the additional costs for implementing energy-efficient technology applications (Cedwal et al., 2015; Kim et al., 2018). Reducing energy use is also seen as a solution to reducing the problem of greenhouse gas emissions (Saputra, Subroto, et al., 2022). According to the International Energy Agency, increased energy efficiency in buildings, industrial processes and transportation can reduce the world's energy needs by one third by 2050, and can help control greenhouse gas emissions globally.

Energy efficiency is closely related to environmental management accounting (Cedwal et al., 2015). The purpose of environmental management accounting is to save energy and save costs due to rising energy prices (Bhochhibhoya et al., 2020), scarcity of energy resources and awareness of the adverse effects of overexploitation of energy on the environment (Ayoub et al., 2014; Omune et al., 2014; Omune et al., 2021; Warbroek et al., 2019). Factors that determine the quality level of environmental management accounting include supply chain, production costs, energy quality and production environmental sustainability (Omune et al., 2021). Environmental management accounting is used in the energy transformation process by applying general principles that have verifiable validity (Gordon & Narayanan, 1984; Henri & Journeault, 2010; Saputra, Putri, et al., 2022). Effective environmental management accounting procedures include data analysis stages history of energy (Fuzi et al., 2019), energy audits and accounting, technical analysis and feasibility studies for business and investment proposals, as well as training and providing information to personnel implementing the work (Phan et al., 2018; Saputra, Subroto, et al., 2022).

Energy efficiency and the use of environmental management accounting are manifestations of stakeholder theory (Schornagel et al., 2012). In stakeholder theory, energy efficiency and environmental management accounting are proxies for planning and programs (Silva et al., 2019). Demands for energy efficiency and environmental management accounting as external and internal stakeholder pressure (Adinehzadeh et al., 2018). These pressures arise from the Government through energy conservation regulations and internal pressure from hotel management and associations to apply environmental management accounting in order to obtain accurate information regarding energy, the environment, and so on (Saputra, Manurung, et al., 2021; Saputra et al., 2023a).

This research is motivated by the limitations of research with the theme of environmental management accounting, especially in industries other than manufacturing (Pavlatos, 2015; Zvezdov, 2012). A more comprehensive understanding of the implementation of environmental management accounting can be obtained through research in the context of the service industry (Stoddard et al., 2012). The hospitality industry has an impact on social and environmental conditions that consume a lot of energy (Han et al., 2018; Lee & Cheng, 2018) and produce hazardous waste (Pereira et al., 2021; Saputra, Manurung, et al., 2021). This condition is a critical problem for tourism facilities.

This research seeks to investigate the determinants of renewable energy, for stakeholders can contribute optimally. Stakeholder pressure in the form of energy efficiency allegedly mediated by environmental management accounting to influence renewable energy commitments. Contribution to stakeholder theory is provided by this research by: first, providing recognition of the importance of stakeholder theory by accommodating the interests of stakeholders, especially the role of organizations in energy efficiency and renewable energy. Policy contributions are intended for hotel management, and the government. For management, this research contributes as a reference in making internal policies or regulations related to social and environmental activities. At the government level, the results of this research contribute to formulating sustainability policies for hotels, for example by strengthening mandatory regulations. Regulations that are

mandatory in nature encourage more hoteliers to comply. The existence of coercive sanctions aims to improve energy conservation, environmental sustainability and sustainable tourism in Indonesia.

## 2. LITERATURE REVIEW

### Stakeholder Theory

In many studies, stakeholder theory is applied to the renewable energy industry, because stakeholder issues are social and environmental issues (Freeman & Mcvea, 2008) faced by companies. The ethical perspective and managerial perspective of stakeholder theory emphasize that companies must carry out strategies and plans (Lock & Seele, 2017). In the ethical perspective, companies must provide benefits to stakeholders, whereas in a managerial perspective, this is done because of the important role of stakeholders for the company (Guix et al., 2018).

### Energy Efficiency and Renewable Energy

Based on stakeholder theory, Perlaviciute and Squintani (2020) state that energy savings have an impact on the use of renewable energy. Bhochhibhoya et al. (2020) also stated that energy efficiency programs can trigger motivation to use renewable energy. Other research states that commitment to renewable energy is influenced by energy conservation, efficiency and increasingly stringent energy management (Cedwal et al., 2015; Omune et al., 2021; Saputra, Subroto, et al., 2022). However, there are several other studies which state that energy efficiency still needs to be proven empirically in relation to commitment to renewable energy in the service industry (Chang et al., 2017; Di Salvo et al., 2017), because so far research on renewable energy is still focused on in the manufacturing industry (Olatomiwa et al., 2016; Warbroek et al., 2019). Efficiency is the maximum value of the ratio between output and energy input in a utilization system or in an energy conversion process (Teng et al., 2012). Energy efficiency is related to using less energy to obtain the same or even more benefits, or using the same energy but producing more benefits (Bößner et al., 2019; Kim & Todorovic, 2013; Perlaviciute & Squintani, 2020).

### Energy Efficiency and Environmental Management Accounting

Stakeholder theory has a section on stakeholder pressure both internal and external (Herbohn et al., 2014). In an organization, internal and external pressures have a relationship that influences each other (Lock & Seele, 2017). Energy efficiency, which is an external pressure, has an effect on the use of environmental management accounting as an internal pressure (Chang et al., 2017). Chedwal et al. (2015) states that energy efficiency affects the implementation of environmental management accounting. Several other studies also state that saving energy which is a form of efficiency can affect the use of accounting mechanisms in companies (Hardy et al., 2020; Saputra, Subroto, et al., 2022; Ying et al., 2011). However, several other studies state that environmental management accounting is not affected by energy saving programs (Butler, 2008; Dikgang et al., 2012). Differences in research results motivated researchers to re-examine the relationship between these variables, namely energy efficiency and environmental management accounting. Research in the field of accounting states that environmental management accounting is a company's internal pressure to use environmental accounting mechanisms in preserving the environment as a company commitment (Saputra et al., 2023b).

### Environmental Management Accounting and Renewable Energy

Internal stakeholder pressure in determining accounting mechanisms in companies is in the form of environmental management accounting as a form of the company's commitment to environmental sustainability and energy saving (Poll, 2015). Research

Korhonen (2007) and Pereira et al. (2021) stated that environmental management accounting mechanisms have an effect on renewable energy commitments. Other research also states that the implementation of environmental management accounting has a positive effect on the commitment to use renewable energy (Stanojević et al., 2010; Tilley & Young, 2009).

Renewable energy can be used as a basis for sustainable development (Agustia et al., 2019; Chifari et al., 2018). The main benefit of using renewable energy is that it does not produce emissions. For example, the use of solar panels or wind turbines does not produce pollution (Aczel et al., 2018; Baxter & Srisaeng, 2021). This is because renewable energy does not release harmful gases when it produces energy. Based on the description of the results of previous research, the third hypothesis of this study:

According to the stakeholder theory approach, the level of environmental management accounting information needs in every company is not always the same (Gunarathne & Lee, 2021). There are factors that affect the level of need for environmental management accounting information, namely regulation and stakeholders (Le et al., 2019), innovation (Sari et al., 2020; Zandi et al., 2019), environmental uncertainty (Somjai et al., 2020), as well as management commitment and environmental strategy (Latan et al., 2018).

These studies investigate the direct impact of contextual variables and environmental management accounting on manufacturing companies. To complete the available explanations, an investigation is needed regarding the indirect impact between energy efficiency, renewable energy commitments, and environmental management accounting. Solovida and Latan (2017) provide evidence of an indirect relationship between strategy efficiency on environmental performance and environmental management accounting as a mediating variable.

### **3. HYPOTHESIS DEVELOPMENT**

The research hypothesis was developed using a combination of stakeholder theory and the results of previous research. One of the pressures of stakeholders for the company is the most important determining criteria for the commitment to use renewable energy are energy efficiency and the use of environmental management accounting. Theoretical outline from stakeholder theory shows how to determine the determinants affecting the commitment to use renewable energy. The following hypotheses are presented when taken together:

H1: Energy efficiency has a positive effect on renewable energy commitments.

H2: Energy efficiency has a positive effect on the implementation of environmental management accounting

H3: Environmental management accounting has a positive effect on renewable energy commitments

H4: Environmental management accounting mediates the effect of energy efficiency on renewable energy.

### **4. METHODOLOGY**

Based on the studies of previous theories and research results that have been described, a conceptual framework and analytical model can be developed that will be used as a basis by researchers to develop hypotheses and justify research results.

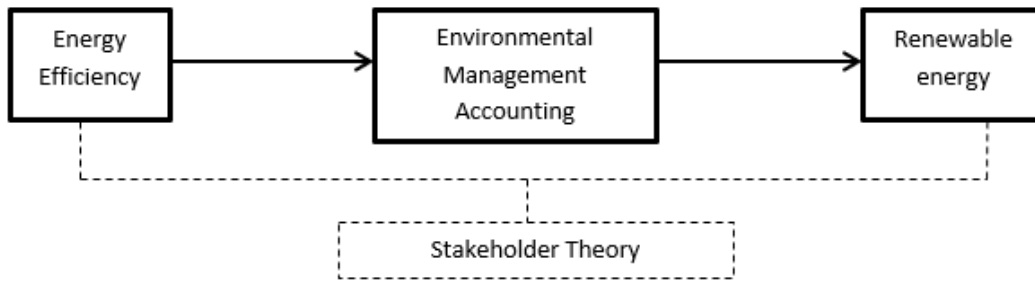


Figure 1. Research Conceptual Framework

This research is explanatory in nature which intends to explain the position of the variables studied and the influence between one variable and another. Renewable energy indicators consist of energy availability, easily accessible energy, and affordable energy (Böbner et al., 2019). Questions/statements of the renewable energy commitment variable, the measurement uses a five- point Likert scale , namely (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, (5) strongly agree. Energy efficiency forms four indicators (Pereira et al., 2021), namely reducing energy use, reducing energy costs and can generate financial savings for consumers if the energy savings do not exceed the additional costs for implementing energy-efficient technology applications. Environmental management accounting forms two indicators (Burritt et al., 2019) , namely monetary information and physical information.

Respondents in this study were hotels represented by General Managers at 4 and 5 star hotels in Bali. Hotel General Managers were chosen because they are able to provide information on hotel performance, environmental management accounting information, energy efficiency, and commitment to renewable energy. They are considered to have in-depth knowledge of all aspects of hotel operations including the use of renewable energy. The research sample is the entire population or is called the sample (Saputra, Subroto, et al., 2021) which is saturated, namely 380 star hotels. Data collection method is by survey technique using a questionnaire. Hypothesis testing is done by direct and indirect testing. Indirect testing, namely testing the mediating variable.

### 5. EMPIRICAL RESULTS AND DISCUSSION

A target sample of 380 hotels, 180 of which have responded, and all of them can be processed, resulting in a response rate of 47 percent. Response rates between 35 - 50 percent are said to be good/adequate for survey research in the context of management (Mellahi & Harris, 2016). This study grouped respondents, namely the initial group (early response) were questionnaires received from January to May 2023 totaling 109 questionnaires, and the final group (late response) was a group whose questionnaires were received after May, namely between June and August 2023 as many as 28 questionnaires. The requirement to carry out a biased non-response test is to first carry out a normality test. The results of the normality test showed that the data were not normally distributed, that is, all variables had a significance level of 0.000 (<0.05), so that the non-response test could be biased using the Mann-Whitney U Test.

Table 1. Mann-Whitney Test Table ( Non-Response Bias )

	Energy Efficiency	Environmental Management Accounting	Renewable energy
Mann-Whitney U	1481,000	1351,500	1498,000
Wilcoxon W	7476,000	7346500	1904,000
Z	-.242	-.935	-.150
asymp. Sig. (2-tailed)	.809	.350	.881

Nonresponse bias test show that the Asymp.Sig. (2-tailed) > level of significance on the variable energy efficiency (0.809), environmental management accounting (0.350) and renewable energy (0.881) meaning that the probability value  $\geq$  level of significance ( $\alpha = 5\%$ ), then the data taken is stated to be unbiased or there is no significant difference between the early response and late response samples . Thus it can be concluded that the data obtained both before and after the cutoff date can be analyzed to prove the research hypothesis.

Calculations that can be used to test construct reliability are composite reliability and cronbach's alpha. The test criteria state that if the composite reliability is greater than 0.7 and Cronbach 's alpha is above 0.600, then the construct is declared reliable.

Table 2. Reliability Test Results

Variable	Cronbach's Alpha	Composite Reliability	Results
Energy Efficiency	0.960	0.964	Reliable
Environmental Management Accounting	0.945	0.952	Reliable
Renewable energy	0.985	0.986	Reliable

Based on the table above it can be seen the value of composite reliability and the value of cronbach's alpha on the latent variable is above 0.700, then the construct and the instrument are declared reliable. Thus all the instruments used in this study are said to meet the criteria or are suitable for use in measuring all latent variables.

An effect is declared significant if the p-value is less than 0.05, and the effect is declared insignificant if the p-value is greater than 0.05. Testing the indirect effect hypothesis is carried out with the aim of testing whether there is an indirect effect of exogenous variables on endogenous variables through intervening variables. The criteria for testing the direct effect hypothesis state that if the path coefficient is positive and the t statistics value  $\geq$  t table (1.96 ) then it is stated that there is a positive and significant influence of exogenous variables on endogenous variables. The results of testing the direct influence hypothesis can be seen through the following table.

Table 3. Results of the Direct Effect Hypothesis Test

Influence	Path coefficient	T statistics	p-values	Information
EE $\rightarrow$ RE	0.335	4,598	0.000	Significant
EE $\rightarrow$ EMA	0.477	6,521	0.000	Significant
EMA $\rightarrow$ RE	0.259	3,434	0.001	Significant

Description: EE: Energy Efficiency; RE: Renewable Energy; EMA: Environmental Management Accounting.

Testing the hypothesis indirectly (mediation) the role of environmental management accounting variables in mediating the effect of energy efficiency on renewable energy is presented in the following table.

Table 4. Results of Indirect Effect Hypothesis Testing

Endogenous Variables	Intermediate Variable	Exogenous Variables	Coefficient	T statistics	p-values	Information
Energy Efficiency	Environmental Management Accounting	Renewable energy	0.066	2005	0.040	Significant

The indirect effect of energy efficiency variables on renewable energy through Environmental Management Accounting is significant, because the direct effect of energy efficiency variables on environmental management accounting and environmental management accounting on renewable energy is significant and with a p-value smaller than  $\alpha$  ( $0.040 < 0.05$  ). So it can be concluded that the Environmental Management

Accounting variable is a mediating variable for the influence of energy efficiency variables towards renewable energy.

The first hypothesis (H1) in this study states that energy efficiency affects renewable energy. The results of testing the hypothesis show support for the hypothesis. This means that the higher the commitment to energy efficiency, the more committed it will be to renewable energy in the hospitality industry. The research results are consistent with the findings from (Saputra, Subroto, et al., 2022). According to Saputra et al. (2021) stated that energy efficiency and renewable energy are also known as the twin pillars of a sustainable energy policy and are a top priority in the sustainable energy hierarchy. In many countries, energy efficiency is also seen to have benefits for national security because it can be used to reduce the level of energy imports from foreign countries and can slow down the rate at which domestic energy resources will be used up (Saputra, Subroto, et al., 2022 ).

Based on several previous studies, energy efficiency will increase the commitment to use renewable energy. Hotels in Indonesia have demonstrated a commitment to renewable energy in their operations (Cummings, 2016). In Salvo et al. (2017) stated that modern appliances, such as freezers, ovens, stoves, dishwashers, and clothes washers and dryers, use significantly less energy than older appliances. Installing a clothesline will significantly reduce energy consumption as a dryer (Khemiri & Hassairi, 2005). Today's energy-efficient refrigerators, for example, use 40 percent less energy than conventional models in 2001. In the following, if all households in Europe replaced all appliances older than ten years with new ones, 20 billion kWh of electricity will be saved annually, because it can reduce CO2 emissions by almost 18 billion kg (Jermisittiparsert et al., 2020).

The second hypothesis (H2) in this study states that energy efficiency affects environmental management accounting. The results of testing the hypothesis show support for the hypothesis. This means that the higher the commitment to energy efficiency, the higher the use of environmental management accounting in the hospitality industry. The results of the study are consistent with the findings of Dibene-Arriola et al. (2021). According to Saputra et al. (2023a) states that energy management can be carried out through the application of environmental management accounting (EMA). According to Wang et al. (2019) environmental management accounting is an effective step to assist companies in dealing with environmental and energy issues. Energy efficiency can increase the use of environmental management accounting in companies so that later they can achieve good environmental performance (Di Salvo et al., 2017; Pereira et al., 2021).

The results of this study are consistent with Saputra et al. (2023b) which explains that management accounting practices in an organization, along with changes in energy efficiency policies make it possible to reduce environmental uncertainty. Energy efficiency policies have a positive effect on corporate environmental management accounting, and are also supported empirically. The results of this analysis indicate that the implementation of corporate environmental management accounting is influenced by the frequency of energy efficiency policies. The more consistently the hotel implements energy efficiency policies, the more consistently environmental management accounting is used within the company, so that the company's sustainability performance will be better (Saputra, Subroto, et al., 2022). This finding is in line with a previous study by Aragón-Correa et al. (2008) who found that energy efficiency practices are positively related to environmental management accounting.

The third hypothesis (H3) in this study states that environmental management accounting has a positive effect on renewable energy. The results of testing the hypothesis show support for the hypothesis. This means that the more consistent the application of environmental management accounting in hotels, the higher the use of renewable energy. The results of this study are consistent with Thanh et al. (2022) which states that

environmental management accounting has an important role in motivating the use of renewable energy (Gunarathne et al. (2021) also mentions that renewable energy and environmental management accounting are two things that influence each other. Environmental management accounting has high potential to increase the use of renewable energy in service industries such as hospitality (Manurung et al., 2022). Increasingly sophisticated use management accounting practices (in this case, environmental management accounting), the better the company's control and decision-making processes and the more obvious the impact of environmental management accounting on the company's use of renewable energy (Saputra et al., 2023a).

This finding has important implications for the hospitality industry in Indonesia, namely the use of environmental management accounting is a key factor for increasing the company's use of renewable energy (Johnsson et al., 2020; Perlaviciute & Squintani, 2020). Environmental management accounting causes decisions made by managers related to the environment to be more accurate and efficient, so there is no wastage of resources or inefficient prevention of environmental pollution. This finding is in line with stakeholder theory to improve sustainability capabilities and performance (Guix et al., 2018; Silva et al., 2019).

The fourth hypothesis (H4) in this study states that energy efficiency affects renewable energy through environmental management accounting. The results of testing the hypothesis show support for the hypothesis. This means that environmental management accounting mediates the effect of energy efficiency on renewable energy. Energy efficiency includes active efforts to reduce energy consumption, for example through changes in behavior, in addition to using energy more efficiently (Poll, 2015). As with other definitions, the line between efficient energy use and energy conservation can be blurred, but it is both important in environmental and economic terms. This is especially the case when actions are directed at saving fossil fuels (Goerner et al., 2009). Energy conservation is a challenge that requires program policies, technology development, and behavior change to go hand in hand (Cummings, 2016). Many energy intermediary organizations, for example government or non-governmental organizations at local, regional, or national levels, work on frequently publicly funded programs or projects to meet these challenges (Di Salvo et al., 2017; Saputra, Subroto, et al., 2022).

Energy efficiency and renewable energy are said to be the "two pillars" of sustainable energy policy. Both strategies must be developed simultaneously in order to stabilize and reduce carbon dioxide emissions (Jermsittiparsert et al., 2020). Efficient energy use is important to slow the growth of energy demand so that increasing clean energy supplies can make a deep wound in the use of fossil fuels (Chang et al., 2017; Warbroek et al., 2019). If energy use grows too fast, the development of renewable energy will catch up with the target (Böbner et al., 2019). Likewise, unless clean energy supplies come online quickly, slowing demand growth will only start to reduce total carbon emissions; reduction of carbon content of energy sources is also required. The sustainable energy economy thus requires a major commitment to efficiency and renewable energy (Dibene-Arriola et al., 2021; Kurznack et al., 2021; Milanés Batista et al., 2020).

The results of this study enrich stakeholder theory through empirical findings of the relationship between stakeholder pressure demanding energy efficiency and the use of renewable energy (Perlaviciute & Squintani, 2020). Adopting energy efficiency will make it easier for companies to gain a reputation, thereby gaining the trust of cooperation from institutions such as the government, associations, business partners and others (Böbner et al., 2019; Moriarty & Honnery, 2019). The reputation gained is able to improve the performance and consistency of hotel renewable energy (Abbas et al., 2023; Enam et al., 2022).



## 6. CONCLUSIONS AND RECOMMENDATIONS

Energy efficiency is proven to have a positive effect on hotel renewable energy. The higher the level of application of energy efficiency, the better the hotel's use of renewable energy. So it can be concluded that efficiency is an important determinant for renewable energy. The higher the level of energy efficiency, the higher the level of consistency in applying renewable energy. As well as the increasingly consistent use of environmental management accounting, the performance of renewable energy will be even better. Environmental management accounting has also proven to have a direct effect on renewable energy, where environmental management accounting shows a positive effect on renewable energy. So, the more consistently implementing environmental management accounting, the more renewable energy will be increased.

The results of testing the indirect effect of superior energy efficiency on renewable energy through environmental management accounting, get positive results. This provides empirical evidence that energy efficiency programs require the application of environmental management accounting to increase commitment to renewable energy. Renewable energy is still an important object to be explored further. As long as there are still problems in the implementation process, it means that there are indications of problems with the use of renewable energy. Observing that this research still has limitations, there are still wide opportunities for further research to broaden and deepen the scope of the research focus. For this reason, this study recommends several points of advice, namely involving more independent variables that are a factor in stakeholder pressure. Expanding means adding new variables from the role of stakeholders, for example green organizational culture (see Gürlek & Tuna, 2017), and energy audit (Zanardo et al., 2018).

## 7. AUTHOR CONTRIBUTIONS

Conceptualization: Made Sudarma, Lely Kumalawati.

Data curation: Lely Kumalawati.

Formal analysis: Made Sudarma.

Investigation: Lely Kumalawati.

Methodology: Made Sudarma.

Resources: Lely Kumalawati.

Software: Lely Kumalawati.

Supervision: Made Sudarma.

Validation: Made Sudarma.

Visualization: Lely Kumalawati.

Writing – original draft: Made Sudarma.

Writing – review & editing: Made Sudarma, Lely Kumalawati.

## References

- Abbas, J., Wang, L., Ben Belgacem, S., Pawar, P. S., Najam, H., & Abbas, J. (2023). Investment in renewable energy and electricity output: Role of green finance, environmental tax, and geopolitical risk: Empirical evidence from China. *Energy*, 269, 126683. <https://doi.org/10.1016/j.energy.2023.126683>

- Aczel, M. R., Makuch, K. E., & Chibane, M. (2018). How much is enough? Approaches to public participation in shale gas regulation across England, France, and Algeria. *Extractive Industries and Society*, 5(4), 427–440. <https://doi.org/10.1016/j.exis.2018.10.003>
- Adinehzadeh, R., Jaffar, R., Abdul Shukor, Z., & Che Abdul Rahman, M. R. (2018). The mediating role of environmental performance on the relationship between corporate governance mechanisms and environmental disclosure. *Asian Academy of Management Journal of Accounting and Finance*, 14(1), 153–183. <https://doi.org/10.21315/aamjaf2018.14.1.7>
- Agustia, D., Sawarjuwono, T., & Dianawati, W. (2019). The Mediating Effect of Environmental Management Accounting on Green Innovation - Firm Value Relationship. *International Journal of Energy Economics and Policy*, 9(2), 299–306.
- Aragón-Correa, J. A., Hurtado-Torres, N., Sharma, S., & García-Morales, V. J. (2008). Environmental strategy and performance in small firms: A resource-based perspective. *Journal of Environmental Management*, 86(1), 88–103. <https://doi.org/10.1016/j.jenvman.2006.11.022>
- Ayoub, N., Musharavati, F., Pokharel, S., & Gabbar, H. A. (2014). Energy consumption and conservation practices in Qatar—A case study of a hotel building. *Energy and Buildings*, 84, 55–69.
- Baxter, G., & Srisaeng, P. (2021). An Assessment of the Environmentally Sustainable Hotel Operation : The Case of Centara Hotels & Resorts , Thailand. 3(2), 1–33.
- Bhochhibhoya, S., Pizzol, M., Marinello, F., & Cavalli, R. (2020). Sustainability performance of hotel buildings in the Himalayan region. *Journal of Cleaner Production*, 250, 119538. <https://doi.org/10.1016/j.jclepro.2019.119538>
- Bößner, S., Devisscher, T., Suljada, T., Ismail, C. J., Sari, A., & Mondamina, N. W. (2019). Barriers and opportunities to bioenergy transitions: An integrated, multi-level perspective analysis of biogas uptake in Bali. *Biomass and Bioenergy*, 122(January 2018), 457–465. <https://doi.org/10.1016/j.biombioe.2019.01.002>
- Burritt, R. L., Herzig, C., Schaltegger, S., & Viere, T. (2019). Diffusion of environmental management accounting for cleaner production: Evidence from some case studies. *Journal of Cleaner Production*, 224, 479–491.
- Butler, J. (2008). The compelling “hard case” for “green” hotel development. *Cornell Hospitality Quarterly*, 49(3), 234–244. <https://doi.org/10.1177/1938965508322174>
- Chang, R. D., Zuo, J., Zhao, Z. Y., Zillante, G., Gan, X. L., & Soebarto, V. (2017). Evolving theories of sustainability and firms: History, future directions and implications for renewable energy research. *Renewable and Sustainable Energy Reviews*, 72(November 2015), 48–56. <https://doi.org/10.1016/j.rser.2017.01.029>
- Chedwal, R., Mathur, J., Agarwal, G. Das, & Dhaka, S. (2015). Energy saving potential through Energy Conservation Building Code and advance energy efficiency measures in hotel buildings of Jaipur City, India. *Energy and Buildings*, 92, 282–295. <https://doi.org/10.1016/j.enbuild.2015.01.066>
- Chifari, R., Lo Piano, S., Bukkens, S. G. F., & Giampietro, M. (2018). A holistic framework for the integrated assessment of urban waste management systems. *Ecological Indicators*, 94, 24–36. <https://doi.org/10.1016/j.ecolind.2016.03.006>
- Cummings, E. T. J. H. L. (2016). Potential users’ perceptions of general purpose water accounting reports. *Accounting, Auditing & Accountability Journal*, 29(1), 471–484.
- Di Salvo, A. L. A., Agostinho, F., Almeida, C. M. V. B., & Giannetti, B. F. (2017). Can cloud computing be labeled as “green”? Insights under an environmental accounting perspective. *Renewable and Sustainable Energy Reviews*, 69(November 2016), 514–526. <https://doi.org/10.1016/j.rser.2016.11.153>
- Dibene-Arriola, L. M., Carrillo-González, F. M., Quijas, S., & Rodríguez-Urbe, M. C. (2021). Energy efficiency indicators for hotel buildings. *Sustainability (Switzerland)*, 13(4), 1–11. <https://doi.org/10.3390/su13041754>

- Dikgang, J., Leiman, A., & Visser, M. (2012). Analysis of the plastic-bag levy in South Africa. *Resources, Conservation and Recycling*, 66, 59–65. <https://doi.org/10.1016/j.resconrec.2012.06.009>
- Enam, R. N., Tahir, M., Rizvi, H. H., Rafique, A., & Mustafa, S. M. N. (2022). A Sustainable Way to Generate Energy through Biomass Flash Pyrolysis in South Asia: A Green Energy Technology. *International Journal of Energy Economics and Policy*, 12(5), 274–279. <https://doi.org/10.32479/ijeep.13335>
- Freeman, R. E., & Mcvea, J. (2008). A Stakeholder Approach to Strategic Management. *The Blackwell Handbook of Strategic Management*, 183–201. <https://doi.org/10.1111/b.9780631218616.2006.00007.x>
- Fuzi, N. M., Habidin, N. F., Janudin, S. E., & Ong, S. Y. Y. (2019). Critical success factors of environmental management accounting practices : fi ndings from Malaysian manufacturing industry. *Measuring Business Excellence*, 23(1), 1–14. <https://doi.org/10.1108/MBE-03-2018-0015>
- Goerner, S. J., Lietaer, B., & Ulanowicz, R. E. (2009). Quantifying economic sustainability: Implications for free-enterprise theory, policy and practice. *Ecological Economics*, 69(1), 76–81. <https://doi.org/10.1016/j.ecolecon.2009.07.018>
- Gordon, L. A., & Narayanan, V. K. (1984). Management accounting systems, perceived environmental uncertainty and organization structure: An empirical investigation. *Accounting, Organizations and Society*, 9(1), 33–47. [https://doi.org/10.1016/0361-3682\(84\)90028-X](https://doi.org/10.1016/0361-3682(84)90028-X)
- Guix, M., Bonilla-Priego, M. J., & Font, X. (2018). The process of sustainability reporting in international hotel groups: an analysis of stakeholder inclusiveness, materiality and responsiveness. *Journal of Sustainable Tourism*, 26(7), 1063–1084. <https://doi.org/10.1080/09669582.2017.1410164>
- Gunarathne, A. D. N., Lee, K. H., & Hitigala Kaluarachchilage, P. K. (2021). Institutional pressures, environmental management strategy, and organizational performance: The role of environmental management accounting. *Business Strategy and the Environment*, 30(2), 825–839. <https://doi.org/10.1002/bse.2656>
- Gunarathne, N., & Lee, K. H. (2021). Corporate cleaner production strategy development and environmental management accounting: A contingency theory perspective. *Journal of Cleaner Production*, 308(December 2020), 127402. <https://doi.org/10.1016/j.jclepro.2021.127402>
- Han, H., Lee, J. S., Trang, H. L. T., & Kim, W. (2018). Water conservation and waste reduction management for increasing guest loyalty and green hotel practices. *International Journal of Hospitality Management*, 75(March), 58–66. <https://doi.org/10.1016/j.ijhm.2018.03.012>
- Hardy, P. Y., Dray, A., Cornioley, T., David, M., Sabatier, R., Kernes, E., & Souchère, V. (2020). Public policy design: Assessing the potential of new collective Agri-Environmental Schemes in the Marais Poitevin wetland region using a participatory approach. *Land Use Policy*, 97(April), 104724. <https://doi.org/10.1016/j.landusepol.2020.104724>
- Henri, J., & Journeault, M. (2010). Accounting , Organizations and Society Eco-control : The influence of management control systems on environmental and economic performance. *Accounting, Organizations and Society*, 35(1), 63–80. <https://doi.org/10.1016/j.aos.2009.02.001>
- Herbohn, K., Walker, J., & Loo, H. Y. M. (2014). Corporate Social Responsibility : The Link Between Sustainability Disclosure and Sustainability Performance. *ABACUS*, 50(4). <https://doi.org/10.1111/abac.12036>
- Jermstipparsert, K., Somjai, S., & Toopgajank, S. (2020). Factors Affecting Firm ’ s Energy Efficiency and Environmental Performance: The Role of Environmental Management Accounting , Green Innovation and Environmental Proactivity. *International Journal of Energy Economics and Policy*, 10(3), 325–331.
- Johnsson, F., Karlsson, I., Rootzén, J., Ahlbäck, A., & Gustavsson, M. (2020). The framing of a sustainable development goals assessment in decarbonizing the construction industry—Avoiding “Greenwashing.” *Renewable and Sustainable Energy Reviews*, 131, 110029.

- Khemiri, A., & Hassairi, M. (2005). Development of energy efficiency improvement in the Tunisian hotel sector: a case study. *Renewable Energy*, 30(6), 903–911.
- Kim, J. T., & Todorovic, M. S. (2013). Towards sustainability index for healthy buildings - Via intrinsic thermodynamics, green accounting and harmony. *Energy and Buildings*, 62, 627–637. <https://doi.org/10.1016/j.enbuild.2013.03.009>
- Kim, Y. H., Barber, N., & Kim, D. K. (2018). Sustainability research in the hotel industry: Past, present, and future. *Journal of Hospitality Marketing and Management*, 1–45. <https://doi.org/10.1080/19368623.2019.1533907>
- Korhonen, J. (2007). Special issue of the *Journal of Cleaner Production*, “From Material Flow Analysis to Material Flow Management”. strategic sustainability management on a principle level. *Journal of Cleaner Production*, 15(17), 1585–1595. <https://doi.org/10.1016/j.jclepro.2006.08.005>
- Kurzack, L., Schoenmaker, D., & Schramade, W. (2021). A model of long-term value creation. *Journal of Sustainable Finance and Investment*, 0(0), 1–19. <https://doi.org/10.1080/20430795.2021.1920231>
- Latan, H., Jabbour, C. J. C., Jabbour, A. B. L. de S., Wamba, S. F., & Shahbaz, M. (2018). Effects of environmental strategy, environmental uncertainty and top management’s commitment on corporate environmental performance: The role of environmental management accounting. *Journal of Cleaner Production*, 180, 297–306. <https://doi.org/10.1016/j.jclepro.2018.01.106>
- Le, T. T., Nguyen, T. M. A., & Phan, T. T. H. (2019). Environmental Management Accounting and Performance Efficiency in the Vietnamese Construction Material Industry — A Managerial Implication for Sustainable Development. *Sustainability*, 11(5152), 1–32.
- Lee, W. H., & Cheng, C. C. (2018). Less is more: A new insight for measuring service quality of green hotels. *International Journal of Hospitality Management*, 68(July 2017), 32–40. <https://doi.org/10.1016/j.ijhm.2017.09.005>
- Lock, I., & Seele, P. (2017). Theorizing stakeholders of sustainability in the digital age. *Sustainability Science*, 12(2), 235–245. <https://doi.org/10.1007/s11625-016-0404-2>
- Manurung, D. T. H., Hidayah, N., Setiany, E., Saputra, K. A. K., & Hapsari, D. W. (2022). Does Carbon Performance and Green Investment Affect Carbon Emissions Disclosure? *Journal of Environmental Accounting and Management*, 10(4), 335–344. <https://doi.org/10.5890/JEAM.2022.12.001>
- Mellahi, K., & Harris, L. C. (2016). Response Rates in Business and Management Research: An Overview of Current Practice and Suggestions for Future Direction. *British Journal of Management*, 27(2), 426–437. <https://doi.org/10.1111/1467-8551.12154>
- Milanés Batista, C., Planas, J. A., Pelot, R., & Núñez, J. R. (2020). A new methodology incorporating public participation within Cuba’s ICZM program. *Ocean and Coastal Management*, 186(January). <https://doi.org/10.1016/j.ocecoaman.2020.105101>
- Moriarty, P., & Honnery, D. (2019). Energy accounting for a renewable energy future. *Energies*, 12(22), 4280.
- Olatomiwa, L., Mekhilef, S., Ismail, M. S., & Moghavvemi, M. (2016). Energy management strategies in hybrid renewable energy systems: A review. *Renewable and Sustainable Energy Reviews*, 62, 821–835.
- Omune, B., Kambona, O., Wadongo, B., & Wekesa, A. (2021). Environmental management practices implemented by the hotel sector in Kenya. *World Leisure Journal*, 63(1), 98–108. <https://doi.org/10.1080/16078055.2021.1888001>
- Pavlatos, O. (2015). An empirical investigation of strategic management accounting in hotels. *International Journal of Contemporary Hospitality Management*, 27(5), 756–767. <https://doi.org/10.1108/IJCHM-12-2013-0582>
- Pereira, V., Silva, G. M., & Dias, Á. (2021). Sustainability practices in hospitality: Case study of a luxury hotel in Arrábida Natural Park. *Sustainability (Switzerland)*, 13(6), 1–21. <https://doi.org/10.3390/su13063164>

- Perlaviciute, G., & Squintani, L. (2020). Public Participation in Climate Policy Making: Toward Reconciling Public Preferences and Legal Frameworks. *One Earth*, 2(4), 341–348. <https://doi.org/10.1016/j.oneear.2020.03.009>
- Phan, T. N., Baird, K., & Su, S. (2018). Environmental activity management: its use and impact on environmental performance. *Accounting, Auditing and Accountability Journal*, 31(2), 651–673. <https://doi.org/10.1108/AAAJ-08-2016-2686>
- Poll, H. M. van der. (2015). Facilitating a greener environment through Management Accounting. *African Journal of Hospitality, Tourism and Leisure*, 4(January).
- Saputra, K. A. K., Manurung, D. T. H., Rachmawati, L., Siskawati, E., & Genta, F. K. (2021). Combining the Concept of Green Accounting With the Regulation of Prohibition of Disposable Plastic Use. *International Journal of Energy Economics and Policy*, 11(4), 84–90. <https://doi.org/10.32479/ijeeep.10087>
- Saputra, K. A. K., Putri, P. Y. A., & Kawisana, P. G. W. P. (2022). Ecotourism, Agricultural Products, And Biological Assets In Accounting. *Russian Journal of Agricultural and Socio-Economic Sciences (RJOAS)*, 2(122), 63–73. <https://doi.org/10.18551/rjoas.2022-02.08>
- Saputra, K. A. K., Subroto, B., Rahman, A. F., & Saraswati, E. (2021). Financial Management Information System , Human Resource Competency and Financial Statement Accountability : A Case Study in Indonesia. *Journal of Asian Finance, Economics and Business*, 8(5), 277–285. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0277>
- Saputra, K. A. K., Subroto, B., Rahman, A. F., & Saraswati, E. (2022). Eco-Efficiency and Energy Audit to Improve Environmental Performance: An Empirical Study of Hotels in Bali-Indonesia. *International Journal of Energy Economics and Policy*, 12(6), 175–182. <https://doi.org/10.32479/ijeeep.13565>
- Saputra, K. A. K., Subroto, B., Rahman, A. F., & Saraswati, E. (2023a). Mediation Role Of Environmental Management Accounting On The Effect Of Green Competitive Advantage On Sustainable Performance. *Journal of Sustainability Science and Management*, 18(2), 103–115. <https://doi.org/http://doi.org/10.46754/jssm.2023.02.008>
- Saputra, K. A. K., Subroto, B., Rahman, A. F., & Saraswati, E. (2023b). Sustainability Performance in Hospitality Industry : Interaction of Strategic Sustainability Management and Sat kerthi culture. *Jurnal Ilmiah Akuntansi Dan Bisnis*, 18(1), 147–162. <https://doi.org/10.24843/JIAB.2023.v18.i01.p10>
- Sari, R. N., Pratadina, A., Anugerah, R., Kamaliah, K., & Sanusi, Z. M. (2020). Effect of environmental management accounting practices on organizational performance: role of process innovation as a mediating variable. *Business Process Management Journal*, 27(4), 1296–1314. <https://doi.org/10.1108/BPMJ-06-2020-0264>
- Schornagel, J., Niele, F., Worrell, E., & Böggemann, M. (2012). Water accounting for (agro)industrial operations and its application to energy pathways. *Resources, Conservation and Recycling*, 61, 1–15. <https://doi.org/10.1016/j.resconrec.2011.12.011>
- Silva, S., Nuzum, A. K., & Schaltegger, S. (2019). Stakeholder expectations on sustainability performance measurement and assessment. A systematic literature review. *Journal of Cleaner Production*, 217, 204–215. <https://doi.org/10.1016/j.jclepro.2019.01.203>
- Solovida, G. T., & Latan, H. (2017). Linking environmental strategy to environmental performance management accounting. *Sustainability Accounting, Management and Policy Journal*, 8(5), 595–619. <https://doi.org/10.1108/SAMPJ-08-2016-0046>
- Somjai, S., Fongtanakit, R., & Laosillapacharoen, K. (2020). Impact of Environmental Commitment , Environmental Management Accounting and Green Innovation on Firm Performance : An Empirical Investigation. *International Journal of Energy Economics and Policy*, 10(3), 204–210.
- Stanojević, M., Vranes, S., & Gökalp, I. (2010). Green accounting for greener energy. *Renewable and Sustainable Energy Reviews*, 14(9), 2473. <https://doi.org/10.1016/j.rser.2010.06.020>

- Stoddard, J. E., Pollard, C. E., & Evans, M. R. (2012). The Triple Bottom Line: A Framework for Sustainable Tourism Development. *International Journal of Hospitality and Tourism Administration*, 13(3), 233–258. <https://doi.org/10.1080/15256480.2012.698173>
- Teng, C.-C., Horng, J.-S., Hu, M.-L. M., Chien, L.-H., & Shen, Y.-C. (2012). Developing energy conservation and carbon reduction indicators for the hotel industry in Taiwan. *International Journal of Hospitality Management*, 31(1), 199–208.
- Thanh, T., Duong, H., Hong, T., Nguyen, S., Thu, K., & Nguyen, H. (2022). Case Study in Manufacturing Enterprises in Danang City.
- Tilley, F., & Young, W. (2009). Sustainable Entrepreneurs: Are They the True Wealth Generators of the Future? *Greener Management International*, 55(1), 79–92.
- Wang, Y., Liang, J., Yang, J., Ma, X., Li, X., Wu, J., Yang, G., Ren, G., & Feng, Y. (2019). Analysis of the environmental behavior of farmers for non-point source pollution control and management: An integration of the theory of planned behavior and the protection motivation theory. *Journal of Environmental Management*, 237(January), 15–23. <https://doi.org/10.1016/j.jenvman.2019.02.070>
- Warbroek, B., Hoppe, T., Bressers, H., & Coenen, F. (2019). Energy Research & Social Science Testing the social , organizational , and governance factors for success in local low carbon energy initiatives. *Energy Research & Social Science*, 58(March), 101269. <https://doi.org/10.1016/j.erss.2019.101269>
- Ying, Z., Gao, M., Liu, J., Wen, Y., & Song, W. (2011). Green accounting for forest and green policies in China - A pilot national assessment. *Forest Policy and Economics*, 13(7), 513–519. <https://doi.org/10.1016/j.forpol.2011.06.005>
- Zandi, G. R., Khalid, N., & Islam, D. M. Z. (2019). Nexus of Knowledge Transfer, Green Innovation and Environmental Performance: Impact of Environmental Management Accounting. *International Journal of Energy Economics and Policy*, 9(5), 387–393.
- Zvezdov, D. (2012). Rolling out Corporate Sustainability Accounting: A Set of Challenges. *Journal of Environmental Sustainability*, 2(1), 1–11. <https://doi.org/10.14448/jes.02.0003>