

Evaluation of Green Performance Appraisal Implementation on Innovation and Energy Efficiency at PT Integra Solusi Utama

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Submitted :06-12-2024, Accepted : 06-01-2025, Published : 06-02-2025

Abstract

This study aims to analyze the effect of Innovation, GPA Implementation, and Managerial Support on Energy Efficiency in an organization. This study uses a quantitative approach with multiple linear regression methods. Data was obtained through a survey involving respondents from various industrial sectors. Statistical tests used include R Square, F test (ANOVA), and t test to test the relationship between independent and dependent variables. The results show that the regression model used is significant ($p = 0.000$), with an R Square value of 53.6%, which means that the variables Innovation, GPA Implementation, and Managerial Support can explain 53.6% of the variation in Energy Efficiency. The t-test showed that only GPA Implementation had a significant effect on Energy Efficiency ($p = 0.025$), while the Managerial Support and Innovation variables showed no significant effect. This finding confirms that GPA Implementation is the main contributing factor in improving Energy Efficiency, so organizations need to focus more on effective GPA implementation strategies. This research also suggests that further studies consider other factors that can influence energy efficiency, such as sustainability policies and energy-saving technologies.

Keywords : Energy Efficiency, Innovation, GPA Implementation, Managerial Support

Introduction

In the context of increasing globalization and industrialization, organizations are increasingly adopting Green Human Resource Management (Green HRM) practices to enhance their environmental sustainability efforts. A critical component of this approach is the Green Performance Appraisal (GPA), which evaluates employee performance based on environmental criteria and sustainability metrics (Asfiah et al., 2024). By integrating sustainability metrics into performance appraisals, companies can effectively link individual contributions to the organization's broader sustainability goals (Shahrulnizam et al., 2024). In addition, encouraging employee engagement in sustainability initiatives is critical, as engaged employees are more likely to actively participate and support GPA efforts (Ali et al., 2024). Ultimately, these practices not only promote a culture of

sustainability within the organization but also align with sustainable business practices that aim to minimize environmental impacts while maximizing economic and social benefits (Permadi et al., 2024). This holistic approach is critical for organizations seeking to achieve operational efficiency alongside their environmental responsibilities. Green Performance Appraisal (IPK) is a transformative method that not only evaluates individual productivity but also emphasizes employee contributions to the company's environmental policies. By integrating environmental aspects into performance evaluations, IPK fosters a sustainable work culture that encourages energy efficiency and innovation in workplace practices (Sadek & Karkoulian, 2024). This approach aligns with the organization's broader commitment to reducing their environmental footprint and promoting sustainable practices, thereby enhancing the company's environmental responsibility (Sungaile & Stankevičienė, 2024). Furthermore, the use of Environmental Performance Indicators (EPIs) in IPK provides a structured framework for assessing these contributions, ensuring that employees are recognized for their efforts in supporting environmental initiatives (Le et al., 2024). Ultimately, by promoting energy-efficient practices, IPK not only reduces the organization's environmental impact but also fosters a workforce that is more aware of sustainability issues (Nurhasanah & Tiyasiningsih, 2024). This holistic approach is critical for organizations aiming to achieve long-term sustainability goals. Green Performance Appraisal (GPA) implementation faces significant challenges, particularly related to employee engagement and resistance to change. Lack of understanding and awareness among employees can hamper the effectiveness of GPA, emphasizing the need for a strong engagement strategy to foster commitment to sustainability goals (Patil et al., 2024). Furthermore, an effective change management strategy is critical to overcome resistance and ensure successful GPA adoption (Artati et al., 2024). Furthermore, measuring the impact of GPA on energy efficiency and innovation is critical to evaluating its success. Energy efficiency metrics play a critical role in assessing the effectiveness of GPA by providing a benchmark for energy consumption and reduction efforts (Sadek & Karkoulian, 2024). Furthermore, GPA can drive innovation in work processes, leading to increased efficiency and productivity in organizations (Ali & Huang, 2024). Thus, this study aims to explore how GPA can contribute to energy consumption reduction and innovation,

addressing these critical challenges..

Literature Review

Green Human Resource Management (Green HRM)

Green HRM effectively integrates human resource management practices with environmental sustainability goals through various strategies. One key aspect is green recruitment, which focuses on attracting candidates who are aligned with the organization's environmental values, thereby increasing the workforce's commitment to sustainability (Sungaile & Stankevičienė, 2024). In addition, environmental training plays a critical role by equipping employees with the skills and knowledge necessary to contribute to sustainability initiatives, leading to increased engagement and motivation (Zournatzidou et al., 2024). Furthermore, sustainability-based compensation links employee rewards to environmental performance metrics, incentivizing contributions to sustainability goals (Papademetriou et al., 2024). Green performance appraisals also evaluate employees' contributions to these goals, fostering a culture that prioritizes environmental considerations in day-to-day operations (Kandel et al., 2024). Finally, promoting employee engagement in sustainability empowers individuals to take ownership of environmental initiatives, driving innovation and commitment within the organization (Nuriyatman et al., 2024). Collectively, these practices form a comprehensive approach to achieving sustainability goals in the workplace.

Green Performance Appraisal (GPA)

Green Performance Appraisal (GPA) is an essential component of Green Human Resource Management (Green HRM), which focuses on evaluating employee performance through environmental indicators. This approach not only promotes environmental awareness among employees but also fosters a culture of sustainability within the organization. Jabbour (2015) highlighted that GPA can significantly enhance sustainability-based innovation, encouraging the development of practices that minimize environmental impact (Sadek & Karkoulou, 2024). By integrating GPA into HR practices, organizations can foster employee environmental awareness,

leading to a more conscientious workforce that understands the ecological implications of their actions (Shaikh et al., 2024). Ultimately, implementing GPA within a Green HRM framework aims to achieve environmental sustainability, ensuring that organizational operations do not compromise ecological integrity (Sungaile & Stankevičienė, 2024). This holistic approach underscores the importance of aligning HR practices with sustainability goals, thereby fostering employee engagement and organizational responsibility towards the environment.

Energy Efficiency in Organizations

Energy efficiency is an essential component of a company's sustainability strategy, as it not only reduces environmental impact but also improves economic performance. According to Porter's Hypothesis, implementing stringent environmental regulations can drive innovation and lead to the adoption of energy-efficient technologies, ultimately improving competitiveness (Espinoza-Castro et al., 2024). Furthermore, green productivity emphasizes the efficient use of resources to minimize waste, with energy efficiency being a key aspect contributing to the reduction of greenhouse gas emissions (Клещов, 2024). To implement energy-efficient practices effectively, employee engagement is essential; motivating employees through Green Performance Appraisals (GPA) can foster a culture of energy efficiency in the workplace (Клещов, 2024). In addition, Energy Management Systems (EMS) play a vital role in identifying inefficiencies and facilitating energy-saving measures, thereby supporting the company's overall sustainability strategy (Sahoo et al., 2024). By integrating these elements, companies can achieve significant improvements in both sustainability and operational efficiency.

Methods

This study uses a quantitative approach with a survey research design. Data will be collected through questionnaires distributed to employees in various organizations that have implemented Green Performance Appraisal. The population of this study is employees in companies that have implemented GPA in their performance evaluations. The sample will be selected using a purposive

sampling technique, where only employees who have experience with GPA will be used as respondents, totaling 50 respondents. In this study, there are several variables that can be used to evaluate the implementation of Green Performance Appraisal (GPA) on innovation and energy efficiency. The following are the relevant variables, Independent Variable (X1), Implementation of Green Performance Appraisal (GPA), Managerial Support (X2), Intervening Variable, Innovation in Organization (Y), Dependent Variable, Energy Efficiency in Organization (z).

Results and Discussion

Validity & Reliability Test

Validity Test Table

Correlations		
	Sig. (2-tailed)	Keterangan
GPA Implementation	0,000	Valid
Managerial Support	0,000	Valid
, Innovation	0,000	Valid
Energy Efficiency	0,000	Valid
**. Correlation is significant at the 0.01 level (2-tailed).		

Interpretation

All items in this study have a significance value of 0.000 (<0.005), thus it can be stated that the items in this study are valid.

Reliability Test Table

Reliability Statistics	
Cronbach's Alpha	N of Items
0,784	4

Interpretation

All items in this study have a Cronbach's Alpha value of 0.784 (>0.70), thus it can be stated that the items in this study are reliable, and the data is continued in further research.

1. Multiple Linear Regression Test

Model 1

Table . T-test

		Coefficients*				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	1,634	1,185		1,378	0,175
	Implementatation GPA	-0,018	0,040	-0,038	-0,439	0,663
	Managerial Support	0,378	0,036	0,898	10,475	0,000
a. Dependent Variable :, Inovation						

Interpretation

1. Implementation of Green Performance Appraisal (GPA)

The value of $t = -0.439$ with $\text{Sig.} = 0.663$ (greater than 0.05) indicates that the effect of GPA Implementation on Innovation and Energy Efficiency is not statistically significant. This means that in this study, GPA Implementation does not have a strong enough effect on Innovation and Energy Efficiency at PT Integra Solusi Utama.

2. Managerial Support

The value of $t = 10.475$ with $\text{Sig.} = 0.000$ (smaller than 0.05) indicates that Managerial Support has a significant and positive effect on Innovation and Energy Efficiency. In other words, the higher the Managerial Support given, the higher the Innovation and Energy Efficiency in the company.

Table F test

ANOVA*						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	197,633	2	98,817	78,258	,000 ^b
	Residual	59,347	47	1,263		
	Total	256,980	49			
a. Dependent Variable :, Inovation						
b. Predictors : (Constant) , Managerial Support , Implementation GPA						

Interpretation

Significance Value (Sig.) = 0.000 and F Value = 78.258, This value is smaller than 0.05, which means that the overall regression model is significant. In other words, the independent variables (GPA Implementation and Managerial Support) together have a significant influence on the dependent variable (Innovation). F value = 78.258, This value indicates that the regression model used is strong enough to explain the dependent variable.

Table R Square

Model Summary				
Model	R	R Square	Adjusted R Square	Std.Errpr of the Estimate
1	.877 ^a	0,769	0,759	1,124
a. Predictors : (Constant) , Managerial Support , Implementation GPA				

Interpretation

The results of the determinant coefficient test where the R square result is 0.769, thus the managerial support and GPA implementation variables have an influence on Innovation of 76.9%. And the rest is influenced by other variables outside this study.

Model 2

Table T Test

		Coefficients*				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18,810	7,454		2,524	0,015
	Implemetation GPA	0,577	0,248	0,286	2,325	0,025
	Managerial Support	0,610	0,406	0,337	1,502	0,140
	, Inovation	0,915	0,899	0,213	1,018	0,314
a. Dependent Variable :, Energy Efficiency						

Interpretation

1. GPA Implementation (Green Performance Appraisal)

The value of $t = 2.325$, with $\text{Sig.} = 0.025 (< 0.05)$, meaning that GPA Implementation has a significant effect on Energy Efficiency.

2. Managerial Support

The value of $t = 1.502$, with $\text{Sig.} = 0.140 (> 0.05)$, meaning that Managerial Support does not have a significant effect on Energy Efficiency.

3. Innovation

The value of $t = 1.018$, with $\text{Sig.} = 0.314 (> 0.05)$, meaning that Innovation does not have a significant effect on Energy Efficiency.

Table F Test

ANOVA*						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2550,538	3	850,179	17,709	,000 ^b
	Residual	2208,342	46	48,007		
	Total	4758,880	49			
a. Dependent Variable :, Energy Efficiency						
b. Predictors : (Constant) , Inovation, Managerial Support , Implementation GPA						

Interpretation

F value = 17.709, Sig. = 0.000, thus the overall regression model is significant, which means that the independent variables (GPA Implementation, Managerial Support, and Innovation) simultaneously have an influence on Energy Efficiency.

Table R Square

Model Summary				
Model	R	R Square	Adjusted R Square	Std.Errpr of the Estimate
1	.732 ^a	0,536	0,506	6,929
a. Predictors : (Constant) , Inovation , Managerial Support , Implementation GPA				

Interpretation

The results of the coefficient determinant test on model 2 where the R square result is 0.536, thus the managerial support variable and GPA implementation have an influence on Innovation of 53.6%. And the rest is influenced by other variables outside this study.

Conclusion

Based on the results of the regression analysis that has been conducted, this study found that the variables Innovation, GPA Implementation, and Managerial Support have an influence on Energy Efficiency. This is indicated by the R Square value of 53.6%, which means that more than half of the variation in Energy Efficiency can be explained by the three independent variables, while the remaining 46.4% is influenced by other factors not included in this research model.

The results of the F test (ANOVA) show that the regression model used is statistically significant with a value of $p = 0.000$, so it can be concluded that together, Innovation, GPA Implementation, and Managerial Support contribute to increasing Energy Efficiency. However, based on the t test, only the GPA Implementation variable has a significant effect on Energy Efficiency ($p = 0.025$), while the Managerial Support and Innovation variables do not show a significant effect in this model.

Thus, this study confirms that GPA Implementation has a more dominant role than other variables in increasing Energy Efficiency. However, considering that there are still other factors that have not been accommodated in this study, it is recommended that further research consider additional variables that may contribute more to increasing Energy Efficiency, such as company policies, the use of energy-saving technology, or a work culture that supports resource efficiency.

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