

The Effect Of Green Intellectual Capital On Corporate Performance At Pt Citra Nusantara Gemilang Hilir Raya Palembang

Pengaruh Green Intellectual Capital Terhadap Kinerja Perusahaan Pada Pt Citra Nusantara Gemilang Hilir Raya Palembang

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ABSTRACT

This study examines the effect of Green Intellectual Capital (GIC) on firm performance at PT Citra Nusantara Gemilang (CNG) Hilir Raya Palembang, a gas distribution company in Indonesia's energy sector. GIC was decomposed into three dimensions: Green Human Capital (GHC), Green Structural Capital (GSC), and Green Relational Capital (GRC). A quantitative associative approach was used, with data collected through a structured questionnaire distributed to 40 employees selected by purposive sampling from a population of 60 employees. Data were analyzed using validity and reliability tests, classical assumption tests, and multiple linear regression with SPSS. All instruments were valid ($r\text{-count} > r\text{-table of } 0.312$) and reliable (Cronbach's Alpha > 0.60). The regression equation obtained was $Y = 20.105 + 0.261X_1 + 0.379X_2 + 0.333X_3$. Partially, GHC had no significant effect on firm performance ($t = 1.919$; $\text{sig} = 0.063$), whereas GSC ($t = 2.909$; $\text{sig} = 0.006$) and GRC ($t = 3.433$; $\text{sig} = 0.002$) had a positive and significant effect. Simultaneously, GHC, GSC, and GRC significantly affected firm performance ($F = 60.568$; $\text{sig} = 0.000$), explaining 83.5% of its variance ($R^2 = 0.835$). These findings indicate that organizational systems and stakeholder relationships built on sustainability principles are the strongest drivers of firm performance in the energy distribution sector, while individual green competence alone is not yet sufficient. The study offers practical implications for strengthening green structural and relational capital alongside green human resource development to achieve sustainable competitive advantage.

Keywords: Green Human Capital Green Structural Capital Green Relational Capital Green Intellectual Capital Firm Performance

ABSTRAK

Penelitian ini mengkaji pengaruh *Green Intellectual Capital* (GIC) terhadap kinerja perusahaan pada PT Citra Nusantara Gemilang (CNG) Hilir Raya Palembang, sebuah perusahaan distribusi gas di sektor energi Indonesia. GIC diuraikan menjadi tiga dimensi: *Green Human Capital* (GHC), *Green Structural Capital* (GSC), dan *Green Relational Capital* (GRC). Pendekatan kuantitatif asosiatif digunakan dalam penelitian ini, dengan pengumpulan data melalui kuesioner terstruktur yang disebarakan kepada 40 karyawan yang dipilih menggunakan metode *purposive sampling* dari populasi sebanyak 60 karyawan. Data dianalisis menggunakan uji validitas dan reliabilitas, uji asumsi klasik, serta regresi linear berganda dengan bantuan perangkat lunak SPSS. Seluruh instrumen dinyatakan valid ($r\text{-hitung} > r\text{-tabel sebesar } 0,312$) dan reliabel (Cronbach's Alpha $> 0,60$). Persamaan regresi yang diperoleh adalah $Y = 20,105 + 0,261X_1 + 0,379X_2 + 0,333X_3$. Secara parsial, GHC tidak berpengaruh signifikan terhadap kinerja perusahaan ($t = 1,919$; $\text{sig} = 0,063$), sedangkan GSC ($t = 2,909$; $\text{sig} = 0,006$) dan GRC ($t = 3,433$; $\text{sig} = 0,002$) berpengaruh positif dan signifikan. Secara simultan, GHC, GSC, dan GRC berpengaruh signifikan terhadap kinerja perusahaan ($F = 60,568$; $\text{sig} = 0,000$), serta menjelaskan 83,5% varians kinerja tersebut ($R^2 = 0,835$). Temuan ini menunjukkan bahwa sistem organisasi dan hubungan dengan pemangku kepentingan yang dibangun berdasarkan prinsip keberlanjutan merupakan pendorong terkuat kinerja perusahaan di sektor distribusi energi, sementara kompetensi *green* individu saja belum memadai. Penelitian ini memberikan implikasi praktis mengenai pentingnya memperkuat modal struktural dan relasional yang berwawasan lingkungan (*green*) serta pengembangan sumber daya manusia yang berwawasan lingkungan guna mencapai keunggulan kompetitif yang berkelanjutan.

Kata Kunci: *Green Human Capital*, *Green Structural Capital*, *Green Relational Capital*, *Green

Intellectual Capital*, Kinerja Perusahaan

1. Introduction

The issue of sustainability has evolved into a global agenda that influences the direction of business strategies and management practices in modern organizations across various industrial sectors. Companies are no longer evaluated solely on their ability to generate short-term financial profits, but also on the extent to which they can maintain ecological balance, manage carbon emissions responsibly, and create sustainable value for all stakeholders in the long term. This commitment is reinforced by the Indonesian government's policy, which aims to achieve Net Zero Emissions by 2060 or sooner, thereby encouraging the business sector to undergo a structural transformation toward business practices that are more environmentally friendly, energy-efficient, and ecologically responsible (Pratiwi & Fidyah, 2025; Sumiati & Isnaini, 2024).

Pressure on companies to adopt sustainability principles is also increasing as regulators evaluate environmental performance through various formal assessment tools. Data from the Corporate Performance Rating Program (PROPER) shows that most companies in Indonesia remain at a basic level of compliance, and some have yet to achieve optimal, comprehensive, and integrated environmental management. This gap not only affects companies' reputations in the eyes of the public and regulators but also has direct implications for long-term competitiveness, which increasingly depends on the ability to adapt to ever-tightening environmental standards (Az'mi & Kristina, 2024).

In this context, the utilization of intangible assets has become increasingly crucial in creating a sustainable competitive advantage that is difficult for competitors to replicate (Barney, 1991; Wernerfelt, 1984). These assets include the competencies of environmentally conscious human resources, organizational systems that support eco-friendly practices, and the quality of relationships with external stakeholders who are increasingly concerned about ecological issues. The concept of Green Intellectual Capital (GIC) has emerged as a conceptual approach that bridges the need for economic performance with the demands of environmental sustainability, by positioning environment-based knowledge, systems, and relationships as strategic corporate resources (Chen, 2008; Josephine et al., 2020; Fitri et al., 2022).

Previous research indicates that GIC has a significant relationship with corporate performance, although the results still vary across contexts. Several studies have found that Green Structural Capital and Green Human Capital have a positive effect on a company's financial performance, while Green Relational Capital yields varying results depending on the industry context and organizational scale (Lastanti & Augustine, 2022; Maharani et al., 2024). Other research reveals that the effectiveness of GIC in driving performance can be enhanced through sound corporate governance mechanisms and transparent sustainability disclosures (Bangun et al., 2024; Sandrilla & Permatasari, 2025). These varying findings suggest that the impact of GIC is not yet fully consistent and requires further testing in more specific corporate contexts, particularly in sectors with high environmental sensitivity.

The energy sector particularly gas distribution companies and clean energy service providers makes the GIC study increasingly relevant and urgent. PT Citra Nusantara Gemilang (CNG) Hilir Raya Palembang is a company engaged in the distribution and utilization of gas energy that is required to maintain operational efficiency, meet occupational safety standards, comply with environmental regulations, and continuously improve service quality. The novelty of this study lies in its specific sectoral context namely, an energy distribution company directly engaged with energy transition issues thereby offering a distinct perspective compared to previous research, which generally focused on the manufacturing or banking sectors (Az'mi & Kristina, 2024; Bangun et al., 2024). Based on this description, this study aims to analyze the influence of Green Human Capital, Green Structural Capital, and Green Relational Capital both

partially and simultaneously on corporate performance at PT CNG Hilir Raya Palembang.

2. Method

This study employs a quantitative method with an associative approach aimed at statistically testing the effect of Green Intellectual Capital on corporate performance (Sugiyono, 2022; Sekaran & Bougie, 2021). The research subject is PT Citra Nusantara Gemilang (CNG) Hilir Raya, located at Jalan Demang Lebar Daun No. 89, Palembang City, South Sumatra a company engaged in the distribution and utilization of natural gas.

Data sources consist of primary data obtained through the distribution of structured questionnaires to employees, and secondary data in the form of internal company documents, books, and relevant scientific journals. The research population consists of 60 employees of PT CNG Hilir. This study employs a quantitative method with an associative approach aimed at statistically testing the influence of Green Intellectual Capital on company performance (Sugiyono, 2022; Sekaran & Bougie, 2021). The research subject is PT Citra Nusantara Gemilang (CNG) Hilir Raya, located at Jalan Demang Lebar Daun No. 89, Palembang City, South Sumatra a company engaged in the distribution and utilization of natural gas.

The data sources consist of primary data obtained through the distribution of structured questionnaires to employees, and secondary data in the form of internal company documents, books, and relevant scientific journals. The study population consisted of 60 employees of PT CNG Hilir Raya Palembang. The sampling technique used was purposive sampling with the following criteria:

1. Permanent employees who have worked for at least one year;
2. Employees directly involved in operational activities related to the implementation of GIC; and
3. Willingness to complete the research questionnaire in full. Based on these criteria, a sample of 40 respondents was obtained.

The research instrument consisted of a questionnaire using a five-point Likert scale. The independent variables were Green Human Capital (X1), Green Structural Capital (X2), and Green Relational Capital (X3), while the dependent variable was Company Performance (Y). The operational definitions of each variable are presented in Table 1.

Table 1. Operational Definitions of Research Variables

Variable	Definition	Indicator
Green Human Capital (X1)	Employees' mental competencies, awareness in supporting organizational sustainability	Environmental knowledge; environmental awareness; green innovation training; green skills; participation in environmental activities
Green Structural Capital (X2)	Systems, technologies, organizational culture that support environmentally friendly practices	Environment-based SOPs; information systems; environmentally friendly technologies; green organizational culture; sustainability policies
Green Relational Capital (X3)	The quality of the company's relationships	Customer relationships; supplier relationships; environmental reputation; stakeholder collaboration; external environmental communication

	stakeholders based on sustainability principles	
Company Performance (Y)	The organization's level of HR success in achieving strategic goals in a measurable and accountable manner	performance; operational efficiency; environmental performance; company growth

Source: Data compiled by the author (2026)

Data analysis techniques included instrument validity and reliability tests, classical assumption tests, multiple linear regression analysis, and hypothesis testing. Validity testing was conducted by comparing the calculated *r* value with the table *r* value; at *n* = 40 and a 5% significance level, the table *r* value was 0.312, so an item was deemed valid if the calculated *r* value was greater than 0.312. Reliability testing uses Cronbach's Alpha coefficient with a threshold of ≥ 0.60 (Ghozali, 2021).

Tests of classical assumptions consist of normality tests using histograms, Normal P–P plots, and the One-Sample Kolmogorov–Smirnov test (data are considered normally distributed if Asymp. Sig. > 0.05), as well as a multicollinearity test by examining the Tolerance value (> 0.10) and the Variance Inflation Factor (VIF) (< 10).

Multiple linear regression analysis was used to determine the direction and magnitude of the effects of *X*₁, *X*₂, and *X*₃ on *Y*, using the equation $Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e$, where *Y* is company performance, α is the constant, β_1 through β_3 are the regression coefficients for each variable, and *e* is the error term. Hypothesis testing was conducted using the *t*-test (partial), the *F*-test (simultaneous), and the coefficient of determination (*R*²). The hypothesis was accepted if the significance level was < 0.05 or if the calculated *t*-value or *F*-value was greater than the value in the Raya Palembang table. The sampling technique used purposive sampling with the following criteria: (1) permanent employees who have worked for at least one year; (2) employees directly involved in operational activities related to the implementation of GIC; and (3) those willing to complete the research questionnaire in full. Based on these criteria, a sample of 40 respondents was obtained.

The research instrument used a questionnaire with a five-point Likert scale. The independent variables consisted of Green Human Capital (*X*₁), Green Structural Capital (*X*₂), and Green Relational Capital (*X*₃), while the dependent variable was Company Performance (*Y*). The operational definitions of each variable are presented in Table 1.

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the F-test (simultaneous), and the coefficient of determination (R^2). A hypothesis was accepted if the significance level was < 0.05 or if the calculated t-value or F-value was greater than the table value.

Results and Discussion Respondent Characteristics

Of the 60 questionnaires distributed to the employee population, 40 met the criteria for purposive sampling and were suitable for analysis. The characteristics of the respondents by age, gender, education level, and department are presented in Tables 2 through 5.

Table 2. Characteristics of Respondents by Age

Age	Frequency	Percentage
20-30 Years	15	37,5%
31-40 Years	18	45,0%
41-50 Years	7	17,5%
Total	40	100%

Source: Data compiled by the author (2026)

Based on Table 2, the majority of respondents were in the 31–40 age group (45.0%), followed by those aged 20–30 (37.5%) and those aged 41–50 (17.5%), indicating that most respondents were of working age.

Table 3. Respondent Characteristics by Gender

Gender	Frequency	Percentage
Male	31	77,5%
Femele	9	22,5%
Total	40	100%

Source: Data compiled by the author (2026)

Table 3 shows that male respondents outnumbered female respondents (77.5% versus 22.5%), reflecting the characteristics of the workforce in energy distribution companies, which have historically been dominated by male workers in operational and technical positions.

Table 4. Characteristics of Respondents by Education Level

Education	Frequency	Percentage
High School	7	17,5%
Vocational High School	1	2,5%
Associate's Degree (D-III)	2	5,0%
Bachelor's Degree (D-IV)	2	5,0%
Bachelor's Degree (S1)	27	67,5%
Master's Degree (S2)	1	2,5%
Total	40	100%

Source: Data compiled by the author (2026)

Based on Table 4, the majority of respondents held a bachelor's degree (67.5%), followed by high school graduates (17.5%), D-III and D-IV (5.0% each), as well as vocational high school (SMK) and a master's degree (S2) (2.5% each), indicating a relatively adequate level of literacy and capacity to adapt to the concept of sustainability among employees.

Table 5. Karakteristik Responden Berdasarkan Departemen

Departement	Frequency	Percentage
Operational	8	20,0%
Maintenance	6	15,0%
HUB Lampung	7	17,5%
Commercial	5	12,5%
FA	4	10,0%

HRD & GA	10	25,0%
Total	40	100%

Source: Data compiled by the author (2026)

Table 5 shows the distribution of respondents by department, with the largest proportion coming from HRD & GA (25.0%), Operations (20.0%), Lampung HUB (17.5%), Maintenance (15.0%), Commercial (12.5%), and FA (10.0%). Thus, the study's respondents represent various organizational functions within the company.

Uji Validitas dan Reliabilitas Instrumen

Validity testing was conducted by comparing the calculated r values for each item with the table r value of 0.312 ($n = 40$, 5% significance level). The test results for the variables Green Human Capital (X1), Green Structural Capital (X2), Green Relational Capital (X3), and Company Performance (Y) are presented in Tables 6 through 9.

Table 6. Validity Test Results for Green Human Capital (X1)

Item	R Hitung	R Table	Notes
X1.1	0,696	0,312	Valid
X1.2	0,777	0,312	Valid
X1.3	0,694	0,312	Valid
X1.4	0,677	0,312	Valid
X1.5	0,707	0,312	Valid
X1.6	0,627	0,312	Valid
X1.7	0,636	0,312	Valid
X1.8	0,734	0,312	Valid
X1.9	0,693	0,312	Valid
X1.10	0,712	0,312	Valid

Source: Data compiled by the author (2026)

Table 7. Results of the Green Structural Capital Validity Test (X²)

Item	R Hitung	R Table	Notes
X2.1	0,623	0,312	Valid
X2.2	0,667	0,312	Valid
X2.3	0,549	0,312	Valid
X2.4	0,751	0,312	Valid
X2.5	0,732	0,312	Valid
X2.6	0,704	0,312	Valid
X2.7	0,732	0,312	Valid
X2.8	0,699	0,312	Valid
X2.9	0,818	0,312	Valid
X2.10	0,586	0,312	Valid

Source: Data compiled by the author (2026)

Table 8. Validity Test Results for Green Relational Capital (X3)

Item	R Hitung	R Table	Notes
X3.1	0,758	0,312	Valid
X3.2	0,725	0,312	Valid
X3.3	0,641	0,312	Valid
X3.4	0,675	0,312	Valid
X3.5	0,761	0,312	Valid
X3.6	0,733	0,312	Valid
X3.7	0,766	0,312	Valid

X3.8	0,723	0,312	Valid
X3.9	0,762	0,312	Valid
X3.10	0,701	0,312	Valid

Source: Data compiled by the author (2026)

Table 9. Results of the Company Performance Validity Test (Y)

Item	R Hitung	R Table	Notes
Y1	0,876	0,312	Valid
Y2	0,817	0,312	Valid
Y3	0,872	0,312	Valid
Y4	0,821	0,312	Valid
Y5	0,850	0,312	Valid
Y6	0,812	0,312	Valid
Y7	0,827	0,312	Valid
Y8	0,831	0,312	Valid
Y9	0,900	0,312	Valid
Y10	0,646	0,312	Valid
Y11	0,618	0,312	Valid
Y12	0,854	0,312	Valid
Y13	0,858	0,312	Valid
Y14	0,621	0,312	Valid

Source: Data compiled by the author (2026)

Based on Tables 6 through 9, all statement items across the four research variables had calculated *r* values greater than the critical *r* value (0.312), ranging from 0.549 to 0.900. Thus, all items were deemed valid and suitable for use as research instruments.

The results of the reliability test using Cronbach's alpha coefficient are presented in Table 10.

Table 10. Reliability Test Results

Variabel	Cronbach's Alpha	Standar Alpha	Notes
Green Human Capital (X1)	0,768	0,60	Reliabel
Green Structural Capital (X2)	0,875	0,60	Reliabel
Green Relational Capital (X3)	0,899	0,60	Reliabel
Company Performance (Y)	0,956	0,60	Sangat Reliabel

Sumber: Data diolah penulis (2026)

Table 10 shows that all variables have Cronbach's Alpha values above the 0.60 threshold: Green Human Capital at 0.768, Green Structural Capital at 0.875, Green Relational Capital at 0.899, and Company Performance at 0.956 (classified as highly reliable). These results indicate that all research instruments exhibit good internal consistency and are therefore suitable for use in subsequent stages of analysis.

Test of Classical Assumptions

Normality tests were conducted using a histogram, a Normal P-P plot, and the one-sample Kolmogorov-Smirnov test. The histogram of the residuals formed a bell-shaped curve, and the points on the Normal P-P plot were scattered along the diagonal line, indicating that the regression model residuals are normally distributed. The results of the Kolmogorov-Smirnov test are presented in Table 11.

Table 11. Results of the One-Sample Kolmogorov-Smirnov Normality Test

Statistik	Value
N	40
Mean Residual	0,0000000

Std. Deviation	1,91888410
Test Statistic (Absolute)	0,105
Asymp. Sig. (2-tailed)	0,200

Source: SPSS output, data processed by the author (2026)

The Asymp. Sig. (2-tailed) value of 0.200 is greater than 0.05; therefore, the regression model residuals are considered to be normally distributed, and the regression model is suitable for further analysis.

A multicollinearity test was conducted by examining the Tolerance and Variance Inflation Factor (VIF) values, as presented in Table 12.

Table 12. Multicollinearity Test Results

Independent Variables	Tolerance	VIF	Description
Green Human Capital (X1)	0,381	3,624	There is no multicollinearity
Green Structural Capital (X2)	0,293	3,418	There is no multicollinearity
Green Relational Capital (X3)	0,403	2,484	There is no multicollinearity

Source: Data compiled by the author (2026)

Table 12 shows that all independent variables have Tolerance values > 0.10 and VIF values < 10, indicating that there is no multicollinearity among the independent variables and that the regression model is suitable for hypothesis testing.

Multiple Linear Regression Analysis

The results of the multiple linear regression analysis are presented in Table 13.

Table 13. Results of Multiple Linear Regression Analysis

Variabel	Koefisien Regresi (B)
Konstanta (α)	20,105
Green Human Capital (X1)	0,261
Green Structural Capital (X2)	0,379
Green Relational Capital (X3)	0,333

Source: SPSS output, data processed by the author (2026)

Based on Table 13, the following multiple linear regression equation was obtained: $Y = 20.105 + 0.261X_1 + 0.379X_2 + 0.333X_3 + e$.

The constant term of 20.105 indicates that if all three independent variables are zero, the company's performance is predicted to be 20.105. The regression coefficient for X1, 0.261, indicates that a one-unit increase in Green Human Capital will increase the company's performance by 0.261 units, assuming all other variables remain constant. The regression coefficient for X2, 0.379, is the largest among the three variables, indicating that Green Structural Capital makes the most significant contribution to improvements in the company's performance. The regression coefficient for X3, at 0.333, indicates that an increase in Green Relational Capital is also followed by an increase in company performance. All regression coefficients are positive, indicating that increases in all three dimensions of GIC tend to be consistently followed by improvements in company performance.

Hypothesis Testing

Hypothesis testing was conducted using the t-test (partial), the F-test (simultaneous), and the coefficient of determination (R^2). The results of the t-test are presented in Table 14.

Table 14. Results of the t-Test (Partial)

Source: SPSS output, data processed by the author (2026)

Based on Table 14, the Green Human Capital variable yielded a calculated t-value of 1.919 with a significance level of 0.063 (> 0.05), so H1 is rejected; Green Human Capital does not have a significant effect on company performance. The Green Structural Capital variable yielded a t-statistic of 2.909 with a significance level of 0.006 (< 0.05), so H2 is accepted. The Green Relational Capital variable yielded a t-statistic of 3.433 with a significance level of 0.002 (< 0.05), so H3 is accepted.

The results of the F-test are presented in Table 15.

Table 15. Results of the F-Test (Simultaneous)

Model	F Hitung	F Table	Sig.	Description
Regresi	60,568	2,87	0,000	H4 Accepted

Source: SPSS output, data processed by the author (2026)

The calculated F-value of 60.568 is greater than the table F-value of 2.87, with a significance level of 0.000 (< 0.05); therefore, H4 is accepted: Green Human Capital, Green Structural Capital, and Green Relational Capital simultaneously have a significant effect on firm performance.

The results of the coefficient of determination test are presented in Table 16.

Table 16. Results of the Coefficient of Determination (R^2) Test

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0,914	0,835	0,821	1,997

Source: SPSS output, data processed by the author (2026)

An R-squared value of 0.914 indicates a very strong relationship between the three independent variables and company performance. The R-squared value of 0.835 indicates that 83.5% of the variation in company performance can be explained by Green Human Capital, Green Structural Capital, and Green Relational Capital, while the remaining 16.5% is explained by other factors outside the research model, such as leadership style, organizational culture, work motivation, and compensation. The Adjusted R-Square value of 0.821 confirms that the regression model still has excellent ability to explain variations in company performance after being adjusted for the number of independent variables used.

Discussion

The Impact of Green Human Capital on Corporate Performance.

The test results show that Green Human Capital does not have a significant effect on company performance (sig = 0.063 > 0.05), so H1 is rejected. Theoretically, GHC reflects employees' environmental knowledge, skills, and awareness, which should drive innovation and efficiency (Chen, 2008). However, these findings indicate that the individual competencies of employees at PT CNG Hilir Raya have not yet been fully translated into direct improvements in productivity or work efficiency. This aligns with the view that the impact of GHC on performance is generally only optimal when supported by an adequate organizational system, a work culture that fosters environmental innovation, and comprehensive management commitment to implementing GIC in an integrated manner.

The Impact of Green Structural Capital on Corporate Performance.

Green Structural Capital was found to have a positive and significant effect on company performance ($\text{sig} = 0.006 < 0.05$), thus H2 is accepted. Work systems, operational procedures, technology, and organizational culture that support environmental management enable employees to effectively apply their environmental knowledge in company activities (Chen, 2008). This finding is consistent with Pujilestari et al. (2025) and confirms that a company's success in improving performance is heavily influenced by the organization's ability to provide infrastructure that supports the consistent implementation of environmentally friendly practices, rather than relying solely on the individual competencies of employees.

The Effect of Green Relational Capital on Corporate Performance.

Green Relational Capital was also found to have a positive and significant effect on company performance ($\text{sig} = 0.002 < 0.05$), thus supporting H3; in fact, it had the highest t-value among the three independent variables. Good relationships with customers, suppliers, the government, and the community enhance the company's trust and reputation, expand business opportunities, and facilitate the company's ability to conduct its operational activities sustainably (Utami et al., 2025). These findings underscore the importance of external legitimacy for companies in the energy sector, whose operations are highly dependent on public trust and compliance with environmental regulations.

The simultaneous effect of green intellectual capital on corporate performance.

Simultaneously, Green Human Capital, Green Structural Capital, and Green Relational Capital have a significant effect on company performance ($F = 60.568$; $\text{sig} = 0.000$) with an explanatory power of 83.5% ($R^2 = 0.835$), thus H4 is accepted. These results confirm that GIC is a strategic asset that plays a crucial role in improving company performance. Although Green Human Capital has not yet shown a significant effect when considered in isolation, the three dimensions of GIC as a whole complement one another and make a tangible contribution to performance improvement. The effective implementation of GIC requires the integration of individual employee competencies, organizational system support, and the quality of relationships with external stakeholders; thus, the integrated management of these three dimensions is key to a company's success in achieving superior and sustainable performance.

These findings also have broader managerial implications for companies in the energy distribution sector facing increasingly stringent environmental regulations. Investments in Green Structural Capital for example, through the digitization of environmental reporting systems, the strengthening of HSSE SOPs, and the adoption of low-emission technologies need to be prioritized because they make the most significant contribution to company performance. On the other hand, strengthening Green Relational Capital through transparent communication with regulators, customers, and communities surrounding operational areas can reinforce a company's social legitimacy while supporting long-term operational smoothness. Meanwhile, for Green Human Capital to have a significant impact, companies need to ensure that improvements in individual employee competencies are accompanied by systems, incentives, and an organizational culture that enable those competencies to be effectively applied in daily work activities.

5. Conclusion

This study aims to analyze the effect of Green Intellectual Capital on corporate performance at PT Citra Nusantara Gemilang (CNG) Hilir Raya Palembang. Based on the analysis results, the following conclusions can be drawn. First, Green Human Capital does not have a significant effect on company performance ($\text{sig} = 0.063 > 0.05$), so H1 is rejected; employees' competencies and environmental awareness do not yet directly contribute to improved performance without adequate organizational system support. Second, Green Structural Capital

has a positive and significant effect on company performance ($\text{sig} = 0.006 < 0.05$), so H2 is accepted. Third, Green Relational Capital has a positive and significant effect on company performance ($\text{sig} = 0.002 < 0.05$), so H3 is accepted. Fourth, collectively, Green Human Capital, Green Structural Capital, and Green Relational Capital have a significant effect on company performance ($F = 60.568$; $\text{sig} = 0.000$), accounting for 83.5% of the variance ($R^2 = 0.835$), so H4 is accepted.

In practical terms, the management of PT CNG Hilir Raya Palembang is advised to maintain and enhance the implementation of Green Structural Capital by refining standard operating procedures, strengthening information systems, and utilizing environmentally friendly technologies, as well as to strengthen Green Relational Capital by improving cooperation with customers, suppliers, the government, and the community. Although Green Human Capital has not yet had a significant impact, the company still needs to improve the quality of its human resources through training and fostering a culture of environmental awareness so that employees' competencies can be optimally applied and aligned with the strengthening of the organizational system.

This study has limitations, including a sample scope limited to a single company using a cross-sectional design, as well as performance measurements that are non-financial and based on respondents' perceptions. Future research is recommended to include additional variables such as Green Human Resource Management, green innovation, or green leadership; expand the number of respondents and the range of industrial sectors; and consider more diverse analytical methods, such as Structural Equation Modeling (SEM), to obtain more comprehensive results.

Declarations

Author contribution. The sole author is fully responsible for the entire research process, from conceptualization, data collection, and analysis to the writing of the article manuscript.

Funding statement. This study did not receive any specific funding from any grant-making organizations in the public, commercial, or nonprofit sectors.

Conflict of interest. The author declares that there are no conflicts of interest in this study.

Additional information. There is no additional information for this article.

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