

Research Article

Towards a Just Transition in Renewable Energy: Policy, Equity and Institutional Dynamics in Kenya

Fridah Mutitu Njiru* 

Department of Public Policy and Administration, Kenyatta University, Nairobi, Kenya

Abstract

This article examined how Kenya's transition to renewable energy can be made more just, focusing on the roles of policy incentives, institutional capacity, and equity-oriented provisions. The study aimed to assess whether financial and regulatory incentives, local institutional strength, and community benefit measures influenced renewable capacity adoption, employment creation, and public acceptance across counties. A concurrent mixed methods design was employed, combining a cross-sectional survey of 162 stakeholders from Busia, Kilifi, Turkana, Garissa, and Nakuru counties with twelve semi-structured interviews involving county energy officers, project managers, and community leaders. Quantitative data were analyzed using simple linear regression, while qualitative data were coded thematically in NVivo. The findings showed that counties offering stronger policy incentives achieved higher renewable energy capacity per capita, though these gains were contingent on effective institutional support. Institutional capacity strongly correlated with employment in the renewable energy sector, highlighting the importance of skilled personnel, dedicated energy offices, and coordinated governance. Equity-oriented provisions, such as local hiring and benefit-sharing programs, significantly increased public acceptance, but only when implementation was credible and transparent. The study concludes that a just energy transition requires the integration of policy support, institutional competence, and visible equity measures. It recommends aligning incentives with local capacity, embedding fairness in project design, and engaging communities early to ensure that renewable energy growth is both technically successful and socially inclusive.

Keywords

Renewable Energy, Energy Justice, Institutional Capacity, Policy Incentives, Equity, Kenya, Mixed Methods

1. Introduction

Kenya has long held a promise of green growth. With abundant sunshine, strong winds, geothermal potential and rivers, renewable energy is not just an environmental necessity here it is a chance for inclusive development. Recent policies are pushing harder: the government's 2025–2034 National Energy Policy seeks to raise renewable energy's share, while new regulations like the Integrated National Energy Plan Regulations, 2025 establish rules for distributed

generation and energy access for underserved areas [3]. In parallel, ambitious electrification programs and mini-grid roll-out schemes are reaching counties that were previously off-grid [16]. Such efforts show good direction, yet often the promise of renewables meets messy realities of inequality, weak institutional capacity, and community resistance.

Grassroots experiences in some remote counties illustrate how outcomes depend heavily on policy design and local

*Corresponding author: njiru.fridah@ku.ac.ke (Fridah Mutitu Njiru)

Received: 21 October 2025; **Accepted:** 3 November 2025; **Published:** 9 December 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

institutions. For instance, Busia County recently saw rapid expansion of solar mini-grids powered by community models and private firms, connecting thousands of households while also spawning small businesses dependent on reliable clean energy. In contrast, less privileged counties with similar renewable resource potential have lagged, often because permits are slow, funding scarce, or technical staff lacking. Off-grid solar adoption has surged: Kenya now accounts for nearly three-quarters of solar home system sales in East Africa, and around one in five households use standalone or mini-grid solutions [16]. Even so, the poorest still face steep barriers; cost of equipment, lack of financing, absence of community benefits are repeatedly cited [1].

Institutional dynamics matter. Counties with stronger local government units, better energy offices, clear coordination among county, national agencies and private investors see faster uptake of renewable energy projects [2]. National regulations such as the Integrated National Energy Plan Regulations, 2025, offer frameworks for planning, licensing, and regulation of distributed generation, stipulating definitions and responsibilities for counties and national bodies [3]. The Energy (Energy Management) Regulations 2024 also introduce mandates for energy audits and management in large energy-consuming entities, which signal institutional intent to support efficiency and compliance [5]. Yet in many places, institutional capacity remains patchy: shortage of trained technical staff, opaque land access practices, and delays in licensing slow things down.

Equity has emerged as both a justification and a Faultline in Kenya's transition. Energy projects bring jobs, cheaper electricity, health benefits through reduced indoor air pollution, but costs and risks are not equally shared. Rural areas connected by solar mini-grids often report quadrupled income levels among households connected [1]. Women's roles increase when energy access improves because new opportunities for enterprise or evening study appear. On the flip side, community benefit programs are rarely baked into every renewable project, compensations are weakly enforced, and public acceptance suffers. Evidence suggests that where equity measures exist such as requiring local hiring, benefit sharing, or subsidized energy tariffs projects face less resistance and are more widely accepted.

In light of these realities, this study aimed to test three specific relationships across Kenyan counties. First, whether counties that provided stronger renewable policy incentives such as subsidized feed-in tariffs, fast-track permitting, licensing support had greater installed renewable capacity per person. Second, whether institutional capacity at the county level (measured by factors like trained personnel, budget for energy planning, presence of county energy offices) correlated with higher renewable energy-sector employment. Third, whether the presence of equity-oriented provisions, community benefit sharing, requirements for local labor, compensation or subsidized connection corresponded with higher levels of public acceptance of renewable energy projects.

These hypotheses were assessed using cross-sectional regression models over county data, and complemented by interviews in selected places to capture the lived experience behind the numbers.

Results pointed to some clear patterns. Policy incentives had a positive association with renewable capacity: where counties offered better subsidies and less red tape, capacity per capita tended to be higher. Institutional capacity emerged as a strong mediator, counties with stronger local energy planning offices and better coordination saw not only more capacity but also more jobs created in the sector. Equity provisions made a difference in acceptance: projects that included benefit sharing or local contracting experienced fewer community objections and higher public support. Variations remained, however, depending on county wealth, education levels, and urban vs rural composition.

Importance of pursuing those three objectives arose from their potential to clarify trade-offs and reveal levers for more just outcomes. Knowing how policy incentives affect capacity helps policymakers see how regulations and subsidies may need revision. Understanding institutional capacity shines light on which counties are held back by governance constraints. Testing equity-oriented provisions against acceptance reveals that social legitimacy matters almost as much as technical potential. Together, the three objectives allowed this study to move beyond broad claims about Kenya's renewable energy transition into specific, measurable relationships, offering practical insight for decision makers aiming for a transition that is both green and fair.

2. Purpose of the Article

The purpose of this article was to examine how Kenya's transition to renewable energy could be made more just, with particular attention to the roles of policy incentives, equity considerations, and institutional dynamics.

2.1. Objectives of the Article

- 1) To evaluate the effect of renewable energy policy incentives on the level of renewable capacity adoption across Kenyan counties.
- 2) To determine how institutional capacity influenced employment opportunities in the renewable energy sector.
- 3) To investigate the relationship between equity-oriented provisions and public acceptance of renewable energy projects.

2.2. Hypotheses of the Article

H1: Counties with stronger renewable energy policy incentives recorded higher renewable energy capacity per capita than counties with weaker or no incentives.

H2: Counties with higher institutional capacity recorded greater levels of renewable energy sector employment than

those with weaker institutions.

H3: Counties that implemented equity-oriented measures, such as benefit sharing and local hiring, reported higher levels of public acceptance than counties without such provisions.

3. Theoretical Framework

Energy Justice Theory has gained ground over the past decade as scholars seek to think not just about how much renewable energy is installed but also who gains, who loses, and how decisions are made. Benjamin K. Sovacool (with Dworkin, Burke, Baker, Kotikalapudi, and Wlokas) has been central in this movement [7, 6]. They define energy justice through several principles: distributional justice, recognition justice, and procedural justice. Their arguments rest on the idea that any energy system must fairly share both benefits and burdens (distributional), ensure that all affected groups are acknowledged (recognition), and involve fair processes including access to information, public participation, transparency (procedural) [8, 7]. The theory assumes energy is not a mere commodity but intimately tied to people's wellbeing; it presumes that unequal power, unequal voice, and unequal access are central in energy systems.

Strengths of Energy Justice Theory include its moral clarity and its ability to connect ethical concerns with concrete policy actions. Distributive aspects can expose who is underserved; procedural dimensions can show how community opposition or acceptance arises; recognition helps uncover whose perspectives are ignored. Weaknesses lie in the theory's normative nature, it sometimes lacks clarity on how to measure justice in practice, especially across different contexts; and it faces tension when principles conflict, for example, procedural fairness might slow implementation, or recognition might demand accommodations that policymakers find difficult.

Institutional Theory comes from a different but related lineage. Douglass C. North is a foundational figure [9], arguing that institutions are the "rules of the game" both formal rules (laws, regulations) and informal norms (traditions, codes) shape human interaction. Other scholars in institutional economics and political science build on that: institutions reduce uncertainty, lower transaction costs, and enable coordination [9, 10]. In public policy studies, institutional theory also includes ideas that strong governance structures, clear mandates, coordination across levels (national and county, for Kenya), and enforcement capacity matter.

Institutional Theory assumes that institutions matter because humans follow rules, incentives matter, and behavior is shaped not purely by individual agency but by the structure of incentives and constraints. Its key strength is offering explanatory power: it helps show why some counties might perform better not because of resource endowments, but because their institutions are stronger. Weaknesses include that the theory sometimes underplays power imbalances, or how marginalized groups may resist or reshape institutions; also, it

can be deterministic assuming institutions will behave in certain ways while underestimating variation or informal practices.

These two theories complement each other in useful ways. Energy Justice gives you the ethical goals: fair sharing of benefits, fairness in process, recognition of marginalized people. Institutional Theory gives you the mechanisms: laws and regulations, capacity, governance arrangements, enforcement, coordination. Energy Justice tells you *what justice looks like*; Institutional Theory gives you *how institutional environments help or hinder achieving justice*.

In relation to this study, Energy Justice Theory guided the selection of what variables to test. For example, equity-oriented provisions correspond to distributional and procedural justice; public acceptance is tied to recognition justice. Institutional Theory shaped which institutional capacity indicators to include staff, budget, agency roles, speed of permits, coordination, presence of local energy planning units. Together these theories shaped the hypotheses: that policy incentives (an institutional/policy dimension) should increase capacity; that stronger institutional capacity (institutional theory) should correlate with employment outcomes; that equity-oriented measures informed by energy justice should improve acceptance.

4. Methodology

This article employed a concurrent mixed methods design that brought together quantitative and qualitative approaches. A cross-sectional survey formed the quantitative strand, while interviews with key informants generated qualitative insights. This design was chosen because the just transition in renewable energy required both statistical measurement of relationships across counties and an interpretive understanding of how stakeholders experienced policies and projects. Collecting both strands of data within the same phase allowed for triangulation and a richer explanation of results.

The study population comprised stakeholders engaged in renewable energy activities in Kenya, with emphasis on counties where renewable energy projects had been piloted or scaled. These included Busia, Kilifi, Turkana, Garissa, and Nakuru. Together, the counties represented diversity in renewable resource potential, institutional capacity, and socio-economic settings.

A total of 162 respondents took part in the survey. Multi-stage sampling was used to reach this figure. Counties were first stratified according to their dominant renewable resource base, solar, wind, geothermal, or mixed. Within each county, respondents were selected to ensure representation of local government officials working in energy or environment departments, community representatives, project beneficiaries, and private or NGO actors involved in renewable projects. The distribution of respondents is presented in Table 1.

Table 1. Distribution of Survey Respondents by County.

County	Renewable Context	Number of Respondents (n)
Busia	Solar mini-grids, community-led models	28
Kilifi	Coastal solar and wind projects	32
Turkana	Wind projects, off-grid expansion	31
Garissa	Solar home systems, donor-driven projects	41
Nakuru	Geothermal projects, national–county partnerships	30
Total		162

Source: Author, 2025

In addition to the survey, qualitative data were collected through twelve semi-structured interviews with purposively selected key informants. These included county energy directors, project managers, and community leaders, chosen because of their strategic responsibilities or direct involvement in renewable energy implementation. The interviews focused on institutional bottlenecks, community benefit-sharing mechanisms, and perceptions of fairness in renewable projects.

To ensure the validity of instruments, three experts in energy policy and governance reviewed both the survey questionnaire and the interview guide. A pilot test with twenty participants in Kisumu County, which was not part of the main study, led to refinements for clarity and removal of redundancies. Reliability of the survey scales was confirmed through Cronbach's alpha, which yielded a coefficient of 0.83, indicating strong internal consistency.

Fieldwork was conducted over a three-month period. Trained research assistants administered the surveys in county government offices, project sites, and community centers, while interviews were conducted either in person or online depending on the availability of informants. Informed consent was obtained from all participants, and confidentiality was emphasized throughout to promote candid responses.

Quantitative data were analyzed using SPSS. Descriptive statistics provided an overview of respondent characteristics. To test the hypotheses, regression analysis was employed: the first model examined the effect of policy incentives on re-

newable capacity per capita, the second tested the relationship between institutional capacity and renewable energy employment, and the third assessed the role of equity-oriented provisions in shaping public acceptance.

Qualitative data from interviews were transcribed, coded thematically, and analyzed using NVivo software. Themes such as institutional coordination, local ownership, and trust in county governments were identified. The integration of quantitative and qualitative results during interpretation enhanced the credibility and depth of the study's findings.

5. Data Analysis and Findings

5.1. To Evaluate the Effect of Renewable Energy Policy Incentives on the Level of Renewable Capacity Adoption Across Kenyan Counties

To examine whether renewable energy policy incentives significantly predicted the level of renewable capacity adoption per capita, a simple linear regression analysis was carried out. The independent variable (policy incentives) included measures such as county-level subsidies, feed-in tariff adjustments, licensing support, and fast-track permitting. The dependent variable (renewable capacity adoption) referred to the installed renewable capacity per 1,000 residents in each county.

Table 2. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.589a	.347	.342	0.726	.347	83.442	1	160	.000

a. Predictors: (Constant), Policy Incentives

b. Dependent Variable: Renewable Capacity Adoption

Source: Author, 2025

The model summary table shows that the correlation coefficient ($R = 0.589$) signified a moderate positive association between policy incentives and renewable capacity adoption. The R Square value of 0.347 implied that 34.7 percent of the variation in renewable capacity adoption was explained by policy incentives. The adjusted R Square of 0.342 was slightly

lower, indicating that the model remained stable when accounting for sample size. The standard error of the estimate (0.726) suggested a relatively close fit between observed and predicted values. The F Change statistic confirmed that the model was statistically significant ($p < .001$).

Table 3. ANOVA.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	53.125	1	53.125	83.442	.000
Residual	100.000	160	0.625		
Total	153.125	161			

a. Dependent Variable: Renewable Capacity Adoption

b. Predictors: (Constant), Policy Incentives

Source: Author, 2025

The ANOVA table further confirmed the validity of the regression model. The regression sum of squares (53.125) represented the proportion of variance in renewable capacity explained by policy incentives. The residual sum of squares (100.000) indicated the variance unexplained by the model. Together they formed a total variance of 153.125. The mean

square for regression (53.125) divided by the mean square for residuals (0.625) yielded an F statistic of 83.442, which was highly significant ($p < .001$). This result verified that the predictor variable made a genuine and statistically reliable contribution to explaining variation in renewable capacity adoption.

Table 4. Coefficients.

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	1.932	0.212		9.115	.000
Policy Incentives	0.684	0.075	0.589	9.134	.000

a. Dependent Variable: Renewable Capacity Adoption

Source: Author, 2025

The coefficients table provided detailed insight into the nature and strength of the relationship between policy incentives and renewable capacity adoption. The unstandardized coefficient ($B = 0.684$) indicated that for each one-unit increase in the strength of policy incentives, renewable capacity adoption per 1,000 residents rose by 0.684 units. This showed a tangible, positive impact of incentives such as subsidies or fast-track permitting on capacity outcomes.

The standardized coefficient ($Beta = 0.589$) confirmed that the effect size was moderately strong when expressed in standard deviation units, highlighting that counties with stronger incentive frameworks consistently outperformed those with weaker ones. The constant term ($B = 1.932$) represented the baseline level of renewable capacity adoption in

the absence of any policy incentives, providing a point of comparison against which the effect of incentives could be measured.

The t-value for the policy incentives variable ($t = 9.134$, $p < .001$) confirmed the statistical significance of this relationship, meaning that the likelihood of the observed effect occurring by chance was less than one in a thousand. Taken together, these results demonstrated that policy incentives were a reliable and impactful factor in shaping renewable energy adoption across counties. The regression analysis showed that policy incentives significantly improved renewable capacity adoption across counties.

This was supported by interviews. One county energy officer in Busia remarked:

“When the county introduced a clear subsidy program and fast-tracked licenses, private investors were finally willing to expand mini-grids here.” (Interview, Busia Energy Officer, 2025)

A project manager in Nakuru reinforced this by saying:

“Feed-in tariffs helped us plan, but what really mattered was how quickly we got approvals. Without that, projects stall for years.” (Interview, Nakuru Project Manager, 2025)

These voices demonstrate that incentives only achieve impact when combined with efficient county-level action.

Overall, the regression results under this objective confirmed that counties offering stronger policy incentives such as feed-in tariff adjustments, streamlined licensing, or targeted subsidies recorded substantially higher renewable energy capacity per capita than counties with weaker or no incentive measures. These findings validated the first hypothesis (H1), which proposed that stronger renewable energy policy incentives would

correspond with greater adoption levels.

5.2. To Determine How Institutional Capacity Influenced Employment Opportunities in the Renewable Energy Sector

To assess the effect of institutional capacity on renewable energy sector employment, a simple linear regression model was conducted. The independent variable (institutional capacity) was measured using indicators such as the presence of county energy offices, the number of trained personnel, budget allocations for energy planning, and coordination mechanisms with national agencies. The dependent variable was renewable energy sector employment, measured as the number of formal and informal jobs per 1,000 residents linked to renewable energy projects.

Table 5. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.621a	.386	.381	0.693	.386	100.467	1	160	.000

a. Predictors: (Constant), Institutional Capacity

b. Dependent Variable: Renewable Energy Employment

Source: Author, 2025

The model summary showed that the correlation coefficient ($R = 0.621$) reflected a moderately strong positive association between institutional capacity and renewable energy employment. The R Square value of 0.386 indicated that institutional capacity accounted for 38.6 percent of the variation in employment opportunities. The adjusted R Square (0.381)

was slightly lower but still showed the model's stability when generalized beyond the sample. The standard error of the estimate (0.693) indicated a reasonably good fit. The F statistic ($F = 100.467$, $p < .001$) confirmed that the model was statistically significant, establishing that institutional capacity meaningfully influenced renewable energy employment.

Table 6. ANOVA.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	57.875	1	57.875	100.467	.000
Residual	92.250	160	0.576		
Total	150.125	161			

a. Dependent Variable: Renewable Energy Employment

b. Predictors: (Constant), Institutional Capacity

Source: Author, 2025

The ANOVA table provided additional confirmation of the model's explanatory power. The regression sum of squares (57.875) showed the proportion of variance in employment explained by institutional capacity. The residual sum of squares (92.250) represented unexplained variance, with a

total variance of 150.125. The mean square for regression (57.875) divided by the mean square for residuals (0.576) produced an F statistic of 100.467, which was significant at $p < .001$. This confirmed that institutional capacity was a reliable predictor of renewable energy employment.

Table 7. Coefficients.

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	1.754	0.198		8.864	.000
Institutional Capacity	0.713	0.071	0.621	10.024	.000

a. Dependent Variable: Renewable Energy Employment

Source: Author, 2025

The coefficients table explained both the magnitude and the significance of the relationship. The unstandardized coefficient ($B = 0.713$) indicated that for every one-unit increase in institutional capacity, renewable energy employment per 1,000 residents rose by 0.713 units. This finding illustrated that stronger county-level institutions directly translated into more jobs in the renewable energy sector, whether in construction, maintenance, distribution, or related services.

The standardized coefficient ($Beta = 0.621$) showed a moderately strong effect size when expressed in standard deviation units, suggesting that institutional capacity was one of the most influential factors driving renewable energy employment. The constant term ($B = 1.754$) represented the baseline level of employment that could be expected in the absence of institutional capacity, which was relatively low compared to when institutional support was strong.

The t-value for the institutional capacity variable ($t = 10.024$, $p < .001$) confirmed the significance of the relationship, ruling out the possibility that the results occurred by chance. These results demonstrated that institutional strength was not merely supportive but was a decisive factor in ensuring that renewable energy transitions translated into job creation.

The data revealed that counties with stronger institutions recorded more jobs linked to renewable energy. Interview feedback confirmed this. A Turkana County official explained:

"We have ambitious wind projects, but without trained staff to evaluate proposals, many opportunities have been lost." (Interview, Turkana County Director, 2025)

In contrast, a Kilifi energy planner pointed to success:

"Because our energy office has dedicated staff and a

budget, we not only attracted investors but also created jobs for technicians, electricians, and youth in maintenance roles." (Interview, Kilifi Energy Planner, 2025)

These insights align with the statistical evidence that institutional capacity accounted for nearly 39% of the employment variation.

The regression results showed that counties with well-functioning energy offices, adequate technical personnel, and budgets for renewable energy planning consistently reported higher levels of employment in the sector. This confirmed the second hypothesis (H2), which argued that stronger institutional capacity would be associated with greater renewable energy employment. In practical terms, the results underscored the importance of governance structures and capacity-building at the county level in making the transition to renewable energy not only greener but also more job-rich.

5.3. To Investigate the Relationship Between Equity-oriented Provisions and Public Acceptance of Renewable Energy Projects

The third objective tested whether equity-oriented provisions significantly predicted public acceptance of renewable energy projects. The independent variable (equity provisions) included measures such as community benefit sharing, local hiring requirements, subsidized connection costs, and compensation mechanisms. The dependent variable was public acceptance, measured through survey responses on satisfaction with renewable projects, willingness to support future projects, and reduced incidence of community resistance.

Table 8. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.557a	.310	.305	0.752	.310	72.234	1	160	.000

a. Predictors: (Constant), Equity Provisions

b. Dependent Variable: Public Acceptance

Source: Author, 2025

The model summary revealed a correlation coefficient ($R = 0.557$), suggesting a moderate positive relationship between equity provisions and public acceptance of renewable projects. The R Square value (0.310) indicated that equity measures explained 31.0 percent of the variation in public acceptance,

while the adjusted R Square (0.305) confirmed the model's stability. The standard error of the estimate (0.752) showed an acceptable fit between observed and predicted values. The F statistic ($F = 72.234$, $p < .001$) confirmed that the model was statistically significant.

Table 9. ANOVA.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	50.125	1	50.125	72.234	.000
Residual	111.000	160	0.694		
Total	161.125	161			

a. Dependent Variable: Public Acceptance

b. Predictors: (Constant), Equity Provisions

Source: Author, 2025

The ANOVA results reinforced the significance of the regression model. The regression sum of squares (50.125) represented the portion of variance in public acceptance explained by equity provisions. The residual sum of squares (111.000) reflected the unexplained variance, while the total

variance was 161.125. Dividing the regression mean square (50.125) by the residual mean square (0.694) produced the F value of 72.234, which was statistically significant at $p < .001$. This finding confirmed that equity provisions provided a meaningful explanation of differences in public acceptance.

Table 10. Coefficients.

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	2.045	0.229		8.932	.000
Equity Provisions	0.618	0.073	0.557	8.497	.000

a. Dependent Variable: Public Acceptance

Source: Author, 2025

The coefficients table demonstrated the specific contribution of equity provisions to public acceptance. The unstandardized coefficient ($B = 0.618$) indicated that for every one-unit increase in equity-oriented measures, public acceptance scores rose by 0.618 units. This meant that projects that embedded benefit sharing, required local hiring, or reduced connection costs gained substantially higher community support compared to those without such provisions.

The standardized coefficient ($Beta = 0.557$) suggested a moderately strong effect size, showing that equity considerations were among the most critical factors shaping public perception of renewable energy projects. The constant term ($B = 2.045$) represented the baseline level of public acceptance in the absence of equity measures, which was relatively low compared to the improvements achieved when such provisions were included.

The t -value for equity provisions ($t = 8.497$, $p < .001$) confirmed the statistical significance of the predictor, eliminating the likelihood that the observed effect occurred by chance. This implied that equity-oriented interventions had a demonstrable and reliable effect on improving project legitimacy in the eyes of communities.

The regression results showed that equity provisions strongly predicted public acceptance of renewable energy projects. Community leaders emphasized this during interviews.

A leader from Garissa stated:

"People agreed to give land for solar projects only after assurances that their sons and daughters would be hired." (Interview, Garissa Community Leader, 2025)

Another respondent in Busia described resistance when benefits were unclear:

“At first, people thought the project was only for outsiders. Once the county required benefit sharing, trust started to grow.” (Interview, Busia Community Representative, 2025)

These testimonies show that fairness is not an abstract idea but a practical condition for gaining legitimacy at the local level.

The findings demonstrated that projects designed with clear equity frameworks such as local benefit-sharing agreements, job creation for residents, and fair compensation mechanisms consistently achieved higher acceptance among communities. Conversely, projects lacking these measures faced more resistance and weaker support. These findings validated the third hypothesis (H3), which stated that counties with stronger equity-oriented provisions would experience greater public acceptance of renewable energy projects. In practical terms, the results suggested that embedding fairness and community benefits into renewable energy initiatives is not only ethically desirable but also strategically essential for smooth project implementation and sustainability.

6. Discussion of Findings

The study brought out clear links among incentives, institutions, and fairness in Kenya’s renewable energy sector. What I found matches with some existing work, adds some clarity, and in some cases, points in a slightly different direction.

6.1. Policy Incentives and Capacity Adoption

Counties that had stronger policy incentives such as feed-in tariff (FIT) policy support or clearer regulatory backing also tended to show higher renewable capacity per person. Studies like [11] have shown that Kenya’s FIT policy has awakened investor interest, even though its implementation has lagged considerably. For instance, only about 10.3 MW of FIT-supported renewables were operational out of an intended 1,551 MW at the time of their study, which highlights the gap between policy intent and execution [11]. Another work by [12] identified institutional and financial barriers such as high initial costs, lack of stable incentives, and cumbersome grid-connection procedures as obstacles to expanding solar PV in Kenya. Those findings echo parts of what the current article’s data show: even with incentives, some counties struggle because of weak institutional follow-through [12]. The current findings extend what those earlier studies said. They suggest policy incentives matter more when local governments have the capacity to act quickly, delays in licensing, for example, dampen the benefit of incentives.

6.2. Institutional Capacity and Employment

The current article observed that counties with better energy governance structures (dedicated energy staff, established coordination between county and national energy

agencies, sufficient budgeting for energy planning) had higher levels of employment tied to renewable energy. The recent “Renewable Energy Status and Uptake in Kenya” article by [4] noted that although Kenya has made advances in renewables, implementation shortfalls persist in counties where institutional capacity is weaker. For example, the uptake of solar home systems was higher where county authorities had better capacity to insist on standards, manage permits, and liaise with private investors [13]. What this current article adds is quantifying that effect: from our regression models, institutional capacity explained nearly 39% of the variation in employment across counties. That suggests strong institutions are not just helpful; they are a central source of difference.

6.3. Equity Provisions and Public Acceptance

The current article found strong positive associations between fairness-oriented measures (like local hiring, benefit sharing, and subsidized connection procedures) and levels of public acceptance. Communities that saw real economic benefits or local involvement were more likely to support renewable energy projects. [14] also reports that acceptance depends heavily on whether communities feel treated fairly, issues such as land rights, compensation, clarity of process, and benefit sharing featured strongly in participants’ concerns. Similarly, the national survey “Assessment of public awareness, acceptance and attitudes towards renewable energy in Kenya” (2020) showed that awareness and education drive acceptance, and where benefits are visible locally, support tends to be greater [15]. The current article found that equity provisions don’t always lead to acceptance unless communities believe local institutions will deliver. That echoes findings from the survey: people were wary when institutions are perceived as opaque or when promised benefits haven’t materialized.

6.4. Connections, Differences, and What This Suggests for Policy

When the findings are considered together, three patterns become clear. Incentives by themselves do not guarantee meaningful progress, as their effectiveness depends on the strength of accompanying institutions such as quick permitting systems, skilled personnel, and accountable oversight. Employment gains in the renewable energy sector tend to arise more consistently from strong institutional capacity rather than from incentives or equity provisions on their own, although fairness measures still play an important role by building legitimacy and reducing community resistance. Public acceptance, on the other hand, depends not only on the promise of equity provisions but also on how credible and visible their implementation appears. In settings where local institutions are weak or mistrusted, even well-designed projects risk being met with skepticism and opposition. What emerges here is that Kenya cannot afford to treat policy, in-

stitutional capacity, and equity as separate levers. Policy incentives need to be matched with capacity building and clear, enforceable benefit sharing to achieve sustainable and broadly accepted renewable energy growth.

7. Conclusion

Kenya's renewable energy transition works best when policy, institutions, and fairness move together. Financial incentives and fast-track permits can expand capacity, but without capable local institutions, projects stall. Strong county energy offices, trained personnel, and coordinated governance not only make projects happen but also generate employment. Communities respond positively when benefits are clear and shared locally, yet even well-intentioned measures fail if institutions cannot deliver reliably.

This study shows that progress is not just about adding megawatts; it is about building systems that work for people. Counties that combine incentives with effective institutions and visible equity measures achieve faster adoption, more jobs, and higher public trust. Kenya's path to clean energy will be successful only if technical potential, administrative capacity, and social fairness are treated as parts of the same equation.

8. Recommendations

The findings suggest that Kenya's renewable energy transition requires coordinated action across policy, institutions, and equity. Counties should prioritize strengthening local energy offices, equipping them with trained personnel and adequate budgets to manage project approvals, coordinate with national agencies, and support employment creation. Policy incentives such as feed-in tariffs, subsidies, and fast-track permitting will be most effective when aligned with institutional readiness, ensuring that opportunities for renewable energy adoption are not lost to administrative delays.

Equity considerations must be integrated into project design. Local hiring, community benefit-sharing arrangements, and affordable connection schemes increase public acceptance and reduce resistance, but only when institutions deliver these measures transparently and reliably. Continuous monitoring and evaluation of projects, policies, and institutional performance can identify gaps, improve accountability, and ensure intended benefits reach communities.

Engaging local communities early in planning, maintaining clear communication about benefits, and building trust are essential for sustainable renewable energy adoption. Together, these steps create a pathway where technical potential, administrative capacity, and social fairness work in tandem to achieve a transition that is both green and just.

Abbreviations

FIT Feed-in Tariff

IEA International Energy Agency
NGO Non-Governmental Organization
SPSS Statistical Package for the Social Sciences
MW Megawatt

Author Contributions

Fridah Mutitu Njiru is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] Carabajal, A. T., Orsot, A., Moudio, M. P. E., Haggai, T., Okonkwo, C. J., Jarrard, G. T., & Selby, N. S. (2024). *Social and economic impact analysis of solar mini-grids in rural Africa: A cohort study from Kenya and Nigeria*. arXiv. <https://arxiv.org/abs/2401.02445>
- [2] Ministry of Energy and Petroleum. (2025). *National energy policy 2025–2034*. Government of Kenya. <https://energy.go.ke/sites/default/files/Final%20Draft%20NEP%202025-2034%20%281%29.pdf>
- [3] Kenya Law. (2025). *The Energy (Integrated National Energy Plan) Regulations, 2025*. Energy and Petroleum Regulatory Authority. https://www.epra.go.ke/legal/web/uploads/686e62bf06b67_THE%20ENERGY%20%28INTEGRATED%20NATIONAL%20ENERGY%20PLAN%29%20REGULATIONS%2C%202025.pdf
- [4] Sustainable Energy for All. (2024). *State of the global mini-grids market report 2024*. SE for ALL. <https://www.seforall.org/publications/state-of-the-global-mini-grids-market-report-2024>
- [5] Mahmood, S. (2024). *Improving the supply side for solar mini-grids in fragile contexts: Policy toolkit*. International Growth Centre. <https://www.theigc.org/sites/default/files/2024-09/Mahmood%20Policy%20toolkit%20September%202024.pdf>
- [6] Sovacool, B. K., & Dworkin, M. H. (2015). *Energy justice: Conceptual insights and practical applications*. *Applied Energy*, 142, 435–444. <https://doi.org/10.1016/j.apenergy.2015.01.002>
- [7] Sovacool, B. K., Burke, M., Baker, L., Kotikalapudi, C. K., & Wlokas, H. (2017). *New frontiers and conceptual frameworks for energy justice*. *Energy Policy*, 105, 677–691. <https://doi.org/10.1016/j.enpol.2017.03.005>
- [8] Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). *Energy justice: A conceptual review*. *Energy Research & Social Science*, 11, 174–182. <https://doi.org/10.1016/j.erss.2015.10.004>

- [9] North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.
- [10] Hall, P. A., & Taylor, R. C. R. (1996). *Political science and the three new institutionalisms*. *Political Studies*, 44(5), 936-957. <https://doi.org/10.1111/j.1467-9248.1996.tb00343.x>
- [11] Ndiritu, S. W., & Engola, M. K. (2020). The effectiveness of feed-in-tariff policy in promoting power generation from renewable energy in Kenya. *Renewable Energy*, 161, 593-605. <https://www.efdnitiative.org/publications/effectiveness-feed-tariff-policy-promoting-power-generation-renewable-energy-kenya>
- [12] Samoita, D., Nzila, C., Østergaard, P. A., & Remmen, A. (2020). Barriers and Solutions for Increasing the Integration of Solar Photovoltaic in Kenya's Electricity Mix. *Energies*, 13(20), Article 5502. <https://www.mdpi.com/1996-1073/13/20/5502>
- [13] Rotich, I. K., Chepkirui, H. & Musyimi, P. K. (2024). Renewable Energy Status and Uptake in Kenya. *Energy Strategy Reviews*, 54, 101453. <https://www.sciencedirect.com/science/article/pii/S2211467X24001603>
- [14] Abdek, M. A., Takehiko M., Shigeo N., Kultip S. & Mariita, N. O. (2024). Determinants of community acceptance of geothermal energy projects: A case study on a geothermal energy project in Kenya. *Renewable Energy Focus*, Volume 50, 100594. <https://www.sciencedirect.com/science/article/pii/S1755008424000589>
- [15] Owusu, P., Ouedraogo, M., et al. (2020). Assessment of public awareness, acceptance and attitudes towards renewable energy in Kenya. *Scientific African*. <https://ui.adsabs.harvard.edu/abs/2020SciAf...900512O/abstract>
- [16] International Energy Agency. (2025). *Kenya's energy sector is making strides toward universal electricity access, clean cooking solutions and renewable energy development*. International Energy Agency. <https://www.iea.org/news/kenya-s-energy-sector-is-making-strides-toward-universal-electricity-access-clean-cooking-solutions-and-renewable-energy-development>