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Household Choice of Renewable Energy Sources in Kenya

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Abstract

Kenya recognizes the relationship between its emerging economy, energy, and the well-being of its citizens through the Sustainable Development Goals and the Paris Agreement on Climate Change. Kenya's Vision 2030 points to the huge contribution of energy toward strengthening adaptability, climate resilience, and good performance in different branches of the economy. The Kenya government has established different policies and laws in a bid to decarbonize the energy sector, and with a goal of attaining complete use of the national grid, 100 percent clean energy by 2030, common access to clean cooking, 2028, gearing towards reaching Net Zero in 2050. The Nationally Determined Contribution of the country is to significantly cut down greenhouse gas emissions by 30 percent by 2030. Despite the development of these policies, the adoption of renewable energy sources among Kenyan households remains suboptimal, highlighting the need to examine the determinants of household choice of renewable energy sources. Therefore, this study sought to determine the factors influencing household choice of renewable energy sources in Kenya. A cross-sectional research design was employed in the study to assess and analyze the choice of renewable energy sources in the country. The study leveraged on secondary data from Multi-Tier Framework Survey conducted in 2016 – 2018 by the World Bank. Anchored on the Theory of Planned Behavior, the dataset provided the information required to examine the factors that influence household choice of renewable energy sources in Kenya. A logit regression model was used to analyze the study objective. Marginal effects were further computed to interpret the influence of explanatory variables on the probability of choosing renewable energy sources. The data was analyzed using STATA. The study found that attitude, subjective norms, perceived behavioral control, knowledge and perceived satisfaction were statistically significant in explaining the determinants of households' behavioral intention to use renewable energy sources. The study recommends the National Government, government agencies, County Governments and non-governmental organizations to improve the affordability and accessibility of renewable energy technologies, strengthen public awareness and knowledge, and promote positive behavioral attitudes towards renewable energy adoption among households.

Keywords: *Renewable Energy, Behavioral Intentions, Household Choice, Kenya.*

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1.0 Introduction

Energy is key for modern society, powering daily life, industry, and economic growth (International Energy Agency [IEA], 2021). Despite historically relying on fossil fuels, concerns over environmental degradation and depleting reserves have driven a shift towards renewable energy alternatives (Takase et al., 2021). This transition offers opportunities for alleviating climate change, boosting energy security, and helping socio-economic development (United Nations Development Programme [UNDP], 2020). Renewable technologies have advanced, offering cost-effective and scalable solutions, with potential for decentralized energy systems (Ang et al., 2022). The transition to renewable energy has become a global priority due to concerns about energy security, climate change, and sustainable development (IEA, 2024). In recognition of the importance of modern energy in improving livelihoods and supporting economic growth, the United Nations adopted Sustainable Development Goal (SDG) 7, aimed at ensuring universal access to affordable, reliable, sustainable, and modern energy by 2030 (United Nations, 2015). Despite progress in expanding energy access, millions of people, particularly developing countries, lack access to modern energy services and rely on traditional biomass fuels such firewood and charcoal (World Bank, 2023).

Global efforts to mitigate climate change have further accelerated the adoption of renewable energy (IEA, 2024). Through the Paris Agreement (PA), countries committed to reducing greenhouse gas (GHG) emissions and limiting global warming by transitioning from fossils to cleaner energy sources such as solar, wind, hydro, geothermal, and bioenergy (Baruch-Mordo et al., 2019). Consequently, governments and development partners have introduced policies and investments aimed at expanding renewable energy production and encouraging the adoption of clean energy technologies (Hossin et al., 2023; IEA, 2024). However, challenges remain in transitioning away from fossil fuels resulting from technological, economic, and societal barriers (Baruch-Mordo et al., 2019). In addition, disparities in access to clean energy persist, necessitating equitable policies (McNamara et al., 2022). Understanding energy dynamics is crucial for developing policies and driving sustainable development (Li & Just, 2020). Therefore, this study scrutinized factors inducing household choice of renewable energy sources in Kenya.

Kenya has made considerable progress in the development and utilization of renewable energy sources as part of its commitment to achieving sustainable development and addressing climate change (Government of Kenya, 2023). Renewable energy sources, particularly geothermal, hydroelectric, wind and solar energy, constitute a significant share of the country's energy mix (Takase et al., 2021). In support of the PA and other national development frameworks, the Government of Kenya has prioritized the expansion of clean, reliable, and affordable energy systems to enhance energy security while reducing GHG emissions (Mumbo et al., 2020). The country has further committed to attaining net zero carbon emissions by 2050 through increased investments in renewable energy technologies and efficiency measures (Government of Kenya, 2015).

Renewable Energy Choice in Kenya

The expansion of infrastructure has increased the availability of renewable energy options to Kenyan households (Energy and Petroleum Regulatory Authority [EPRA], 2025). For instance, the contribution of solar and wind energy to the national grid increased following investments in renewable energy generation, broadening access to cleaner of energy (Kenya Electricity Generating Company [KENGEN], 2022). Similarly, the growth of decentralized energy systems, particularly solar home systems, has enhanced household access to renewable energy,

especially in areas where access to conventional energy infrastructure remains limited (EPRA, 2025).

While access to renewable energy technologies has improved over time, the extent to which households adopt and utilize these energy sources differs across socioeconomic groups and geographical locations (Government of Kenya, 2021). Factors such as affordability, awareness, accessibility, institutional support, and household perceptions continue to influence energy choices of renewable energy technologies (Kiprop et al., 2019). Consequently, some households adopt renewable energy technologies for domestic use, while others continue to rely on alternative energy technologies (Agandi, 2023).

In response to these challenges, the Government of Kenya has implemented policies and programmes aimed at increasing access to renewable energy and encouraging its choice (Government of Kenya, 2023). A major milestone in the energy sector was the enactment of the Energy Act, 2019, which consolidated existing energy laws and provided a comprehensive framework for the development, management, and utilization of renewable energy sources (Energy Act, 2019). The Act promotes energy access, energy efficiency, and investments in renewable energy technologies (Takase et al., 2021). Complementary policy instruments, including the Climate Change Act of 2016, the National Climate Change Acton Plan, the Kenya Bioenergy Strategy 2020-2027, and the National Energy Efficiency and Conservation Strategy 2020, further underscore the role of renewable energy and energy efficiency in achieving sustainable development and reducing greenhouse gas emissions (Government of Kenya, 2020). These frameworks have contributed to a gradual increase in the adoption of renewable energy technologies, particularly solar energy, at the household level (International Renewable Energy Agency [IRENA], 2024). Despite the existence of these policies and institutional frameworks, the choice of renewable energy technologies compared to the overall energy continues to decline (World Bank, 2025). In addition, Kenya is falling short of its NDC target of reducing GHG emission by 30% in 2030, as carbon emissions increased by 5.4 percent between 2015 and 2020 (IEA, 2022).

1.1 Statement of Problem

Energy is a critical driver of modern society, powering everyday activities, industrial processes, and economic progress (IEA, 2021). In line with Kenya's Vision 2030 development strategy, the country aims to achieve a clean, safe, and sustainable environment by 2030, necessitating the coordination of environmental laws for enhanced planning and governance (Government of Kenya, 2018). Moreover, Kenya has laid down ambitious goals that aim at increasing the adoption of renewable energy, realizing universal access to clean cooking by 2028 and progress towards Net Zero emissions by 2050, and in line with current global and regional commitments, including SDG 7, the PA, and NDC. To support these goals, the country has developed various policies and legislation aimed at bolstering economic sustainability and reducing GHG emissions (Odhengo et al., 2019). Notable among these policies and regulations are the Climate Change Act of 2016, NCAAPs, and Kenya's Vision 2020 (Government of Kenya, 2021). Moreover, the NDC of the country explicitly focuses on cutting GHG emissions by 30 percent by the year 2030 consistent with sustainable development agenda in Kenya (Brandt et al., 2018). However, the choice of renewable energy technologies in Kenya remains inadequate as shown by declining share of renewable energy in the country's overall energy mux and a 5.4 percent increase in carbon emissions between 2015 and 2020, indicating that the country is falling short of its NDC target of reducing GHG by 30 percent in 2030 (World Bank 2025; IEA, 2022). These trends highlight the need to understand the factors influencing household choice of renewable energy sources.

Previous studies, including by Iro and Danlami (2022), Kimutai et al. (2019), Osiolo (2009), Mbaka et al. (2019), mainly examined the influence of household socio-economic and demographic characteristics on energy choice in Kenya. Similarly, Yadav and Pathak (2017) applied the Theory of Planned Behavior to explain solar energy adoption, while Qalati et al. (2022) extended the theory by incorporating descriptive norms and moral responsibility. However, these studies did not comprehensively examine the combined influence of attitudes towards renewable energy, perceived behavioral control, social influence, perceived satisfaction on renewable energy sources, and knowledge of renewable energy technologies on household renewable energy choice in Kenya. Consequently, the current study addressed this gap by examining how these behavioral factors influence household choice of renewable energy sources in Kenya. By incorporating these variables, the study provides a more comprehensive understanding of the determinants of renewable energy adoption and utilization among Kenyan households.

Thus, the present research examined the household choice of renewable energy sources in Kenya.

1.2 Study Objective

To analyze the determinants of household behavioral intentions on the choice of renewable energy sources in Kenya.

2.1 Theoretical Literature

Theory of Planned Behavior (TPB) was created by Icek Ajzen in 1991. The theory gives in-depth formulation of human behavior and anticipates human behavior (Wang et al., 2021). It states that there are three defining elements of subjective norms, attitude, and perceived behavioral control (PBC) that impact behavior and include it in a person. These motives define effective behavior (Jing, Juan, & Zhang, 2016).

The attitude is an estimation of the behavior by an individual, be it positive or negative (Fishben & Yzer, 2003). The beliefs on the consequences of the behavior and how these consequences are held, as either rewarding or punishing, are what constitute this component. Subjective norms on the other hand involve the perceived social pressure to take part or to abstain in an activity (Rai & Beck, 2015). The subjective norms tend to be affected by the views and anticipations of family members, friends or social groups (Armitage & Conner, 2001). The PBC involves an estimation of a person of his/her capability to engage in a certain behavior, and will consider past events, resources available and the barriers that would be expected.

TPB is an effective model of explaining behavior intention and the information on the attitude and use of renewable energy sources. The attitude, social influence and perceived barriers can be effectively handled through appropriate policies aimed towards the transition to the use of sustainable sources in Kenya. Figure 1 presents the TPB.

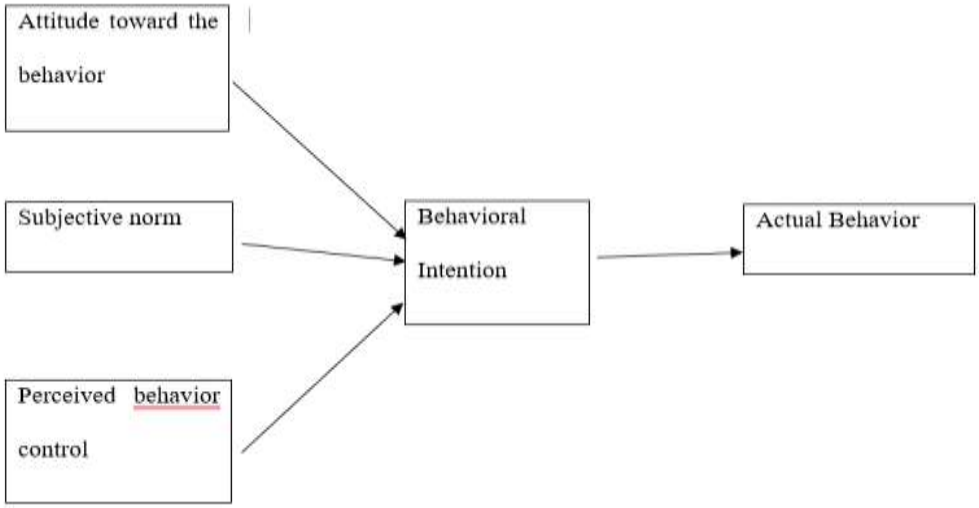


Figure 1: Theory of Planned Behavior (TPB)

Source: Icek Ajzen (1991)

2.2 Empirical Literature

Qalati et al., (2022) investigated the drivers of the intentions of saving energy and the behavior of households in Pakistan. The research was anchored on the TPB, which was expanded to descriptive norms and moral responsibility. The data were examined using partial least squares structural equation model (PLS-SEM). The findings showed that attitudes, subjective norms, perceived behavioral control, and knowledge significantly influenced households' energy saving intentions and behavior. The study focused on energy saving behavior rather than household choice of energy sources. The present study will examine the determinants of household intention on the choice of renewable energy sources using nationally representative data in Kenya.

Study by Iro and Danlami, (2022), the authors used the study to evaluate the demographic and policy issues affecting the household lighting fuel choice in the developing world. Multinomial logit model was applied in the analysis of the 760 samples collected with the help of a cluster area sampling method. The research established that age of the household head, level of income, urban residence, and the number of rooms, and access of electricity play positive functions in the possibility of using electricity as a lighting source. This study failed to analyze the household behavioral intentions on the choice of fuel. The current study examined the household behavioral intentions like the attitude, subjective norms, perceived behavioral control and knowledge in determining the choice of renewable energy source in Kenya.

Mbaka et al., (2019) reviewed the preference and consumption intensity of household in Kenya. A cross-sectional household data was used as obtained by National Energy Survey, 2009. The sample size of households (3663) was used to analyze Cragg double-hurdle model. The study findings reached the conclusion that the energy preference or intensity of use by the household is highly determined by location of the household, decision maker as to energy use in the household, the level of education and age of the household head in addition to the average monthly income of the household. The study, however, failed to discuss the impact of perceived satisfaction on preference and choice of renewable energy technologies. The current study incorporated perceived satisfaction in analyzing the determinants of behavioral intentions on the choice renewable energy sources in Kenya.

Kimutai, et al., (2019) examined what influences the number of household energy sources in Kenya. The research analysis involved using Generalized Linear Model to work with data of 560 households taken out of household survey carried out in 2017 and 2018 by means of using semi structured questionnaires. The research aimed to forecast the amount of energy sources which households will use in powering lamps and cooking. It was observed that income level along with the household age of the head, size, and distance to the closest fuel supplying shop had a very significant effect on the number of sources the household relies on to provide energy towards cooking and lighting. This study failed to look at some of the important household behavioral factors which significantly affect the choice of renewable energy sources. The present study incorporated the household behavioral factors to analyze the determinants of choice of renewable energy sources in Kenya.

Yadav and Pathak, (2017) explored the role of TPB in predicting the adoption of solar energy in India. The study found that attitudes toward cost savings, social influence and perceived ease of adoption were significant predictors of intention to install solar panels. The study focused solely on solar energy adoption leaving out other commonly used renewable sources of energy. The current study examined the determinants of household behavioral intentions on the choice of renewable energy sources encompassing biogas, solar and briquettes.

Osiolo (2009) conducted research on improving household fuel choice and substitution in Kenya. Utilizing panel data from 2006 household survey conducted by KNBS, the analysis employed the Heckman selection model. The findings revealed that households consider various factors such as household expenditure, fuel price, location of residence as well as proximity to fuel sources when making decisions on fuel use. Other factors included gender and education level of the household head. This study did not include household behavioral intentions. Therefore, the current study incorporated household behavioral intentions to analyze how these factors influence the household choice of renewable energy sources.

2.3 Conceptual Framework

The TPB model was extended by incorporating household knowledge of renewable energy sources as an additional explanatory variable. This extension is consistent with Ajzen's (1991) proposition that TPB may be expanded to include additional factors where such inclusion enhances explanatory power. Household knowledge was included since awareness and understanding of renewable energy technologies influence household attitudes and perceived behavioral control, thereby shaping behavioral intentions and actual energy use as supported by empirical studies (Qalati et al., 2022). Additionally, perceived satisfaction was included since it significantly affects fuel transition (Elasu et al., 2024). The extended TPB framework is therefore appropriate for this study as it demonstrates how household attitudes, social influence, perceived control, and knowledge jointly influence the household choice of renewable source of energy. The extended TPB framework is shown by Figure 2.

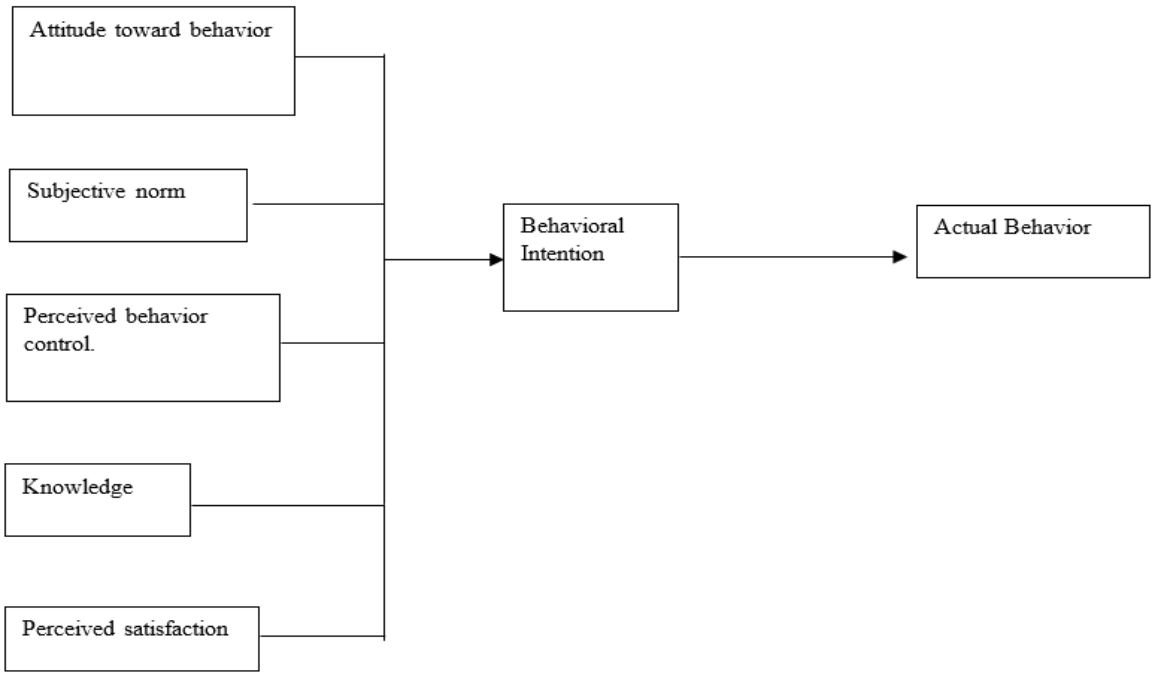


Figure 2: Conceptual Framework

Source: Author (year)

3.0 Methodology

The chapter provides a description of the research methodology in measuring the factors that drive choice of renewable sources of energy in Kenya. This will comprise of research design, theoretical framework, definition and measurement of variables, data analysis methods and diagnostic tests.

3.1 Research design

To determine the household intentions and the influencing factors that involve the household choice of renewable energy sources in Kenya, a cross-sectional research design was used. The present research is a non-experimental design. Data was analyzed with the help of qualitative and quantitative methods.

3.2 Data type and Source

The research utilized secondary data from the Multi-Tier Framework (MTF) Survey 2016-2018 conducted by the World Bank. The MTF provided comprehensive household-level information on energy use and access in Kenya. The dataset contained relevant indicators that enabled the analysis of the determinants of household behavioral intentions on the choice of renewable energy sources in Kenya. Variables relating to perceptions of renewable energy affordability, and usefulness were used to capture attitude. Household's awareness of renewable technologies and access to energy-related information were used for Knowledge; community exposure to energy information and social influences on energy-use decisions were used to represent subjective norms; satisfaction with energy sources was used to measure perceived satisfaction; and accessibility, reliability, and service quality were used as indicators of perceived behavioral control. These measures facilitated the examination of behavioral factors on households' actual renewable energy choice in Kenya.

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3.3 Theoretical Framework

The study was anchored on TPB theory. According to the TPB, behavioral intentions are formed by attitudes, subjective norms, and perceived behavioral control (Zhang et al., 2019).

$$BI_i = f(\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Where BI_i is the behavioral intentions for household i; β_1, β_2, β_3 are the parameters of the model; X_1 is the household attitude (ATT); X_2 is the subjective norm (SN); and X_3 is the perceived behavioral control (PBC).

The determinants of behavioral intentions were analyzed using a variable that takes a binary form to identify whether a household adopts renewable energy or not, as shown in equation 2.

$$BI_i = \begin{cases} 1, & adopts\ renewable\ energy \\ 0, & otherwise \end{cases} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

The binary equation was rewritten as:

$$P_i = f(\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Where P_i is the probability that the household corresponding to the i^{th} observation adopts renewable energy

3.4 Empirical Model

A logit regression model was used to analyze the determinants of household's behavioral intention on the renewable energy sources.

Equation 3 was modified to include household knowledge (KNW) and perceived satisfaction (PSF).

$$logit(p) = \left(\frac{p_i}{1 - p_i}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} \ldots\ldots\ldots\ldots\ldots 4$$

Where pi is the probability that the household corresponding to the i^{th} observation adopts renewable energy, the coefficients βs are the parameters of the model to be estimated, X_1 is the household attitude (ATT), X_2 is the subjective norm (SN), X_3 is the perceived behavioral control (PBC), X_4 is the household knowledge (KNW), and X_5 is the perceived satisfaction (PSF).

The variables that were used to evaluate the determinants of behavioral intentions on the choice of renewable energy the attitude of household head towards renewable energy (ATT), the subjective norm on renewable energy (SN), the perceived behavioral control toward renewable energy (PBC), the household knowledge on renewable energy (KNW) and the perceived satisfaction (PSF).

Therefore, the logit regression model was rewritten as:

$$logit(p) = BI_i = \beta_0 + \beta_1 ATT_i + \beta_2 SN_i + \beta_3 PBC_i + \beta_4 KNW_i + \beta_5 PSF_i + \varepsilon_i \ldots\ldots 5$$

3.5 Data Analysis and Diagnostic tests

Diagnostic tests were done to ensure that the estimated model was appropriate for ensuring consistent coefficient estimates. Statistical procedures as was applied in the study had the assumptions of regression as the underlying reference point. Diagnostic tests were done to ensure that the estimated model was appropriate for ensuring consistent coefficient estimates. Statistical procedures as was applied in the study had the assumptions of regression as the

underlying reference point. Diagnostics carried out consisted of multicollinearity and goodness of fit.

4.0 Results and Discussion

The chapter provides a comprehensive overview of the descriptive statistics and empirical findings from the study on the household choice of renewable energy sources in Kenya. Furthermore, diagnostic tests were performed to verify the reliability of the study's results.

4.1 Descriptive statistics

Table 1 shows the descriptive statistics derived from the data for the categorical variables that were used. The statistics show the frequency and percentages.

Table 1: Summary Statistics for Categorical Variables

Variable		Frequency	Percentage
Attitude (ATT)	Agree	3434	74.81
	Disagree	724	15.77
	Neutral	432	9.41
	Total	4590	100.00
Subjective norm (SN)	Agree	3904	85.05
	Disagree	345	7.52
	Neutral	341	7.43
	Total	4590	100.00
Perceived behavioral control (PBC)	Agree	1930	42.05
	Disagree	2295	50.00
	Neutral	365	7.95
	Total	4590	100.00
Knowledge (KNW)	No	437	9.52
	No opinion	950	20.70
	Yes	3203	69.78
	Total	4590	100.00
Perceived Satisfaction (PSF)	Very satisfied	815	17.76
	Somewhat satisfied	1327	28.91
	Neutral	816	17.78
	Dissatisfied	1196	26.06
	Very dissatisfied	436	9.50
	Total	4590	100.00

Source: Constructed from the Data

Table 1 indicates the following results. The results indicated that most respondents (74.81 percent) agreed with the adoption of renewable energy, suggesting a generally positive attitude among households. A smaller proportion (15.77 percent) disagreed, while 9.41 percent were neutral, indicating limited resistance and some level of uncertainty toward renewable energy adoption. Households with favorable attitudes were more likely to adopt renewable energy technologies, while negative or uncertain attitudes may reduce adoption likelihood (Seher et al., 2024).

Households that agreed with the subjective norms were 85.05 percent, suggesting strong social approval among households. On the other hand, 7.52 percent disagreed, while 7.43 percent were neutral, indicating limited resistance and some level of uncertainty regarding social influence on renewable energy adoption. Social influence is likely to play a significant role in shaping adoption decisions, as supportive norms can reinforce individuals' intentions to adopt

renewable energy technologies (Al Maalouf et al., 2024). Furthermore, households exhibited relatively low levels of perceived behavioral control, with 50 per cent of the respondents disagreeing that they had control over adopting renewable energy, while 42.05 percent agreed and 7.95 per cent were neutral.

Households exhibited high levels of knowledge regarding renewable energy, with 69.78 percent indicating that they were aware of renewable energy while 20.70 percent reported no opinion, suggesting some level of uncertainty or incomplete knowledge. A smaller proportion of 9.52 percent of households reported that they had no knowledge of renewable energy. Although knowledge is generally high among households, a notable proportion still lacks full understanding of renewable energy. This may be attributed to limited access to detailed information, the technical complexity of renewable energy systems, and uneven exposure to awareness initiatives, which result in partial or incomplete understanding among some households (Wall et al., 2021).

Respondents indicated varying levels of perceived satisfaction with renewable energy adoption, with 29.91 percent indicating that they were somewhat satisfied. This suggests a moderate level of satisfaction. A further 17.76 percent of households were very satisfied, while 17.78 percent were neutral, indicating some level of uncertainty or mixed experiences. A notable proportion of respondents (26.06 percent) were dissatisfied, and 9.50 percent were very dissatisfied, suggesting the presence of dissatisfaction among a considerable number of households. Higher perceived satisfaction promotes trust and continued uptake while dissatisfaction may discourage adoption by reducing confidence in technology (Ding et al., 2021).

4.2 Diagnostic Tests

Diagnostic tests were performed to test the reliability of the logit model used in the study. The multicollinearity analysis and goodness of fit test were done to confirm the reliability of the model.

4.2.1 Multicollinearity

Multicollinearity of independent variables was assessed before the logistic regression results are interpreted. To test this, the Variance Inflation Factor (VIF) was considered, and it is presented in Table 2. VIF is an indicator used to measure the extent of variance inflation of a regression coefficient that is caused by collinearity. The values of VIF that are below 5 typically mean that multicollinearity is not a serious issue, and the values that exceed 10 signify severe issues.

Table 2: Multicollinearity Analysis

Variable	VIF	1/VIF
ATT		
Agree	1.48	0.675
Neutral	1.59	0.63
SN		
Agree	1.96	0.509
Neutral	2.04	0.489
PBC		
Agree	1.09	0.916
Neutral	1.23	0.811
KNW		
No opinion	1.08	0.93
Yes	1.2	0.836
PSF		
Very Satisfied	1.68	0.595
Somewhat Satisfied	1.88	0.532
Dissatisfied	1.83	0.548
Very Dissatisfied	1.4	0.717
Mean VIF	**1.54**	

Source: Constructed from the Data

The results of the VIF test presented in Table 2 above ranged between 1.08 and 2.04, with a mean VIF of 1.54. These values are well below the critical threshold of 5, indicating that there is no evidence of serious multicollinearity among the independent variables included in the model. Therefore, the results suggest that the independent variables used in the regression model are sufficiently independent from each other, and all variables were retained for the logistic regression analysis.

4.2.2 Goodness of fit test

The goodness-of-fit test of Hosmer-Lemeshow was used to determine the fit of the logistic regression model. The test states that the null hypothesis is not rejected when the chi-square calculated is greater than the critical value or p-value >0.05, indicating that the model fits the data well. The results are presented in Table 3.

Table 3: Goodness-of-fit test

(Table collapsed on quantiles of estimated probabilities)	
Number of observations	4590
Number of groups	10
Hosmer-Lemeshow chi2(8)	11.38
Prob > chi2	0.181

Source: Constructed from the Data

From Table 3, the Hosmer–Lemeshow test produced a chi-square value of 11.38 with 8 degrees of freedom and a probability value of 0.1809. Since the p-value is greater than 0.05, the null hypothesis that the model fits the data well and cannot be rejected. This suggests that there was no significant difference between the observed and predicted values, indicating that the logistic regression model provides an adequate fit to the data. Therefore, the model was considered appropriate for explaining households' behavioral intention to adopt renewable energy.

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4.3 Empirical Findings

A logit regression equation was used to analyze the study objective. The probability of a household adopting or not adopting renewable sources of energy formed the dependent variable. The logit model explains how predictor variables influence the probability of an outcome by transforming it into log-odds form. A household was used as a unit of analysis, and the characteristic of the household head represented the individual household members.

Table 4 provides the findings of the binary logistic regression model that was estimated to analyze the variables affecting the behavioral intention of the households to adopt renewable energy. Behavioral intention (BI) is the dependent variable. The explanatory variables were attitude (ATT), subjective norms (SN), perceived behavioral control (PBC), knowledge (KNW), and perceived satisfaction (PSF). These variables were chosen in accordance with the theory of planned behavior and the early empirical research connected with the adoption of technology. Table 4 presents the regression results of the estimation of equation 5.

Table 4: Logit regression model results of Determinants of Household Behavioral Intentions on the Choice of Renewable Energy

Logistic regression			Number of obs = 4,590			
			LR chi2(17) = 959.99			
			Prob > chi2 = 0.0000			
Log likelihood = -2171.6456			Pseudo R2 = 0.1810			
BI	**Coef.**	**Std. Err.**	**z**	**P>z**	**[95% Conf. Interval]**	
ATT						
Agree	.3504166***	.1169802	3.00	0.003	.5796936	.1211397
Neutral	-.5652772***	.1597823	3.54	0.000	-.8784447	-.2521098
PBC						
Agree	-.4397261***	.079436	-5.54	0.000	-.5954179	-.2840343
Neutral	-.9945194***	.140347	-7.09	0.000	-1.269594	-.7194443
SN						
Agree	.455998***	.1388595	3.28	0.001	.1838383	.7281577
Neutral	.0641312	.1886243	0.34	0.734	.3055656	.433828
KNW						
No Opinion	-.146614	.1924919	-0.76	0.446	-.5238912	.2306632
Yes	.7457147***	.1580214	4.72	0.000	1.055431	-.4359984
PSF						
Very satisfied	2.16468***	.1711189	12.65	0.000	1.829293	2.500067
Somewhat	1.62134***	.1192359	13.60	0.000	1.387641	1.855038
Dissatisfied	-.2507563***	.095972	-2.61	0.009	-.438858	-.0626546
Very	-.5639009***	.1246995	-4.52	0.000	-.8083075	-.3194943
cons	.8475775	.1788085	4.74	0.000	.4971194	1.198036

**** denote statistically significant at 1%, (.) shows the standard error*

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R-squared is used to show how well the regression model explains the observed data (Gujarati & Porter, 2009). From the results in Table 4, R-Squared was found to be 0.181, showing that 18.10 percent of the variation in determinants of household behavioral intentions was explained by the independent variables in the logit regression model. According to Ozili (2023), a logit model with an R-squared of at least 0.10 is considered acceptable provided the key explanatory variables are statistically significant and theoretically consistent. The likelihood ratio chi-square value of 959.99 with a probability of 0.0000 at five per cent level is statistically significant, indicating that the explanatory variables have a joint effect in predicting the determinants of behavioral intention on the choice of renewable energy source of energy in Kenya

From the logit regression results in Table 4, marginal effect analysis was performed to explain the effect of the explanatory variables on the probability of adopting a renewable energy source. The marginal effects were preferred because they explain the relationship between the dependent variable and the independent variables in terms of changes in probability, making the results easier to interpret (Wooldridge, 2020). Marginal effects measure how the predicted probability of adopting a renewable energy source changes as the explanatory variables change, holding all other factors constant. The marginal effect results are shown in Table 5.

Table 5: Marginal effects on Determinants of Behavioral Intention after logit model regression

margins, dydx (*)
Average marginal effects
Model VCE: OIM

Number of obs = 4,590

Expression: Pr (BI2), predict ()
dy/dx w.r.t. : 1.ATT 3.ATT 2.KNW 3.KNW 1.PBC 3.PBC 1.SN 3.SN 1.PSF 2.PSF 4.PSF 5.PSF

Delta-method

	dy/dx	**Std. Err.**	**z**	**P>z**	**[95% Conf.**	**Interval]**
ATT						
Agree	.0525263***	.016777	3.13	0.002	.0854086	.0196440
Neutral	-.0876036***	.025053	3.50	0.000	-.1367066	-.0385006
SN						
Agree	.0748932***	.023767	3.15	0.002	.0283107	.1214757
Neutral	.0110186	.0323805	0.34	0.734	.052446	.0744831
PBC						
Agree	-.0690311***	.0124509	-5.54	0.000	-.0934344	-.0446277
Neutral	-.1673316***	.025306	-6.61	0.000	-.2169304	-.1177328
KNW						
No opinion	-.0233672	.0312714	-0.75	0.455	-.084658	.0379236
Yes	.1271745***	.0286307	4.44	0.000	.1832896	-.0710594
PSF						
Very satisfied	.2910985***	.0187291	15.54	0.000	.2543902	.3278069
Somewhat	.2506511***	.0183851	13.63	0.000	.2146169	.2866853
Dissatisfied	-.0561343***	.0213153	-2.63	0.008	-.0979115	-.014357
Very Dissatisfied	-.1295188***	.028703	-4.51	0.000	-.1857757	-.073262

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*Note: dy/dx for factor levels is the discrete change from the base level and *** denote statistically significant at 1%, (.) shows the standard error*

Source: Constructed from the Data

Attitude

Findings from the study indicated that the coefficient of agreeing that renewable energy technologies are beneficial, reliable, environmentally friendly, and suitable for household use was positive and statistically significant at one per cent level. The probability of adopting renewable energy technology increased by 0.053 for the households that agreed with these positive perceptions compared to households that disagreed. This implies that households with favorable perceptions of renewable energy technologies were 5.25 per cent more likely to adopt renewable energy technologies than households with unfavorable perceptions. This suggests that positive perceptions regarding the benefits, reliability, environmental friendliness, and suitability of renewable energy technologies promote their adoption and use among households (Yadav and Pathak, 2017). Similar findings were reported by Claudy et al. (2013), who found that positive attitudes significantly influence the adoption of renewable energy technologies.

Similarly, the coefficient of being neutral regarding the benefits, reliability, and suitability of renewable energy technologies was negative and statistically significant at one per cent level. The probability of adopting renewable energy technologies decreased by 0.088 for households that neither agreed nor disagreed that renewable energy technologies are beneficial, reliable, and suitable for household use, relative to households that disagreed. This implied that households that were uncertain about the value and suitability of renewable energy technologies were 8.8 per cent less likely to adopt them. According to Hoppe (2002), households that lack a clear evaluative stance may postpone adoption decisions due to insufficient information, low confidence or unclear perceived benefits of renewable energy technologies. This finding supported the Theory of Planned Behavior, which states that individual evaluation of a behavior influences the intention to perform it (Ajzen, 1991). This finding was consistent with Yadav and Pathak (2017), who found that attitude significantly influences the intention to adopt solar and energy-saving technologies.

Subjective Norms

The coefficient of agreeing that family members, friends, peers, and the community support and encourage the adoption of renewable technologies was positive and statistically significant one per cent level. The probability of adopting renewable energy increased by 0.075 for households that agreed with the social influence compared to households that disagreed. This implied that households that agree are 7.5 per cent more likely to adopt renewable energy relative to households that disagree. This suggested that positive social pressure or encouragement from family members, peers, and the community strengthens household intentions to adopt renewable energy technologies (Horne and Familia, 2021). This result supports the findings of Bollinger and Gillingham (2012), who reported that social influence and normative pressure play a significant role in shaping household energy decisions.

Perceived Behavioral Control

The coefficient of agreeing that the household has the resources, knowledge, and the capacity to adopt, use and sustain renewable energy technologies was negative and statistically significant in explaining behavioral intention at a one percent level. The probability of adopting renewable energy technologies decreased by 0.069 for households that agreed they had the ability and capacity to adopt renewable energy technologies compared to the households that disagreed. This implied that such households were 6.9 per cent less likely to adopt renewable energy technologies Households who perceive some constraints or difficulties are less likely

to form strong intentions toward renewable energy adoption (Davis, 1989). This result supports Rana et al. (2025) who found that perceived behavioral control directly influenced household intentions to adopt renewable energy technologies, with lower perceived behavioral control weakening intentions.

The coefficient of being neutral regarding whether the household has the resources, knowledge, and capacity to adopt renewable energy technologies was negative and statistically significant at one per cent level. The probability of adopting renewable technologies decreased by 0.167 for households that neither agreed nor disagreed that they had the ability and capacity to adopt renewable energy technologies, relative to households that disagreed. This indicated that households that were uncertain about their capacity to adopt renewable energy technologies were 16.7 percent less likely to adopt them. The uncertainty or indecision about households' ability to adopt renewable energy almost completely suppresses adoption of renewable energy (Kotyza et al., 2024). Households are more likely to form strong intentions when they perceive fewer constraints and greater control over adoption decisions. The negative coefficients may indicate constraints such as high installation costs, lack of access to technology, or limited technical knowledge. This finding was consistent with Masud et al., (2025) who found that perceived behavioral control significantly determines household intention to adopt renewable technologies such as solar and biogas.

Knowledge

Households that reported having knowledge and awareness of renewable technologies and their use exhibited a positive coefficient which is statistically significant at one per cent level. Relative to households without knowledge of renewable energy technologies, having knowledge increases the probability of adoption of renewable energy by 0.127 percent. This implies that households that are aware of renewable energy technologies, their benefits, and applications were 12.7 per cent more likely to adopt renewable energy technologies.

This suggests that households with awareness or information about renewable energy technologies are more likely to adopt them. Knowledge therefore explains the use of renewable energy, since households need adequate information before making energy decisions (Qalati et al., 2022). This result supports Harkema et al., (2011) findings that indicated knowledge gaps and weak information flows significantly constrain household adoption decisions.

Perceived satisfaction

The coefficient for households that were very satisfied with the ability of renewable energy technologies to meet their daily household energy needs was positive and statistically significant at one per cent level. The probability of adopting renewable energy increased by 0.291 for households that were very satisfied compared to households that were neutral. This implies that households that were highly satisfied with the cost, reliability, convenience, and overall performance of renewable energy technologies were 29.1 per cent more likely to adopt renewable energy technologies. The finding suggested that households that derive a high level of contentment from using renewable energy technologies for daily household energy needs are more likely to continue using and adopting such technologies. This was consistent with Li and Just (2018), who found that positive user experiences and satisfaction with renewable energy increased the likelihood of continued use and adoption

Similarly, the coefficient of being somewhat satisfied with the use of renewable energy for daily households was positive and statistically significant at one per cent level. The probability of adoption increased by 0.251 relative to the neutral households, implying that households that were moderately satisfied with the performance of renewable energy technologies s 25.1 per cent more likely to adopt renewable energy technologies. This suggests that households

that perceive energy technologies as reasonably reliable, affordable, convenient, and capable of meeting their energy requirements are more willing to continue using them. This was consistent with Al-Refaie et al. (2023), who reported that when households are moderately satisfied with the cost, reliability, and performance of renewable energy, they are more willing to continue using it and recommend it to others.

Conversely, the coefficient of being dissatisfied with the use of renewable energy technologies was negative and statistically significant at one per cent level. The probability of adoption decreased by 0.056 for the households that were dissatisfied with the use of renewable energy sources relative to the neutral household indicating that dissatisfied households were 5.6 per cent less likely to adopt renewable energy technologies. This suggests that households that perceived renewable energy technologies as failing to adequately meet their energy requirements, being unreliable, inconvenient, or not cost effective were less likely to adopt them (Ding et al., 2021). Similar findings were reported by Afful-Dadzie et al. (2020), who observed that unfavorable user perceptions and experiences with renewable energy technologies may discourage their adoption.

On the other hand, the coefficient of being very dissatisfied with their experience of using renewable energy technologies to meet daily household needs was negative and statistically significant at one per cent level. The probability of adoption of renewable energy decreased by 0.130 compared to neutral households, implying that households who were highly dissatisfied with the experience of using renewable energy technologies were 13.0 per cent less likely to adopt renewable energy technologies. The results suggest that households that are highly dissatisfied with the performance of renewable energy technologies are less likely to adopt them. The result is consistent with Buscher and Sumpf (2015), who found that negative user experiences reduce confidence and trust in renewable energy technologies, thereby discouraging their adoption.

In general, the results of the regression analysis show that several categories of attitude, subjective norms, perceived behavioral control, knowledge and perceived satisfaction are significant predictors of the behavioral intention of households to use renewable energy. The results are in line with the Theory of Planned Behavior, according to which individual attitudes, perceived ability, and social influence determine behavioral intention.

The coefficient for households with neutral subjective norms and those with no opinion on knowledge regarding renewable energy were statistically insignificant, suggesting that their likelihood of adopting renewable energy technologies did not differ significantly from that of the respective categories.

4.4 Summary of the findings

The purpose of the study was to analyze the determinants of household behavioral intention on the choice of renewable energy sources in Kenya. Attitude, subjective norms, perceived behavioral control, knowledge and perceived satisfaction were used to assess this objective. The results indicate that behavioral intention played an important role in shaping household adoption of renewable energy technologies. The coefficient of the agreed attitude category was positive and statistically significant, while that of the neutral category was negative and statistically significant, suggesting that favorable attitudes promoted the adoption of renewable energy technologies, whereas neutral attitudes reduced the likelihood of adoption. Similarly, the agreed subjective norms category exhibited a positive and statistically significant coefficient, implying that social support and encouragement from family members, friends, peers and the community promoted the adoption of renewable energy technologies.

In contrast, the coefficients of both the agreed and neutral perceived behavioral control categories were negative and statistically significant, indicating that perceived constraints and uncertainty regarding the ability to adopt and sustain renewable energy technologies reduced the likelihood of adoption. Furthermore, having knowledge had a positive and statistically significant coefficient, demonstrating that knowledge and awareness of renewable energy technologies promoted their adoption among households.

In addition, perceived satisfaction significantly influenced the adoption of renewable energy technologies. The coefficients of households that were very satisfied and somewhat satisfied with the use of renewable energy were positive and statistically significant, while those of dissatisfied and very dissatisfied categories were negative and statistically significant. This implied that positive user experiences encouraged households to adopt renewable energy technologies, whereas dissatisfaction reduced the likelihood of adoption. However, the neutral subjective norms category and the no opinion on the knowledge category were statistically insignificant determinants of household behavioral intention on the choice of renewable energy sources.

5.0 Conclusion

From the analysis, the study concluded that household behavioral intentions regarding the choice of renewable energy sources in Kenya are significantly influenced by attitude, subjective norms, perceived behavioral control, knowledge of renewable energy sources, and perceive satisfaction with renewable energy technologies. Therefore, households are more likely to choose renewable energy sources when they hold favorable perceptions towards technologies, receive social support for their use, possess adequate knowledge, have confidence in their ability to use them, and are satisfied with their performance.

6.0 Policy Recommendation

The national government, through the Ministry of Energy and Petroleum in coordination with the County Governments, should undertake programs aiming at changing households' attitudes towards renewable energy. The recommendation is based on the study finding that a positive attitude towards renewable energy technologies significantly influenced households' behavioral intentions to choose renewable energy sources. The programs should be focused on sensitizing households on the environmental, economic, and health benefits of renewable energy sources such as solar energy, biogas, and clean cooking fuels. Such programs will help improve perceptions and enhance households' willingness to adopt renewable energy technologies.

The Ministry of Energy and Petroleum together with the Ministry of Information, Communications and the Digital Economy should support nationwide media campaigns through radio, television, and digital platforms to encourage the use of renewable energy sources. Such programs will encourage and build positive perceptions toward renewable energy use. This recommendation is based on the study finding that subjective norms significantly influenced households' behavioral intentions on the choice of renewable energy sources.

The County Governments, in collaboration with the Non-Governmental Organizations (NGOs), Community Based Organizations (CBOs) should promote renewable energy adoption through community-based awareness campaigns, peer learning initiatives, and demonstration projects showcasing successful adopters. This is because households that conform to prevailing social norms are more likely to adopt renewable energy technologies. Engaging local leaders and cooperatives to champion renewable energy technologies will help normalize their use, strengthen social acceptance, and ultimately increase uptake across households.

The Energy and Petroleum Regulatory Authority (EPRA), in coordination with the Ministry of Energy and Petroleum, should implement targeted interventions to enhance households' perceived ease of adoption. This includes simplifying access to renewable energy technologies, strengthening technical support services, reducing regulatory complexities, and expanding financing options to lower perceived and actual barriers. This would improve confidence in adopting renewable energy among households, thereby increasing its adoption because the study found that agreed and neutral households on the perceived behavioral categories were less likely to adopt renewable energy technology.

The National Government, through the Ministry of Energy and Petroleum, should strengthen targeted awareness interventions through nationwide media campaigns on the benefits of renewable energy adoption, while the County Governments should coordinate community sensitization forums and local outreach programs. In addition, the National Government, through the Ministry of Education, should integrate renewable energy content into school-based programs and demonstration projects to reinforce positive social learning and promote adoption. This would improve household knowledge, influence behavior and therefore increase the uptake of renewable energy technologies since the study found that having knowledge of renewable energy technologies significantly influences households' behavioral intentions on the choice of renewable energy.

The government should strengthen regulatory enforcement through the Kenya Bureau of Standards (KEBS) and the Anti-Counterfeit Authority (ACA). Specifically, KEBS should ensure that all renewable energy technologies meet required quality and safety standards before reaching the market. On the other hand, the ACA should intensify efforts to prevent the circulation of counterfeit renewable energy products. This would protect households from substandard and fake technologies, enhance consumer confidence, and promote the uptake and sustained use of reliable renewable energy solutions. This recommendation is based on the study finding that perceived satisfaction with renewable energy technologies positively influenced households' behavioral intentions to choose renewable energy sources. Overall, the perceived satisfaction of the users of renewable energy would be improved through the quality of products and regulations.

REFERENCES

Afful-Dadzie, A., Mallett, A., & Afful-Dadzie, E. (2020). The challenge of energy transition in the Global South: The case of electricity generation planning in Ghana. *Renewable and Sustainable Energy Reviews*, 126, 109830.

Agandi, V. O. (2023). Socio-economic factors influencing adoption of solar energy technologies: A case of households in Narok County [Strathmore University]. http://hdl.handle.net/11071/13362.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.

Al Maalouf, N. J., Sayegh, E., Inati, D., & Sarkis, N. (2024). Consumer motivations for solar energy adoption in economically challenged regions. *Sustainability*, 16(20), 8777.

Al-Refaie, A., Lepkova, N., & Hadjistassou, C. (2023). Using system dynamics to examine effects of satisfaction with PV systems, advertising, and competition on energy security and CO_2 emissions in Jordan. *Sustainability*, 15(20), Article 14907. https://doi.org/10.3390/su152014907

Ang, T., Salem., M, Kamarol, M., Das, H., Nazari., M. & Prabaharan, N. (2022). A Comprehensive Study of Renewable Energy Sources: Classifications, challenges and Suggestions. *Energy Strategy Reviews*, 43, 100939.

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, 40(4), 471–499.

Baruch-Mordo, S., Kiesecker, J., Kennedy, C., Oakleaf, J., & Opperman, J. (2019). Sustainable Implementation of Renewable Energy Goals. From Paris to practice: Sustainable implementation of renewable energy goals. *Environmental Research Letters*, 14(2), 024013.

Bollinger, B., & Gillingham, K. (2012). Peer effects in the diffusion of solar photovoltaic panels. *Marketing Scienc*e, 31(6), 900–912.

Brandt, P., Herold, M., & Rufino, M. (2018). The Contribution of Sectoral Climate Change Mitigation Options to National Targets: A Quantitative Assessment of Dairy Production in Kenya. *Environmental Research Letters*, 13, Article 034016. https://doi.org/10.1088/1748-9326/aaac84

Büscher, C., & Sumpf, P. (2015). "Trust" and "confidence" as socio-technical problems in the transformation of energy systems. *Energy, Sustainability and Society*, 5(1), 34. https://doi.org/10.1186/s13705-015-0063-7.

Claudy, M. C., Peterson, M., & O'Driscoll, A. (2013). Understanding the attitude–behavior gap for renewable energy systems using behavioral reasoning theory. *Journal of Macromarketing*, 33(4), 273–287.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.

Ding, L., Shi, Y., He, C., Dai, Q., Zhang, Z., Li, J., & Zhou, L. (2021). How does satisfaction of solar PV users enhance their trust in the power grid? Evidence from photovoltaic poverty alleviation projects in rural China. *Energy, Sustainability and Society*, 11(1), 31.

Elasu, J., Ntayi, J. M., Adaramola, M. S., Buyinza, F., Atukunda, R., & Ngoma, M. (2024). Climate shocks, adaptive mechanisms and household energy transition in Uganda. *Discover Energy, 4*(1), 19. https://doi.org/10.1007/s43937-024-00040-w.Energy and Petroleum Regulatory Authority. (2025). *Energy and Petroleum Statistics Report 2025.*

Energy Act, No. 1 of 2019 (2019) (Kenya).

Fishbein, M., & Yzer, M. C. (2003). Using theory to design effective health behavior interventions. *Communication Theory*, 13(2), 164–183.

Government of Kenya (2015). *The Energy Bill, 2015*. (National Assembly Bill No. 50 of 2015). Government Printer.

Government of Kenya (2018). *National Climate Change Action Plan 2018–2022*. Ministry of Environment and Forestry.

Government of Kenya (2020). *Kenya national energy efficiency and conservation strategy*. Ministry of Energy.

Government of Kenya (2021). *Updated nationally determined contribution*. Ministry of Environment and Forestry.

Government of Kenya (2023). *Kenya Energy Transition and Investment Plan 2023–2050*. Ministry of Energy and Petroleum.

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill Education.

Harkema, S., Popescu, F., & Leloux, M. (2011). Exploration into the barriers and obstacles constraining diffusion and adoption of renewable energy solutions. *International Journal of Economic Practices and Theories, 1*(1).Heltberg, R. (2003). Household fuel and energy use in developing countries: *A multicountry study* (ESMAP Technical Paper No. 042). World Bank.

Hoppe, H. C. (2002). The timing of new technology adoption: Theoretical models and empirical evidence. *The Manchester School*, 70(1), 56–76.

Horne, C., & Familia, T. (2021). Norms, norm sets, and reference groups: Implications for household interest in energy technologies. *Socius: Sociological Research for a Dynamic World*, 7, 1–15.

Hossin, A., Xiong, S., Alemzero, D., & Abudu, H. (2023). Analyzing the Progress of China and the World in Achieving Sustainable Development Goals 7 and 13. *Sustainability*, 15(19), 14115.

International Energy Agency (2023). *Renewable Energy Market Update 2023.*

International Energy Agency (2024a). *Renewables 2023: Analysis and forecast to 2028*.

International Energy Agency (2024b). *World energy outlook 2024.*

International Energy Agency. (2021). *World energy outlook 2021*.

International Energy Agency. *(2022). World energy outlook 2022.*

International Renewable Energy Agency (2024). *Renewable Energy Market Analysis: Africa and its regions.*

Iro, N., & Danlami, H. (2022). *Households and the Choice and Cooking Fuel in Kano State, Nigeria*. Ahmadu Bello University Press Limited.

Jing, P., Juan, C., & Zhang, F. (2016). Application of the expanded theory of planned behavior in intercity travel behavior based on MIMIC model. *Journal of Industrial Engineering and Engineering Management*, 30(4), 61–68.

Kenya Electricity Generating Company (2022). *Integrated Annual Report and Financial Statements for the year ended 30 June 2022.*

Kimutai, S. K., Kiprop, A. K., & Siagi, Z. O. (2019). Factors affecting the number of household energy sources in Kenya: Generalized linear model. *International Journal of Novel Research in Engineering and Science, 6(2),* 27–32.

Kotyza, P., Cabelkova, I., Pierański, B., Malec, K., Borusiak, B., Smutka, L., Nagy, S., Gawel, A., Bernardo López Lluch, D., Kis, K., Gál, J., Gálová, J., Mravcová, A., Knezevic, B., & Hlaváček, M. (2024). The predictive power of environmental concern, perceived behavioral control and social norms in shaping pro-environmental intentions: A multicountry study. *Frontiers in Ecology and Evolution, 12,* Article 1289139. https://doi.org/10.3389/fevo.2024.1289139.

Li, J., & Just, R. E. (2018). Modeling household energy consumption and adoption of energy-efficient technology. *Energy Economics*, 72, 404–415. https://doi.org/10.1016/j.eneco.2018.04.019

Masud, R., Al Mamun, M. A., Hossain, M. K., Rekha, R. S., & Alam, S. M. S. (2025). Understanding the adoption of renewable energy technologies by households in South Asia: A theory of planned behavior perspective. *Discover Sustainability, 6(1),* 1–17. https://doi.org/10.1007/s43621-025-01051-w

Mbaka, C. K., Gikonyo, J., & Kisaka, O. M. (2019). Households' energy preference and consumption intensity in Kenya. *Energy, Sustainability and Society, 9*, Article 20. https://doi.org/10.1186/s13705-019-0201-8.

McNamara, W., Passell, H., Montes, M., Jeffers, R., & Gyuk, I. (2022). Seeking energy equity through energy storage. *The Electricity Journal*, 35(1), 107063. https://doi.org/10.1016/j.tej.2021.107063

Mumbo, A., Bess, C., & Mutua, F. (2020). Renewable energy: The paradigm shift - Energy, development and climate change, Kenya-South Africa context. *Journal of Engineering in Agriculture and the Environment,* 6(2).

Odhengo, P., Atela, J., Steele, P., Orindi, V., & Imbali, F. (2019). *Climate finance in Kenya: Review and future outlook.* The National Treasury, Adaptation Consortium, African Centre for Technology Studies (ACTS), and International Institute for Environment and Development (IIED).

Osiolo, H. (2009). *Enhancing household fuel choice and substitution in Kenya* (KIPPRA Discussion Paper No. 102/2009). Kenya Institute for Public Policy Research and Analysis (KIPPRA).

Ozili, P. K. (2023). The acceptable R-square in empirical modelling for social science research. In C. Saliya (Ed.), *Social research methodology and publishing results: A guide to non-native English speakers* (pp. 134–143). IGI Global. https://doi.org/10.4018/978-1-6684-6859-3.ch009.

Qalati, A., Qureshi, A., Ostic, D., & Sulaiman, M. (2022). Factors influencing Pakistani household's energy- saving intentions and behavior: An extension of the theory of planned behavior. *Sustainability*, 14(19), 12448.

Rai, V., & Beck, A. L. (2015). Public perceptions and information gaps in solar energy in Texas. *Environmental Research Letters*, 10(7), 074011.

Rana, M., Al Mamun, A., Hossain, K., Rekha, S., & Alam, S. (2025) Understanding the adoption of renewable energy technologies in South Asis: A theory of planned behavior perspective. *Discover Sustainability*, 6, Article 251.

Seher, P., Tofique, S., & Afzal, S. (2024). Determinants of solar energy adoption intention: A meta-analysis. *International Journal of Research Publication and Reviews*, 6(9), 2503–2512.

Takase, M., Kipkoech R., & Essandoh, P. (2021). A comprehensive Review of Energy Scenario and Sustainable Energy in Kenya. *Fuel Communications*, 7, 100015.

United Nations Development Programme. (2020). *Sustainable energy and human development: Accelerating energy access and renewable energy transitions*.

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development. United Nations.*

Wall, W. P., Khalid, B., Urbanski, M., & Kot, M. (2021). Factors influencing consumers' adoption of renewable energy. *Energies*, 14(17), Article 5420.

Wooldridge, M. (2020). Introductory econometrics: *A modern approach (7th ed.)*. Cengage Learning

World Bank. (2023). *Tracking SDG 7: The energy progress report 2023*.

World Bank. (2025). *Renewable energy consumption* (% of total final energy consumption) - Kenya https://data.worldbank.org/indicator/EG.FEC.RNEW.ZS?locations=KE

Yadav, R., & Pathak, G. S. (2017). Determinants of consumers' green purchase behavior in a developing nation: Applying and extending the theory of planned behavior. *Ecological Economics*, 134, 114–122.

Zhang, L., Fan, Y., Zhang, W., & Zhang, S. (2019). *Extending the theory of planned behavior to explain the effects of cognitive factors across different kinds of green products. Sustainability, 11*(15), 4222. https://doi.org/10.3390/su11154222