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INFLUENCE OF TECHNOLOGY ON EXECUTION OF SOLAR POWER PROJECTS IN SOUTHWEST, NIGERIA

BY

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Abstract

This paper examined the influence of technology on execution of solar power projects (ESPP) in southwest, Nigeria. The study adopted a research survey design and a census population of 158 solar companies. The study retrieved and used 109 valid questionnaire collected from the top managers, representing about 69 percent. The data were collected using a digital questionnaire created with CSPro (Census and Survey Processing System). The study adopted descriptive and inferential statistics which included: mean, standard deviation and structural equation modelling (SEM) respectively. Furthermore, the SEM analyses conducted showed that technology was highly significant at the 95 percent level ($\beta = 0.735$; $p = 0.000$). The study further revealed that economic status of the community ($\beta = 0.204$; $p = 0.014$) and sustainability of the projects ($\beta = -0.267$; $p = 0.014$) significantly influenced execution of solar power projects at 95 percent level. The result showed that technology is critical to successfully execution of solar power projects. The study recommended that the solar power developers should explore collaboration with private investors to share the financial burdens of acquiring modern technology for successful execution of solar power projects in Southwest, Nigeria. The study provided insights into the factors that influenced the execution of solar power projects in Southwest, Nigeria. The findings have implications for policymakers, solar power developers, and investors seeking to promote the growth of solar power industry in the country.

Keywords: *Technology, execution of solar power projects, sustainability, economic status, corporate institution supports*

I INTRODUCTION

Solar power technology as a source of electricity has gained a considerable attention globally because the rate of growth of the industrial sector depends on the level of energy generated in a country. Electricity as a form of energy, has diverse applications because of its flexibility and ease of transmission and distribution. Its availability remains a major factor in the location of industries and a strong instrument of social and economic development (Akuru et al., 2017). It is indeed fundamental to the fulfilment of basic individual and community needs in our modern society. Keeping hospitals open and operational, running factories, lighting and heating houses, lighting streets, provision of potable water, among others require energy (Akorede et al., 2016). Likewise, the development of rural areas, megacities, and communities is dependent on greater accessibility of electric supply which is extremely important to human development (Olabode & Akintelu, 2022). Thus, adequate supply of this infrastructure services has long been perceived as essential for urban development both in developing and developed economies (Dabara et al., 2015).

However, the development of renewable energy resources has faced a number of hurdles, primarily related to cost, regulation, and financing (Lee & Zhong, 2015). The development of renewable energy systems is a capital-intensive process that most developing countries cannot undertake without financial support from development partners (Rambo, 2013). The situation has been compounded by the fact that governments of low-income countries face significant budget constraints for the capital-intensive infrastructure required to reach the hundreds of millions of households and businesses without grid electricity (Falchetta et al., 2022).

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Considering the rising figure of population without access to electricity, African countries, in particular, the Nigerian government have devised different initiatives to improve the access to energy. In 2005, the Electric Power Sector Reform Act (EPSR) unbundled Power Holding Company of Nigeria (PHCN) into six (6) generating companies (GenCos), one (1) transmission company (TransCo), and eleven (11) distribution companies (DisCos) to provide the general legal framework for the formation of several entities (corporations), to take over the assets and liabilities of the old regulatory body and to establish the Nigerian Electricity Regulatory Commission (NERC). The National Integrated Power Project (NIPP) was also developed to solve the difficulties of insufficient electricity generation in Nigeria (Dahunsi et al., 2022). The deregulation of the electricity sector in Nigeria has brought to the fore the need to explore alternative power generation options for the improvement of power capacity, reliability, and availability (Oladipo et al., 2018).

Thus, the main objective of the study was to determine the influence of technology on execution of solar power projects (ESPP) in Southwest, Nigeria, with a view to guaranteeing sustainable power supply in the region. We therefore hypothesized that technology has no significant effect on the ESPP in the region.

The study would provide valuable insights for policymakers, solar power developers, and investors seeking to promote the growth of the solar power industry in the region. The study would assist corporate institutions in establishing certain renewable energy projects. Finally, study would assist the government in formulating accommodating policies to enhance accessibility of funds for execution of solar power projects in the country. The study covered household and community solar power projects in Southwest, Nigeria. The states covered are Ekiti, Lagos, Ogun, Ondo, Osun and Oyo States.

II LITERATURE REVIEW

Factors Influencing the Execution of Solar Power Projects

Abdullahi et al. (2021) investigated the causes and insight of the barriers that are responsible for the slow implementation of the solar energy initiative in Nigeria. The study was conducted qualitatively, through semi-structured face-to-face interviews of 25 participants. The study reveals technological, financial, political, and social barriers have been the reasons for slowing down solar energy development in Nigeria. While the technical barrier is a challenge to the energy implementation, socio-cultural issues have also been an obstacle to the implementation process. It is suggested that the stakeholders of the initiatives were to proffer sustainable policies to enable public and private promoters to be able to generate, and distribute electricity through solar PV, to complement the inadequate conventional electricity sources from the grids.

A study by Dabara and Ankeli (2015) on infrastructure financing and urban development in Nigeria revealed that inadequate investment in basic infrastructure (due to severe budget constraints) and the rapid rate of urbanisation in Nigeria was putting considerable strain on the nation's limited infrastructure. Hence, there is a need for large and continuing amounts of investments in almost all areas of electricity infrastructure in Nigeria. This is because electricity is the basic tool that drives industrialization, technological advancement, engineering transformation and economic growth all over the world (Akuru, 2017). Solar Power Projects as a source of renewable energy are being used to replace fossil dominated electricity generation especially in the sub-Saharan African countries (Mas'ud, et al., 2016). Renewable energy has a prominent role in promoting energy access and addressing environmental concerns with energy use in Nigeria (Oniemola, 2015). Renewable energy sources such as biomass, geothermal, hydropower, solar and wind, energy sources are by their nature infinite and environmentally friendly when compared to conventional energy sources such as coal, oil and natural gas (Ajayi & Ajayi, 2013). Renewable energy technologies can bring about both environmental and socio-economic benefits.

III. THEORETICAL REVIEW

The Theory of Project Execution (Emerson, 1917) is similar to the concept of job dispatching in manufacturing where it provides the interface between plan and work. Fondahl (1980) recommends the following procedure for execution based on the implementation of a critical path network. This consists of two elements: decision (for selecting task for a project from those predefined tasks that are ready for execution), and communicating the assignment (or authorization) to the project team.

The theory outlines the critical steps required to successfully execute a project, including solar power projects (Kerzner, 2017). The theory emphasises the importance of careful planning, effective execution, and ongoing monitoring and control to ensure project success. Solar power projects require significant upfront capital investments, and securing financing is often a major challenge (IRENA, 2020). Effective project execution is critical to ensuring that solar power projects are completed on time, within budget, and to the required quality standards. This, in turn, affects the project's ability to generate revenue and repay loans or provide returns on investment. It follows that for successful execution of any project, there are ten core processes: scope planning, scope definition, activity definition, resource planning, activity sequencing, activity duration estimating, cost estimating, schedule development, cost budgeting, and project plan development (Koskela & Howell (2002). The output from these processes, make up an input to the executing processes. Thus, a successful solar energy execution involves the integration of project management processes, quality management, human resource management, communication management, procurement management and environmental management. By applying project execution theory, solar power project companies and other stakeholders can ensure that projects are executed successfully and provide a strong return on investment.

Another relevant theory is the Resource Dependency theory (Pfeffer & Salancik, 1978), which opined that organisation behaviour is affected by the external resources they possess. Firms negotiate with their external environment in order to secure access to the resources which they need to survive, such as funding, technology and regulatory support. Resource Dependency Theory (RDT) gained prominence in 1978, when Jeffrey Pfeffer and Gerald Salancik published a book titled, "The External Control of Organisations: A Resource Dependence Perspective" which was mostly acceptable in the Anglo-American discussion during the period (Nienhüser, 2008). Chen (2015) inquisitively stated that Emerson (1962) had proposed this theory before this time but the theory has lately gained wide acceptance in the field of strategic management and organisational theory considering the studies that have used it.

A central assumption of Resource Dependence Theory (RDT) as explained by Nienhüser (2008) is that, "dependence on 'critical' and important resources influences the actions of organisations and that organisational decisions and actions can be explained depending on the particular dependency situation." A resource is critical when an organisation will find it difficult to perform its activity when such resource is not available even when the quantity needed is very small. For instance, sub-contractors, while simultaneously increasing the reliance of other organisations on their own resources e.g., project skills.

Given the potential importance of key resources like technology as a source of competitive advantage for projects within an intra-organization and inter-organization environment, RDT is useful tool for exploring the nature and methods of competition and collaboration between projects in the context of an environment of scarcity.

IV. METHODOLOGY

The study employed survey research design. The aim was to accurately describe the current state of affairs as it exists and thereafter explore the relationships among the variables. The research was conducted in Southwest, Nigeria, comprising Ekiti, Lagos, Ogun, Ondo, Osun and Oyo States. The choice of this location was driven by the fact that it houses majority of the country's manufacturing industries and most residential and industrial users have few hours of electricity (Sasu, 2023). The study population comprised solar power companies registered in Nigeria that are active in the southwest, Nigeria. The study identified 158 registered solar power companies in southwest, Nigeria. It is important to note that Renewable Energy Industry is dominated by a limited number of companies due to a high-cost of investment. Census Sampling Technique was employed for the study. The researcher generated the list of all the registered solar power companies in the southwest. Due to the number, all the 158 companies were involved in the survey for the administration of questionnaire.

The main data for this study were obtained through primary source. A structured questionnaire was developed to gather quantitative data from top management level of the solar power companies. The questionnaire was developed from past studies and checked through a thorough review. Digital version of the questionnaire was created using the CSPro (Census and Survey Processing System). Fieldwork was conducted through electronic messages to the emails of the identified solar power companies to facilitate real-time data collection, ensuring accuracy and efficiency.

The instrument was piloted in Delta State, with the distribution of the survey instrument to twelve (12) companies which was randomly selected from the solar power companies in State. The purpose of the pilot study was to adjust the questionnaire so that respondents have no problems in answering the questions.

The project supervisors and experienced senior scholars in the field of study made inputs to validate the contents of the research instruments. Questionnaire validity ensured that the instrument was adequate for the collection of data to achieve the objectives. It also helped to confirm whether the format used in designing the instrument was appropriate or not. The reliability of the instrument was tested with the use of Cronbach's Alpha coefficient value. Taber (2018) reported that Cronbach's alpha between 0.45–0.98 is acceptable. Table 1 showed Cronbach's Alpha (CA) coefficient for all the study variables were above 0.70, which suggested that the instrument used for evaluation was highly reliable.

Table 1: Construct Reliability

Construct	Number of Items	Cronbach's Alpha	Composite Reliability
Awareness	6	0.917	0.938
Economic Status	5	0.903	0.928
Execution of Solar	6	0.932	0.946
Government Incentive	5	0.915	0.933
Sustainability	5	0.894	0.922
Technology	5	0.932	0.949

Source: Researcher's Field Survey, 2024

Based on the objective of the study, a model was specified as follows:

$ESPP_i = \beta_0 + \beta_1 TEC_i + \beta_2 CIS_i + \beta_3 SUS_i + \beta_4 ECS_i + \beta_5 AW_i + \varepsilon_i$

where:
ESPP - Execution of solar power projects
TEC - Technology
CIS – Corporate institution supports
SUS - Sustainability of power project
ECS - Economic status of the people in community
AW - Awareness about the usefulness of solar power.

β_0 is the constant, β_1- β_5 are the parameters of the regression and ε denotes the error term.

The data collected were analysed using SmartPLS, a specialized software for Partial Least Squares Structural Equation Modeling (PLS-SEM). It is an alternative method to

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the historically more commonly used covariance-based SEM (CB-SEM) when analyzing the data using structural equation modeling (SEM) (Hair & Alomer, 2022).

V. RESULTS AND DISCUSSION

This section presents the analysis and discussion of the results of the descriptive and inferential statistics in line with the objective of the paper.

Response Rate

The researcher administered 158 copies of questionnaire to the top management of the selected solar power production outlets across Southwest, Nigeria, but a total of 109 copies were properly filled and returned. This represented an overall successful response rate of 68.99%, as shown in Table 2. The result revealed that 109 copies of the questionnaire were properly filled and returned, giving a response rate of 68.99 percent. Bryman and Bell (2011) posit that a response rate of ≥50% is acceptable to analyse the results for a study. The above assertion was corroborated by Kirby et al. (2019) who stated that for surveys, a response rate of 20-30% is considered acceptable, while 30-50% is good, and above 50% is excellent.

Table 2: Response Rate

Questionnaire	Frequency	Percentage
Returned	109	68.99
Not Returned	49	31.01
Total	158	100.00

Source: Researcher's Field Survey, 2024

Major Challenges Facing Execution of Solar Power Projects in the Region

Table 3 presents the responses of the respondents on the major challenges facing execution of solar power companies in the region. The result indicated that 49.5% of the respondents opined that the major challenges faced while developing solar power projects was financial challenged which ranges from lack of access to finance and high borrowing cost, among others, while 73% opined that the major challenges faced were macroeconomic challenges such as exchange rate and inflation. In addition, it was revealed that 18.3% of the respondents expressed that the major challenges faced in the course of developing solar power projects fake materials, inferior and sub-standard materials and pirated material, while 12.8% confirmed that the major challenges experienced in the developing solar was high cost of acquisition of solar system by potential customers of the projects. More so, 8.1% of the respondents confirmed that the major challenges faced were environmental challenges.

Table 3: Major Challenges Faced while Developing Solar Power in Nigeria

Major challenges	Frequency	Percent	Cumulative Percent
Financial challenges (High interest, lack of government incentives	49	49.5	49.5
Macroeconomic Problem (exchange rate, Inflation, importation cost)	8	7.3	57.6
Fake material; inferior and sub-standard material; pirated material)	20	18.3	77.8
Cost of Acquisition	14	12.8	91.9
Environmental (siting of the facility, location, Rejection)	8	8.1	100.0
Total	99	90.8	

Source: Researcher's Field Survey, 2025

Strategies for Overcoming the Challenges Facing Execution of Solar Power Projects

Table 4 presents the strategies employed to overcome the challenges facing execution of solar power projects in the Southwest, Nigeria. The result indicated that 38.5 percent of the respondents opined that overcoming the major challenges faced while developing solar power projects was to embrace more financing options such as credit scheme, borrowing from family and friends, 3.2% of the respondents were of the opinion that the government should formulate policy that would promote the solar business in Nigeria. In addition, it was revealed that 8.6% of the respondents expressed that one of the ways to overcome the major challenges faced in the course of developing solar power projects was to initiate flexible payment plan, 22.6% of the respondents confirmed that one way to overcome the major challenges experienced in the developing solar was cost of acquisition of solar was to put in place mechanism of acquiring quality raw material and qualified personnel such as consistent training of the work force, outsourcing the material from reliable sources. More so, 11.8% of the respondents confirmed that one of the ways of overcoming the major challenges faced was to initiate customer's orientation, while 8.6% acknowledged that the best ways of overcoming this challenges were ownership of one's property and God's grace. Evidence from the analysis was explicit that embracing more source of financing was necessary to overcome major challenges faced during the course of developing solar power projects, followed by acquisition of quality materials and qualified personnel during the course of developing solar power projects in Southwest, Nigeria.

Table 4: Overcoming Challenges Faced in the Execution of Solar Power in the Region

Strategies used to overcome the challenges?	Frequency	Percent	Cumulative Percent
Embracing more finance options (Self	42	45.2	45.2

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finance, borrowing from friends and family, credit scheme, bank loan)			
Government policy	3	3.2	48.4
Flexible payment plan	8	7.8	57.0
Acquisition of quality material and qualified personnel	21	22.6	79.6
Customers' Orientation (creating more awareness, advertisement)	11	11.8	91.4
Others (God's grace, acquisition of own property, not yet overcome)	8	8.6	100.0
Total	93	85.3	

Source: Researcher's Field Survey, 2025

Influence of Technology on Execution of Solar Power Projects

The study investigated the relationship between technology and execution of solar power projects. From Table 5, the result showed that technology construct indicator was analysed with TEC1, TEC2, TEC3, TEC4 and TEC5. The result of the latent construct analysis showed that TEC1 (0.875; CR= 20.767; P-value<0.01), TEC2 (0.928; CR= 31.063; P-value < 0.01), TEC3 (0.903; CR= 25.213; P-value<0.01), TEC4 (0.857; CR= 10.565; P-value<0.01) and TEC5 (0.871; CR= 12.916; P-value < 0.01). This implied that the TEC1, TEC2, TEC3, TEC4 and TEC5 significantly predicted the technology construct and these indicators were used as measurement for the technology. Figure 1 displayed the outcomes of the bootstrapping procedure, illustrating the obtained results and their implications for the structural model analysis for relationship between technology and execution of solar power projects.

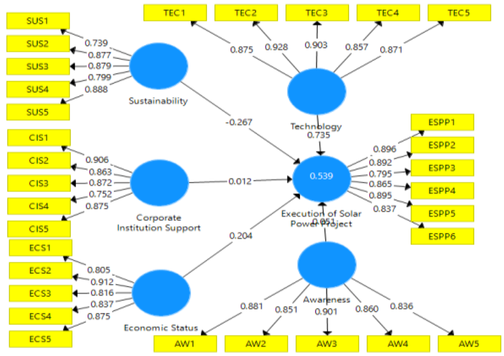

Figure 1: Bootstrapping Outcome for Corporate Institutional Support and Execution of Solar Power Projects.

The results of the structural equation modelling analysis showed a moderate overall effect size because the coefficient of determination (R^2) has a value of 0.539 for the execution of solar power projects which is above 0.50. This indicated a moderate predictive power and this was in line with the classification by Hussain, et al. (2018) who documented that an R^2 value of 0.75 is considered substantial, 0.50 is moderate, and 0.26 is weak. Also, it was explicit that every route of the estimation has positive value except the sustainability effect on the execution of solar power energy systems. This indicated that there were positive correlations between the variables along each path except for sustainability effect. The study presented the Outer Model with their respective p-values for of the construct. This showed the significant of each latent construct to each variable.

From Table 5, result showed that the awareness about solar power construct indicator was analysed with AW1, AW2, AW3, AW4 and AW5. The result of the latent construct analysis showed that AW1 (0.881; CR=13.575; P-value<0.01), AW2 (0.851; CR= 8.084; P-value < 0.01), AW3 (0.901; CR=26.799; P-value<0.01), AW4 (0.86; CR= 12.951; P-value<0.01) and AW1 (0.836; CR= 15.071; P-value < 0.01). This implied that the AW1, AW2, AW3, AW4 and AW5 significantly predicted the awareness about solar power construct. In addition, it was explicit that a higher level of awareness about solar power energy encouraged more investment in its supply to the community. Thus, the study employed these indicators as proxy for the awareness about solar power.

The result further showed that corporate institutional support was analysed using CIS1, CIS2, CIS3, CIS4 and CIS5. Evidence from the latent construct analysis revealed that CIS1 (0.906; CR= 5.524; P-value<0.01), CIS2 (0.863; CR=5.337; P-value < 0.01), CIS3 (0.872; CR= 4.996 P-value<0.01), CIS4 (0.752; CR= 3.653; P-value<0.01) and CIS5 (0.875; CR=5.093; P-value < 0.01). This implied that the CIS1, CIS2, CIS3, CIS4 and CIS5 significantly predicted the corporate institutional support construct. This implied that the corporate institutional support was measured with CIS1, CIS2, CIS3, CIS4 and CIS5.

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Table 5: Latent Construct Analysis

Latent Construct	Estimates	Standard Error	CR	P-Values
AW1 <- Awareness	0.881	0.065	13.575	0
AW2 <- Awareness	0.851	0.105	8.084	0
AW3 <- Awareness	0.901	0.034	26.799	0
AW4 <- Awareness	0.86	0.066	12.951	0
AW5 <- Awareness	0.836	0.055	15.071	0
CIS1 <- Corporate Institutional Support	0.906	0.164	5.524	0
CIS2 <- Corporate Institutional Support	0.863	0.162	5.337	0
CIS3 <- Corporate Institutional Support	0.872	0.175	4.996	0
CIS4 <- Corporate Institutional Support	0.752	0.206	3.653	0
CIS5 <- Corporate Institutional Support	0.875	0.172	5.093	0
ECS1 <- Economic Status	0.805	0.07	11.569	0
ECS2 <- Economic Status	0.912	0.031	29.089	0
ECS3 <- Economic Status	0.816	0.051	16.106	0
ECS4 <- Economic Status	0.837	0.053	15.775	0
ECS5 <- Economic Status	0.875	0.04	21.687	0
ESPP1 <- Execution of Solar Power Projects	0.896	0.031	29.199	0
ESPP2 <- Execution of Solar Power Projects	0.892	0.039	23.107	0
ESPP3 <- Execution of Solar Power Projects	0.795	0.062	12.77	0
ESPP4 <- Execution of Solar Power Projects	0.865	0.05	17.446	0
ESPP5 <- Execution of Solar Power Projects	0.895	0.036	24.679	0
ESPP6 <- Execution of Solar Power Projects	0.837	0.046	18.373	0
SUS1 <- Sustainability	0.739	0.101	7.288	0
SUS2 <- Sustainability	0.877	0.071	12.423	0
SUS3 <- Sustainability	0.879	0.081	10.822	0
SUS4 <- Sustainability	0.799	0.121	6.598	0
SUS5 <- Sustainability	0.888	0.055	16.252	0
TEC1 <- Technology	0.875	0.042	20.767	0
TEC2 <- Technology	0.928	0.03	31.063	0
TEC3 <- Technology	0.903	0.036	25.213	0
TEC4 <- Technology	0.857	0.081	10.565	0
TEC5 <- Technology	0.871	0.067	12.916	0

Source: Researcher's Field Survey, 2024

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Result in Table 5 also showed that the economic status of a community construct indicators was analysed with ECS1, ECS2, ECS3, ECS4 and ECS5. The result of the latent construct analysis showed that ECS1 (0.805; CR= 11.569; P-value<0.01), ECS2 (0.912; CR= 29.089; P-value < 0.01), ECS3 (0.816; CR= 16.106; P-value<0.01), ECS4 (0.837; CR= 15.775; P-value<0.01) and ECS51 (0.875; CR= 21.687; P-value < 0.01). This implied that the ECS1, ECS2, ECS3, ECS4 and ECS5 significantly predicted the economic status of a community construct and they were used as measurement of economic status in the study.

Also, it was shown that execution of solar power projects was analysed using ESPP1, ESPP2, ESPP3, ESPP4, ESPP5 and ESPP6. Evidence from the latent construct analysis revealed that ESPP1 (0.896; CR= 29.199; P-value<0.01), ESPP2 (0.892; CR= 23.107; P-value < 0.01), ESPP3 (0.795 CR= 12.77; P-value<0.01), ESPP4 (0.865; CR= 17.446; P-value<0.01), ESPP5 (0.895; CR= 24.679 P-value < 0.01) and ESPP6 (0.837; CR= 18.373; P-value < 0.01). This implied that the ESPP1, ESPP2, ESPP3, ESPP4, ESPP5 and ESPP6 significantly predict the execution of solar power projects construct. In addition, it was explicited that projects execution within the planned timeline required proper integration of projects management processes.

Evidence from Table 5 further showed that the sustainability effect construct indicator was analysed with SUS1, SUS2, SUS3, SUS4 and SUS5. The result of the latent construct analysis showed that SUS1 (0.739; CR= 7.288; P-value<0.01), SUS2 (0.877; CR= 12.423; P-value < 0.01), SUS3 (0.879; CR= 10.822 P-value<0.01), SUS4 (0.799; CR= 6.598, P-value<0.01) and SUS5 (0.888; CR= 16.252; P-value < 0.01). This implied that the SUS1, SUS2, SUS3, SUS4 and SUS5 significantly predicted the sustainability effect of solar power construct and these indicators serve as measurement for sustainability effect.

Table 6 showed the results of structural equation estimates for the effect of technology on the execution of solar power projects in Southwest, Nigeria. The results revealed that technology (β = 0.735, t = 5.565, p = 0.000) and economic status of a community (β = 0.204, t = 2.454, p = 0.014) have positive effects on execution of solar power projects in the Southwest, Nigeria. However, sustainability (β = -0.267, t = 2.473, p = 0.014) has a negative but significant effect on execution of solar power projects in the Southwest, Nigeria. This implied that technology, economic status of a community and sustainability were significant predictor of execution of solar power projects in the Southwest, Nigeria. Evidence from the study revealed that a unit change in awareness of solar, corporate institutional support, economic status of a community, sustainability and technology respectively would lead to 0.051, 0.012, 0.204, -0.267 and 0.735 unit changes in execution of solar power projects in the Southwest, Nigeria. However, the results revealed that technology was the most significant predictor of execution of solar power projects in the Southwest, Nigeria. In addition to this, the coefficient of determination (R^2) has a value of 0.539 and this implied that technology, corporate institutional support, awareness, economic status and sustainability accounted for 53.9% variation in execution of solar power projects. More so, the study showed that the model was fit since the value of standardized root mean square residual (SRMR) fell between 0 and 0.08.

Table 6: Path Construct Analysis

Path	Beta	Standard Error	T. Statistics	P-Values
Awareness -> Execution of Solar Power Projects	0.051	0.073	0.706	0.48
Corporate Institutional Support -> Execution of Solar Power Projects	0.012	0.094	0.123	0.902
Economic Status -> Execution of Solar Power Projects	0.204	0.083	2.454	0.014
Sustainability -> Execution of Solar Power Projects	-0.267	0.108	2.473	0.014
Technology -> Execution of Solar Power Projects	0.735	0.132	5.565	0.000
R-Squared	0.539			0.000
Adj-R-Squared	0.516			0.000
SRMR	0.07			

Source: Researcher's Field Survey, 2024

VI. CONCLUDING REMARKS

The study indicated that technology, sustainability and economic status have been consistently significant, showing their importance in the execution of solar power projects. The variable for sustainability of power projects displayed significant negative sign in a relationship between execution of solar power projects and indicating that the majority of the solar power companies in the southwest did not prioritise sustainability. The finding, therefore, highlighted the need for innovative execution of solar power projects that integrate sustainability considerations into project planning and execution, ensuring that solar power projects are both environmentally friendly and economically viable.

Based on the findings, the study recommended that producers of solar power projects should consider exploring

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collaboration with private investors in order to share the financial burden of acquiring modern technology that may be involved in the production process. Further, potential investors should be educated on the benefits and impact of technology in the execution solar power projects in order to encourage participation.

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