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Achieving Green Innovation in Energy Industry through Social Networks, Green Dynamic Capabilities, and Green Organizational Culture

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Abstract: This research paper aims to evaluate the effect of social networks on the green innovation of energy sector firms working around the globe. The study also evaluated green dynamic capabilities' mediating, and green organizational culture's moderating role in the association of the social networks and green innovation. The study will help electricity production and distribution firms to become more environmentally proactive and achieve green innovation. For this research, study data were collected from employees working in the energy sector firms of Pakistan. Standardized scales were adapted from previous studies and a questionnaire was developed using 'Google Docs' and distributed using Facebook. From different energy sectors of Pakistan, 476 respondents filled the questionnaires. To examine the research hypotheses, we chose energy firms that act as small and medium enterprises and face problems in the achievement of green innovation. For testing the proposed relationships, descriptive statistics, regression, and correlation analyses were used. The results supported all the hypotheses of the study. Current research has various theoretical and practical implications for managers of the energy industry, and governments.



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1. Introduction

Businesses face substantial challenges along with numerous opportunities, especially in the energy sector where power demand is increasing day by day [1]. On the other hand, stakeholders are exerting pressure to provide green energy [2]. Therefore, these organizations are in continuous search of methods and procedures that are effective as well as pro-environmental. Green innovation is one of the solutions to this problem. Green innovation is defined as any novel enhanced product, method, or organizational changes that decrease the use of natural resources and emissions of harmful gas and enhance employee working conditions [3]. Green innovation is affected by different factors including green organizational identity and green creativity [4]; environmental knowledge and environmental orientation [5]; use of green methods [4]; green dynamic capabilities [6]; social networks [7,8]; and green organizational culture [9]. Among these, social networks are a key component that connect the firm with other business partners. For energy firms,

researchers have suggested green dynamic capabilities as a foundation for the attainment of resources that have a unique specialized capacity for marketing, which augment the implementation of strategies and lead to advanced strategic performance [10]. In this research, we selected the energy firms that work through the means of solar and thermal power potentials. If this is used in an organized pattern then it could ensure energy security in a sustainable way for a long period.

Social networks are particularly important as they provide the firms access to resources, help them in the distribution of power, and provide vital information for their survival. Thus, social networks help in achieving sustainability [11]. Social networking theory was first introduced by Jacob Moreno and Emile Durkheim in the late 1890s and studies how people randomly interconnect with each other in a different structure of society [12]. However, there is limited research on the topic linking social networks and green innovation for energy sector firms. Therefore, there is an evidence gap that will be filled by the current research. Although the existing body of knowledge suggests a positive relationship between social networks and green innovation [7,13], it does not explain the internal mechanism that is connected in the linkage of the aforementioned variables. According to prior literature, green innovation is based on green dynamic capabilities [14]. When the organization possesses green dynamic capabilities, they are more inclined toward green innovation. Green dynamic capabilities are high-level organizational capabilities that help in achieving sustainable competitive advantage via green innovation [15]. On the other hand, green dynamic capabilities are strongly influenced by inside and outside resources/factors including social networks. Thus, green dynamic capabilities play a mediating role in the social networks and green innovation links.

Another important factor that influences innovation is green organizational culture [9]. This variable is related to internal organizational culture. Green organizational culture stimulates norms and values for enhancing organizational performance [9,16]. It shapes the employees' behavior which further leads to improving pro-environmental networks and helps the organization achieve green innovations. Thus, green organizational culture plays a moderating role in the connection between social networks and green innovation. This relationship is rarely tested in the literature. This empirical gap will also be filled by the current research.

The main objective of our study is to examine the influence of social networks on green innovation for energy sector organizations in Pakistan. Furthermore, green dynamic capabilities' mediating, and green organizational culture's moderating role is also evaluated. This research proposed and empirically tested a model which helps in understanding the importance of the different factors for enhancing green innovation in energy firms.

For the accomplishment of the study objectives, this paper is divided into different sections. This introduction section is followed by a literature review and hypotheses development section, methods section, and analyses and results section, and the paper concludes with a discussion section explaining the results, implications, and limitations of the current study.

2. Literature Review

2.1. Social Networks and Green Innovation

Social networks are a group of interconnected and interdependent firms that collaborate and share ideas and resources for enhancing their performance [17]. It is a continuous process that is based on interactions among the collaborating firms. Social networks are composed of different actors that are essential for the sustainability of a firm [18]. On one side, social networks help in acquiring essential knowledge and technologies that exist outside the organization, and on the other side, social networks create an environment where members of different firms can learn from the experiences of other firms' employees [17]. Social networks help firms in formulating and implementing pro-environmental strategies for enhancing environmental performance. Thus, social networks facilitate green innovation, which is defined as efforts to reduce the harmful impact of business activities

on the ecosystem. The notion of green innovation is based upon the innovation theory of Schumpeter (1942) [19]. According to the theory, customers are more satisfied when the product fulfills their demand, as well as being less harmful to the environment. Thus, green innovation creates a win-win situation for the firm, environment, and stakeholders, as it helps in maintaining environmental management. There has been a rising trend of green innovation in the last three decades, as it has been considered by many as a tool for enhancing business performance, improving market share, and satisfying customers.

According to the knowledge-based view of a firm, the firm's knowledge has a strong influence on its performance [20,21]. Thus, organizations with better and updated knowledge can see improved green innovation. Alternatively, firms seek to use up-to-date technologies that can reduce costs and enhance customer satisfaction. Social networks can help the firm to access knowledge as well as state-of-the-art technologies. Therefore, social networks positively influence green innovation. Based upon the above arguments, the hypothesis is formulated as:

Hypothesis 1 (H1). *Social networks positively affect green innovation.*

2.2. Green Dynamic Capabilities Play Mediating Role between Social Networks and Green Innovation

Green dynamic capabilities are defined as the construction, integration, and reconfiguration of resources (internal as well as external) that make a firm more eco-friendly [22]. Green dynamic capability is a high-level ability that is useful for achieving sustainable competitive advantage [13]. Social networks enhance the green dynamic capabilities of a firm and enable the firm to access available green resources, which helps firms to fulfil the shifting needs of the outside environment through developing and obtaining green innovation [23]. The concept of green dynamic capabilities is rooted in the dynamic competence theory [24]. According to this theory, the main foundation of competitive advantages is the dynamic capabilities of the firm. Meanwhile, taking into consideration the impact of social networks, energy firms can augment the efficiency of uncertain factors which improve innovation activities and reconfigure other factors [25]. Thus, the effectiveness of green dynamic capabilities is to be expected as an application of the social network [26]. Green dynamic capabilities also help firms in managing green technologies and external information, as green dynamic capabilities are affected by social networks. Social networks integrate the external and internal resources that are necessary for enhancing the environmental performance of a firm [27] via green innovation. Through them, firms can rapidly respond to the challenge of green innovation.

Thus, green dynamic capabilities help firms to become green in every way. According to many existing researchers, social networks are the antecedents of green dynamic capabilities [28,29]. When a firm receives valuable input in the form of information, advice, technology, and material from other firms, it tends to develop strong green dynamic capabilities. Once the firm has green dynamic capabilities, it attempts to reap a competitive advantage by capturing the market through green innovation. On the other hand, social networks provide resources and information to the firm for enhancing green innovation. From the above arguments, the hypothesis is formulated as:

Hypothesis 2 (H2). *Green dynamic capability mediates the linkage between social networks and green innovation.*

2.3. Green Organizational Culture Plays Moderating Role between Social Networks and Green Innovation

All the values, norms, obligations, and assumptions related to the attempt to be a pro-environment firm are referred to as green organizational culture [30]. Green organizational culture is the interaction of the social network attempts to improve workers' ability, which supports the creation of opportunities for fostering green innovation. It is the firm's shared culture that ensures environmental protection [31]. Green organizational culture supports

workers and social networks that are equipped with innovative skills/knowledge to engage in tasks that increase their willingness and efforts for green innovation practices [32]. Such a culture helps an organization to recognize environmental concerns, and employees show positive behavior toward environmental sustainability. Green organizational culture alters the existing organizational culture to be more proactive towards sustaining the environment [33]. It educates the employees, encouraging them to make a significant contribution toward addressing environmental concerns. Organizations adopt green organizational culture for two basic reasons: first, to enhance their environmental performance, thus improving their corporate image; second, to satisfy institutional/stakeholders' pressure to achieve a triple bottom line.

Green organization culture helps in formulating green policies that foster green innovation. It guides the firm to utilize social networks for accessing state-of-the-art technology, information, and resources [33]. Thus, green organizational culture also improves the green innovation of a firm due to social networks. Therefore, we argue that firms focus more on establishing green-organizational culture, which improves the impact of social networks on green innovation compared to a lack of green culture. From the above arguments, the hypothesis formulated is given below.

Hypothesis 3 (H3). *The relationship between social networks and green innovation is moderated by green organizational culture in such a way that if green organizational culture is high, the relationship is stronger and vice versa.*

The theoretical model of the study is presented in Figure 1:

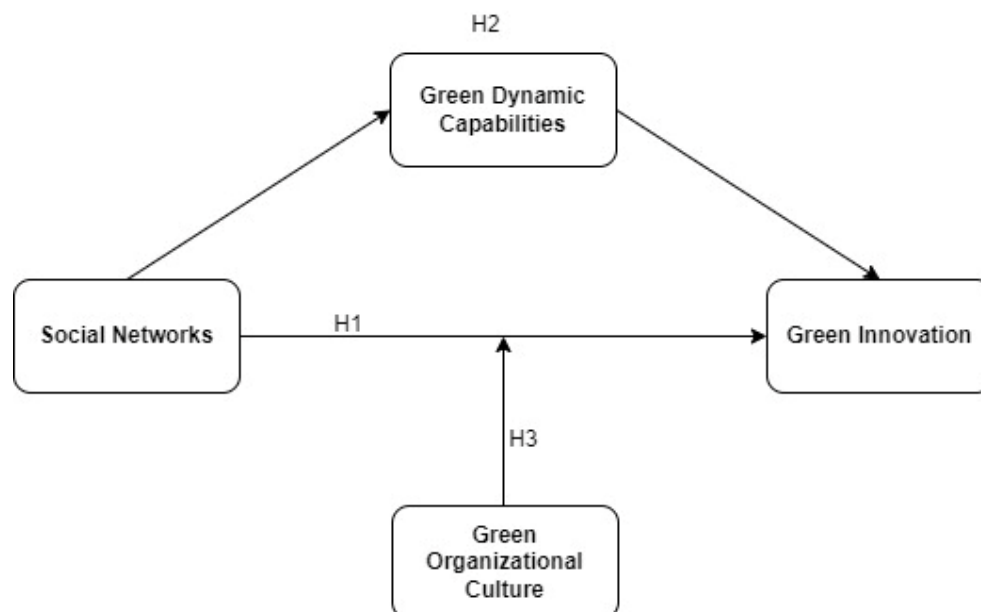


Figure 1. The theoretical model of the current study.

3. Methods

In the current study, data were collected online. Following the recommendation of [32,34], 'Google Docs' was used for developing the web-based questionnaire. The population of the current research was all the professionals/employees associated with small and medium-size energy firms. They were searched for using the Facebook application. In the search box of Facebook, the keywords of 'energy sector of Pakistan', and 'energy professions in Pakistan' were used to search the groups. In the first search, a total of 397 groups were searched. However, after reading the description of the groups, only 102 groups were found to be relevant to the current research. The remaining 295 groups were related to jobs, colleges, quotes, etc. Therefore, they were excluded from the population of the current

study. Out of 102 relevant groups, only 35 were open and the remaining groups had limited access. The questionnaire link along with the description and request to fill the questionnaire form was sent to all the open groups on 15 May 2021. On the same day, a message containing details of the research, a questionnaire link, and a request to share this link in their respective group was sent as a private message to all the closed-groups admins. As a result, 13 group admins replied to us and shared a description of the research and questionnaire link in their group. In the first month, 139 questionnaires were filled by respondents. A second request was sent to all the remaining closed-group admins on 16 June 2021 and the same day, the link was again posted in all open access groups. As a result, 15 more closed-group admins posted our request in their respective groups. In the period of one month, 175 more responses were received. On 16 July, a third request to post the link in their respective group was made and on the same day, the link was re-posted in all the open groups. In a month's time, 162 more respondents filled the questionnaires. To obtain the maximum response, the questionnaire link was kept open for three months (from 15 May 2021 to 16 August 2021). During this time, a total of 476 respondents filled the questionnaires, which was sufficient for testing a mediation model.

In the survey, members' participation was intentional and unspecified. Although the scale did not contain personal or sensitive information, ethical endorsement was still attained from the ethical research committee/board. The participants were assured that the data would not be shared with anyone else and would only be used for research purposes. Characteristics of survey respondents is given in Table 1.

Table 1. Characteristics of survey respondents.

S. No.	No. of Respondents (%)	Respondents' Position	Respondents' Experience
1	156 (32.77%)	A senior member of staff	1 to 5 years
2	175 (36.76%)	supervisor	6 to 8 years
3	145 (30.46%)	CEO	8 to 12 years

3.1. Data Collection

To collect data, structured questionnaires were adapted from existing studies. Further detail is given below:

The variable of 'social networks' was tested using a scale modified from the study of [35] which is a ten-item, five-point Likert scale (where: 1 = Strongly Disagree, to 5 = Strongly Agree). This scale was consistent as the value of Cronbach's alpha coefficient was 0.713, greater than the threshold value of 0.7, confirming the internal consistency reliability of the construct. The value of CR = 0.94 > 0.7 and AVE = 0.64 > 0.5 and AVE > CR confirmed the discriminant validity of the instrument.

To measure green dynamic capabilities, a five-point five-item scale was adapted from the study of [36]. The Cronbach's alpha coefficient green dynamic capabilities scale was 0.83 > 0.7, showing internal consistency. The value of CR = 0.90 > 0.7 and AVE = 0.60 > 0.5, whereas CR > AVE, confirming the discriminant validity of the instrument.

For the measurement of green organizational culture, we used a scale adapted from the study of [37]. It was a six-item, five-point Likert scale. The Cronbach's alpha coefficient of the green organizational culture scale was 0.754 > 0.7, establishing the internal consistency reliability of the construct used for measuring green organizational culture. The value of CR = 0.89 > 0.7 and AVE = 0.61 > 0.5, whereas CR > AVE, confirming the discriminant validity of the construct.

To measure green innovation, the scale was adapted from the study of [38]. Green innovation is measured through eight items. The Cronbach's alpha coefficient of the green innovation scale was 0.81, which is greater than 0.7, thus, confirming the internal consistency reliability of the construct. The value of CR was 0.88 > 0.7 and AVE = 0.61 > 0.5, whereas CR > AVE, ensuring the discriminant validity. Complete detail of questionnaire is given in Appendix A.

3.2. Data Analysis

To test the proposed relationships, correlation, and regression along with a descriptive analysis were used. Baron and Kenny [39] was utilized for testing the mediation effect. For testing the moderation effect, hierarchical regression was used.

The discriminant validity of the scale was tested using the recommendations of [40]. Shared variance and AVE were compared, and the results show that the shared variance was less than AVE, which proves the convergent validity. Table 2 presents the values. In addition, all the AVE values were greater than 0.50, and the composite reliability for all the variables was greater than 0.70, which supported the discriminant validity of the scale. For detecting the issue of multicollinearity, VIF and tolerance were used, and it was found that for all the variables, VIF was well below 10 and tolerance was greater than 0.25. This confirms that there was no issue of multicollinearity.

Table 2. Discriminant validity of the construct.

	Items	Factor Loading	Cronbach's Alpha	Composite Reliability (CR)	AVE
Social networks	10	0.76–0.88	0.71	0.94	0.64
Green innovation	8	0.73–0.81	0.81	0.88	0.61
Green dynamic capability	5	0.72–0.79	0.83	0.90	0.60
Green organizational culture	6	0.73–0.82	0.75	0.89	0.61

Model fitness was tested using a confirmatory factor analysis (CFA), which is a technique used to observe the factor structure of the observed variables. Four different models were evaluated using different indicators. The first model was a single-factor solution, the second model represented a two-factors solution, and the third model represented a three-factors solution. However, the best model fit was attained using a four-factor solution ($\chi^2 = 1301.21$; GFI = 0.93; CFI = 0.92; and RMSEA = 0.039). The Harman test was also applied to evaluate the ordinary method bias. All the items used were loaded into an exploratory factor analysis with no rotation. The result shows that there were 4 diverse factors with an eigenvalue greater than 1. The four factors are accountable for 51% variation, with the largest factor accounting for 17% variation. Thus, there was no serious issue of common method bias (CMB), as it is confirmed that social networks and green innovation are conceptualized as two different variables.

4. Results

Descriptive analyses (mean and SD) were used to test the central tendency of the data. All the variables were found to have a mean of more than 2.95, which confirmed that all the participants were from firms where all the concepts of the current study were in practice. Table 3 shows the results. The table also shows that all the variables of the study were positively and significantly correlated with each other.

Table 3. Descriptive and correlation values.

No.	Variables	Mean	SD	1	2	3	4
1	Social networks	3.01	0.49	1			
2	Green innovation	3.12	0.56	0.297 **	1		
3	Green dynamic capability	3.25	0.52	0.41 *	0.39 *	1	
4	Green organizational culture	2.99	0.91	0.42 **	0.51 **	0.38 **	1

Note: * $p < 0.05$, two tailed; ** $p < 0.01$, two tailed.

Mediation Analyses

A mediation analysis was tested using the Baron and Kenny [39] approach. The results are shown in Table 4. This approach is based on four steps. The first three steps require a significant relationship among the IV, DV, and mediator, which is satisfied. In the fourth

step, green innovation is simultaneously regressed with social networks and green dynamic capabilities. Due to the addition of green dynamic capabilities, the linkage between IV and DV was insignificant. As per the recommendations of [40], this confirmed the occurrence of mediation. Thus, H1 and H2 of the study are supported by data.

Table 4. Regression analysis.

Relationship	R ²	F-Value	Beta	T-Value	Sig.	Result
SN→GI	0.211	20.1	0.21	12.61	<0.001	Supporting H1
SN→GDC	0.371	29.8	0.32	10.91	<0.001	
GDC→GI	0.121	29.7	0.17	13.28	<0.001	
SN→GDC→GI	0.291	25.8	0.012	2.124	0.231	Supporting H2

To test the H3 that highlights the moderation effect of green organizational culture in the association of social networks and green innovation, a hierarchical regression analysis was conducted and shown in Table 5. Two models were formulated. Model-A depicts a direct relationship between social networks and green innovation. Model-B shows the moderation effect. Green innovation was multiplied with green organizational culture to obtain an interaction term. The results show that green organizational culture positively moderates the relationship ($\beta = 0.23$, sig. < 0.001) between social networks and green innovation in such a way that when green innovation organizational culture is high, the relationship between social networks and green innovation becomes stronger and vice versa. Thus, H3 of the study is also accepted.

Table 5. Hierarchical regressions.

	Model-A	Model-B
Green innovation (dependent variable)		
Social networks (independent variable)	0.23 **	0.17 **
Green organizational culture (moderator)	0.31 **	0.33 **
Green Innovation × green organizational culture (interaction term)		0.21 **
R ²	0.187	0.198
Adjusted R ²	0.185	0.197
ΔR^2	0.187	0.011
ΔF	153	15.81

Note: ** $p < 0.01$.

5. Discussion

Energy sector firms are concerned with the production and distribution of energy. The success of any economy is highly dependent on the supply of energy to all the other sectors. Thus, the energy sector is the backbone of any economy. Without an effective energy sector, no economy can flourish. However, energy sector firms are also involved in carbon emissions, thus, contributing to environmental degradation and global warming. These firms are under greater pressure from stakeholders to reduce carbon emissions, forcing them to adapt and employ green strategies. They are now more inclined toward green innovation and to achieve this, they are using their social networks. The concept of social networks is rooted in social networking theory, which was first introduced by Jacob Moreno and Emile Durkheim in the late 1890s. The theory studies how people randomly interconnect with each other in a different structure of society [12]. This theory is very helpful for large groups and is also practically used in various disciplines including political science, marketing, sociology, and economics. Social networking theory mainly focuses on the role of the social linkage in the transmission of information or media influence which enables behavioral change. Social networks also enhance the social dynamic capabilities of a firm to improve its environmental performance through green innovation. Energy firms also adopt green organizational culture to nurture their capability for green innovation.

This study is based on testing three hypotheses involving social networks, green innovation, green dynamic capabilities, and green organizational culture. The first hypothesis of the study tested the direct impact of social networks on green innovation, taking the premise that social networks are a group of interconnected and interdependent firms that collaborate and share ideas and resources for enhancing their performance [16]. It is a continuous process that is based on interactions among the collaborating firms. Social networks are composed of different actors who are essential for the sustainability of a firm [17]. On one side, social networks help in acquiring essential knowledge and technologies that exist outside the organization, and on the other side, social networks create an environment where members of different firms can learn from the experiences of other firms' employees [18]. Social networks help firms in formulating and implementing pro-environmental strategies for enhancing environmental performance. Thus, social facilitate green innovation, which is defined as efforts to reduce the harmful impact of business activities on the ecosystem. The notion of green innovation is based upon the innovation theory of Schumpeter (1942) [19]. To evaluate the proposed hypotheses, simple regression was used. The data supported the hypothesis ($\beta = 0.21$, sig. < 0.001). These outcomes are also supported by previous studies' findings. The second hypothesis tested green dynamic capabilities mediating role in the link between social networks and green innovation [33]. The approach was used to test the proposed relationship that green dynamic capability is a high-level ability that is useful in achieving a sustainable competitive advantage [7]. Green dynamic capabilities emphasize the use of social networks and available green resources, which help firms to fulfil the shifting needs of the outside environment through developing and obtaining green innovation [23]. The concept of green dynamic capabilities is rooted in dynamic competence theory [24]. According to this theory, the main foundation of competitive advantages is the dynamic capabilities of a firm. Meanwhile, taking into consideration the impact of social network capability, energy firms can augment the efficiency of uncertain factors which improve innovation activities and reconfigure other factors [25]. Thus, the effectiveness of firm green resources is to be expected as an application of the green dynamic capability. Through green dynamic capabilities and social networks, firms can rapidly respond to market changes via green innovation [26]. Green dynamic capabilities also help firms in managing green technologies and external information, as green dynamic capabilities are affected by social networks. Social networks integrate the external and internal resources that are necessary for enhancing the environmental performance of a firm [27]. Thus, green dynamic capabilities help firms to become green. According to many existing researchers, social networks are the antecedents of green dynamic capabilities [28,29]. H2 was also supported by the data. A similar result was also reported by [41].

The third and last hypothesis tested how green organizational culture moderates the association of social networks and green innovation. This hypothesis finding is also consistent with previous literature, which states that green organizational culture is the interaction of the social network's attempts to improve workers' ability, which supports the creation of opportunities for fostering green innovation. It is the firm's shared culture that ensures environmental protection [31]. Green organizational culture supports workers and social networks that are equipped with innovative skills/knowledge to engage in tasks that increase their willingness and efforts for green innovation practices [33]. Such a culture helps an organization to recognize environmental concerns, and their employees show positive behavior toward environmental sustainability [42]. Green organizational culture alters the existing organizational culture to be more proactive towards sustaining the environment [33]. It educates the employees, encouraging them to make a significant contribution toward addressing environmental concerns. Organizations adopt green organizational culture for two basic reasons: first, to enhance their environmental performance, thus, improving their corporate image; second, to deal with institutional/stakeholders' pressure to achieve a triple bottom line.

Green organization culture helps in formulating green policies that foster green innovation. It guides the firm to utilize social networks for accessing state-of-the-art technology,

information, and resources [35]. Thus, green organizational culture also improves the green innovation of a firm due to social networks. Hierarchical regression was used to test this link [43]. According to the results, this hypothesis was also supported by the data and reported similar results.

6. Conclusions

This study used an integrated approach to achieve green innovation via social networks, green innovation, green dynamic capabilities, and green-organizational culture in energy sector firms. This relationship is further strengthened by green organizational culture's moderating, and green dynamic capabilities' mediating role. In this study, we used a quantitative method in which we collected data from different small and medium energy firms. The data supported all the hypotheses. Based on the data analyses, it can be concluded that social networks foster green innovation.

6.1. Theoretical Implications

This research has some noble theoretical and practical implications. First, our study presents an alternative model for energy firms to achieve social, economic, and environmental sustainability using green innovation. Second the population of this study is small and medium energy sector firms' employees, which helped to generalize the study's result. Third, this research builds an empirically tested model involving social networks, social dynamic capabilities, environmental performance, and green innovation. No study in the literature combines these four variables in a single model. The last contribution of the current study is that it uses a comprehensive methodology related to energy firms.

6.2. Practical Implications

This research also has several critical practical implications. The first implication of the current research is that energy firms should build up green dynamic capabilities to incrementally improve green innovation, thus, helping energy firms to achieve environmental sustainability. Second, energy firms can use social networks for enhancing green innovation. Finally, on the basis of the results of the current study, energy firms should develop a green organizational culture that works as a catalyst to enhance green innovation via social networks.

6.3. Limitations and Future Directions

Along with some notable implications, there are also some limitations of the current study. First, the study collected data using a self-reporting scale, which can lead to biases among respondents. Collecting data at a different point and conducting experimental research can negate this negative impact. Second, the study has one independent, one dependent, one mediating, and one moderating variable. The addition of further variables such as green leadership, etc., can enhance the overall comprehensiveness of the model. Finally, using mixed methods research can also be useful for the generalization of the current model.

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Appendix A. Questionnaire

Social Networks

Our SME has good ties with other organizations.

We consider our customers and other stakeholders as our most important networking partners.

Other SMEs and people help our SMEs in establishing new ventures.

The members of the social network help each other in identifying and acting on any opportunity.

If our SME takes steps, people and SMEs join us to share knowledge and resources.

Our SME's social network helps in efficiently disseminating the information.

Our partners help us in information gathering.

We have regular meetings with our strategic partners.

In our social network, all the partners are ready to help each other.

When any of the partnering firms face any problem, all the partners help that firm.

Green Dynamic Capabilities

Our top management is aware of social and environmental issues closely related to the production, marketing, use, and disposal of our products.

Our SME focuses on developing new techniques and processes for fixing ecological concerns.

Our SME understands the needs of customers and develops green products to fulfill them.

In our SME, employees are treated equally.

Our SME coordinates with the community to satisfy mutual needs.

Green Organizational Culture

In our SME, the environmental dimension is considered one of the top organizational priorities.

Our mission statement includes concerns for environmental protection.

Our top management has a clear vision of green organizational culture.

Our green priorities are well communicated among the employees.

In our SME, there is punishment for noncompliance with environmental management issues.

Our SME top management actively participates in environmental management issues

Green Innovations

Our SME chooses materials that produce the least amount of pollution for conducting the product development or design.

Our SME uses the fewest amount of materials/resources to make the products.

Our SME chooses the materials of the product that consume the least amount of energy, water, and other resources for conducting the product development or design.

The green processes used by our SME help to reduce hazardous substances or waste.

The green processes used by our SME help to recycle waste and pollution that allow them to be treated and re-used.

The green processes used by our SME help to reduce the consumption of water, electricity, coal, or oil.

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