

## Solar Energy Adoption Potentials in Saudi Arabia: Case Study of Abdul Latif Jameel Company

Amani Kaadoor<sup>1</sup>

<sup>1</sup>Assistant Professor, Marketing Dept., College of Business – Rabigh, King Abdulaziz University

### ABSTRACT

Saudi Arabia is facing an increasing demand for energy that is expected to increase even further in the coming years, due to industrialization and population growth. In order to meet this demand and in accordance with the new vision adopted by the country (vision 2030), Saudi Arabia is witnessing a transition from hydrocarbon-based energy to the diversification of energy supply and the use of more clean and renewable sources of energy. Moreover, the Saudi Arabia government is promoting solar energy as a key energy source to be adopted as part of this transition due to its abundance in the country. In response, companies like Abdul Latif Jameel (ALJ) are trying to enter this market by improving their investments in different fields. ALJ is one of the first companies to explore the energy market in Saudi Arabia and made a strategic decision to have a foot in this promising market. ALJ is now developing their business strategy in order to exploit the available opportunities in Saudi Arabia's energy market. This paper aims to provide a better understanding of the opportunities and challenges that may face companies while formalizing their strategy for renewable energy market in emerging countries by studying the case of ALJ company and the Saudi Arabia solar market

### INTRODUCTION

Many countries across the globe are actively making efforts towards adding more renewable-based energy to their national energy mix. These efforts are driven by concerns about global warming and the finite nature of fossil fuel and are incentivized by recent energy technology advancements [53][54][33] [22]. Moreover, some studies stressed the importance of adopting renewable energy on the long-term sustainability of the economic growth of countries [30] [36].

Driven by the same concerns, Saudi Arabia, a major oil producer, has recently launched a new initiative, as part of the country's 2030 vision, to diversify the country's sources of energy by adopting more renewable energy into the heavily fossil-fuel-based energy mix of the country [38][46] [49].

Saudi Arabia continuous economic growth in the last few decades is accompanied by increasing energy consumption. If the same growth pace continues, it is projected that the country will consume all its production of oil and turns to import oil in just two decades [24]. Therefore, Saudi Arabia is trying to find alternative solutions to meet the growth in domestic energy demand. In addition to possessing the world's most abundant oil fields, the country also is blessed with abundant solar availability during the year. Hence, solar energy is an obvious renewable energy alternative for the country. Integrating solar power into the Saudi grid offers a feasible, clean, safe, and reliable solution, as well as freeing up more oil for export [24][57] [11].

Therefore, this paper is trying to answer the following question: what factors should be considered by investors targeting renewable energy in emerging economies like

Saudi Arabia. The paper will answer this question by analyzing a regional company strategy to target this market. The company is Abdul Latif Jameel (ALJ).

ALJ is a prominent company in Saudi Arabia that is actively investing in solar power and seeks to contribute, if not to lead, the country's efforts to adopt solar power. In this paper, ALJ's strategy for investing in the solar power market of Saudi Arabia will be evaluated. First, the literature review will be provided, then SWOT and Porter's five forces analysis will be utilized to analyze ALJ's strategy for solar energy in the Saudi Arabia market.

### Background

In this section, an overview of Saudi Arabia's current energy challenges is offered, as well as a review of solar power and its current status in Saudi Arabia. Finally, a review of Abdul Latif Jameel company is provided.

#### A. Energy Consumption in Saudi Arabia

Saudi Arabia produces most of its electricity by burning oil and the national energy mix for the country is mainly based on fossil fuel [46]. Saudi Electric Company (SEC), a government company, controls 71% of generative capacity and private companies provide the remaining capacity [38] [49]. Saudi Arabia is the world's second-largest oil producer after the United States of America (Fig. 1). Furthermore, more than 90% of the world oil reserve capacity is in Saudi Arabia [16], and Saudi Arabia also has the world's sixth largest natural gas reserves [52] [49].

Moreover, Saudi Arabia has witnessed a growth in industrialization and population in the last few decades that has resulted in high energy demand. Although Saudi Arabia population is around 30 million people, it is

nonetheless, the world’s seventh-largest consumer of oil [52] [49]. In addition, Saudi Arabia energy consumption is substantial on a per-capita basis and is higher than many industrialized countries such as the US and Russia as shown in Fig.2 [52] [20]. Saudis burn more than the quarter of the oil production to meet peak electricity load which has been rising by 7% every year [1]. Furthermore, it is projected that consumption will increase by 32% from 2014 to 2020 and more than double by 2032 [59]. In fact, according to a report issued by the Chatham House institute [24], if this consumption behavior continues and the country does not find energy supply alternatives, domestic consumption alone could deplete Saudi’s oil exports by 2021 and force the country to import oil by 2038 [24]. Additionally, there is another energy-related problem that the country faces; while 80 % of the Saudi population live in urban areas, 20 % are living in rural areas where there is no energy supply. They live in remote areas not served by the national grid; thus they need independent resources [38] [45] [8].

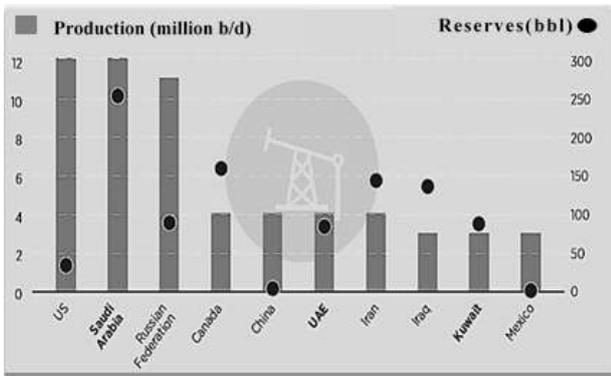


Fig. 1. The world’s ten largest oil producers in 2014 [52].

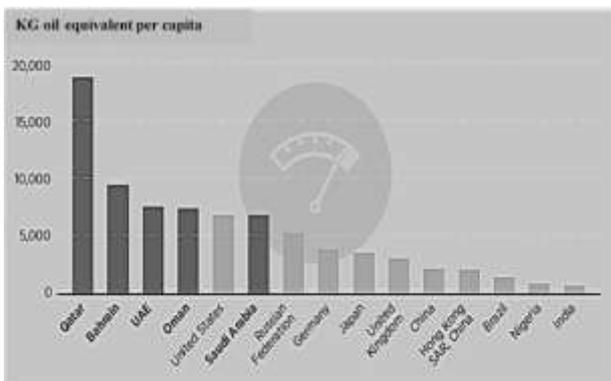


Fig. 2. Total primary energy uses per capita in 2012 [52].

### B. Solar Power

Solar energy refers to energy generated by transforming radiant light and heat coming from the sun into energy. It is often called solar power when the generated energy is in the form of electric current [41][47]. Solar power is a tremendous potential source of power; it is estimated that if one day of sunshine were harvested completely into electric power, it would cover the whole world’s needs of

electricity for 20 years [58][55]. Furthermore, in the last decade, solar power technology advancements resulted in increasingly more practical and economically viable solutions to harness sunlight heat and transform it into electricity. Two of the most prominent solar power technologies are Photovoltaic Solar Panels (PV) and Concentrated Solar Power (CSP). PV is cheap and the most commonly used solar power technology worldwide today. CSP, on the other hand, is becoming popular in recent years as its more efficient than PV, however; it is more expensive [58][34] [26].

Solar power has gained momentum in recent years as it is clean, sustainable, abundant in many parts of the world, and becoming more affordable. Furthermore, it is flexible, as it can be integrated into the grid or used alone, which is important for rural areas that are not covered by the grid [41][23] [56].

### C. Solar Power in Saudi Arabia

Saudi Arabia is located within an area that is one of the richest and most productive for solar radiation; it is estimated that the annual solar radiation in that region exceeds 2100 KWh/m<sup>2</sup> [60][40][46]. Fig.3 shows the annual regional distribution of solar irradiation which presents a Saudi Arabian capacity that can not only meet the energy demand growth but also could provide excess power for export.

The solar power abundance and its suitability coupled with falling technology costs, strengthen the business case for solar energy in Saudi Arabia. As a result of the newly adopted national plan “Saudi Arabia vision 2030” that aims to alleviate the dependency on oil and allow the country to receive benefits from the renewable energy resources. Fig. 4. shows the total growth in renewable energy capacity in GCC by country 2014-2018.

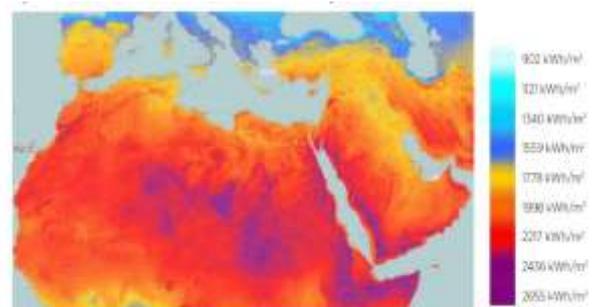
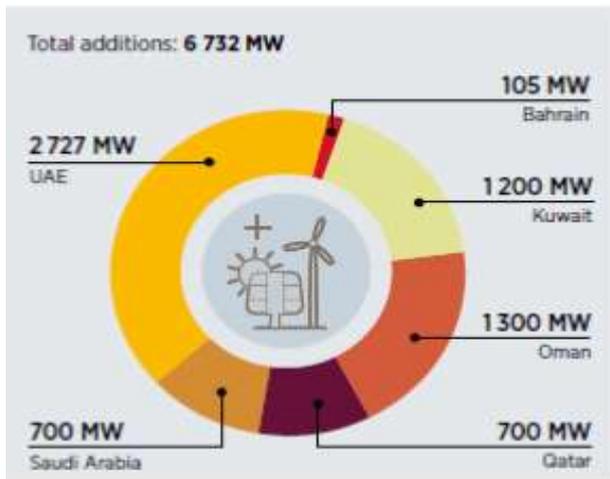


Fig. 3. Solar resources (kWh/m<sup>2</sup>) (Annual Average) [52].



**Fig.4. The total growth in renewable energy capacity in GCC by country 2014-2018 [International Renewable].**

Solar power is not a new trend or technology in Saudi Arabia. It has been there since the 1960s, but it was used on a small and mainly for university projects [4] [35] [18]. Research and development activities have taken a systemic manner since the 1970s by King Abdulaziz City for Science and Technology (KACST) [3] [11]. In the 1980s, national scale projects have been initiated when the Energy Research Institute (ERI) at KACST conducted collaborative research in the solar energy field with different nations such as the United States and Germany. The cooperation program with the U.S.A resulted in providing two rural villages in Saudi Arabia with solar energy that were entirely off the grid because they were not connected to the central grid, whereas the cooperative program with Germany was focusing on the development of solar hydrogen production technologies [4]. In the 2000s, more renewable energy institutes and centers were built to expand the development of renewable energy further emphasizing on solar energy. Since then, large scale solar power projects were built or installed that generate between 500 KW to 100 MW of energy [60][40][46]. While early renewable energy initiatives in Saudi Arabia consisted of solar installations in the range of hundreds of kilowatts to tens of megawatts, recent developments have seen installed renewable capacity expand into the multi-gigawatt scale, with total utility-connected solar capacity expected to reach around 12 GW by 2025 and national targets planning for tens of gigawatts by 2030 [46].

#### D. ALJ Overview

It can be seen from the above discussion about Saudi Arabia energy needs and the current situation regarding solar power that Saudi Arabia is a promising market for solar energy.

Abdul Latif Jameel (ALJ) is a family business that was founded in Jeddah, Saudi Arabia, in 1945 [27][28]. It is now one of the biggest Saudi-based companies. It has an international presence in 32 countries, and its operations expand to many sectors including transportation, energy, construction, financial, manufacturing, media, and consumer products and employs more than 17,500 people [27][28][2][13]. In 2015, ALJ made a strategic decision

to enter the solar power market by acquiring Fotowatio Renewable Ventures (FRV), a leading European solar developer with global operations. After the acquisition, FRV becomes part of ALJ Energy and Environmental Services [1][12][6].

ALJ acquisition of FRV is an essential part of the company's decision to enter Saudi Arabia's solar power market, with the goal of gaining the competitive advantage of being one of the early and most significant companies in the country's solar energy market.

#### Methodology

ALJ's strategy will be evaluated using Porter's five forces analysis. Furthermore, a SWOT analysis will be applied to ALJ to further investigate strengths, weaknesses, opportunities, and threats in order to look for areas of improvement that can help the company preserve its competitive advantage.

#### E. Porter's Five Forces

The behavior of the solar energy market in Saudi Arabia should be studied to evaluate ALJ's strategy. It is pivotal to study the powers and threats that could influence the growth or decline of the industry. A useful tool that can be used in such type of research is Porter's five forces framework [31], which is an analysis tool that considers five competitive forces that shape strategy. Those forces are rivalry among existing competitors, threat of new entrants, bargaining power of buyers, bargaining power of suppliers, and the threat of substitute products or services [32]. Porter five forces framework can be used to analyze industry, market, or product/service attractiveness and competition. This framework helps provide a better understanding of the risks and threats on the strategic level that are associated with an industry, market, or product/service. Allowing firms to make better decisions about the attractiveness of their investment, what is their current position, and where they need to position themselves to have a better competitive advantage.

The authors used Porter five forces framework to analyze the Saudi Arabia solar power market using data they collected about the market and the company from literature.

#### ANALYSIS

First, the porter five forces analysis is provided, then SWOT analysis will follow.

#### F. Porter Analysis

##### 1) Rivalry among competitors

The threat of competitors is medium. Rivalry among existing competitors is the most important competitive force in the solar power industry. The competition between existing solar electric generation firms depends on the solar power industry's cost structure, experience effects, and market growth. The cost structure of the solar power for ALJ is not an issue as the company's strategy could provide a lowest solar price of 2.99¢/kWh. However, as prices continue to fall, firms (domestic and foreign) are required to increase the efficiency of their operations to meet dropped prices, and that definitely will create increased pressure on competitors in the market.

Strong experience-effect is a product of the highly skilled workers needed to install and maintain solar power generation infrastructure. ALJ company can take advantage of their leading position on the experience curve, which was gained by acquiring FRV. Large-scale renewable energy developers are able to deliver projects at lower prices due to economies of scale, accumulated experience, and access to advanced technical and financial capabilities. In the Saudi Arabian market, Abdul Latif Jameel (ALJ) has leveraged these advantages to secure a competitive position, enabling the delivery of high-volume solar projects at comparatively lower costs. According to International Renewable Energy Agency (IRENA), ALJ's acquisition of Fotowatio Renewable Ventures (FRV) represented a strategic move that significantly strengthened the company's capabilities and market position through access to a multi-gigawatt renewable energy project pipeline[52].

The literature suggests that domestic firms lacking comparable technical expertise, project development experience, and cost efficiencies may face substantial barriers to entry in such a market. These experience effects limit the ability of less established firms to compete on price with large, vertically integrated developers or experienced international players. As a result, the presence of firms such as ALJ, alongside foreign renewable energy developers, intensifies competitive rivalry within the Saudi renewable energy sector.

More recent industry analyses further indicate that ALJ has expanded its renewable energy portfolio beyond utility-scale solar generation to include a broader range of clean energy and environmental services. This strategic diversification reflects both the maturation of the renewable energy market in the Gulf region and Saudi Arabia's broader renewable energy ambitions under **Vision 2030**, as well as increased alignment with international renewable energy policy frameworks [Y. Chu].

The solar energy's high market growth rate makes it a target for new entrants. Currently, there are a few leaders in Saudi Arabia market that have a substantial market share. ALJ is one of the leading players. Thus, the company will not have to worry about small scale rivals who want only to get a slight market share and not attempting to displace the large companies. Smaller market participants, however, will encounter fierce rivalry for small market share position [].

## 2) Threat of New Entrants

The threat of new entrants is high. Solar energy market has been growing in Saudi Arabia, see Fig. 5, and Saudi Arabia is anticipated to experience robust growth rate in its solar power market through 2020. Increasing focus of Saudi government is expected to significantly boost power generation from renewable sources in the coming years. The market is a nascent market in Saudi Arabia that has high potentials to grow especially with the announced government goal to generate 41 GW of solar power by 2032 [5]. The barriers to entry are medium for many reasons. Although the country needs more efforts in regard to renewable energy policy and regulation

framework, and investing in solar energy sector requires a large Capital cost, government subsidies, grants, and loans encourage renewable energies businesses specifically the solar energy [5] [14][15]. Moreover, government moved toward cutting off the government subsidies to the conventional energy (generated by burning oil) and revised electricity tariff rates.

On the other hand, the government is moving to support renewable energy (tax reduction/ low cost finance) which makes the industry more attractive for investors [43]. Another reason is the cost declining of building renewable energy facilities driven by technological improvement, low cost finance, and the large scale of production. However, there are still a few entrants to Saudi market because policy and regulations are considered in early stages. More clarification in institutional roles and responsibilities is required, which form a barrier faces new entrants.

Additionally, for ALJ, the threat lies in big companies rather than small entities. However, acquisition strategy will ensure a well-established and sustainable position. ALJ is a giant in the market which has many advantages: first, it repulses new entrants. The acquisition of FRV makes ALJ equipped with global expertise and a pipeline of projects in different stages and brought extensive experience in engineering, development and construction of solar installations, and that will maintain the control of the company's market share and sustain it for now. The main driver of the solar energy industry is competitive price and efficiency which ALJ offers. ALJ, with the best finance and management of the assets, can gain a competitive advantage (cost advantages). The evidence is that the company won 800 MW tender in Dubai at 2.99 cents a kWh – setting a new world record [21], Jeffrey]. However, ALJ should maintain that competitive advantage by investing more in R&D to develop solar technologies suited to Saudi environment.

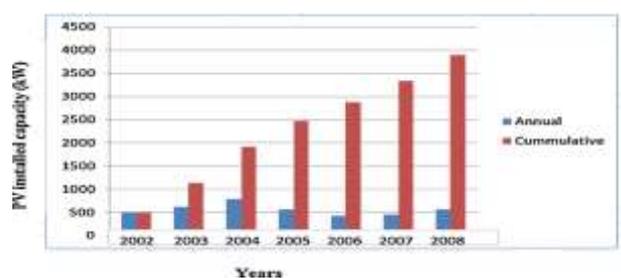


Fig. 5. A variation of the annual addition and cumulative PV installed capacities between 2002 and 2008 in Saudi Arabia [4].

## 3) Bargaining Power of Buyers

The bargaining power of those who buy solar energy is high. The potential buyers are the public sector (education, health, etc.), businesses, and residents. According to KA-CARE (King Abdullah City for Atomic and Renewable Energy), approximately 80% of energy is used by buildings (residential, governmental, and commercial) [5] [14], [15]. The number of residents who are looking for solar energy still slight. However, public and business sectors demand are increasing as it aligns

with the government vision to expand the utilization of solar energy. There are a lot of players in this industry from local \ regional to international organizations. Buyers have plenty of options to choose from. The high bargaining power of buyers who demand solar energy is caused by a lack of product differentiation and the size of projects of potential buyers. Solar products are mainly differentiated based on cost/KW of efficiency, and thus, low product differentiation in this industry makes the buyer more discriminant. As stated previously ALJ is aware of the intense competition and brutal price war. Fortunately, ALJ is a leading company in the competition and forcing solar companies to lower their prices as ALJ provides high efficiency with competitive price. Finally, the number of buyers are expected to increase creating more power of buyer. According to Saudi Arabia vision 2030, the growth trend of solar energy will increase more creating more buyers as the government tries to force companies to implement it and create public awareness of solar energy.

#### 4) Bargaining Power of Supplier

The power of suppliers is moderately low. The main reason for that is the Saudi market has many foreign suppliers who lead sharp price competition with low shift cost. Nowadays, solar- energy prices have fallen dramatically due to the rapid increase in the number of Chinese factories producing inexpensive and more efficient solar technologies. The competitive advantage of Chinese manufacturers (e.g., low labor costs) has allowed them to mass produce large quantities of low priced solar panels. According to PV-Tech website, in 2016, eight of the top-10 module suppliers to the solar industry were Chinese companies [52]. The growing presence of the solar cell supplier is a factor in the competitive force. The availability of multiple suppliers, low switching costs for the client, and weak product uniqueness is the result of extremely low power of supplier in the Saudi market.

#### 5) Threat of Substitute Products

The threat of substitute products or services is a highly competitive force in the solar electric generation industry, driven by highly profitable firms who benefit from low tariff and government assistance. The substitute (i.e., conventional sources of energy) are already present in [the market](#), and it is dominated by public and private companies. It is an economically attractive option in Saudi Arabia where it has the lowest utility tariffs in the world, charging less than 2 cents/kWh.

People still have not been motivated to shift to solar energy. Indeed, the economic benefits of substitutes make this the most severe threat level in the industry due to cheap substitute products available, and customers' switching cost to solar energy is relatively high as they need to pay a quite amount of money at the beginning for the switching to solar system (buying the solar cells and installations). However, ALJ's low price and the supportive government strategy toward solar energy may reduce this challenge and make solar power more affordable for consumers.

### G. SWOT Analysis

SWOT analysis of ALJ company is provided here, see Fig. 6 for a summary.

STRENGTHS	WEAKNESS
<ul style="list-style-type: none"> <li>• Strong brand image</li> <li>• Well-known and good reputation company</li> <li>• Acquisition for strong and popular solar energy developer domestically and globally (FRV)</li> <li>• Acquired for expertise and other capabilities.</li> <li>• Power over price</li> <li>• Strong growth</li> <li>• Strong financial ability</li> <li>• Power on all the entire chain.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited retail stores in Saudi Arabia</li> <li>• Focusing on large scale project neglecting small scale</li> <li>• Solar panel highly undifferentiated products.</li> </ul>
OPPORTUNITY	THREAT
<ul style="list-style-type: none"> <li>• Government support for renewable energy alternatives</li> <li>• Government reduction for fuel and electricity subsidies</li> <li>• The increase in electricity tariffs</li> <li>• Substantial increase in people awareness</li> <li>• Massive potential for solar energy market and abundant solar radiation</li> <li>• Being from the market pioneer</li> <li>• The decreasing in cost of solar.</li> </ul>	<ul style="list-style-type: none"> <li>• Affordability of electricity</li> <li>• Favorable business environment for foreign investors</li> <li>• Ease of imitation of the company's products</li> <li>• The low cost of Chinese products</li> <li>• Unclear administrative authority</li> <li>• Lack of policy and regulations framework.</li> </ul>

Fig. 6. ALJ SWOT Analysis.

#### 1) Strengths

ALJ has a strong brand image (one of Saudi Arabia's leading commercial enterprises with operations in the Middle East, UK, Central Asia and China, and Africa), good reputation and well-known as the company that Committed to social and economic sustainability[M. Sulphey]. Also, has acquired FRV is the first developer of large-scale solar energy projects in Spain. Moreover, it developed energy projects in Europe as well as international expansion such as USA, Australia, Latin America. ALJ's acquisition has opened a new stage of great potential to FRV as it has facilitated penetration in the markets of the Middle East, North Africa, and Turkey [FRV Celebrates].

All of FRV's solar projects pipeline and operational assets are part of ALJ Energy. Thus, ALJ has a large organizational size and diversified business and products[37]. Moreover, it has a solid position in each business that indicated that ALJ is a trustable company and has the ability to expand and succeed.

The acquisition of FRV has brought advantages to ALJ including expertise and other capabilities such as innovative products and service, and extensive experience. ALJ' strategy enabled a steady growth in 2017, ChiefExecutive Officer ofFRV stated that recently, ALJ involved in solar energy projects increased 50% than before the acquisition in 2015 [Business: Washingto].

Additionally, ALJ has power over price, typically customers rebel against price increases by switching to competing products[39], but if a company has pricing power, customers will continue using the product. ALJ can sell energy to the customers at prices below the market price rate. Also, ALJ has power over the entire chain: sales, financing, engineering, installation, monitoring, and financing services. Thus, ALJ has more control over cost. Furthermore, the company has a strong financial ability needed in large scale projects; according to Forbes,

Abdul Latif Jameel is ranked 12 (with a net worth \$1.5 billion) among the wealthiest Arabs in 2016.

## 2) *Weaknesses*

Solar panels are largely undifferentiated products in relation to competitors for most consumers[51]. This makes an opportunity for companies to imitate competitors easily. Additionally, limited retail stores in Saudi Arabia can limit ALJ add-on services. Moreover, the company is focusing on large scale projects like universities and give less attention to small scale opportunities which can be profitable.

## 3) *Opportunities*

The government of Saudi Arabia has announced and forced a renewable energy program[29] [17] [9]. As Saudi Arabia's energy minister [said](#) "the country will begin soliciting bids for a massive renewable energy push" [Saudi Arabia To]. The government announced an overall investment of \$109 billion to generate electricity from renewable energy sources. The government continues to reduce fuel and electricity subsidies and has already taken actions and increased electricity tariffs[19][50][48]. Adding to that, Awareness about solar energy starts to seize people attention toward solar energy. Reducing subsidies and increasing people's awareness will motivate people toward solar energy as an alternative power generation solution.

Moreover, Saudi Arabia is blessed with abundant solar radiation throughout the year, and it is inexhaustible which offers immense potential for the solar power market in the country[42][43][10]. Being a market pioneer is a significant win and allows ALJ to gain competitive advantage.

Additionally, the cost of solar power has fallen and will continue to fall [61][7]. This could alleviate the competition and allow ALJ to have substantial market share and profits before newcomers even start to consider the market. Only large investors can get high operating profit from solar energy distribution since it requires enormous investment to install, maintain and distribute.

## 4) *Threats*

ALJ faces tough competition. The primary competitors are the traditional utilities that supply energy to potential customers. A reduction in utility electricity prices will make it unprofitable to install solar panel [62] [25]. Because commercial customers pay less for energy than residential customers, they will be the first to abandon Solar energy solutions. Furthermore, a new competitor in the market is another threat. Saudi Arabia was rated by the World Bank as the world's 3rd most favorable tax country and has the highest level of foreign direct investment in the Middle East, North Africa and Turkey (MENAT) region [International Investment]. This will invite and open the door wider to foreign investors, and it will increase firms' appetite for solar power investment in the country.

Additionally, competing firms include large companies as well as start-ups and regional/national firms offering products similar to ALJ product. Other firms can also imitate the ALJ's products. ALJ may face threats from

Chinese firms due to cost difference as they are going to solar energy intensively. Moreover, A major threat may be the Saudi culture. People in Saudi Arabia have generally perceived the quality of products produced from other countries such as Australia and Germany as a superior[44][ 16], so that may affect a local company as ALJ. Also, while the government created the Renewables program as an entity that is responsible for alternative sources of energy, there is still overlap [61][7]; there are several government departments related to renewable energy, which can result in confusing administrative authority. In addition, the lack of policy and regulations framework can discourage domestic and foreign solar energy investors.

## **Discussion**

### *H. Opportunities and Challenges for ALJ*

From the analysis, it can be seen that the primary sources of competitive pressure in the solar power generation industry consist of two main forces: the threat of new entrants, and the rivalry among existing competitors. The intense pressure of these two forces, along with the high strength of the threat of substitutes and the bargaining power of buyers, makes the solar electric power generation industry a very competitive environment in the Saudi market. The government heavily subsidies to a conventional source of energy (fossil fuels) play a significant role to distort solar power industry profitability. The challenge with this conclusion is that the customer base for solar in the Saudi market is growing so it would logically make sense to join an industry with an expanding customer base. However, the warning signs here show that there are some adversities in the industry that would make success very difficult to achieve and sustain particularly small companies.

Presently, Saudi Arabia solar energy market is so lucrative for businesses with high capital such as ALJ due to the enormous solar energy projects that the government announced. Companies with moderate capital attempting to achieve profitability will likely lose much of their resources in order to invest in R&D and compete. Potential entrants with excessively high capital and superior financial and supply chain management may seek to take a higher market share position, possibly overcoming the initial barriers to profitability.

The acquisition of the FRV by ALJ is a substantial strategic decision. It takes the company in the right direction because getting to the market is not the only issue, but rather, it is also how and by whom and in what scale. ALJ acquisition choice is what makes the difference in the company's future in the solar energy market. The acquisition brings know-how, capabilities another resource will not only strengthen ALJ' energy business and establish the company as a leader in the Saudi market, but also is a strong signal to become a leading player internationally. The previous analysis shows some challenges and opportunities

Saudi Arabia initiative plan to diversify its energy supplies with more focus on renewable energy creates a huge opportunity for power plant development Companies. Furthermore, Saudi Arabia would like to

become a large-scale exporter of solar electricity within the next 30–50 years. This new market for these technologies will open up, creating more competitive opportunities.

The financial capability associated with the knowledge and experience strengthen ALJ market position as the company now able to bid for projects based on a comprehensive and developed platform. ALJ has the capabilities to hold a dominant role in Saudi solar power industry by investing in innovation which many companies cannot keep up with. This strongly indicates that ALJ is growing and has improved over time. The company's diversification of products shows that its business is expanding. The strong brand image and sizable organizational size enable the company to fight off competition and new entrants. The acquisition added to ALJ and equipped the company with resources to provide a competitive advantage for the ALJ. Being among the leading and first in the solar energy market in Saudi Arabia is the most significant advantages the pioneers own. It will create brand or product awareness. ALJ through its leading market can create customer loyalty.

ALJ can contribute to public awareness of solar energy program. In alignment with the Saudi Arabia's renewable energy plan, ALJ can play a more prominent role. It can cooperate with the government to release a marketing campaign that aims to two goals, the first one is to increase the public awareness of the solar energy as an alternative power. The second is to introduce ALJ products to all possible buyers. The campaign should demonstrate the solar as a necessity rather than a luxury.

Finally, all ALJ R&D activities should be continued with great emphasis on commercialization. Another opportunity ALJ can exploit, is entering a new market similar to the Saudi market. For example, the Middle East, Africa, and Southeast Asia places where the price of conventional electricity is higher than in Saudi Arabia.

### **Challenges**

According to the previous analysis, non-economic barriers such as regulatory and policy uncertainty, institutional and administrative barriers will impede the investment of renewable energy in the Saudi market. ALJ as a Saudi company will be affected as well. However, efforts are made to overcome existing barriers by setting up a dedicated institution and providing a vision for the sector's development through renewable energy plans and targets. Dedicated policies and regulatory frameworks will provide stability to the sector and encourage investors.

Another reason that will slow the Saudis' renewable energy plan to materialize is the petroleum subsidies that protect Saudi consumers from any real pressure to use solar energy. However, the government is already

reducing the subsidy. Also, presently, small companies start to commercialize their products and people begin to see the solar panels on buildings top roofs.

### **Conclusion, Implications, and Future Research**

Saudi Arabia has undergone a rapid population growth, as well as, economic and industrial development, which have increased the energy demand and requiring more power generation to meet it. With the continued growing number of residential and industrial customers, the electricity demand is projected to continue its growth to reach double its current size by 2023.

Saudi Arabia is planning to meet domestic demand by developing renewable energy alternatives, specifically solar power. ALJ, a large and diversified business, has sensed and visualized the opportunity. The company had made a strategic decision when it announced the acquisition of FRV. The analysis of the company and its acquisition decision in addition to analyzing the industry showed that the solar energy market in Saudi Arabia has a huge potential and opportunities. Industry profit potential will be high for ALJ with significant market share. ALJ will encounter moderate competitive force from competitors, while it will face high threats from buyers, substitutes, and new entrants. However, the evaluation expected that ALJ with its strengths such as (the size of the company, acquisition strategy, huge and solid capital) could compete and lead the competition with the advantages that gain with its acquisition strategy.

Future studies are needed to investigate and understand Saudi energy market better; such details and extensive research of the market and environment will provide a clearer vision for investors. Thus economic and non-economic problems can be considered and overcome.

This paper's analysis of the Saudi market and ALJ company offers the government and policymakers with a better understanding about the obstacles of the market that can assist to speeds up the constitution of the renewable energy framework and the procedures to facilitate investing. Furthermore, this paper is beneficial and add knowledge for ALJ, and similar companies who are interested in entering the renewable energy market of Saudi Arabia to enable them to develop strategies to fit and invest in the Saudi energy market.

### **Acknowledgment**

The author would like to express her sincere appreciation to Dr. Husam Barham for his valuable academic contributions, insightful consultations, and constructive guidance throughout the development of this research paper. His expertise and thoughtful feedback significantly contributed to strengthening the research framework and enhancing the overall quality and rigor of the study

### **REFERENCES**

1. Abdul Latif Jameel completes FRV acquisition," pv magazine International. [Online]. Available: [https://www.pv-magazine.com/2015/04/08/abdul-latif-jameel-completes-frv-acquisition\\_100018962/](https://www.pv-magazine.com/2015/04/08/abdul-latif-jameel-completes-frv-acquisition_100018962/).

[Accessed: 19-Apr-2017].

2. "Abdul Latif Jameel: A Saudi-Japanese success story." [Online]. Available: <http://ara.tv/9bzfr>. [Accessed: 18-Apr-2017].

3. A. H. Almasoud and H. M. Gandayh, "Future of solar energy in Saudi Arabia," *J. King Saud Univ.-Eng. Sci.*, vol. 27, no. 2, pp. 153–157, 2015.
4. A. Hepbasli and Z. Alsuhaibani, "A key review on present status and future directions of solar energy studies and applications in Saudi Arabia," *Renew. Sustain. Energy Rev.*, vol. 15, no. 9, pp. 5021–5050, 2011.
5. A. Al Ghabban, "Saudi Arabia's Renewable Energy Strategy and Solar Energy Deployment Roadmap," 17-Apr-2010.
6. Admin\_Brooktec, and Admin\_Brooktec. "Abdul Latif Jameel Strengthens Energy Business With Acquisition of Leading Solar Developer Fotowatio Renewable Ventures (FRV)." FRV, 4 Feb. 2021, frv.com/en/abdul-latif-jameel-fortalece-su-negocio-energetico-con-la-ad-3.
7. A. Waqas, et al. "Revolutionizing photovoltaics: From back-contact silicon to back-contact perovskite solar cells." *Materials Today Electronics* 9 (2024): 100106.
8. Alfaran, Deem, et al. "Wind Energy Potential in Dhahran, Saudi Arabia." 2025 IEEE Kiel PowerTech. IEEE, 2025.
9. A. AlGhamdi. "Saudi Arabia energy report." *King Abdullah Pet. Stud. Res. Cent* 19 (2020): 1-28.
10. A. Amjad. "Transforming Saudi Arabia's energy landscape towards a sustainable future: Progress of solar photovoltaic energy deployment." *Sustainability* 15.10 (2023): 8420.
11. Al-Ismail, Fahad Saleh, et al. "Impacts of renewable energy generation on greenhouse gas emissions in Saudi Arabia: A comprehensive review." *Sustainability* 15.6 (2023): 5069.
12. alj.com, "Abdul Latif Jameel Energy Acquires FRV | Abdul Latif Jameel®," ALJ. [Online]. Available: <https://www.alj.com/en/news/acquisition-of-leading-solar-developer-frv/>. [Accessed: 20-Jan-2019].
13. alj.com, "Our Locations - Headquarters and Offices | Abdul Latif Jameel®," ALJ, 2019. [Online]. Available: <https://www.alj.com/en/about/locations/>. [Accessed: 20-Jan-2019].
14. AlKassem, Abdulrahman, et al. "Design analysis of an optimal microgrid system for the integration of renewable energy sources at a university campus." *Sustainability* 14.7 (2022): 4175.
15. Almasri, Radwan A., et al. "Assessment of Energy Use and Photovoltaic Energy Potential in Saudi Arabian Governmental Schools." *Applied Sciences* 15.7 (2025): 3809.
16. Almatrudi, Mohammed Abdulrahman, Ibrahim Alhassan, and Prakash Singh. "Vocal for Local: A Saudi Arabian Consumers' Perspective Towards Saudi-made Products and Foreign Products." *Global Business Review* (2023): 09721509231207792.
17. Al-Saidi, Mohammad. "Energy transition in Saudi Arabia: Giant leap or necessary adjustment for a large carbon economy?." *Energy Reports* 8 (2022): 312-318.
18. Amiri, Ali Ahmad, et al. "A strategic multi-criteria decision-making framework for renewable energy source selection in Saudi Arabia using AHP-TOPSIS." *Renewable Energy* 236 (2024): 121523.
19. Kumar Sahu, "A study on global solar PV energy developments and policies with special focus on the top ten solar PV power producing countries," *Renewable and Sustainable Energy Reviews*, vol. 43, pp. 621–634, Mar. 2015.
20. Bakare, Mutiu Shola, et al. "A comprehensive overview on demand side energy management towards smart grids: challenges, solutions, and future direction." *Energy Informatics* 6.1 (2023): 4.
21. Beyer, Jeffrey. "The Saudi shift: laying the groundwork for a clean energy future." 2 Oct. 2025, [www.undp.org/arab-states/blog/saudi-shift-laying-groundwork-clean-energy-future](http://www.undp.org/arab-states/blog/saudi-shift-laying-groundwork-clean-energy-future). Accessed 22 Jan. 2026.
22. Elavarasan, Rajvikram Madurai, et al. "A comprehensive review on renewable energy development, challenges, and policies of leading Indian states with an international perspective." *Ieee Access* 8 (2020): 74432-74457.
23. G. K. Singh, "Solar Power Generation by PV (Photovoltaic) Technology: A Review," *Energy*, vol. 53, pp. 1–13, May 2013.
24. G. Lahn, P. Stevens, "Burning Oil to Keep Cool: The Hidden Energy Crisis in Saudi Arabia" Chatham House, London: The Royal Institute of International Affairs, 2011, [online] Available: [http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/1211pr\\_lahn\\_stevens.pdf](http://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/1211pr_lahn_stevens.pdf).
25. Gasim, Anwar A., et al. "Modeling final energy demand and the impacts of energy price reform in Saudi Arabia." *Energy Economics* 120 (2023): 106589. <https://view.ckcest.cn/AllFiles/ZKBG/Pages/872/5621093b176409391e9bf09d5a2d60e2857b2035.pdf>
26. Hu, Jinjing, et al. "Photothermal fabrics for solar-driven seawater desalination." *Progress in Materials Science* 150 (2025): 101407.
27. Jameel, Abdul Latif. "Abdul Latif Jameel Energy Acquires FRV | Abdul Latif Jameel®." Abdul Latif Jameel, 26 May 2021, [alj.com/en/news/acquisition-of-leading-solar-developer-frv](https://www.alj.com/en/news/acquisition-of-leading-solar-developer-frv/).
28. Jameel, Abdul Latif. "About Us and Our Diversified Businesses | Abdul Latif Jameel®." Abdul Latif Jameel, 9 June 2025, [Online]. Available [alj.com/en/about/story](https://www.alj.com/en/about/story).
29. M. A. M. Ramli, S. Twaha, and Z. Al-Hamouz, "Analyzing the potential and progress of distributed generation applications in Saudi Arabia: The case of solar and wind resources," *Renewable and Sustainable Energy Reviews*, vol. 70, pp. 287–297, Apr. 2017.
30. M. Bhattacharya, S. R. Paramati, I. Ozturk, and S. Bhattacharya, "The Effect of Renewable Energy Consumption on Economic Growth: Evidence from Top 38 Countries," *Applied Energy*, vol. 162, pp. 733–741, Jan. 2016.
31. M. E. Dobbs, "Guidelines for applying Porter's five forces framework: a set of industry analysis templates," *Competitiveness Review*, vol. 24, no. 1, pp. 32–45, Jan. 2014.
32. M. E. Porter, "The five competitive forces that shape strategy," *Harv. Bus. Rev.*, vol. 86, no. 1, pp. 25–40, 2008.
33. M. Khanam, H. Barham, A. Nour, S. Thabet, and T. Daim, "Technology Assessment in the Energy Sector," in *Research and Development Management*, T. Daim, J.

Kim, and K. Phan, Eds. Cham: Springer International Publishing, 2017, pp. 61–85.

34. M. T. Islam, N. Huda, A. B. Abdullah, and R. Saidur, "A Comprehensive Review of State-of-the-art Xoncentrating Solar Power (CSP) Technologies: Current Status and Research Trends," *Renewable and Sustainable Energy Reviews*, vol. 91, pp. 987–1018, Aug. 2018.

35. Meng, Shuhan, et al. "Trajectory mapping and future charting of hydrogen energy policy: A systematic review." *Expert Systems* 42.2 (2025): e13696.

36. Miah, Mohammad Dulal, Muhammad Shafiullah, and Md Samsul Alam. "The effect of financial stress on renewable energy consumption: evidence from US data." *Environment, Development & Sustainability* 26.10 (2024).

37. N. Al Sabban, Y. Al Sabban, and M. K. Rahatullah, "Exploring corporate social responsibility policies in family owned businesses of Saudi Arabia," *International Journal of Research Studies in Management*, vol. 3, no. 2, Mar. 2014.

38. O. Alnatheer, "The Potential Contribution of Renewable Energy to Electricity Supply in Saudi Arabia," *Energy Policy*, vol. 33, no. 18, pp. 2298–2312, Dec. 2005.

39. P. Klemperer, "Competition when Consumers have Switching Costs: An Overview with Applications to Industrial Organization, Macroeconomics, and International Trade," *The Review of Economic Studies*, vol. 62, no. 4, pp. 515–539, Oct. 1995.

40. Qahtan, Abdultawab M., et al. "Building-integrated photovoltaics (BIPV) in Saudi Arabia for sustainable energy transition: A comprehensive review of status, challenges, and future prospects." *Energy and Buildings* (2025): 116301.

41. R. S. of Chemistry, "Energy," 02-Apr-2014. [Online]. Available: <http://www.rsc.org/campaigning-outreach/global-challenges/energy/>. [Accessed: 19-Jan-2019].

42. S. H. Alawaji, "Evaluation of solar energy research and its applications in Saudi Arabia — 20 years of experience," *Renewable and Sustainable Energy Reviews*, vol. 5, no. 1, pp. 59–77, Mar. 2001.

43. S. H. Alawaji, "Life after oil," *Refocus*, vol. 2, no. 2, pp. 14–19, Mar. 2001.

44. S. N. Bhuiyan, "Saudi consumers' attitudes towards European, US and Japanese products and marketing practices," *European Journal of Marketing*, vol. 31, no. 7, pp. 467–486, Aug. 1997.

45. Samman, Ahmad E., et al. "Assessing climate variability and trends in global solar radiation over Saudi Arabia using the CLARA-A3 dataset." *Journal of Atmospheric and Solar-Terrestrial Physics* 270 (2025): 106486.

46. Saudi Arabia Renewable Energy Consulting Firm. "Saudi Arabia Renewable Energy | Consulting Firm." Saudi Arabia Renewable Energy Consulting Firm, 4 Dec. 2024, [saudienergyconsulting.com/insights/articles/saudi-arabia-solar-investment-2025-signs-12-gw-and-rising-fast?utm\\_source=chatgpt.com](https://saudienergyconsulting.com/insights/articles/saudi-arabia-solar-investment-2025-signs-12-gw-and-rising-fast?utm_source=chatgpt.com).

47. SEIA, "About Solar Energy," SEIA, 2018. [Online]. Available:

<https://www.seia.org/initiatives/about-solar-energy>. [Accessed: 19-Jan-2019].

48. Senyonyi, Brian, Hatem Mahmoud, and Hamdy Hassan. "Systematic review of solar techniques in zero energy buildings." *Clean Technologies and Environmental Policy* 27.2 (2025): 727-772.

49. Serriño, Moises Neil V. "Energy security through diversification of non-hydro renewable energy sources in developing countries." *Energy & Environment* 33.3 (2022): 546-561.

50. Shafiullah, Md, Shakir D. Ahmed, and Fahad A. Al-Sulaiman. "Grid integration challenges and solution strategies for solar PV systems: A review." *IEEE Access* 10 (2022): 52233-52257.

51. T. Gerarden, "Demanding innovation: The impact of consumer subsidies on solar panel production costs," Technical report, Working paper, Harvard University, 2017.

52. Tech, P. V. "Top 10 solar module suppliers in 2018." Londres. Disponível em: <https://www.pv-tech.org/top-10-solar-module-suppliers-in-2018/>. Acesso em 17 (2022).

53. The Climate Reality Project, "Here Are 11 Ways to Shift to Renewable Energy," *Climate Reality*, 03-Feb-2016. [Online]. Available: <https://www.climateRealityproject.org/blog/follow-leader-how-11-countries-are-shifting-renewable-energy>. [Accessed: 17-Jan-2019].

54. United Nations Framework Convention on Climate Change, "The Paris Agreement | UNFCCC," 22-Oct-2018. [Online]. Available: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>. [Accessed: 17-Jan-2019].

55. Y. Chu, Shahid, Turki Al-Aqeel, and Nawaz Peerbocus. "Saudi Arabia's Unfolding Power Sector Reform." KAPSARC: Riyadh, Saudi Arabia (2020).

56. Yan, Zhen, et al. "Biological optics, photonics and bioinspired radiative cooling." *Progress in Materials Science* 144 (2024): 101291.

57. S. AlYahya and M. A. Irfan, "The Techno-economic Potential of Saudi Arabia's Solar Industry," *Renewable and Sustainable Energy Reviews*, vol. 55, pp. 697–702, Mar. 2016.

58. J. Khan and M. H. Arsalan, "Solar Power Technologies for Sustainable Electricity Generation – A Review," *Renewable and Sustainable Energy Reviews*, vol. 55, pp. 414–425, Mar. 2016.

59. Y. Chu and P. Meisen, "Review and Comparison of Different Solar Energy Technologies," *Global Energy Network Institute (GENI)*, San Diego, CA, 2011.

60. F. R. Pazheri and others, "Solar Power Potential In Saudi Arabia," *Int. J. Eng. Res. Appl.*, vol. 1, no. 4, pp. 171–174.

61. C. Candelise, M. Winkler, and R. J. K. Gross, "The dynamics of solar PV costs and prices as a challenge for technology forecasting," *Renewable and Sustainable Energy Reviews*, vol. 26, pp. 96–107, Oct. 2013

62. Y. Alyousef and P. Stevens, "The cost of domestic energy prices to Saudi Arabia," *Energy Policy*, vol. 39, no. 11, pp. 6900–6905, Nov. 2011

63. .