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SOLAR ENERGY DEVELOPMENT AND MARKET EXPANSION IN SOUTH-EAST ASIA: THE CASE OF MYANMAR AND VIETNAM

I.V. Onyusheva,
PhD, Associate Professor, Professor of RAM, RANH,
Turan University, Almaty, Republic of Kazakhstan
E-mail: dr.irina.onyusheva@gmail.com
G. Yaw Myaw, MBA
Stamford International University,
Strategy First Institute, Yangon, Myanmar
Email: myawyawng@gmail.com

ABSTRACT

Purpose – This paper is devoted to solar energy development and market expansion in South-East Asia taking into consideration the case of Myanmar and Vietnam.
Methodology - The research methodology of this paper is based on conducting the comparative analysis of existing patterns of macroeconomic development, political and social issues in the context of the solar energy industry in Myanmar and Vietnam. It is also implemented PESTEL, SWOT, risk management techniques, systematic vision, causes and consequences analysis, and expert assessment.
Originality/Value – Myanmar and Vietnam are very highly potential developing markets of South-East Asia those having both strategic geographic locations and many contemporary attractive competitive advantages for international business development. The given research is studied the solar energy industry in the context of analysis of leading representatives both in Myanmar and Vietnam. Thus, this article presents the most contemporary analytical review of this current economic situation of the solar energy sector in Myanmar and Vietnam based on the latest data of 2016-2018.
Findings – In the given research it has been studied the current issues of solar energy development and market expansion in Myanmar and Vietnam. It has been presented detailed market analysis including consideration of key representative companies, market entry strategies, and detecting market features of Myanmar and Vietnam. It has been carried out risk identification, risk assessment and risk management analysis detecting significant business development environmental factors for the solar energy development in South-East Asia. Based on risk management methods, it is suggested risk management strategies and future development prospects in the framework of further solar energy market expansion.
Key words – Solar energy, development, market expansion, South-East Asia, Myanmar, Vietnam.

INTRODUCTION

This paper is devoted to research of solar energy development and market expansion issues, particularly in South-East Asia region, taking into consideration Myanmar and Vietnam. Within the research, it basically covers the topics about the brief introduction of the solar industry, brief introduction of the company, the market comparison, market entry strategy and risk identification and assessment, managing risk analysis of Myanmar and Vietnam markets. The solar energy industry is booming these days around the world including South-East Asian market that has a really large potential to invest. In this sense, the Myanmar government is paying attention to the renewable energy, especially solar energy [1]. It is the appropriate time to enter and invest the solar market of Myanmar, but there are also several potential risk factors to be considered. So, the report has mentioned the risk analysis and the managing risk strategy methods in order to reduce the risk.

INDUSTRY PORTFOLIO AND COMPETITIVE ADVANTAGES

The world currently relies heavily on the coal, oil and natural gas for the energy production, which are not renewable and limited quantity. But during these days, the renewable energy like solar energy is becoming more popular and reliable to use as they are renewable and can use long term. Developed countries are encouraging to use the solar energy.

According to the current data of the Average Annual Growth Rates of Renewable Energy Capacity and Biofuels Production, End-2010 to End-2015, it is shown that solar power is the highest growth rate in renewable energy to produce the electricity. Nowadays, a lot of investments are being made in making the future solar better, cheaper and easier. The production costs of the solar equipment have been decreased by around 27 percent [2]. According to the report of Solar PV Capacity shares of Top 15 countries in 2015, it could be seen that China has got the largest share of 30% overall market share. Moreover, Chinese solar companies are also the global leaders in the solar industry [3].

As a key industry representative in this field in Myanmar, it should be mentioned about 'Jinko' Company. The vision of the company is to "revolutionize our energy mix and take responsibility to ensure a sustainable future". The mission of the company is "to provide a comprehensive, one-stop clean energy solution and become the industry benchmark" [4].

The 'Jinko' is one of the largest global leaders in the solar industry, having the 10.4% of global market share. 'Jinko' has more than 12,000 employees all over the world and there are 8 production plants in 4 countries and 21 warehouses in the 9 countries**.** The 'Jinko' Company is always looking for the opportunity to expand the promising solar market and there are already 30 sales offices with approximately 2,000 customers in more than 90 countries. The 'Jinko' Solar distributes its solar products and sells its solutions and services to a diversified international utility, commercial and residential customer base all over the world [5].

The 'Jinko' has established since 2006 and it has been 12 years that the company has been started. It has one of the industry's largest R&D centers and UL certified module testing facilities with over 250 scientists and solar experts, always trying to optimize the modules into more efficient, reliable, durable and cost-effective PV energy solutions. Moreover, the manufacturing system of 'Jinko' can be produced according to the tailored made requirement depending on the customers [4].

The main competitive advantages of the 'Jinko' is the quality of the product. As the company has got its own R&D department, the 'Jinko' would like to serve the best customer service process by delivering the best product reliability and quality to the customers with strict quality control process. In addition, the management always encourages the new innovations in order to make sure to produce the competitive products. According to the annual income statement of 2017, it has invested around 10% of the gross profit into the research and development. Moreover, in the overall shipments graph from 2010 to 2017, it could be seen that the compound annual growth rate has been increased by 47% continuously which is the total figure combined from the various sales regions all over the world [5]. It could be assumed that there is a great potential for 'Jinko' Company.

KEY EXPANSION MARKET

As 'Jinko' Company is looking for the new potential market to expand the business, the South East Asia countries could be taken into account. By 2050, the South East Asia region's population is expected to grow by another 25%, so, there is a huge demand on the supply of electricity in the regional countries. According to the ASEAN Ministers on Energy Meeting (AMEM), it is being said that ASEAN is going to use the renewable energy sources concerning with the huge demand for electricity in the region. In addition, as the solar PV prices have been decreased 27 percent in the last year, the ASEAN leaders are very interested in solar energy investment and inviting energy investment in their countries [2].

According to the political stability, government policies and regulation, solar energy market potential, profitability and infrastructure resources, it is selected two most potential countries: Myanmar and Vietnam.

MYANMAR MARKET ANALYSIS

Myanmar is an emerging market with an annual GDP growth rate of 5.9 in 2017 [6]. Since the new NLD government has been changed, the government policies and regulations have been adjusted and some are on the way in adjusting. There are 5.4 millions of people in Myanmar and the demand for electric power supply

is increased by 15 percent yearly. It is expected that the power consumption demand will be 4,531MW in the next two years by the ministry. Currently, there are 3,189MW is being generated by the government, but there is a 1,342MW power supply deficit to meet the requirement at the present time [7].

According to the report "Myanmar's Electricity Vision", it is shown that the government is planning to use the green energy in order to meet Myanmar's future energy needs and the current energy crisis. It is expected that the green energy business sector can create 3.8 million jobs in the next 35 years in Myanmar [8]. Furthermore, the solar energy will be the most used renewable energy in 2050 with 46 percent of all renewable energy mix. Therefore, it can be seen that there is also a huge potential in the solar energy sector. At the same time, there are some really weak economic points that must be improved in Myanmar market, particularly labor market [9-11]. The SWOT analysis of Myanmar market is as below in Table 1.

Table 1 - SWOT Analysis of Myanmar Market

Strengths	Weaknesses
The penetration of solar energy in Myanmar is increasing dramatically from 9% in 2014 to 25-27% in 2016. Two solar projects have been signed in Mar 2016 and started to build in early 2018. 108USD per month of minimum wages which is much lower than Vietnam (176.31 per month). A large population of youth in demographics	Poor infrastructure support Few skilled working force
Opportunities	**Threats**
Government plans to use the solar energy as the main energy source with 46 percent in overall energy source. The huge potential solar market as there are still power deficit in some regions of the country, for e.g.: some households from rural areas are using household size solar PV plate to generate electricity. Few competitors are in the Myanmar solar energy market, so, can be the market leader if it is earlier to enter the market.	Unstable exchange rate: USD and Myanmar Kyat currency exchange rate is unstable and can effect on the profit. Political risk: Corruption is common in some government offices in order to proceed the process smoothly.

Note: Source – Compiled by authors on the base of [1-3;6-11].

VIETNAM MARKET ANALYSIS

Vietnam is one of the fastest-growing economies and it is expected to become the developed country by 2020. There is a massive power demand for the developing economy and it is expected to have 320 TWh power demand in 2020 [12]. Vietnam government has planned a long-term strategy to increase the use of renewable energy according to the Vietnam energy outlook report in 2017 [13].

Most importantly, the government is planning to use the solar energy as the country's main energy sources of electrical output. There is only 0.01 percent of solar power in overall country's total power output in Vietnam currently, but the government is planning to increase the ratio to 3.3 percent in the next decade. Recently, several nuclear power projects are being canceled and being replaced with solar power plant projects at the cost of 2 billion USD [14]. On the other hand, there is already a really hot competition in the Vietnam market with so many solar companies from the local as well as US, Taiwan and Chinese. The SWOT analysis of Vietnam market is as below in Table 2.

Table 2 - SWOT Analysis of Vietnam Market

Strengths	Weaknesses
Well-built infrastructure Vietnam ranked 82 out of 190 countries concerning with the ease of doing business in 2016 (Kerli, 2018) Stable GDP growth of around 6.46%	Many local and foreign competitors in the solar industry Price and technology competitiveness is very high in terms of solar energy equipment
Opportunities	**Threats**
The promising potential market for the solar energy sector Government focus on the solar energy as the main energy source	In some government departments, bribery cases could be still found and companies have to spend the extra budget for that.

Note: Source – Compiled by authors on the base of [12-16].

The market comparison between Myanmar and Vietnam is represented below in Table 3.

Table 3 - Market Comparison Between Myanmar and Vietnam

Factors	Myanmar	Vietnam
Political Stability	Some conflicts in northern and western part of the country	Basically stable political situation
Population	55,3 million	92.7 million
Competition	Few	Severe
Entry Barrier	Low	High
Minimum Labor Cost	108USD per month	176.31 per month
Infrastructure resources	Poor infrastructure support	Well-built infrastructure
Tax Exemption and Tax Incentives	The Foreign Investment Law of 2012 provides general incentives that can be used by investors in renewable energy projects. Key incentives include: 5-year income tax holiday for foreign investors; Income tax relief for up to 50% of the profits for exported goods; Reductions on research and development expenses; Rights to carry forward and loss and offset for three consecutive years; Exemptions or relief of customs duties for import of machinery, equipment, instruments, spare parts, and materials required by the company.	There are tax exemptions and incentives applicable to the solar energy, for instance, corporate income tax (CIT) at 10% for 15 years and import goods exemption for the goods used in implementing the solar project etc.

Note: Source – Compiled by authors on the base of [2;3;8;11-18].

According to the analysis, both of the countries have several advantages and disadvantages according to different scenarios. Depending on the 'Jinko' Company current situation, it could be time to find the new large potential market for further growth. As Bill Gallery, Project Manager of Lighting Myanmar once said: one of the biggest challenges in Myanmar solar industry is the low-cost competition [17]. However, as 'Jinko' company already has its own research department and advanced technology, the quality and price of the product can be well adapted.

Moreover, there is 26.962 GW solar energy opportunity in Myanmar, according to the Bui Duy Thanh, Principal Energy Economist at ADB. The penetration of solar energy in Myanmar is increasing dramatically from 9% in 2014 to 25-27% in 2016 [18].

Therefore, it is suggested to invest in Myanmar solar market at the present time as it is a really new promising potential market. Again, being the early entrant in the fresh solar market would be one of the competitive advantages to become the market leader and it will enhance more brand loyalty and gain the most potential market share.

MARKET ENTRY STRATEGY

After deciding the country, the entry mode of the market is also one of the most critical factors for the market internalization strategy. Based on current situation analysis, we would like to recommend the Joint Venture Method to enter the Myanmar solar market as the 'Jinko' has little knowledge about the current solar market situation, distribution, local resources and most importantly, the relationship with the local government. As the solar energy projects are given as a tender by the local government, it is very important to have a good mutual strong relationship with the government. On the other hand, by doing a joint venture with the local solar company partner, 'Jinko' Company can already get the local solar networks and in a way, it can reduce costs and risks.

In addition, it could be found an appropriate partner in the local market and negotiate the flexible agreement with them. In the worst case, even if the project is failed, the company can exit the market with less cost according to the terms and condition signed in the contract, unlike the other entry market. Compared with other market entry method, the joint venture is more likely to be suitable for this case as the company can test entering the market that has promising potential market balanced with risks.

RISK IDENTIFICATION, ASSESSMENT AND MANAGEMENT

As there is a lot of potential in the solar industry in Myanmar, there are a lot of potential risks to be considered too. Potential risks are analyzed according to the PESTEL analysis. The key potential risk factors are mentioned below.

Political Perspective. Even though the political situation is unstable in some northern and western part of the country, but the population in those rural areas are few and there is no enough profitable market for those areas. There could be some cases to give gifts to the government authorities in order to get the news of the project or probably tender for the solar project. Therefore, it could make the extra cost to the company. The 'Jinko' mainly focuses on the large commercial solar energy projects, the relationship with government departments is critically important.

Economic Perspective. The economy GDP growth is relatively stable and increasing year by year according to the report. So, there is a relatively low risk in this area. During these days, the Myanmar government has officially announced the change of increase in minimum wages [10]. It is likely to be expected that the spending power of the consumers will be higher and the economy is in a growing stage.

On the other hand, the infrastructure is still not yet fully developed. So, it will have an effect on the organization in terms of transportation and delivering equipment.

Social Perspective. Myanmar has large young demographic populations which are young and energetic enough to work [11]. But, from another perspective, the working force still needs to be trained well in order to perform efficiently. The young working force has not prepared the skills and abilities that need to be used in the job, so, it could be expected that it may take time to train them.

Technology Perspective. Relating to the technology perspective of the solar energy segment, there is literally no energy production equipment being made in Myanmar. Most of them are all imported from the foreign countries like China, Thailand, India etc.

Environmental Perspective. As the solar energy production itself is very environmentally, there is a very low potential risk in the environment segment.

Legal Perspective. According to the Myanmar Investment Law [18], it encourages that foreigner to work together with local partners in terms of regulation and ownership. As it is going to operate the joint venture, it could get the benefits by working together with local partners. Myanmar government operation efficiency is mostly paperwork, so it can take more time than normal. In Table 4 it is presented the risk identification and assessment matrix.

Table 4 – Risk Identification and Assessment Matrix

Risk Identification	Impact on organization	Severity of impact	Likelihood/ Probability	Score
Political Perspective	Increase cost Time-consuming Low efficiency	A 100	80%	100
Economy Perspective (Poor infrastructure)	Need to invest more cost in operation and transportation which will result in higher price margin Time-consuming	A 100	70%	80
Social Perspective (Unprofessional working force)	Need to invest more training cost to develop the skills of the employees Time-consuming to develop professional skills	B 50	70%	80
Legal Perspective (Low-efficiency operation)	May take more time to complete official paperwork process Need to prepare more cost to do the government operation paperwork	B 50	70%	80

Note: Source – Compiled by authors on the base of [2;3;8;11-18].

According to the risk identification and risk assessment, the probability of the most potential risk that has 100 scores are not likely to be avoided and need to prepare ahead of it. Regarding the political and economic risk, there should be budget preparation and adaptation to change the plan in accordance with the situation change, as both of the risks cannot be transferred or avoided.

On the other hand, the social and legal risk can be somewhat transferred to the third party outsourcing service company. From the social perspective, the talented local employees can be recruited from the third party outsourcing company. Relating to the legal perspective, there are third parties who help to process the government procedures and follow up the progress. Those third parties service providers can make sure to complete the official paperwork processes within the time frame depending on different service fees. However, as 'Jinko' Company will have a joint venture relationship with the local partner, it can be assumed that the risks are being shared with the local partner.

CONCLUSION

In conclusion, it is seen there is a huge potential market to invest while there are totally high-risk factors that could have an impact on the investment. I believe that the higher risk, there will be a higher return. Also, there are solutions that can be managed to reduce the risks from occurring and achieve the objective. Therefore, the 'Jinko' Company is recommended to invest the solar energy sector in Myanmar with joint venture market entry method which is in a way sharing risks and could test entering the potential of Myanmar market.

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ТҮЙІН

Оңтүстік Шығыс Азияда күн энергиясын дамыту және нарықты кеңейту: Мьянма мен Вьетнам мысалында

Аталған мақала Мьянма мен Вьетнам мысалында Оңтүстік Шығыс Азияда күн энергиясын дамыту және нарықты кеңейтуге арналған. Мақаладағы зерттеу методологиясы Мьянма мен Вьетнамдағы күн энергиясы индустриясы контексінде салыстырмалы және жүйелі талдауға, себептер мен салдарды, статистикалық топтама әдістерін және сараптамалық бағалауды талдауға негізделген. Бұдан басқа, жұмыста PESTEL, SWOT, тәуекелдерді басқару әдістері, жүйелік және себептік-салдарлық талдаулар, сараптамалық бағалау қолданылған. Негізгі компания-өкілдерді қарастыруды, нарыққа кіру стратегиясын және Мьянма мен Вьетнам нарықтарының ерекшеліктерін анықтауды қоса алғанда нарыққа жан-жақты талдау ұсынылған. Тәуекелдерді сәйкестендіру және бағалау, сондай-ақ тәуекелдерді басқаруға талдау жүргізілген. Оңтүстік Шығыс Азияда күн энергетикасын дамыту үшін бизнесті дамытудың маңызды факторлары айқындалған. Тәуекелдерді басқару әдістері негізінде тәуекелдерді басқару және бақылау стратегиясы ұсынылған, сондай-ақ күн энергетикасы нарығын одан әрі кеңейту аясында одан әрі даму перспективалары қарастырылған

РЕЗЮМЕ

Развитие солнечной энергии и расширение рынка в Юго-Восточной Азии: на примере Мьянмы и Вьетнама

Данная статья посвящена развитию солнечной энергетики и расширению рынка в Юго-Восточной Азии на примере Мьянмы и Вьетнама. Методология исследования статьи основана на проведении сравнительного анализа существующих моделей макроэкономического развития, политических и социальных вопросов в контексте индустрии солнечной энергии в Мьянме и Вьетнаме. Помимо, в работе применены PESTEL, SWOT, методы управления рисками, системный и причинно-следственный анализы, экспертная оценка. Был представлен подробный анализ рынка, включая рассмотрение ключевых компаний-представителей, стратегии входа на рынок и выявление особенностей рынков Мьянмы и Вьетнама. Проведены идентификация и оценка рисков, а также анализ управления рисками. Выявлены значимые факторы развития деловой среды для развития солнечной энергетики в Юго-Восточной Азии. На основе методов управления рисками предложены стратегии по их управлению, а также рассмотрены перспективы последующего развития в рамках дальнейшего расширения рынка солнечной энергии.