

# **Revolutionizing Energy Storage in Southeast Asia: the Role of Korean Investment**

Dimas Yunianto Putro, MBA, PhD

Indonesian Professionals Association in South Korea (IPA KR)

## **Introduction**

Southeast Asia is a region characterized by rapid economic growth, which has led to an increased demand for energy. The energy sector in Southeast Asia is highly diverse, with a mix of fossil fuels and renewable energy sources. However, the region faces several challenges, including energy security, access, and environmental sustainability. To address these challenges, there is a growing need for investment in the energy sector, particularly in the area of renewable energy and energy storage technologies.

Korean investment in the energy sector in Southeast Asia is crucial for several reasons. Firstly, Southeast Asia is a key market for Korean energy companies, and the region's economic growth offers significant investment opportunities. Secondly, Korea's expertise in energy storage technologies can support the increasing use of renewable energy sources in the region. Finally, investment in the energy sector can strengthen the economic and strategic ties between Korea and Southeast Asia. Korea's energy sector is highly advanced, with a focus on technology and innovation. Korean companies have developed cutting-edge energy storage technologies, which can support the integration of renewable energy sources into the grid. In particular, Korean companies have expertise in lithium-ion battery technology, which is becoming increasingly important for energy storage applications. Furthermore, Korean companies have experience in exporting energy storage technologies, making them well-positioned to enter the Southeast Asian market.

Previous research has highlighted the potential for Korean investment in the energy sector in Southeast Asia. Several studies have examined the economic and environmental benefits of investment in renewable energy and energy storage technologies. These studies suggest that investment in the energy sector can create significant economic value and job opportunities in the region, while also reducing greenhouse gas emissions and enhancing energy security. However, there are also challenges associated with investment in the energy sector, including regulatory and policy barriers. Therefore, supportive policies and regulatory frameworks are needed to enable the deployment of energy storage technologies in Southeast Asia.

## **Korean Expertise in Energy Storage Technologies**

Korea's expertise in energy storage technologies has been a key driver of the country's energy sector growth. According to data from the International Energy Agency, South Korea was the 5<sup>th</sup> largest producer of energy storage systems in the world in 2020, with a production capacity of 4.7 GWh. The country's energy storage industry is expected to continue growing, with a projected annual growth rate of 31% from 2020 to 2025.

The potential benefits of Korean energy storage technologies in Southeast Asia are significant. According to a study by the Asian Development Bank, energy storage systems can help to integrate renewable energy sources into the grid, reduce energy costs, and enhance energy security in the region. The study estimates that the deployment of energy storage systems in Southeast Asia could lead to a reduction in carbon dioxide emissions by up to 66 million tons by 2030. In addition, there is significant market potential for energy storage systems in Southeast Asia. According to a report by Wood Mackenzie, the energy storage market in the Asia-Pacific region is expected to grow rapidly, with a projected capacity of 81 GW by 2030. The report notes that Korean companies are well-positioned to capture a significant share of this market, given their expertise in energy storage technologies and experience in exporting these technologies to other markets.

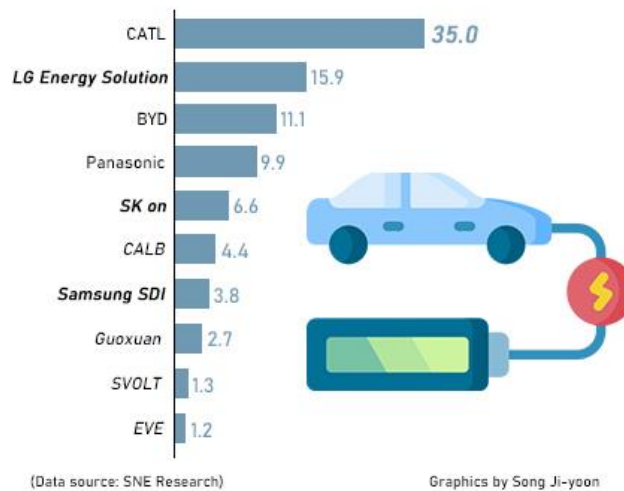
### **Opportunities for Korean Investment in Southeast Asia**

Potential areas of investment for Korea in the energy sector in Southeast Asia are diverse, ranging from fossil fuels to renewable energy sources. According to data from the ASEAN Centre for Energy, the region's primary energy demand is projected to increase by 50% by 2040, driven by population growth and economic development. The region's energy mix is also expected to shift towards renewable energy sources, with a projected increase in renewable energy capacity from 15% in 2017 to 32% by 2040.

In this context, potential areas of investment for Korea in the energy sector in Southeast Asia include renewable energy, energy storage, and energy efficiency. According to a report by the Korea Energy Economics Institute, renewable energy investment in Southeast Asia reached \$9.5 billion in 2020, with the majority of investment in solar and wind power. The report notes that there is significant potential for investment in energy storage systems and microgrids, which can support the integration of renewable energy sources into the grid.

In addition, investment in energy efficiency measures, such as building retrofits and industrial energy management, can help to reduce energy consumption and costs in the region. Potential benefits of Korean investment in the energy sector in Southeast Asia are also diverse, with both economic and strategic implications. According to data from the Korean Ministry of Trade, Industry and Energy, Korea's exports of energy-related goods to Southeast Asia reached \$11.2 billion in 2020, with the majority of exports in the oil and gas sector. Investment in the renewable energy sector can offer new opportunities for Korean companies to expand their exports to the region, while also contributing to the region's sustainable energy transition. Furthermore, Korean expertise in energy storage technologies can bring additional benefits to the region. Energy storage is critical for the integration of renewable energy sources into the grid, as it allows for the storage of excess energy produced during periods of high generation for use during periods of low generation. Korea is a global leader in energy storage technologies, with companies such as LG Energy Solution, SK On, and Samsung SDI being among the top global suppliers of lithium-ion batteries.

**Global EV battery market share (%) - Q1 2022**



**Figure 1.** Korea's 3 major electric vehicle battery makers.

The potential for Korean investment in the energy sector in Southeast Asia is significant, with opportunities for investment in renewable energy, energy storage, and energy efficiency. Korean expertise in energy storage technologies can bring additional benefits to the region, such as improved energy security and grid stability. Investment in the energy sector can also strengthen the economic and strategic ties between Korea and Southeast Asia. Therefore, it is essential for Korea to continue to explore and expand its investment opportunities in the energy sector in Southeast Asia, to contribute to the region's sustainable energy transition and promote cooperation between Korea and the region.

### Challenges and Limitations

According to data from the Korea International Trade Association, Korean investment in Southeast Asia's energy sector has been increasing steadily in recent years. In 2020, Korean companies invested approximately \$2.5 billion in Southeast Asia's energy sector, representing a 6% increase from the previous year. The majority of this investment went towards the development of power plants and the exploration of natural resources. However, Korean investment in Southeast Asia's energy sector is still relatively small compared to other countries such as China and Japan. According to the International Energy Agency, China and Japan invested \$12.8 billion and \$9.4 billion, respectively, in Southeast Asia's energy sector in 2020. This suggests that Korean companies still face significant challenges in competing with other major players in the region's energy sector.

Another challenge is the vulnerability of the energy sector to external factors such as changes in global oil prices and political instability. This unpredictability can make it difficult for Korean companies to plan and invest in the sector over the long term. Furthermore, the high level of investment required for large-scale energy projects can be a significant barrier for Korean companies, particularly smaller firms or those without significant financial resources.

Despite these challenges, there are also opportunities for Korean companies in Southeast Asia's energy sector, such as the region's growing demand for energy and the potential for investment in renewable energy sources. To mitigate the challenges and limitations faced by Korean investment, possible ways include the following:

1. Collaboration with local partners: Working with local partners can help Korean companies navigate the complex regulatory environment and build relationships with local stakeholders. This can help to reduce the risk and costs associated with investing in the region.
2. Focus on renewable energy: With the increasing global focus on renewable energy, Korean companies can prioritize investments in renewable energy projects in Southeast Asia, which can provide long-term sustainability benefits.
3. Government support: The Korean government can provide support and incentives to Korean companies looking to invest in Southeast Asia's energy sector. This can include financial assistance, market research, and diplomatic support to help navigate local regulatory environments.

## **Policy Implications and Recommendations**

Korean investment in Southeast Asia's energy sector has significant policy implications for both Korean and Southeast Asian governments. For Korean government, the investment in the region's energy sector can help to diversify their energy sources and reduce dependence on Middle Eastern oil. Additionally, the investment can strengthen Korea's economic ties with Southeast Asian countries and enhance diplomatic relations.

For Southeast Asian governments, Korean investment in the energy sector can bring in much-needed investment and expertise to support the development of the region's energy infrastructure. Furthermore, the deployment of energy storage technologies in the region can help to increase energy security and reduce the reliance on fossil fuels. However, the deployment of energy storage technologies can also pose challenges in terms of regulatory frameworks and policies.

To enable the deployment of energy storage technologies in Southeast Asia, supportive policies and regulatory frameworks are required. According to a report by the ASEAN Centre for Energy, current policies and regulations in Southeast Asia are inadequate to support the deployment of energy storage technologies. The report suggests that supportive policies and regulations should include the following:

1. Feed-in-tariffs and net-metering schemes: These policies can incentivize the adoption of renewable energy and energy storage technologies by providing financial incentives to users.
2. Standards and guidelines for energy storage: Regulations need to be in place to ensure that energy storage technologies can be integrated into the grid safely and effectively. This includes the development of technical standards and guidelines for the installation and operation of energy storage systems.

3. Support for grid modernization: The deployment of energy storage technologies requires modernization of the grid infrastructure to accommodate the increased flexibility and reliability of the grid.

## Conclusion

The main findings of the analysis suggest that Korean investment in Southeast Asia's energy sector can bring significant benefits for both Korean and Southeast Asian governments. The deployment of energy storage technologies can provide improvements in energy security, reduction in greenhouse gas emissions, and enhance the flexibility and reliability of the grid. However, the deployment of energy storage technologies also poses challenges in terms of policies and regulatory frameworks. Supportive policies and regulatory frameworks need to be in place to ensure the effective integration of energy storage technologies into the grid. The implications for Korean investment in Southeast Asia's energy sector are that the Korean government should prioritize supportive policies and regulatory frameworks in its investment strategy. By doing so, Korean companies can take advantage of the significant potential for energy storage in the region and contribute to the transition to a low-carbon energy system. Additionally, these policies can strengthen economic ties between Korea and Southeast Asian countries and enhance diplomatic relations.

## References

1. International Renewable Energy Agency (2018). Energy Storage Deployment in Southeast Asia. Available at: [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jun/IRENA\\_Energy\\_Storage\\_Deployment\\_in\\_Southeast\\_Asia\\_2018.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jun/IRENA_Energy_Storage_Deployment_in_Southeast_Asia_2018.pdf).
2. ASEAN Centre for Energy (2019). Energy Storage Technologies for Southeast Asia: Policies and Regulations. Available at: [http://www.aseanenergy.org/wp-content/uploads/2019/07/Energy-Storage-Technologies-for-Southeast-Asia\\_Policies-and-Regulations.pdf](http://www.aseanenergy.org/wp-content/uploads/2019/07/Energy-Storage-Technologies-for-Southeast-Asia_Policies-and-Regulations.pdf).
3. Korea Trade-Investment Promotion Agency (2020). Investing in Southeast Asia's Energy Sector. Available at: [https://www.kotra.or.kr/portal/download/Kotra\\_Today/2020/KT20200627.pdf](https://www.kotra.or.kr/portal/download/Kotra_Today/2020/KT20200627.pdf).
4. The Korea Herald (2021). South Korea to invest \$10.5 billion in Southeast Asia's green energy sector. Available at: <https://www.koreaherald.com/view.php?ud=20210601000735>.
5. The Diplomat (2019). South Korea's Green Energy Diplomacy in Southeast Asia. Available at: <https://thediplomat.com/2019/07/south-koreas-green-energy-diplomacy-in-southeast-asia/>.