


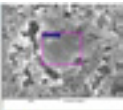

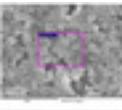


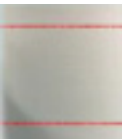


# Invest KOREA Market Place

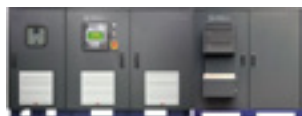
Invest Korea Market Place (IKMP) is an online business matching platform available on Invest KOREA's website with information on approximately 300 Korean companies seeking to partner with foreign investors. This month, Invest Korea introduces some outstanding companies in Korea's secondary battery industry.

COMPANY A		Investment Requirement		Company Profile	
 <i>Silicon metal powder</i>  <i>Fine silicon metal powder</i>  <i>si + C powder</i>	<b>Amount</b>	USD 3.2 million	<b>Patents and Certificates</b>	Method to manufacture silicon-combined materials and a method and device to manufacture silicon powder (11 patents)	
	<b>Investment Structure</b>	Minority, M&A	<b>Financial Performance</b>	(Sales in 2018) USD 1.55 million	
<b>Investment Highlights</b> <ul style="list-style-type: none"> <li>• <b>Nano silicon powder:</b> Nano silicon powder is a substitute that can overcome the limited capacity of carbonaceous anode materials of the lithium-ion battery. The applications of the rechargeable battery vary ranging from small-sized products, such as smartphones, tablet PCs, laptop computers, wearable devices, and drones, to medium- and large-sized products such as electric vehicles, hybrid vehicles, and energy storage systems.</li> <li>• <b>Lithium-ion battery (for electric vehicles) market:</b> The increasing interest in eco-friendly vehicles, along with the rapid development of related technologies and the size of the global lithium-ion battery (electric vehicles) market, is expected to reach 54.3GWh in 2020 from 15.7 GWh in 2016, with an average annual growth rate of 36.4%.</li> </ul>					

COMPANY B		Investment Requirement		Company Profile	
<b>Competitor</b> Binder-boehmite melting  	<b>Our company</b> Uniform binder-boehmite mixture  	<b>Amount</b>	USD 3 million	<b>Patents and Certificates</b>	<ul style="list-style-type: none"> <li>• Certificate of R&amp;D Center and Venture Business</li> <li>• Applied for 2 patents for coated separators for mid-/large-sized EV and ESS secondary batteries and a manufacturing method</li> </ul>
<i>Technology for uniform coatings</i>		<b>Investment Structure</b>	Minority, Joint Venture, M&A	<b>Financial Performance</b>	(Sales in 2018) USD 0.16 million
<b>Competitor</b> Nonuniform coating thickness can increase the percent defective. 		<b>Investment Highlights</b> <ul style="list-style-type: none"> <li>• <b>Growing high-capacity battery market along with the increasing demand for a coated separator:</b> The size of the demand for a coated separator for secondary batteries is expected to increase to 4,776 Mm<sup>2</sup> in 2020 from 1,022 Mm<sup>2</sup> in 2015, with an average annual growth rate of 36.1%. Particularly, the value of the EV market is projected to grow to KRW 35 trillion in 2020, with the value of the ESS market to KRW 28 trillion.</li> <li>• <b>Premium separator technology with a long life span and high safety:</b> The company has a patent for a key battery separator and can independently manufacture a slurry, crucial mixture in a separator coating process. In addition, it can directly design important processes of separator coating facilities and manufacture a variety of premium-coated separators.</li> </ul>			
<b>Our company</b> Uniform coating thickness of ± 1.5 μm reduces the percent defective. 		<i>Comparison of the quality of wrinkles in coatings</i>			

COMPANY

C



EGO-EP-100K EGO-P-100K (Outdoor PCS system) EGO-125K (Outdoor Battery system)

### Outdoor all-in-one ESS



### Home ESS

Investment Requirement		Company Profile	
<b>Amount</b>	USD 4.5 million	<b>Patents and Certificates</b>	5 patents under registration including a patent for a battery management system
<b>Investment Structure</b>	Minority	<b>Financial Performance</b>	(Sales in 2018) USD 0.86 million

#### Investment Highlights

- Marketability of the energy industry:** At present, the energy storage system (ESS) is an effective means of establishing a stable and efficient energy supply/demand system, and is attracting global attention as a new growth engine with high market potential. Today, secondary battery based electricity storage methods are drawing attention, and the market environment is being created in earnest, especially focusing on lithium ion batteries that feature high energy density and high efficiency. Recently, as lithium ion battery applied ESSs have been intensively installed in Korea and around the world, the demand for lithium ion batteries among global ESSs is expected to grow at an annual average of 97.2% increasing to 11,420 MWh by 2020.
- Strengths of the energy storage systems (ESS) market:** As solar power or wind power cannot continue to generate energy, it is important to store the generated electricity before using it as needed. Thus, the ESS market is expected to rapidly grow in conjunction with the expansion of new and renewable energy. The rapid growth of the Korean market is attributable to the government's policy intended to increase the dissemination of new and renewable energy and ESSs since 2016. Technological infrastructure for ESS batteries is superior in terms of selling prices and profitability.

COMPANY

D



### All-solid-state electrolyte



### Token cell for all-solid-state batteries



### All-solid-state batteries

Investment Requirement		Company Profile	
<b>Amount</b>	USD 2.5-4.2 million	<b>Patents and Certificates</b>	Registration (or application) of 11 domestic patents and a technology transfer/patent, along with one Patent Cooperation Treaty (PCT) application
<b>Investment Structure</b>	Minority	<b>Financial Performance</b>	(Sales in 2019) USD 9.39 million

#### Investment Highlights

- All-solid-state lithium-ion secondary battery:** Our company has successfully developed a garnet-type oxide-based solid electrolyte material, which is the key technology for all-solid-state lithium-ion secondary batteries. Because the solid-state electrolyte material has been proven safe for medium-to-large-capacity battery technology, it ensures excellent technological competitiveness. The technology transfer from the Korea Institute of Industrial Technology (KITECH) and our garnet-type oxide-based solid electrolyte material have improved the ionic conductivity of the existing liquid-state electrolyte and expressed a high voltage through a wider potential window.
- All-solid-state lithium-ion secondary battery market:** According to SNE Research, the lithium-ion secondary battery market is projected to reach USD 250 billion by 2030 from USD 24 billion in 2018, with a compound annual growth rate (CAGR) of 21% during the forecast period. The stability issue of lithium-ion secondary batteries with liquid electrolytes has resulted in active and rigorous studies on solid electrolytes for lithium-ion secondary batteries locally and abroad. Because of the spread of electric vehicles and the rapid growth of the energy storage system (ESS) market, Hyundai Motor Company, Samsung SDI, and LG Chem are focusing on the commercialization of all-solid-state lithium-ion secondary batteries, which will increase the value of the all-solid-state battery market.