Lithium Battery Equipment Industry Enters Into a Golden Age

Wuxi Lead Intelligent Equipment: Lithium Battery Equipment Market To Exceed RMB 13 Billion In 2016
Feb. 22, 2016

On February 18, Wuxi Lead Intelligent Equipment disclosed in Investor Relations Activity Record that demand for power lithium batteries would keep increasing in the next three years, and energy storage batteries tended to develop rapidly with cost reduction. The lithium battery equipment market is expected to reach **RMB 13 billion** in 2016, with demand mainly from domestic market. Currently, the company operates in full capacity, with 70-80% orders from the lithium battery equipment (motive lithium battery equipment accounted for more than 60%). Due to capacity constraints, the company’s capacity mainly produces high-margin products. In terms of market share, its **winding products accounted for 50%** of intelligent lithium battery equipment.

Industry 4.0 Becomes Catalyst For Lithium Battery Equipment Industry
Sep. 9, 2016

"Industry 4.0" is a subversive transformation and upgrading of intelligent production capitalizing that is based on traditional industrialization but involves the Internet of Things.

With development of large-scale and power lithium batteries production, its equipment industry will develop towards the trend of high-precision, full automation and intelligence in line with **"Industry 4.0"**. Industry 4.0 will not only greatly improve the level of intelligent production of battery manufacturers, but also improve the quality and performance of lithium battery production equipment. **Automation and intelligence level will be the core competitiveness** of lithium battery equipment manufacturers.

Yinhe Acquires 100% Stake In Areconn For RMB 438 Mln
Nov. 6, 2016

Yinhe acquired Areconn on December 1, 2016. Audited by China Securities Regulatory Commission, Yinhe was approved to buy the asset by issuing shares and paying cash, and to raise corresponding funds. The two companies can complement each other’s advantages, and share resources, to give full play to synergies in terms of brand, technology, R&D, channel and customers and to form economies of scale by combing the focus of development so as to avoid vicious competition and efficiently manage capacity and asset allocation of both parties. It will help provide a more solid foundation for creating **the strongest lithium-ion battery intelligent production line in China**.
Lithium battery production equipment can be classified into front-end equipment, mid-range equipment and back-end equipment, applied in chip production, cell assembly, cell activation detection and battery packaging, respectively.

Lithium battery equipment production in China has entered into maturity stage, and the technology improves to international level.

Cost per KWh of lithium battery drops. Power battery will become the future growth point of lithium battery market, which will benefit lithium battery equipment industry.

- The cost of Ni-MH and nickel-cadmium batteries per kWh fell slightly, while that of lead-acid battery rose. Cost of Li-ion battery per kWh dropped by 40% YoY, boosting its economic efficiency.

- China’s lithium battery capacity is estimated to reach 25GWh in 2016, up 49.8% YoY, accounting for 45% in all applications. Moreover, it will maintain rapid growth afterwards, and be a major growth point, which will benefit lithium battery equipment industry.

Despite decentralized competition in domestic lithium battery market, concentration rate of stand-alone machine is high. Potential market size of lithium battery manufacturing equipment is to reach 50 billion during 13th 5-Year Plan.

- Domestic lithium battery market competition pattern is decentralized but the concentration ratio of stand-alone machine equipment is high. Specifically, market share of the top 3 producers amounts to 50%.
- Investment cost of lithium battery equipment is about RMB 400 million/GWh. Lithium battery capacity plan during 13th Five-Year Plan will bring RMB 80 billion in lithium battery equipment investment, and the investment stemmed from the demand for lithium battery is conservatively estimated to be at least RMB 50 billion.
- Power lithium battery equipment market tends to keep in the lead, with RMB 10 billion estimate and RMB 12 billion estimate in 2016 and 2017 respectively. 3C digital lithium battery equipment has entered into the replacement cycle, and the replacement market size will reach RMB 2.88 billion in 2016 and RMB 3.97 billion in 2017. Energy storage lithium battery equipment market is expected to expand after 2018.
- Coater, winder and activation capacity testing equipment account for 70% of the cost of lithium battery production line equipment. With the improvement of domestic coating machine and winding machine, China is expected to achieve import substitution.

Development trend of lithium production equipment industry is integration, automation and whole-line mode.

- As enterprises consolidation in lithium battery equipment industry is accelerated, listed companies with good financing channels expand rapidly, thus market share tends to centralized in listed companies.
- Lithium battery equipment automation will help enhance the uniformity of lithium battery products while reduce labor costs, and improve product qualification rate.
- Whole-line mode of lithium battery equipment can reduce the construction time cost and realize equipment modularization, increasing production efficiency and gross margin.
# Table of Contents

1. **Application and Development**  
   - Page 5

2. **Market Analysis**  
   - Page 8

3. **Enterprise Case Studies**  
   - Page 15

4. **Industry Opportunity Exploring**  
   - Page 20
Lithium battery production process can be divided into pole piece manufacturing, cell assembly, cell activation detection and battery packaging.

Front-end equipment: highlight coater
- Front-end equipment has a vital impact on the performance of cell. Domestic equipment still needs improvement in efficiency, accuracy, stability and other aspects compared to that of foreign countries.
- Coater is in the upgrade stage. Extrusion coater is more preferred due to a higher accuracy, thinner coating and lower energy consumption.

Medium-end Equipment: highlight winder and laminator
- Market size is small and domestic equipment is in import substitution stage. Some domestic equipment are capable to compete against imported products.
- Winder is of high efficiency in battery production and is promising in the near term under tightened lithium battery capacity; batteries produced by laminator have better performance, promising in the long run.

Rear-end equipment: highlight PACK (battery assembly)
- Higher degree of localization; the gap between domestic and foreign equipment is small; large market size for test equipment
- PACK does not belong to lithium battery production process in theory. Artificial assembly line is insufficient due to the outbreak of new energy vehicles, so automated battery assembly line is the development trend.
China's lithium battery equipment industry entered a mature stage, and technology moved toward international level

<table>
<thead>
<tr>
<th>Stage</th>
<th>Year(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank Stage</td>
<td>1997</td>
<td>In this stage, there was barely any professional lithium battery equipment manufacturer. Lithium battery equipment mainly relied on imports. Some domestic machinery manufacturing enterprises cooperated with battery manufacturers and lithium battery research institutes in research and development of lithium battery manufacturing equipment.</td>
</tr>
<tr>
<td>Introduction Stage</td>
<td>2002</td>
<td>With the rapid development of lithium battery industry, battery equipment manufacturing industry has gradually developed. Some companies hired experts from Japan to accelerate the polish up the domestic lithium battery equipment technology. Hence, medium- and low-end equipment formation emerged then and China even exported a few products abroad, evidencing the rapid pace of lithium battery equipment industry in China.</td>
</tr>
<tr>
<td>Growth Stage</td>
<td>2009</td>
<td>Domestic lithium battery capacity expanded fast with policy support. Lithium battery production equipment basically realized localization. Some domestic lithium battery equipment manufacturers shift to research and development of more advanced fully automated lithium battery equipment, lifting the quality of domestic lithium battery equipment to international high-end level.</td>
</tr>
<tr>
<td>Maturity Stage</td>
<td>2015</td>
<td>Although domestic equipment still needs improvement in most high-end lithium battery equipment fields, the gap between domestic and international level has narrowed significantly. The performance of products in some specific fields has been very close. With continuous development of domestic equipment technology, import substitution of high-end products will turn out possible.</td>
</tr>
<tr>
<td>so far</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Table of Contents

1. Application and Development  
2. Market Analysis  
3. Enterprise Case Studies  
4. Industry Opportunity Exploring
Cost per KWh of Li-ion battery dropped apparently; power battery is the main growth point in the future, benefiting lithium battery equipment industry.

<table>
<thead>
<tr>
<th>Changes in Battery Cost per kWh of Various Battery Types in China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric cost (RMB/KWh)</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>2015</td>
</tr>
<tr>
<td>2016</td>
</tr>
</tbody>
</table>

Sources: Zheshang Securities, public data, SMM

- Cost of lead-acid batteries rose over 30% in 2016 due to rising lead prices, with electric cost up RMB 260/KWh.
- Electricity cost of Ni-MH, nickel-cadmium batteries decreased slightly as raw material costs declined due to oversupply.
- Electricity cost of lithium-ion battery fell 40% YoY in 2016 thanks to technological progress and industrial scale, and this greatly enhanced its market competitiveness.

- Lithium-ion battery is mainly used in three fields: power, energy storage, 3C products
- Power lithium-ion battery capacity in China is expected to reach 25GWh in 2016, up 49.8% YoY, and will maintain rapid growth in the future.
- The proportion of motive lithium-ion battery rose from less than 10% in 2011, to 45% in 2016, and is expected to expand further in the future and become the main growth point of lithium-ion battery market. This will benefit li-ion battery equipment industry.
Domestic lithium battery equipment market competition pattern is dispersed, and enterprises focus on classified equipment market.

- Lithium-ion battery equipment has almost realized production localization. Domestic market competition pattern is dispersed. The number of enterprises is large, but that with the core technology and of large scale is limited. Market competition focused on classified production equipment.

- Market concentration of stand-alone lithium battery equipment is high. The market share of the top 3 companies amounted to 50%. Whilst, different companies produce different lithium battery equipment. For instance, coating machines are mainly produced by Katop, HAONENG and Areconn while winders are mainly produced by Lead Intelligent Equipment, Yinhe and Areconn.

- Profitability at lithium-ion battery equipment industry has been considerable since 2014. With supply surplus and higher entry barrier for the lithium-ion battery industry in 2016, low-end battery capacity hampers or suspends expanding. It will affect some SMEs with weak technology, which is less likely to approach to first-tier products. SMEs are expected to be merged or forced out of the market from 2017, with Li-ion battery of the lithium-ion battery equipment on the rise.

---

**Market Share of China Lithium Battery Equipment, 2016**

- Overseas companies
- Lead Intelligent Equipment
- Areconn
- Geesun
- Katop
- Yinhe
- HAONENG
- Other domestic companies

Sources: CICC, Guotai Junan Securities, public data, SMM

**Market concentration of Lithium Battery Equipment in China, 2016**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>CR3</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winder</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>Roller press</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>Splitting machine</td>
<td>65%</td>
<td>35%</td>
</tr>
<tr>
<td>Coating machine</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Sources: CICC, Guotai Junan Securities, public data, SMM

Note: CR3 denotes the concentration degree of three enterprises in the market. For the above-mentioned different production equipment market, the corresponding enterprises vary.
In terms of end-user demand for lithium-ion battery, the incremental demand amount will be at least 85GWh during 13th Five-Year Plan, and the corresponding lithium battery equipment investment will exceed RMB 30 billion.

In actual investment, increment of lithium battery capacity may be more than the demand for lithium battery. Besides, regarding of the upgrading of some equipment, conservative estimation on the potential incremental market size will be RMB 50 billion or more.
Li-ion Power battery production equipment keeps in the lead and 3C digital Li-ion battery enters update cycle

- Incremental capacity of power Li-ion battery is 25GWh and 30GWh in 2016 and 2017 respectively, according to statistics, and the market size of power Li-ion battery production equipment is RMB 10 billion and 1.2 billion respectively, measured by unit investment cost of 400 million per GWh.
- Power Li-ion battery has larger potential than 3C digital and energy storage battery, as is expected to expand rapidly.

- With shipments of 3C digital products entering low-speed growth tunnel, the incremental capacity sees 2GWh per year with equipment investment at RMB 400 million.
- 3C digital Li-ion battery enters update cycle. Replace demand for 3C digital Li-battery production equipment will be 2.88 billion in 2016 and 3.97 billion in 2017, at the replacement rate of 20%.

- Lithium battery energy storage is widely applied in business and household. Despite the slow pace at present, with the national power price reform and the improvement in cost performance of energy storage equipment, energy storage commercialization growth will see acceleration and will be a new growth point in demand for lithium battery.
- Energy storage demand is expected to release after 2018 and to reach 11GWh by 2020. Corresponding demand for lithium battery production equipment will be during 13th Five-Year Plan. RMB 2.4 billion

Data Source: Company announcements, CICC, SMM

© SMM. All rights reserved.
Coater, Winder and Activate Grading & Testing Equipment Occupies Large Market Share

Cost Breakdown of Domestic Lithium Battery Production Equipment

- Coater: 30%
- Winder: 20%
- Transverse Cutting: 20%
- Assembling and Drying: 10%
- Coating & Testing Equipment: 10%

In the domestic lithium battery production line, equipment cost takes up a high proportion. Specifically, coater, winder and activate grading & testing equipment accounting for 30%, 20% and 20% of total cost respectively, amounting to 70% of total production equipment cost.

Localization rate of coater and winder is merely 50% at present, while imported equipment price is several times higher than domestic equipment. Domestic equipment performance has approached to international level, which will lower the import substitution cost afterwards.

Coater and Winder to Realize Import Substitution

Estimated Market Potential on Lithium Battery Production Equipment, 2016-2017

- RMB 13.53 billion in 2016 and RMB 16.73 billion in 2017 (see the previous content) as the basis, market potential for coater will be RMB 4.06 billion and RMB 5.02 billion in 2016 and 2017 respectively, and that for winder will be RMB 2.7 billion and 3.3 billion in 2016 and 2017 respectively, and activate grading & testing equipment RMB 2.7 billion and RMB 3.3 billion in 2016 and 2017 respectively.

- Most high-end coaters and winders used in China are imported from Japan and South Korea. Whilst, domestic equipment can compete against importers by better service and lower prices in similar performance. However, localization rate of grading & testing equipment has already exceeded 90%, with domestic brands competing against each other.
Integration, Automation and Whole Line for Lithium Battery Production

**Integration**

- **Market Share To Centralized In Listed Companies:** Around 300 producers involve in lithium battery production equipment in China, but most of them earn revenues under RMB 100 million. Listed companies, having good financing channels, are easy to gain market shares though expansion.

<table>
<thead>
<tr>
<th>Time</th>
<th>Buyer</th>
<th>Acquired Company</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2015</td>
<td>Zhiyun Automation</td>
<td>Geesun</td>
<td>54%</td>
</tr>
<tr>
<td>March 2016</td>
<td>Han’s Laser</td>
<td>Dongguan Junzhuo</td>
<td>51%</td>
</tr>
<tr>
<td>April 2016</td>
<td>Kanhoo Industry</td>
<td>Haoneng Technology</td>
<td>100%</td>
</tr>
<tr>
<td>May 2016</td>
<td>Yinghe Technology</td>
<td>Areconn Precision Machine</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Data Source: Company Announcement, CICC, SMM*

**Automation**

- **Promoting Product Uniformity:** Producers should use fully-automatic equipment to ensure product consistency as power lithium battery is required to possess high uniformity.
- **Reducing Labor Cost and Increasing qualification ratio:** Automatic lithium battery production equipment will increase uniformity, reduce labor costs and promote qualification ratio.

**Whole Line**

- **Reducing Construction Time:** The complete line will help reduce equipment purchase, installment and testing time.
- **Benefiting Equipment Modularization:** whole-line mode will help realize the modularization, substantially increasing production efficiency and gross margin.

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 2015</td>
<td>Its 1st phase of Li-battery production equipment base</td>
<td>It took only 4 months from contract signed to installation adjusted, but if adopted imported segmented equipment, it would take a year and half.</td>
</tr>
<tr>
<td></td>
<td>started trial operation, the equipment provide by Yinghe Technology.</td>
<td></td>
</tr>
<tr>
<td>May 2016</td>
<td>Approving to set up team to formulate standardization for complete line of lithium battery production.</td>
<td>To promote standardizations on lithium battery production equipment, and this will help complete line to open market.</td>
</tr>
</tbody>
</table>

*Data Source: Essence Securities, SMM*
# Mainstream Companies at Home and Broad

<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>Main Products</th>
<th>Major Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaido Manufacturing</td>
<td>Japan</td>
<td>Winder, Double-layer Capacitor Winder, Automatic machinery, Air-actuated Control, Fluid And Labor-saving System, Lithium-ion Battery Winding Machine</td>
<td>Hitachi</td>
</tr>
<tr>
<td>CKD</td>
<td>Japan</td>
<td>Winder, Capacitor Winder, Electrolytic Capacitor Winder, Li-ion Primary Battery Winder, Primary Assembly Machine</td>
<td>Nissan, Toyota</td>
</tr>
<tr>
<td>Koem</td>
<td>South Korea</td>
<td>Winder, Capacitor Winder, Electrolytic Capacitor Winder, Li-ion Primary Battery Winder, Primary Assembly Machine</td>
<td>-</td>
</tr>
<tr>
<td>Areconn Precision Machine</td>
<td>China</td>
<td>Coater, Roller Press, Pelleter, Slitting Machine, Winder, AIO Machine Of Soldering and Winding</td>
<td>ATL, BYD, Coslight Battery</td>
</tr>
<tr>
<td>Sevenstar Electronics</td>
<td>China</td>
<td>Agitator, Coater, Roller Press and Filling Machine</td>
<td>Panasonic, China Aviation Lithium Battery, Shandong Wina, Tianjin Lishen, Guoxuan High-Tech</td>
</tr>
<tr>
<td>Katop Automation Technology</td>
<td>China</td>
<td>Coater</td>
<td>ATL, CATL, BYD, BIC</td>
</tr>
<tr>
<td>HangKe Technologies</td>
<td>China</td>
<td>Sorting and Testing Machine, Digital Products Formation and Testing, Motive Li-battery Formation and Testing</td>
<td>Sony (Wuxi), LG (Nanjing), SDI (Tianjin, Tianjin Lishen, ATL, China Aviation Lithium Battery</td>
</tr>
</tbody>
</table>

**Note:**
- Japanese and South Korean Producers pay more attention on industry subdivision and expand business in high-end market with **advanced technology and clear direction**.
- Most domestic enterprises produce low- and mid-end equipment and eye on **integration of production line** afterwards, with technology awaiting improvement.
Chinese Representative Enterprise: Yinghe Technology

**Company Profile**

- **Headquarter**: Shenzhen, Guangdong
- **Market Value**: RMB 7 billion
- **Main Business**: Kernel equipment for Li-battery production, including winder, coater and pellete\r
- **Partnership**: Guoxuan High-Tech, OptimumNano Energy, BYD, ATL and other Chinese mainstream Li-battery producers

**Development Process**

- Established in 2006, focus on the R&D, production and sales of automatic equipment
- During 2007-2008, successfully developed the first batch of automatic Li-battery equipment and was awarded as Shenzhen High-Tech Enterprise.
- During 2009-2010, pellete, lamination machine, coater and cutter came into the market successively; provide complete set of automatic Li battery production equipment
- In 2015, officially listed on GEM
- In 2016, announced to acquire Dongguan Areconn Precision Machine (Li-battery equipment producer) with RMB 438 million.

**Bellwether of Chinese New Energy Equipment Industry: Yinghe Technology**

- Complete Set of Li-ion Battery Production Equipment Line
  - Branched in Jiangxi and Huizhou take charge of front-end and mid-equipment
  - Shenzhen HuiHe Intelligent Tech focuses on the development of MES and BMS
  - Sinpo involves in **liquid filling machine and cylindrical winding**.
  - DongGuan Areconn Pml Precision Mechanism focuses on development of **high-end facilities**
- Automation of Li-ion battery production equipment (robots + software control):
  - Huizhou DingHe Intelligent Equipment involves in R&D of automatic production line of rear-end Li-ion battery and **PACK**

**Industrial Distribution**

- **Complete Set of Li-ion Battery Production Equipment Line**: Branch in Jiangxi and Huizhou take charge of front-end and mid-equipment
  - Shenzhen HuiHe Intelligent Tech focuses on the development of MES and BMS
  - Sinpo involves in **liquid filling machine and cylindrical winding**.
  - DongGuan Areconn Pml Precision Mechanism focuses on development of **high-end facilities**

**Business Operation**

- **Profits Source**:
  - **Sectional Li-Battery Production Equipment**: winder and coater, high output, despite fierce competition
  - **Complete Set of Li-Battery Production Equipment**: including a set of front-end, mid- and rear-end equipment, high superiority and profitability
  - **Equipment Upgrade**: helping Li-battery production equipment be automatic and enhancing productivity

**Company Status**: experts in Li-ion battery production equipment and has attained achievements. It acquired Areconn Precision Machine via horizontal expansion recently to reinforce the advantages in Li-ion battery facilities.
Chinese Representative Enterprise: Lead Intelligent Equipment

**Company Profile**
- **Headquarter**: Wuxi, Jiangsu Province
- **Market Value**: RMB 14 billion
- **Main Business**: Kernel equipment for Li-battery operation, including coater, pelletter, agitator, PV automatic equipment and thin film capacitor automatic equipment
- **Partnership**: Samsung, ATL and BYD

**Development Process**
- Established in 2002, successfully designed AC capacitor auto testing equipment.
- During 2004-2006, designed various supporting equipment for capacitors.
- Successfully designed WHC500 high voltage auto winding M/C to substitute imported equipment.
- In 2008, expanded business into Li-ion battery industry and set up Li-ion battery division, with winder exporting to US.
- During 2008-2013, reinforced R&D, developed various kinds of Li-ion battery production equipment and was rewarded "Jiangsu pilot small and medium-sized IT enterprise".
- The company listed on the Shenzhen Stock Exchange in 2015.

**Industrial Distribution**
- **Lead Intelligent Equipment—Superior Capacitor Producer**
  - **Automatic Capacitor Equipment**: film slitting machine and winder
  - **Automatic Li-Battery Production Equipment**: winder and coater
  - **Automatic PV Production Equipment**: high-speed tabber and stringer and capacitor testing equipment
- Company’s core product is winder, whose performance approaches to imported equipment’s level. The company will expand R&D on other core equipment, and coater and testing equipment will be the major objectives.

**Business Operation**
- **Company Status**: It started up with film capacitor equipment and then expanded business into Li-ion battery and PV automotive production equipment with income increased to RMB 1 billion in 2016 from RMB 130 million in 2013.
- **Profits Source**:
  - **Automatic Capacitor Equipment**: already developed, the market is small but income flows are stable
  - **Li-ion Battery Production Equipment**: The fifth generation of winder has high cost-performance ratio and enables import substitution; coater and other rear-end equipment contribute to part of revenue
  - **Automatic Photovoltaic Production Equipment**: Supply automatic products and will benefit from the development of photovoltaic industry.
Chinese Representative Enterprise: CKD

Company Profile
- **Headquarter**: Japan
- **Capital Fund**: JYP 11.16 Bln
- **Main Business**: Automatic machinery, labor-saving machinery, pneumatic control components, drive element and Li-ion battery production equipment
- **Partners on Winder**: Nissan, Toyota and Chinese Li-ion battery production equipment producers

Development Process
- Cofounded in 1943 by 5 Japanese enterprises with investment at JPY10 million
- Renamed the company "CKD Corporation in 1979 and listed on Tokyo Stock Exchange
- Built branch in Malaysia, US and Thailand during 1984-1989
- Merged and acquired several factories during 2000-2001
- The company expanded business further and set up branches in China, India, Vietnam, Singapore and Indonesia during 2002-2015

Global Leading Brand of High-End Winder: CKD

Industrial Distribution
- **Component Product**: Pneumatic components and labor-saving components
- **Automatic Machinery**: industrial machinery, **Lithium-ion battery winding machine**, solder paste inspection machine, pharmaceutical, medical and food packaging machine, lamp manufacturing equipment
- Its business coverage is diversified, but its Li-ion production equipment only depends on winder. The technology is advanced with high market recognition and considerable market share

Business Operation
- **Company Status**: Global automatic machine and pneumatic component supplier. The company has business in regions across the world with advanced technology.
- **Profits Source**:
  - **Component Product**: Global component product supplier, occupying large share in global market.
  - **Automatic Machine**: The company has world advanced technology on winder, occupies a part of market share in China but the price is comparatively high. With the realization of import substitution, its profit will be eroded.
Content

1. Application and Development 5
2. Market Analysis 8
3. Enterprise Case Studies 15
4. Industry Opportunity Exploring 20
Investment Opportunity and Superior Enterprises

High-End Li-Battery Manufacturing Equipment

1. Coater
   - Coaters start upgrading, and extrusion coaters are preferred. Currently, high-end coaters are still dominated by foreign enterprises but the domestic firms have advantages in cost and service.

2. Winder
   - Several domestic winders enable their property to approach to that of imported equipment, and have significant advantage in price and service, with import substitution expected to realize.

Automation and Integration of Li-Battery Production Equipment

1. Automation of Li-Battery Line
   - Automation of Li-battery manufacturing equipment will enhance the uniformity of the Li battery products, reduce labor costs and improve the qualified rate.

2. Integration of Li-Battery Line
   - The integration of Li-battery production equipment line helps reduce time cost, reach consistency of production equipment and increase production efficiency and gross margin.

Li-Battery Producers

1. Lithium Battery Producers adopting automation and integration techniques
   - Lithium battery industry is in expansion. The companies that adopt the automation and integration techniques to produce Li battery can take apparent advantages not only in construction cost but also in production efficiency, which brings considerable return to themselves.

Superior Enterprises:

- **Yinghe Technology**: a leader of high-end Li-battery production equipment and supplier for integrated production line, acquired 100% stake of Dongguan Areconn Precision Machine, forming complementary advantages in product lines and strong synergy effect in clients channels, procurement and production. The alliance between giants will foster the integrated production line project conducted successfully.

- **Lead Intelligent Equipment**: involves in R&D and sales of automatic complete production line and has a serious of core technology. The company’s products, including automatic winder, approach to international advanced level with high market recognition. Lead plans to acquire JOT with EUR 52.04 million to expand business of automatic equipment further.

- **Lihe Group**: its subsidiary Zhuhai Higrand is planning to list on New OTC Market. The company is in the lead in sectors such as including winder and pellete, and has large room for import and low-end substitution.

- **Kanhoo Industry**: is planning to acquire Haoneng Technology, to expand business into field of Li-battery production equipment and material so that it will realize a reverse in operation performance. Haoneng Technology’s coater ranks the top two in China. After completion of acquisition, Kanhoo Industry will become a first-tier Li-battery production equipment producer in China.

- **Guoxuan High-Tech**: mainly engages in R&D, production and sales of new material battery, battery cell, power battery, electric bicycle, wind/solar green lighting systems, electric vehicles, etc.. Its output capacity keeps expanding and it cooperates with Yinghe Technology to study the solution for integrated production line, moving towards the target of automation and integration. The company will thus drastically increase production efficiency and reduce producing costs.
Financial Analysis: Yinghe Technology vs. Lead Intelligent Equipment

1. Current Financial Index Analysis

- **Yinghe and Lead are both outstanding enterprises regarding of current financial index.** P/E ratio is slightly high but still in a reasonable range. The most noteworthy part is their **strong profitability** and their performance are expected to be better in the future with the development of Li-battery market.

<table>
<thead>
<tr>
<th>Company</th>
<th>Net Asset</th>
<th>Net Profit</th>
<th>PE Ratio</th>
<th>PB Ratio</th>
<th>Gross Margin</th>
<th>Net Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yinghe</td>
<td>606 Mln</td>
<td>93 Mln</td>
<td>56.17</td>
<td>11.63</td>
<td>39.71%</td>
<td>16.42%</td>
</tr>
<tr>
<td>Lead</td>
<td>806 Mln</td>
<td>153 Mln</td>
<td>67.96</td>
<td>17.2</td>
<td>42.20%</td>
<td>25.81%</td>
</tr>
</tbody>
</table>

**Data Source:** Q3 Report, SMM

2. Historical Financial Index Analysis

- **Net margin ratio of Yinghe reveals a downward trend** while the gearing ratio increases, indicating that **the high-speed expansion** impacts the company’s financial status. Nevertheless, it still sees a bullish forecast due to large development room in Li-battery market.

- **Lead develops robustly** with stable profitability and reasonable gearing ratio. Similarly, regarding of the flourish Li-battery market, this company can see a positive development trend in the future.
SMM is a leading market research and consulting company in China’s nonferrous metals, steel and high-performance materials industries, and is dedicated to providing professional survey, analysis, strategy and management advice to customers at home and abroad.

SMM has a team of professionals and consulting talents with rich industry experience, who have won recognition from domestic and overseas clients.

For more information about our products and services, please contact:

**Nicholas Ye**  
Managing Director  
+86-1381 8901 855  
+86-21-5166 6861  
[Nicholas.Ye@smm.cn](mailto:Nicholas.Ye@smm.cn)  
Add: 7th FL in South Section, Building 9, Lujiazui Software Park, No. 20, Lane 91, E'Shan Road, Pudong New Area, Shanghai, China.  
www.smm.cn