

### **2** I JUNE 2017 BOI **NET APPLICATION** (January - April 2017)

### Foreign investment by target sectors





# TIR **CONTENT** June 2017

#### 02 | BOI Net Application

#### 03 Cover Story

Emerging technological trends impacting machinery industry

### 05 | Short Article

Moving towards an automated world **06** | **Industry Focus** Strengthening Thailand's manufacturing sector

#### 08 Company Interview

A driving force in the Thai agricultural industry

- 09 News Bites
- 10 Missions and Events
- 11 | Thailand Economy-At-A-Glance
- 12 | About BOI

# Emerging technological trends impacting machinery industry

hailand is at the heart of one of the world's major manufacturing zones, with ASEAN accounting for 5% of global manufacturing in terms of value-added. As a regional trade hub with a well-diversified economy, Thailand's manufacturing sector remains a core industry for the country, and its machinery industry plays a crucial supporting role in driving growth in manufacturing and in the overall economy.

COVER

Thailand's machinery and parts manufacturing industry has seen substantial growth in recent years. According to Thailand's Department of Industrial Works, Ministry of Industry, in 2016 there were 4,458 factories in Thailand producing machinery and parts and almost 250,000 workers in the industry. Exports of machinery and parts rose 15.2% annually between 2010-2016.



#### Thailand machinery and parts export value

#### Technology trends in manufacturing

Worldwide, the manufacturing industry is being transformed by innovation and technological advancements. The designs, systems, and processes of modern factories around the world are undergoing rapid changes, and machinery manufacturers, especially in Thailand, need to embrace these changes in order to stay competitive. Doing so will help them improve productivity in their operations, and provide their customers, who may be implementing their own innovations, with a competitive edge.

The "data-driven factory of the future", in which all internal and external activities in the production facility are connected in real-time on the same, easily accessible platform, is well on its way to becoming a reality. This concept is being driven by four technology trends:

• Internet of Things (IoT): While the IoT has received media attention for its use in the home (connected refrigerators, lights, etc), the real value of this breakthrough technology will be in factories. Utilizing the power of the

The designs, systems, and processes of modern factories around the world are undergoing rapid changes, and machinery manufacturers need to embrace these changes in order to stay competitive.



3D Printing offers manufacturers a variety of cost and time saving uses that eliminate the constraints of economies of scale.

assembly Internet to connect and manufacturing machines, office computers and devices, and essential stakeholders (executives, operators, suppliers, and customers), IoT can provide real-time data that will increase production, labor utilization, and output efficiencies. Manufacturers preparing to invest in IoT technology will need to evaluate and select essential data streams, train workers capable of operating this nextgeneration equipment, and hire specialists who can analyze and evaluate the "big data" and the output from the factory floor. Companies like Toyota Tsusho Electronics (Thailand) have already begun using IoT, such as Amazon Web Services (AWS), to analyze data for the company's 50,000 trucks and 10,000 taxis in the country. Meanwhile, staterun energy giant, PTT, has invested heavily in the IoT and digitization in order to increase production efficiencies and reduce costs.

• Automation and Robotics: Automation and robotics have also received significant media coverage in the past few years. But concerns about full automation and the loss of "human creativity" has led to the development of a concept called, "cobotics", in which robots "complement" rather than replace humans. Early implementations of this concept have been focused in the automotive and aerospace industries, but as new technology that allows for greater operational integration between robots and humans develops, "cobotics" will spread quickly to other industries. Thai Beverage Group (ThaiBev) and Charoen Pokphand (C.P.), two of Southeast Asia's biggest F&B conglomerates, have recently announced plans to develop robots and automated production technology and machinery, in line with the Thailand 4.0 policy. The International Federation of Robotics reports that 2.32 million robots will be used around the world this year, while in Thailand, 41,600 robots will be used in 2017.

• 3D Printing: 3D printing offers manufacturers a variety of cost and time saving uses that eliminate the constraints of economies of scale. Currently, manufacturers are using 3D printing (also known as "additive manufacturing") in product development, the production of prototypes, and to dramatically reduce the design-to-production timeframe. But the possibilities of 3D printing for manufacturers going forward are significant. Everything from the production of highly specialized, low-volume products and parts, to creating tools for the molding, forming or casting of products and parts could be implemented through 3D printing. The global 3D printing market is expected to be worth THB 682 billion (US\$20 billion) by 2020. In late 2015, Cal-Comp Electronics (Thailand) Plc and Taiwan's Kinpo Group established a 50-50 venture, XYZ Thailand, to manufacture 3D printers in Thailand. Globally, XYZ Printing sold 80,000 3D printers in 2016, and expects to sell 130,000-150,000 3D printers in 2017.

Augmented Reality • (AR): The mainstream view of AR is that its primary applications are in gaming, and virtual experience (i.e. travel). But like other emerging technologies, AR has a definite application in manufacturing, where operators can use AR goggles on the factory floor to perform complex tasks and jobs, and get immediate feedback about potential quality and accuracy issues. Safety and training, maintenance, and inventory tracking are among the other uses for AR technology. Property giants, Sansiri and Ananda Development, have recently started investing in "proptech" startups that use technology solutions like digitization and augmented reality to solve urban living problems.

By making strategic investments in these emerging technologies now, machinery and parts manufacturers will have a significant jump on their competition, and will avoid the kinds of disruptions that have plagued established players in other industries.

### JUNE 2017 I 5 SHORT ARTICLE

new era of automation as companies increase their use of automated machines and robots in order to remain competitive in the global manufacturing arena.

While the evolution of machinery towards automation is in progress, its full adoption will take some time. Factors that will affect the extent of this adoption are classified into four main areas.

First, the feasibility of adopting new technologies, both technically and financially, is the key challenge in this development. Important technologies that are invented need to be adapted into solutions that automate specific activities. Also, developing automation technologies takes capital and usually requires high initial costs compared to wages. One of the largest examples is Amazon, the world's e-commerce giant which has aggressively shifted from using people in its warehouses to automated robots. The company now has 45,000 robots working in their warehouses, a 50% increase from last year to cope with the increasing demand in e-commerce and to overcome increasing wages.

Second, labor market dynamics such as the supply, demand and cost of labor will affect the adoption rate of automation. Japan is now facing the highest proportion of working seniors among developed countries. According to the Statistics Bureau of Japan, the number of workers older than 65 is calculated at 21.7 % of its total population. This shift is creating an acute shortage in the labor supply in the manufacturing sector, therefore creating a space for automation to be adopted. Thailand, though not in as urgent a predicament as Japan, will nonetheless follow a similar shift with its ageing population. Currently, Thais older than 65 account for 9.7% in 2015, and this rate is set to grow further.

# Moving towards an automated world

Third, automation can also provide economic benefits such as an increased quality of work and safety as well as labor cost-saving. Significant benefits like decreases in the accident rate by using automation could go far beyond labor substitution. According to the Social Security Office of Thailand, accidental rates in food factories have shown a significant decrease from 9,080 instances in 2010 to 4,534 in 2015, a reduction of 13% annually. Increased use of automated machines, as is the case among companies such as Charoen Pokphand (C.P.) and ThaiBev, in automated production lines could further improve safety.

Fourth, regulatory and social acceptance could take time as people transition with the adoption of new technologies where machines replace human interaction in some settings such as hospitals or basic medical care. CT Asia is the first Thai company to manufacture commercially serviced robots, called Dinsow. In 2014, the company released its third-generation Dinsow robots which focus on taking of the elderly population and became the first Thai robot to be exported to Sweden and Japan. CT Asia Robotics continues to partner with Thai and Japanese hospitals and expects to sell more than 1,000 Dinsow Minis this year.

Taking all of these factors into account, the role of automation will further change and expand in this new era, where machines are required to increase productivity and safety as well as to deal with labor shortages. Thailand, as a production hub for many machinery and parts for local consumption and exports, is strategically positioned to adapt to such technologies and advance the levels of automation and robotics in various businesses including food, agriculture, and medical services. Factors that will affect the adoption of automation and robotics



Technical and financial feasibility







# 6 I JUNE 2017 INDUSTRY FOCUS

# Strengthening Thailand's manufacturing sector

Thailand is a growing robotics market in Asia, ranked eighth in the Global Supply of Industrial Robots in 2015. Source: World Robotics 2016 s a regional trade hub with a well-diversified economy, Thailand's manufacturing sector remains a core element for the country, and its machinery industry plays a crucial supporting role in driving growth in manufacturing and in the overall economy. Many companies have already integrated machinery and automation in order to enhance their productivity, reduce waste, and enhance competitiveness.

Thailand's machinery industry has seen substantial growth in recent years. In 2016, exports of machinery and parts reached THB 261 billion (USD 7.7 billion). The largest sector was industrial machinery with an export value of 77%, followed by agricultural machinery at 13% and machine tool at 10%. The largest export products are air pumps and compressors, liquid pumps and printers, while export destinations include the United States, Japan and China.



#### Strength in the manufacturing sector

Thailand has long been known as the Detroit of Asia for its booming automotive industry, as well as an important exporter of electronic components and processed foods. With its position as one of the major manufacturing hubs in the world, the machinery industry plays a crucial role in both developing and encouraging substantial growth in these sectors.

Given the country's strong industrial position, Thailand has been recognized by several key players in the industry.

ABB Limited, a pioneering global technology leader in power and automation, has been involved in the development of Thailand's utility and industrial sectors for more than 100 years. The company saw numerous opportunities in the Thai machinery industry. "ABB provides the best solutions with cost effective ways of manufacturing products for our customers geared to support the automotive and food industry," explained Mr. Chaiyot Piyawannarat, Country Managing Director of ABB in Thailand, Myanmar, Cambodia and Lao PDR.



"Setting up ABB in Thailand as the hub that supports neighboring countries is one of the most successful strategic moves that we made."

Mr. Chaiyot Piyawannarat, Country Managing Director of ABB in Thailand, Myanmar, Cambodia and Lao PDR

#### Top export destinatiom of machinery products in 2016



**Thailand Investment Review** 

KUKA, a newcomer to Thailand in 2015, is one of the world's leading suppliers of intelligent automation solutions. Mr. Martin Wenzel, Chief Executive Officer of KUKA Thailand, said that strong production in the Thai food and beverage, and consumer goods sectors has created a huge demand for robots and machinery. The company helps clients in designing and operating complete solutions of scalable, flexible, and effective manufacturing processes. The company has thus far generated more than 50% of its total revenues from the food and beverage, and consumer goods industries in Thailand.

Patkol PLC is a leading Thai company in food machinery and has been operating for more than 50 years. Given Thailand's strong agricultural sector, the company plays as an important role in strengthening the value chain from the agricultural to value-added food processing industries. As many companies strive to increase their competitiveness as well as labor cost-savings, Thailand's food machinery industry is growing at a solid pace, said Mr. Sangchai Chotechuangchutchaval, President of Patkol PLC.

# The emergence of CLMV creates huge opportunities

Acting as a gateway to ASEAN given its strategic location, together with its readiness in infrastructure, Thailand has considerable potential to be a manufacturing hub and to serve the large and growing market demand in neighboring countries, dubbed CLMV. ABB, KUKA, and Patkol are just three examples of companies that are using Thailand as a manufacturing hub for the region.

ABB Thailand plays a vital role in Southeast Asia. The production base is the largest in the region and the company is also responsible for operations in Cambodia, Laos and Myanmar.

As noted by Mr. Wenzel at KUKA, he believes that there are huge opportunities to tap into the food and beverage sector in CLMV as the import growth rate for these countries is at 27% annually. This rapid growth presents profitable opportunities for the Thai food and beverage sector which acts as the main exporter to these countries.

With growing demand in ASEAN, Patkol aims to increase its exports to ASEAN with growth in the company's portfolio expected to more than double from 20% to 50% through its medium-term strategy which aims to use Thailand as a production hub in the region.

#### Thailand's robust human resources

With 76 universities and 83 vocational schools, Thailand produced approximately 56,231 graduates from engineering and related courses in 2016. The country has plenty of highly skilled engineers and researchers entering this fast growing market.

According to Mr. Chaiyot, ABB believes the country provides strong competencies in human resources, with employees who are able to absorb and manage the complex technologies from abroad, and work effectively on day-to-day operations with support from ABB Group. As a result, with more than 1,000 employees, ABB Thailand relies on a workforce which is more than 95% Thai.

Patkol has over 300 engineers and 1,000 technicians with a strong foundation to design the machines for its own patents as well as providing the important services needed to serve its customers as a competitive manufacturing base.

#### Confident in the future of Thailand

As the country focuses on enhancing its competitiveness, there will be increased opportunities for machinery and automation companies to play an important role in further strengthening the Thai manufacturing sector as it continues to advance. ABB, KUKA, and Patkol are confident in investing for a better future with greater solutions in an increasingly dynamic market in Thailand.

# Government and BOI are playing a crucial role

As one of the government's targeted industries, the Thai government and education centers are providing continuous support to develop the machinery industry. Thailand offers various resources for research and development and human resources training such as the Institute of Field Robotics (FIBO), King Mongkut's University of Technology, Thonburi, and the Center for Biomedical and Robotics Technology, Mahidol University.

The Board of Investment (BOI) recognizes the importance of the machinery sector and offers attractive incentives to encourage the industry's growth and development. BOI investment incentives for machinery Industry in Thailand include a tax exemption on import duties on machinery, an exemption of corporate income tax for up to 8 years, and an additional 5-year 50% reduction of corporate income tax on net profit.



"Thailand was too important for us not to come." Mr. Martin Wenzel, Chief Executive Officer

of KUKA Thailand





Thailand is our manufacturing hub for food machinery serving demand both locally and in ASEAN."

Mr.Sangchai Chotechuangchutchaval, President of Patkol PLC

# 8 I JUNE 2017 COMPANY **INTERVIEW**

# A driving force in the Thai agricultural industry

"Thailand is KUBOTA's leading manufacturing hub for agricultural machinery production and an export hub to ASEAN."

Mr. Opart Dhanvarjor

(Japan) and SCG (Siam Cement Group), is a leading agricultural machinery manufacturer in Thailand. SIAM KUBOTA has a long haul history with the Thai agricultural sector going on for more than 39 years. In 2007, with its operations firmly established in Thailand, the company set up a new factory in Amata Nakorn Industrial Estate in order to meet rising demand in agricultural machinery. Today, as the industry is moving towards

IAM KUBOTA Corporation, a joint

venture between KUBOTA Corporation

increased efficiency and productivity, and modern farming technology has the potential to capture substantial market growth for the company, estimated at roughly 90% of the company's product portfolio. Mr. Opart Dhanvarjor, Senior Executive Vice President



of SIAM KUBOTA Corporation stressed that the company is working hard to design its products to be assimilated with market trends that utilize farming machinery to increase productivity. With Thailand's abundance of natural resources, one of the successful product strategies is in implementing designs that can adapt and fit to various types of crops such as rice, sugarcane, cassava and maize. The company has achieved a strong growth rate from these products.

Service is another factor in achieving assurance and satisfaction from customers. Mr. Opart said that the company provides the best service for maintenance and repairs. The company has over 200 service centers, within accessible distances of 50 km, in the country to support and facilitate its customers.

# KUBOTA in step with Thailand's agricultural development

Aiming to grow further with Thai farmers in achieving effective agricultural processes, SIAM KUBOTA has set up a promising knowledgesharing platform through "KUBOTA (Agri) Solutions" (KAS). The solutions are designed to support farmers for all process starting from land preparation, planting, maintenance and harvesting including logistics. As a result, farmers can get the maximum benefit from higher productivity and cost reductions to further enhance their competitiveness in world markets.

Today, the average rice yield in Thailand is around 450 kg/rai. The government has targeted a yield of 600 kg/rai by the end of 2022. For sugarcane, the gap between Thailand and the world's average yield is still large, from 9.15 to 20 tons/rai. With KAS, farmers can achieve better yields by enhancing their productivity. Working with agriculture community, SIAM KUBOTA sent out specialists to assist and teach modern farming technologies and KAS to farmers from seeding to harvesting through-out the entire value chain. The solutions are focused on increasing productivity and achieving improved outputs with better yields.

Mr. Opart noted that the company's aspiration is to provide agricultural solutions aimed at a better living for all stakeholders.

Mr. Opart Dhanvarjor, Senior Executive Vice President of SIAM KUBOTA Corporation



# The top destination for the agricultural machinery

Mr. Opart revealed the three key reasons behind SIAM KUBOTA's investment in Thailand.

First, solid domestic demand is present as agriculture is the main sector for the country, employing 35 percent of the Thai workforce and a major exporter of agricultural products. In 2016, Thailand exported 9.8 million tons of rice, making it the second largest exporter in the world. Meanwhile, the shift to increased use of machines to improve efficiency and productivity is creating substantial growth in agricultural machinery.

Second, given Thailand's strategic location, together with its readiness in infrastructure and strong supply chain in auto parts which makes production costs very competitive, the country therefore acts as a manufacturing hub to serve demand throughout the ASEAN region. The demand for agricultural machinery in ASEAN has shown considerable growth potential since emerging strongly in recent years. In 2016, the company's exports accounted for 45% of its revenues.

Finally, the government's support in offering attractive incentives is a valuable factor. SIAM KUBOTA has continued to receive considerable support from the Board of Investment (BOI). The company believes that all investors can benefit from investing in the country.

The company will continue to be a driving force growing alongside Thai farmers in order to further drive the Thai agricultural and food industry as well as to be the ASEAN leader. Solid domestic demand is present as agriculture is the main sector for the country, employing 35 percent of the Thai workforce and a major exporter of agricultural products.



#### Robots to support transition to Thailand 4.0

In targeting an innovation-driven economy, Thailand 4.0 will involve a significant adoption of robotics engineering. Pisanu Vichiensanth, director and senior executive vice-president of ThaiBev Group and director of Oishi, said the company uses almost 100 robots in its warehouses and factories in order to increase productivity and efficiency. This includes an investment of THB 2 billion (USD 58.6 million) at its Oishi factory alone. The robotics industry is growing with an average demand growth of 10-15%. On the education front, CP Group has teamed up with Panyapiwat Institute of Management (PIM) to offer a Bachelor of Engineering in Robotics and Automation in order to prepare the future workforce for the market. Associate Professor Sompop Manarungsan, PIM's president, said the institute has welcomed 50 students into the program this year. The demand for robotics will continue to rise as many countries are dealing with ageing societies and a shortage of workers but need to increase productivity and competitiveness.

#### Thailand climbs in IMD competitiveness ranking

According to the latest ranking by the IMD World Competitiveness Center, a research group based at IMD business school in Lausanne, Switzerland, Thailand's ranking moved up to 27th place in 2017 from 28th in 2016. The advance was due to the improved performance of the Thai economy, an effective central bank policy and efficiency in government decisions, according to Arturo Bris, director of the World Competitiveness Center. Meanwhile, in the new report for 2017, Thailand is ranked 41st in the IMD World Digital Competitiveness Yearbook. This report measures an economy's ability to adopt and explore digital technologies in the transformation of government practices, business and society in general. The new Digital Competitiveness rankings show that Thailand is at an important stage of its digital infrastructure and that an adaptive and responsive regulatory direction can assist with technological change, Mr. Bris added.

## 10 I JUNE 2017 BOI'S MISSIONS AND EVENTS



On May 18, 2017, Deputy Prime Minister, Dr. Somkid Jatusripitak (sixth from the left), gave the opening remarks at the "Thailand Cross-Border Trade and Investment Conference", organized by BOI and Bank of China at BITEC Bangna. The Deputy Prime Minister was accompanied by the Secretary General of BOI, Mrs. Hirunya Suchinai (fifth from the right), Ms. Wiboonlasana Ruamraksa, the Permanent Secretary, Ministry of Commerce (fourth from the right), and Dr. Kanit Sangsubhan, the Secretary General of the Eastern Economic Corridor Office of Thailand (fourth from the left). Activities at the conference included business matching and the signing of an MOU between the Thailand Board of Investment and Bank of China (Thai) Public Company Limited.



Deputy Prime Minister, Dr. Somkid Jatusripitak (eight from left), led the government's investment roadshow to Tokyo, Japan from June 4 - 8, 2017 and delivered the keynote address on "Thailand 4.0 means Opportunity Thailand" in a seminar, organized by BOI and JETRO on June 7, 2017 at the Grand Prince Hotel New Takanawa, in Tokyo. The mission also included one-on-one meetings with leading Japanese companies.



On May 1, 2017, BOI Deputy Secretary General, Ms. Ajarin Pattanapanchai (sixth from the left), together with Dr. Nares Damrongchai, CEO of Thailand Center of Excellence for Life Sciences (TCELS) (fourth from the right), welcomed a US press delegation from the biotech sector to the One Start One Stop Investment Center (OSOS). Ms. Pattanapanchai also gave a presentation on BOI policy updates and investment opportunities in the biotech industry in Thailand.



Ms. Ajarin Pattanapanchai, BOI Deputy Secretary General, led an investment mission to the US and Canada from May 21-28, 2017. The mission included investment seminars in Minneapolis and Toronto, in addition to company visits and networking meetings. She gave a presentation on "Why Thailand as an investment destination" on May 25, 2017 in Toronto, in order to attract investment in the medical device, electronics, automotive, and automation & robotics sectors.



From May 6 – 14, 2017, BOI Deputy Secretary General, Ms. Duangjai Asawachintachit (fourth from right), led the BOI's mission to Sweden, Finland, Denmark and Norway, together with the Director of the Strategy and Planning Division, Ministry of Digital Economy and Society, Dr. Phornphan Tannukit (third from left), and the BOI's Stockholm Office, participated in panel discussions on "Thailand: Land of Investment." The mission included networking opportunities with several organizations and meetings with companies in the software industry.



BOI Senior Executive Investment Advisor, Ms. Bonggot Anuroj (fifth from the left), together with the Director of the BOI's Seoul Office, Mr. Worakan Kosolpisitkul (right), leading the delegation from Thailand to participate in an investment mission in Seoul, South Korea from May 22-26, 2017. The mission included networking with organizations and company visits to different ICT industries. Ms. Bonggot also gave a presentation at the "Thailand's Eastern Economic Corridor (EEC): the Future of ASEAN" seminar which was honorably participated by His Excellency, Mr. Sarun Charoensuwan, Ambassador of Thailand to the Republic of Korea (fourth from the left).

# JUNE 2017 | **11** THAILAND ECONOMY-AT-A-GLANCE



**Thailand Investment Review** 

# **12** I JUNE 2017 ABOUT **BOI**

The Office of the Board of Investment (BOI) is the principle goverment agency that operates under the Prime Minister's Office for the purpose of encouraging investment in Thailand. We at the BOI serve as the professional contact points for investors, providing them with useful investment information and services. We offer business support and investment incentive to foreign investors in Thailand, including tax and non-tax incentives. A few non-tax incentives include granting land ownership to foreigners and facilitating visas and work permits. Besides serving the needs of overseas investors, we also offer consultation services to Thai investors who are interested in investment opportunities abroad.



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