Thailand’s Electrical and Electronics Industry
THAILAND: The World’s Electrical and Electronics Industry Investment Destination

Constituting a nearly US$60 billion sector, Thailand’s electrical and electronics industry has thrived and expanded continuously for almost three decades. Throughout the years, the electrical and electronics industry has not only played an increasingly important role in the nation’s economy as a major export earner, but has also positioned Thailand as the regional leader in Southeast Asia. Recognizing the sustainable development of the electrical and electronics industry as a priority for the Kingdom, the Thai Government has launched proactive investment policies and measures, which have attracted investments from many multinational companies and led the industry to prosperity in Thailand.

In 2011, the electrical and electronics industry contributed almost 24% of Thailand’s annual export revenues, generating US$55 billion. Major export destinations were ASEAN (17%), the EU (14%), China (14%), the US (13%), Hong Kong (12%), and Japan (11%). According to the Thailand Electrical and Electronics Institute, Thailand’s electrical appliance industry is predicted to increase 5%-7% in 2012, while Thailand’s electronics industry is forecasted to expand about 10%-12% in 2012.
Thailand’s Electrical and Electronics Industry Exports, 2007-2011

Source: Thai Electrical and Electronics Institute
Electrical Appliance Industry

Thailand is ASEAN’s largest production base in the electrical appliances sector, and is the world’s 2nd largest producer of air conditioning units and 4th largest producer of refrigerators. In 2011, Thailand’s electrical appliance exports were valued at US$22.1 billion, 9% higher than the previous year. On the other hand, imports increased by 10% to a total of US$18 billion from 2010 to 2011.
The Thai electrical appliance industry has been experiencing steady growth in the past few years, and this trend is expected to continue in the coming years. Thailand’s robust manufacturing base and well-developed infrastructure, including an efficient road and ports system, make Thailand an ideal place for electrical and electronics operations. Currently, almost all of the major electrical appliance manufacturers are represented in Thailand. The Kingdom is not only a regional leader, but also a leader on a global level as Japanese, Korean, European and American multinational companies manufacture electrical appliances in Thailand.

With over 800 electrical appliance factories across the country, Thailand has attracted numerous world-renowned foreign and joint-venture companies from across the globe. Japanese manufacturers constitute half of the industry: JVC, Sony, Orion, Nikon, Pioneer, Panasonic, Canon, Sharp, Hitachi, Mitsubishi, Toshiba, TDK, NEC, Stanley, Rohm, Alps Electric, Epson, Alpine, Minebea, NHK, Seiko, Sanyo and Fujitsu, among many others are represented in Thailand. Additional prominent international investors include Tatung and Acer from Taiwan; LG and Samsung from South Korea; Western Digital, Seagate, Hutchinson, Honeywell, Carrier, Emerson and Spansion from the US; as well as Europe’s Electrolux, Philips, Stiebel Eltron, Schneider, BHS, ABB and Fasco.
Based on the export values in 2011, Thailand’s major electrical appliance products were air conditioners, refrigerators, and digital cameras & video camera recorders. Air conditioners, which accounted for 15% of the electrical appliance industry, had the highest export value in the industry; while the export of refrigerators and digital cameras & video camera recorders increased by 10% and 12%, respectively, from 2010.

The major export destinations for Thailand’s electrical appliances in 2011 were ASEAN (19%), Japan (14%), the EU (13%), the US (11%), China (6%), and Hong Kong (5%). ASEAN was the largest market for Thailand’s electrical appliances, with orders worth US$4.3 billion in 2011, a 13% growth from the previous year; followed by exports to Japan, which had an export value of US$3.2 billion, an increase of 10% from 2010.

![Thailand’s Major Electrical Appliance Export Markets, 2011](source: Thai Customs Department)

**Electronics Industry**

The electronics industry is one of Thailand’s most prominent industries within the manufacturing sector. In 2011, Thailand’s overall trade in the electronics industry alone was worth approximately US$56 billion, an increase of 10% from 2007. Its export revenues accounted for nearly US$31 billion.
In 2011, Thailand’s main electronics exports were hard disk drives (HDD) and integrated circuits (IC), which accounted for approximately 34% and 26% of total electronics exports, respectively. Thailand is ranked as the world’s number #1 HDD and components manufacturing base, commanding 40%-45% share of the worldwide HDD production. Major HDD producers – Western Digital, Seagate, Hitachi GST and Toshiba – have production bases in Thailand. The country holds a similarly remarkable reputation in the IC and semiconductor industries, and boasts one of the largest assembly bases for these products in Southeast Asia.

Considering the increase in global demand for high-technology consumer electronics, including computers, flat panel displays, tablets, gaming consoles, and wireless devices, Thailand is the ultimate investment destination for the sector. Electronics investors will undoubtedly be able to benefit from this strong growth in demand, as well as the comprehensive support from the government of this global hub, in the electronics world.

Thailand’s roster of manufacturers in this fast-growing sector is marked with numerous world-class companies, including Fujitsu from Japan, LG Electronics from Korea, Seagate from the US, and Philips Electronics from the Netherlands. These companies have established facilities for a diverse scope of purposes, from production and assembly to testing and R&D.

Parallel to the rocketing demand for computers and mobile phones, the total value of Thailand’s exported electronics amounted to approximately US$31 billion in 2011. The primary markets for these exports were China (18%), Hong Kong (17%), ASEAN (16%), the EU (14%) and the US (14%).
Hard Disk Drives (HDD)

The HDD industry has long held paramount significance for the country, as Thailand has supplied nearly half of the world’s HDDs since 2005. In 2011, Thailand’s total computer components exports (including HDD) were valued at US$17 billion. Thailand’s HDD exports alone totaled US$10 billion in 2011, represented 62% of total computer component exports. This industry will continue to profit from the forecasted 7.7% growth of global HDD shipment in 2012. The competitiveness of Thailand’s HDD industry is derived from a deep network of world class supporting industries manufacturing most of the parts and subcomponents utilized in the assembly of final HDDs.

As a result of the sustained growth in electronics production and exports, an increase in electronic imports was also observed, especially for semiconductors, discrete components and electronics subcomponents. The total value of electronics imported into Thailand in 2011 was approximately US$25 billion.
Concentrated in the country’s central and northeastern regions near Bangkok, Thailand’s HDD cluster development program gives companies the ideal combination of efficiency, cost-savings and readily-available expertise. Within the various clusters, HDD producers in Thailand are divided into different tiers, as illustrated below:

Thailand’s Hard Disk Drive Cluster

Source: Hard Disk Drive Institute
Data creation is expected to grow by 44 times in the next decade, but storage capacity for that will increase by about 30 times. Thus, this gap adds up to a very significant demand for digital storage.

- John Coyne, President and CEO of Western Digital Corporation-

Key Players in HDD Assembly and Components in Thailand:

**HDD-Part Producers:**
- Alps Electric
- Hutchinson Technology
- Magnacomp Precision
- Minebea
- NHK
- Nidec
- Nitto Denko

**HDD Producers:**
- Hitachi
- Seagate
- Toshiba
- Western Digital
Integrated Circuits (IC)

Integrated circuits is Thailand’s largest electronics import and its second-largest electronics export. Ranking in order of importance, the major export markets for Thailand’s ICs in 2011 are: Hong Kong, Singapore, Japan and China.

Considering the rising demand for electrical apparatuses and electronics of all types, the IC industry will certainly prosper. This segment of the electronics market features excellent business opportunities for prospective investors, as there currently exists a trade deficit in the sector. According to Thai Electrical and Electronics Institute, the value of ICs imported into Thailand over the last decade is greater than that of any other electronics import. In 2011 alone Thailand imported US$10 billion worth of ICs.

Key Players in the IC cluster in Thailand:

**IC Design:**
- Rohm LSI
- Silicon Craft Technology

**Lead Frame:**
- Rohm Mechatech
- SumikoLeadFrame
- TSP-T
- Yamakin

**Testing:**
- Microchip
- Maxim Integrated

**Assembly:**
- Circuit Electronics
- Hana Semiconductor
- Microchip
- NXP
- Spansion
- Millennium Microtech
- Oki
- Rohm Integrated System
- Sanyo Semiconductor
- Sony Device Technology
- Stars Microelectronics
- Stats ChipPAC
- Thai NJR
- Toshiba Semiconductor
- UTAC Thai
- Vigilant Technology
Opportunities

HDD and IC

As the world’s largest HDDs and components producer, Thailand’s suppliers benefit from first class industrial clusters. In fact, almost all of the major world players in the HDD manufacturing industries can be found within a 250-kilometer radius of Bangkok.

Over the past years, Thailand has proven itself to be an extremely attractive location for the assembly and testing of HDDs, ICs and electronic subcomponents, such as printed circuit boards (PCBs). Although the electronics market in Thailand is mature and well-developed, there remain areas with high market potential that manufacturers considering to expand their market can explore. For example, many key components of the upstream electronic value chain, including semiconductor devices, ICs, and discrete components such as diodes and transistors, are still currently imported from abroad, primarily from Korea, Japan, Taiwan, and Singapore. Manufacturers can easily capture a new market and generate a new source of profit, as they look into manufacturing the above components locally in the country.

In addition, IC design and related activities offers a burgeoning field of opportunity, particularly in wafer design, where there is currently little or no domestic production. The government extends generous support to relevant organizations and institutes by organizing human resource development training programs and conducting research on their behalf.

RFID

Thailand is at the forefront of cutting-edge technologies, with radio-frequency identification (RFID) being no exception. The RFID market in Thailand is
currently valued at about US$26.1 million, and has great potential to become a major production center in Asia, especially for inlay and coil parts used in RFID.

In 2010, the value of the entire worldwide RFID market was approximately US$6.4 billion, and is projected to grow at a CAGR of 19.5% through 2014. Across the globe, the Radio Frequency Identification (RFID) industry has in recent years experienced unprecedented growth in almost every sector in which the technology is used.

**Automotive Electronics**

With the ubiquitous presence of automobiles and car owners’ ongoing quest for sophisticated gadgets and electronic applications in vehicles, the automotive electronics industry represents a market brimming with potential and opportunities. The global market for automotive electronics is projected to reach US$243.7 billion by 2015, registering a CAGR of 6.4% during the period 2006-2015. Various sectors across the industry are anticipated to undergo strong volume growth, especially for side-impact airbags in the passive restraint market. Within the automotive electronics market, the most rapid growth will be experienced in the area of entertainment. In addition, demand for sophisticated driver-assistance systems such as collision avoidance, night vision, and lane departure has been growing. With its many advantages, Thailand is extremely attractive for system and component suppliers, as companies seek to enhance cooperation between companies and cope with cost pressures.

Capturing a spot on the list of the world’s top fifteen automobile manufacturing countries, Thailand is striving to enter the top ten. This has been a strong driving force behind the development of all relevant supporting industries, including automotive electronics and parts. At the same time, the global demand for OEM automotive electronics is projected to grow 12.3% annually, escalating to US$174 billion in 2014.
Why Thailand

Thailand offers a number of unique advantages for electrical appliance and electronics producers. These include:

**Competitive workforce:** Currently, over 400,000 people are employed in Thailand’s electrical and electronics sector. Indeed, the well-qualified, but extremely affordable workforce is a considerable attraction for many investors. Over 60 public and private engineering institutes across the country are accredited by the Council of Engineers. In addition, Thailand offers 152,000 certified engineers, with a new inflow of approximately 20,000 engineering graduates joining the workforce each year.

Advancing the competitiveness and technical capabilities of the workforce has always been a main focus of the Thai Government. To ensure an adequate supply of qualified personnel for the industry, the BOI and the Ministry of Education have implemented a Human Resources Development Plan. Additionally, Thailand offers several other resources for technical training, including:

- The Thai Microelectronics Center (TMEC), established by the Ministry of Science and Technology in 1998;
- The Western Digital HDD Technology Training Institute (HTTI), an institution established through the cooperative efforts of Thailand’s National Electronics and Computer Technology Center (NECTEC) and Western Digital; and
- NECTEC's Industry/University Cooperative Research Centers in 3 areas:
  1. HDD Advanced Manufacturing – The Institute of Field Robotics (FIBO), King Mongkut’s University of Technology Thonburi
  2. HDD Components – The Engineering Faculty, KhonKaen University
  3. Data Storage Technology and Application – King Mongkut Institute of Technology Ladkrabang

**Access to markets:** The Free Trade Agreements between Thailand and various countries, such as Australia, New Zealand, India, Japan and members of ASEAN, gives Thailand, and its foreign investors, a considerable advantage in reaching out to the different markets in the vibrant electronics industry. Under the ASEAN Free Trade Agreements (AFTA), most parts and finished electronics exported throughout ASEAN have been tariff-free since 2010.
The establishment of the ASEAN Economic Community (AEC) in 2015 will only further enhance Thailand’s attractiveness. The AEC will serve as a massive single market that is fully integrated into the global economy with equitable economic development. The 10 member states of ASEAN collectively offer close to 600 million consumers. The AEC will open new doors to manufacturers by transforming ASEAN into a region with free movement of goods, capital, services, investment and workforce.

Excellent logistics systems: Thailand boasts world-class infrastructure, including state-of-the-art ports, airports and communication facilities. Suvarnabhumi International Airport and Laem Chabang Deep Sea Port offer manufacturers the transportation foundation they need for their export operations. The 225 km of inter-city motorways – currently in expansion – linking Bangkok to other regions of the country, also facilitate overall domestic transportation. In addition, Thailand is a hub of transportation in the Southeast Asia region; the perfect route through the east-west and north-south corridor that can distribute products to nearby countries including Laos, Cambodia, Vietnam, Myanmar, Malaysia, Singapore and also southern China from the north and northeast of the Kingdom.

Development of electronics clusters: In an effort to promote productivity and efficiency in the industry, the government has been proactive in encouraging the development of electronic clusters. Proximity between firms and their input suppliers within the clusters enhances communication and facilitates flow of goods. At the same time, clustering helps to reduce logistics costs through improved supply chain management. Manufacturers also benefit from shared core technological innovations and human resource development programs.

“Thailand is a good operating base for us due to being the center of the Indochinese peninsula. Here we have quick access to export markets in surrounding countries. Additionally, Thailand’s infrastructure is well established. A lot of suppliers have already shifted their production here.”

-Mr. Hirotaka Murakami, CEO of the Panasonic Group of Companies in Thailand-
Developed Network of Supporting Organizations

Government and organizations supporting the growth and competitiveness of the electrical and electronics industry in Thailand include:

The Electrical and Electronics Institute (EEI): Founded in 1998, the EEI is an autonomous institute under the Ministry of Industry Industrial Development Foundation. It promotes and supports the development and export of electrical and electronic products, as well as serves as a center of information for the industry.

The Hard Disk Drive Program: The Hard Disk Drive Program is operated under the cooperation of the National Electronics and Computer Technology Center (NECTEC), the National Science and Technology Development Agency (NSTDA), the International Drive Equipment and Manufacturers Association (IDEMA), the Electrical and Electronics Institute (EEI), the Asian Institute of Technology (AIT), Institute of Field Robotics (FIBO) and the Board of Investment of Thailand (BOI). Other supporters include Seagate and Western Digital. The key aim is to
enhance the HDD cluster and strengthen the industry in Thailand through the development of:
1. Human resources;
2. Technology in four major branches: Material & Metrology, ESD/EOS & Contamination, Automation, and High Precision Mold/Die;
3. Supply chain of supporting industries; and
4. Policy and investment incentives.

The National Electronics and Computer Technology Center (NECTEC): NECTEC, an organization under the National Science and Technology Development Agency (NSTDA), is mainly responsible for undertaking, supporting and promoting the development of electronics and computer technologies through research and development activities. NECTEC also provides linkages among research communities and industries through the established industrial clusters.

Research Centers: The Thailand Science Park (TSP), operated by the National Science and Technology Development Agency (NSTDA), serves as the hub for industrial R&D activities of private sectors. It is also home to national research centers, such as NECTEC, and is equipped with cutting-edge facilities.

Board of Investment (BOI) Incentives

Thailand Board of Investment offers a wide range of fiscal and non-tax incentives for investments based on location. Tax-based incentives include exemption or reduction of import duties on machinery and raw materials, and corporate income tax exemption and reduction. Non-tax incentives include permission to bring in foreign workers, own land and take or remit foreign currency abroad.

Under the BOI’s program of Investment Promotion for Sustainable Development, projects in 12 electronics and electrical industry activities that apply for BOI incentives prior to the end of 2012 for any location except Bangkok are eligible for a special package of incentives, including
- Exemption of import duties on machinery
- Corporate income tax exemption 8 years with no cap
- 50% reduction of corporate income tax for 5 years from the expiry date
- Double deduction of public utility costs for 10 years
- Deduction from net profit of 25% of the investment in infrastructure installation and construction cost in addition to normal capital depreciation for 10 years
The BOI also has a special promotional package for projects in activities related to production of all electronics, electrical appliances, and parts. Approved projects in these activities are entitled to receive following rights and benefits.

- Exemption of import duty for machinery all zones throughout the period of the promoted status.
- Exemption from corporate income tax as follows;
  - 5-years corporate income tax exemption if the projects located in zone 1
  - 6-years corporate income tax exemption if the projects located in zone 2
  - 7-years corporate income tax exemption if the projects located in promoted Industrial zone or Industrial Estate
  - 8-years corporate income tax exemption if the projects located in zone 3
- Investment in replacement machinery using higher technology used in the production of Integrated Circuit (IC), HDD and parts, are regarded as the part of investment promoted projects.
- Those applying for investment promotion must submit applications according to the criteria specified by the Office of the Board of Investment, as well as a specified plan for raw materials and parts usage.

For further information:

The Thailand Board of Investment (BOI): www.boi.go.th

ASEAN Supporting Industry Database (ASID): www.asidnet.org

Electrical and Electronics Institute: www.thaieei.com

National Electronics and Computer Technology Center (NECTEC): www.nectec.or.th

Electronic & Computer Employers’ Association: www.eceathailand.com