

Advanced Electronics & Semiconductor

ANIN MEKSUKSAI

Director

Special Operation Center for Strategic Investment

Thailand Board of Investment

Thailand's Market Readiness

- Rank 10th largest electronics exporter worldwide in 2022
- 290% investment application growth in 2023 (YoY)
- Export value of E&E [industry](#) (2023) is **USD 74.9 billion** and expect to grow **6.76 %** (YoY) in 2024
- Revenue in semiconductor industry in Thailand expected to reach **USD 13 billion** in 2027 (8% CAGR from 2023)

IoT / 5G

- The revenue for the IoT industry is expected to reach more than **USD 13 billion** by 2028.
- 5G are available at **26%** of time use ahead of Germany (13%), UK (10%), and Japan (7%) in 2023 and are expanding.

Smart electronic devices

- Smart electronics is expected to grow rapidly in 2024 as global EV manufacturers start production in Thailand
- The revenue of **smart home devices** is expected to grow **14.19%** (CAGR 2024-2028), reaching USD 396.6 million by 2028.

HDD to support Generative AI Tech

- **Top 3** Global HDD exporter
- Export Value (2023): more than USD 8,200 mil.
- AI technology drives the demand of HDD.

Semiconductor devices

- In E&E (2023), integrated circuits (ICs) are Thailand's top import and second-largest export.
- **Top 13** Global IC exporter

PCB & PCBA

- **No.1** PCB & PCBA manufacturing hub in ASEAN
- More than **half of the top 20** Taiwanese PCB makers already set up a factory in Thailand



Thailand: A Major Hub for Global Electronics Exports



3%

of global electronics export are from Thailand in 2022.

Top Thai E&E Export Destination in 2023



USA
32%



ASEAN
15%



Japan
9%

Top Thai E&E Export Destination in ASEAN



Malaysia
4%



Vietnam
3%



Singapore
3%

Thailand: Unlocking E&E Potential with a Robust Ecosystem

Clean Energy

- Utility Green Tariff (UGT): Provide renewable energy bundled with the renewable energy certificate (REC) with the options of additionality and treacibility.

Government Support

- Exemption of CIT for up to 13 yrs.
- Exemption of import duty and VAT(7%) on machinery and raw materials for export production
- [Long-Term Resident \(LTR\) Visa](#)
 - 10 years Visa, 17% PIT for qualified LTR holder, and more

Availability of Land and Utilities

- 68 industrial estates in 16 provinces
- Reliable electricity and water supply



Talent Pool Availability

- Forecast number of STEM graduates (2022 - 2026):
 - > **110K** from Science Degree
 - > **184K** from Engineering Degree
- Semiconductor & advanced electronics sandbox

Strategic Location

- Located at the **center of ASEAN**, the connectivity hub for CLMV
- Spotlight on being a global export hub, connecting 50+ Markets
- Manufacturing base and home for world-leading corporations



Other Key Drivers

- **FTAs: 15 FTAs in 19 countries** and ongoing negotiation for 5 FTAs including TH-EU FTA
- Safety & low risks - Effective response to crisis
- neutral position

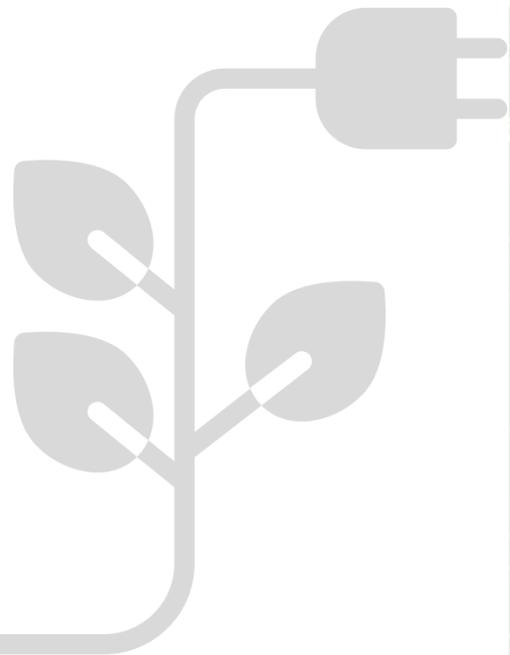
RE100 The global corporate RE initiative bringing hundreds of MNEs committed to 100% RE

Major Japanese brands join the RE100 : Commit to use 100% RE by 2050



Ecosystem: Clean Energy Serving the MNEs' ESG Strategy

UGT
mechanism
enabling
MNCs
to achieve
NET ZERO GOAL



Utility Green Tariff 1 (UGT1)



Non-specified clean energy from existing RE portfolio

- Available for all type of users
- Start at 100 kWh per block
- Premium price (REC fee) top-up

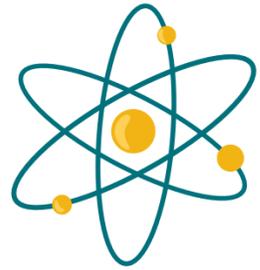
Utility Green Tariff 2 (UGT2)



Specified clean energy from new RE portfolio

- For large consumption user of electricity
- Sleeved PPA (with Utility)
- New tariff structure (not uniform)
- Demand-supply matching

Ecosystem: Availability of STEM Talent for E&E & Semiconductor



STEMPLUS Platform

Offer training courses covering Advanced Electronics operated by qualified educational institutes. A 250% tax deduction for employee development expenses spent on the program and a 150% tax deduction for expenses paid on hiring STEM employees.



Semiconductor and Advanced Electronic Sandbox

The collaboration between 17 leading universities and 7 leading electronic in Thailand such as Nisshinbo Micro Devices, ADI, Infineon, and Delta aiming to produce 3,000 highly-skilled professionals in this field per annum.



Education Cooperation Project between Japan and Thailand

KOSEN-KMITL / KOSEN-KMUT since 2019 - 800 students currently in progress.



Talent Acquisition Program

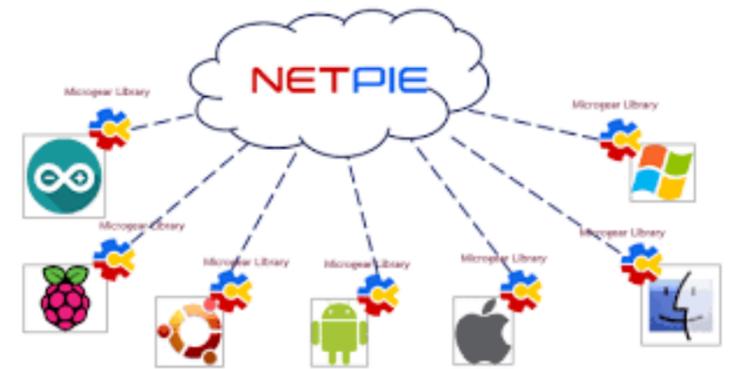
The collaboration between BOI and MHESI to offer STEM job recruitment service to companies from the same industry.

E&E Support Platforms and Testing Center

INDUSTRIAL IOT AND DATA ANALYTICS (IDA) PLATFORM



A cooperative project between the National Science and Technology Development Agency and private sector partners that collects data from IoT devices installed on machines throughout the manufacturing chain. The aim of this project is to help firms digitalize manufacturing, increase production efficiency, and conserve energy.



NETPIE service is provided by National Electronics and Computer Technology Center (NECTEC) and offers an IoT cloud-based platform-as-a-service that seamlessly connects IoT devices by transferring the complexity from application developers or device manufacturers to the cloud.



A center for the testing, certification, calibration, training, inspection, and site survey of electrical and electronic products.

Institutes are Researching for E&E Development and Insight



A research institute under NECTEC focusing on the research and development of sensor and silicon-based electronic devices. The areas of research include Micro Electro-Mechanical Systems (MEMS), ISFET Platform, Wafer-level Sensor Prototyping, Integrated Circuits (IC), Surface Technology, and Microfluidic Devices.



An independent institute established by the Ministry of Industry with the aim of driving the usage of domestic products, expanding the export market, and providing quality and reliable insights into the E&E industry data.



The goal is to attract investments in EECd by building confidence and motivation, fostering collaboration between the private sector, education institutions, and the government on 30 acres in EECd. This initiative aims to create a digital ecosystem and open platform for startups, particularly in FinTech, AgriTech, TourismTech, HealthTech, EduTech, and GovTech.

Comprehensive Semiconductor Supply Chain in Thailand

UPSTREAM SEMICONDUCTOR

MIDSTREAM PRINTED CIRCUIT BOARD (PCB)

DOWNSTREAM PCBA + BOX BUILD, CONSUMER PRODUCTS

SEMICONDUCTOR FRONT END

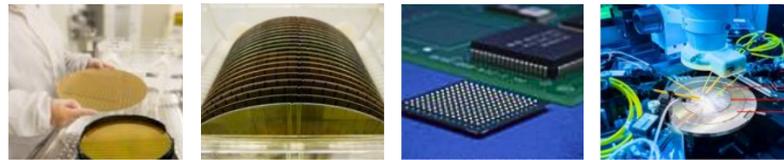
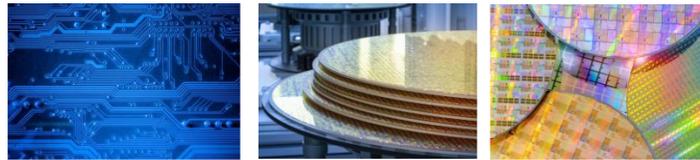
SEMICONDUCTOR BACK END

Electronics design Silicon Wafers Wafer Fabrication

Wafer Sort Die Bank Assembly IC Testing

PCB Fabrication FA Lab SMT (Surface-Mount Technology) PTH (Plating Through Hole) PCBA Test

Box Build Product Test Pack/Ship



TAX HOLIDAY FOR UP TO 13 YEARS

TAX HOLIDAY FOR UP TO 8 YEARS

• WAFER FABRICATION **13 years**

• ELECTRONIC DESIGN **8 years**
e.g. microelectronics (IC design), optoelectronics, embedded system (hardware & software design)

• MANUFACTURE/TEST SEMICONDUCTORS & INTEGRATED CIRCUIT (IC) **5-8 years subject to M/C investment**
E.G. Wafer grinding, sawed dice, wafer testing, IC testing, IC module

• COPPER CLAD LAMINATE (CCL) **5-8 years subject to M/C investment**
• FLEXIBLE COPPER CLAD LAMINATE (FCCL)
• PREPREG

• HDI PCB **8 years**

• FLEXIBLE PCB **5-8 years subject to M/C investment**
• MULTILAYER PCB **5-8 years subject to M/C investment**

• SURFACE-MOUNT DEVICES (SMD) **5-8 years subject to M/C investment**
e.g. resistors, capacitors, and inductors

• PCBA/DOWNSTREAM PRODUCTS FROM PCBA (using SMT) **3-5 years subject to M/C investment**

• THROUGH-HOLD DEVICES **3 years**
e.g. resistors, capacitors, and inductors

• SMART ELECTRONIC APPLIANCES (USING SMT FOR PCB ASSEMBLY LINE) **6-8 years subject to M/C investment**

• SOLID-STATE DRIVES (SSD) **8 years**
• ADVANCED TECHNOLOGY HDD

• FLAT PANEL DISPLAYS/KEY PARTS **5 years**
e.g. backlight panel, diffuser, LCD film, electrode and polarizing film

• PERIPHERAL DEVICES & SIGNAL CABLE (from metal forming/conductive material fabrication) **5 years**

• AUDIO-VISUAL PRODUCTS **3-5 years subject to the use of SMT**

• ELECTRO-MAGNETIC PRODUCTS **3 years**



Nisshinbo Micro Devices (Thailand) Co.,Ltd.

MISSING LINK



Additional Incentives

Competitiveness Enhancing Incentive

200%

**Additional
CIT Exemption
Limit**

Eligible investment/ expenditures



Technology and Innovation



Human Resource Development



Development of Business
Operators' Potentials

Investments/Expenditures
to Sales in the First 3 years

Additional periods for CIT
exemption

≥ 1% or ≥ 200 MB

1 year

≥ 2% or ≥ 400 MB

2 years

≥ 3% or ≥ 600 MB

3 years

≥ 4% or ≥ 800 MB

4 years

≥ 5% or ≥ 1,000 MB

5 years



In case of investments/
expenditures on R&D ≥ 1%



CIT Exemption
with **NO CAP**



Maximum period
not to exceed



13
years

Investment Stimulation Program

- Stimulating the investment of business activities eligible for 3-8 years of CIT exemption
- Actual investments **not less than 1 bil. THB within 12 months** from the issuance of investment promotion certificate
- Submission of applications within the last working day of the year 2024

+50%
CIT Reduction
5 years

Other BOI Promoted Activities

Regional headquarters (RHQ)/ International Business Center (IBC)

Trade and Investment Support Office (TISO)

International Procurement Office (IPO)



Activities

Providing business activities to group companies, including International Trade

Providing support services for domestic and/or overseas customers e.g. Business advisory, engineering & technical services, wholesaling products manufactured in Thailand, services to group companies, etc

Procurement of raw materials, parts, and components used in manufacturing industries for domestic wholesale and/or overseas exports.



Incentives

- Visa & work permit facilitation
- Majority or total foreign ownership
- Right to own land
- Exemption of import duty on m/c used for R&D and training activity

Tax (by Revenue Department)

- Reduced CIT rate to 3%, 5%, and 8% (from 20%)
- Reduced PIT rate to 15%
- Exemption of CIT on dividends, WHT on dividends & interest, and Specific Business Tax etc.



- Visa & work permit facilitation
- Majority or total foreign ownership
- Right to own land

- Exemption of import duty on machinery
- Exemption of import duty on raw material imported for use in production for export
- Visa & work permit facilitation
- Majority or total foreign ownership
- Right to own land



Conditions

- Investment \geq 1 MB (\approx 4.3 mil.Yen)
- Registered capital \geq 10 MB (\approx 43 mil.Yen)
- Employ at least \geq 10 employees
- Operating expenses \geq 60 MB (\approx 257.3 mil.Yen), in case of receiving tax incentives from Revenue department

- Investment \geq 1 MB (\approx 4.3 mil.Yen)
- Selling & administrative expenses 10 MB (\approx 43 mil.Yen)

- Investment \geq 1 MB (\approx 4.3 mil.Yen)
- Registered capital \geq 10 MB (\approx 43 mil.Yen)
- Must have warehouse with the IT-based system, appropriate activities procurement (e.g. quality inspection & packaging), and etc.



BOI CONTACT IN JAPAN



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