

Thailand's Science, Technology and Innovation Policy and Institutional Framework

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Secretary General

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UNCTAD MULTI-YEAR EXPERT MEETING

Innovation for Productive Capacity-building and Sustainable Development:
Policy Frameworks, Instruments and Key Capabilities

19 -21 March 2014



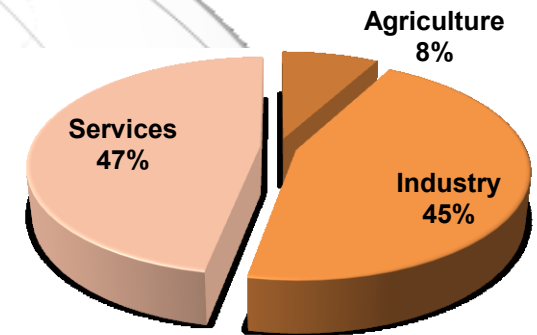
สกปร
WWW.STI.OR.TH

National Science Technology and Innovation Policy Office, Thailand

Thailand Context

- An upper middle income and 2nd largest economy in ASEAN after Indonesia
- Total population 67.4 million in 2013
- Area 513,120 km² (51st in the world)
- Median age 35.1 years, Life expectancy at birth 74.05 years
- Population Growth Rate 0.52% (2013 est.)
- World's Top 3 **rice** exporter
- World's Top 5 **sugar** exporter
- World's Top **chicken** meat exporter
- World's largest natural **rubber** producer and exporter
- World's 2nd largest **hard-disk drive** exporter after China
- **Auto manufacturing** hub of Southeast Asia

GDP (2013): US\$ 385 billion

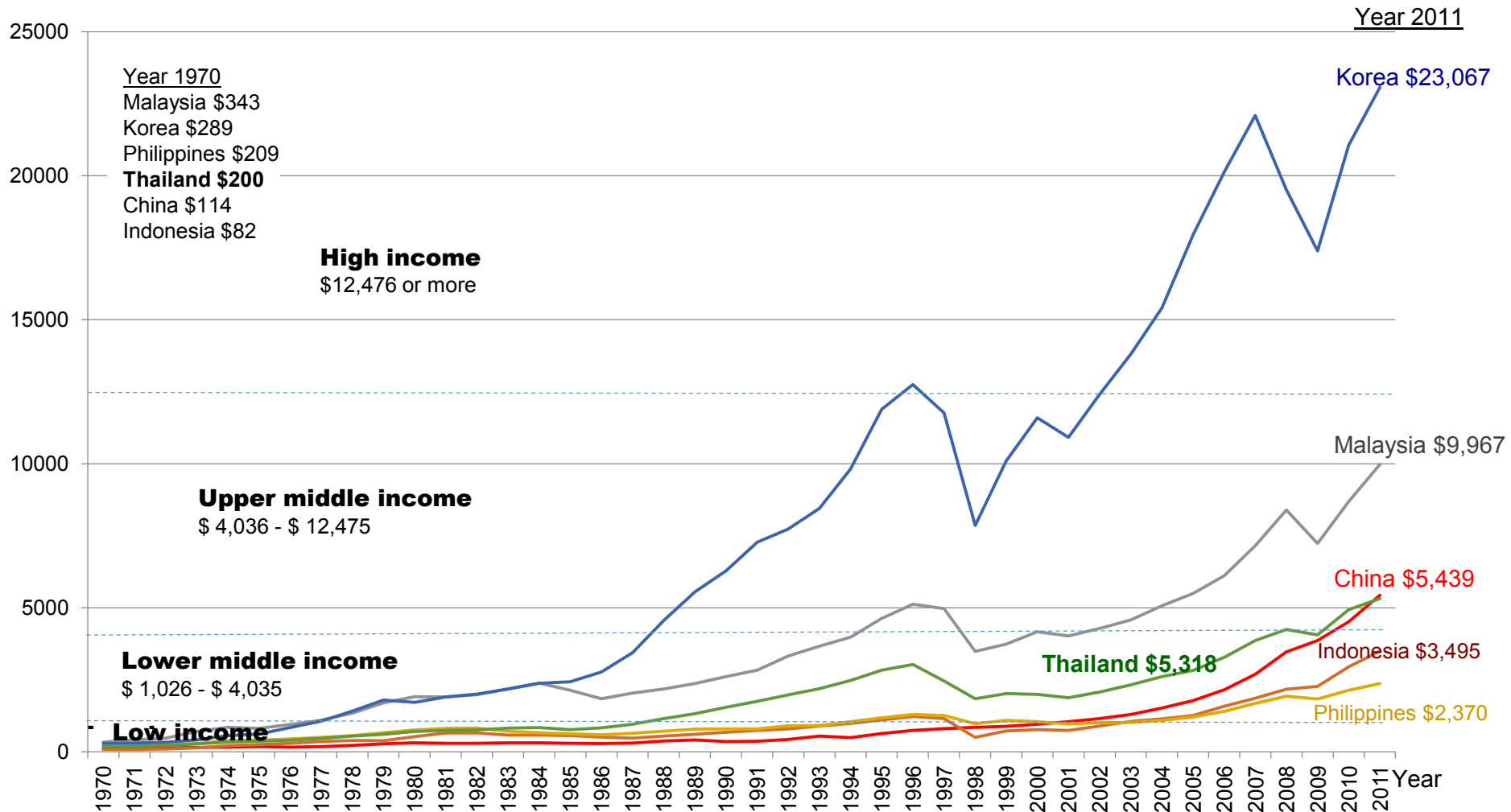


Competitiveness ranking:

- **18th** (from 185) in Ease of Doing Business 2013
- **37th** (from 148) in Global Competitiveness Report 2013 by World Economic Forum
- **27th** (from 60) in IMD World Competitiveness Rankings 2013

Thailand in the middle income group

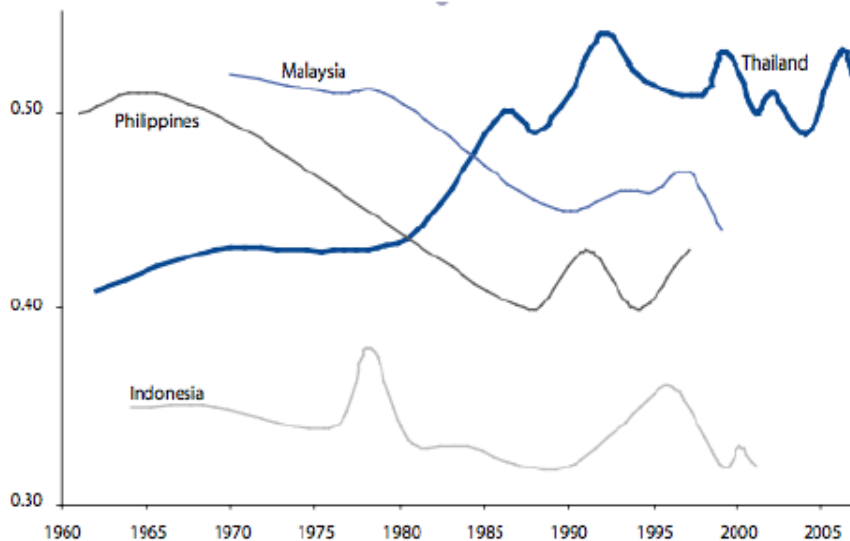
GDP per capita at current price (US dollars)



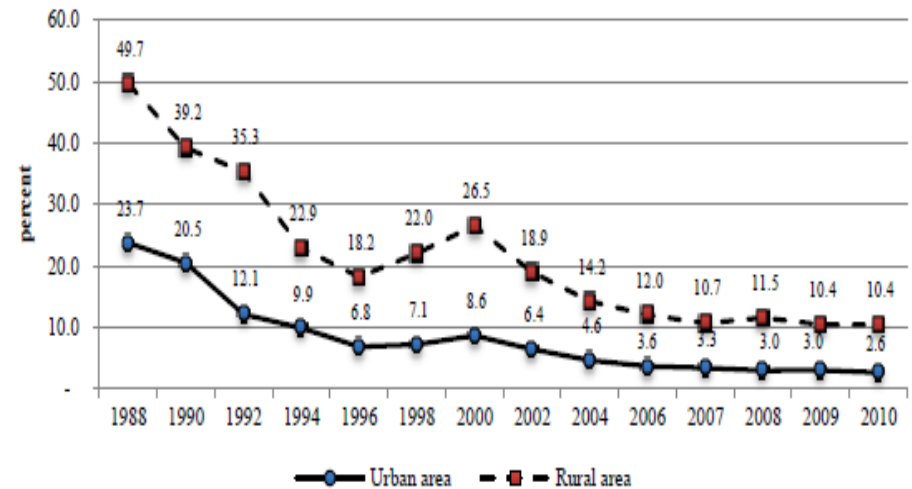
STI Graphics, data from UN Statistics Division and the World Bank

Social factor is important to sustainable growth

- Poor income distribution has led to social disparity. Thailand's income inequality remains relatively high compared with other ASEAN countries at similar level of development.
- Social disparity could lead to political and social instability.



Source: UNDP (2010) cited from Prof. Hal Hill, ANU.

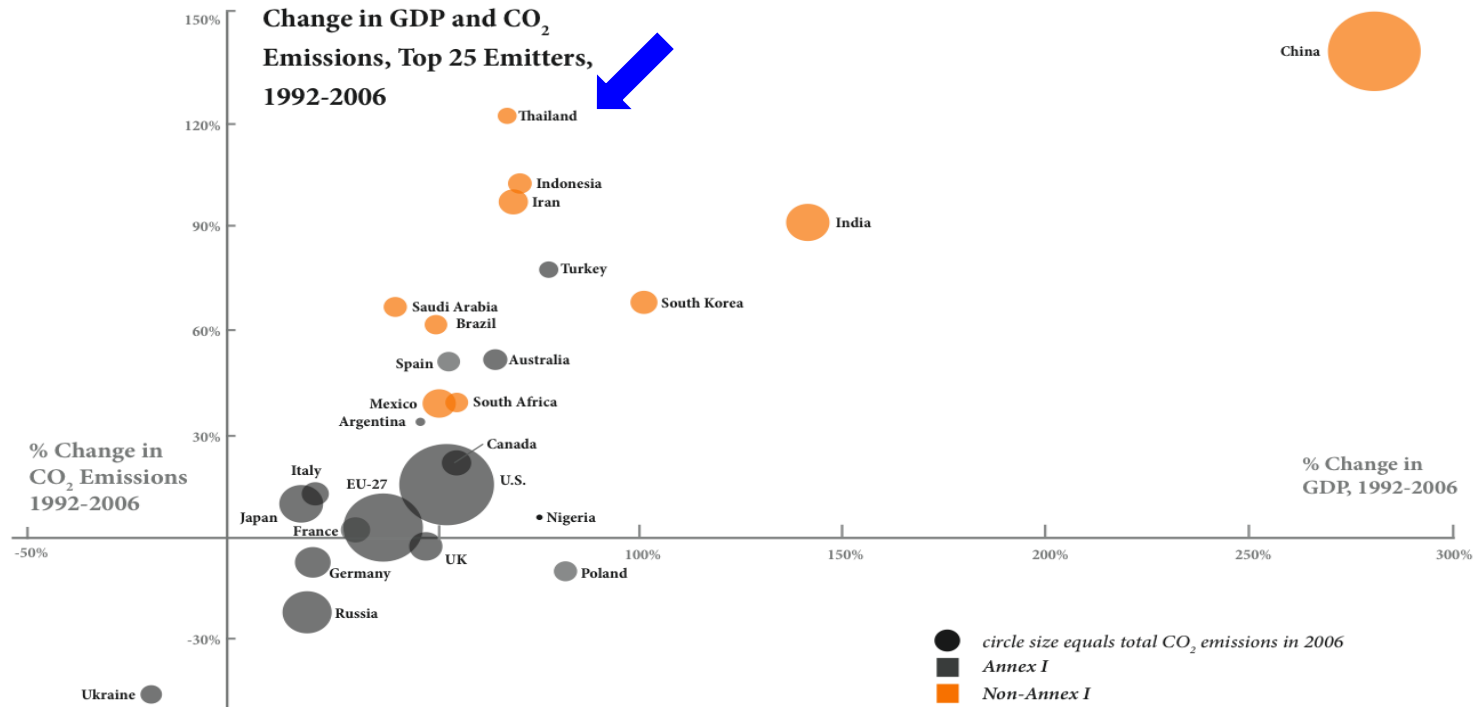


Source: Household Socio-Economic Surveys, NSO; calculated by NESDB¹³

Reference: Pasuk Phongpaichit & Pornthep Benyaapikul (2012)

Environmental factor also adds to sustainable growth

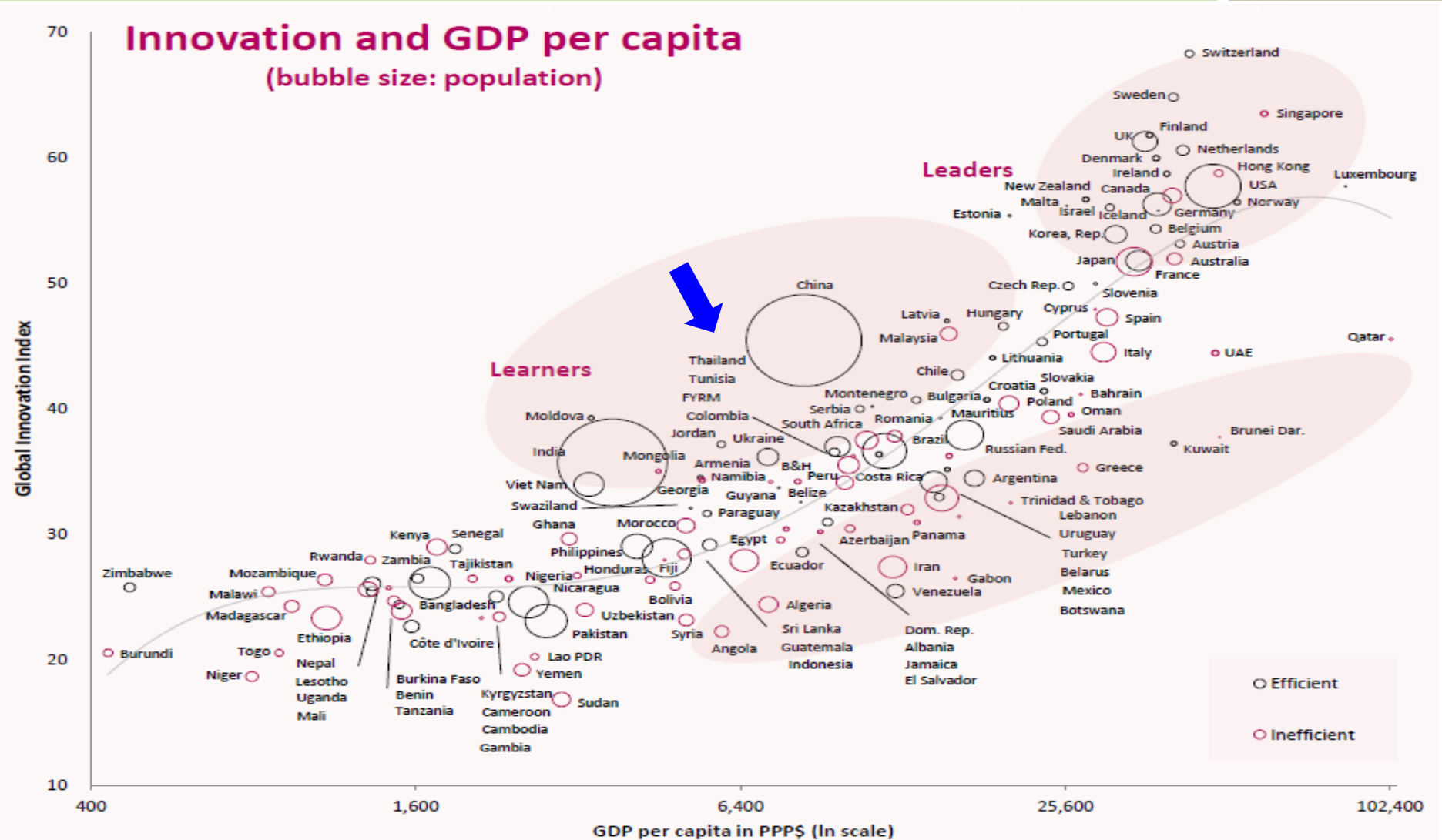
- Thailand CO₂ emissions grew nearly as fast as China, but the economic growth was not as fast.
- Thailand may face difficulty conforming to future global targets of emission reduction.



Change in GDP and carbon emissions, 1992-2006 (Top 25 emitters)

Source: WRI (2009), Reference: Phongpaichit & Benyaapikul (2012)

Thailand's innovation capability in the "Learners" group



Source : INSEAD and WIPO (2012)

STI Institutional Framework: A Snap Shot

- Legal & Institutional Infrastructure
- National STI Policy and Master Plan
- STI Ecosystem
 - National policy making level
 - Ministerial policy making level
 - Policy executing level
 - Operation/utilization level (public/private/community)
- STI Infrastructure
 - Physical - National R&D Centers, Science Parks Network, National Research Universities
 - Legal - IP Framework to Enhance Innovation
- Incentives and Supporting Schemes
 - Financial/Tax incentives
 - Industrial Technical Assistance Programme
- STI Human Resource Development
 - Special Programmes/Initiatives - THAIST, talent mobility, STEM education
- International Cooperation

Part 9 Science, Intellectual Properties and Energy Policies

Section 86. The State shall act in compliance with the science, intellectual properties and energy policies as follows:

- (1) enhancing the development of science, technology and innovation in all aspects** by enacting specific law in so doing, preparing budget for studying and making of researches, establishing institution for research and development, encouraging the use of results emerging from researches and development, the efficient transfer of technology and the appropriate development of researchers, and disseminating science and modern technology knowledge to the public and encouraging the public to apply science into their living;
- (2) supporting an invention** or excogitation for new wisdom, preserving and developing local wisdom and Thai wisdom, and protecting intellectual properties;
- (3) promoting and supporting continuously and systematically of the research, the development and the use of natural alternative energy** which is beneficial to the environment.

**Sustainable Economic and
Social Development**

**National
Target**

**Science, Technology and
Innovation Capability**

Driving Force

Organization & STI Goals

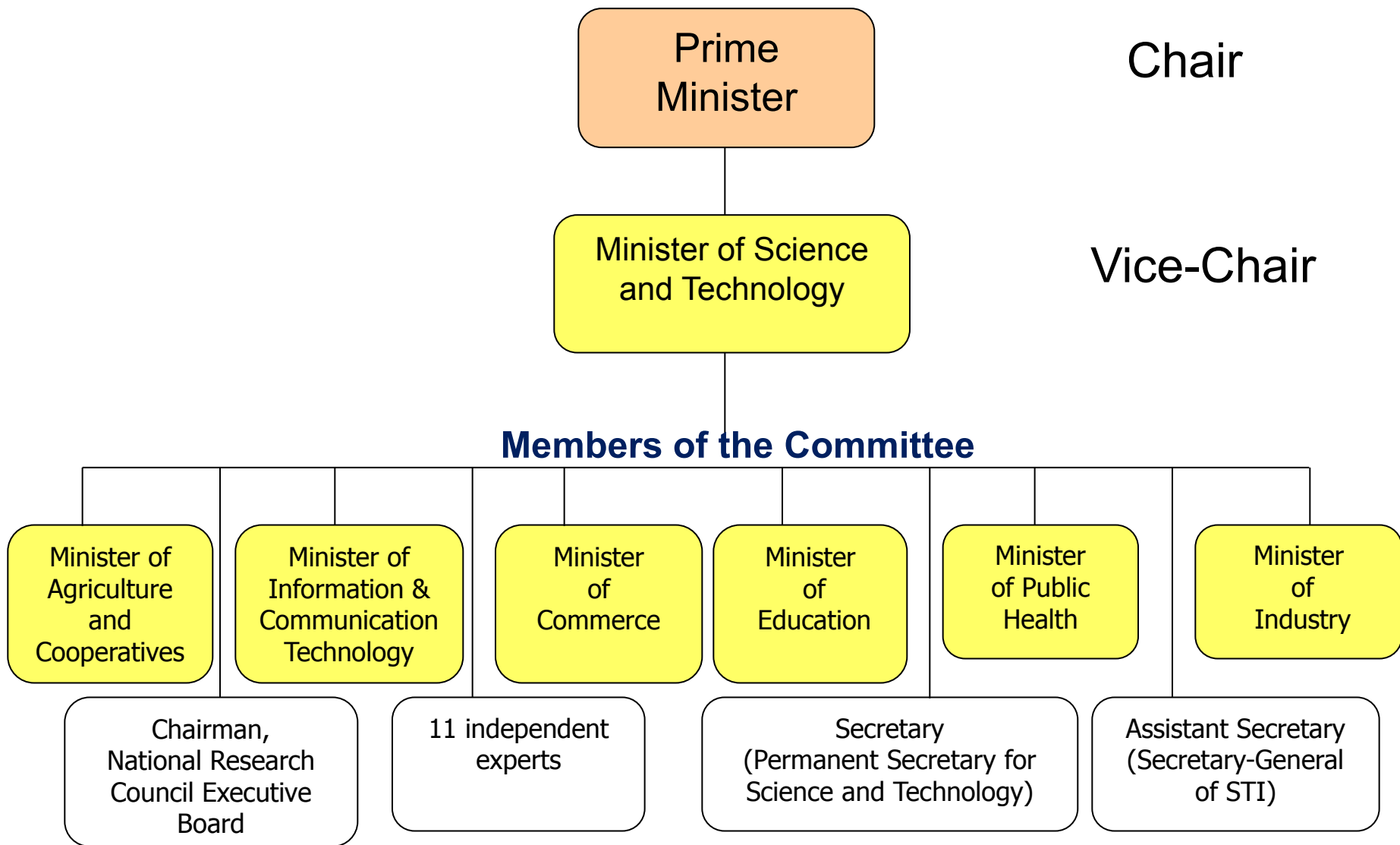
**National STI Policy
Committee**

National STI Policy Office

**Unified National STI Policy and Master Plan
Collaborating Mechanisms between Public
and Private Sector**

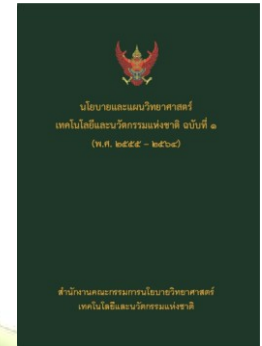
STI as a Critical Part of Intellectual Infrastructure

National Science, Technology and Innovation Policy Committee



National STI Policy and Master Plan

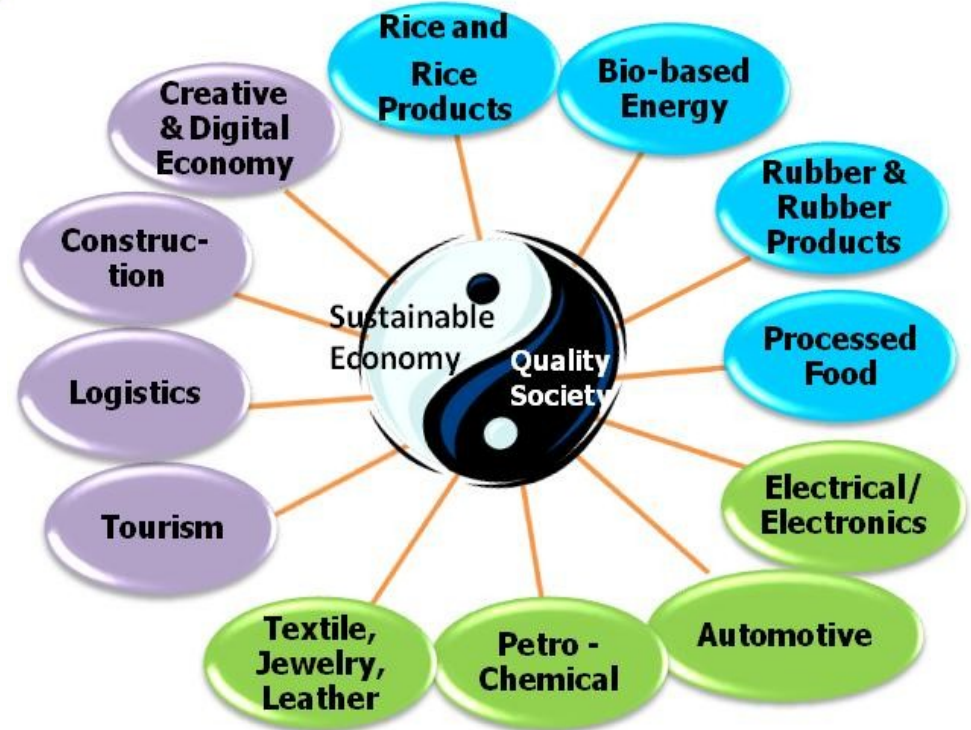
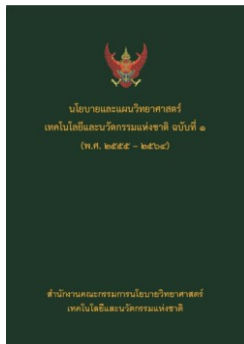
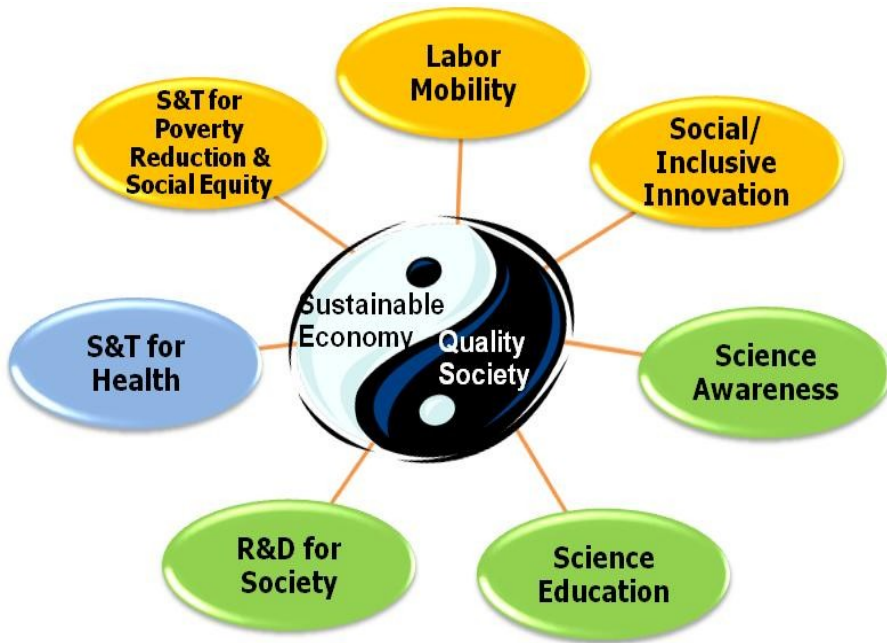
National Science Technology and Innovation Policy and Plan 2012 - 2021



- Address **development of STI & STI** for development
- First time **“Innovation”** is systematically introduced
- Provide national direction for the next **10 years** with periodic adjustments
- Identify **priorities** and **balance** between economic and social development and context for Thailand
- Prepare for **changes** that will have major impacts to the society
- Plan derived from widespread **participatory process** with implementation strategies



National Science Technology and Innovation Policy and Plan 2012 - 2021



Green Innovation
for Quality Society and Sustainable
Economic Growth

1. Empowering Society
and Local Communities

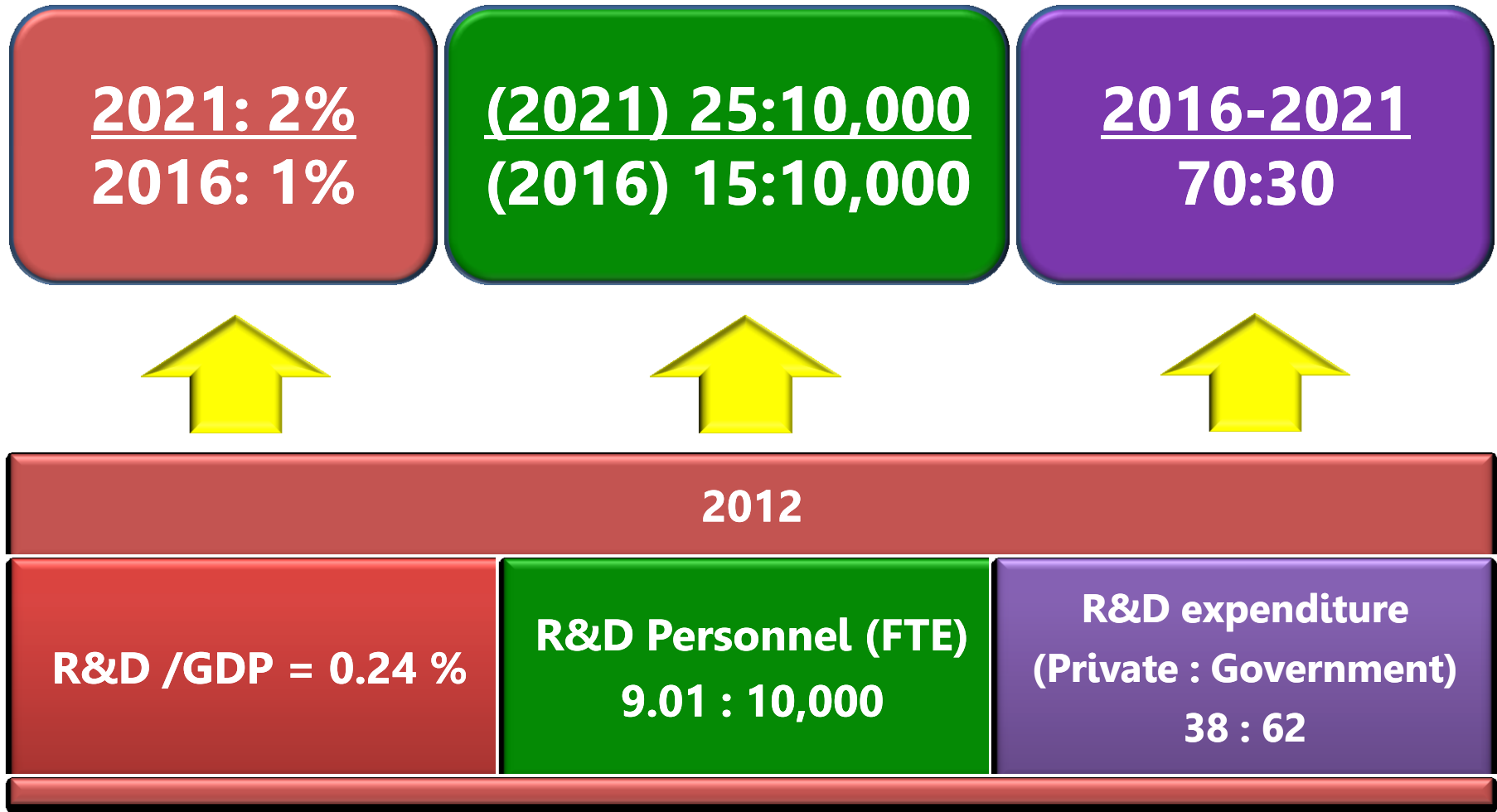
2. Enhancing Economic
Competitiveness and
Flexibility

3. Ensuring Energy,
Resource and **Environment**
Security

4. Developing and Enhancing STI Human Capital

5. Promoting and Supporting the Development of STI Infrastructure
and **Enabling Factors**

STI Investment Targets

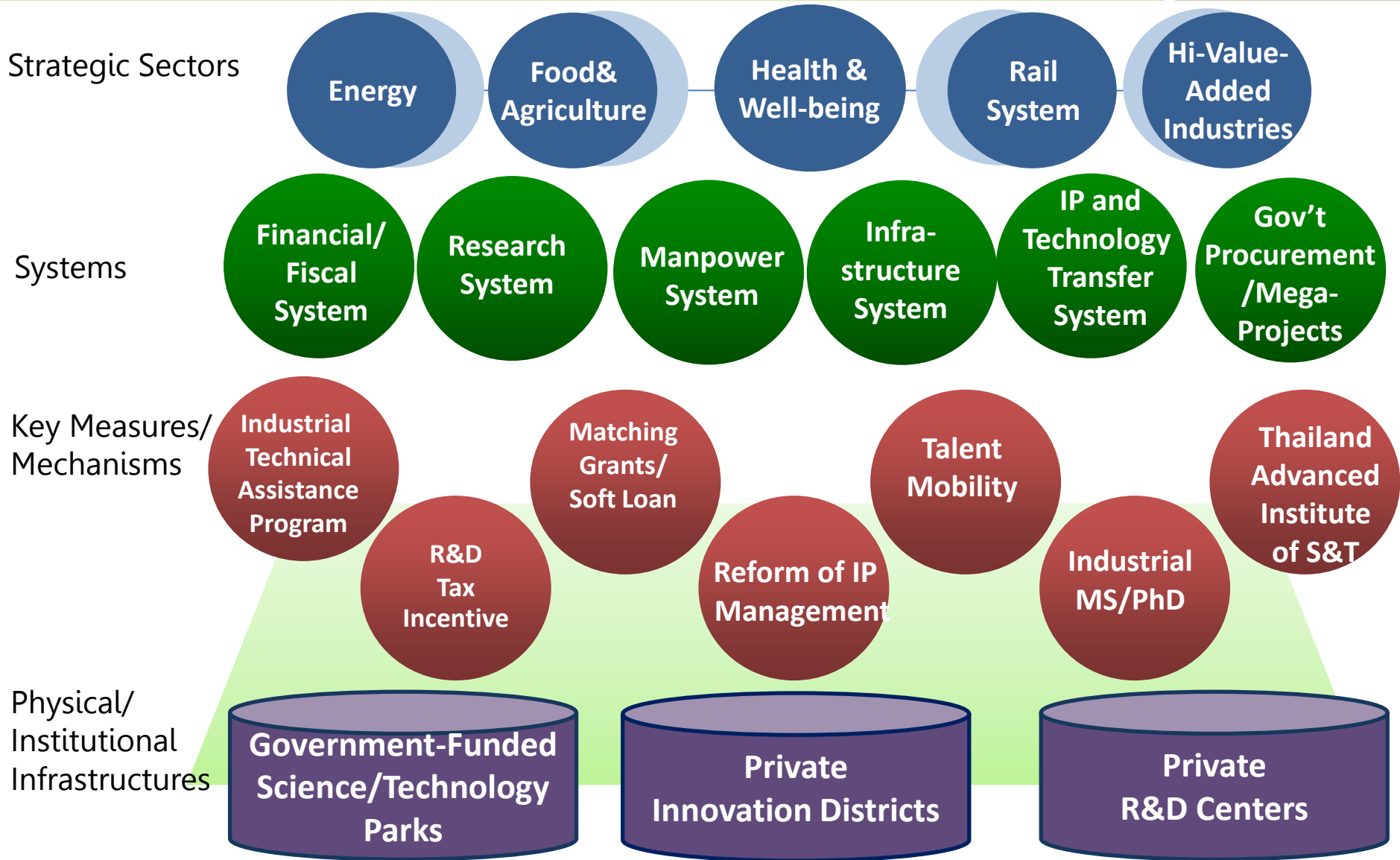


Thailand Status in 2012

- R&D Exp = 21,493 MB
- R&D Exp : Gov : Private = 13,318:8,175 MB
- R&D Personnel = 57,220 (man-year)

Source: National Science Technology and Innovation Policy Office

STI Policy Framework to Enhance Innovation



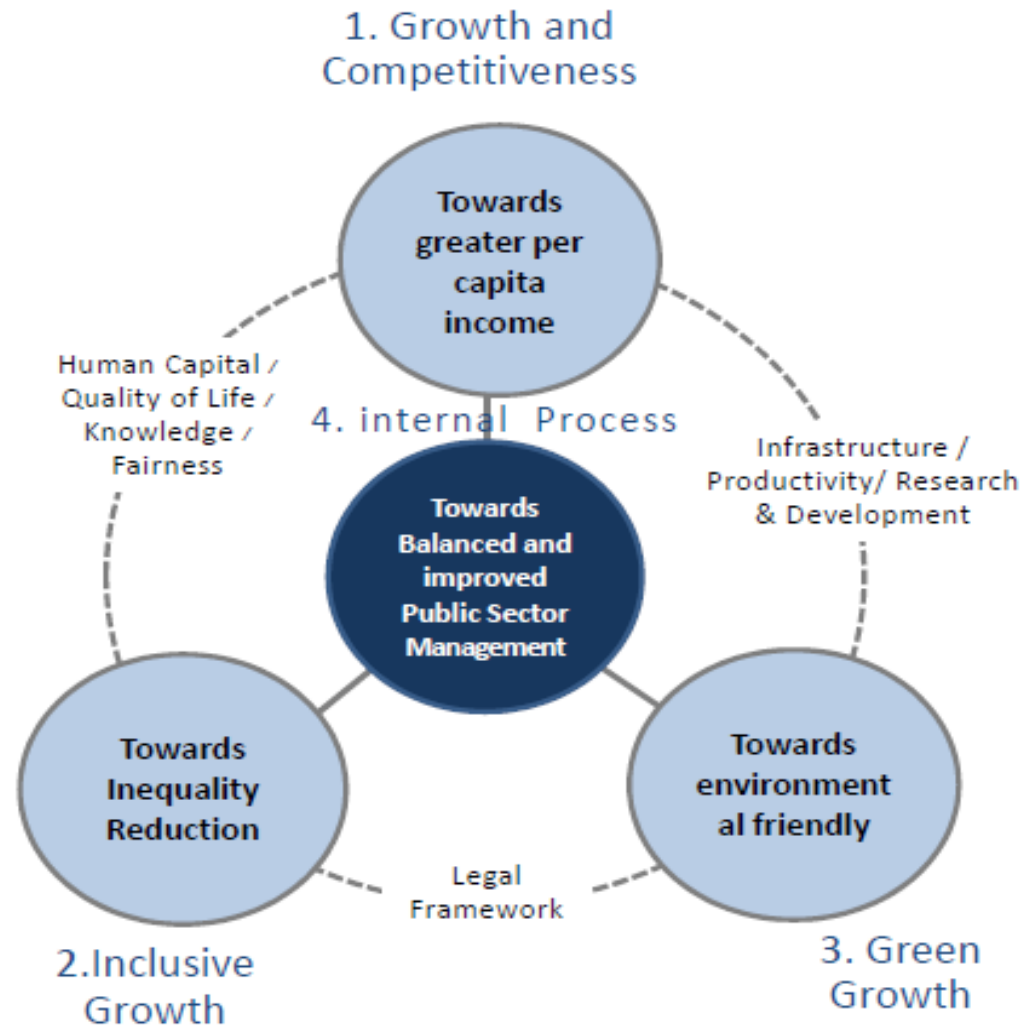
STI Plan fits in nicely with the Country's New Growth Model

Vision

Enhance national competitiveness and develop a happy society with equity, fairness and resilience

Objective and Principle

- 1. Growth and competitiveness:** maintain economic growth and increase per capita income, strengthen the existing industries and develop future industries as a new source of income
- 2. Inclusive growth:** Lower poverty, create greater economic distribution, lessen economic gap
- 3. Promote green growth:** reduce Green House Gas Emission and natural resource and water management
- 4. Internal Process:** align strategies at all levels to achieve the determined development targets, prepare government manpower and modernize rules and regulations



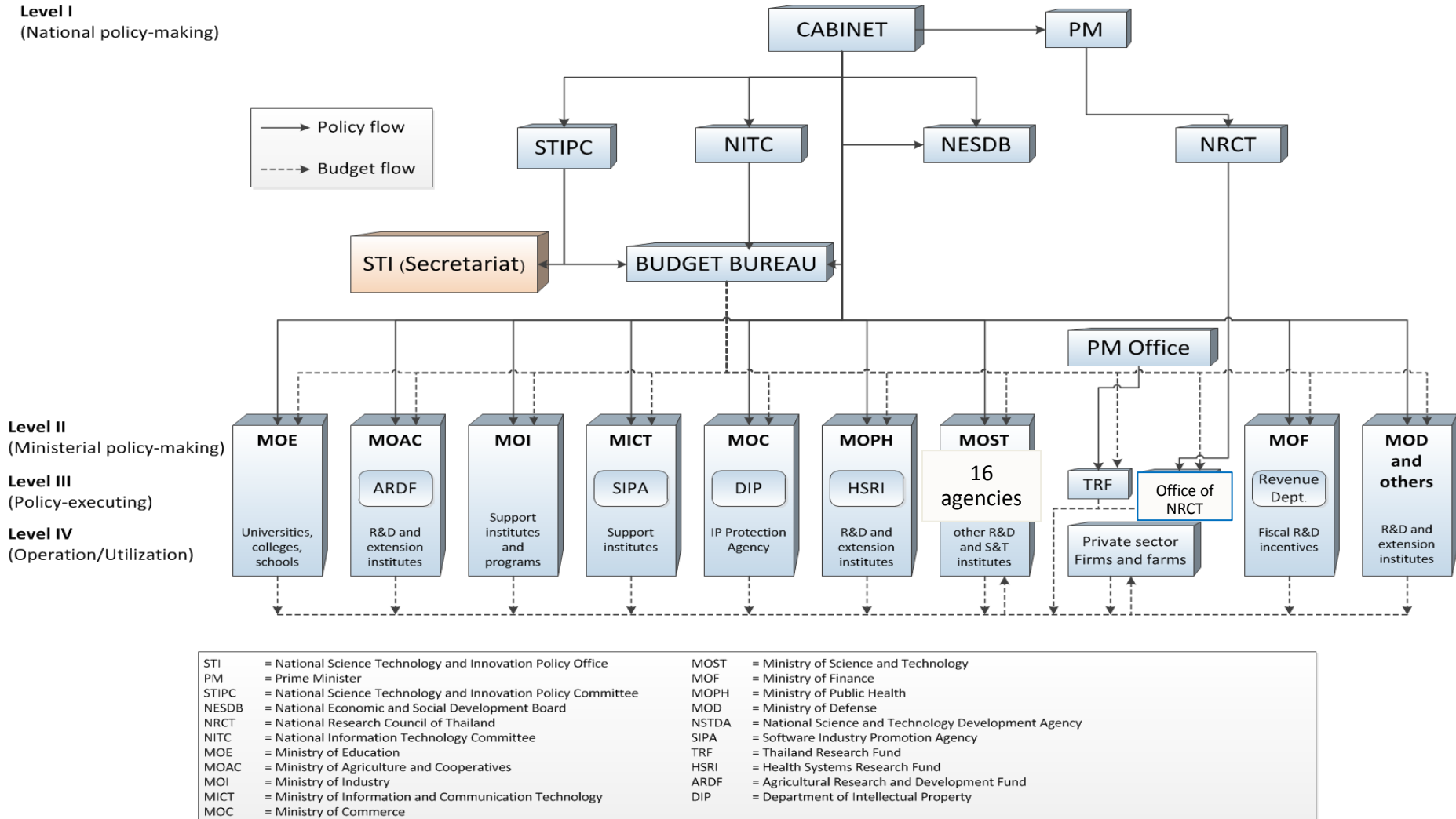
Source: National Economic and Social Development Board (NESDB), 2013

STI Ecosystem

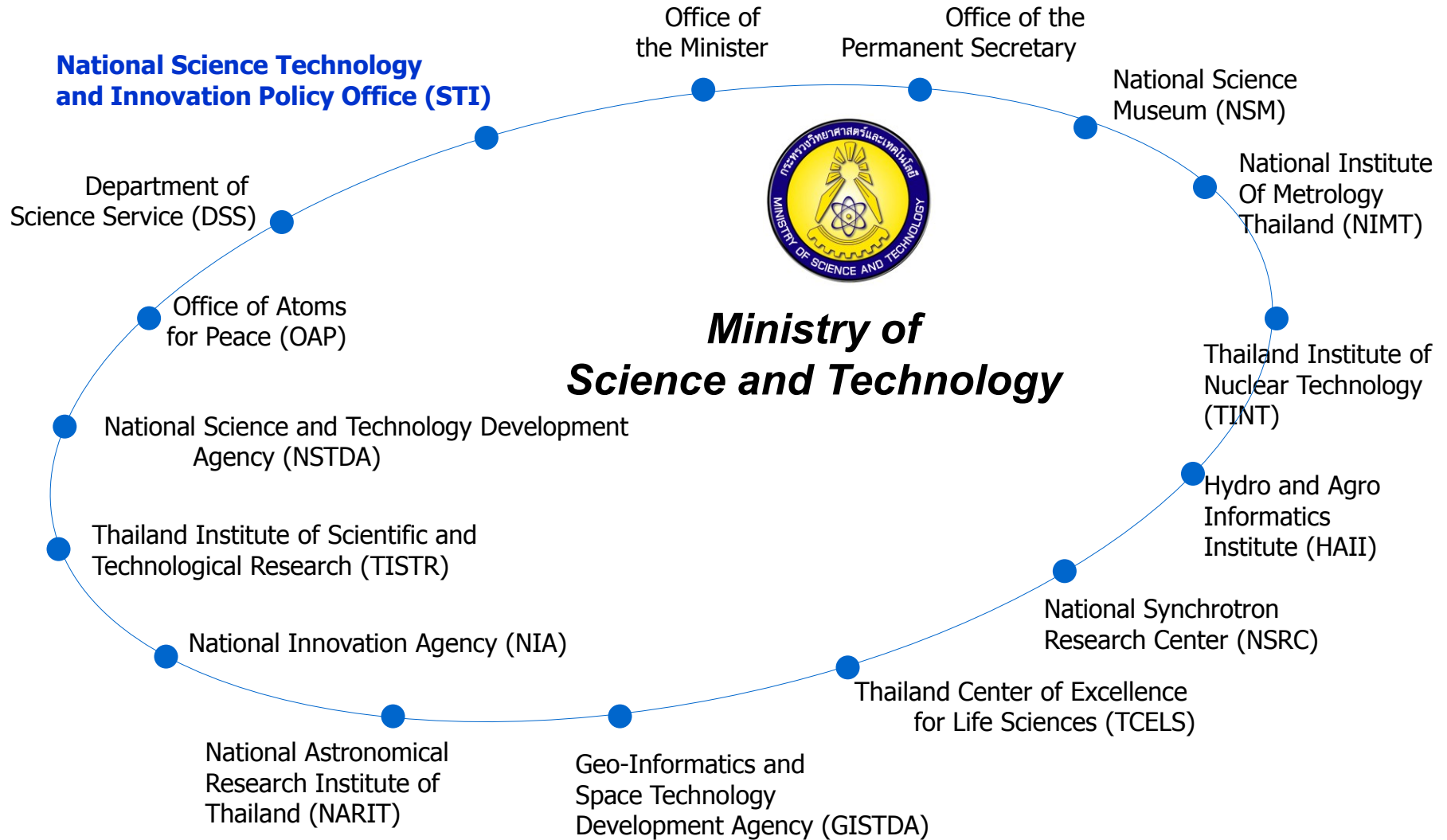
Thailand's STI Ecosystem:

A Variety of Institutional Complementarities

Organizational Structure for Science Technology and Innovation policy system in Thailand



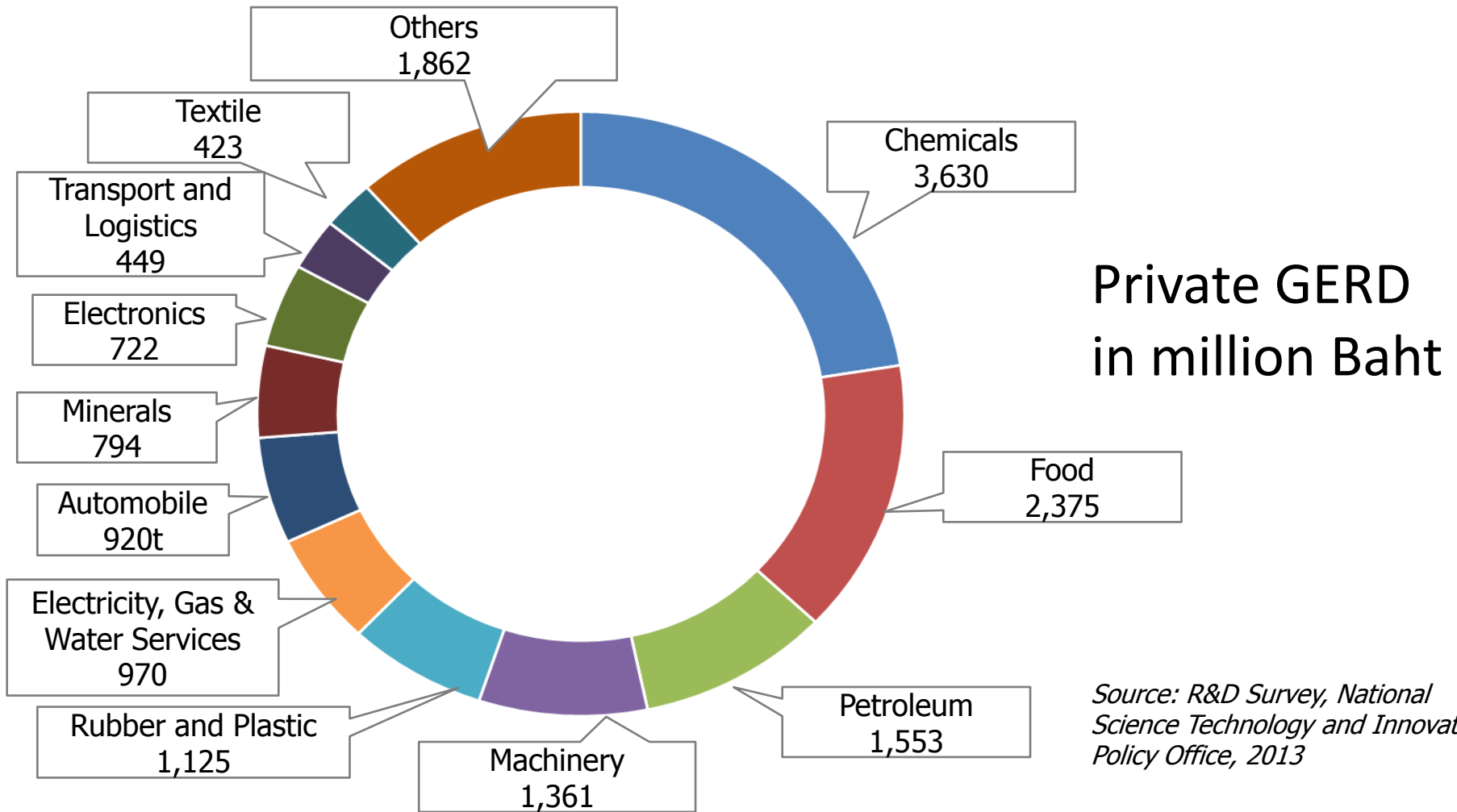
Agencies under Ministry of Science and Technology



Top 10 Private Sector R&D Investment, 2013

Major Business Groups:

Federation of Thai Industries/Board of Trade/Bankers Association



Source: R&D Survey, National Science Technology and Innovation Policy Office, 2013

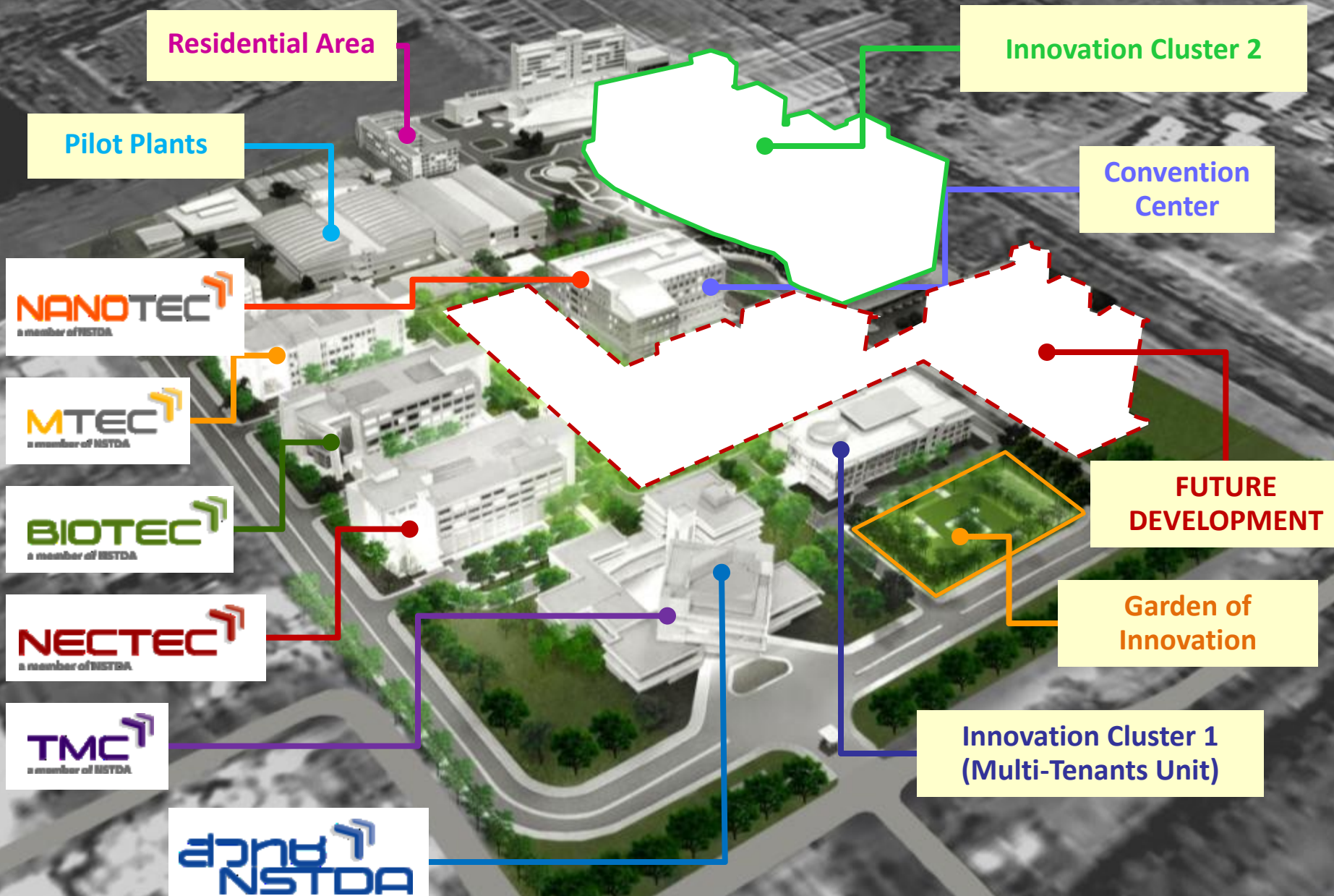
National Research Universities



Source: Office of the Higher Education Commission

STI Infrastructure

National R&D Centers at Thailand Science Park



Source: National Science and Technology Development Agency (NSTDA)

Regional Science Parks Network

Northern Science Park

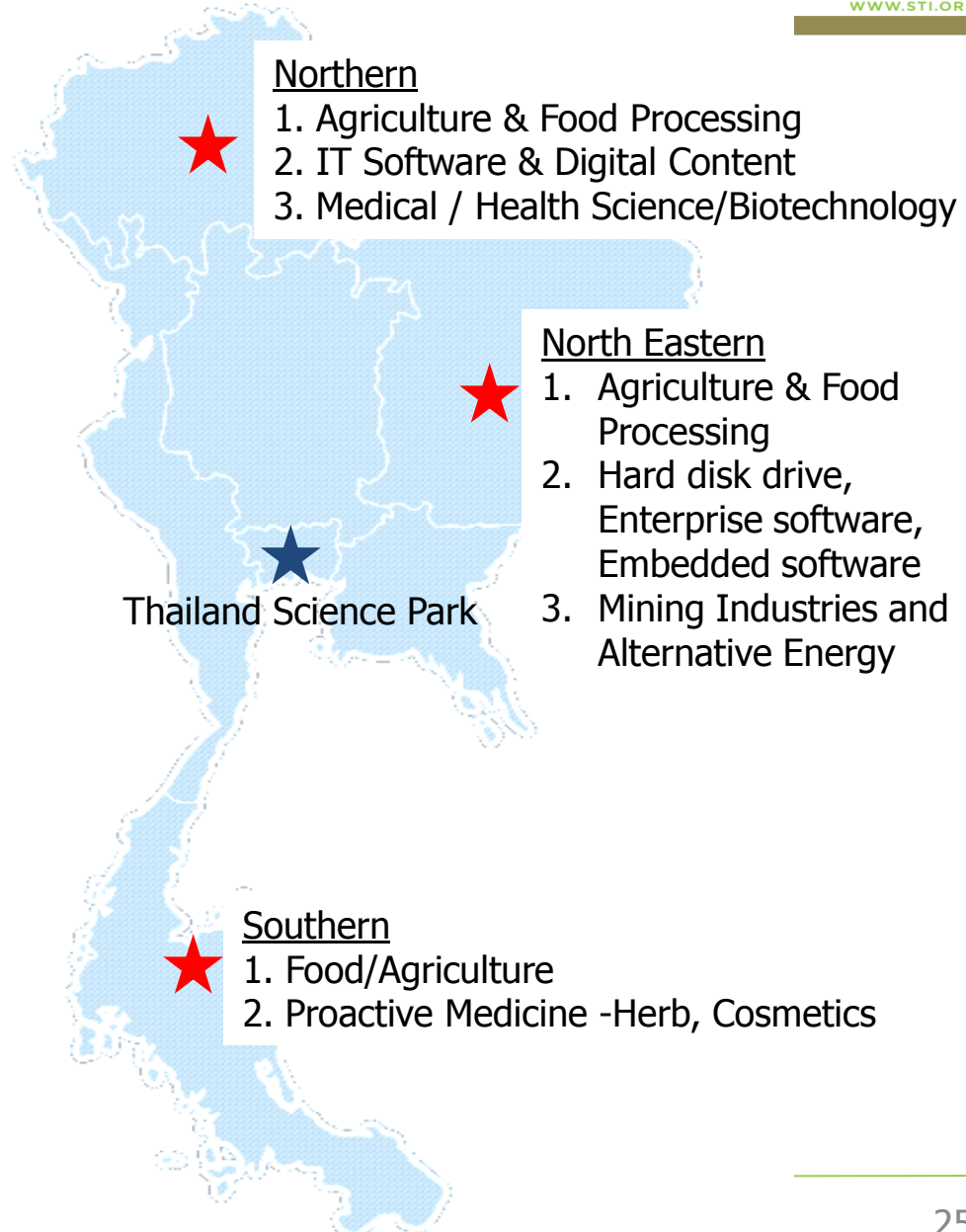
- (1) Chiang Mai University
- (2) Maejo University
- (3) Naresuan University
- (4) Mae Fah Luang University

North Eastern Science Park

- (1) Khon Kaen University
- (2) Suranaree University of Technology
- (3) Maha Sarakham University
- (4) Ubon Ratchathani University

Southern Science Park

- (1) Prince of Songkla University
- (2) Walailak University



IP Legal Framework to Enhance Innovation

Government Budget

Funding Agency

Conventional funding for basic and applied research

University

Research Institute

Private Company

Research Technology Organization (RTO)

Legal enabler for IP utilization

1. Financial support for SMEs' R&D

2. Streamlining IP process

3. Capacity Building of TTO

IP Creation, Registration and Licensing

TTO
in university or research institute

Royalty income



Private Firm (old and new)

Market

New products, New services, New jobs, New companies

Proof of concept

Proto type

Pilot Production

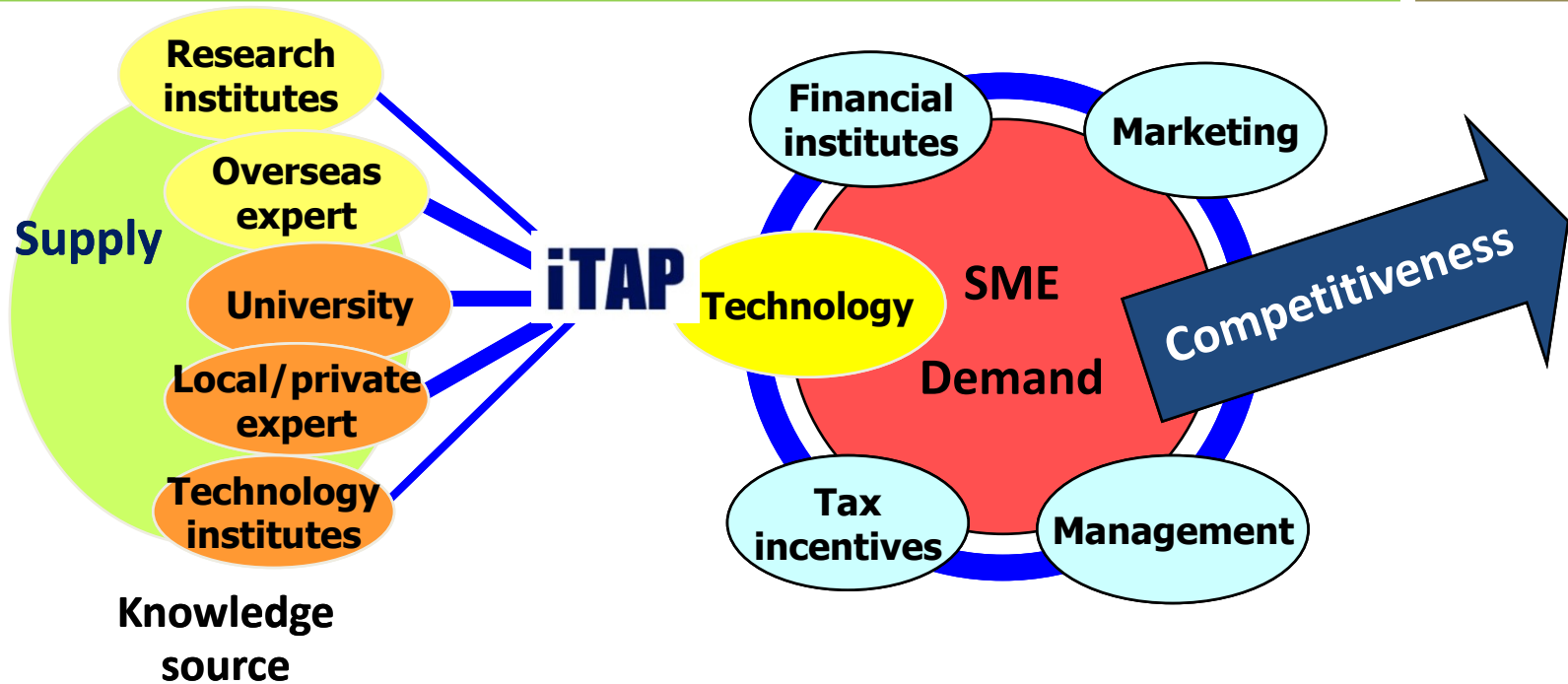
Mass production

4. Translational Research Fund

Incentives and Supporting Schemes

- Grants / Matching Grants
 - Innovation Coupon, NIA
 - Industrial Technology Assistant Program (ITAP), NSTDA
- Loans
 - Company Directed Technology Development Program (CD), NSTDA
 - Good Innovation Zero Interest, NIA
- Tax Incentives
 - STI (Skills, Technology, Innovation) Program and Tax Incentives for University-Industry Research Collaboration, BOI
 - 200% tax incentive for R&D expenditures and accelerated depreciation rate for R&D equipment, Revenue Department

ITAP as a Tool for Technology Transfer



Source: National Science and Technology Development Agency (NSTDA)

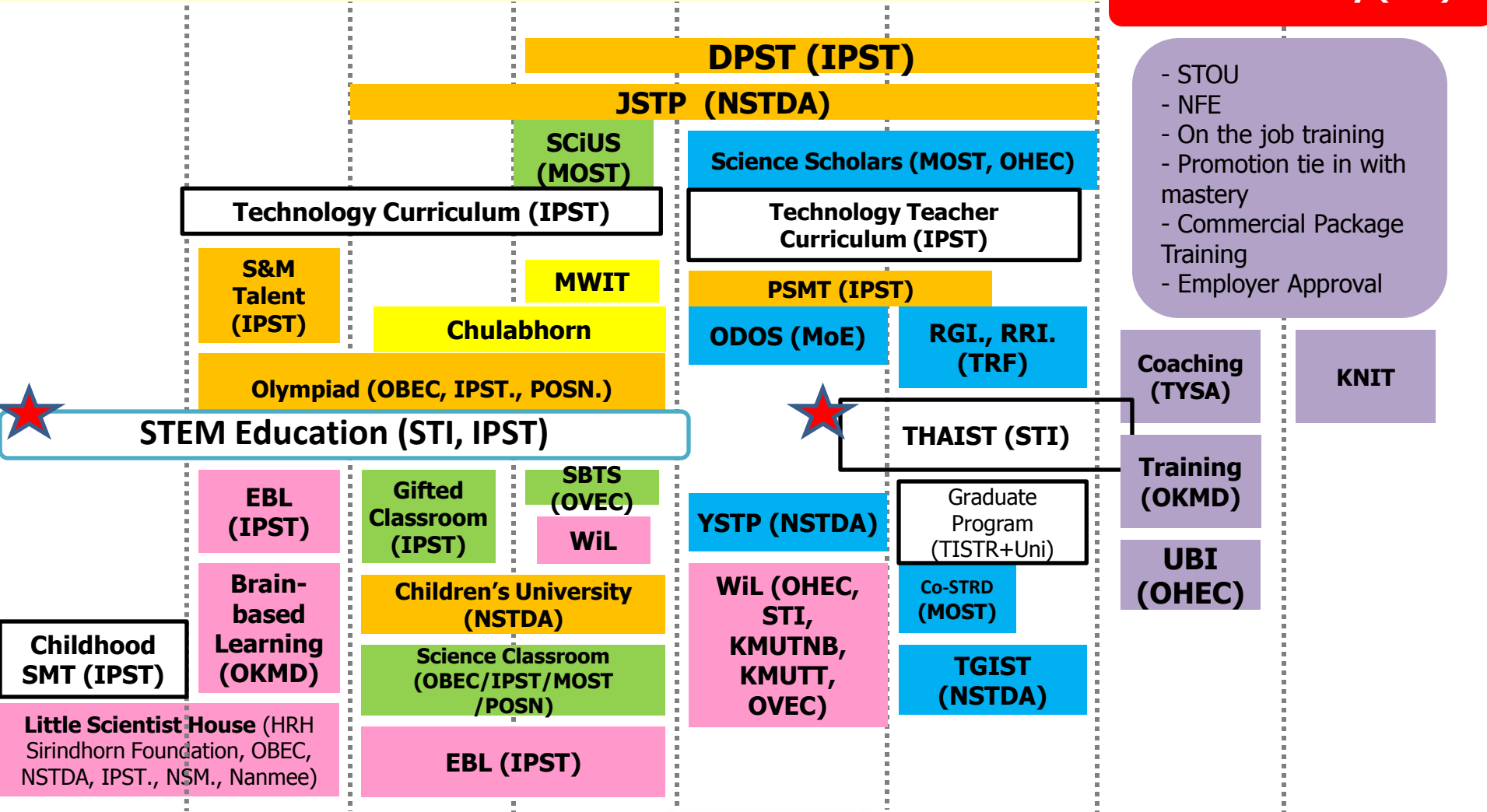
STI Human Resource Development

■ Learning Method
 ■ Enrichment/Mentoring
 ■ Specialty Schools
 ■ Class in School
 ■ Scholarship Programme
■ Life-long Learning/Training
 ■ Enabling System
 Formal Education/Others

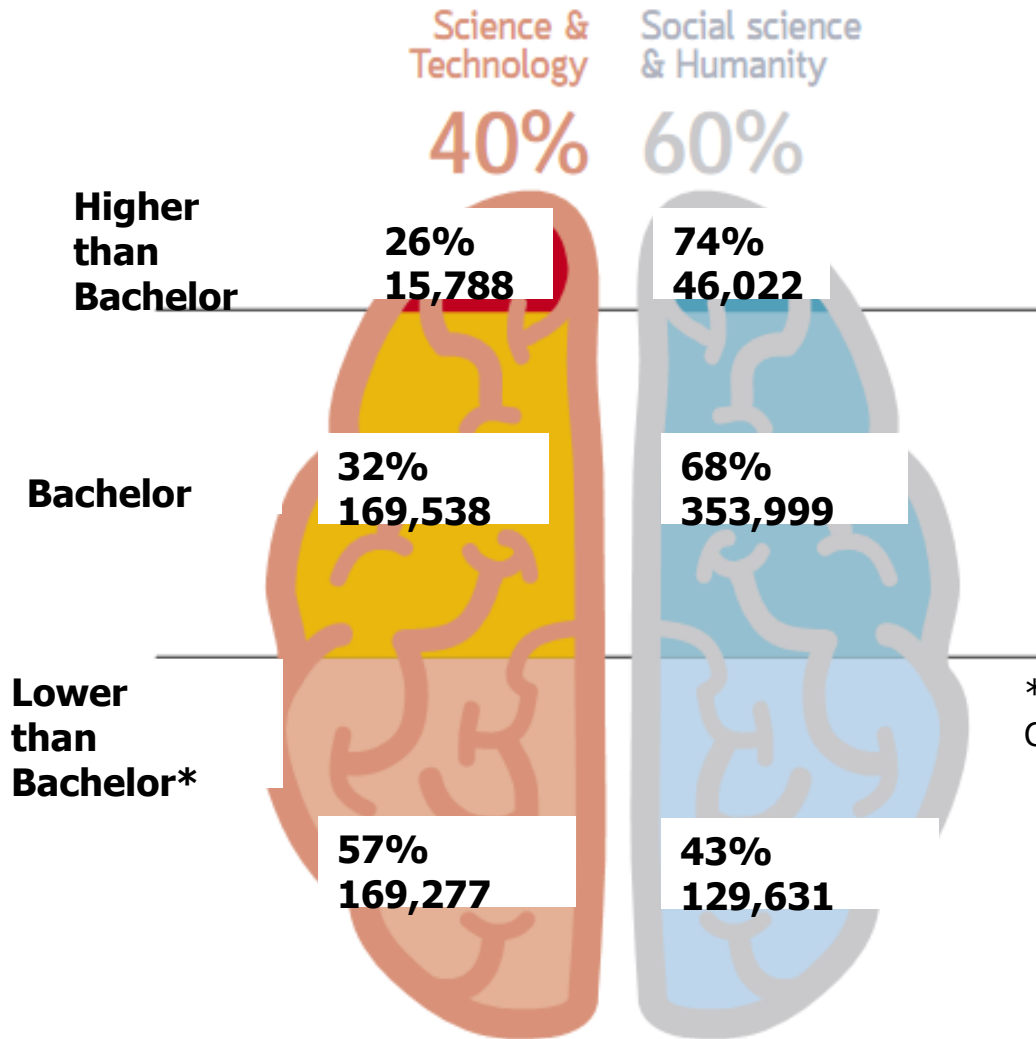
STI HR Development Programmes

Talent Mobility (STI)

- STOU
- NFE
- On the job training
- Promotion tie in with mastery
- Commercial Package Training
- Employer Approval



Thailand STEM Education



Proportion of new enrolment in S&T subject compared with social science subject in 2011

* Vocational Certificate and High Vocational Certificate
Source

1. Office of the Higher Education Commission, Thailand
2. Office of the Education Council, Thailand
3. Office of the Vocational Education Commission, Thailand

Summarised by STI

SCIENCE-BASED TECHNOLOGY SCHOOL : SBTS

Concept

SBTS is national vocational schools for gifted and talented students who have developed skills in invention and technology. The Teaching and Learning of this project use Project-Based approach. The aim of this project is to develop these students to become the technologist or innovator in the future.

- **The cabinet approved this project on December 18th, 2007.**
- **The Ministry of Education and the Ministry of Science and Technology decided to launch the pilot SBTS program. (2008-2012)**
- **The first SBTS school is located in Science Based Technology Vocational College (Chonburi).**

Lamphun College of Agriculture and Technology, (Agricultural Biotechnology)



Singburi Vocational College, (Food Technology)



Suranaree Technical College, (Science Based Industrial Technology)



Science Based Technology Vocational College (Chonburi), (Science Based Industrial Technology)

Phang-nga Technical College, (Innovation in Tourism)



Technical HRD of Vocational Diploma Level – Collaboration with Michelin Siam Co., Ltd.



- Co-develop curriculum and select students to the programme
- Arrange classes
- Administration work

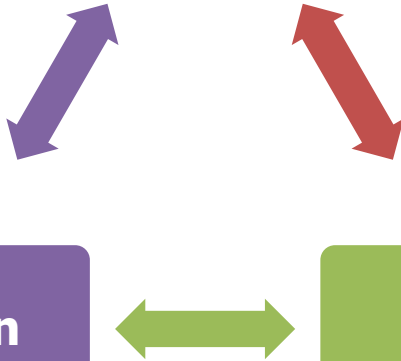
**Austria-Thai
Technical
College**

- VEC: formulate policy/select college
- STI: focal point and drive the project until success

- Co-develop curriculum and select students to the program
- Provide 2-year financial support
- Allow 10-month placement for students
- Provide salary/payment
- Offer job position to the graduates (must meet requirements)

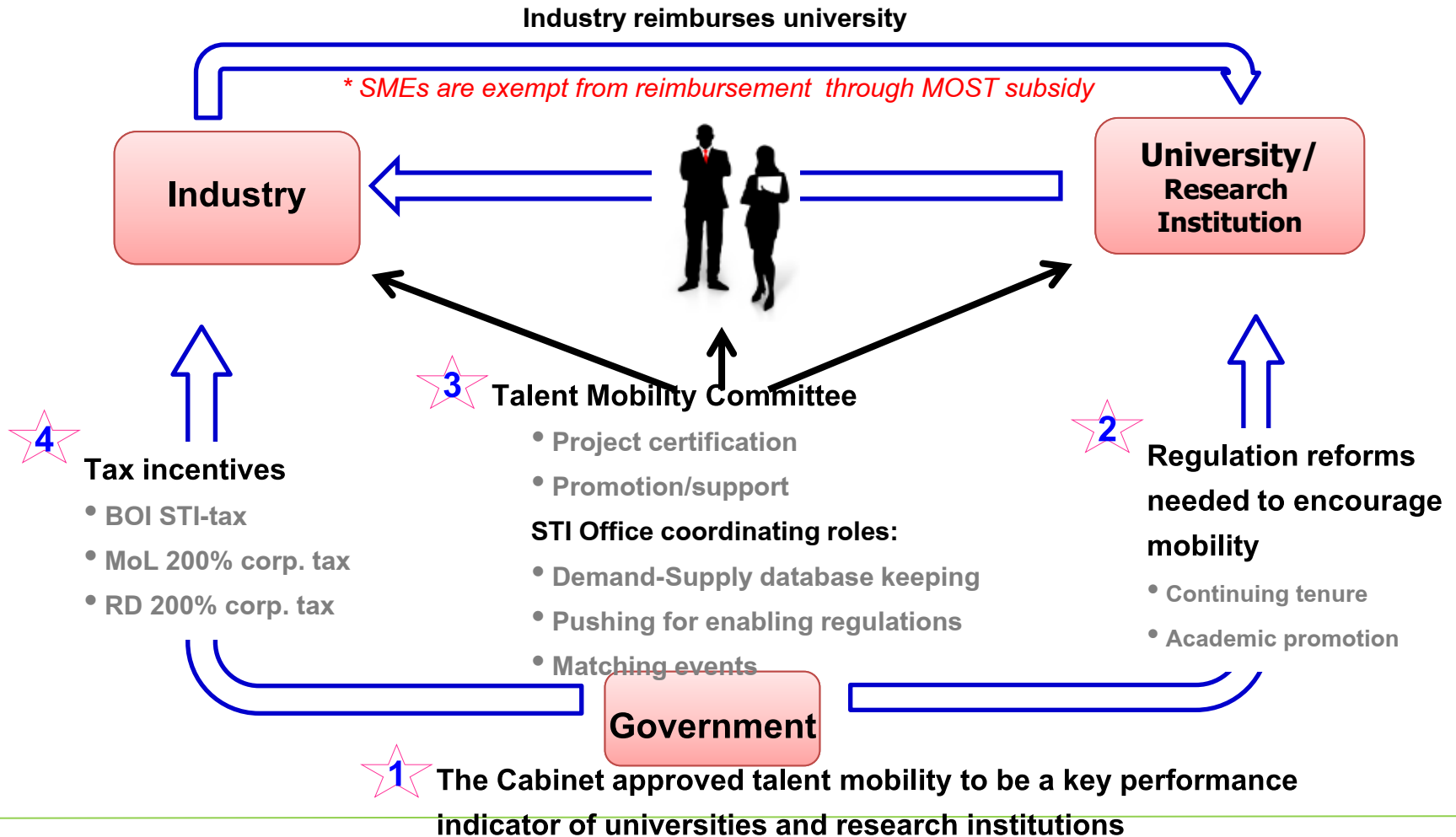
Michelin

**VEC
STI**



Talent Mobility Programme

To facilitate the mobility of researchers in governmental agencies and higher education institutions to industrial sector.



International Cooperation

ASEAN Community 2015



10 nations
600 million people
Combined GDP of
US\$1.8 trillion





The ASEAN Krabi Initiative

Science, Technology and Innovation (STI) for a Competitive , Sustainable and Inclusive ASEAN

Endorsed by ASEAN S&T Ministers at the 6th IAMMST as a policy framework for STI cooperation in ASEAN, December 2010

Rationale

ASEAN 2015 – Vision of ASEAN Leaders

Roles of STI – A Balance between Competitiveness and Human Development (People-oriented STI)

Reinventing ASEAN Scientific Community for a Meaningful Delivery of STI Agenda in ASEAN

Thematic Tracks

ASEAN Innovation for Global Market

Digital Economy, New Media & Social Network

Green Technology

Food Security

Energy Security

Water Resource Management

Biodiversity for Health & Wealth

Science and Innovation for Life

Paradigm Shift

STI Enculturation

Bottom-of-the - Pyramid (BOP) Focus

Youth-focused Innovation

STI for Green Society

Public-Private Partnership Platform

Courses of Action

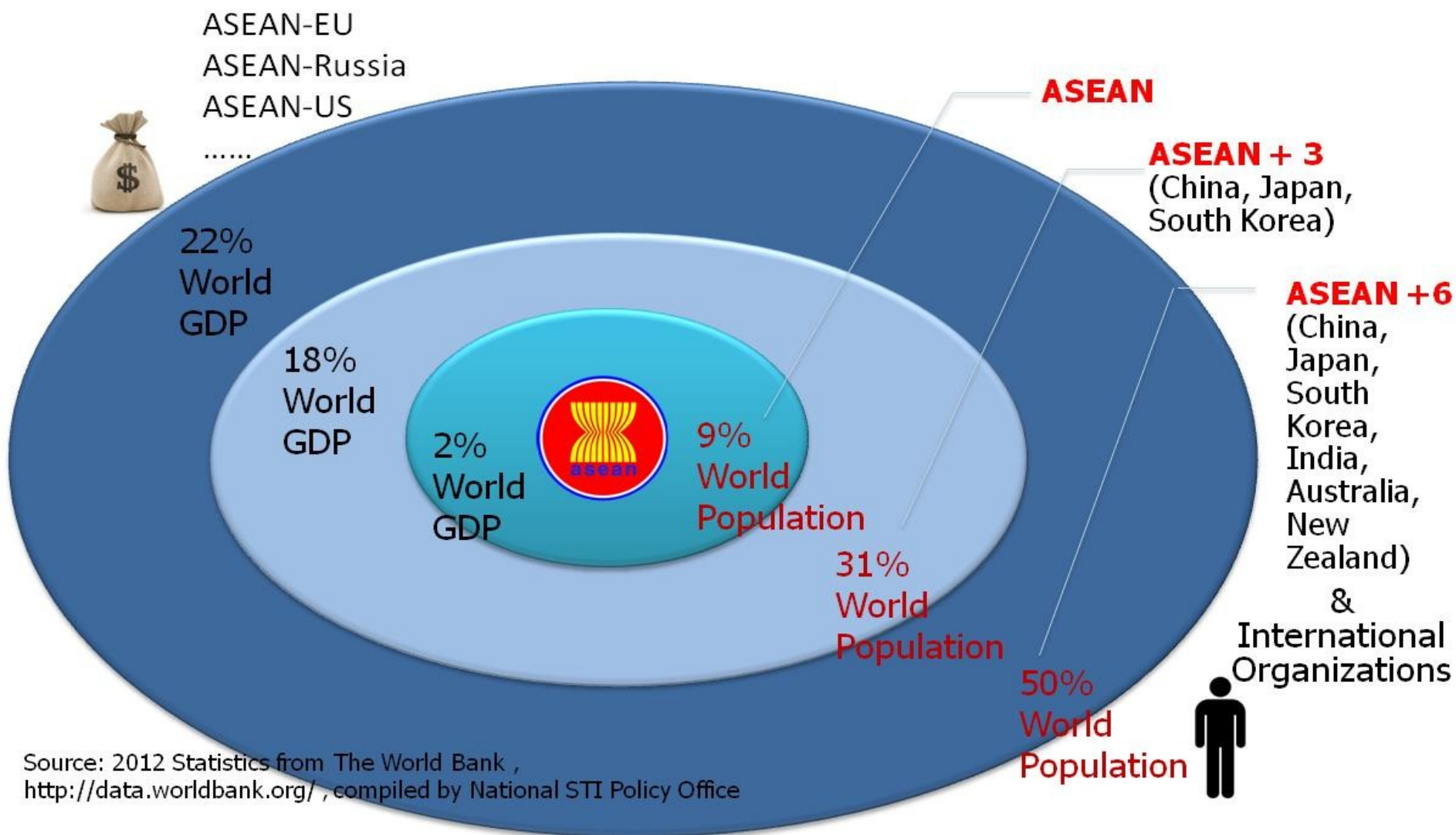
Organisational restructure for a meaningful delivery of STI agenda in ASEAN

Develop mechanisms to pursue partnerships and cooperation with other stakeholders in STI

Enhance ASEAN Plan of Action on S&T for 2012-2015 and leverage the recommendations of the Krabi Retreat for development of future APAST beyond 2015

Implement monitoring and evaluation mechanism for the implementation of STI thematic tracks

ASEAN and Dialogue Partners





ASEAN Talent Mobility Workshop

27-28 March 2014

Patong Merlin Hotel , Phuket, Thailand

www.aseantalent.net

Objectives:

- exchange views and experiences on talent management and development of STI human resources
- discuss policies and mechanisms to promote talent mobility in ASEAN and international brain circulation
- explore the potential of developing "ASEAN Talent Mobility (ATM)" Program as a platform for talent mobility among ASEAN and their partners

Participants

- Representatives from ASEAN COST
- Representatives from the private sector and universities
- ASEAN dialogue partners

Expected Outcome

A set of recommendations and plan of action for the ASEAN Talent Mobility (ATM) Program

Thank you for your attention.



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