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RRi

สกว TRF

GLOBAL EDUCATION DIALOGUES

The East Asia Series

2013-2014

Co-innovation for Social and Economic Growth

Building platforms and creating mechanisms to drive triple helix in ASIA/ASEAN context

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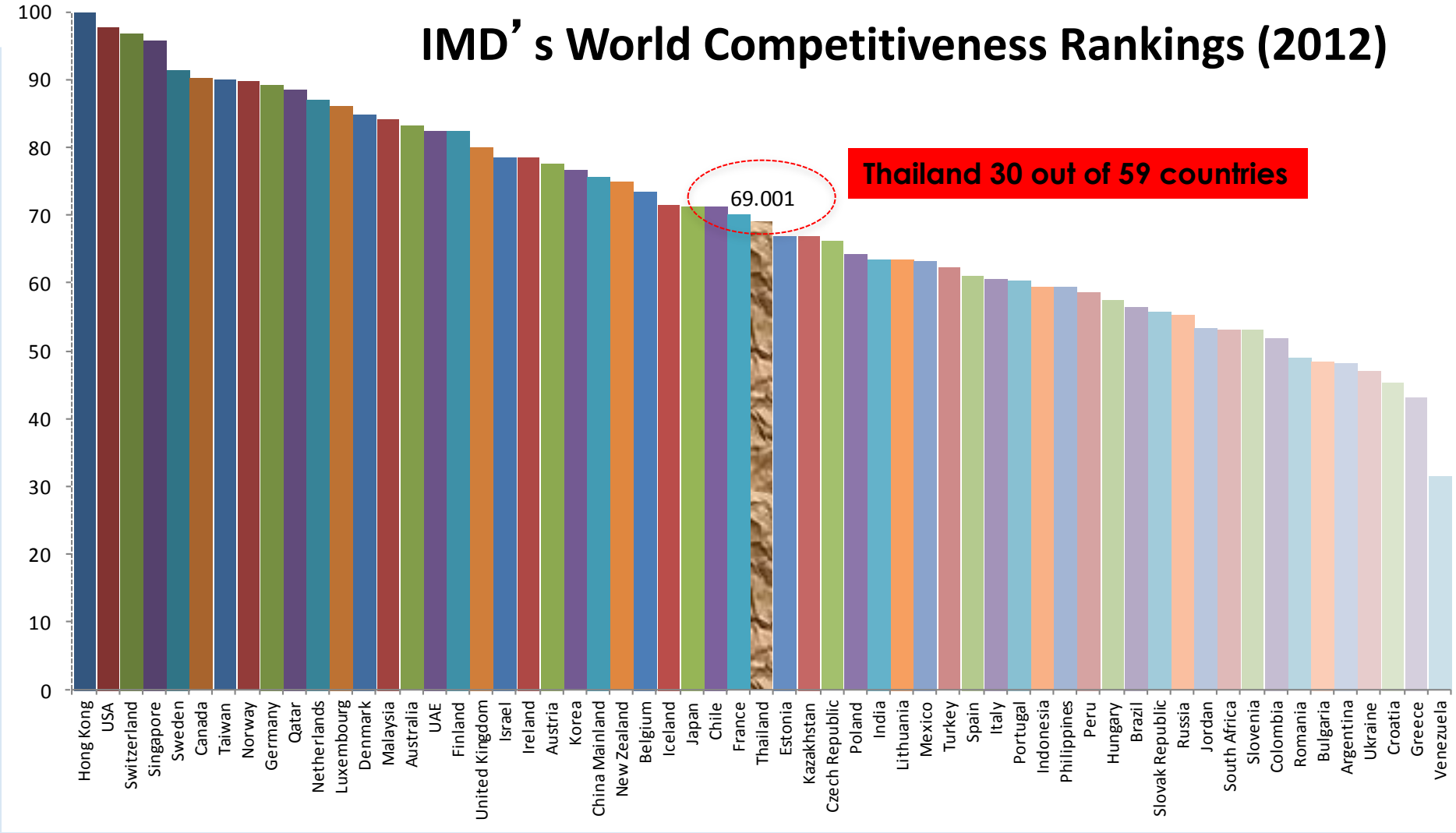
Outline

- **Where are we now?**
  Challenges for Thailand
- **Where do we plan to be?**
  Sustainable economy
- **How do we get there?**
  Approaches to linkages

IMD's World Competitiveness Rankings (2012)



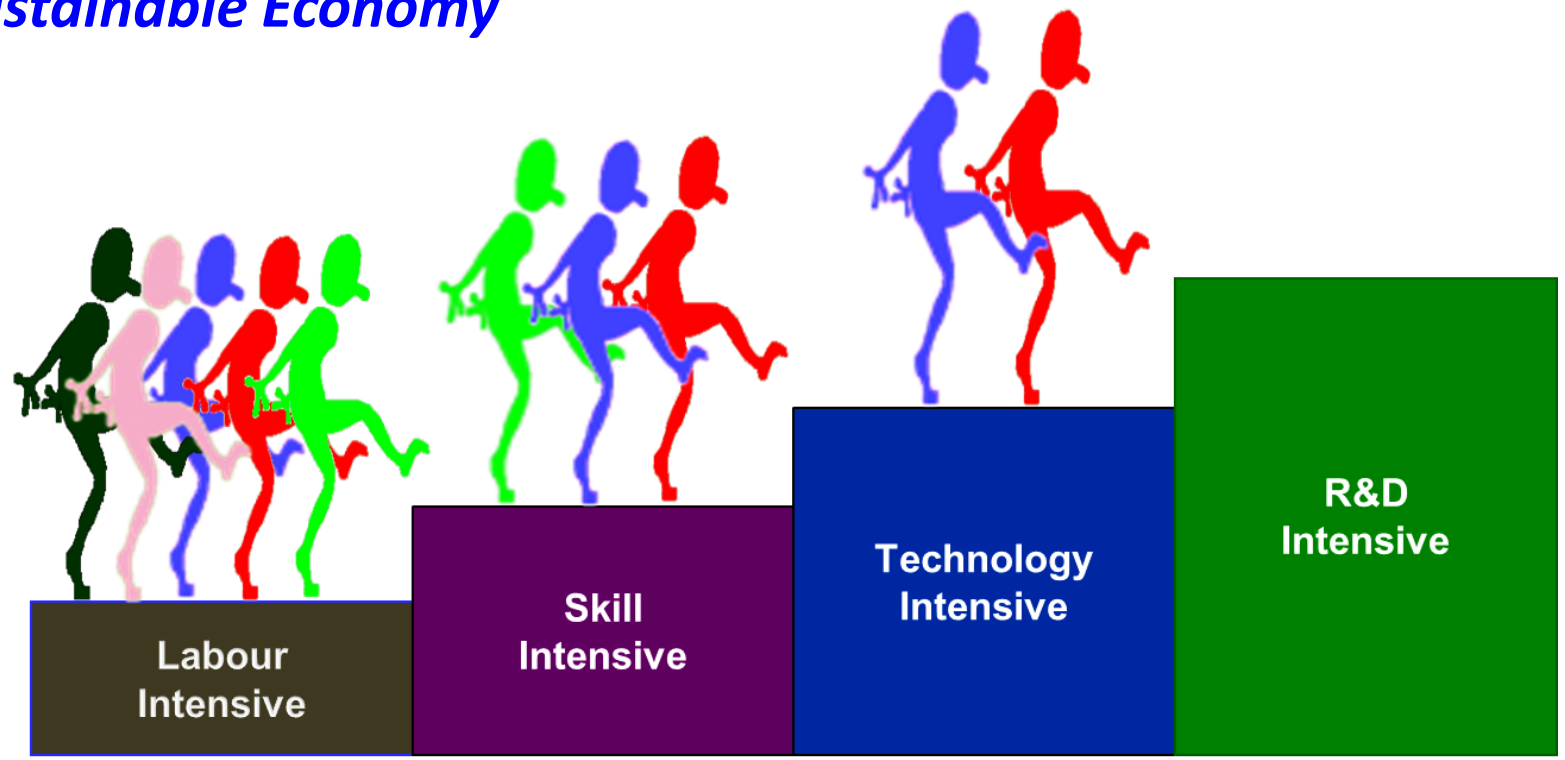
Source : International Institute for Management Development
World Competitiveness Yearbook 2012.

Where are we now?

- Small percentage of industry with R&D capability
- Low investment in R&D by Private Sector
- University R&D not market-driven
- Low incentives and support for university researchers to link with industry
- *Lack effective mechanisms* for university-industry linkage/collaboration

Where do we plan to be?

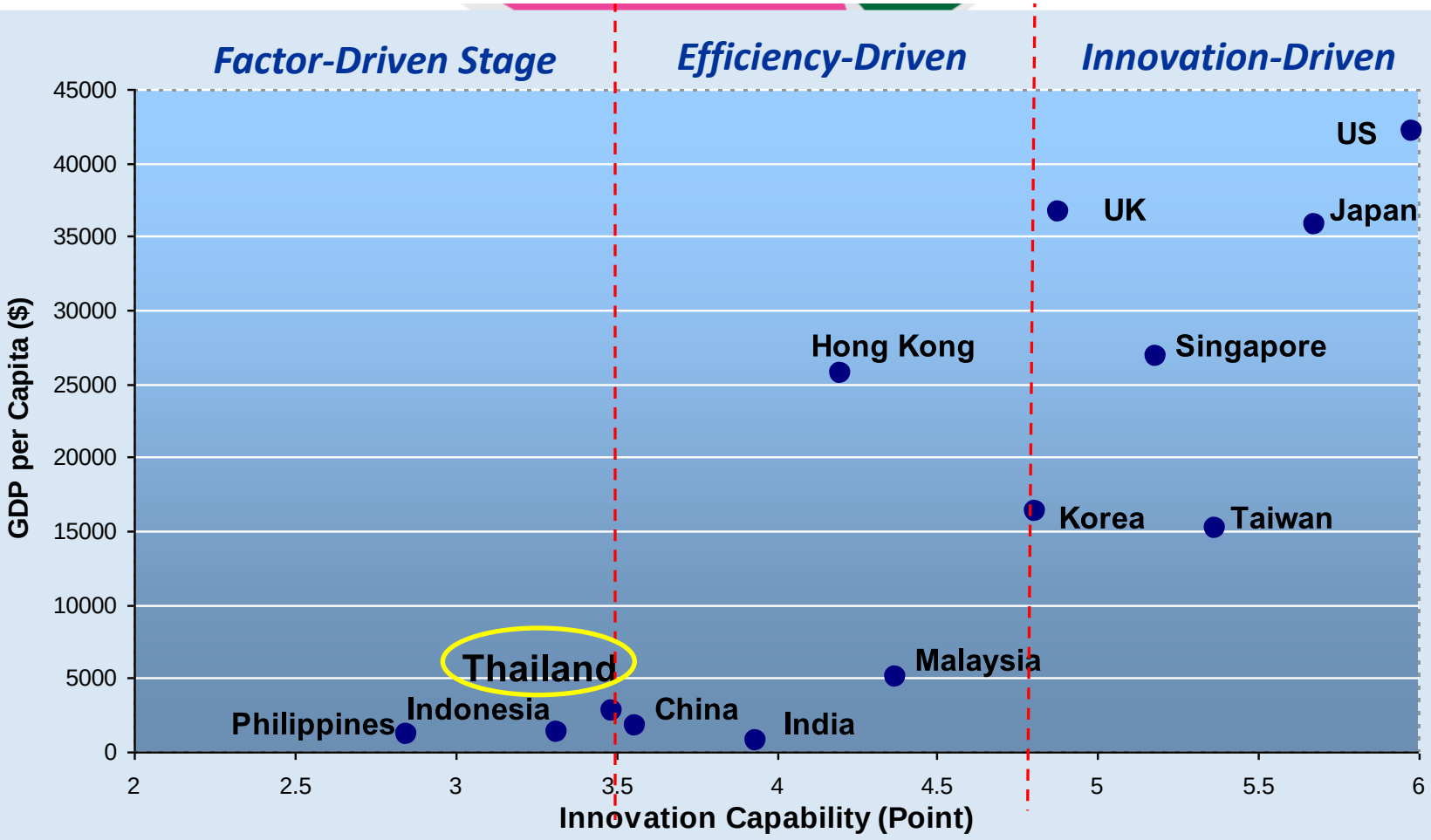
Sustainable Economy



Innovation Driven Economy

Need for Innovation

Where do we want to be in the global arena ?



Source : WEF Report 2005-2006/ CMU 3 Analysis

How do we get there?

1. From Lab to Market
2. From Market to Lab

Role of Intermediary is essential

How?

Effective Policies

- ***Policy to stimulate demand and use of innovation***
- ***Policy to stimulate open innovation***
- ***Policy to support***

✓ *creation of "intermediaries"*

✓ *creation of networks between university-industry-government*

✓ *adaptation of R&D results for commercial exploitation*

How?

Effective Programmes

- ***Programmes that promote commercially relevant R&D and industry-driven R&D***
- ***Programmes that promote development of infrastructure that support Triple Helix activities***
- ***Programmes that facilitate commercialization of R&D results***

Collaboration Breeds Success

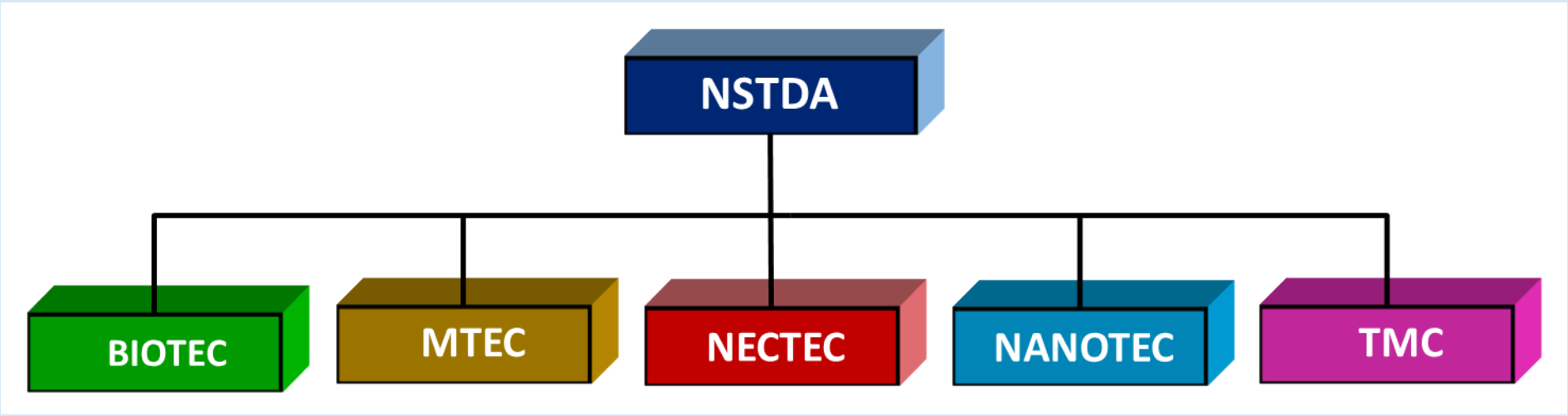
Building University-Industry-Government Linkages

"Triple Helix"

Examples

Financial	***NSTDA:***	***Tax Incentives, Soft Loans, Investment…..***
	TRF:	***Graduate Scholarships …….***
Technical	***NSTDA:***	***ITAP ……..***
Facilities	***NSTDA:***	***Science Park, Incubator……..***

NSTDA: National Science and Technology Development Agency



BIOTEC : National Center for Genetic Engineering and Biotechnology
MTEC : National Metal and Materials Technology Center
NECTEC : National Electronics and Computer Technology Center
NANOTEC: National Nanotechnology Center
TMC : Technology Management Center

Tax Incentive

Revenue department allows double deduction of company R&D expenses …. TMC acts as intermediary, stimulates companies to work with universities and government labs…..

TMC: R&D Certification Committee, RDC

	Certified (Projects)	Value (mBaht)
2013	374	1,417
2002-2013	2,164	7,085

"Linking Universities, Government, and Companies"

Soft Loans

NSTDA provides financial support to companies in the form of low-interest loans for R&D, improvement of products and production processes

TMC: Company Directed Technology Development Programme, CD

Collaborating financial institutions:

Bangkok Bank ธนาคารกรุงเทพ

SCB ไทยพาณิชย์

ธนาคารกรุงไทย KRUNGTHAI BANK

ธนาคารกรุงศรีอยุธยา BANK OF AYUDHYA

ธนาคารนครหลวงไทย Siam City Bank

TMB ธนาคารทหารไทย TMB BANK

UOB ธนาคารยูโอบี จำกัด (มหาชน) United Overseas Bank (Thai) Public Company Limited

ธนาคารพัฒนาวิสาหกิจ ขนาดกลางและขนาดย่อมแห่งประเทศไทย

ธนาคารสินเอเอซีย ACL BANK

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Greater Pharma

Example: CD provided 30 million baht soft loan to Greater Pharma to license technology from Mahidol University for the production of mite allergen vaccine

House Dust Mite
Allergen Vaccine

Mahidol University

Technology Transfer

HDMA Vaccine
Commercial Production
Greater Pharma

"Linking Universities, Government, and Companies"

Investment

NSTDA promotes private sector investment in S&T by co-investing, forming joint-venture enterprises

NSTDA Investment Centre, NIC *(formerly under TMC)*

Examples:

- **Innova Biotechnology Co., Ltd.**

  NSTDA funds Mahidol researcher…
  develops diagnostic methods for hepatitis B and C virus, cholera, dengue…
  NSTDA co-invests in start-up company to produce diagnostic kits

- **MicroInnovate Co., Ltd.**

  BIOTEC collaborates with KMUTT and SPM Feed Co. to develop probiotics for animal feed and forms a new joint venture company with SPM Feed to commercialize product

Technology Commercialization

NSTDA funds research and provides IP registration service and commercialization of technology through its Technology Licensing Office, TLO

TMC: Technology Licensing Office, TLO

Examples

- **ADTEC,** a university spin-off carries out collaborative research with MTEC… wants to license technology for making titanium dental implant (currently 100% imported)
- TLO helps ADTEC license to local company and sign MOU with 10 Dental Schools to implement workshops for dentists and students

"Linking Universities, Government, and Companies"

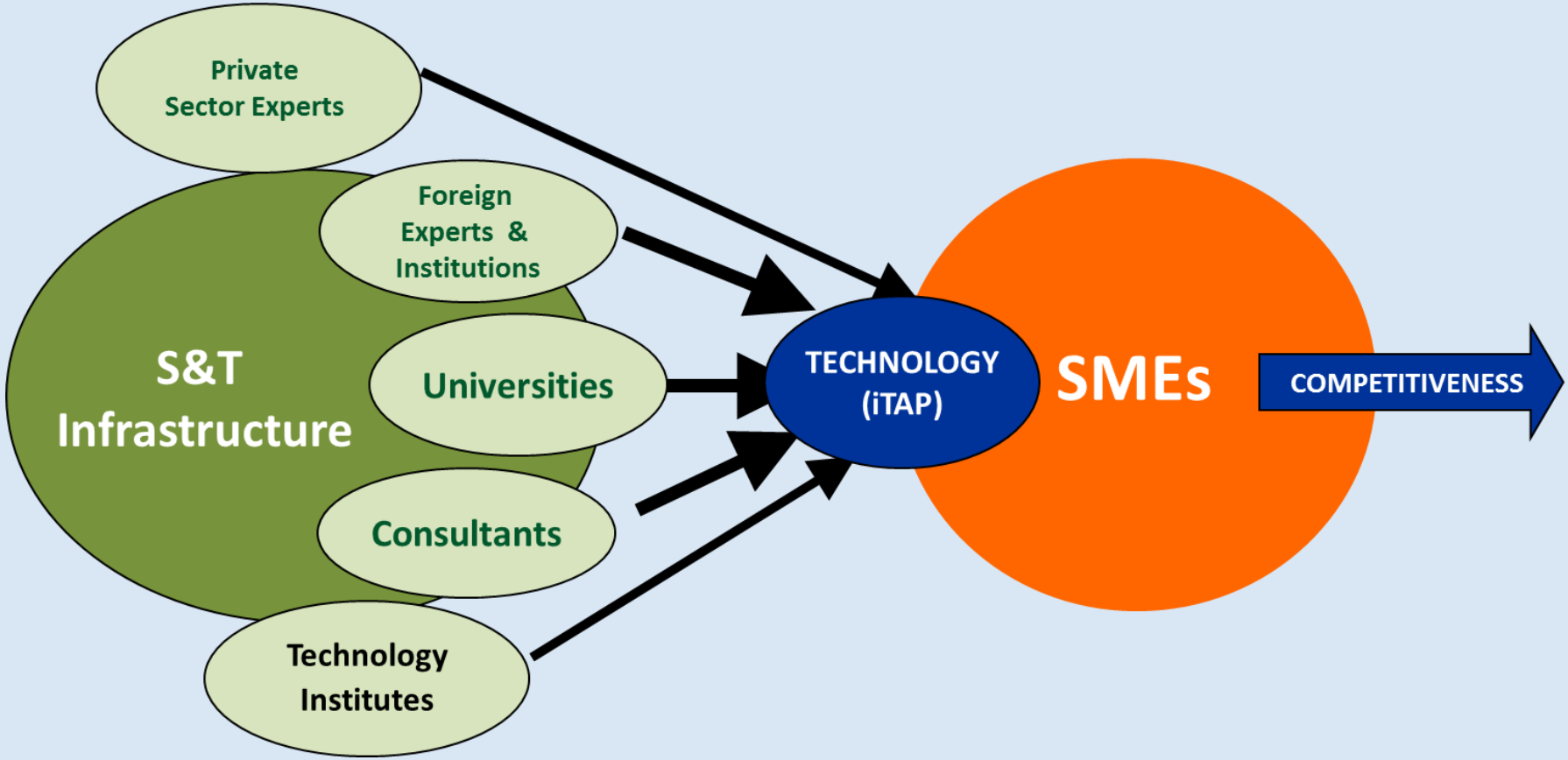
Technology Assistance

iTAP solves technical problems, upgrades technology in firms and assists the private sector to acquire appropriate technology

TMC: Industrial Technology Assistance Programme, iTAP

- Diagnose production problems, source local or overseas experts to solve problems, subsidize expenses
- *Attach local university people to overseas experts, help technology transfer to firms and universities*
- Promote university researchers as experts, create industry-university linkage, encourage collaborative and contract R&D

iTAP: Industrial Technology Assistance Programme



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iTAP: Industrial Technology Assistance Programme

SME

Contacted SMEs	~16,000 Co.
Investigation, diagnosis	~5,600 Co.

Technology Development

Technology Development (Projects with experts)	~4,200 projects
Technology acquisition 96 trips	~1,300 Co.

iTAP

Central Region

1. National Science and Technology Development Agency (NSTDA)

Northern Region

2. Northern NSTDA (Chiangmai) (NNSTDA)

Northeastern Region

3. Khonkaen University (KKU)
4. Maha Sarakham University (MSU)
5. Ubon RaJathanee University (UBU)
6. Suranaree University of Technology (SUT)

Western Region

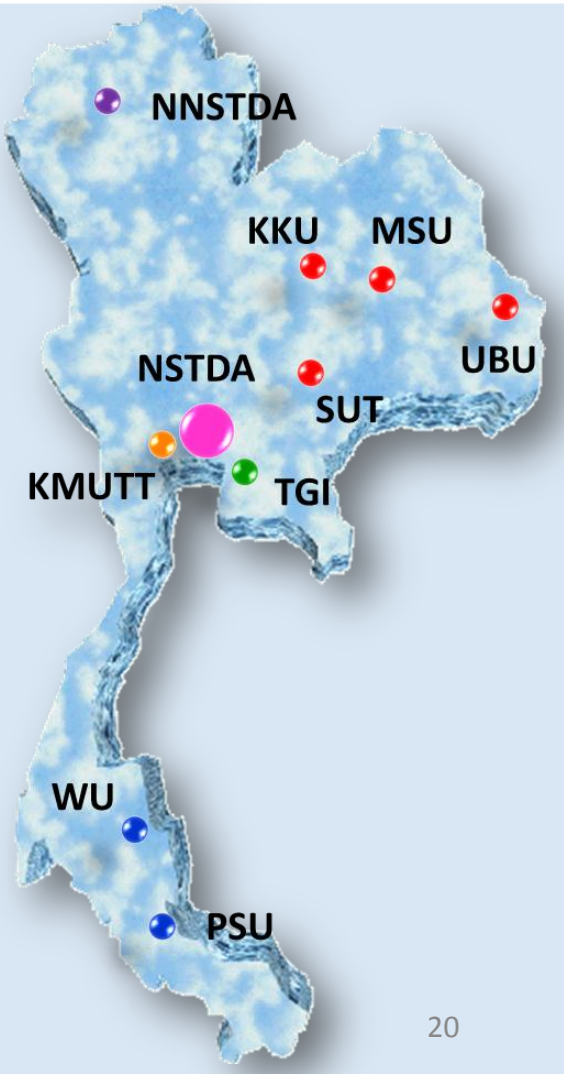
7. King Mongkut's University of Technology Thonburi (KMUTT)

Eastern Region

8. Thai-German Institute (TGI)

Southern Region

9. Walailak University (WU)
10. Prince of Songkla University (PSU) (2 Nodes)



Dairy Home

Bedtime Milk
…for deep sleep

Challenges

- To determine melatonin content in fresh milk
- To produce pasteurized milk with high melatonin content

Support from iTAP

- R&D by university researcher to increase melatonin in fresh milk
- Optimize pasteurization process for maximum preservation of melatonin

Outcome

- New product : High-melatonin pasteurized milk
- Patent filed

Vine Viset

Natural Vinegar

Challenges

- How to produce vinegar as by-product from bottling of baby corn
- Continuous vinegar production process

Support from iTAP

- Expert from university
- Developed production process and eventually developed use of local microorganism

Outcome

- High efficiency process, reduce cost, reduce time, import substitution
- Better baby corn product, sales increase 10%
- New product: no. 1 exporter of vinegar from Thailand

Carpet Maker

> 10,000
Color Shades
Hand-made Carpets

Challenges

- How to upgrade to upper market (made-to-order carpets)
- Need enormous variety of color shades

Support from iTAP

- Specialist from Thai University to develop dyeing process, quality control room and new dyeing facilities

Outcome

- High accuracy of dyeing process
- Set up standard color matching lab
- > 10,000 new color shades produced
- Making carpets for 5-star hotels

Mould Mate

Rubber Track for Tractors

First manufacturer in Thailand

Challenges

- Want to create high value products from natural rubber
- New Regulation: Rubber track to substitute Metal track for environmentally friendly tractors

Support from iTAP

- Specialist from China to develop new design and process of rubber track

Outcome

- First in Thailand to market the 100% natural rubber track
- 95 Mbaht export to EU in first year
- Create new brand “Star Track”
- Set up R&D unit in Thailand Science Park

Rice Milling

iTAP BIG impact

Outcome

- Productivity increased by 100%
- Whole grain rice increased from 40% to 50%
- Energy consumption decreased substantially

- 51% of total cultivation area is used to grow rice
- Number of rice mills: 43,000
- Involves 3.7 M households (~ 15 M persons)
- Export value: 200,000 MBaht (6,500 M USD/annum)

University experts provide consultation in parameters optimization, productivity improvement, loss reduction and training of workers

iTAP-KKU

Heat Exchanger for Rubber Sheet Curing

Outcome

- Reduced firewood use by 40%
- Reduced curing time from 5 days to 4 days
- Better quality sheets and lower risk of damage by fire

University experts designed and constructed new heat exchanger for the rubber curing plant

- 1.3 M households (~ 5.2 M persons)
- Export value 70,000 M Baht (2,300 M USD)
- 12% of cultivation area is used to grow rubber trees
- 660 rubber sheet curing co-operatives of small farmers

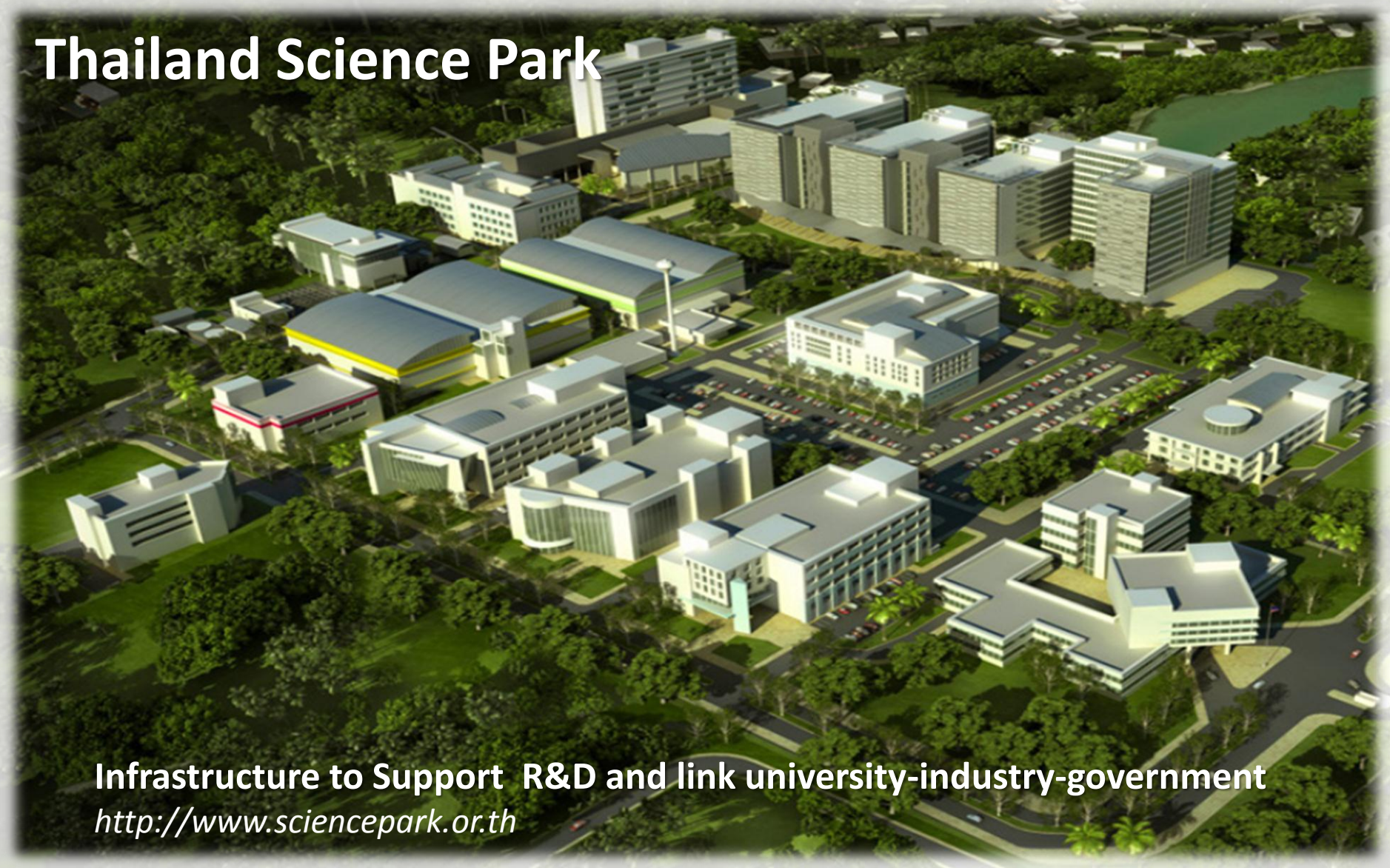
iTAP-WU and KMUTNB

Thailand Science Park

First Science Park in Thailand ~7 Billion Baht
Opened in 2002, now housing NSTDA and ~ 60 Companies
Phase 2 with >120,000sq.m space opening in 2014

- **Facilitates Innovation**
- **Attracts High-Tech & International Companies**
- **Facilitates Commercialization of Technologies**
- ***Links Universities, Research Labs, and Companies***
- ***Incubates Start-ups***
- **Generates employment**

Thailand Science Park



Infrastructure to Support R&D and link university-industry-government

http://www.sciencepark.or.th

Examples

Betagro: *Collaborative R&D with BIOTEC and Universities*

Novartis: *Collaborative R&D with BIOTEC and Universities*

Shisheido: *Collaborative R&D with NANAOTEC and Universities*

Western digital: *Partnership with NECTEC and Universities*

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Science Park Network

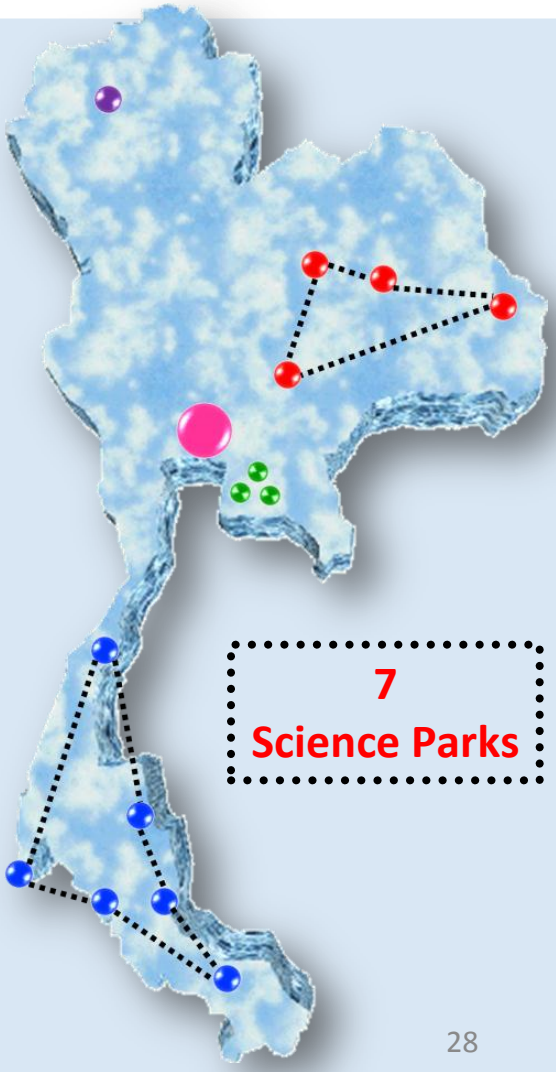
Thailand Science Park
- Pathumthani

Northern Science Park
- Chiangmai

Northeastern Science Park
- Khonkaen
- Maha Sarakham
- Ubon Rajathanee
- Nakorn Rachasima

Southern Region
- Songkhla
- Phuket
- Pattani
- Pattalung
- Suratthani
- Nakorn Srithammarat

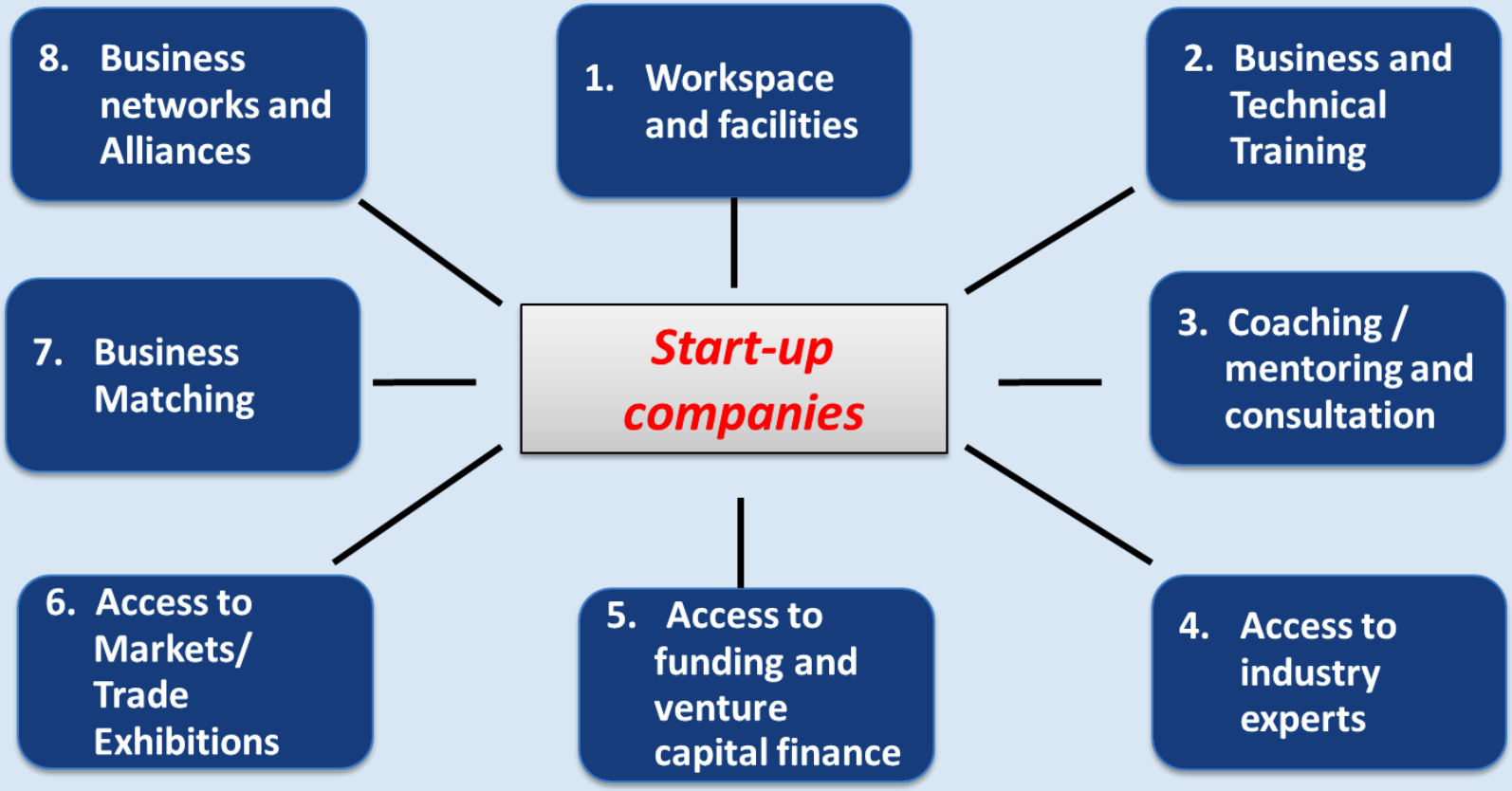
Eastern Area
- Krenovation Park
- Amata Science City
- Burapa?



Supportive Services to foster business to success

Incubating Start-ups

TMC: Thailand Science Park



Flexoresearch Group Co., Ltd.

Incubation Activities: In-kind value $U.S.9,000 included

- Training in business management
- Lab Space
- Coordination with researchers
- Exhibition local (2 times) and international (5 times)
- Business meeting and matching with foreign company
- Consultation for terms and conditions in developing contracts and MOU
- IP and Technology Licensing consultation
- Market expansion consultation

Enzyme for recycling paper

Results: During 2007-2011

- Awards : 7 international awards including
  Technology Pioneer 2011 in World Economic Forum 2011
- IP: 6 patents with 3 trade secrets
- Licensing to company in South Africa covering 12 countries in 2011
- Investment in recycled paper pulp manufacturing in Malaysia in 2011
- Spin off Flexoresearch Group International Co., Ltd. for international trade in 2011

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Paijit Sangchai

FLEXORESEARCH | Thailand

BACK NEXT

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Paijit Sangchai loves to solve problems that seem unsolvable. "There are so many environmental problems associated with papermaking, I thought I should do something about it," he says. In his native Thailand, laminated paper wasn't being recycled, so it was often burned. Since founding Flexoresearch in 2007, he's developed five series of enzymes for various aspects of recycling paper. While several are local adaptations of existing technologies, the blends of enzymes that peel away plastic, aluminum and other substances from paper are unique. For every 300 tons of coated paper, Paijit produces 270 tons of recycled pulp, plastic and metals. His pulp can be used as a replacement for asbestos in construction materials. It's stronger, safer and cheaper.

The benefits are manifold. Making more types of paper ripe for recycling can help protect forests, reduce waste that would end up burned or in landfills, boost the incomes of the scavengers who collect paper, improve air quality and lessen health risks. The goal is to turn waste into wealth and pollution into profit, Paijit says. With his factory operating at capacity, that's anything but pulp fiction.

—by Robert Horn

Flexoresearch Group Co., Ltd.

Enzyme for recycling paper

Hi-Grimm Environment and Research Co., Ltd.

Collaborations with

- The National Center for Genetic Engineering and Biotechnology (BIOTEC)
- NSTDA/Thailand Science Park
- The Environmental Faculty at Mahidol University

Bioremediation Products

Products : ***Bioremediation agents: developed 13 formulae***

Results 2007-2012 :

- Awards: 3 international awards
- IP: 1 patent
- International dealers in Malaysia, South Korea, Philippines
- Investment in new Pilot Biotechnology Plant, Mahidol University

"Linking Universities, Research Labs, and Companies"

Keeen & Awards:

The best Invention in Environment, China

The Best Innovation in Biotechnology, Japan

Gold Medal Award ITEX, Malaysia

Thai-BISPA

Thai Business Incubators and Science Parks Association

Founded 16 January 2009 through the collaboration of the
Ministry of Industry, Ministry of Science, Ministry of Education :

Grand Opening

Press-Release

Thai-BISPA

Thai Business Incubators and Science Parks Association

1st Thai-BISPA Day 15 January 2010

Exhibition: 41 Technologies

Incubatees meet Investors: 32 meetings

Researchers meet Industry: 28 meetings

"Linking Universities, Government, and Companies"

RRi Graduate Scholarship

Research and Researcher for Industry, RRi
launched August 2012 by Thailand Research Fund, TRF

- Most recent mechanism to attract industrial R&D
- 1 Billion U.S. dollars/15 years committed by government
- R&D topic from industry
- 30,000 U.S. dollars matching fund from industry per Ph.D. scholarship of 60,000 $
- Joint ownership of IP with right to buy off sole ownership at 60,000 $

RRi Graduate Scholarship 1st Year

Ph.D. Scholarship

- 76 Projects
- 18 universities
- 57 companies

M.Sc. Scholarship

- 193 Projects
- 24 universities
- 154 companies

MOU with 7 companies

for 5 Ph.D. scholarships per year for 5 years

IP EXPO 2013

RRi: *Exhibition of University IPs and Business matching*

16th September 2013 @QSNCC

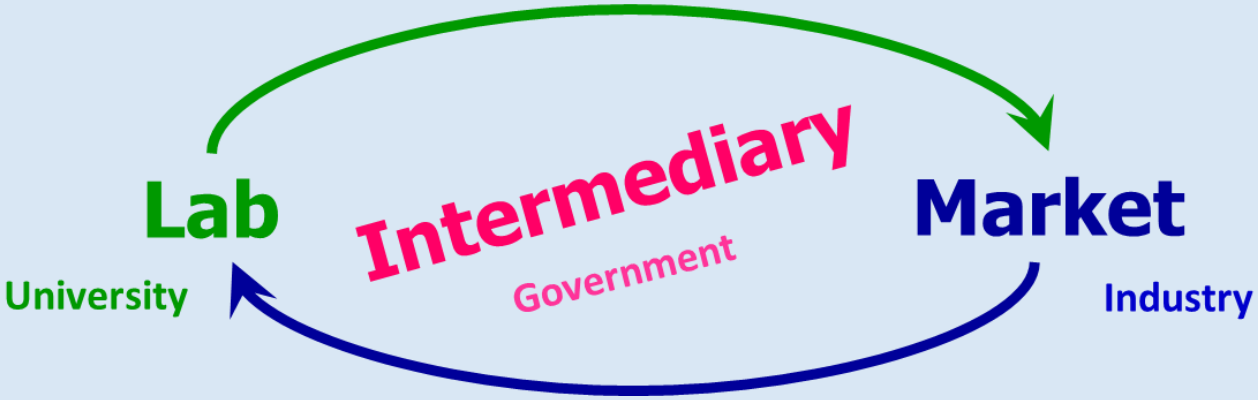
Programme

- *Keynote address on IP Commercialization*
- *Panel Discussion by researchers and industrialists*
- *Pitching of significant University technologies*
- *Workshop on Industry R&D needs*

> 1,100 Participants

Researchers turn Money into Knowledge

Entrepreneurs turn Knowledge into Money



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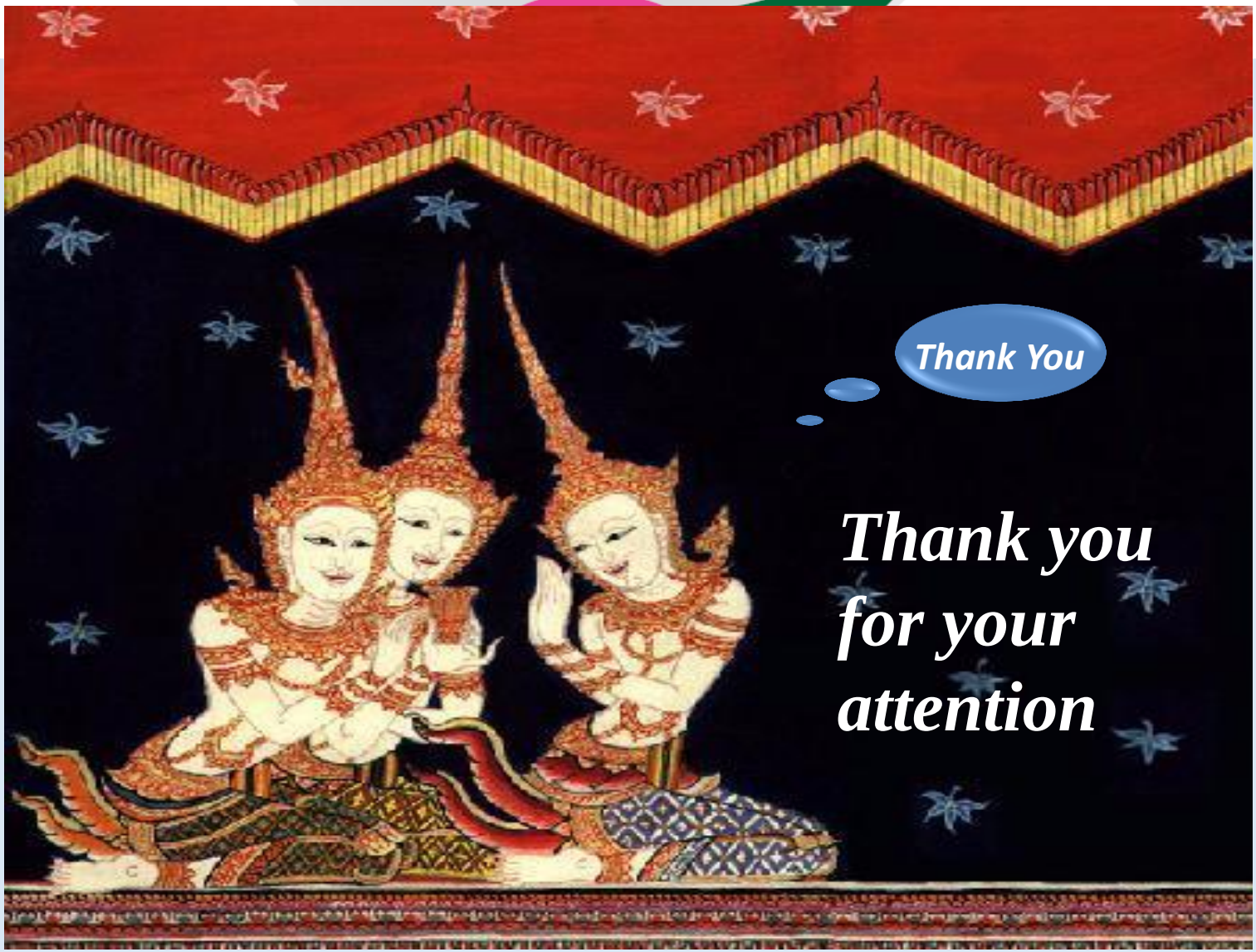
Thank You
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