TOPIC 1：Reform Strategy for Intellectual Property Management and Commercialization

SUBTOPIC 3：Intellectual Property Management and Commercialization Strategy Reform for R&D Institues

Presenter: Ming-Ji Wu
Director General, Department of Industrial Technology
Ministry of Economic Affairs (MOEA)
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Outlines

1. Preface
2. Status and Problem Analysis
3. Strategy Implementation
4. Issues for Discussion

1. Preface

Focus

Objective of Sub-topic: **To expand the operation capacity of non-for-profit R&D institutes for value-added chain of IP, and revitalize competitive advantage of national IPs.**

•Content is focused on :

Constructing national IP reforming strategies from industrial perspectives

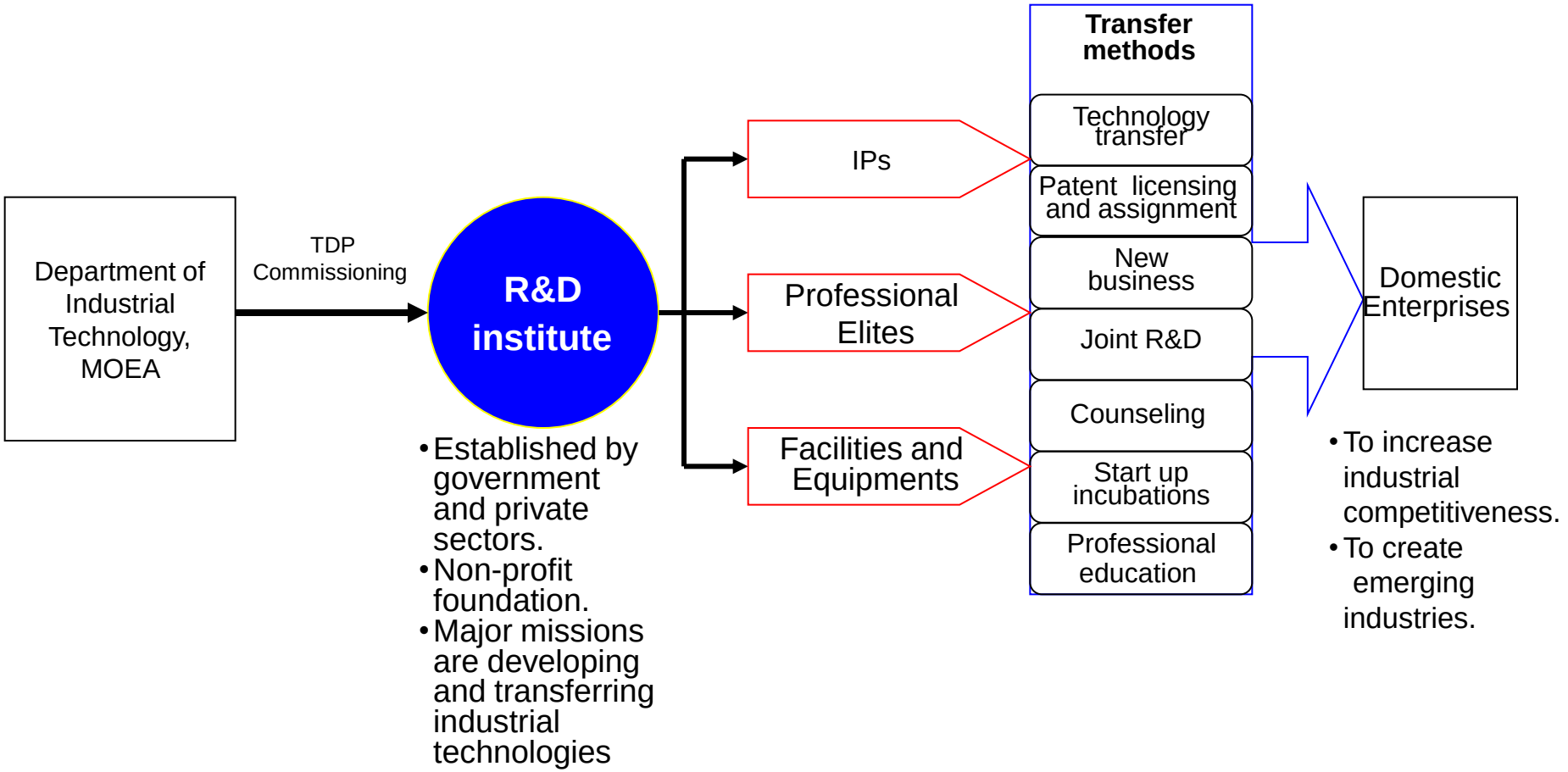
1. Strengthening IP creation

To consolidate IP strategic planning, patent mapping, and standard setting for improving innovation value of our industrial IPR and international influence.

2. Revitalizing IP utilization and industrialization

To focus on industrialization and standardization to meet industry's demand for resulting in IP utilization and commercialization.

Positioning R&D institute



- Established by government and private sectors.
- Non-profit foundation.
- Major missions are developing and transferring industrial technologies

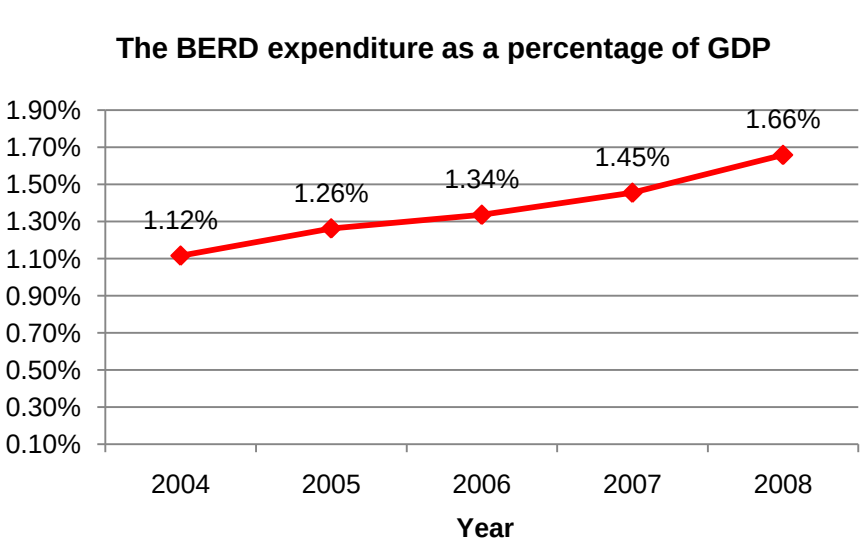
- To increase industrial competitiveness.
- To create emerging industries.

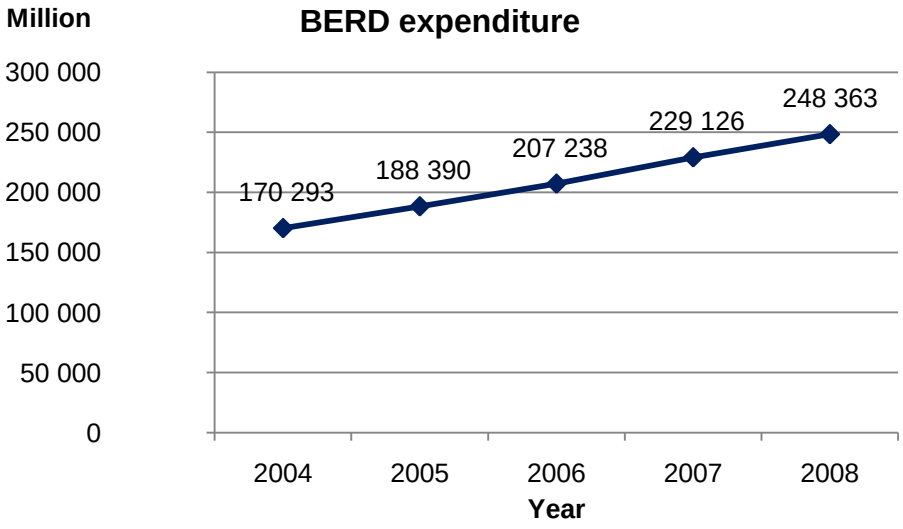
2. Status and Problem Analysis

Status of BERD expenditure

- The Business Enterprise R&D (BERD) expenditure is increasing, but mostly focused on various technology developments
- The BERD expenditure in terms of GDP percentage is increasing.

⇨ Still lack of core and essential IPs, however the manufacture efficiency is increasing.





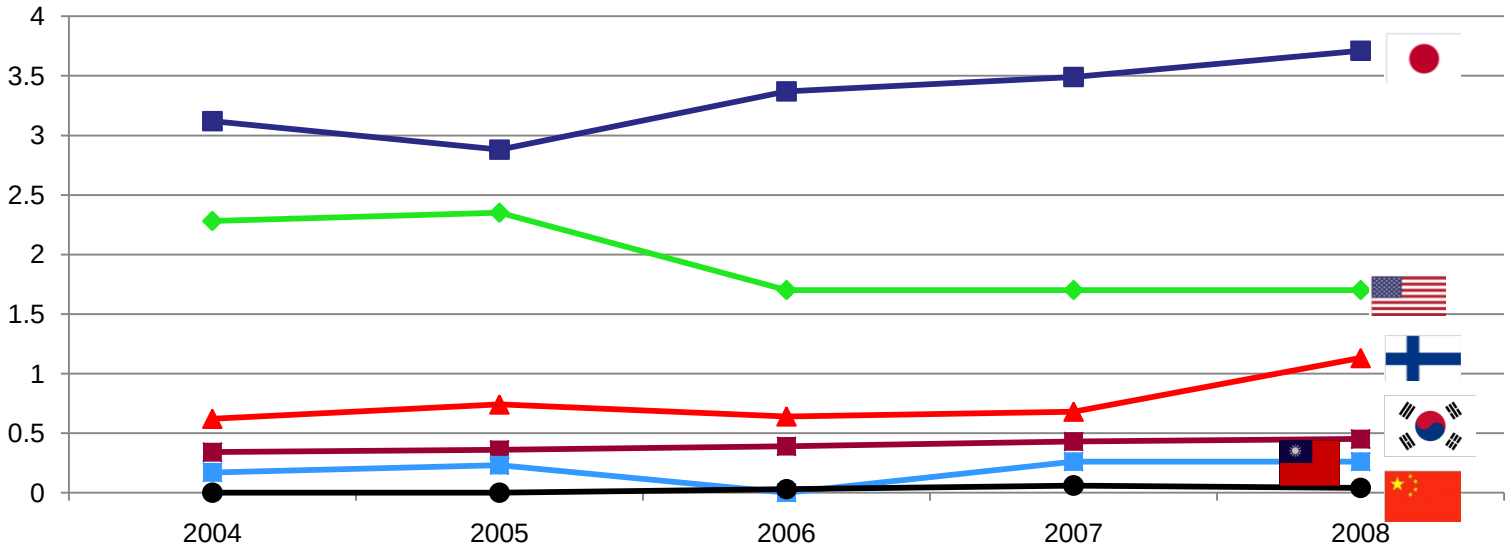
source :
Summary of Science Technology Statistics (2009)

The percentage of BERD expenditure by type

unit ：%

Type / year	2004	2005	2006	2007	2008
Basic Research	0.7	0.5	0.5	0.4	0.4
Applied Research	18.1	19.8	20.2	19.7	19.7
Experimental Development	81.3	79.7	79.4	79.9	79.9

The unfavorable balance of technology trade needs to be improved.



source : OECD, MSTR 2010/1(Source of China: Version 14, 2010,patent statistic bulletin, State IP Office of the People's Republic China)

Balance of technology trade

Technology trade (amount in million) / year	2004	2005	2006	2007	2008
Technology import (million USD)	271.0	401.7	--	509.2	--
Technology export (million USD)	1580.5	1731.3	--	1974.9	--
Receipt payment ratio (%) of technology trade	17.14%	23.20%	--	25.78%	--

Source : Summary of Science Technology Statistics (2009)

The Expenditure of Technology Development Program (TDP)

TDP of MOEA is the policy tool of government to facilitate R&D institutes to carry out innovation of industrial technology. R&D institutes are not-for-profit Industrial technology R&D organizations and governmental R&D labs which are capable of conducting research and development.

Unit: million USD

Item/year	2005	2006	2007	2008	2009	2010
Expenditure of TDP (a)	361	423	408	438	455	453
Growth rate, %		17.27%	-3.61%	7.43%	3.74%	-0.32%
Percentage of national R&D expenditure (a/b)	4.24%	4.55%	4.06%	4.12%		
National R&D expenditure (b)	8,515	9,304	10,042	10,649		
Growth rate, %		9.27%	7.93%	6.04%		
Expenditure of universities	972	1,138	1,224	1,300		
Growth rate, %		17.05%	7.55%	6.20%		

Note: Currency exchange rate is 1 USD=33 NTD

Source: Department of Industrial Technology and National Science Council

The outputs of TDP

The key indices of achievements of TDP progressively grow each year.

Item/year	2005	2006	2007	2008	2009
Technology transfer – in # of cases	974	930	866	785	1,051
– in # of companies	1,262	1,223	1,099	930	970
Patent granted – in # of cases	985	1,025	1,020	946	1,259
Patent utilization – in # of cases	714	771	673	778	751
Industry investment – in # of cases	485	665	778	1,020	1,549
– in # of companies	534	770	856	1,155	1,270
Cntract research and service – in # of case	1,819	1,459	1,414	1,663	2,171
– in # of companies	2,315	1,748	1,741	2,262	1,350
Technology source-in and joint research – in # of cases	32	35	25	26	21
Papers – in # of cases	2,536	2,808	3,039	2,889	3,167

Source: Department of Industrial Technology

Comparison of achievements between R&D institutes and Universities.

R&D institutes

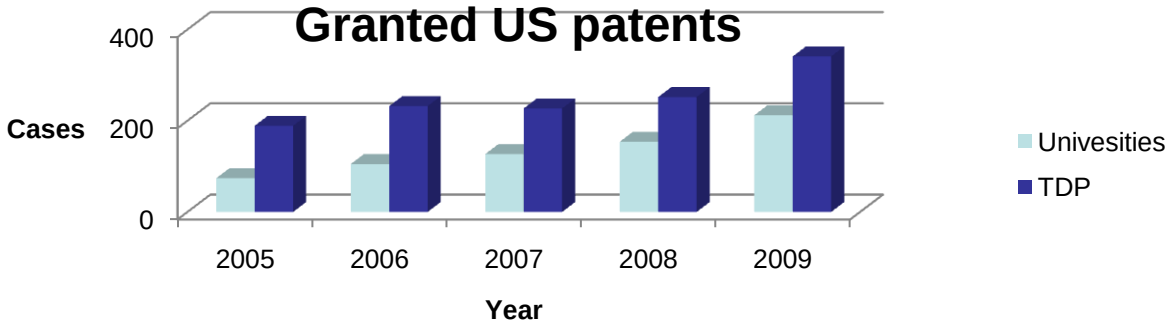
Item/year	2005	2006	2007	2008	2009
Patent granted (domestic) – # of cases	646	646	610	443	468
Patent granted (overseas) – # of cases	339	379	410	503	791
Patent granted (USA) – # of cases	189	232	227	252	341
Total	985	1025	1020	946	1259

source of information: Department of Industrial Technology

Universities

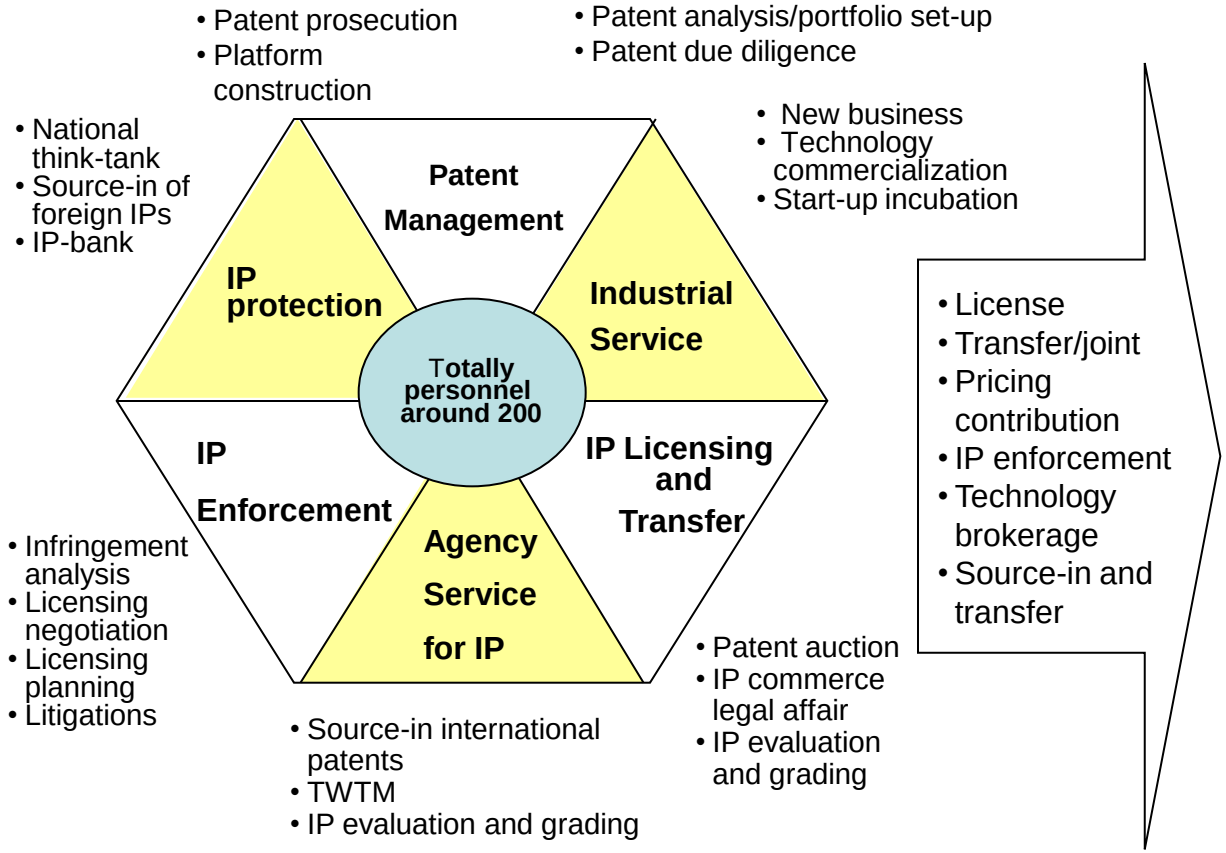
Item/year	2005	2006	2007	2008	2009
Patent granted (domestic) – # of cases	425	635	636	438	568
Patent granted (USA) – # of cases	74	105	127	154	212

Sources of information: Higher Education Evaluation & Accreditation Council of Taiwan



Constructing IP utilization capacity of R&D institutes' IPs (by ITRI)

Technology transfer capacity of Industrial Technology Research Institute (ITRI) has reached critical mass. The business model of technology transferring has been diversified .



Item\Year	2005	2006	2007	2008	2009
Patent application (case)	2,149	2,302	2,263	2,754	2,328
Patent granted (case)	885	985	908	1,072	1,308
Patent application rate (%)	27.1	27.5	27.4	29.2	26.8
Technology transfer (companies)	851	766	653	593	630
Contract research (companies) including contract and joint research	1,732	1,485	1,316	1,247	1,234
Facilitation of investment amount by manufacturer (million)	203	175	180	203	219

(Note：Personnel of domestic R&D institutes and universities < 20
， Personnel of foreign R&D institutes and universities < 60)

Source: ITRI

Significant achievements(1)

A lot of technologies have won R&D 100 Awards and Technology Innovation Awards.

2010

Flexible material for display technology

-The novelty is a “de-bonding layer” material without adhesive force. The plastic film thinner than 0.01 cm can be detached from the glass carrier.
- It realizes very thin display panel and e-book.

2010

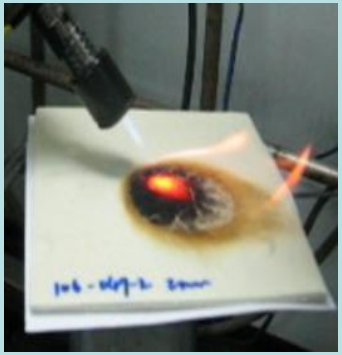
2D and 3D Switchable display

-The key feature is a display contains 2D and 3D display capability simultaneously.
-To pick 2D or 3D for display
-The 3D can be flexibly extended, while 2D Maintains its clarity.

2010

REDDEX - a super fire-proof material

- A new high-molecule bendable fire-proof material can sustain temperature as high as 1,000 deg C for an hour.
- Free from halogens/ phosphor/sulfide, and it only produces steam when it burns.
- Can be used for coating, thin film, pipe, and woven material.



2009

Super-thin Hi-Fi paper speaker

-The thickness of product is in the range of 0.1cm, similar to paper which is flexible.
-It produces high efficiency, and its sound quality is equivalent to those of traditional speakers.
-Applicable to cell phones, 3C products, mall advertisement, and large sign-boards, etc.

Significant achievements(2)

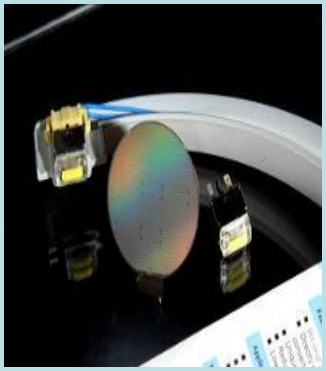
2009

High- safty STOBA lithium battery

- Capable of preventing extreme heat and explosion caused by battery short-circuit, Drastically enhance safety of lithium battery
- Has already transferred to several manufacturers, facilitated investment in $80 million NTD.

On-Chip AC LED

- Capable of directly plug into AC power supply without using a converter; it's size is relatively smaller and weight is lighter than those of average LEDs and can further save power by 10% to 30%
- The technology has already transferred to several domestic manufacturers, and facilitated one manufacturer and international major plant of LED for cross licensing

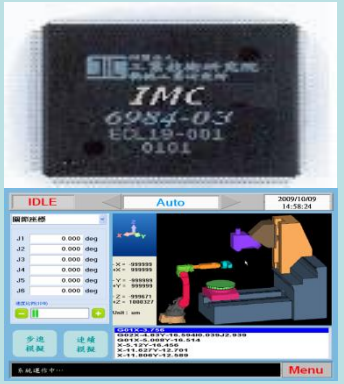


"Ultra-high speed USB 3.0 slim" memory card.

-Transmission efficiency has reached 4.8Gb/sec, and it is 10 times of the existing fastest memory card, and compatible with to all USB 2.0 /3.0 slots
- Technology has been transferred to more than 10 manufacturers.

Multi-axis movement control technology

- Highly integrated Movement control chip (3'rd generation)
-With built-in CPU, 32 axis all-digital concurrent movement, 1024 point IO control, nano-scale resolution command, 3rd Party IP value-added and other features
- Technology has been transferred to more than 20 manufacturers.



Domestic industries are heading toward ODM and OBM models.

Facing international IP litigation becomes a normality to domestic enterprises .

- Core and essential patents are mostly owned by foreign companies.
- Numbers of patent infringement litigations are increasing.
  - –Famous brands such as Acer and HTC are targets of US litigations.

Litigation statistic of domestic ICT industries (2000 – 2008)

Category	LED		IC (without DRAM)		DRAM		LCD		Network communication		Computer industry	
	Case	Number	Case	Number	Case	Number	Case	Number	Case	Number	Case	Number
Foreign company againsts domestic company	13	27	25	39	27	68	>70	>200	7	13	157	13
Domestic company againsts foreign company	0	0	15	9	5	8	13	15	1	1	21	6
Domestic companies against each other	5	5	22	23	7	8	N.A	N.A	5	5	N.A	N.A
Total	18	32	62	71	39	84			13	19	178	19

Source : ITRI

Assisting domestic enterprises to confront with international patent litigations.

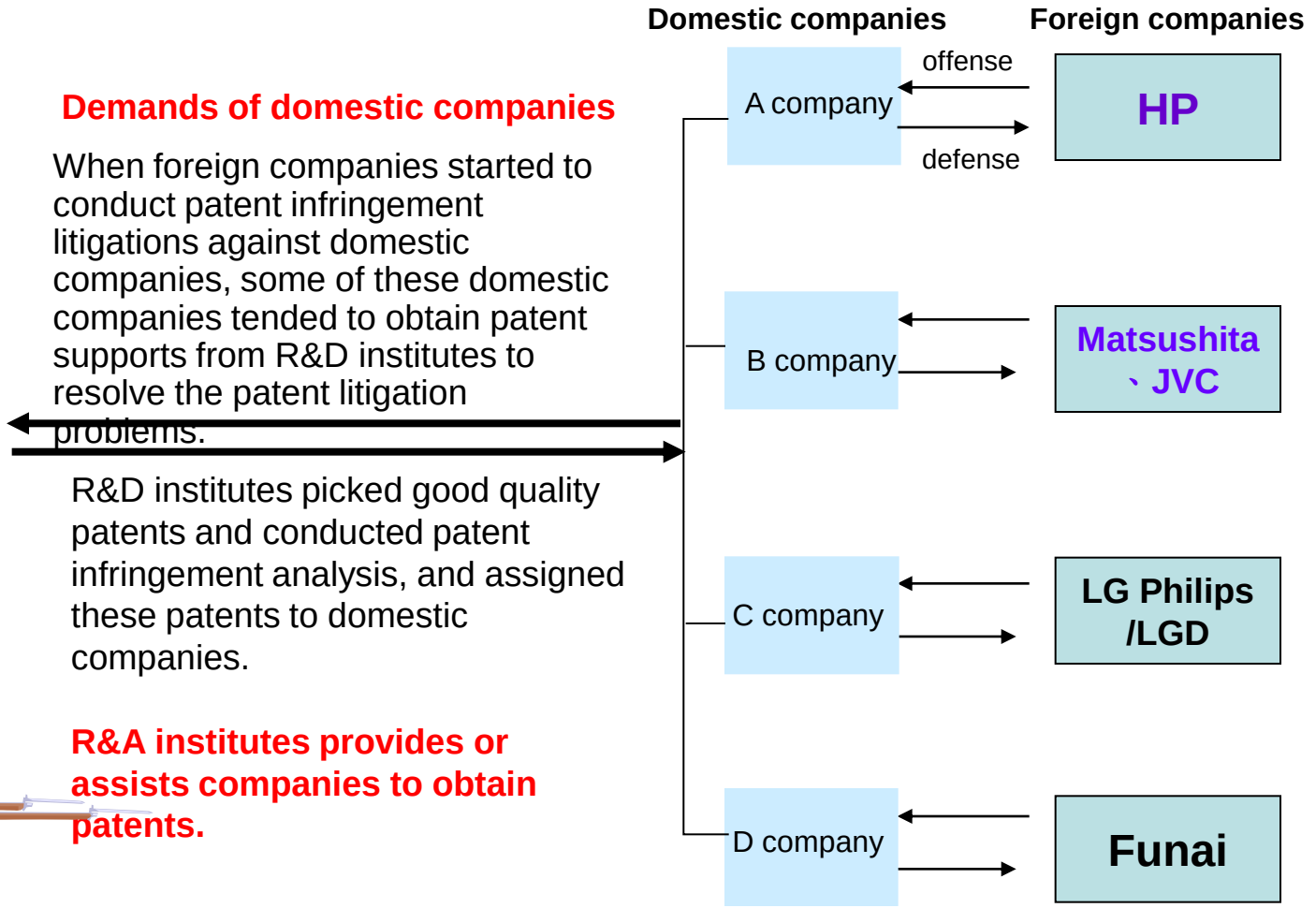
R&D institutes

Demands of domestic companies

When foreign companies started to conduct patent infringement litigations against domestic companies, some of these domestic companies tended to obtain patent supports from R&D institutes to resolve the patent litigation problems.

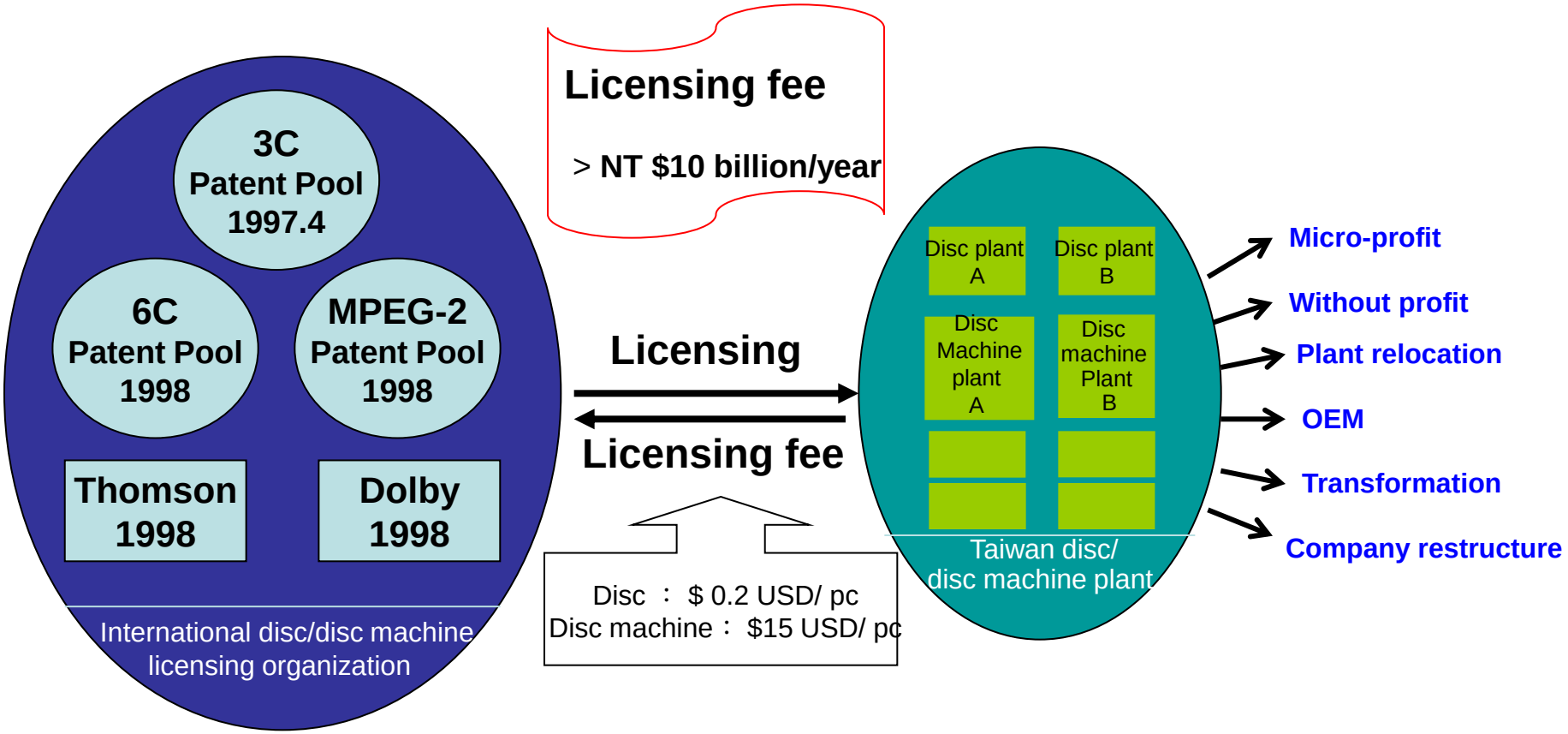
R&D institutes picked good quality patents and conducted patent infringement analysis, and assigned these patents to domestic companies.

R&A institutes provides or assists companies to obtain patents.

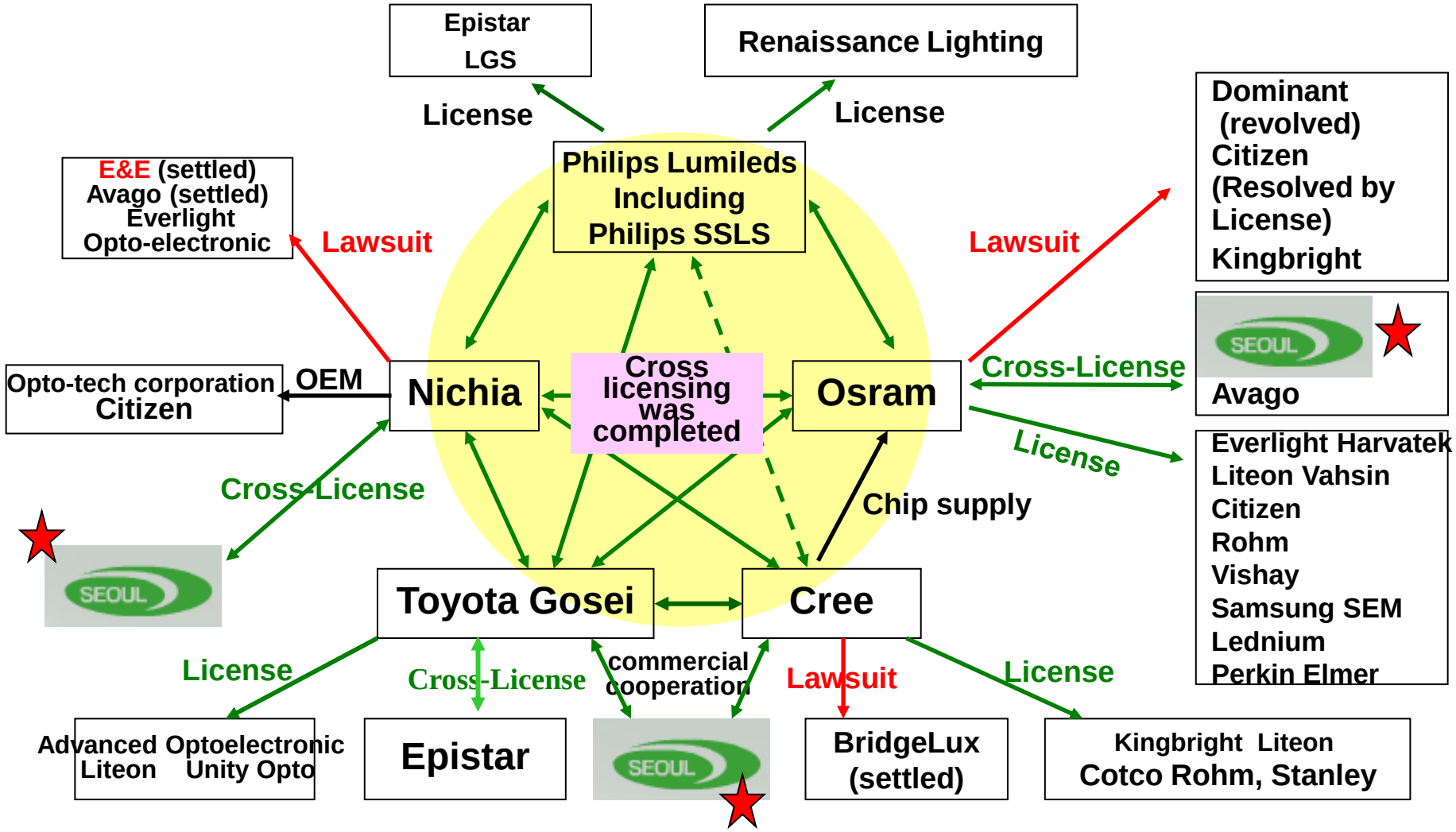


Standard setting becomes one of IP games.-By DVD industry-

- Core and essential patents are mostly owned by foreign companies.
- DVD development efforts is gradually reduced due to vicious competition from international companies.

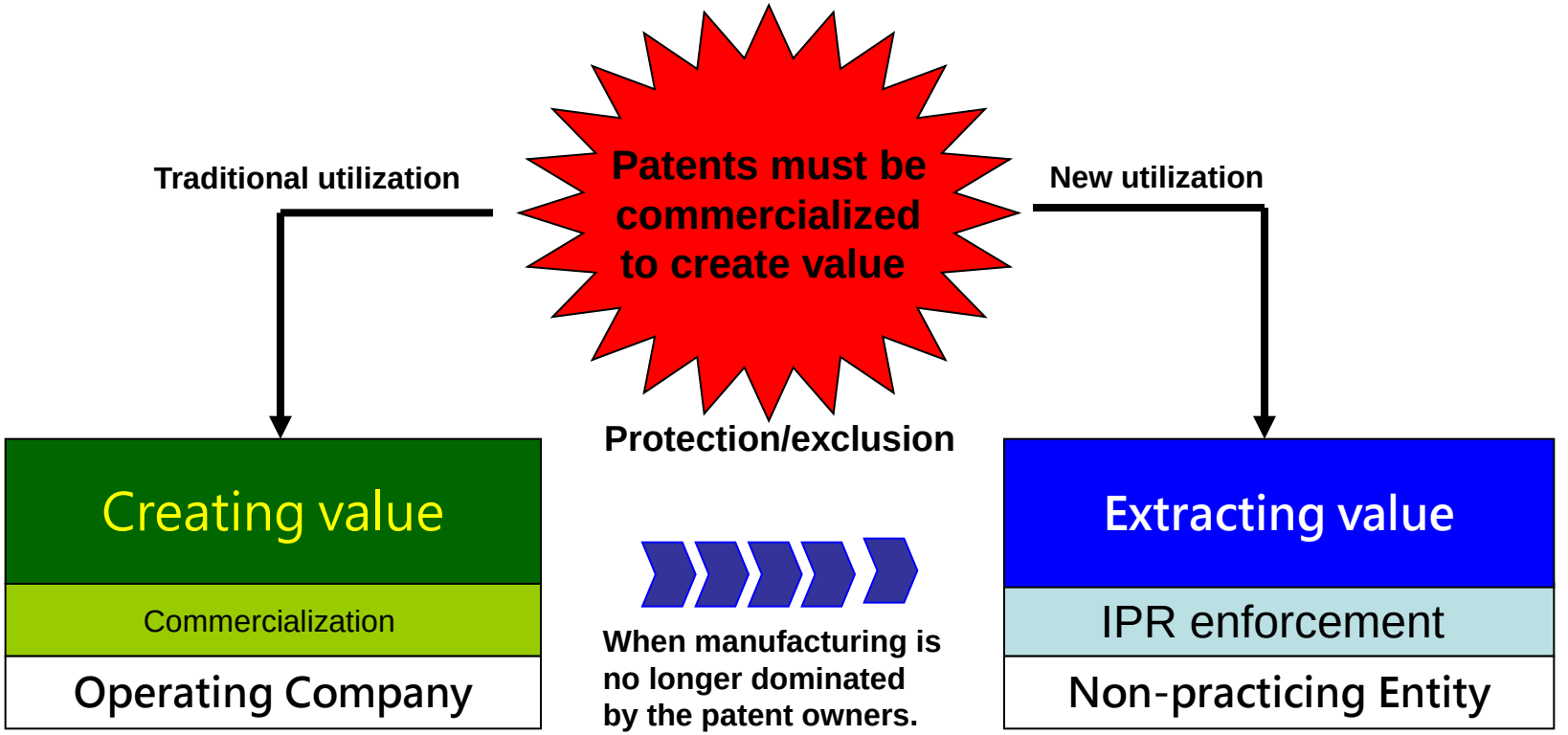


Patent alliance and monopoly is a serious concern.-By LED industry-



source: organized by Electronics and Optoelectronics Research Laboratories, ITRI

NPE is a big threat to the industries(1)

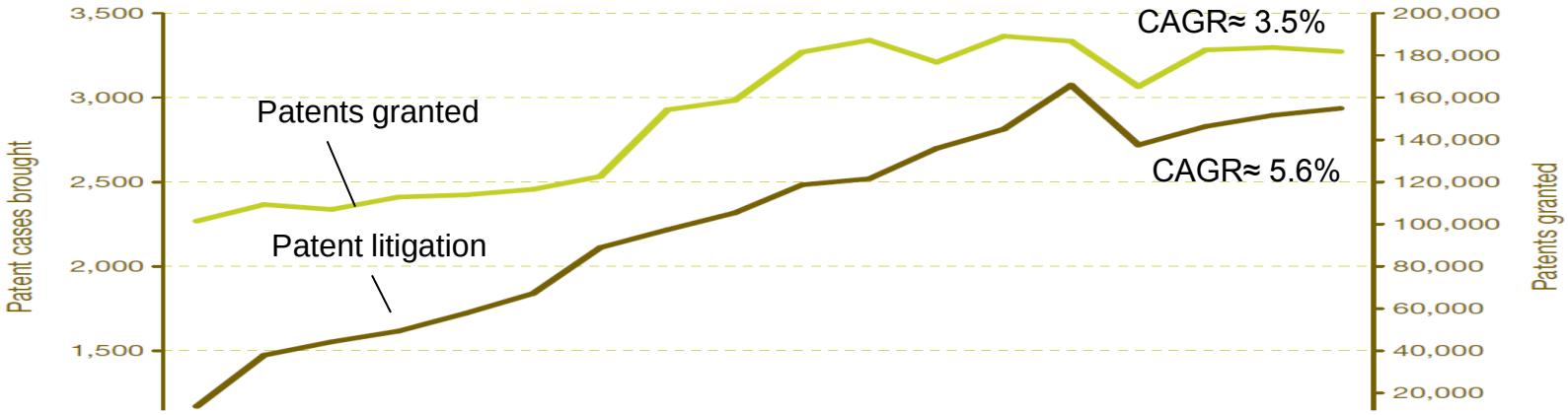


–Know-how utilization .
–Through patent deployment and mapping, the added value can be derived.

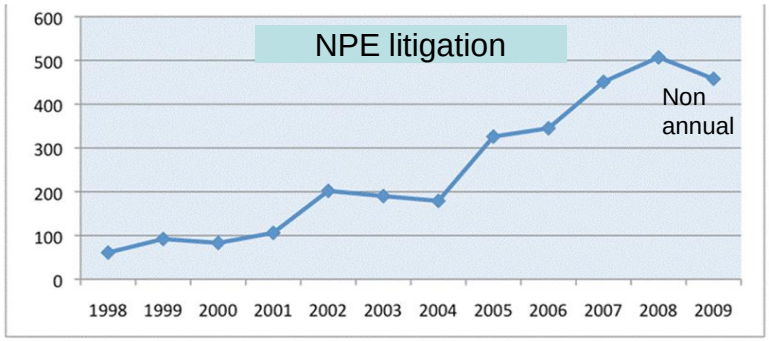
–Patent Rights utilization.
–Patents are value creation commodities
–Licensing, assignment, and IP enforcement.

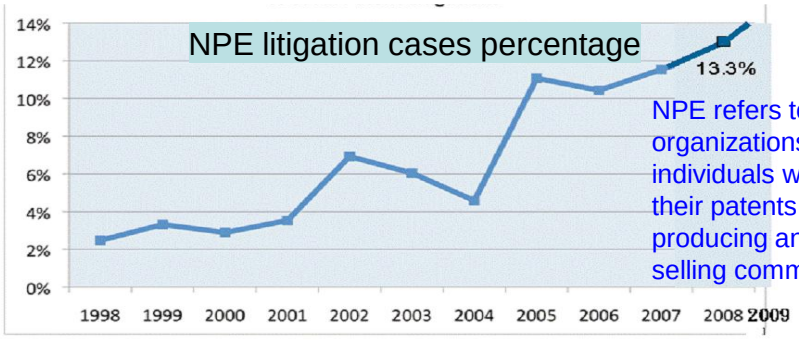
NPE is a big threat to the industries(2)

- Patents (IPR enforcement) have gradually become an income source of European and American enterprises.
- The rising and flourishing of NPE (Non-Practicing Entities) in America and Europe: More than 300 NPEs have been established.



Source: PricewaterhouseCoopers LLP





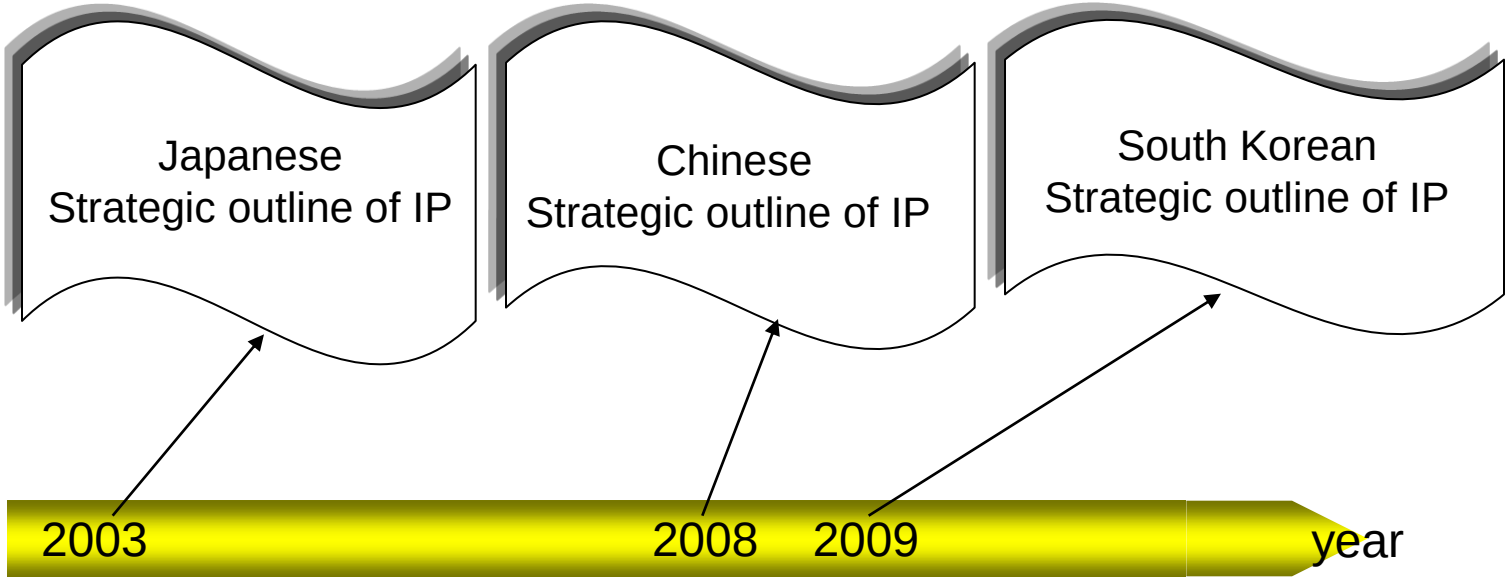
NPE refers to organizations or individuals who use their patents not for producing and/or selling commodities.

Source: PatentFreedom © 2009 Data captured as of January 1, 2010

Japan, China, and South Korea have proclaimed their national IP strategies respectively.

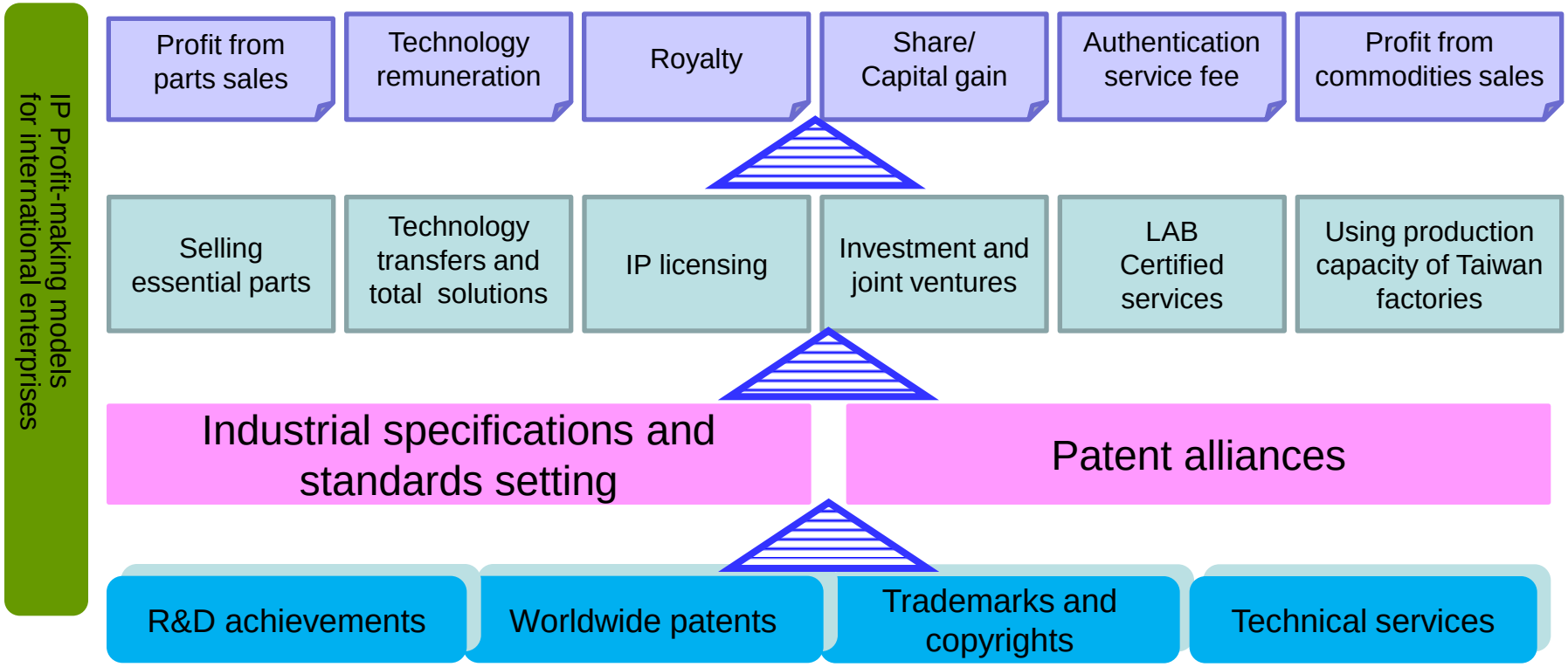
- The key points of Japanese, Chinese, and South Korean national IP strategies.

✓ Expanding R/D investment to build up core technologies and patents.
✓ Stressing on industrialization of research outcomes from universities and R&D institutes.
✓ Encouraging foreign IPs source-in and emphasizing on international patent deployments.
✓ Establishing IP funds.



IP diversified utilizations have been an international trend.

- IP utilizations have been diversified wherein technology standardizations and patent alliances are key approaches.



Source: Solicitor Y.P. Chou

Establishing IP fund is the key policy of developed countries .

■The mission of IP fund is to revitalize domestic IPs and reduce outflow abroad. And also source-in foreign IPs.

U.K.

★ **BTG plc**

–Since 1949
–Private enterprise

U.S.A.

★ **IV**

★ **360ip**

–Founded after 2000
–Private enterprise

Japan

★ **Innovation Network Corporation of Japan**

–Founded in 2009
–Public/private joint venture

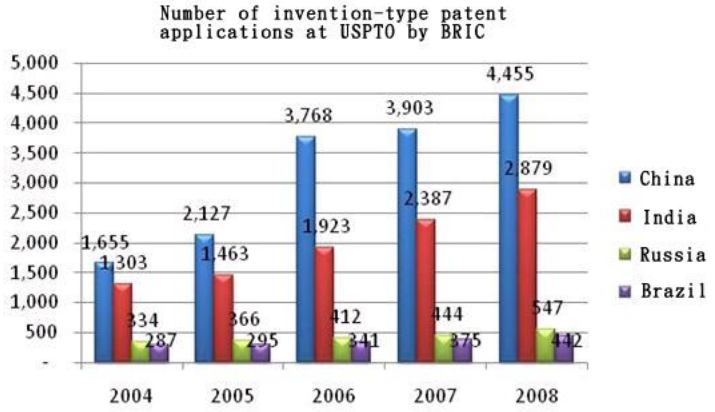
Korea

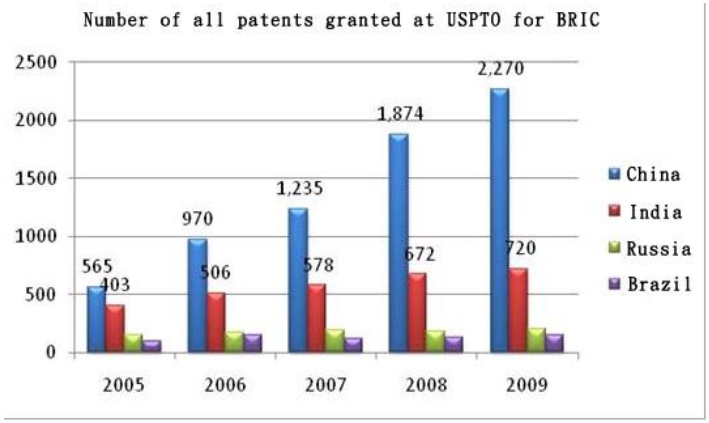
★ **Intellectual Discovery**

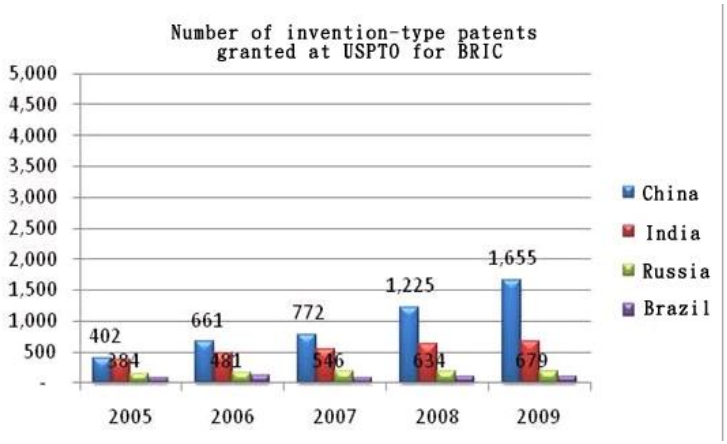
–Founded in 2010
–Public/private joint venture

Innovation capacity of emerging countries is an international focal point.

- Multi-national enterprises take advantage of rapid-growth innovative capacity of the emerging countries.





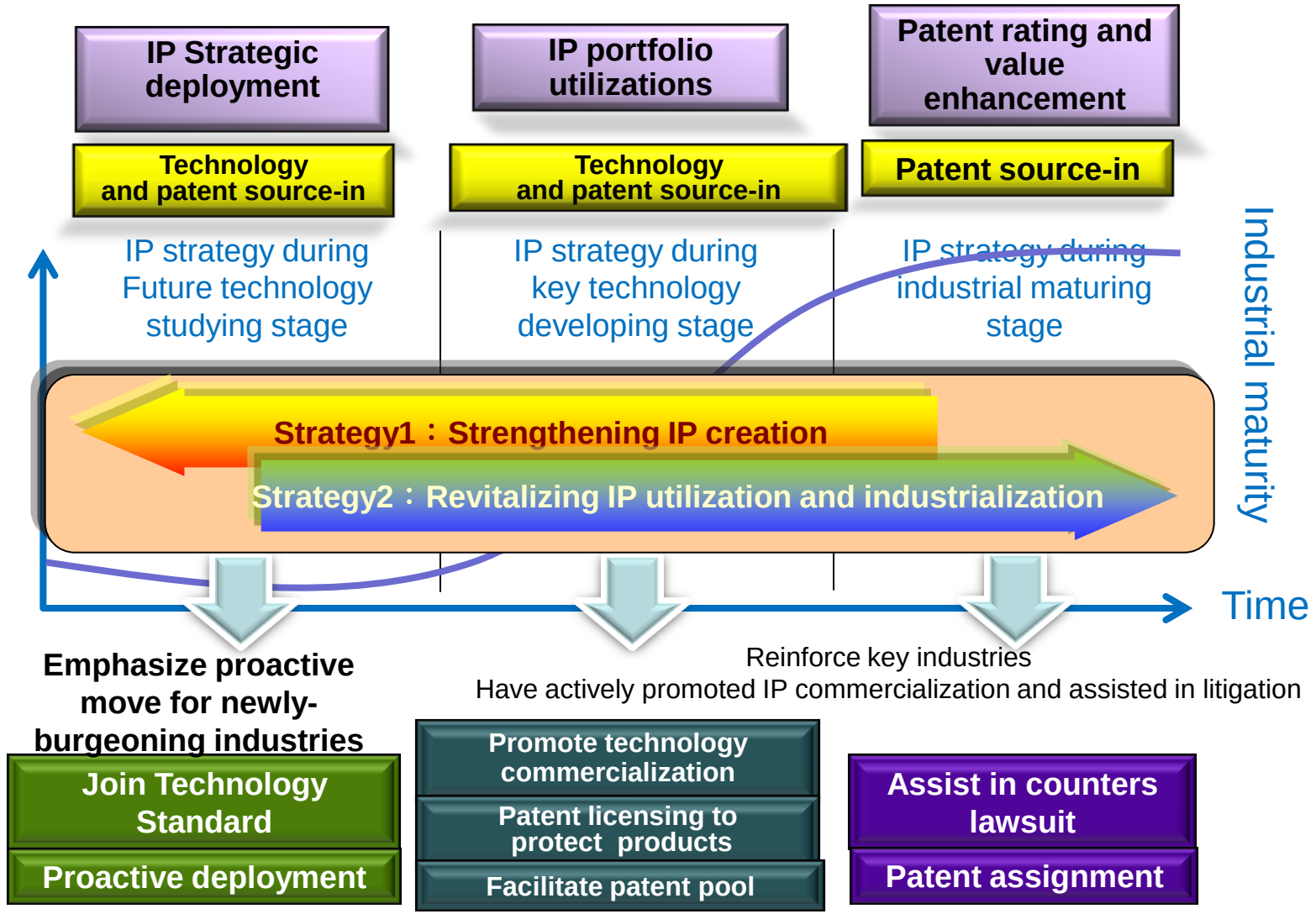


Microsoft	2005	2006	2007	2008	2009	Total
No. of patents	746	1463	1638	2026	2901	8774
Domestic inventors	699	1358	1514	1866	2641	8078
Foreign inventors	47	105	124	160	260	696
-Chinese inventors	19	68	78	103	172	440
-Percentage (%) of patents granted to Chinese inventors among all foreign inventors	40.4	64.8	62.9	64.4	66.2	63.2

3. Strategy Implementation

The framework of IP strategies.

■Technologies implementation steps of IP strategies.

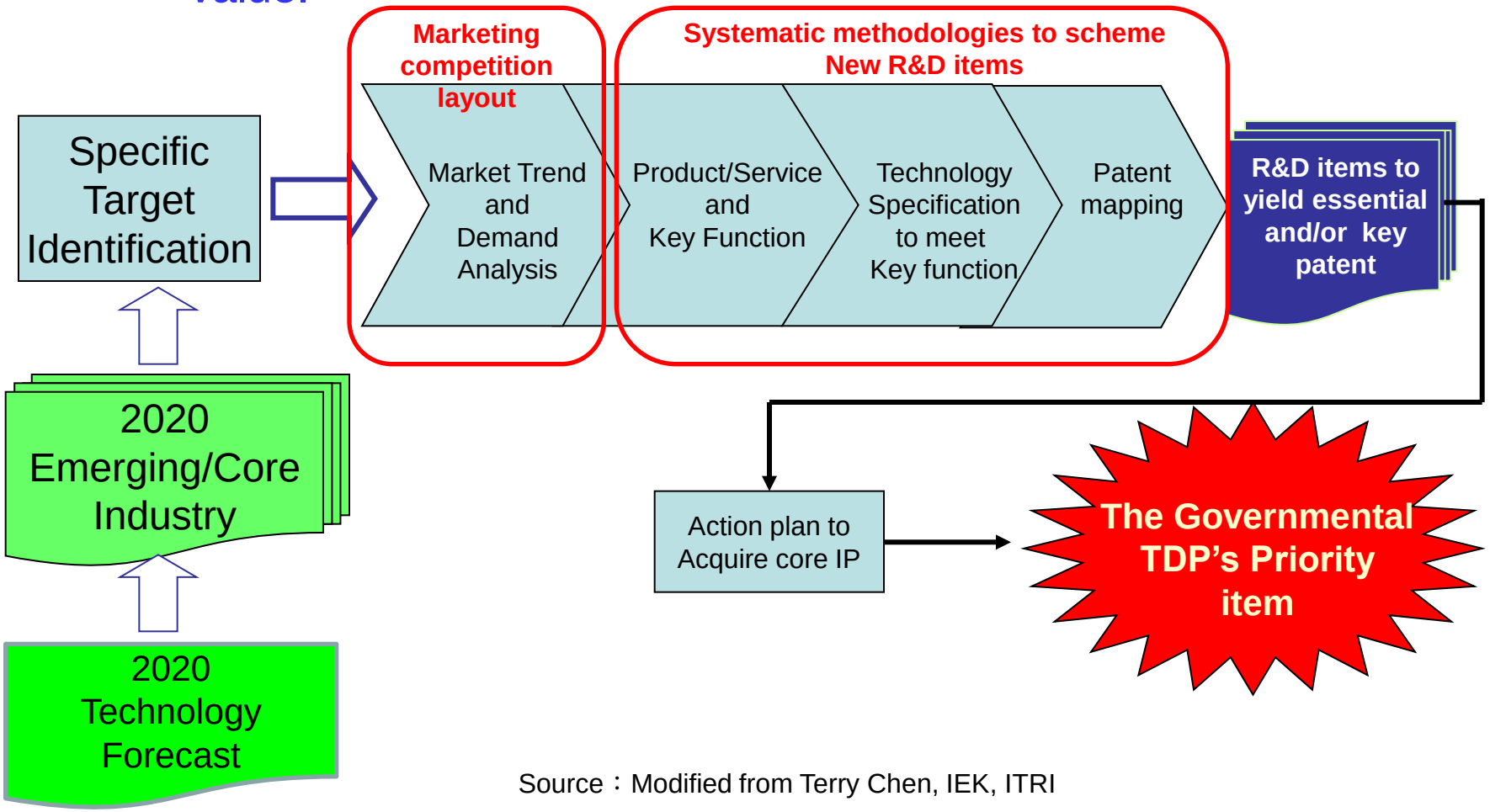


Strategy Implementation 1
Strengthening IP creation

Basics of strategy	Action plan
1. To consolidate IP strategic planning, patent mapping, and standard setting mechanism for improving innovation value of our industrial IPR and international influence.	1.1 To scheme mid-term and long-term plan aligning with our industrial development direction for raising the patent quality and value.
	1.2 To carry out IP analysis and mapping tasks on each TDP for creating essential patents and avoiding infringement.
	1.3 To aggressively participate in standard settings with international standard bodies for helping domestic IP involvement.
	1.4 To adopt open innovation model for speeding up new technology innovation in all strategic technology areas through collaboration with foreign R&D community.

Strategy Implementation 1
Strengthening IP creation

1.1 To scheme mid-term and long-term planning aligning with our industrial development direction for raising the patent quality and value.



Source：Modified from Terry Chen, IEK, ITRI

Strategy Implementation 1
Strengthening IP creation

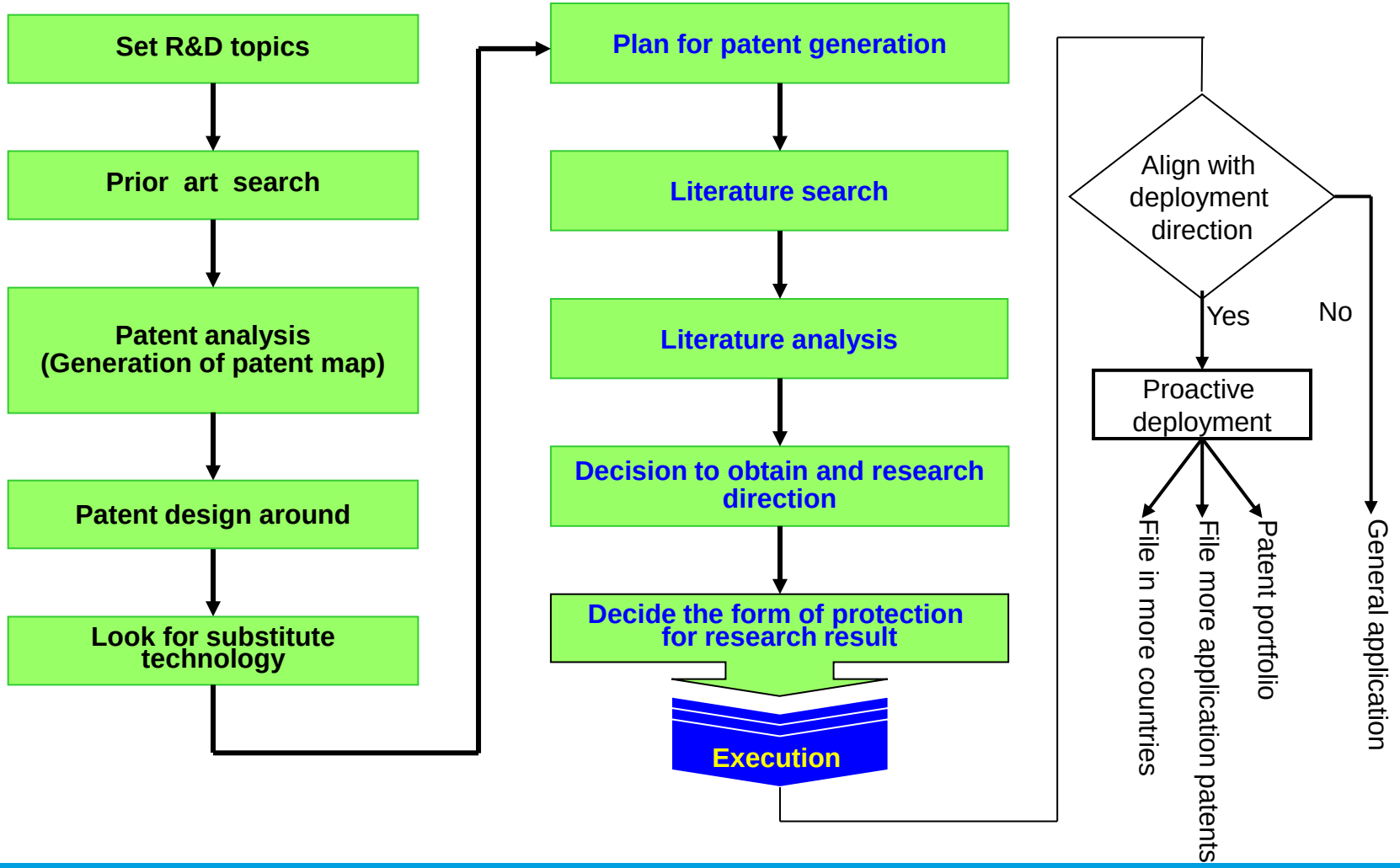
Aligning with focuses of 2020 industrial development in Taiwan, the following【technology areas】have been preliminarily selected for patent mapping to generate core and key patents (and technology).

Emerging industries	Technology areas	Description	Patent mapping model
Flexible display	–flexible display panel	Flexible electronic or 3D display	□A ■B ■C
	–back light device	OLED or any new source of light	■A □B ■C
	–processing equipment	Flexible display processing and light equipment	□A ■B ■C
Advanced medical equipment	–compounded medical device	Combining medicine with medical equipment	■A □B □C
	–electro-optic medical device		■A □B □C
	–large medical equipment	Mainly CT scanner, OCT scanner, etc.	□A ■B ■C
Advanced electronic parts	–rechargeable post-lithium battery	i.e., rechargeable battery not using lithium, but of even higher capacity, which may be used in electronic vehicles or energy storage system	■A □B ■C
Green energy	–bio-energy	combining micro-algae incubation and growth tecl	■A □B □C
	–high-efficiency low-cost flexible		■A □B ■C
Information technology	–cloud service applications	including in-vehicle and distant medical service, e	□A ■B ■C
	–4G or 5G system technology		■A □B □C

A : “strategic patent”
B : “special ad hoc blocking and inventing around”
C : “blanketing and flooding”

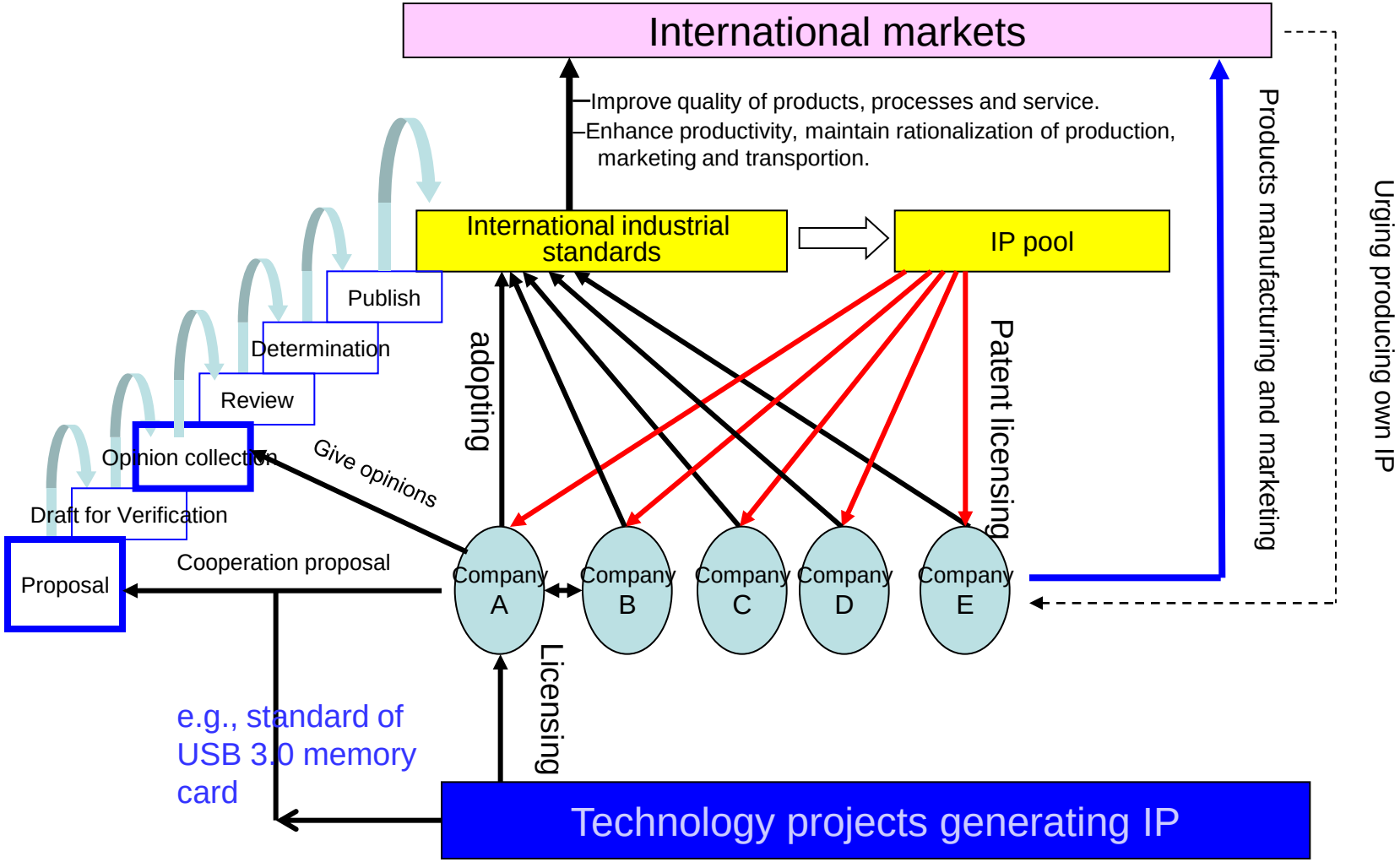
Strategy Implementation 1
Strengthening IP creation

1.2 To carry out IP analysis and mapping tasks on each TDP for creating essential patents and avoiding infringement.



Strategy Implementation 1
Strengthening IP creation

1.3 To aggressively participate in standard settings with international standard bodies for helping domestic IP involvement.



Strategy Implementation 1
Strengthening IP creation

1.4 To adopt open innovation model for speeding up new technology innovation in all strategic technology areas through collaboration with foreign R&D community.

Pooling together patents of ITRI and other local and foreign industrial and academic research institutions to create new business opportunities.

R&D institutes Internal IP

Other IP

***IP Portfolio and Pooling**
***Screening and verification**
***IP evaluation**

New business opportunities

- **Including IP of domestic and foreign R&D organizations, universities, and etc.**

- **exclusive/non-exclusive/cross license**
- **Assignment/joint patent ownership**
- **Technology in exchange of stock share /establishing new business ventures**
- **IP enforcement**

- **Providing autonomous innovation IP and technology to industries.**
- **Providing IP for businesses counter lawsuit, increasing IP competitiveness.**
- **Promoting industries to invest.**

Strategy Implementation 2

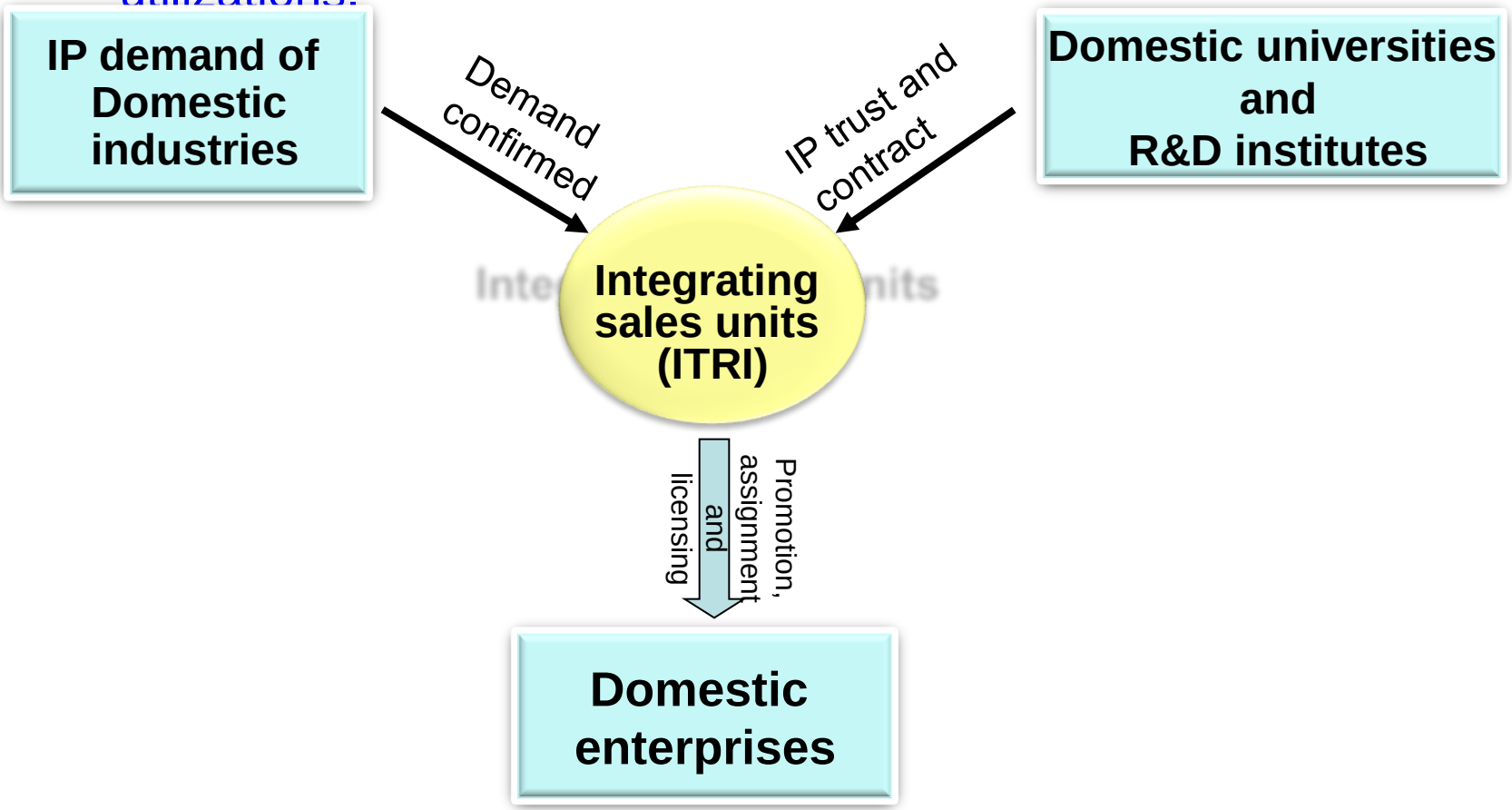
Revitalize IP utilization and industrialization

Basics of strategy	Action plan
2. To encourage collaboration between R&D institutes and universities, and analyze/execute international IPs. Industrialization models for intensifying IP defense capabilities.	**2.1 To take advantage of capable and experienced organization (such as ITRI) to help universities realizing IP utilizations through mechanism of patent portfolio and alliance to realize IP utilizations.**
	2.2 To analyze international IPs' industrialization models and their impact, and propose practical IP utilization methods for domestic use.
	2.3 To explore existing IP resources from R&D institutes of emerging countries for enriching and globalizing patent portfolios in key technology areas through international collaboration.

Strategy Implementation 2

Revitalize IP utilization and industrialization

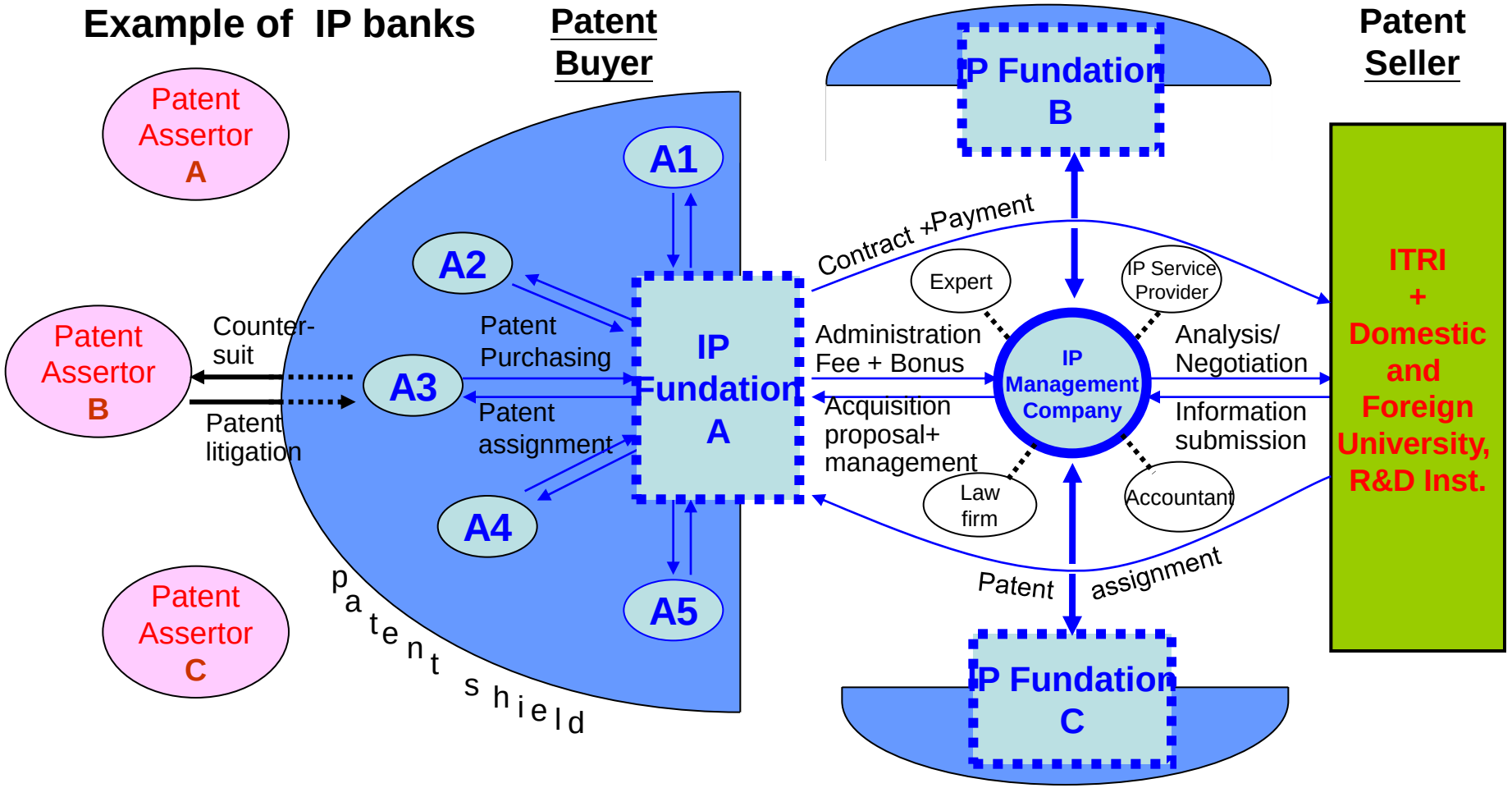
2.1 To take advantage of capable and experienced organization (such as ITRI) to help universities realizing IP utilizations through mechanism of patent portfolio and alliance to realize IP utilizations.



Strategy Implementation 2

Revitalize IP utilization and industrialization

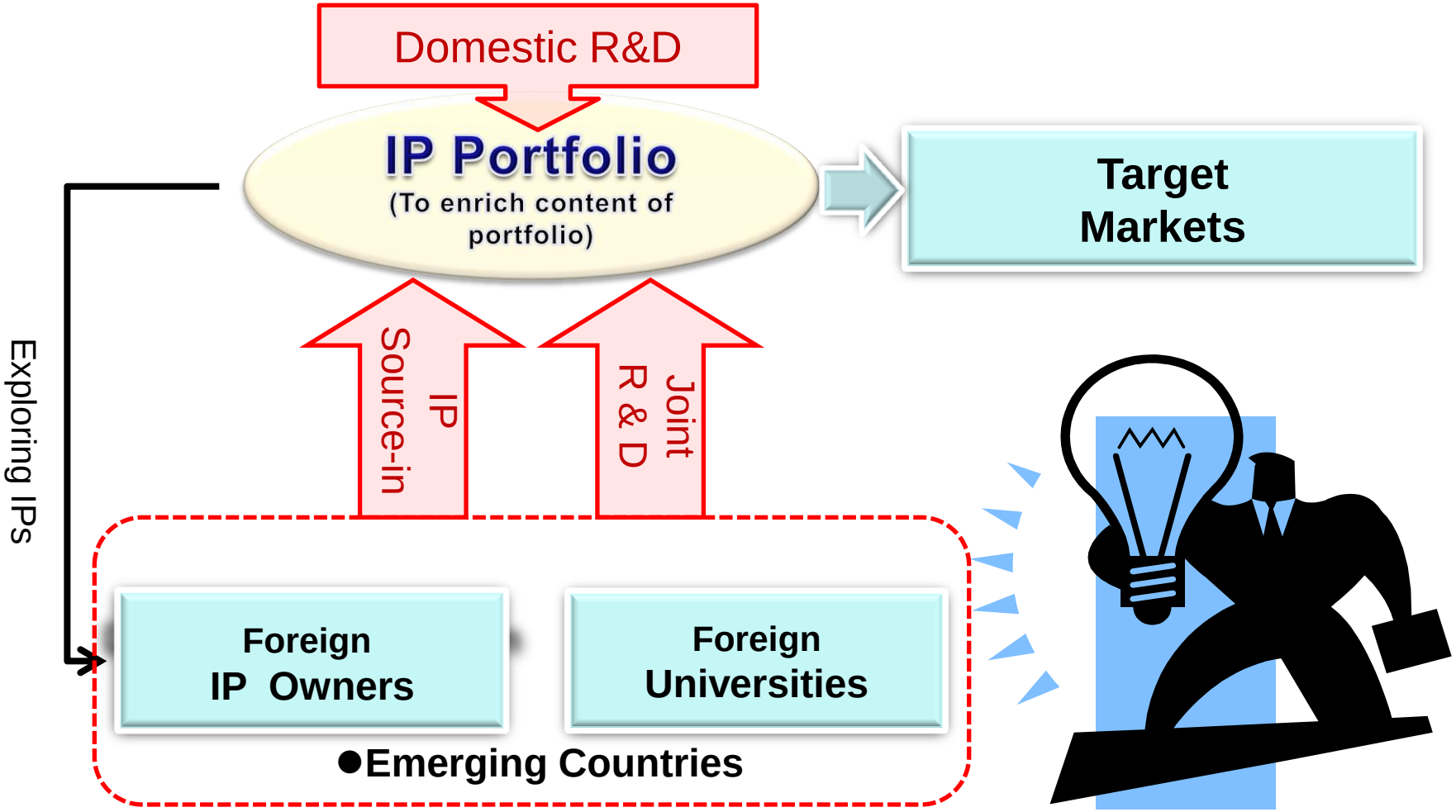
2.2 To analyze international IPs' industrialization models and their impact, and propose practical IP utilization methods for domestic use.



Strategy Implementation 2

Revitalize IP utilization and industrialization

2.3 To explore existing IP resources from R&D institutes of emerging countries for enriching and globalizing patent portfolios in key technology areas through international collaboration.



4. Issues for Discussion

Issues for Discussion

1. How to enhance strategic planning of TDP prior to excessive R&D investment to create core patents?

2. How to leverage domestic and foreign R&D resources and capacities more effectively for not-for-profit R&D institutes? How to explore and assess collaboration opportunities?

3. Whether should allow more experienced institute (such as ITRI) to realize industrialization for universities and R&D institutes?

4. How to encourage domestic enterprises/ university/ not-for-profit R&D institutes to actively participate in the activities of international industrial standard setting bodies and patent alliances?

Appendix 1

Government research institutions

Chung-Shan Institute of Science and Technology	Institute of Nuclear Energy Research	16 Agricultural Research Institutes/Agricultural Research and Extension Stations under Council of Agriculture

Research institutions under the Ministry of Economic Affairs

Industrial Technology Research Institute	Metal Industries Research and Development Center	Automotive Research and Testing Center	Cycling and Health Industry R&D Center	Plastics Industry Development Center
Institute for Information Industry	Food Industry Research and Development Institute	Precision Machinery Research Development Center	Stone & Resource Industry R&D Center	Footwear & Recreation Technology Research Institute
Taiwan Textile Research Institute	Development Center for Biotechnology	United Ship Design & Development Center	Medical and Pharmaceutical Industry Technology and Development Center	Printing Technology Research Institute

Research Institution under National Science Council

National Applied Research Laboratories

Research Institution under Department of Health

National Health Research Institutes

Research Institution under Council of Agriculture

Animal Technology Institute Taiwan