

Japan - Taiwan Workshop on “Industry-Academia Collaboration”
(2015.03.10)



Industry-University
Collaboration Activities
at
TOHOKU UNIVERSITY

- **Number of Faculties/ Schools:**
Undergraduate (10), Graduate (16),
Professional Graduate Schools (3),
Research Institutes (6), Hospital (1)
- **Number of Students:** 17,852
Undergraduate 11,060
Graduate 6,757
International Students 1,532
(Taiwanese Students 42)
- **Number of Staff:** 6,211



3 Core Principles since its Foundation (1907)

Research First

Open-Door

Practice-Oriented
Research and Education

Satomi Vision (2013)

“Leap for World Class”

“Lead Reconstruction of Tohoku and Regeneration of Japan”

Focus of Industry-University Collaboration

□ *“Leap for World Class”*

⇒ Implementation of Large-Scale Joint Research

Formulation of Research Centers/Hubs

Inducement of New Industries

□ *“Lead Reconstruction of Tohoku and Regeneration of Japan”*

⇒ Contribution toward Regional Construction

(Industry-University Collaboration leading to attraction of companies and creation of new ventures)

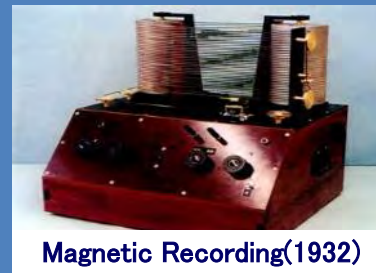
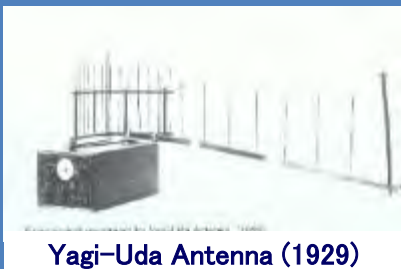


Tradition of “Practice-Oriented Research and Education”

- 1917** Dr. Kotaro Honda’s “KS Steel” (Institute for Materials Research)
- 1926** Dr. Shuji Yagi & Dr. Shintaro Uda’s “Yagi-Uda Antenna”
(Research Institute for Electrical Communication)
- 1944** Research Institute for Electromagnetic Materials
- 1961** Semiconductor Research Institute

Forerunners of University Startups

- 1938** Former Tohoku Metal Industries Co., Ltd. (NEC TOKIN Corporation)
- 1952** Former Yagi Antenna Inc. (Hitachi Kokusai Electric Inc.)



Commercial Applications:

- Yagi-Uda Antenna
TV Antenna
- Magnetron
Radar, Microwave etc.
- Magnetic Recording
Floppy Disk, HDD etc.

Tohoku University's Potential

① Ranking by Research Fields

Overall: No. 77 in the World (No. 5 in Japan)

Fields	World	Japan
Material Sciences	No. 6	No. 2
Physics	No. 12	No. 2
Chemistry	No. 28	No. 6

Thomson Reuters ESI April 2013

② Joint Research/Patent

Item	Record
Joint Research w/ Industry	About 800 projects/yr Around 3 billion yen
Patent Applications	About 400 applications/yr (Domestic 300 / Intl. 100)
Registered Patent	About 1,700 patents
License Income	About 90M yen (Yr. 2013)

③ Landmark Industrialization

Tohoku Metal Industries Co., Ltd.
(NEC TOKIN Corporation)
Tohoku Steel Co., Ltd.
Tsuken Electric Industry Co., Ltd. etc.

④ Number of University Startups 2014

Rank	Institution Name	Number
1	University of Tokyo	58
2	Tohoku University	32
3	Tokyo Institute of Technology	31
4	Kyoto University	27
4	Osaka University	27
6	Kyushu University	24
7	Hokkaido University	20
8	Keio University	15
8	Waseda University	15
10	Tsukuba University	14

“University Startup Statistics 2014” by Teikoku Databank, Ltd.

⑤ Large-Scale Projects

1. Center of Innovation Program (COI-STREAM)
2. Tohoku Medical Megabank Project
3. International Research Institute of Disaster Science
4. Impulsing Paradigm Change through disruptive Technology (ImpACT) - Spintronics & Robotics
5. Translational Research Center based on Medical-Engineering Cooperation

Working toward Expansion/Extension of Joint Research Projects, Exploitation/Commercialization of Research Results, and Creation of New Industries

Main Focus:

1. Expansion/Extension of Joint Research Projects

- PR: Tohoku University Research Profiles, Innovation Fair
- Execution of Organizational Partnership Agreements (entered with 23 Organizations in total)

2. Exploitation/Commercialization of Research Results

- Joint Research Chairs/Divs. (~2014: 5 Projects, 2015: 2 Projects) (exchange researchers from both sides and create full-scale results)
- Management of Industry-University Collaboration Centers
 - Center for Innovative Integrated Electronics Systems (CIES)
 - Material Solutions Center (MaSC)

3. Creation of New Industries

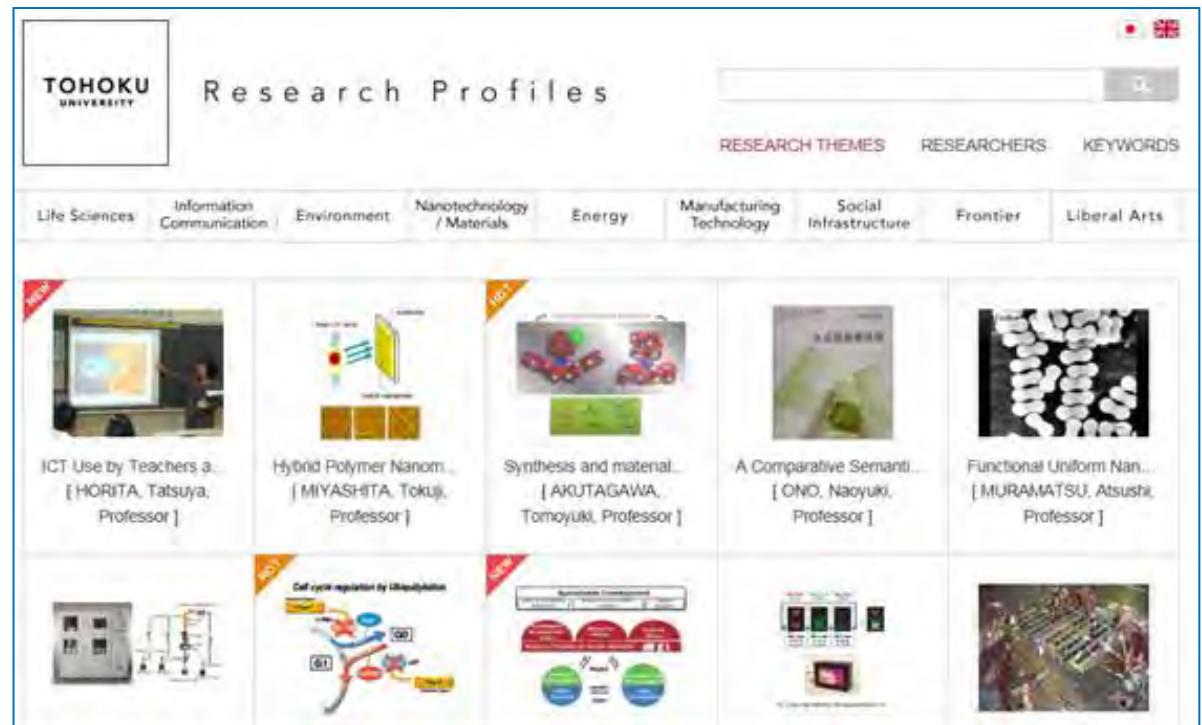
- Investment Project (Project for Public-Private Innovation Program)
 - Creation of new ventures from universities' research outcomes



Center for Innovative Integrated Electronics Systems (CIES)

Find a Match for R&D Needs

- ❑ Research profiles in 9 technical fields are publicized on the WEB to be utilized in industry (396 Profiles in Japanese & 352 Profiles in English)
- ❑ Booklet: Newly issued in Sept. 2014 for Japanese ver. & Nov. 2014 for English ver.



TU Research Profiles WEB - <http://www.rpip.tohoku.ac.jp/seeds/lang:en/>

Organizational Partnerships

Promote synergistic collaborations through organizational partnerships with companies/institutes in all fields, including R&D, human resources development, and responsibility toward the local community

- Development of innovative technology & products through multi/inter-disciplinary research
- Establishment of steering committee to manage multi/inter-disciplinary joint research
- Operation of laboratory tours and technology workshops to find new research subjects
- Organization of joint symposium and seminar

Date	Organization Name
2006. 1. 19	Hitachi, Ltd.
2006. 1. 31	National Institute of Advanced Industrial Science and Technology
2006. 2. 21	National Institute of Radiological Sciences
2006. 7. 27	Seiko Epson Corporation
2006. 12. 26	The Kahoku Shimpo
2007. 1. 31	The 77 Bank, Ltd.
2007. 3. 6	DOWA Holdings Co., Ltd.
2007. 8. 3	Japan Aerospace Exploration Agency (JAXA)
2008. 7. 25	Central Institute for Experimental Animals
2009. 2. 19	High Energy Accelerator Research Organization
2009. 3. 9	National Institute for Fusion Science (NIFS)
2009. 4. 14	RIKEN

Date	Organization Name
2010. 2. 12	NTT & NTT East Corporation
2010. 6. 4	Sumitomo Metal Mining Co., Ltd.
2011. 7. 26	Tokio Marine & Nichido Fire Insurance Co., Ltd.
2011. 11. 22	IBM Japan, Ltd.
2012. 1. 19	National Institute of Information and Communications Technology (NICT)
2012. 10. 16	Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
2013. 8. 1	Toshiba Corporation
2013. 11. 12	National Institute for Materials Science (NIMS)
2013. 12. 18	Tohoku Regional Bureau, Ministry of Land, Infrastructure, and Transport
2014. 8. 1	National Institute of Biomedical Innovation

(23 Organizations as of March 2015)

Centers for Collaborative Research:



New Industry Creation Hatchery Center (NICHe)



Junichi Nishizawa Memorial Research Center



Clinical Research, Innovation and Education Center (CRIETO)



Material Solutions Center (MaSC)



Center Innovative Integrated Electronic Systems (CIES)



Research Center for Rare Metal and Green Innovation

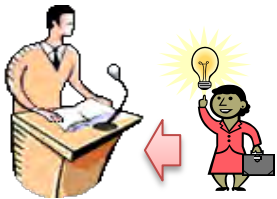
Incubation Facility:



Tohoku University Collaboration Business Incubator (T-Biz)

- Managed by Organization for Small & Medium Enterprises and Regional Innovation, Japan (SME Support, Japan)
- Accommodates more than 20 SME companies including university ventures

Liaison with Global Corporations etc. (Business Development Division: Global)



Approach form global corps. at international conference etc.

- Follow-up contact with foreign corporations/Japanese subsidiaries
- Respond to visit request and arrange plans
- Liaise with foreign govt. agencies (embassies, chamber of commerce etc.)
- Support execution of collaboration agreements etc.



Visit by Rio Tinto CEO (2014.10)



Execution of Collaboration Agreement with IMEC (2012.6)

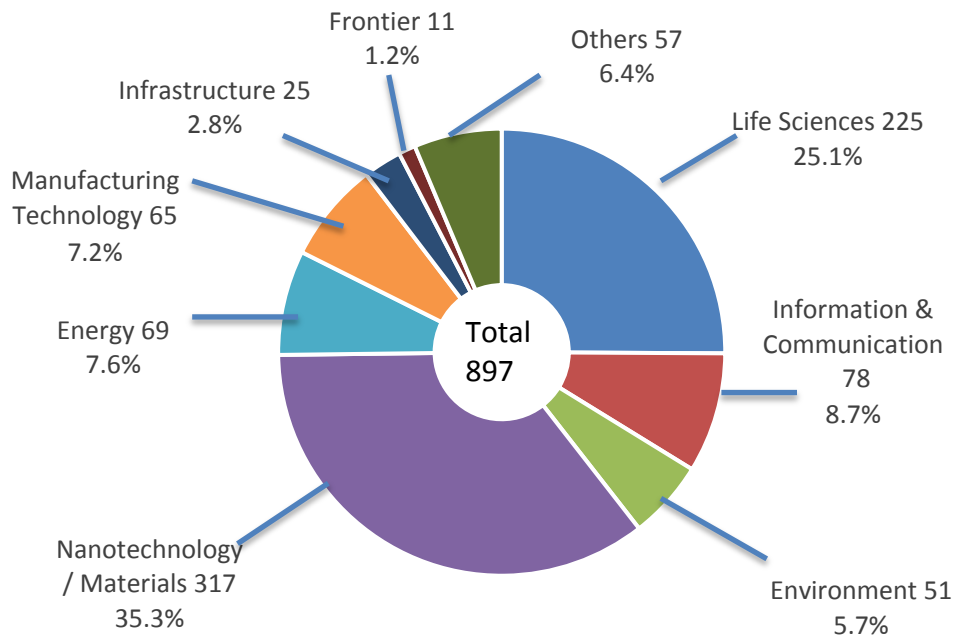
Yr. 2009~2014 Foreign Visitors

US Companies, British Companies, German Companies, Italian Companies, French Companies, Korean Companies, Chinese Companies, Taiwan Govt. Agencies, US Govt. Agencies, Finland Govt. Agencies, British Govt. Agencies, Singapore Govt. Agencies, Swedish Govt. Agencies, and others

Research Agreements & Intellectual Properties in FY2013

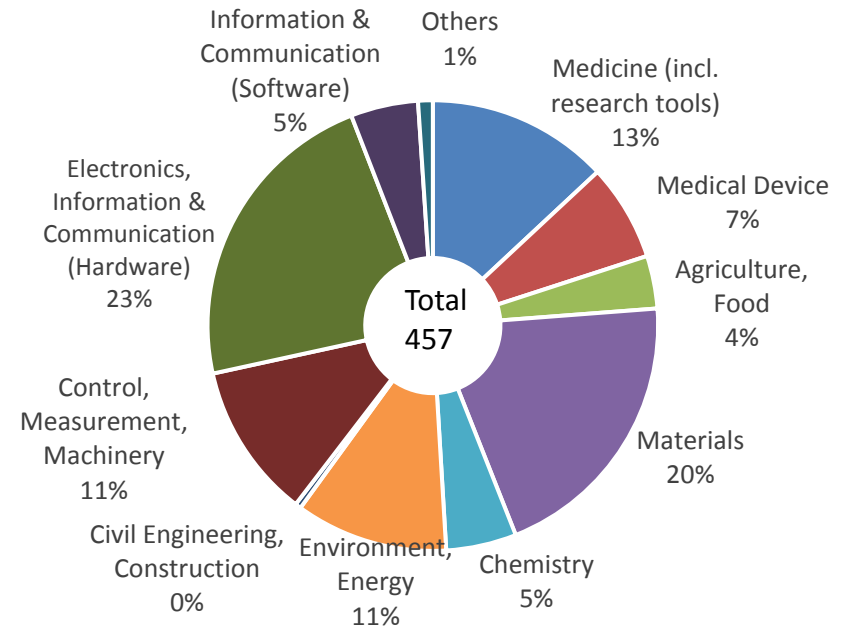
Joint Research Agreements

■ Breakdown of Total 897 Agreements in FY2013



Invention Disclosures

■ Breakdown of Total 457 Disclosures in FY2013



Fiscal Year	Research Agreements	Amount (million yen)
2011	862	2840
2012	831	3084
2013	897	4127

Fiscal Year	Invention Disclosures	Domestic Applications	PCT Applications
2011	451	353	117
2012	427	305	103
2013	475	356	107

FY2013 Ranking of Joint Research with Industry - Overall

No.	Number of Agreements		Amount (thousand yen)	
	1	University of Tokyo	1,622	Kyoto University
2	Kyoto University	1,008	University of Tokyo	5,628,401
3	Osaka University	961	Tohoku University	4,126,669
4	Tohoku University	897	Osaka University	3,223,943
5	Kyushu University	687	Kyushu University	2,774,839

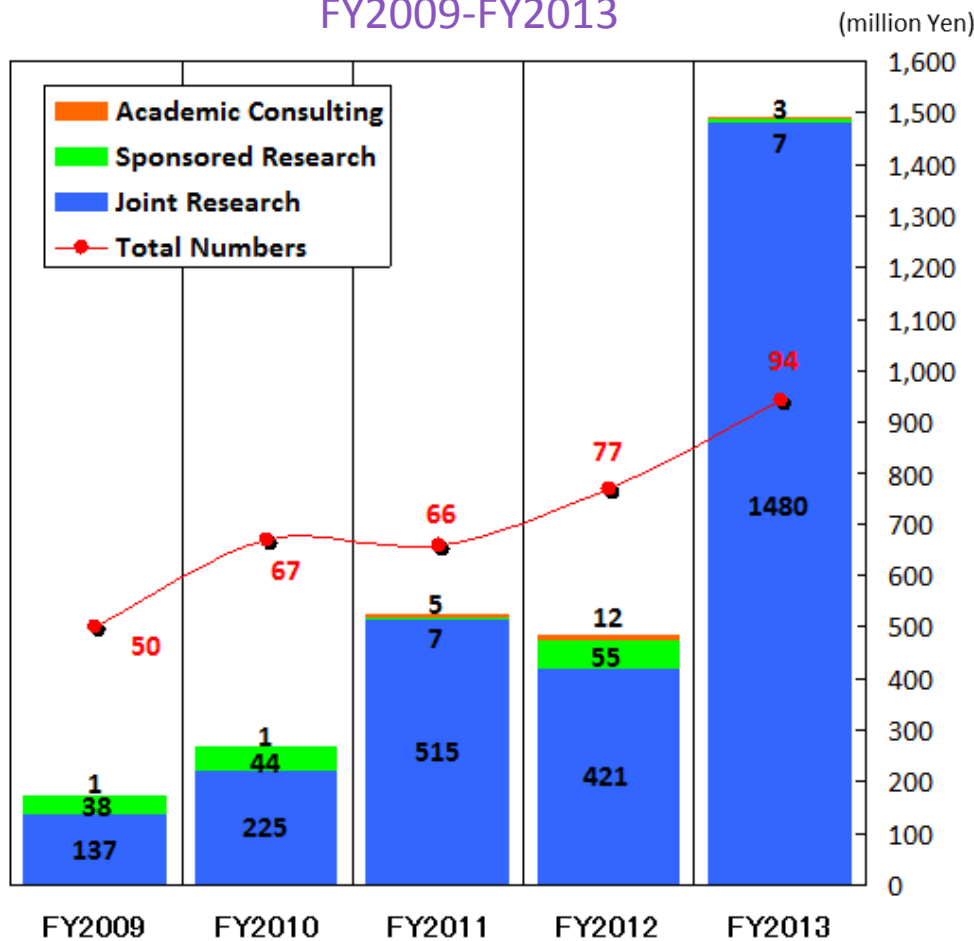
FY2013 Ranking of Joint Research with Industry - Foreign

No.	Number of Agreements		Amount (thousand yen)	
	1	University of Tokyo	22	University of Tokyo
2	Tokyo Institute of Technology	21	Tohoku University	127,206
3	Tohoku University	17	Tokyo Institute of Technology	118,229
4	Kyoto University	10	Nagoya University	89,961
5	Osaka University	9	Kitasato University	65,848

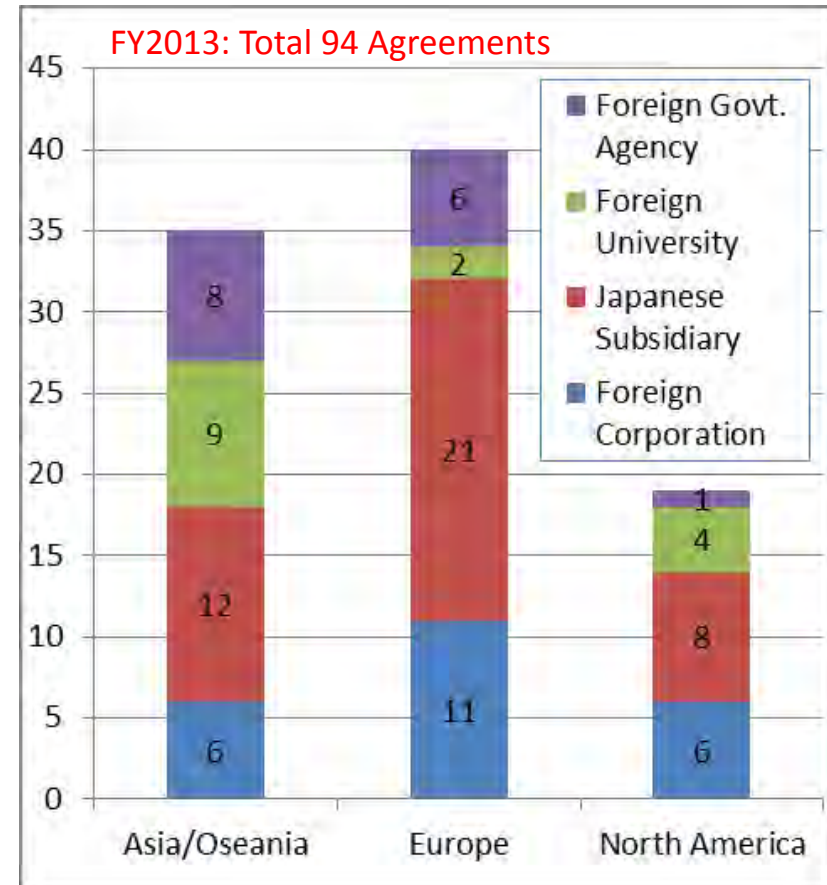
(Data: Industry-University Collaboration Statistics 2013 by Ministry of Education, Culture, Sports, Science and Technology)

- ❖ Includes amount and numbers for international agreements with Japanese subsidiaries of foreign companies
- ❖ There was a significant increase in amount due to one exceptionally large-scale agreement

International Research Agreements FY2009-FY2013



International Research Agreements by Regions



□ University-Level Academic Exchange Agreements

National Cheng Kung University

National Chiao Tung University

National Chung Hsing University

National Taiwan University

Soochow University

National Chengchi University

National Chung Cheng University

National Taiwan Ocean University

National Tsing Hua University, Hsinchu

→ Cooperation in research & education, human resource exchange etc.
(9 Taiwanese institutions out of total 190 foreign Institutions)

□ Research Cooperation Agreements:

MOU between Taiwan Industrial Technology Research Institute (ITRI) and
Research Organization of Electrical Communication, Tohoku University

→ Research cooperation in ICT for disaster resilience

and a few other industry collaborations...

As of August 2014

Intellectual Property
Management
at
TOHOKU UNIVERSITY

Tohoku university, as a research-first university, contributes to public welfare and industry development by progressively promoting prevalence of its research outcomes, while initiating the following intellectual property policy to secure the right of inventions and fully utilize such inventions in society.

1. Clarification of IP ownership

Intellectual properties based on the inventions generated by the university's research activities belong to the university. The university systematically manages the intellectual property in order to secure and exploit its right.

2. Priority for utilization of IP in society

Acquisition and management of the intellectual property right shall be given the highest priority and the university shall promote extensive use of the intellectual property worldwide.

3. Enhanced collaboration with industry

In collaboration with its TLO (Technology Licensing Organization) and utilizing internal liaison framework, the university adequately responds to industry's diversified needs for the intellectual property and research.

4. Creation of novel wisdom through exploitation of IP

IP exploitation revenues are allocated to the university to promote creation of novel wisdom, while those are also allocated to the inventors adequately to enhance their research incentives.

5. Swift handling of acquisition and management of IP

The university establishes a specialized function (i.e. IP Division) for acquisition and management of the IP right and facilitates efficient and effective decision-making.

6. Transparency in management

Industry and the university found a highly transparent and equal partnership based on mutual trust, and establish an audit function to achieve sufficient social accountability.

1. Utilization of University's IP in Society

- Contribute to public welfare and industry development through utilization of research outcomes as intellectual properties
- Elevate incentives to create inventions and realize IP creation cycles through reduction of IP exploitation revenues into subsequent research projects

2. Prevalence of University's Research Achievements and Potentials

- Lead to higher assessment of the university, laboratories, researchers etc.
- Expand the university's research potentials through acquisition of external funds from joint/sponsored research, academic consulting, and MTA etc.
- Facilitate industry-university collaboration while the university creates basic inventions and the industry creates more innovative technologies through further development

3. Promotion of Industrialization

- Respond to industry's diverse needs by providing intellectual properties to local companies and ventures

4. Development of Human Resource

- Educate the minds of university researchers and students for importance intellectual property
- Develop IP-minded human resource through foundation of organized management of intellectual properties and confidential information

In principle, “the right to obtain a patent” for inventions made by the university faculty is given to the university.

(Tohoku University Policy of Invention Article 4.1)

University retains the right when the inventions are patentable and marketable

Patentability: Satisfies both novelty and inventive step

Marketability: Has a good prospect of being assigned or licensed to industry

The right is given to individual inventor(s) if University does not seek the right

→ Inventor(s) may file the patent application

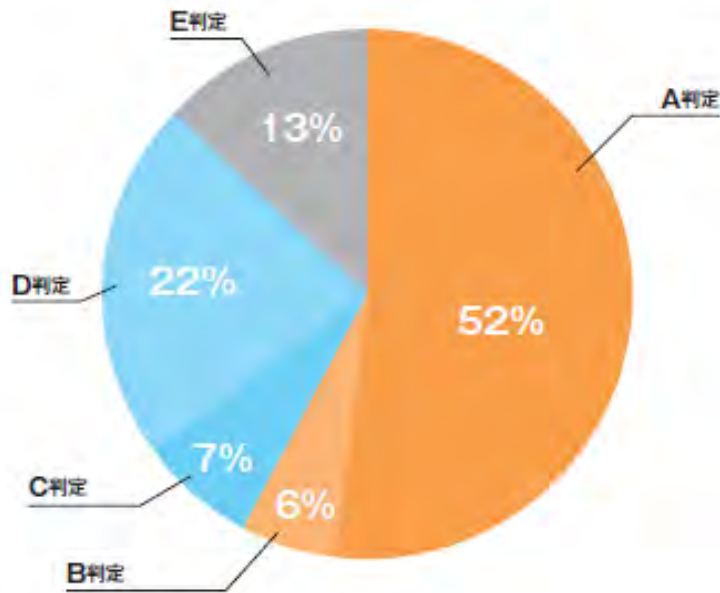
→ Inventor(s) may assign the right to an industry partner

Student Inventions

- University may file the application in its name if the faculty member(s) is/are involved as inventor(s) for the student invention
- “The right to obtain a patent” has to be assigned to University at the student’s own discretion (i.e. the assignment cannot be forced)
- University does not seek rights for students’ sole inventions

FY 2013 Classification of Invention

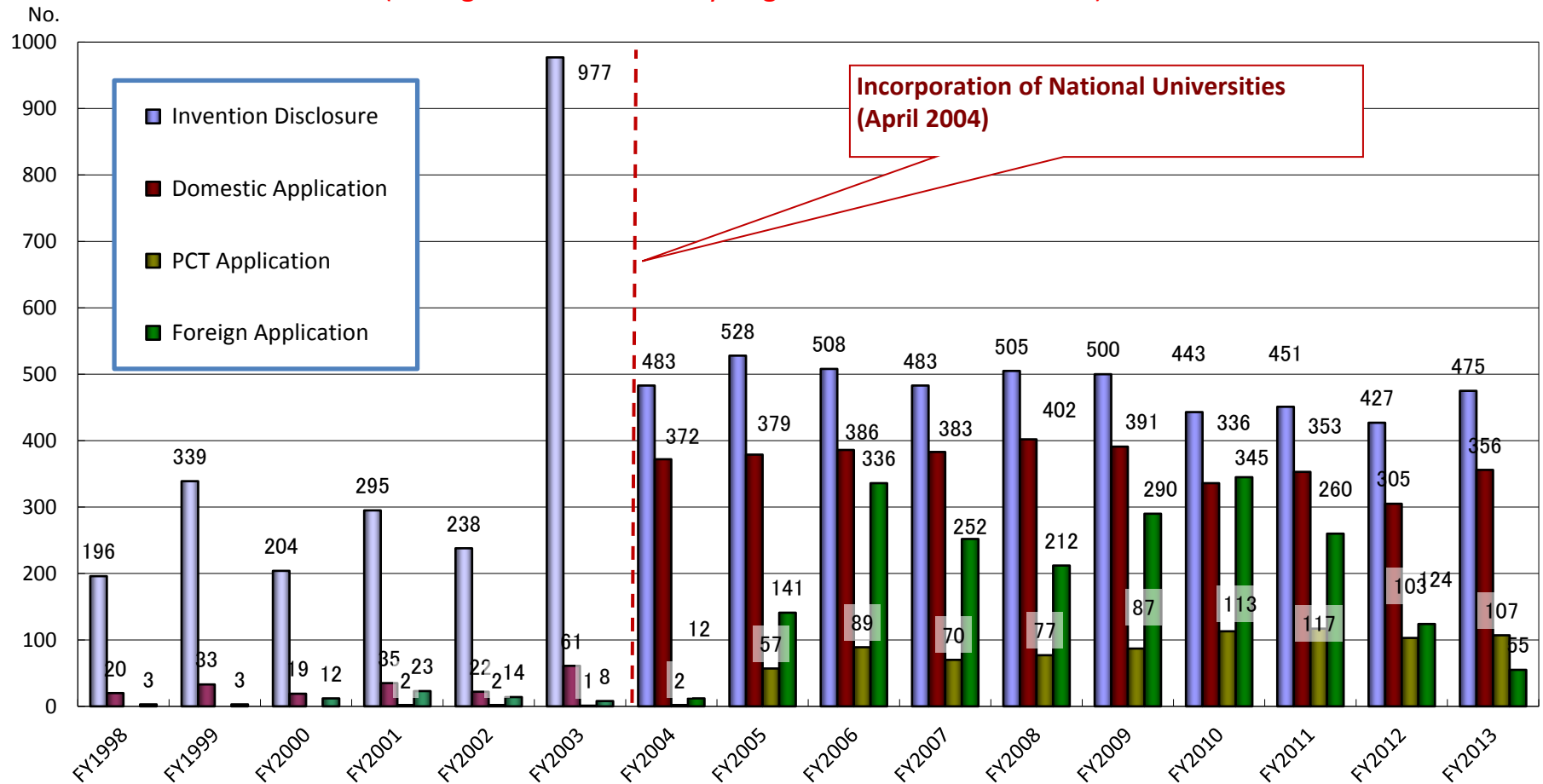
After invention disclosures are examined by an internal IP evaluation committee, they are divided in five different Classes:



In most cases (i.e. Class A), the patent related costs are paid by the partner companies of joint research projects

Class	Ownership	Costs paid by	No.
A	University + Company or University solely	Company 100%	247
B	University + Company/Institution	Paid according to ownership ratio of the Parties	29
C	University solely	University (IP Division)	33
D	University solely	University (Lab)	104
E	Individual(s)	-----	62
TOTAL			475

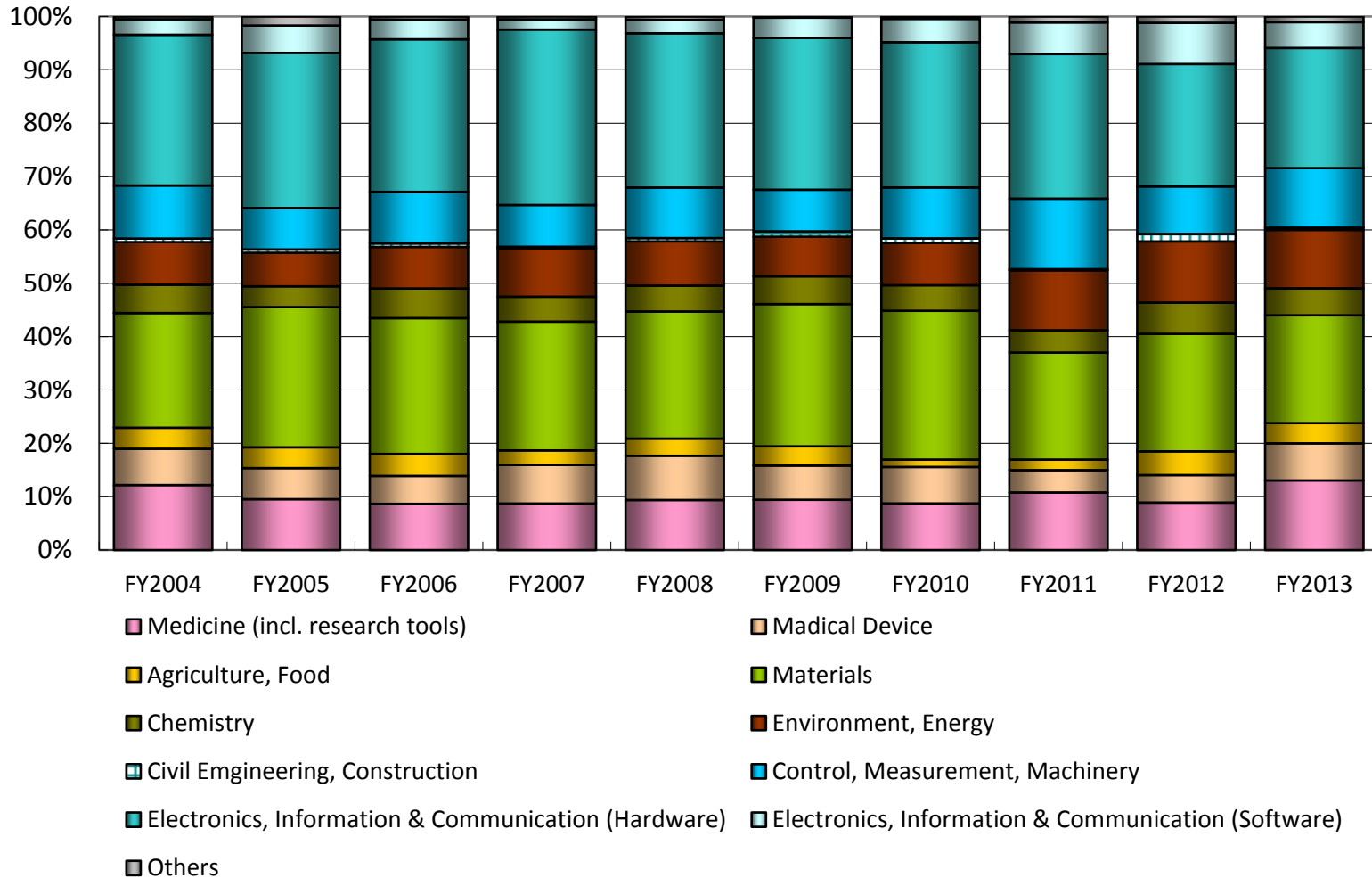
Number of Invention Disclosures & Patent Applications (the rights were owned by JP government until FY2003)



(As of May 2014)

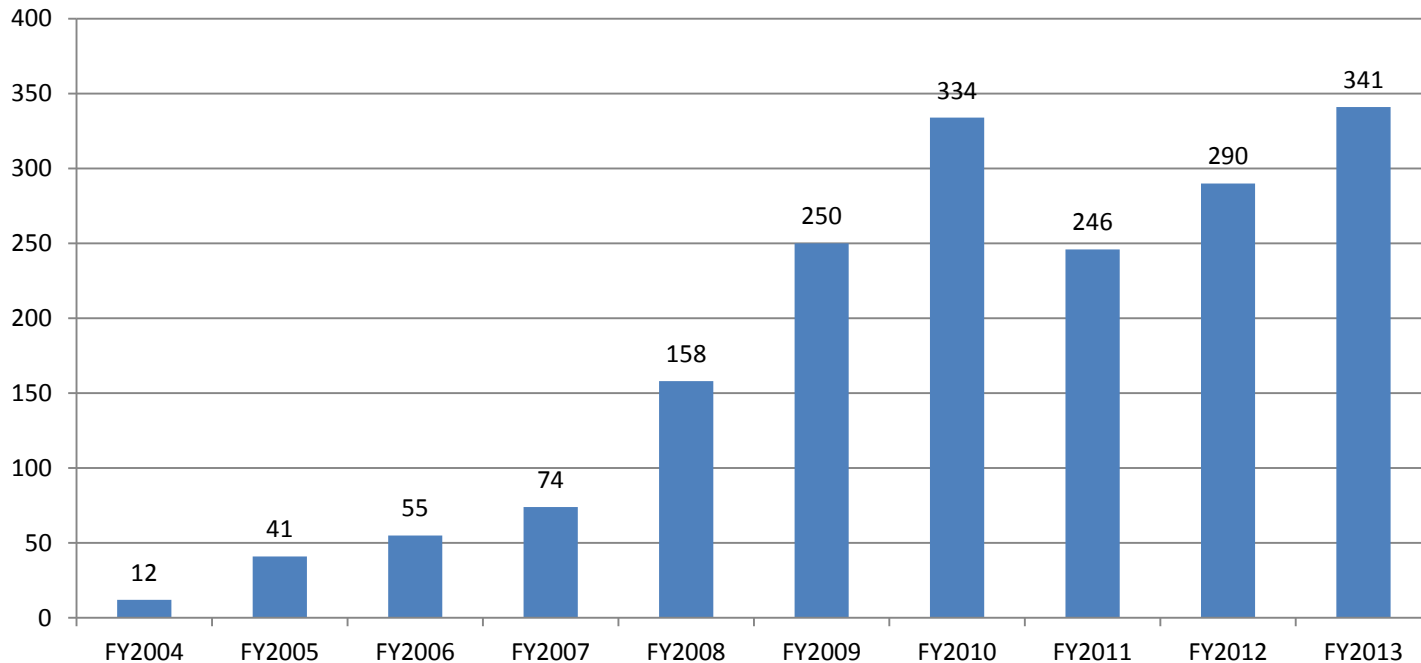
Invention Disclosures by Technology Fields

Invention Disclosures sorted by Technology Fields



(As of May 2014)

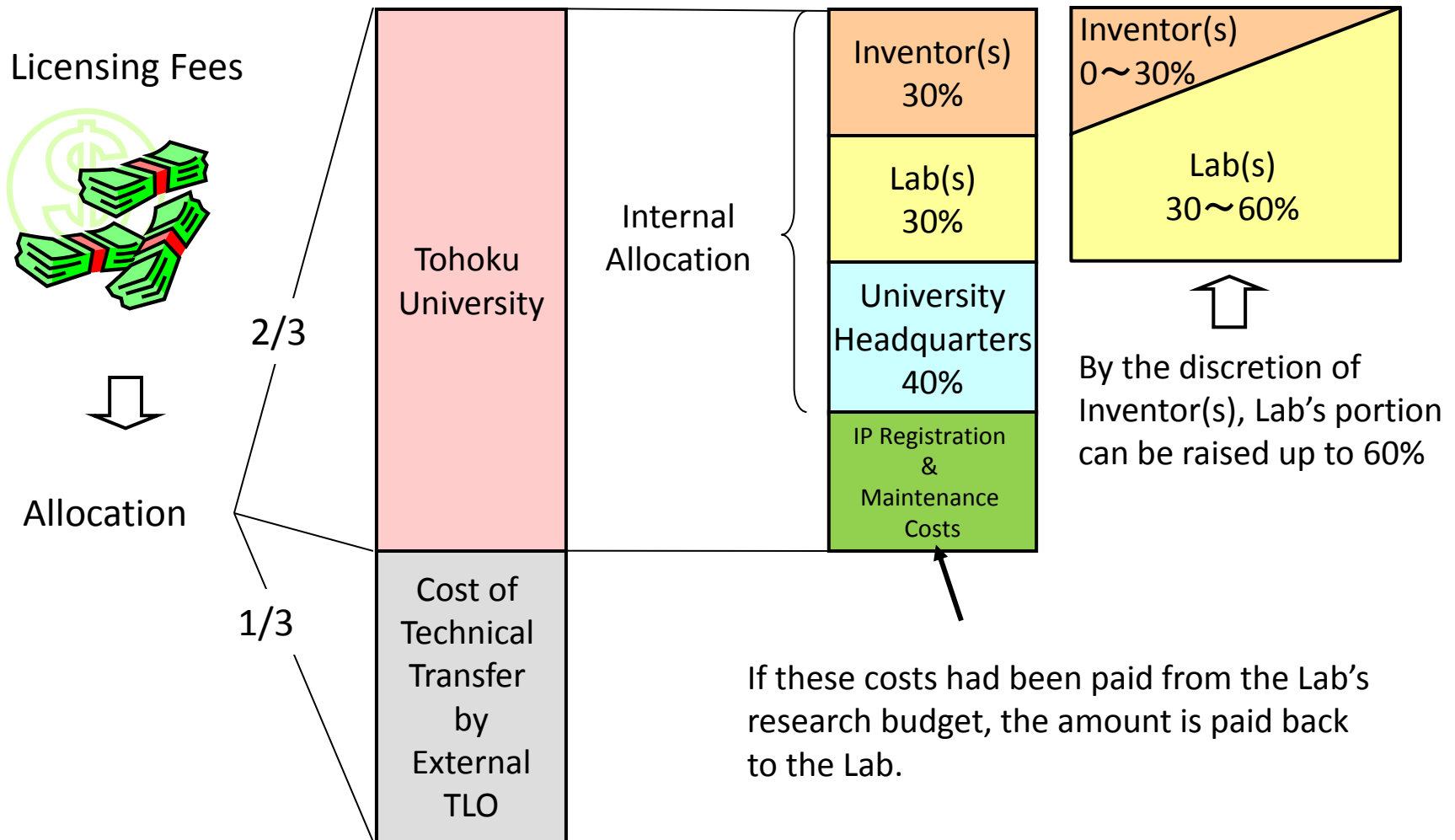
Number of Technology Transfer Agreements



Technology transfer agreements for University's patents (incl. pending patents)

- The number decreased in FY2011 due to The Great East Japan Earthquake but it is on the rise afterwards
- Multi-year agreements are incrementally counted in each responding year

Allocation of IP Revenues



Tohoku University actively promotes Industry-University collaboration focused on commercialization/industrialization of university's research outcomes in cooperation with both regional and global companies.

Through this Workshop, we hope to deepen our relationships with academic institutions in Taiwan and extend such relationships with global companies in Taiwan as well.

Thank you very much for your attention.