ATRIP Mid-Year Seminar

Domestic and International Technology Transfer in Japan

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Outline

1 Japan's Innovation Capacity

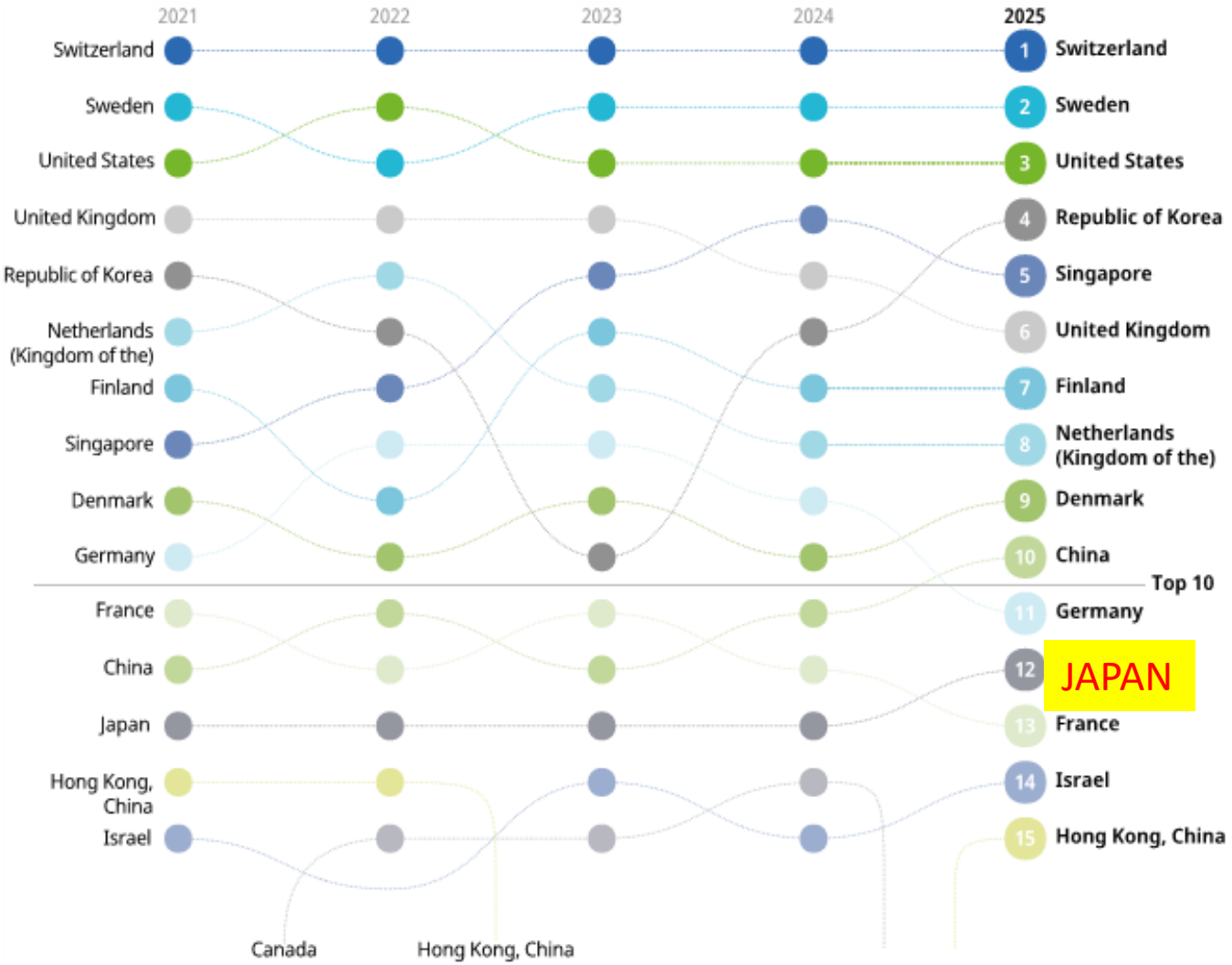
2 Domestic Technology Transfer

3 International Technology Transfer

Japan's Innovation Capacity

WIPO Innovation Index 2025

Figure 1 The GII dynamo: the top 15 innovators, 2021–2025



WIPO, Global Innovation Index 2025: Innovation at a Crossroads, 56.

Innovation in Japan

- Strengths < >: a ranking in the WIPO GII 2025
  - ✓ Education (education at the basic level) <3>
  - ✓ Public research-industry co-publications <1>
  - ✓ Patents <3>
  - ✓IP receipts (in total trade) <2>
- Weaknesses
  - ✓ Entrepreneurship policies and culture <66>
  - ✓ Venture Capital investment <32>, <37>
  - ✓ Expenditure on education <102>
  - ✓ Graduates in science and engineering <85>
  - ✓ Youth demographic dividend <137> → acceptance of foreign workers and technology transfer

Domestic Technology Transfer

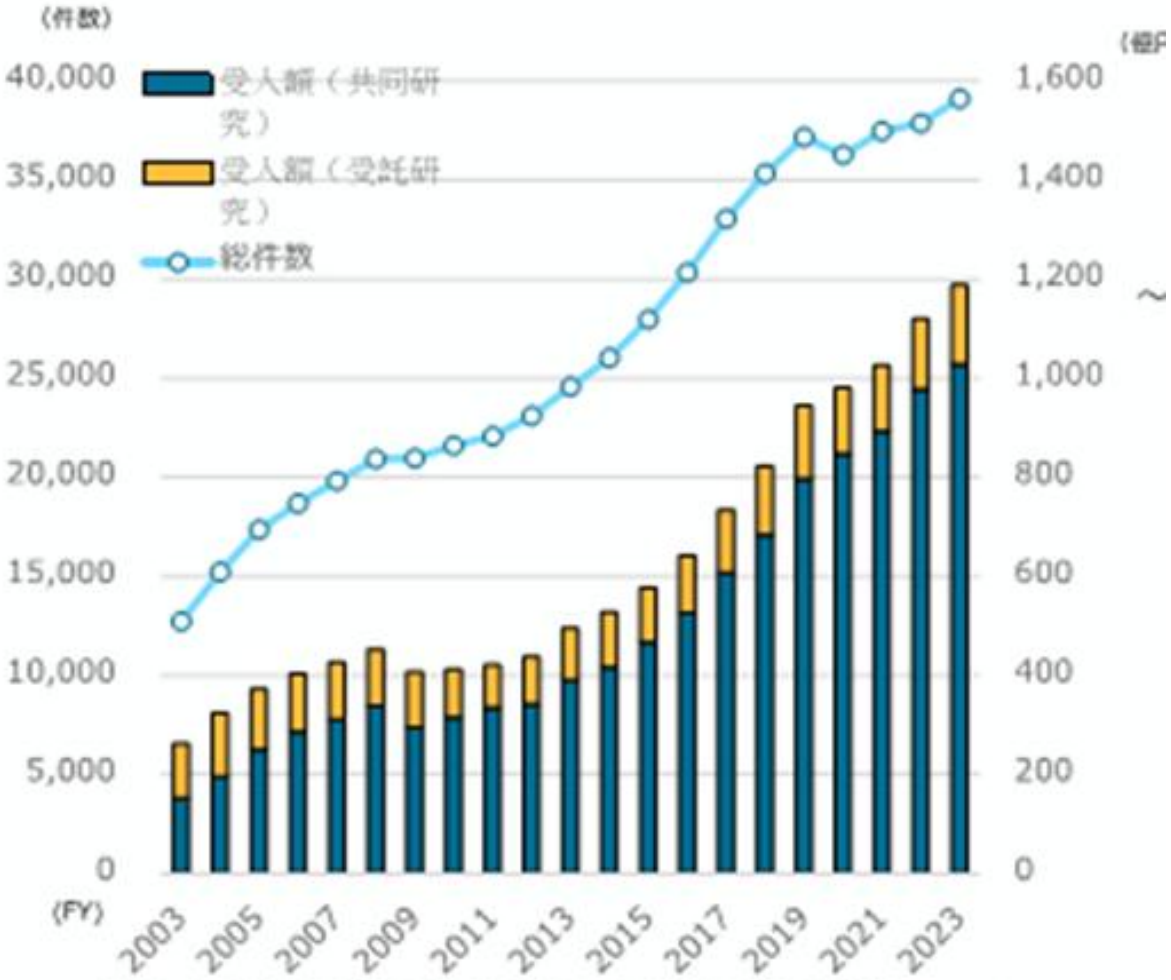
Policies taken for industry-academia collaboration

- **TLO Act (1998)**: Promoted the establishment of Technology Licensing Organizations at universities and national research institutions, with measures including patent fee reductions
- **Japanese Bayh-Dole Act (1999)**: Enabled IPRs from national R&D projects to be assigned to the commissioned research entities
- **Industrial Technology Enhancement Act (2000)**: Allowed national university faculty to concurrently serve as officers in for-profit corporations
- **Patent Law Amendments (2004 and 2015)**: Reforms regarding employee inventions

Results and achievements

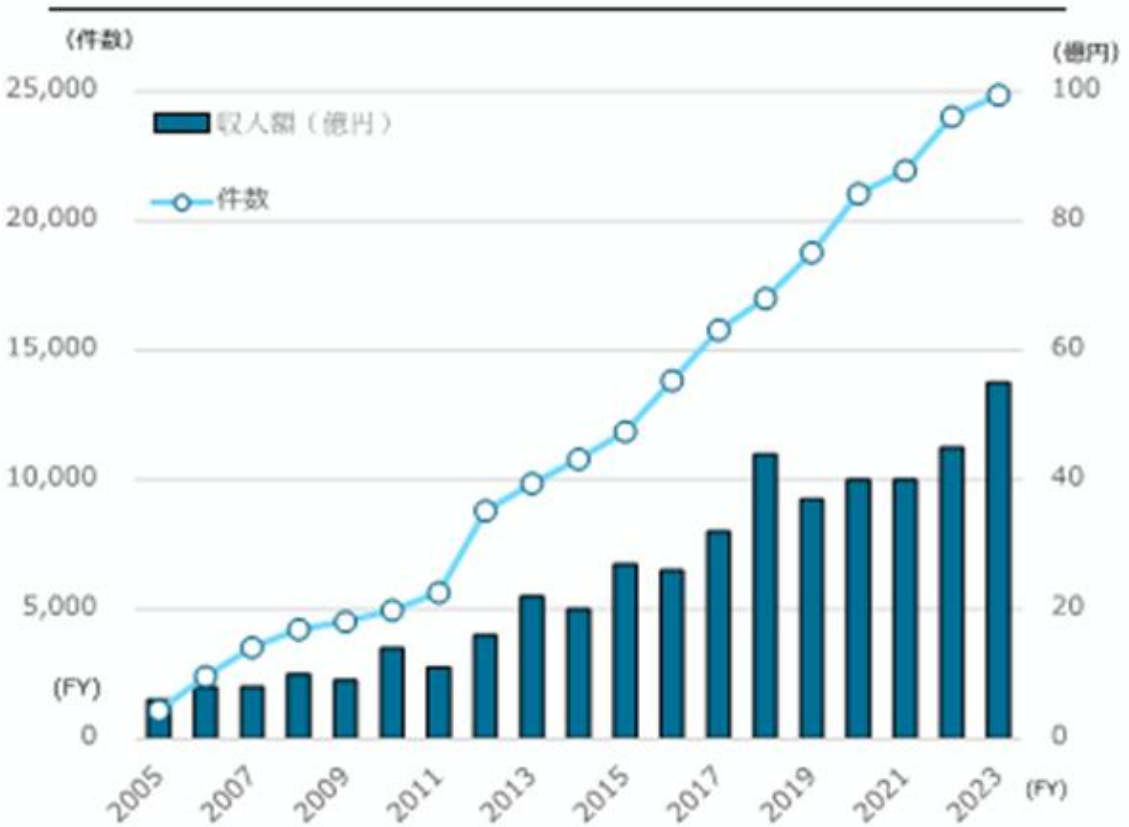
- Policy changes have led to a marked increase in collaboration activity:
  - **Joint/Commissioned Research:** Both the number of cases and the total funding received have grown steadily since 2003.
  - **Patent Utilization (licensing or transfer):** Between 2005 and 2023, the number of patent utilizations increased approximately **22.5 times**, while income increased **9.2 times**.
  - **University Ventures:** There has been a dramatic rise in university-launched startups, reaching **5,074 companies by 2024**.
- Despite this growth, Japan's university revenue from IPRs remains significantly lower than that of its peers—reportedly **1/50**th of that of US universities and **1/6**th of that of UK universities.

Joint/Commissioned R&D Projects



（出典）文部科学省「令和5年度大学等における産学連携等実施状況について」

Utilization of and Income from University Patents



件数数：2005→2023　約22.5倍

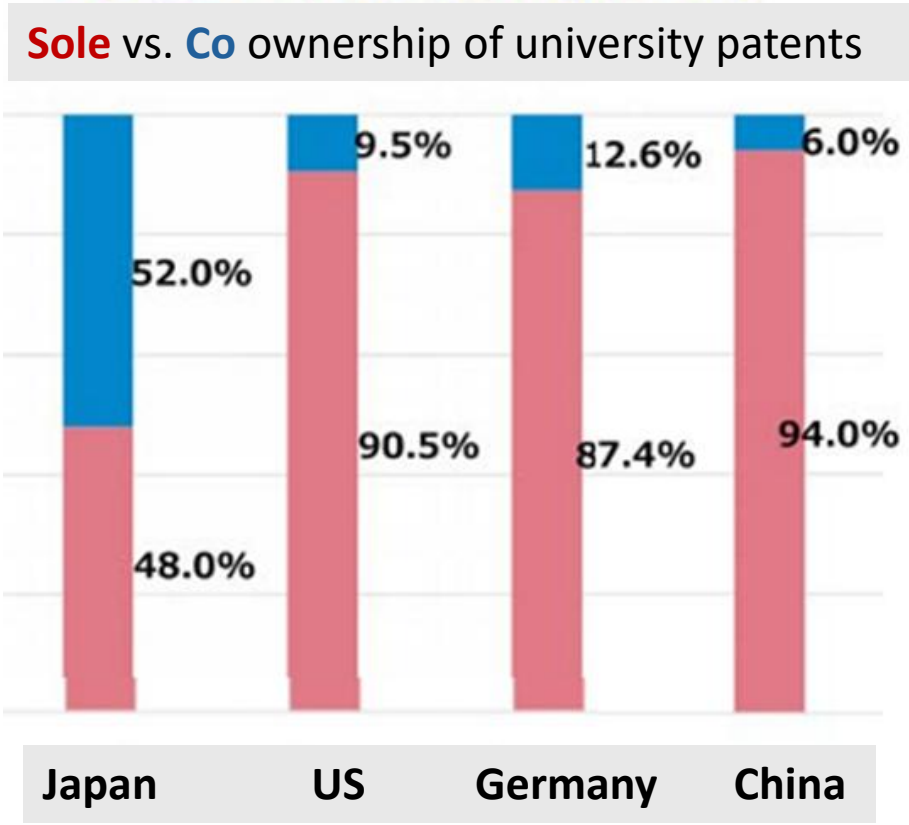
収入額：2005→2023　約9.2倍

（出典）文部科学省「令和5年度大学等における産学連携等の実施状況について」

https://www.meti.go.jp/shingikai/sankoshin/sangyo_gijutsu/innovation/pdf/007_03_00.pdf

Characteristics and Issues of Industry-Academia Collaboration in Japan

- A notable feature of the Japanese system is the **co-ownership of patents** between universities and companies.
- **Why co-own?** Universities often prefer co-ownership so that companies will cover patent application costs and handle enforcement against infringement.



https://www.jst.go.jp/crds/pdf/2021/RR/CRDS-FY2021-RR-04.pdf

Characteristics and Issues of Industry-Academia Collaboration in Japan

- **Licensing Constraints:** Under Japanese Patent Law (Art. 73(1)(3)), the consent of all co-owners is generally required to license the patent to a third party. This can prevent universities from freely licensing technology to startups.
- **The "Compensation" Conflict:** While the Patent Act (Art. 73(2)) allows each co-owner to work the patented invention freely, Japanese custom often requires companies to pay "compensation" to the university (another co-owner) when they implement the technology. This creates friction, as companies must pay the costs of obtaining and maintaining the patent, as well as for its use.
- Fundamental Problem: **Insufficient financial resources** of universities

Current Challenges in Japanese Industry-Academia Collaboration

- **Industry-University Dialogue**: Insufficient mutual understanding regarding university transformation efforts and corporate expectations
- **Deep Tech Industry-Academia-Government Collaboration**: Immature collaboration infrastructure for developing deep tech requiring advanced scientific foundations
- **Human Resource Linkages**: Low mobility of personnel between companies and universities
- **Global Industry-Academia Collaboration**: Weak global connections in terms of funding and personnel; inability to incorporate global needs to strengthen research capacity
- **University Management with International Competitiveness**: Delayed construction of strong financial foundations through virtuous cycles of research, education, and strategic investment compared to Western counterparts
- **IP Profitability**: Low IP revenue relative to the number of university IP holdings; insufficient as a resource for strengthening research capacity
- **Deep Tech Research Infrastructure and Hub Formation**: Stagnation in basic scientific capabilities in industrial sectors that will lead the future
- **Role of National Research Institutions in Regional Ecosystems**: Formation of regional innovation ecosystems that contribute to deep tech startup development and regional industry development

Ministry of Economy, Industry and Trade (2025)

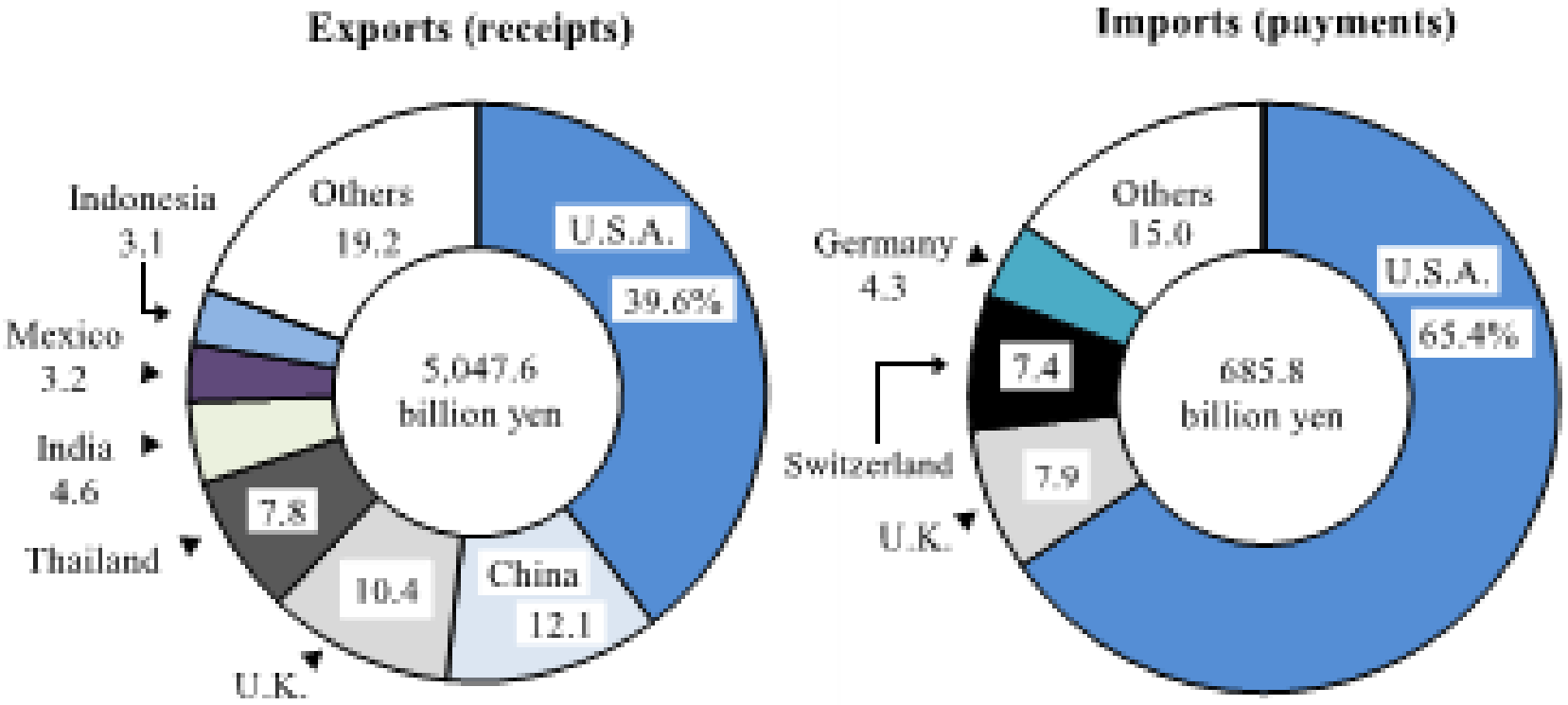
International Technology Transfer

Global IP Receipts and Payments, Balance, in USD Billion, 2023 (WIPO)

Economy	Exports (USD Billion)	Imports (USD Billion)	Ranking Exports	Ranking Imports
United States	134.44	47.54	1	3
Japan	51.47	28.65	2	6
Germany	47.72	22.93	3	7
Netherlands (Kingdom of the)	42.20	41.81	4	4
United Kingdom	31.69	21.05	5	8
Switzerland	29.67	30.44	6	5
France	16.67	15.51	7	11
Ireland	15.39	152.56	8	1
Singapore	13.83	18.18	9	9
China	12.17	52.73	10	2

https://www.wipo.int/en/web/global-innovation-index/w/blogs/2025/international-trade

Composition of Japan's Technology Trade (FY2023)



https://www.stat.go.jp/english/data/handbook/pdf/2025all.pdf?utm_source=chatgpt.com

Major challenges

- How to achieve technology transfer to address global challenges and promote economic development in developing countries?

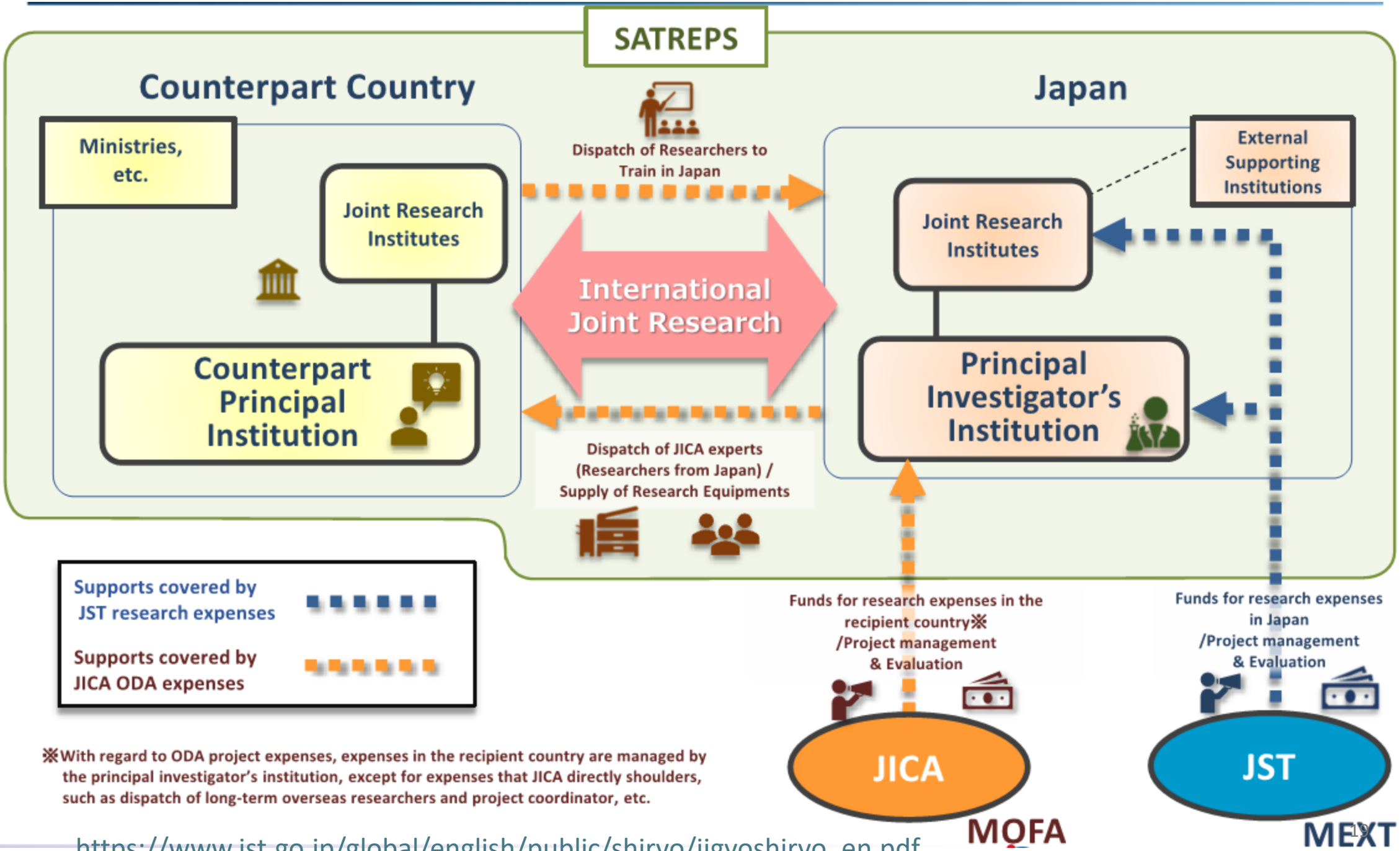
- The relationship with economic security

Technology Transfer for Global Development

- Limitations of international law
  - Generally: TRIPS Agreement Articles 7, 8, 40, 66.2, and 67
  - Climate change: UNFCCC (1992) Article 4; Paris Agreement (2015) Article 10
  - Infectious diseases: WHO Pandemic Agreement Articles 7, 10, and 11
- Regulation by international law
  - *E.g.*, Forced technology transfer: TRIPS, IIAs (international investment agreements), etc.
- Promoting international technology transfer requires **intergovernmental cooperation** and **policy incentives**.

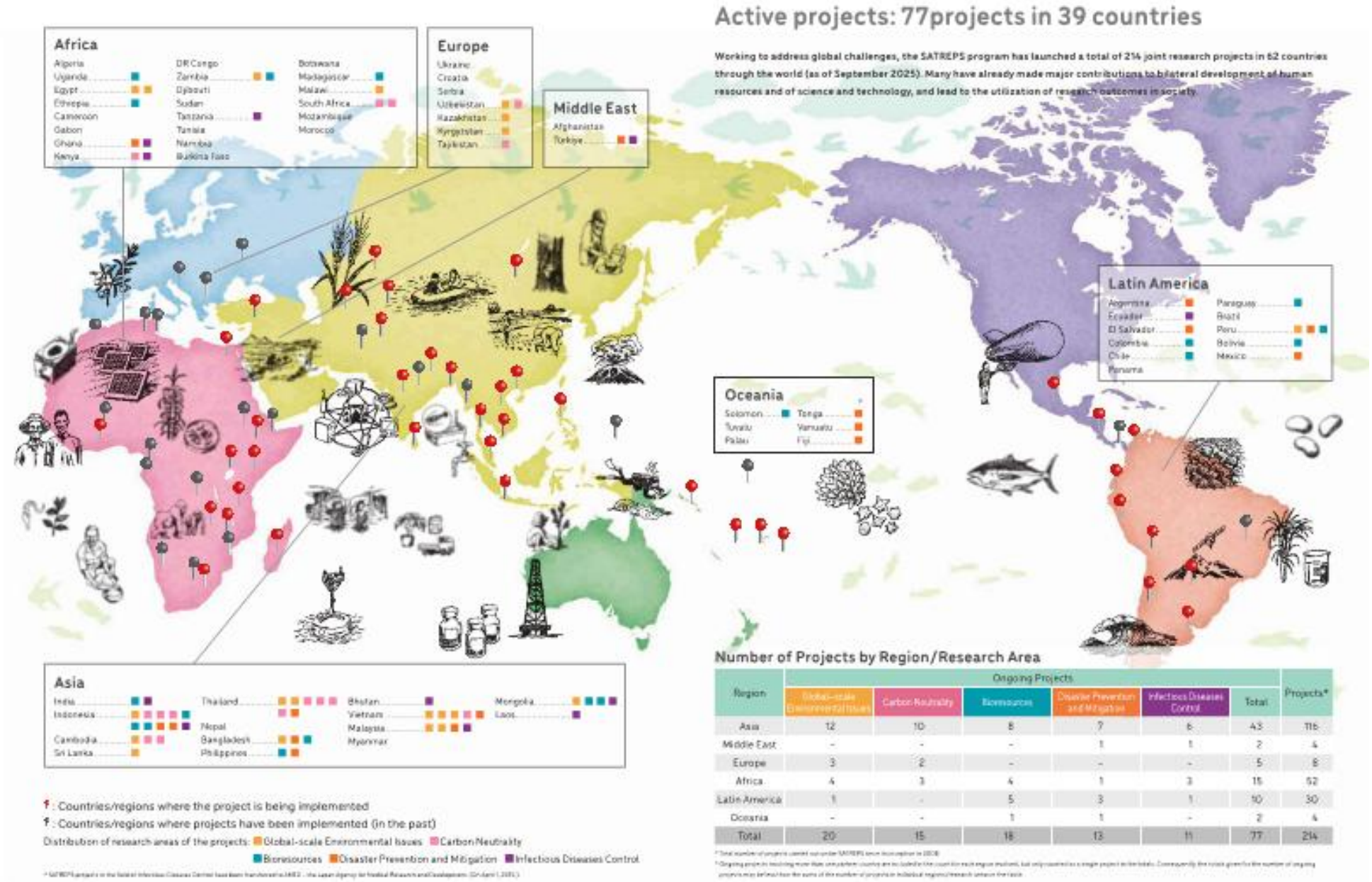
Japan's efforts (examples)

- **SDG-Related:**
  - SATREPS (Science and Technology Research Partnership for Sustainable Development) by the Japan Science and Technology Agency (JST)/Japan Agency for Medical Research and Development (AMED) and Japan International Cooperation Agency (JICA)—joint research between domestic and international research institutions
- **Climate Change-Related:**
  - Asia Zero Emission Community: A platform for cooperation toward carbon neutrality/net-zero emissions in Asia, involving 11 partner countries (Australia, Brunei, Cambodia, Indonesia, Japan, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam)
  - Joint Crediting Mechanism **(JCM)**: A system to cooperate with developing countries for reducing greenhouse gas emissions, where emission reduction amounts are assessed as contributions by both partner countries and Japan



※With regard to ODA project expenses, expenses in the recipient country are managed by the principal investigator's institution, except for expenses that JICA directly shoulders, such as dispatch of long-term overseas researchers and project coordinator, etc.

https://www.jst.go.jp/global/english/public/shiryo/jigyoshiryo_en.pdf



Number of Projects by Region/Research Area

Region	Ongoing Projects						Projects*
	Global-scale Environmental Issues	Carbon Neutrality	Bioresources	Disaster Prevention and Mitigation	Infectious Diseases Control	Total	
Asia	12	10	8	7	6	43	116
Middle East	-	-	-	1	1	2	4
Europe	3	2	-	-	-	5	8
Africa	4	3	4	1	3	15	62
Latin America	1	-	5	3	1	10	30
Oceania	-	-	1	1	-	2	4
Total	20	15	18	13	11	77	214

https://www.jst.go.jp/global/english/public/shiryo/satreps_brochure_e_web.pdf

Technology Transfer and Economic Security

- Tightened technology trade controls/ introduction of a secret patent system in 2022
- Relationship with international law

  Technology trade controls may **conflict with** provisions of GATT (Article 11, etc.) and TRIPS (Articles 4 and 28.2, etc.).

  However, they may be **justified** under **security exception provisions** (e.g., GATT Article 21, TRIPS Article 73).
- **Consistency with international law must always be carefully considered.**

Thank you for your attention!