WORLD TRADE ORGANIZATION

Council for Trade-Related Aspects of Intellectual Property Rights

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ITEM 12 IP AND INNOVATION: UNIVERSITY TECHNOLOGY PARTNERSHIPS

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AGENDA ITEM 12: IP AND INNOVATION: UNIVERSITY TECHNOLOGY PARTNERSHIPS

12.1 United States

367. The United States sponsored this agenda item in order to continue our conversation of the positive role of IP in the innovation lifecycle, including for consumers and for economic development, as part of the enabling environment for technology transfer.

368. Universities around the world are engines for innovation and technology transfer. And if they are not today, they can be tomorrow, with the right policy framework. Universities are often responsible for the basic research that gives rise to the next big idea that can change peoples' lives for the better. Universities are therefore often the first step in this innovation lifecycle, but too often the big idea does not make it to the marketplace. The promise of innovation that is first conceived by professors and researchers in university laboratories frequently goes unrealized.

369. Just as IPRs protection and enforcement is crucial to protecting consumers and the investments that are made in research and development, IPR is also a critical factor in the forming the university technology partnerships that translate basic research into goods and services for consumers, that deliver the social benefits of innovation.

370. IPRs facilitate the commercialization of innovations, by enabling the innovators to attract investors. With a patent, plant variety protection or a design right, the information has become a tradable commodity, a product that can be licensed or sold.

371. Technology partnerships leverage technology transfer by providing universities with additional resources to find solutions to problems, manufacturing knowledge, knowledge of adaptations required for marketing to comply with local laws and regulations. In short, technology partnerships allow research begun in a university setting to advance to a commercial setting. Universities, therefore, are not only laboratories of ideas, but also incubators for start-ups and spin-offs.

372. Universities benefit from such partnerships in that they may derive revenue from the transaction, as well as providing an educational and financial opportunity for their professors and researchers to further develop technologies in businesses of different sizes. The partners of universities: other universities, government entities, and the private sector, benefit in that they may be able to reach a market faster with innovative technology from the university.

373. Furthermore, university research is also important to the private sector in that the private sector does not always have the resources to invest in research and development, and partnerships can give them access to the new technologies.

374. The Wisconsin Alumni Research Foundation or WARF, for instance, exemplifies the university technology transfer model, by advancing scientific research at the University of Wisconsin in Madison by patenting technologies from the university and licensing the inventions to companies capable of developing them to benefit humankind. Proceeds from the activities are invested in an endowment that supports research at the University of Wisconsin in Madison and the Morgridge Institute for Research. WARF was founded in the United States in 1925, by a group that recognized the importance of IP to facilitate the development and commercialization of inventions.

375. In the 1920s many people, especially children, suffered from the bone disease rickets. Harry Steenbock was a professor at the University of Wisconsin-Madison, and discovered that irradiating food with ultraviolet light enriched its vitamin D content. Using his own money he filed a patent application.

376. And Professor Steenbock's patent was recognized for its tremendous value. He was approached by a company and was offered $900,000 dollars (about $10 million today) for his technology. He did not immediately accept this offer. While there are many models of university technology transfer, Professor Steenbock's tale tells the story of university technology transfer generally. He turned back to his university and offered to donate his invention.

377. But the University turned him down. The State Attorney General said that it had no authority to spend money on a faculty member's IP. Yet, Professor Steenbock was creative and he did not give up. He and nine University of Wisconsin alumni founded the first technology transfer office in the United States – WARF. Mr. Steenbock's patent was granted to WARF, WARF licensed the patent to the company, and by the time the patent expired, children were drinking milk with vitamin D, and WARF had received more than $14 million dollars. He had also created a model of technology transfer that continues not only in Wisconsin, but around the world.

378. In 2005, WARF was recognized with the U.S. National Medal of Technology. The citation for the medal stated that it recognized the "support of the entire cycle of innovation, from research to invention to investment" provided by WARF and that "WARF pioneered the transfer of university ideas to U.S. business to improve the human condition, benefit the U.S. economy and fund further scientific inquiry." And today, WARF handles all of the technology licensing for the University of Wisconsin and is a leader in it field. WARF epitomizes the model of university innovation and technology transfer, which principally consists of mobilizing university research resources and IP assets in order to develop partnerships to drive innovation to the marketplace and to catalyze further research.

379. Universities can excel at basic research. Their professors and researchers often reside at the cutting edge of technology in laboratories that permit us to peer into the future, even if only for an instant.

380. Universities do not, however, typically excel at commercialization, nor should they. That said, university technology transfer offices, like WARF, serve as the critical bridge from professors to pharmacy shelves, from laboratories to the low-carbon marketplace. Basic research often remains the primary university priority, and by harnessing IP, technology transfer offices generate much-needed capital to re-invest in further basic research. Where public sector funding can be scarce and grants can be highly-competitive to secure, the IP-revenue generated from university technology partnerships is critical to the sustainability of continued university research.

Important University Technology Partnerships

381. So, you may ask – "what have university technology partnerships actually brought us?" The list is long, too long to attempt to even begin to recite today. On promising list is available at: www.onlineuniversities.com/blog/2012/08/100-important-innovations-that-came-from-university-research/

382. Several highlights include:

- *Fluoride toothpaste.* Fluoride toothpaste wasn't invented at a university, but it was perfected there. While fluoride had been an ingredient in toothpaste since 1890, it was not until Dr. Joseph Muhler at Indiana University headed up a Procter & Gamble project that the FDA-approved version we know today was concocted.

- *The seat belt.* The first modern three-point seatbelt that is found in most vehicles today was developed by Roger Griswold and Hugh DeHaven at the Aviation Safety and Research Facility at Cornell University in New York and was the result of intensive crash injury research. The device would later be perfected by Nils Bohlin at Volvo. Other seatbelt research would be conducted at the University of Minnesota by James "Crash" Ryan in 1963, further pushing forward the science of safety.

Technology Transfer Partnership Resources

383. But, the university technology transfer offices that helped advance these breakthroughs do not exist in isolation and cannot survive without the proper regulatory framework. Conversely, situated in an innovative environment, university technology partnerships can flourish.

384. The United States has identified key aspects of an innovative environment in past interventions under this agenda item. But, if you are looking for a second opinion, WIPO has also opined on this issue.

385. In 2003, WIPO commissioned, with funds from the Japan Funds in Trust, a series of studies on University Technology Transfer Partnerships in China, India, Japan, Philippines, the Republic of Korea, Singapore and Thailand. We would be very interested in an update of these national experiences.

386. In addition, the study resulted in a document, "*Developing Frameworks To Facilitate University-Industry Technology Transfer A Checklist Of Possible Actions*." While I will not read it to you now, I will highlight key for technology transfer to occur including:

- An efficient IP system.
- University has the right to own and manage IPRs and transfer technology to industry for commercialization.
- Clear and transparent policy on IP ownership by public universities or when there is public funding component.
- Development of human resources skilled in technology transfer activities.
- Requirements to inventions resulting from public funding be commercialized.
- Safeguarding the public interest.
- Programs to support the establishment of technology transfer offices.
- A grace period so that publication of research results prior to filing a patent application does not compromise their patentability.
- Framework for the establishment of spin-off companies.
- Seed funding for spin-offs and start-ups.

387. With that, we look forward to hearing from other Members today regarding their university technology transfer programs and national policies to stimulate and diffuse university innovation.

12.2 Australia

388. We would like to thank the US for proposing this item for the agenda. Australian universities are renowned for the depth and diversity of the research and development opportunities they provide and the quality output they produce, leading to advances in medical and scientific research, new technological innovation and improvements in economic productivity. Australian universities are highly globalised and actively persue international partnerships with the objective of encouraging innovation and the development of new IP output through joint projects, and this is illustrated by growing institution-to-institution links including through a significant increase in new memorandums of understanding, particularly across Asia.

389. The Australian government is committed to fostering international research collaboration, including through funding for strategic research funds currently in place with India and China. Under this model, governments make a co-investment in the fund to foster strategic research and collaboration of mutual benefit. Funding is directly towards the establishment of joint research centres, group missions and research knowledge exchange. The Australian government has encouraged greater industry collaboration to ensure that research output meets the current and future needs of industry, including through the establishment of Cooperative Research Councils or CRCs, which foster end-user driven research partnerships involving researchers, industries, communities and governments. There are currently 40 active CRCs operating in the fields of agriculture, forestry and fishing, manufacturing and services. Over the life of the CRC programme, non-government commitment to CRC research has equated to over three times the amount of government seed funding.

390. Australia has also targeted IP innovation through the industry innovation precincts which bring together value chains by partnering with stakeholders across industry. Researchers work with business to develop new innovations, increasing the productivity, efficiency and competitiveness of businesses across their industry. Two new precincts were opened in 2013, focusing on the food and beverage industry and the manufacturing sector.

12.3 Canada

391. Universities lie at the forefront of innovative thinking and provide an environment that encourages research and development. The quality and quantity of academic publishing from universities greatly contributes to the dissemination of information around the world. Apart from this large availability of information, universities provide much value to encouraging innovation through their technology partnerships. Part of this equation is to address effective IP management to encourage and reward successful outcomes.

392. Effective IP management is a key component of successful academic-business collaboration. Many post-secondary institutions are working to better tailor IP agreements to the needs of different sectors to ensure that the research, ideas and knowledge generated by faculty, students, and graduates are more easily accessible to businesses. National associations including the Alliance for Commercialization of Canadian Technologies and the Association of University Technology Managers have developed standardized IP templates and other tools to enhance the practice of knowledge transfer. The use of these templates can help to streamline the negotiation process so that collaborative research activities between post-secondary institutions and businesses are more effective.

393. One project example that Canadian universities are involved in that help promote technology transfer and assistance is the University Partnerships in Cooperation and Development Program. This program supports partnerships between Canadian universities and higher education organizations in Latin America, Africa, Asia, the Middle East and Eastern Europe. The purpose of this program is to strengthen the capacities of higher education institutions in developing countries in a wide range of areas contributing to poverty reduction. Part of this program provides direct training to learners who then go on to train others and strengthens educational programs in a wide range of sectors. In particular, outcomes seen from this program led to improvements in building expertise to sustainably manage natural resources and increasing skills in more efficient technologies such as drip irrigation.

394. Another example of successful technology partnerships can be found in the Canada/Germany bilateral relationship. For over 40 years, the Canada-Germany Science and Technology Cooperation Agreement has fostered bilateral cooperation around the themes of research, discovery and innovation. As part of this process, efforts have been made to bring together executives from top universities and research councils to strengthen academic and commercial cooperation. This illustrates the importance of seeking out international partnerships between universities which help lead to complementary pairings between universities and researchers. These outcomes will foster greater innovation and improving the quality of life for all parties.

395. The creation of these technology partnerships leads to a greater understanding and dissemination of technical information and knowledge on which a product, process, or service is based, along with the transfer of skills and know-how, all of which combine to help stimulate further innovation. Furthermore, IPRs can provide additional incentives by potentially rewarding inventors and authors for their creations that lead to commercialization in the marketplace.

396. We underscore the fact that patents have an important role to play in the dissemination of technology. Apart from financial gains for businesses, patent disclosures help contribute to the wider knowledge base surrounding inventions, leading to further innovations in this area.

397. We can all continue to build upon these ideas to simplify the transfer, management and commercialization of academic research and provide greater certainty to business partners. Universities can be encouraged to work collaboratively on common tools and best practices to address the many complexities at the interface of academic research and industry. Canada's International Education Strategy aims to increase the number, breadth and depth of active collaborations between Canadian and foreign postsecondary institutions and research centres. Deeper links between research institutes and the attraction of researchers will help strengthen innovation and competitiveness—keys to success in today's highly competitive, knowledge-based economy.

12.4 India

398. We are again surprised by the inclusion of an agenda item on "IP and Innovation: University Technology Partnerships" at the behest of one developed country. We hope that it remains a stand alone item. We have seen similar agenda items in the past meetings of the TRIPS Council where the developed countries tried to highlight the fact that IP was good because it would propel development. The developing countries on the other hand maintained that there was no evidence to prove that strong IP could deliver on development or innovation. In fact IP is only one of the several factors required for development. It is rather unfortunate that rather than addressing the long pending agenda items of this Council which are of interest to the developing countries, few Members are attempting to convert the TRIPS Council into a debating forum.

399. The framers of the TRIPS Agreement had a very clear view that there was no direct relationship between IP and development. They therefore framed the Agreement by providing flexibilities and left it to the national legislations to define the path of innovation on the basis of their particular socio economic needs. While developed countries have tried to create private monopolies over minor or incremental innovations, the developing countries can define their own patent threshold on the basis of their socio economic development. Thus in order to provide affordable access to medicines, educational material or any other tools for socio economic development, it is essential that the minor innovations do not get patented. Rather than fostering development, the monopoly rights through patents could in fact block invention /innovation and development in the developing countries. It is important to note that higher number of patents do not mean real innovation.

400. The proponent of this agenda item would like us to believe that IP would not only lead to innovation but by following the US model in their universities, we could convert our national universities into centres of growth and technology transfer. While the model has been severely criticised even in the US, the proponents would like the governments to forget about the resources that they have invested in the Universities, provided these institutions demonstrate their output in the form of the number of patents that they have registered or the number of licensing agreements with the commercial entities. The over-emphasis on IP may thus deviate the focus of the universities from basic research and teaching to that of meeting the commercial needs of the industry. We therefore fail to understand the model where the government spends money but does not have any role in deciding the priorities for the universities. Thus, in an IP centric model, even if the government would have a priority for research in neglected diseases like Malaria or Typhoid to meet the needs of its large population, the universities may prefer to work on the diseases that could provide them better returns.

401. The model proposed by the US assumes that IP can facilitate innovation and transfer of technology. It may be relevant to a very few countries that have abundant resources and IP to protect. But the model cannot be extrapolated to other countries having very limited resources. In the developing countries, where the governments have limited funds even to attract the best brains to their universities or to develop their basic infrastructure, by defining the output of a university through a narrow focus on the number of registered patents, we suspect that the universities could become commercial enterprises by deviating from their objective of teaching and basic research. They would thus end up spending their limited resources on patent litigations and looking for opportunities to collaborate with industry.

402. Finally, we must not ignore the fact that most of the economic contribution of public sector research institutions has historically occurred without patents—through dissemination of knowledge, publications, presentations at conferences, and training of students. Throughout the 20th century, the universities were the most powerful vehicles for the diffusion of basic and applied research by ensuring that their research remained in the public domain and the industry and other public sector researchers could use it . By creating exclusive rights over the output of research we suspect that it would result in over commercialisation of universities and may lead to issues of corruption, conflicts of interest etc.

403. It it is very important that we do not lose sight of the history of innovation. The developed countries have reached this level of development not through high IP standards but through a flexible approach. If there were patent monopolies even hundred years before, we would not have seen the current revolutions in varied fields like telecom, pharmaceuticals, engineering, IT etc. It therefore reminds me of the famous quote from Bill Gates where he said if people had taken out

patent monopolies when the web was still in its infancy, the IT industry would be at a complete standstill even today.

404. India strongly believes that innovation should happen in the universities. But creating monopolies through IPRs is not a solution. The Open Source Drug Discovery (OSDD) pioneered by the Centre for Scientific and Industrial Research is one such effort to provide innovative health products to the developing world at an affordable cost. The idea is to provide a global platform where the best minds can collaborate & collectively endeavour to solve the complex problems associated with discovering novel therapies for neglected tropical diseases like Tuberculosis, Malaria, Leishmaniasis etc. In fact the idea for Open Source Drug Discovery is inspired by the success of open Source models in Information Technology (For e.g., Web Technology, The Linux Operating System) and Biotechnology (For e.g., Human Genome Sequencing) sectors. OSDD collaboratively aggregates the biological, genetic and chemical information available to scientists in order to use it to hasten the discovery of drugs. Similar models could be replicated in other fields like environmental technologies and goods where IPRs create barriers in accessing them at an affordable cost.

12.5 Hong Kong, China

405. Hong Kong, China would like to thank the United States for placing this item on the agenda. We welcome the opportunity to share with other Members our experience in university technology partnerships in the context of knowledge transfer.

406. In Hong Kong, we think that knowledge, including technology and expertise, generated in universities should not only stay there. Partnerships and collaboration between academia and business and the community will bring a synergy that can benefit society as a whole in multiple ways. Knowledge from academic research can improve our health, enhance efficiency and cost-effectiveness of business operations, enrich our cultural lives, kindle entrepreneurship and open the doors to countless possibilities. In return, feedback from society can inform improvements and inspire new ideas for research and teaching.

407. In Hong Kong, knowledge transfer is not only about science and technology. It also encompasses other disciplines such as healthcare, social sciences, arts and humanities, engineering and the environment. In our view, knowledge transfer is one of the three core functions of a university – a natural extension of research and teaching. The universities in Hong Kong are great supporters of knowledge transfer and have set up dedicated teams to promote it. Financial support, entrepreneurship education and assistance in marketing and outreach are provided to academic staff as well as students.

408. The Hong Kong government is also supportive of knowledge transfer. Since 2009-10, we have dedicated HK$50 million (about US$6.4 million) per year to subsidise the universities to expand and step up their knowledge transfer activities. Funding is also available from the Innovation and Technology Fund to enhance the universities' capability in technology transfer and commercialisation of R&D outcome.

409. Although knowledge transfer is a relatively new concept in Hong Kong, our universities have in recent years made considerable progress in different areas. Below I would like to share with you a few examples.

410. A biologist at the City University of Hong Kong found that fish can be turned into reliable safety inspectors. After some genetic modification, the liver of a type of fish, medaka, can turn into fluorescent green when exposed to oestrogen. The more polluted the environment is, the brighter the green will be. This technology can provide a low-cost, reliable and fast safeguard against polluted and unsafe products including food and cosmetics. A City University graduate has now commercialised this technology and exported it to a number of countries.

411. At the Hong Kong Polytechnic University, some engineering professors believed and proved that optic fibres are not just for telecommunications. They found that optic fibres can also be used to record important parameters of mega-structures such as temperature and vibrations of trains, TV towers and buildings to ensure their safe operation. Optic fibres provide a reliable, durable and cost-effective means to detect abnormalities such as cracks and overheating. This technology is

currently used largely in Hong Kong's metro and railways and a number of express rail links and bridges in the mainland of China.

412. Hong Kong has used sea water for flushing for more than 50 years. The advantage is that precious drinking water can be saved, but the processing of the resulting sewage is financially and environmentally costly. An engineering professor at the Hong Kong University of Science and Technology found that a bacterium can be incubated by the large amount of sulphates in sea water for processing waste water. Compared with the traditional method, this process can reduce 90% of sludge, 30% of greenhouse gas emission, and 50% of the cost. This technology has now been exported to the mainland of China and Cuba, where water shortage has become a growing concern.

413. Now we move to education and the arts. Cantonese opera has been staged in southern China for more than a thousand years and is an integral part of Hong Kong's cultural heritage. It is taught in the schools of Hong Kong as part of the music education and a means of preservation and promotion. The Hong Kong Institute of Education, in partnership with Cantonese opera actors and schools, provides systematic training for teachers. The training programme is very well-received and is a vivid illustration of how knowledge can be passed from academia to society.

414. As can be seen from the above, knowledge transfer has brought considerable tangible and intangible benefits to Hong Kong and beyond. The higher education sector in Hong Kong will continue to step up their knowledge transfer activities, hopefully with even greater support from business and the community. Hong Kong, China looks forward to more opportunities to learn from and exchange views with other Members

12.6 European Union

415. The EU is happy to contribute once more to the important debates that have been taking place in the TRIPS Council on different aspects of "IPR and Innovation". Let me stress that we do not share a previous intervention that appeared to portray the past debates under this agenda point as opposing developed and developing countries. Such perspective entirely overlooks the numerous, valuable and constructive contributions that both developing and developed countries have made in the last couple of years under this agenda point highlighting and exemplifying how IP is one of the instruments for innovation.

416. The EU has supported partnerships among universities all over the world for many years. A lot of this cooperation has technology as one of its core elements and linked to this, the phenomenon of knowledge transfer. The importance of improving Knowledge Transfer (KT) between public research institutions and extending this also to third parties is identified as one of the key areas for action by the European Commission.

417. In the Communication on the Innovation Union from 2010, other concrete actions are announced to facilitate effective collaborative research and KT including developing a set of model consortium agreements and trans-national collaboration. In 2011, in the field of higher education, the Commission set out key policy issues to promote innovation in higher education through more interactive learning environments and strengthened KT infrastructure and encouraging partnerships and cooperation as a core activity through reward structures, incentives for multidisciplinary and cross-organisation cooperation and the reduction of regulatory and administrative barriers to partnerships between institutions and other public and private actors.

418. I can give you some examples, which reflect a small portion of what is happening on the ground:

- *The EU ASEAN university partnerships* which started back in 2000. The objective of the programme is to enhance cooperation between higher education institutions in the two regions, to promote regional integration within ASEAN countries, and to strengthen the mutual awareness of European and Asian cultural perspectives. The programme promotes, amongst others, collaborative studies and research programmes and solidarity among scientists and scholars and scientific and scholarly knowledge and information dissemination.

- Under Horizon 2020, the European Framework programme or Research and Innovation, emphasis has also been put on developing *European Research Infrastructures* (ESFRI), which integrate and open up national research facilities, including e-infrastructures. The networks of research infrastructures across Europe strengthen its human capital base by providing world-class training for a new generation of researchers and engineers and promoting interdisciplinary collaboration.

419. These infrastructures are necessary to avoid duplication of efforts, to coordinate and rationalise the use of facilities pool resources so that the Union can also acquire and operate research infrastructures at world level. The goal is to encourage research infrastructures to act as early adopters of technology, to promote R&D partnerships with industry, to facilitate industrial use of research infrastructures and to stimulate the creation of innovation clusters. This activity will also support training and/or exchanges of staff managing and operating research infrastructures.

420. These research infrastructures also support international partnerships and cooperation activities.

- Under the umbrella framework of the so-called "Marie Curie Actions" (which also form part of the Horizon 2020 Programme mentioned above), a specific programme is destined for international cooperation: the International Research Staff Exchange Scheme (IRSES). It helps research organisations (such as universities and research centres) to set up or strengthen long-term cooperation with others, through a coordinated exchange programme for their staff. All areas of research are covered, except those under the EURATOM Treaty.

- The European Institute of Innovation and Technology (EIT) also has an international cooperation section. One of its prime actions is to develop Knowledge and Innovation Communities (KICs) which are made up of higher education institutions, research organisations and other stakeholders in the innovation process. A KIC connects excellence-driven innovation hubs with a results oriented approach to attain the Horizon 2020 objectives. KICs are comprised of collaborators from different cultures and backgrounds which challenge traditional collaborative models and thus create new value chains. The EIT is funding KICs through a contribution of €2.7 billion from Horizon 2020.

421. Individual EU Member States also have extensive bilateral research cooperation agreements with third countries. For example:

- the United Kingdom, via its Science and Innovation Network (29 missions in 24 countries) and Joint Commissions. The Joint Commission with India, for example, amounts to joint funding commitments of £70 million for 7 new research agreements. One of the 7 agreements is aimed at cooperative research on chronic non-communicable diseases such as diabetes, cardiovascular disease and chronic respiratory diseases. The UK also operates RCUK, a key facilitator for research cooperation agreements which promotes closer research relationships between Indian and British researchers and helps with the exploitation of jointly funded research results. A flagship UK-India program of collaboration has been the UK-India Education and Research Initiative (UKIERI). It has committed almost £25 million to support around 500 partnerships. A central component is the mobility of undergraduate and graduate students and collaborative research projects between the two countries.

- Spain carries out a lot of science and innovation cooperation via its two main government organisations: the Ministry of Science and Innovation and the Consejo Superior de Investigaciones Cientificas. Spain has cooperation with developed, emerging and developing countries. For historical reasons, the target of most of the cooperation is carried out with Latina America and North Africa. The Agreements are primarily for the exchange of research personnel but also include joint research and workshops, etc.

IP generated from collaborative research

422. The results of research and innovation are, more often than not, protected by IP in order to reimburse costs related to the research and development carried out. Of course, the owners of the IP are then responsible for the level of licensing they accord to third parties and the future sharing

of benefits if an innovation becomes a product sold on the commercial market. The IP portfolio is beneficial to all parties and thus also a good development tool for developing countries.

423. In general, collaborative research agreements are governed by four principles:

- the parties will mutually notify each other the IP generated and will undertake to protect the IP within a period of time
- the parties will exploit effectively the IP generated
- the parties will not exercise any discriminatory treatment
- the parties will protect confidential information.

424. Participants must jointly develop a Technology Management plan with reference to the IP, publications and the use of the IP created during the joint research. Usually, the IP will be jointly owned.

425. The European Commission has produced European Research Area Guidelines on IP Management in international research collaboration agreements between European and non European Partners. http://ec.europa.eu/research/innovation-union/index_en.cfm?pg=other-studies

12.7 Japan

426. This delegation would like to express its deep gratitude to the US for the efforts in proposing the "IP and Innovation -university technology partnership" as an agenda item of this Council meeting. Japan appreciates this opportunity and wishes to share its view and experiences in this field with other Members.

427. At the outset, Japan would like Members to be aware that it is highly beneficial for all Members to deepen their understanding on how the IP system is actually linked to innovation, in the context of university-technology partnerships. From this point of view, we will make an intervention.

428. This delegation recognizes that a great number of valuable technologies are being developed at universities, and many of them could form the bases for innovation. Based on the idea that innovation can be promoted by effectively utilizing these technologies, various efforts have been made to facilitate the commercialization of technologies developed at universities in Japan.

429. First of all, this delegation would like to share with Members one case based on our own experience. It is a case in which a university-launched venture company successfully started business operations by obtaining a patent for the technology that it developed jointly with a university, and then effectively utilized this patent in its business.

430. This venture company successfully developed products featured with micro actuators, as typified by micro plastic gear. The notable point of this story is that the company succeeded based on combining moulding technology and tribology, which had been researched and developed at a local university, with high-precision processing technology, which was specific to and typical of the company's region.

431. Although an executive of this company had originally worked at a manufacturing plant of a leading manufacturer, he lost his job due to the sudden closure of the plant. However, having obtained assistance from an association that promotes industry-university cooperation, he finally succeeded in developing "micro gear", as already stated, by utilizing the moulding technology and tribology that originated from the local university researched and developed.

432. After establishing a venture company, he obtained a patent for the technology of micro plastic reduction gears that he had developed jointly with the university. He then strategically marketed this technology, highlighting the technology itself as a competitive product. Today, this technology is being used in various products in notable fields; for instance, in autofocus mechanisms on single-lens reflex cameras in the optical equipment field, and in micropipettes in

the medical equipment field. Thus, this university-developed technology has significantly been contributing to developing innovation.

433. This delegation hopes that Members will see, based on this exemplar case, the following three points.

434. First, this venture company focused on the capability and importance of this university-developed technology and sought ways to connect the technology to its business. Technology of this kind contributed to not only expanding the business of his company but also providing an incentive to the university that assisted him to further conduct R&D activities.

435. Second, this venture company utilized its patent effectively. The company obtained patent rights not only for the core technologies developed jointly with the university but also for applied technologies too. By doing so, the company gained bargaining advantages in negotiations it conducted with other companies, which led to smooth and efficient commercialization of the university-developed technology.

436. Third, this venture company was established with the support of the Government of Japan. It was regarded by a regional consortium as a business in which R&D activities should be furthered. The Government of Japan has actively worked on promoting commercialization of university-developed technologies, by way of, for example, launching projects that support industry-university collaborations and enacting laws that support the activities of TLOs, or Transfer Licensing Organizations, which assist in transferring university-developed technologies to industry.

437. This delegation lastly would like to emphasize, once again, that finding an effective way to link university-developed technology to business is indispensable in terms of facilitating innovation. In line with this, it also should be noted that IP such as patents plays a crucial role in transferring technology from universities to companies. It should be well worthy for Members to deepen their understanding on the "linkage" needed between IP and business activities, and reflect such "linkage" into their own policies, through sharing cases in which IP was successfully utilized or their efforts to facilitate such utilization. This delegation welcomes further discussions on these issues at this Council and also would like to continue to make active contributions by sharing our views and experiences that we hope are useful to other Members.

12.8 New Zealand

438. The question of how to successfully commercialise ideas developed within universities is a live one for New Zealand as we seek to increase the contribution of higher education to New Zealand's economic growth. My comments today will focus on one particular facet of this issue.

439. New Zealand is a small player (an estimated 1.7%) in a growing international higher education market.

440. In 2011, the New Zealand Government set a goal of doubling the economic value of New Zealand's international education services by 2025. Education New Zealand plays an important role in assisting the Government to achieve this objective: it markets New Zealand's education industry overseas and it has been tasked with growing the economic value of New Zealand's international education industry to achieve the Government's 2025 target.

441. In achieving this goal, Education New Zealand does not rely only on seeking to attract more students to New Zealand, but also on increasing the revenue from international education services. Some of the ways this can be achieved is through supporting participants in the education sector to enter into joint ventures – and we have heard a lot of examples of this in other Members' statements, but also through the commercialisation of IP held by providers and agencies in the sector for sale internationally.

442. Education New Zealand is working with organisations in the New Zealand education sector, including universities, to explore the capacity of institutions to commercialise their institutional IP.

443. Commercialisation of IP is just one area of Education New Zealand's interest in the topic of university technology partnerships. Obviously commercialising research is another important factor, as other Members have discussed today. The discussion today in the Council will provide useful food for thought as this policy work continues.

12.9 Chinese Taipei

444. At previous meetings, we have discussed the benefits that the IP system can bring to the local economy, and we shared our experiences of supporting industrial innovation, assisting in the creation of small and medium-sized enterprises, and so on. Now, we turn to discuss the partnership between universities and industries on research and development.

445. We can all agree on the significance of the academia as origin of creation and innovation. However, without the bridge that brings academia and industries together, there would probably be no benefit at all to society, the economy or the community. Therefore, in the pursuit of industrial development and economic growth, in our experience it is essential that some form of close cooperative partnership is established between academia and industries.

446. Many of our trade and economic policies, as well as programmes, have been based on a realization of the importance of establishing this close cooperation. We have actively encouraged our industries and academic institutions to work together in a technical alliance. Within the framework of this alliance, the industries can provide the resources for innovation and the academics develop the technologies to meet the defined industrial needs. Up to now, two such alliances have been established.

447. Also, from 2009 to 2011, a 3-year partnership programme was set up between universities and regional industries, in which some 20 universities devoted their entire research capacity to regional development. 753 cases of technology transfer were successfully completed.

448. Persuading industries and the academia to work together is a "win-win" policy. The whole economy benefits as a direct result of their cooperation.

12.10 Brazil

449. Brazil would like to thank the US delegation for proposing this agenda item and welcome the debate on IP and Innovation: University technology partnerships.

450. At the outset, it is important to highlight that patents are far from being the single element driving innovation. It is only one in a larger mix of different tools that promote innovation. The Global Innovation Index, for example, refers to the importance of linkages and the right infrastructure for innovation, to the fact that collaboration, the flow of ideas among different innovation players, and access to knowledge as important ingredients of innovation.

451. My first comment is that any in-depth discussion on this topic must be based on the realization that the granting of exclusive IPRs can only be justified to correct a potential failure in the markets of technology and knowledge.

452. That correction of situations of market failure entails costs for society. By establishing monopolies, however provisional they may be, protection of IP can impair market efficiencies in allocating production factors and resources. To compensate for the possible costs of misallocation, the IP system demands, in return for the granting of exclusive or monopolistic IPRs, full disclosure of the know-how of the protected invention in such a way that society as a whole may benefit from it and build upon it.

453. Regarding the efforts to balance rights in some international models of university technology partnerships, one example that can be mentioned is the march-in rights mechanism. This mechanism is applied in cases where a public funded invention has not been adequately developed or applied to inventions within a reasonable time required by the government allowing for non-exclusive licensing.

454. This essential trade-off to the patent system has another component: to be able to apply for it, inventions must be, according to Article 29, novel, useful and non-obvious. Not all innovations or inventions should be entitled to patent protection. This is clear enough. However, what exactly should be protected and how to translate the three conditions for patent application in Article 29 into national legislation and regulations remains one of the most intractable and divisive issues whenever one discusses the current international patent system.

455. Against this background, the greatest challenge for public policy makers in any country is arguably how to design a theoretically "optimal" system that would be capable of generating incentives for investment in innovation while at the same time minimizes losses caused by the granting of IP rights.

456. Having said that, I would like to refer to Brazilian national experience in University Technology Partnerships. Since the adoption of the Innovation Act in 2004, all the Brazilian universities and research institutes are encouraged to establish Technological Innovation Centres (the so-called NITs) with a view to manage their innovation policies. In accordance with the Innovation Act, the NITs are responsible for (a) safeguarding institutional policies related to the fostering of creations' protection, licensing, innovation and transfer of technology; (b) evaluating and classifying the results obtained from research activities and projects developed by the institution; (c) assessing the convenience and promoting the protection of the inventions developed by the institution; and (d) monitoring the processing of applications and the maintenance of IPRs of the institution.

457. The NITs have an important role in raising awareness on how to innovate and protect inventions. The NITs are also responsible for managing the partnerships between the institution and the private sector, fostering public-private cooperation.

458. After 10 years, the NITs still face some challenges, but it is important to note that they are changing the way universities and research institutes work in Brazil. In 2012, 176 institutions participated in a broad research with a view to evaluate the implementation of the Innovation Act. The results were very positive: 116 institutions already completed the establishment of their NITs and 49 are completing the process. Before the Innovation Act, only few institutions had a structure similar to a NIT and they were concentrated in the most developed regions of the country. The establishment of the NITs was followed by the growth of investments in research and development in such institutions and of the patent applications submitted by them both in Brazil and abroad. In fact, in 2012, three of the top five spots in PCT patent applications in the Brazilian Patent office (INPI) were occupied by Brazilian Universities.

12.11 Guatemala

459. We welcome the United States' proposal regarding the inclusion of agenda item 12, under which we can discuss the relevance of academia in promoting development.

460. Universities have recently been discovering their multifaceted potential and creativity, which is not confined to literary works or conceptual issues but also involves targeted research that can in some way respond to countries' social or economic needs, by meeting the key objectives of innovation.

461. Under the triple helix model (university-industry-government), **universities** play the central role, conducting research and development activities based on academic principles; **industry** is a supplier whose commercial activities aim to meet customer demands in order to generate new business opportunities; and **governments** are responsible for the political conditions and the proper regulatory framework to foster environments conducive to growth.

462. Academic activity is therefore an essential component of national policy when it comes to framing a strategy for innovation and the transfer of technology, in that it encourages the efficient use of IP systems. My delegation accordingly considers that it will be most useful to continue discussing the matter in these Council meetings.

12.12 Switzerland

463. We would like to associate ourselves with the statements made by previous delegations about the value of this agenda item for the purposes of the discussions held in this Council. Innovation must benefit public society. From this perspective, an invention is then useful if it reaches the market and consumer as a finished and marketable product.

464. Scientists doing active research in innovative fields of technology are, despite their genius in academic research, often not naturally born entrepreneurs, manufacturing experts or marketing specialists. So the challenge is how to bring these various talents together and eventually an invention successfully to the market.

465. The missing link is a matching mechanism of good ideas and entrepreneurs that are ready to take the risk of investing in a new technology.

466. There are a number of prerequisites for closing this gap. First, we need legal certainty and a reliable system of justice and second, it is important to have enough transparency in order to enable the matching of technological inventions and the industry that is able to market this invention. The IP system and patents in particular play a key role in bridging this gap by bringing together the stakeholders and helping them to structure and manage their business relationship.

467. For the purpose of signalling their new ideas and inventions to potential investors and other venture partners, most Swiss academic research institutions own a Technology Transfer Office (TTO). These offices motivate researchers to protect their inventions by patents. The university will be the owner of these patents. The TTO will try to find entrepreneurs to licence their invention out for further development of those ideas. In more recent times, it also happens that researchers themselves license back their inventions for a small license fee and build a new company in form of a spin off.

468. This practice of licensing out the results of the publicly financed research at universities results in a double benefit for the public interest. On the one hand, the revenue generated by the licence fees can be reinvested in additional research at the university and thereby relieve the public budget, on the other hand, the spin-off enterprises generate new jobs and tax revenue.

469. In Switzerland, a considerable number of innovative SMEs have their roots in such university spin offs. To name just one: Based in Zurich, Switzerland, Prionics is one of the world's leading providers of farm animal diagnostic solutions and is a recognized centre of expertise in BSE (Bovine Spongiforme Encephalopathy) or mad cow disease and prion disease. Founded in 1997 as a spin-off from Zurich University, Prionics' today 150 employees research and market innovative diagnostic solutions for major farm animal diseases, thereby making a major contribution to the protection of both animal and consumer health.

12.13 El Salvador

470. Our delegation would like to welcome the inclusion of this agenda item, particularly as we consider that it goes hand-in-hand with our domestic projects that we have been promoting, such as IP and the university initiatives which is part of our 5-year development plan of the government. It is implemented in our IP office whose dissemination role has meant that it is has been actively working to promote and interact with universities, research centres the competent training bodies for human and industrial resources, amongst others, to thus enrich technology poles.

471. We have also been promoting important projects that would promote these efforts such as supporting through the WIPO support we had, the technological and innovation support centres, CATIS, which have facilitated our innovators access to local information services on technology and other related high-quality services, helping to take advantage of this initiative, promote creativity and promote and manage IP issues. Thus we indicate our support for the maintenance of this agenda item as it is a good platform for an exchange of experience.

12.14 Bangladesh

472. We appreciate the initiative of the United States for the introduction of this issue and welcome the debate and exchange of ideas in the Council. The issue of university technology partnership is important for both the developed and developing countries, but maybe for different reasons. We agree that university technology partnerships could be an important driver of economic growth, but there are two types of universities – government and private.

473. We have nothing to say about the role or function of private universities and they usually operate as private companies. That is why private universities are free to indulge in any kind of commercially beneficial research and reserve patent protection. But public universities funded by the government in developing countries like Bangladesh are different cases, because the government is accountable to the people for the money they spend in all the sectors which includes education, research and universities. So while we describe the role of university technology partnerships regarding IP and innovation, it is obvious that it will not play the same role in all the countries with the same effect.

474. The present global IP regime does not provide a level playing field, and does not necessarily promote innovation and development equally in all the countries. In most of the developing countries and in all the LDCs the private sector does not have the capacity to invest heavily in research and development; it is the government and public sector which fill the gap created by the absence of the private sector in research. Big educational institutions like universities and governmental organizations do the bulk of research for the benefit of the common people. Government-sponsored universities and the research organization in the field of higher education in Bangladesh had developed high-yielding tea, paddy and jute in the field of agriculture and all the peoples of Bangladesh are benefiting from this invention. Domestically prepared oral dehydration salt for the treatment of diarrhoea was invented in Bangladesh by a government-sponsored disease research centre, which is now saving the lives of millions all over the world.

475. However, for the interest of the people, these inventions were not protected, so we agree with the initial statement that universities can be an important source of IP and innovation, but due to lack of any identifiable transfer of technology and due to the spirit of universal benefit, public universities in the developing countries should always cater to the needs of the people based on the priorities for the social development, and protecting and patenting their achievements for commercial interest could be counter-productive to the idea of development.

12.15 United States

476. I want to thank all of the delegations for their interventions on this item. I also wanted to respond to a few of the questions raised.

477. One question was whether developing countries are engaged in university technology transfer. Today's interventions by several developing and developed countries provide the answer. WIPO has also confirmed the answer to this question in the affirmative.

478. According to the WIPO report we referenced in our intervention:

> Indian industry has really started collaborative programs with universities. Although Indian success in competing in the global market has been modest in the manufacturing sectors, its success in the software sector is remarkable. The market share for India in the global IT service business is now 4.4 %. Major global IT companies have outsourced some part of their operations to India and have established R&D centres there as well. Indian IT engineers are working in many industrialized countries and contributing to the advancement of information technology. A few world-famous universities like Indian Institute of Technology have made this success possible.

479. Also, according to the Indian Foundation for Innovation and Technology Transfer, there are numerous Indian universities and other institutions involved in technology transfer. These include:

- Indian Institute of Science (IISc), Bangalore
- Aligarh Muslim University
- All India Institute of Medical Sciences (AIIMS)
- Banaras Hindu University (BHU)
- Central Board of Secondary Education (CBSE)
- Bose Institute, Kolkata
- College of Engineering & Technology, Bhubaneswar Delhi College of Engineering
- Guru Gobind Singh Indraprastha University
- Harcourt Butler Technological Institute
- Indian Agricultural Research Institute (IARI)
- Indian Association for the Cultivation of Science (IACS)
- Indian Institute of Foreign Trade (IIFT)
- Indian Institute of Forest Management (IIFM)
- Indian Institute of Information Technology (IIIT), Kolkata

480. Additionally, a question was raised regarding whether the emphasis on industrial relationships and entrepreneurial activities is diverting universities from their main mission of education and research, we have researched this issue and found that technology transfer is not new to universities, and in fact dates back to the early 1800's in Europe, and expands education and research opportunities rather than diverting them.

481. Today's universities must seek to provide students with experience that provides them with the opportunity to solve real world problems. It also provides them with experience in teaming with industrial scientists as well as giving them an opportunity to become comfortable with the industrial workplace environment.

482. As universities involve students in relationships with industry or provide them with opportunities to start new companies, universities recognize an obligation to do so in a manner that preserves the students' sense of balance and perspective as to the long-term value of the university experience.

483. Finally, a delegation asked whether collaboration with industry invariably creates financial conflicts of interest for academics and will change the ratio of basic to applied research. We note that this issue has also been studied and concluded that the concern is unfounded.

484. University faculty interacts with industry as educators, principal investigators under research programs, consultants, creators of IP used by industry and as entrepreneurs. Accordingly, universities' conflict of interest policies seek to ensure that the personal financial interests of faculty do not improperly affect the content, quality or timely release of research.

485. Moreover, studies show that the ratio of basic research to applied research has remained about the same since 1980.

12.16 India

486. India appreciates the points that have been made by the US delegation and the mention of the universities in this context. In fact what we wanted to say is that it is not that we are against transfer of technology from the universities, in fact the Indian universities have done quite well under Indian Institutes of Technology (IITs) and National Institutes of Technology (NITs) and have done a great job in this part. What we want to stress, like Bangladesh, is that one should not only revolve around IP as if IP were the only tool for transfer technologies, so we have concerns only on that particular issue.