

Technology Market Scan

ASIA-PACIFIC CHINA

Innovation patents 2017

China's innovation patent filings surged both in number and quality in 2017, a spokesman said. New patent filings numbered 1.38 million last year, up 14.2%. About 420,000 have been accepted, said Hu Wenhui, spokesperson for the State Intellectual Property Office. "As of the end of 2017, the number of patents in China hit 1.35 million. That is nearly 1 patent per 1,000 people," Hu said.

China has a number of domestically developed core technologies in telecommunications, aviation and space, high-speed railways, nuclear energy. Over the years, the quality of the patents filed in these fields has notably improved, Hu said.

<http://www.xinhuanet.com>

R&D spending up 11.6% in 2017

China's spending on research and development (R&D) grew faster in 2017 as the country continued to push for innovation-driven development. Preliminary calculations showed that R&D spending rose 11.6% year-on-year to 1.75 trillion yuan (about 280 billion U.S. dollars) in 2017, 1 percentage point higher than in 2016, the National Bureau of Statistics (NBS) said. The spending accounted for 2.12% of China's gross domestic product, 0.01 percentage points higher than the previous year.

Chinese enterprises spent more than 1.37 trillion yuan on R&D last year, up 13.1% from 2016, while R&D spending at government institutions and colleges increased 7% and 5.2%, respectively. Some 92 billion yuan, or 5.3% of the total spending, was put into fundamental research in 2017, up 11.8% from a year earlier, the NBS said.

According to the 13th five-year plan for national science and technology talent development (2016–2020), China will increase its annual per capita spending on R&D to 500,000 yuan by 2020, up from 370,000 yuan in 2014.

China had 5.35 million people working in R&D at the end of 2015, the world's largest pool of R&D personnel.

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INDIA

R&D expenditure up

A national survey on the status of research and development in the country has shown that the gross expenditure on R&D (GERD) has more than tripled from Rs. 24,117 crore to Rs. 85,326 crore in the decade from 2004–05 to 2014–15. It is estimated that it could have further gone up to Rs. 94,516 crore in 2015–16 and crossed the Rs. 1 lakh crore mark in 2016–17 reaching up to Rs. 1,04,864 crore.

The Survey conducted by the National Science and Technology Management Information System (NSTMIS) under the Department of Science and Technology (DST) has also shown that the per capita R&D expenditure has increased to Rs. 659 (US dollars 10.8) in 2014–15 from Rs. 217 (US dollars 4.8) in 2004–05 and that GERD was mainly driven by the government sector with central government accounting for 45.1%, state governments 7.4%, public sector industries 5.5% and institutions of higher education 3.9%. The private industry accounted for the balance 38.1%.

Significantly, the share of business enterprises, from both public and private sector, has been showing an increasing trend. Their share of 43.6% in 2014–15 was found to be fairly higher than the situation in just five years earlier: in 2009–10 their share was just 34.2%. The study has revealed that public sector R&D was led by defense related industries and fuel industry, while the private sector R&D was dominated by drug and pharmaceuticals and transportation.

However, the composition of R&D expenditure in India contrasted sharply when compared with select developed and emerging economies. The survey compared the levels of participation of the government, business enterprises, and institutions of higher education in R&D in India with those in 13 other countries – USA, UK, Spain, Russia, Republic of Korea, Mexico, Japan,

Italy, Germany, France, China, Canada and Australia.

It found that India topped the list with regard to the government's participation in R&D but hit the bottom in terms of participation of institutions of higher education. Government's participation in R&D in the other countries ranged from 7% in U.K. to 38% in Mexico, as against India's 55%. In contrast, the share of institutions of higher education in R&D in the other countries varied from 7% in China to 40% in Canada, as compared to India's a mere 4%.

Another significant finding of the survey is that as much as 81.3% of R&D expenditures incurred by central government sources came from just eight major scientific agencies: Defence Research and Development Organisation led the table with a share of 37.8%, followed by Department of Space (16.6%), Department of Atomic Energy (11.6%), Indian Council of Agricultural Research (11.4%), Council of Scientific and Industrial Research (9.5%), Department of Science and Technology (7.7%), Department of Biotechnology (2.9%) and Indian Council of Medical Research (2.4%) during 2014–15.

Further, it has shown that women's participation in extra mural R&D projects has increased significantly from a mere 13% in 2000–01 to 29% in 2014–15. In absolute numbers, 1,301 women Principal Investigators had availed extramural R&D support during 2014–15 as against just 232 in 2000–01. In terms of personnel directly engaged in R&D activities, there were 39,388 women (13.9%) as on April 1, 2015, out of the total 2.82 lakh personnel. It has also revealed that out of the total of 27,327 doctorates awarded in the country, 15,246 or 56.4% were from the S&T disciplines during 2014–15. India occupied the third rank in terms of PhDs awarded in S&T after China (30,017) and USA (26,520).

On patents, the survey has noted that a total of 46,904 patents were filed during 2015–16 and of them, 28% or 13,066 were filed by Indian residents. As per WIPO report 2016, India is ranked 10th in terms of resident patent filing activity.

<https://www.thehindubusinessline.com>

Mechanism for tech transfer

Heeding to advice of the Laghu Udyog Bharati, an affiliate associated with small industries, the government has set up a mechanism in the Council of Scientific and Industrial Research (CSIR) – a public sector research institution – for regular interface with small-scale industry for transfer of technologies from its laboratories to industries. “They had certain issues about connecting with CSIR for technology transfer. (I) impromptu announced setting up of a regular mechanism for interface between SSI (small-scale industries) and CSIR and appointed a nodal officer in CSIR”, tweeted Union science and technology minister Harsh Vardhan on Monday while referring to his interaction with representatives of the Laghu Udyog Bharati.

The nodal officer in CSIR will coordinate with the small-scale industry and the CSIR labs for appropriate technology required by them. The Laghu Udyog Bharati leaders met the minister on Sunday and told him that there was a “disconnect between CSIR and the small-scale industries and it should be addressed”. The Laghu Udyog Bharati has 450 branches and 25,000-member units across the country.

Noting that the CSIR laboratories have patented over 1,000 processes and technologies, which are available for commercial exploitation, the science ministry said, “Some of these technologies have been commercialised. The CSIR labs are willing to work with user industries to develop applications and products to meet the needs of the market.” It said, “The SSI sector is the largest employment provider in the country, next to agriculture. It contributes almost 40% of the gross industrial value added in the Indian economy.”

With a pan-India presence, the CSIR has a network of 38 national laboratories, 39 outreach centres, and three Innovation complexes. These labs cover a wide spectrum of science and technology – from radio and space physics, oceanography, chemicals, biotechnology and nanotechnology to mining, aeronautics, instrumentation,

environmental engineering and information technology.

<https://timesofindia.indiatimes.com>

MALAYSIA

SME loan/financing referral platform

Credit Guarantee Corporation Malaysia Berhad (CGC) has launched Malaysia’s first SME Loan/Financing referral platform for the benefit of the country’s vibrant micro, small and medium enterprises (MSME), commonly known as SMEs. The “imSME” platform would serve as an online one-stop-center for SME loan/financing by providing an array of financing products and services offered by the participating banks and agencies. CGC targets over 2000 SMEs to benefit from the newly launched imSME by end of this year.

The imSME, represents “I am mSME” which covers micro, small and medium-sized entrepreneurs. It is the first online SME loan/financing referral platform in the country, mooted by Bank Negara Malaysia (BNM) and powered by CGC.

The imSME is targeted at all SMEs, currently facing difficulties in securing financing from the financial institutions (FIs), for various factors. It is a unique online platform that enable SMEs to search and find loan/financing product that best fits their needs, faster and at their convenience. The effort is to further strengthen the SMEs’ self-service capabilities while enhancing their total online experience in line with the central bank’s call for the SME sector to embrace financial technology (FinTech) to remain competitive.

Currently, there are 14 financial institutions (FIs) and development financial institutions (DFIs) participating in the imSME, namely, Affin Bank Berhad (Affin Bank), AmBank (M) Berhad (AmBank), Bank Pertanian Malaysia Berhad (AgroBank), Bank Simpanan Nasional (BSN), Bank Kerjasama Rakyat Malaysia Berhad (Bank Rakyat), CIMB Bank Berhad (CIMB), Hong Leong Bank, Malayan Banking Berhad (Maybank), Oversea-Chinese Banking Corporation Limited (OCBC), OCBC Al-Amin Bank Berhad, Public Bank Berhad, Public Islamic

Bank Berhad, RHB Bank Berhad (RHB), and SME Bank.

In total, these 14 FIs and DFIs have a network of over 2,400 branches throughout Malaysia and over 60 financial products for SMEs hence making it easy for SMEs to discuss with their preferred financier once the match is selected.

CGC has also set up an imSME Financial Advisory Team to assist SMEs who are unable to find their financing product match in imSME or whose applications through imSME were not approved by the FIs. The imSME Financial Advisory Team will diagnose the cases and make recommendations for capacity building programs or alternate financing accordingly.

Since the soft launch in November 2017, 321 SMEs have submitted their applications of which 64 matched with the available products at imSME, and five were approved, valued over RM500,000.

<http://www.adfiap.org>

PHILIPPINES

Program to accelerate technology transfer

To rev up agriculture, aquatic, and natural resources (AANR) technology transfer for the benefit of the people, the Department of Science and Technology – Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (DOST-PCAARRD) spearheads the “Enhancing Technology Transfer and Commercialization of Agri-Aqua Technologies” Program. The DOST-PCAARRD initiated the program which intends to accelerate the impact of over 600 technologies that were product of research and development in the field of agriculture, aquatic, and natural resources.

This PCAARRD-funded program comprises of five components namely (1) technology and business services, (2) e-research and knowledge management, (3) science and technology (S&T) promotion, (4) capacity building, and (5) technology roll out/deployment and strategic partnerships. Moreover, the program provides assistance to research and development institutions,

and promotes sharing of S&T best practices in view of the Council's mandate on technology transfer. PCAARRD has formulated certain systems in transferring technologies. It has classified programs and projects into technologies suitable for deployment, extension, and commercialization.

According to DOST-PCAARRD Technology Transfer and Promotion Division Director Melvin B. Carlos in a briefing in March, a program shall resort to deployment and extension when effective technology utilization and adoption are influenced by non-market considerations. On the other hand, commercialization is employed for technologies that can reach users and adopters more efficiently through the market system.

The crafted extension or deployment modalities of the Council are implemented in various regions in the country in partnership with AANR stakeholders in the public, academic, and private sectors. These include S&T-Based Farm (STBF), S&T Community-Based Farm (STCBF), Technomart, S&T Model Farm, and S&T Action Frontline for Emergencies and Hazards (SAFE).

In the effort to heighten its recourse, the DOST-PCAARRD Innovation and Technology Center (DPITC) was established "to serve as a one-stop hub for technology owners and generators, investors, end-users and other stakeholders to facilitate the commercialization of technologies generated in the AANR sector."

<http://pia.gov.ph>

REPUBLIC OF KOREA

Government to invest in service R&D

The government will invest 5 trillion won in R&D for the service sector. Service businesses will get more tax benefits for their R&D investments. These are part of the measures to upgrade the country's service industry that is far behind manufacturing. At an economy-related ministers' meeting Wednesday, the government noted the country's service industry lacks a competitive edge despite each administration's pledge to nurture the sector. Its labor productivity falls far short of that of the manufacturing sector.

"While developed economies are nurturing new services such as the sharing economy, telemedicine and digital healthcare as new growth engines, the Republic of Korea has been lagging behind in launching or developing innovative services," the government noted in a media release. As a result, most of the service jobs in the country are low-paying, though the service industry is about twice as effective in job creation compared with the manufacturing industry. The service industry here is mostly represented by small businesses such as restaurants and lodgings run by the self-employed, and they suffer from excessive competition.

Behind the poor performance of the service sector is a lack of R&D investment. The ratio of service R&D to total R&D stood at only 8.7% in Republic of Korea's private sector, compared to 29.9% in the United States and 46.4% in France. The ratio of service in total government R&D also stood below 4%.

According to the government plan, regulations will be eased on R&D investment by service businesses, so they can easily set up R&D institutes and get tax benefits. Newly introduced services such as the sharing economy will also enjoy tax benefits for R&D investments.

The government will also invest around 5 trillion won for the next five years in service R&D. The areas of focus this year include smart media, smart homes, and technologies to overcome dementia as well as development of services for public safety. Businesses that succeed in developing new services will get loans by state-run financiers.

The government also unveiled plans to innovate Centers for Creative Economy and Innovation. There are 17 of these centers around the country aimed at nurturing startups. These centers have their roots in the previous Park Geun-hye administration, but there has been criticism since it simply matched each center with a conglomerate, pressuring conglomerates to make contributions.

The centers will also be launching a Korean version of "TED Talks," providing diverse

lectures or organizing forums for future entrepreneurs. They will search for promising startups, funding their R&D efforts.

<http://www.koreatimes.co.kr>

Innovation index

According to the Ministry of Strategy & Finance on January 23, Republic of Korea topped the Bloomberg Innovation Index for the fifth consecutive year. The Bloomberg Innovation Index is divided into seven assessment categories: R&D intensity showing R&D expenditure as percent of GDP; Manufacturing added-value; Productivity showing GDP and GNI per employed person; High-tech density showing the number of domestic high-tech companies; Tertiary efficiency showing the total enrollment in tertiary education; Researcher concentration showing the number of professionals engaged in R&D per million population; and Patent activity showing resident patent filings, total patent grants and patents in force per million population. This year's assessment covered a total of 50 countries.

Republic of Korea was followed by Sweden, which recorded 84.7 points. Singapore jumped from sixth to third with 83.05 points. Japan ranked sixth with 81.91 points, the United States came in 11th with 80.42, and China took the 19th place with 73.36.

Republic of Korea ranked first in the Patent activity category and second in R&D intensity and Manufacturing added-value. However, it ranked 21st in Productivity, the category in which it came in 32nd last year. "The Republic of Korean government will keep trying so that the productivity of the local service industry, which is relatively lower than that of the manufacturing sector, can be improved with time," the ministry explained.

<http://www.businesskorea.co.kr>

SRI LANKA

Funds to support SME development

The Asian Development Bank's (ADB) Board of Directors has approved \$75 million in additional financing to continue support toward the development of small

and medium-sized enterprises (SMEs), considered vital for economic growth and job creation in Sri Lanka. "SMEs have the potential to reduce regional inequalities in Sri Lanka given that SMEs are more widespread throughout the country than larger enterprises, which are mainly based in the capital Colombo," said Don Lambert, an ADB Principal Finance Specialist. "The additional support will ensure that more SMEs have wider access to credit."

SMEs contribute about 45% of Sri Lanka's gross domestic product and provide about half of the country's jobs. However, access to finance remains a significant challenge for the SMEs. About 30% of local enterprises cite this issue as a major deterrent to their growth and development—one of the highest percentages among ADB developing member countries after Afghanistan, Mongolia, and Nepal.

Many of these SMEs have no previous experience dealing with formal financial institutions like banks, are led by women, or based in rural areas, according to ADB. The additional financing for the SME Line of Credit Project will increase the available loans for participating banks to \$175 million by 2020, from the original loan figure of \$100 million approved in February 2016. This additional support will further encourage local partner banks to grow their SME portfolios—particularly to enterprises outside Colombo or are women-led—and eventually help Sri Lanka address some of its major development challenges through economic diversification, job creation, women empowerment, and inclusive growth.

Apart from providing wider access to finance to SMEs, the project is also developing innovative SME financing schemes, while building capacity of SMEs particularly in information and communications technology, business process outsourcing, fruits and vegetables, as well as processed food and beverage.

<https://www.finchannel.com>

THAILAND

Innovation loan

The Science and Technology Ministry plans to ask for cabinet approval to bor-

row US\$300 million (9.67 billion baht) from the Asian Development Bank (ADB) to promote science, technology and innovation, to borrow US\$300 million (9.67 billion baht) from the Asian Development Bank (ADB) to promote science, technology and innovation, to support the government's much-touted Thailand 4.0 scheme.

Science and Technology Minister Suwit Maesincee said the ministry is consulting the National Economic and Social Development Board for the loan plan. He said the Finance Ministry has suggested ADB provide experts to help design projects, give advice, evaluate projects and recommend foreign experts to facilitate the activities. The ministry would use the loan mainly for projects to strengthen national competitiveness, said Mr Suwit.

They include improving the nation's science and technology infrastructure, such as the national biodata system, the Thailand Earth Observation System II, big data analytics, a synchrotron particle accelerator, fission and fusion technology, science and technology parks, precision agriculture, medical devices and automation.

The ministry also plans to team up with large listed companies on the SET 100 and SET 50 to drive innovation development among 5,000 small and medium-sized enterprises. Mr Suwit said thanks to the government's promotion of R&D over the past three years, spending on R&D has reached 0.75% of the country's GDP last year, up from 0.62% in 2015. R&D spending in 2017 was 102.5 billion baht.

The ministry expects Thailand's overall spending on R&D and innovation will reach 1% of GDP over the next 1–2 years. For two decades, expenditure on R&D and innovation never exceeded 0.25% of GDP, until spending began to gradually increase over the past five years, the DE Ministry said. The incumbent government is committed under the 20-year strategic plan to raising R&D expenditure to 2% of the country's GDP in 2036.

R&D spending in 2015 accounted for only 0.62% of GDP. The plan calls for the private sector to provide 80% of R&D spending by 2036. It accounts for 70% now. The gov-

ernment has allocated 17 billion baht to that end for fiscal 2018, up 15% from 2017. <https://www.bangkokpost.com>

VIET NAM

Hi-tech agricultural cooperatives

Viet Nam has planned to have 500 high-tech agricultural cooperatives and to increase the high-tech farming production value by five times by 2020. This was revealed by the Ministry of Agriculture and Rural Development, which said that 60% of the cooperatives would be located in the country's major agricultural production hubs such as Cuu Long (Mekong) River Delta, Hong (Red) River Delta, the northern mountainous region and Tay Nguyen (Central Highlands) region.

Of note, the production value of hi-tech agricultural products was expected to be five times higher. The average income from hi-tech farming products was expected to be three times higher than products which did not apply technologies during cultivation, from the current 1.5 times. In addition, the percentage of cooperatives using automation technology models and biotechnology would be increased from the current 17% to 30–40%.

The ministry said it was important to develop a production value chain of high-added value farming products and to promote the linkage of cooperatives with enterprises, as well as to encourage technology transfer and provide preferential loans to agricultural cooperatives.

At the same time, training would be provided to cooperatives' members. The agriculture ministry targeted that this year, 100 people would be sent to Japan, Taiwan province of China, Republic of Korea and Israel to learn hi-tech farming experiences, and by 2020, the number would reach 500. According to the ministry's statistics, there are now 193 hi-tech agricultural cooperatives in Viet Nam, more than 85% of which are operating in plantation and forestry, 9% in animal husbandry and the rest in aquaculture. They are mainly in Lam Dong Province, which has 36 cooperatives, while Long An has 14, Ha Noi 13 and HCM City 11 cooperatives.

<http://english.vietnamnet.vn>