



Building a prosperous and stable economic future

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South Korean and EU government officials and business leaders, including Jean-Marie Hurtiger, chairman of the European Union Chamber of Commerce in Korea, EU ambassador to Korea Tomasz Kozłowski, and South Korean Trade Minister Kim Jong-hoon, raise a toast during a reception at the Foreign Ministry in Seoul, South Korea, on 1 July 2011 to celebrate the the Korea-EU free trade agreement. | EPA/YONHAP NEWS AGENCY

By Jae-Hong Kim

Realising that its impressive emergence from past recessions can be contributed to structural reforms and increased spending on innovation, education and R&D, Korea considers scientific research and technologic innovation as the main mechanism for the country's growth and primary survival method in the highly competitive world.

Korea's R&D expenditure over the last two decades has consistently increased. In 2010, the percentage of GDP in Korea allocated towards R&D expenditure was 3.74%, which is five times compared to the ratio in 1980s, and it is also the third-highest in the world.

The private sector has also contributed to Korea's advancements in R&D. Despite the economic crisis, they also have continued to invest in R&D as they have in previous years. The business sector accounts for nearly 75% of total national R&D expenditure in 2010. As a result, Korea leads the world market in many high-tech fields. For instance, we are world's No.1 DRAM, PDP, large TFT-LCD, and OLED producer as well as the market leader in shipbuilding with advanced design and production capability.

Aforementioned achievements, based on

Korea's investment in R&D, and the emphasis on trade skyrocketed trade volume is the reason that in 2011 Korea became the ninth country in the world to reach the 1 trillion dollars in trade.

I am proud to say that Korea has shown the amazing economic and technological progress in the last decades and now we are one of the world's more important S&T global actors.

Education, and programmes aimed at getting young people more engaged in the research and technology sector is becoming a critical issue in Korea for the country's future leadership in various industrial sectors.

As with many other industrialised countries, Korea is seeing a slight reduction in the number of students entering engineering and technological fields, with many highly talented students opting to study in more 'lucrative' fields such as medicine or law.

In response to this, we are providing support for a number of programs designed to improve the number and quality of engineering and technology students. For example, to promote human resources in R&D we provide funding to excellent university laboratories in industrial core technologies, and encourage companies to recruit master or doctoral degree students in S&T majors by supporting labour cost.

Also the Management of Technology (MoT) programme provides funding to forty undergraduate and four graduate courses across Korea to meet the demand for students with both industrial science and management capabilities. We also provide operational support for a number of technology workshops for middle and high school students, providing them the materials and equipment to gain a hands-on experience in technology. Lastly, we emphasize the development of our current industrial technology workforce through the implementation of various training and educational programs.

It is our hope that through these actions we provide optimal support and access to resources which can bolster current technological development and secure a sustainable future for technology research in Korea.

Since the conclusion of the Arrangement on S&T Cooperation in 1992, South Korea and the EU have maintained a mutually beneficial relationship. And in 2003, the Korea-EU S&T Ministerial meeting coupled with South Korea's participation in the ITER project facilitated Korea's participation in the 6th EU Framework Program (FP6) and the signing the S&T Cooperation Agreement with the EU in 2006. This Agreement emphasized the importance of the reci-

procuity in providing access to RTD programs and the promotion of a knowledge-based society for the benefit of economic and social development.

The two landmarks in the Korea-EU S&T cooperation were the bi-annual Joint S&T cooperation Committee (JSTCC) meetings (2007-Seoul, 2009-Brussels, 2011-Seoul) and the 7th Framework Programme. In 2009, EUREKA network has announced South Korea as its first Associated Country beyond the EU. It has been a prominent instrument and a historical stepping-stone to enhance the technology cooperation between Korea and European private sector.

In 2010 relations between the EU and Korea reached another milestone with the signing of the Free Trade Agreement (FTA). Its purpose is to facilitate a deeper economic partnership by improving access to markets which could provide an opportunity to further cooperation in S&T fields as well.

Over the last two decades the number of researchers from both sides collaborating in EU programmes such as FP7, EUREKA and Korean National RTD programme has been rapidly increasing and we anticipate even more possibilities to further our interconnection in R&D innovation for the sake of build a prosperous and stable economic future.

PROJECT IN FOCUS

AREEF: the first KIAT-funded project



Augmented Reality (AR) is a computer vision technology that enriches our perception of the world by providing an additional layer of virtual information for the current viewpoint. Originally pioneered in the military domain, e.g. with head-up-displays in fighter aircraft, it

has been subject of various research projects over the past two decades. For more than ten years now, it has also been prominently used in the TV sector, where live-broadcasts from sport-events such as soccer or swimming are superimposed with additional information about particular situations, e.g. an offside in soccer, or who is on which lane in

swimming. Finally, with the technology advancing at a rapid pace, Augmented Reality is becoming increasingly commonplace for mobile entertainment applications. While previous work was concerned about staging the AR-experience in the medium air, researchers at Fraunhofer FIT in Germany pioneered the idea of using this technology

under water.

Now a Korean-German collaborative R&D project funded by the Korea Institute for Advancement of Technology (KIAT) takes this idea to a new level and is charting out how this innovation could be used for creating marketable and fun-to-use entertainment and edutainment applications for

EU and Korea partner for sustainable technology

Interesting times lead to interesting synergies

By Andy Carling

In 1936, when Europe and Asia were on the way to tragedy, a New York lawmaker, Frederic Rene Coudert, was in correspondence with Sir Austen Chamberlain, brother of the future British Prime minister, Neville Chamberlain.

In reply to a letter from the American that closed with a reference to 'interesting times', Sir Austin wrote back, "Many years ago, I learned from one of our diplomats in China that one of the principal Chinese curses heaped upon an enemy is, 'May you live in an interesting age.'" "Surely", he added, "no age

has been more fraught with insecurity than our own present time."

Many will share the sentiment today. If that isn't enough, there is a spectre haunting Europe - the spectre of austerity. Millions live in the prosperous nations of Europe, wondering when the economic crisis will hit them and their livelihoods.

Conventional wisdom could look at the world today and think that business prospects are not good, but that would be wrong. In the business world, interesting times are times of opportunity, a time of innovation where the brightest will thrive.

In times past, one response to tightening

economic circumstances was protectionism and a touch of trade war. Today, we know better; it is co-operation and understanding of the economic climate and trading partners that leads to success. This is the foundation of the Eureka programme, but it's not just about talking, but doing business together.

This year's Eureka Day is more significant than usual. Held in Brussels, the heart of the European Union, it is connecting the 39 European members of the Eureka Network with their newest member, South Korea, the first Asian nation to join the market-orientated research and development network that stretches from Iceland to Israel.

The gathering has been organized by the Korea Institute for Advancement of Technology, who were founded in mid 2009 as a quasi-government institute under South Korea's Ministry of Knowledge Economy. KIAT President, Yong-geun Kim says that under his guidance, "KIAT will play a crucial role in suggesting R&D strategies for industrial technology through systemic technology planning and policy research. It will also strengthen the competitiveness of the industrial technology ecosystem in Korea."

Korea has also left the ranks of newly emerging countries at the end of 2011, when its trading volume was measured at over \$1

with a European lead organization

swimming pools. Thus, the project is not only working on a novel topic in itself, but it also marks a new level of Korean-European collaboration, as it is the first KIAT-funded international collaborative R&D project that is led by a European partner.

New Europe speaks with Dr. Leif Oppermann of Fraunhofer FIT, principal investigator of the AREEF project, about their experiences so far.

How has research and development improved the Korean (and European) economy in the past few years? What specific examples can you give?

Knowledge is key to the development of a society. The last century saw industrialization-processes in western countries like England, Germany, or the United States, and also in eastern countries like the Republic of Korea. This paradigm shift towards capitalism naturally led to an increased importance of research and development for providing the technological innovations to survive in a competitive world. This was always a driving force in important economic sectors such as the automotive industry, where Germany is regarded as a world-leader, but Korean companies are rapidly catching up through consistent investment in research, development, and collaboration. Likewise, Korea already established itself as a world-leader in the electronics sector, with the majority of top-class LCD panels and mobile devices being "made in Korea".

Have there been any educational, or other, programmes aimed at getting young people into the research/technology sector?

German society at large, and the Fraunhofer-Gesellschaft in particular, have long

recognized the need to attract and win young talents for research and support this endeavour in a number of ways. In addition to traditional ways of entering research early, e.g. through student assistant posts and thesis supervision, we also offer internships for pupils and run the yearly Girl's Day and Fraunhofer-Talent-School events, amongst others.

So far, what collaborations have been going on between EU and Korean companies and/or individual European governments, and how might they improve in the future?

In 2008, the German federal cabinet officially enacted their strategy for Germany's role in the global knowledge economy. Hereby the German government acknowledged the fact that 90% of research outcomes are generated outside Germany and that it is thus vital for our continued success as a society to intensify our international collaborations. In their strategy report the German government specifically highlighted Korea as a new partner and competitor which invests massively in research and development and thus contributes to securing its long-term economic uplift.

Being present at the forefront of international collaboration and contract research, the Fraunhofer-Gesellschaft reinforces this strategic line through its presence in the Korean market. In addition to its 60 institutes in Germany, Fraunhofer also has a dedicated representative office in Seoul. Fraunhofer already collaborates with Korean companies and organizations in a number of ways. Collaborations under the umbrella-theme "Megacity" intend to counterbalance the negative effects of urbanization (pollution, noise, energy consumption,

etc.), as found in striving cities like Seoul, through research into greener energy and better building materials, and also through more efficient and customer friendly e-government services.

How easy is it for EU and Korean firms to collaborate on R&D/innovation projects?

From my personal experience I can say that it is a relatively straight forward process. So far I have been involved in a contract research with the Electronics and Telecommunications Research Institute (ETRI) and now with the KIAT/MKE-funded "AREEF" project that we are leading, whose consortium consists of three additional firms in Korea and Germany. The international R&D collaboration scheme by KIAT and the Ministry of Knowledge Economy (MKE) behind it provided us with an ideal opportunity to intensify our links with Korea and form strategic partnerships.

Do barriers still exist?

There are no unsurmountable barriers. But naturally such ventures can present a number of challenges on their way that need to be solved. Finding the right cooperation partners is one such challenge, as it requires personal networking prior to forming consortia. Luckily, this is now made much easier thanks to networking events such as the KORRIDOR Information Days, or the Korea EUREKA Day 2012 that will take place in Brussels on the 21st of March.

Other potential challenges include language barriers and small cultural differences, but these can be overcome with mutual effort, and can be actually fun to learn about when communicating with the partners. On

the legal side, we had some discussions about the applicability and prevalence of some Korean guidelines that seemed incompatible with some European and also German national guidelines. But these issues could all be solved thanks to the excellent support that we received by KIAT during the negotiation phase.

What can the EU and Korean learn from each other in terms of, for instance, technology transfer?

On the one hand, EU countries such as Germany can provide knowledge that supports an economically profitable, socially acceptable, and environmentally friendly development of business and society. On the other hand, Koreans can teach us how to act like tigers and become leaders in dynamic markets such as electronics and telecommunications. Supported by the country's high investment in research and development, Korea consequently has a higher-than-average number of skilled and motivated engineers. Altogether this provides a rich ground for collaboration.

From your experience, how vital is it for companies (both in Europe and Asia) to invest more in R&D? And how can governments best serve the interest of companies in this regard?

Investments into research and development are crucial for advancement of the global knowledge economy. From my experience of working for Fraunhofer, which is Europe's largest application-oriented research organization, I would highlight the importance of diverse funding-scheme that do not only provide opportunities for big organizations, but also to the many excellent small and medium sized enterprises that are out there.

trillion, joining the global trade giants, U.S., Germany, China, Japan, France, the U.K., the Netherlands and Italy.

The main exports were in ships, petroleum products, semiconductors, LCD, cars and cell-phones.

On hearing of the important breakthrough, Knowledge Economy Minister Hong Suk-woo said, "Now, it's time for Korea to reach a \$2 trillion trade target by exploring new growth engines and setting a new trade vision and paradigm."

In Brussels, the nation will show business leaders from across Europe and beyond how they aim to achieve this ambitious target; through innovation.

For Korea, a growth strategy founded on innovation is a practical matter; of research leading to real world products, but business needs to look further, look harder and swiftly translate technological breakthroughs into products for the fastest moving marketplaces.

The success of Korean companies in innovation is more than impressive. In 1991, Hyundai made the first independently developed Korean car engine and have gone on to design cutting edge engines, transmissions and chassis. This leads to safer and greener vehicles.

Samsung's latest phones, the Galaxy II is recognized as the leading phone today, combining processing power and functionality with two other qualities that are admired in Korean products, an elegant and economic design matched to excellence in build quality.

LG Electronics has also become a leading global brand, with a large portfolio, including home appliances, telecoms and home entertainment. They introduced the first internet TV in 2007 and continued innovating, including sets that allow you to change channels with a gesture.

Only a fool would predict the technology we will be using in five years time, but a wiser man would realize that whatever is going to



Robots perform taekwondo routines in Gwacheon, south of Seoul, South Korea. | EPA/STR

happen, it will have a Korean company's name on the product.

What is even more important is that, with

this Eureka Day, these innovative companies are asking if you want to join them on this adventure.



Towards a more 'consolidated and efficient innovation environment' for EU and Korea

Interview with Yong-Geun Kim, President of the Korea Institute for Advancement of Technology (KIAT)

Could you provide a brief background about the Institute? And how does KIAT respond to pursuing innovation?

The Korea Institute for Advancement of Technology (KIAT) is a public institute dedicated to the development of industrial technology in Korea. We were founded in May 2009, combining functions from former institutes into a more efficient agency for the implementation of governmental policy and the management of technology and innovation support activities. KIAT has six primary roles: to study policy related to industrial technology innovation; determine medium and long-term planning and result analysis related to innovation; establish and enhance the infrastructure for industrial technology; promote and support of regional industries; support for the promotion of commercialization and the transfer of technology; and facilitate the international industrial R&D cooperation activities.

To fulfil these functions, KIAT is managing about €880m with more than 240 staff members. I believe that KIAT has become one of Korea's most principle organisations for the development of international relationships through the support of open and collaborative partnerships.

It is well-known that innovation will be essential to maintain a sustainable and prosperous economy. However, there must also exist a strong understanding that such innovation can no longer take place purely within the borders of one country. Therefore, international cooperation support for industrial R&D has become one of the most significant aspects of our activities in which KIAT is taking a leading role in



Korea.

We are fervently working to promote the opportunities in overseas programmes available to Korean researchers, such as the EU FP 7, EUREKA Network, and eventually Horizon 2020. In addition, KIAT holds numerous annual matchmaking events, most notably KOREA EUREKA DAY, to facilitate collaboration among Korean and European innovation leaders.

How easy is it for EU and Korean researchers to collaborate on R&D/innovation projects? What is KIAT supporting in this regard?

Like with many international collaborative endeavours, the partnership between Korea and Europe began with enthusiasm and ambition though comforted many challenges. Some of which were cultural and linguistic barriers, incongruence in government R&D policies, lack of flexibility of funding programmes, shallow involvement

and inexperience in established networks, and researchers' uncertainty regarding overseas multilateral research projects. However, we have maintained the belief in our collaborative potential.

To overcome the barriers obstructing the development of mutually beneficial R&D projects, KIAT has been supporting Korean participation in the Seventh Framework Programme, especially to the industrial research community. KIAT itself has also been involved in a number of FP7 international cooperation projects, such as KORRIDOR, KORANET and EURASIAPAC, which have focused on the development of Korea-Europe cooperation.

KIAT is also home to the Korean National Project Coordinator for the EUREKA Network. Since Korea first participated in EUREKA in 2005, Korea has been involved in more than 30 projects, collaborating with 400 different organizations from various European countries. And

we have been the central management office for Korea's membership of the Enterprise Europe Network (EEN) since joining in 2009.

With the ratification of the EU-Korea Free Trade Agreement in 2011, we expect the level of collaboration throughout Europe to increase. With the co-operation on policy instruments, adaptation to international research standards, and further participation in the development of new funding instruments, I foresee an even more consolidated and efficient innovation environment between Korea and Europe.

Where do you hope to see KIAT in the future and what research are you keen to see it pushing?

We aspire to lead the country in the development and implementation of new policy, strategies and programmes that will provide an environment which truly supports creativity and allows Korean technology to reach its full potential.

In terms of specific technology support, we will remain open to all high quality bottom-up driven research. However, as in Europe, we understand the great importance being placed on tackling the grand social challenges so we expect to see an increase in projects related to green technology, biotechnology, and energy related technologies in addition to ICT where Korea stands strong.

My hope is to see KIAT firmly established as a global leader in the industrial technology ecosystem and an active stakeholder both domestically and internationally for the support of innovation. Our aim is to raise Korea's global competitiveness by supporting and championing the best new concepts and in turn to see this knowledge commercialised into successful new technologies and products.

EU and Korea: like-minded partners

South Korea has been one of the crucial like-minded partners of the EU in Asia over the past decade. In recent years, the EU-Korea relationship has evolved, culminating in 2010 when two incremental agreements were signed, the new Framework Agreement (FA) and the Free Trade Agreement (FTA), creating a broad and comprehensive partnership and a basis for a Strategic Partnership agreed in October 2010.

The broadened co-operation is aimed to boost trade and investment relations, underpin political dialogue, step up co-ordination and dialogue on global issues and stimulate sectoral cooperation especially in areas such as science and technology, innovation, research and development, education and environment.

Since 2007, the EU and Korea were actively engaged in exchange of information on scientific and technological topics and research and development projects in the areas of science and technology. In addition, Agreement on the Scientific and Technological Cooperation between the EU and Korean government was signed to further strengthen collaboration in these key areas for economic growth.

EU and Korea closely worked together to create International Fusion Energy Organization for the Joint Implementation of the International Thermonuclear Experimental Reactor (ITER) Project, which should provide ground-breaking results for the future of our energy supply.

To encourage, facilitate and enhance co-operation in civil global satellite navigation,

the EU and Korea signed in 2006 an agreement on global navigation satellite system (GNSS), within the framework of Galileo project.

The ground-breaking Free Trade Agreement (FTA) between the EU and Korea, integrating the two economies and removing virtually all tariffs and many non-tariff barriers between them, was the EU's first such deal with an Asian country.

Since the beginning of its provisional application on 1 July 2011, the FTA immediately started delivering positive results. In mere two weeks in place, the EU-Korea FTA elevated EU's export to Korea by 16%, while the volume of Korean export to the EU rose by 19%. The impact is ever so obvious, taken into consideration that the volume of Korean ex-

port to European market was slowly decreasing prior to that.

Granted, over the same period the EU trade deficit with Korea more than halved, but the overall benefits of the increased economic exchange yield profits to both economies, providing multi-billion savings in just tariff cuts. In addition, a joint export market worth more than €30 billion was created, which is expected to more than double EU-South Korea bilateral trade in the next 20 years.

The Framework agreement and Strategic Partnership will bring closer political co-operation on a wide range of international concerns, including non-proliferation of weapons of mass destruction, human rights, cooperation in the fight against terrorism, climate change, energy security and development assistance.