

Review

Development of Asia and HORIBA's Analysis Technology アジアの発展とHORIBA計測技術

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It is while the globalization of the world economy is advanced, and the needs for various measurements are increasing especially remarkably with economic growth in 30 recent years in the field over many topics of industry, the environment, medical, and the research and development, etc. in each country of Asia. The HORIBA group uses the analysis technology, positively relates in the advancement of the Asian society, and works on the measurement needs well as adjusting of the diversity in many Asian countries. The staffs of each company in HORIBA group are investigating the local situation in each country and the region, developing and improving the instruments, measurement systems and the measurement techniques in cooperation with the local governments, the universities, research laboratories and the enterprises, and meeting the best measurement needs in each field.

世界経済のグローバル化が進む中であって、最近の30年間にアジア各国では経済成長と共に、産業、環境、医療、研究開発などの多岐にわたる分野で様々な計測へのニーズが特に著しく増加している。HORIBAグループは計測技術を用いて、アジア社会の進歩に積極的に関わり、開発した技術をアジア各国の多様性のある計測ニーズにうまく適応するように取り組んでいる。HORIBAグループ各社のスタッフは各国・地域の現地状況を調査し、現地政府・大学・研究機関・企業と協力して、計測装置・計測システム・計測手法を開発・改善し、それぞれの分野で最適な計測ニーズに対応している。

Introduction

By the hosting of the 1964 Olympics in Tokyo, the 1988 Olympics in Seoul and the 2008 Olympics in Beijing, it can be said that the Olympics, as a symbol of Asian society and economic growth, demonstrates the changing prosperity of the societies and economies of Northeast Asia in the past 20 years or so - in order Japan, South Korea and China. Ever since the economic downturn precipitated by the Lehman Brothers bankruptcy in 2008, the economic growth of Asia has been the driving force behind the world economy, and, in particular, the growth of rising countries such as China and India has attracted attention. At present, the largest export destination of the export-type economies of Japan and South Korea has shifted away from the United States to their neighbor, China.

China, the most populated country in the world, has achieved annual economic growth close on 10% in the 30 years since implementation of the Reform and Opening-up Policy in 1978. Capital gained from overseas investments, and technology and business know-how are flowing into China,

with the result that, now, China is the country that multinational corporations want to invest in the most. India, another country with a population of over one billion, began reforms in 1991 and economic growth at one time resulted in a GDP rate of about 5.5%. However, it is predicted that the economic growth rate will be about 7.5% from 2000 onwards and will reach around 8.5% in 2010.^[1] Figure 1 shows the change in GDP in major Asian countries and the Asian region, and the state of economic growth in Japan, China, South Korea, India and ASEAN (Association of South East Asian Nations) countries for the period 1990 to 2008.

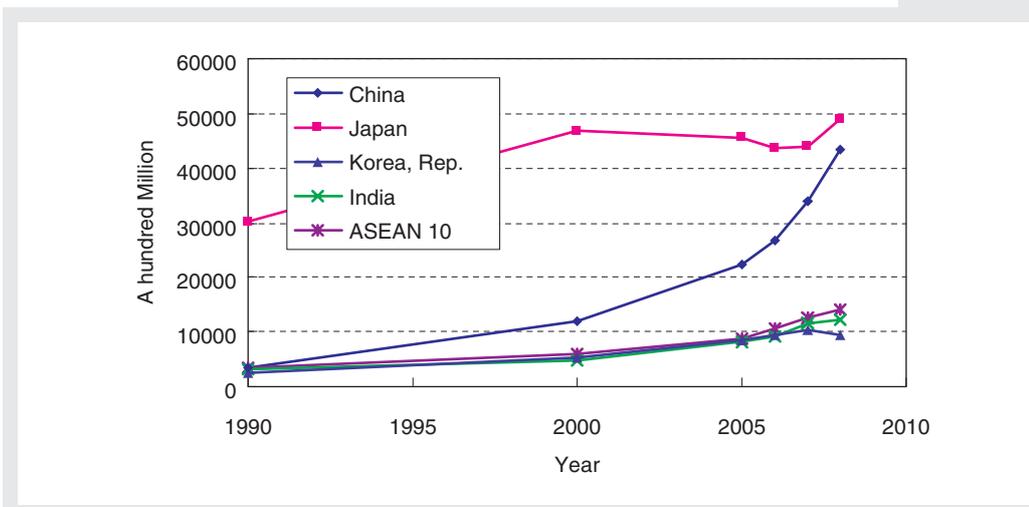


Figure 1 Change in GDP in Major Asian Countries and the Asian Region (Data Courtesy of the World Bank WDI Database)

At the end of the 19th century in the 1890's, America became the country with the largest manufacturing industry in the world, with UK relinquishing top spot as the “world’s factory.” It is predicted that in 2011 or 2014, at the latest, China will take the United States’ place as the world’s largest scale industrial nation,^[2] and the manufacturing industry of the Asian region will have grown larger.

Domestic spending in each of the Asian countries also indicates a growth trend. For example, internal demand in China in 2009 increased to 180 billion dollars, whereas the increase in the United States stopped short at 90 billion dollars. Individual consumption in Asia’s ten main countries, excluding Japan, has increased 7% since September 2008.^[3] Furthermore, in 2009, the total sales of consumer products in China increased to 12.53 trillion yuan, accounting for over half of China’s GDP. It is predicted that, in 2010, China’s domestic demand will further increase to 295 billion dollars and exceed overseas demand.^[4]

Within the Asian region, there is a tendency for industrialization and urbanization of rising countries, in particular, to propel technology and expand consumption, and it is thought that stable and sustained economic growth will continue for a long time.

The Social/Economic Growth and Industrialization/Urbanization of Asia & State of the Measurement Industry

Measurement Needs Arising From Economic Growth of the Asian Region

Measurement needs for improved product quality and business results in the manufacturing industry, in particular, have increased long with economic growth in the Asian region. In China, the heavy and chemical industries of iron and steel, cement and automobiles, amongst others, are expanding rapidly and have currently grown into almost the world's largest scale manufacturing industries. In India, there are plans to establish new thermal electric power stations (using about 70% coal fuel) in the next five years to improve the infrastructure for raising the electricity supply by around 28%.

On the other hand, in many countries and regions, problems such as water resources, energy and environmental issues are becoming more and more obvious as a result rapid economic growth in the Asian region. For example, it is predicted by the Asian Development Bank that water resource insufficiency in the Asian region will reach 40% in 2030 as a result of the increase in water used for industry and agriculture due to population increases and more prosperous lifestyles.^[5] In Indonesia, they are planning to improve the drinking water supply infrastructure by full operation of a water supply network in 2012 and commencing operation of a seawater desalination plant in December this year. In Malaysia, there are signs that a national water resources environmental policy will be established for the conservation, security and reclamation of water resources. Because of contamination of water resources by a larger urban population and industrialization, China has set the target for the city sewage treatment rate to 70% for the 11th Five-Year Plan (2006 to 2010) as a national environment conservation measure. At present, China's city sewage treatment capacity has improved 75% from the 10th Five-Year Plan (2001 to 2005), with the number of city sewage treatment plants reaching 1,993 and the nationwide sewage treatment capacity exceeding 100 million m³/day.^[6] The "People's Republic of China Circulation and Economy Promotion Law" that was put into effect as of January 1, 2009, incorporates provisions relating to water recycling, energy saving and reduced industrial waste, and it is considered that this will form the basis of the continual advancement of green industrial growth in China in the future.

Measurement needs and technology in the Asian region are approaching European and American levels as a result of global developments in economic and technological exchange. Of all Asian countries, the scale of China's analysis market is relatively large. Measurement needs have risen in keeping with rapid economic growth, and imports of measurement instruments from abroad have continued to increase since the 1980's, with advanced automated measurement instruments currently accounting for the majority of imports. Ever since the economic downturn precipitated by the Lehman Brothers bankruptcy in 2008, overseas measurement instrument

companies have made aggressive inroads into the Chinese market. For example, they have established technical tie-ups and tie-ups for consignment production with local industries, set up joint ventures and established operating division headquarters in China. In addition they are deploying various business models including the establishment of China service centers and development centers, and are pushing ahead with programs to develop business through localization.

In 1995, the gross product of the Analysis instrument industry in China was 23.7 billion Chinese yuan. This rose to 251.7 billion yuan or about 3.3 trillion yen in 2007, almost a ten-fold increase in the space of 12 years.^[7] Further, one of the corporations in China's measurement service industry, CTI (Centre Testing International) became the first company (300012) to be listed under this service business category in the Shenzhen Stock Exchange. In China, domestic Analysis instrument companies are posting increased sales and measurement technology is making remarkable progress. In China's Analysis instrument industry, which comprises mainly small- and medium-size enterprises, there is an increasing number of companies with annual sales over one billion yen. As a result, it is considered that there will be more companies like these being listed locally. Moreover, because of increasing measurement needs and government policies for supporting innovation, it is considered that investment in the technological development of the Analysis industry in China will increase.

Development of the HORIBA Group's Measurement Technology in Asian Countries

Out of regard for the importance of interchange by the Analysis industry in the Asian region, Atsushi Horiba, chairman^{*1} of the Japan Analytical Instruments Manufacturers' Association (JAIMA), is strengthening interchange activities with the China Association for Instrumental Analysis (CAIA). Kozo Ishida, chairman^{*2} of the Japan Environmental Technology Association (JETA) has concluded a cooperative agreement with the China-Japan Friendship Environment Protection Center and opened the JETA China Beijing Liaison Office, and is continuously disseminating Japan's latest measurement technology overseas and expanding the measurement business in China and Asia by means of mutual visits with CNEMC (China National Environmental Monitoring Center).

In 1996, the HORIBA Group established business bases in Beijing and then in Shanghai, Guangzhou and Shenzhen, and, in 2010, decided on establishing a joint venture in China. It already established a subsidiary in India, in 2007. In this way, the HORIBA Group is pushing ahead with expansion of its business in Asian countries and the Asian region.

*1: HORIBA Ltd., Chairman, President & CEO

*2: HORIBA Ltd., Vice President

Automotive Test Systems Segment

In recent years, in the Asian region, the number of automobiles manufactured and sold has increased remarkably. In 2009, China passed the United States in both numbers of automobiles manufactured and sold to become the world leader, and is continuing to grow this year, too. For example, General Motors - representative of the world's automotive industry - faced bankruptcy in the United States even though sales in China increased by 67% in the same year. In the January to May period of 2010, General Motors China sold one million cars, and achieved 50% of its fiscal target. In India, small cars in particular are very popular, and, in July, 2010, domestic sales of cars was 158,764 units, a 38% increase from the previous year's Figure of 115,084 for the same period.^[7] Moreover, car companies in China and India have bought up world-famous automobile companies such as Volvo, Jaguar and Land Rover with a view to improving quality and expanding output. On the other hand, however, in Asia automobile emissions have caused the air and environment in major cities to deteriorate significantly. For example, in 2007, NOx derived from automobile emissions accounted for 30% of the total amount of emissions throughout China. To remedy air pollution in the major cities caused by air pollutant emissions from cars, the governments of various nations have introduced automobile emission regulations; continued efforts by the automobile industry also are vital. The automotive test market in Asia also has grown larger; for example, in China, during the years 2007 to 2009, sales of automobile-related test instruments grew by an annual average growth rate of 27%.

The HORIBA Group's automotive test technology is widely used in Asian countries. For example, in the 1990's, automobile emission measurement instruments were installed^[8] in the China-Japan Friendship Environment Protection Center - a symbol of environmental cooperation between Japan and China - and are seeing active use even today in the field of automotive emission measurement for protecting China's environment. Moreover, engine emission measurement instruments were introduced into Beijing's Municipal Environmental Protection Agency. HORIBA Group technology is also recognized in fields other than automotive test such as the area of agricultural equipment, where a little over 20 million tractors are already owned and two million are being produced annually.^[9] In 2007, the China Environmental Protection General Office and National Mass Supervision, Inspection & Quarantine General Office publicly disclosed "Emission Regulations for Contaminants in Emissions from Diesel Engines for Non-road Use & Measurement Methods (China Stages I, II)." In order for the Chinese Ministry of Agriculture to reinforce inspection, it decided this year to purchase facilities including the HORIBA diesel engine emission measurement and engine dynamo system. Consequently, it is considered that the HORIBA Group will be able to contribute to the measurement of emissions in the agricultural equipment sector in China.

In 2006, the HORIBA Group established the local subsidiary HORIBA India Private Limited, confident in the growth of India's car industry. The company participated in NATRiP (National Automotive Testing and R&D Infrastructure Project) with its measurement technology as part of India's endeavors to development the car industry, and, in September, 2009, as part

of a government initiative, collectively delivered HORIBA gas emission measurement systems to government-certified testing laboratories as facilities for automotive testing and R&D. From here on, emission measurement technology in India's car industry will be established and the development of India's car industry will be greatly aided by the technical support of the HORIBA Group.

Process & Environmental Segment

Asian countries are facing issues such as increased populations, increased environmental pollution caused by urbanization and industrialization, and the deteriorating natural environment, and their respective governments are pushing ahead with programs to study environmental measures and responses matched to actual environmental circumstances.

Though China's GDP exceeds the total of that of ASEAN and India because of economic growth these past 30 years or so, side effects of this growth include considerable consumption of natural resources and environmental pollution. From 2002 onwards, the Chinese government shifted course from a national policy that gives priority to GDP over to the building of an economy in harmony with the environment. National investment in the environmental sector in the 11th 5-year plan (2006 to 2010) is 1.53 trillion yuan (about 20 trillion yen) or close to twice that of the 10th 5-year plan (2001 to 2005), and it is predicted that there will be plans for a further twofold increase in environmental investment during the period of the 12th 5-year plan (2011 to 2015). In March 2008, State Environmental Protection Administration of the People's Republic of China was promoted to Ministry of Environmental Protection of the People's Republic of China, Department of Environmental Monitoring also was newly established, and investment for environmental monitoring was increased.

The effect of reductions in important pollutant emissions such as SO₂ and COD³ is being seen in the state of the environment throughout China from 2002 onwards. For example, the total amount of SO₂ and COD emissions in China nationwide in 2008 fell by 8.9% and 6.6%, respectively, from 2005 levels. In China, the main energy source is coal, and China leads the world in total SO₂ emissions with the annual amount of coal used for combustion exceeding 1.2 billion tons. In China's 11th 5-year plan, the government set a target of a 10% reduction in SO₂ emissions, and for the past ten years installations of flue gas desulfurization systems in China have been at around the same level as installations for the 30 years in the United States.^[10] Also, from 2006 onwards, the 1st National Pollutant Source Survey was conducted. 5,925,600 pollutant source locations were covered in this survey and about 1.1 billion of basic data were acquired. This enabled the Chinese government to gain a better understanding of the circumstances behind pollutant source emissions, and needs for monitoring of pollutant sources will increase even more.

In each of the fields in China's Analysis instrument industry during the period 2007 to 2009, the growth rate of the environmental Analysis instrument market was the highest, and sales of environmental Analysis instruments in China grew by an annual average growth rate of close to 55% compared with previous years.

The HORIBA Group is actively engaged in environmental monitoring in Asian countries. For example, the HORIBA Group is cooperating with international environmental organizations in the East Asia region, and for ten years since 1998 has dispatched four engineers. These engineers have been dispatched to the Asia Air Pollution Research Center (formerly, the Japan Environmental Sanitation Center, Acid Deposition and Oxidant Research Center) as the network center of the Acid Deposition Monitoring Network in East Asia (EANET). The EANET network supports technical activities in the field of acid deposition monitoring together with 13 East Asian countries and international organizations, and is engaged in environmental problems as part of an international framework.

From 2003 onwards, a new product (OPSA-150) with a wide range of new functions that factor in the water quality conditions of Chinese sites was developed based on a track record and experience in operating close to 100 units of the HORIBA UV organic pollutant monitor (OPSA-120). In February, 2006, it became the first UV organic pollutant monitoring product in the Chinese market to acquire certification from Ministry of Environmental Protection of People's Republic of China (MEP). Moreover, production of OPSA-150 for the Chinese market was started at the HORIBA Shanghai plant. And, in 2007, annual sales and installation of over 200 OPSA-150 units became a big foothold for HORIBA's water quality and environmental measurement business in China. Though about 20 domestic and foreign analyzer manufacturers have acquired MEP certification for analyzers using UV technology, the HORIBA Group leads the water quality UV analyzer market in China as the pioneer in this area. However, in China, the building and administration of a service organization for continuous environmental monitoring instruments is still insufficient; strengthening of not only sales and marketing but also an OPSA-150 site servicing and management system are required.

In 2005, the HORIBA Group received a request from the Chemical Industry Press, a major technical publishing house in China, to write a technical book



Figure 2 Joint Press Announcement by HORIBA and Chemical Industry Press

about automatic environmental monitoring in Chinese.^[11] Under the editorial supervision of HORIBA Ltd. Kozo Ishida, a Chinese version of “Environmental Monitoring with Automated Continuous Technology” written by 27 experts from the HORIBA Group was published before the Beijing Olympics in May, 2008. This book pooled the extensive expertise and knowledge about environmental monitoring technology within the HORIBA Group, and helped spread environmental monitoring technology to Greater China. In timing with the book’s publication, the HORIBA Environmental monitoring Technology Exchange Symposium was held. Nearly 20 companies including XINHUA News Agency, China Environmental Newspaper and China Environmental Monitoring participated in this event. Here, the meaning behind this book’s publication was explained to all those in attendance who gave high marks to the level of the HORIBA Group’s environmental monitoring technology. At present, this technical book is being put to effective use as sales and advertising materials, and as training materials for new employees. Figure 2 shows the announcement of the book’s publication at the Chemical Industry press.

In October 2009, the first greenhouse gas (three components: CO₂, CH₄ and N₂O) continuous monitoring systems (VIA-510, APHA-370 and GA-360) in China’s environmental protection sector were installed at the Yunnan Province Environmental Monitoring Center. A field evaluation conference was held with the Chief Director of the China National Environmental Monitoring Center, Chief Directors of many Environmental Monitoring Centers in important provinces and direct-controlled municipalities, and university professors in attendance. These monitoring systems were highly acclaimed. Moreover, in 2010, installation of CO₂, CH₄ and N₂O, 3-component continuous monitoring systems was finalized at three background monitoring sites (national established stations) directly controlled by Ministry of Environmental Protection of People’s Republic of China as HORIBA ambient air monitoring instruments.

This year, India’s Minister of the Environment, Jairam Ramesh announced that he would be drafting a database of the worst polluting companies in India using as a standard the major polluting corporations list drafted the previous year by the Chinese government.^[12] It is considered that needs for continuous monitoring of polluting sources will increase in India as a result of stricter environmental regulations. It is anticipated that the environmental monitoring business will grow due to HORIBA’s contribution to the environment in Asian countries and the expanding environmental market.

*3: COD or Chemical Oxygen Demand indicates the amount of oxygen required to oxidize oxidizable matter (organic matter, sulfides or nitrites, etc.) in water.

Medical Segment

Increased personal income as a result economic growth, improved lifestyles and a shift over to a more health-conscious life are appearing in Asian countries. In China, the need for medical equipment matched to demands for medical checkups and examinations has grown considerably as a result of urbanization, improved income and standard of living and promotion of

healthcare reform. The HORIBA Group is strengthening business development in the field of medicine in Asia including China.

In the four years leading up to 2009, the HORIBA Group was able to build a sales and service network covering all of China. From before then, sales of 3-part blood cell counters had expanded with many sales being achieved in small- and medium-sized hospitals. Currently, sales of high-end models have increased installations at large hospitals.

In February, 2009, the first PENTRA DX120 hematology analyzer in China was installed in the Zhu Jiang hospital affiliated to the Southern Medical University in China's Guangdong Province. Before installation of this HORIBA instrument, this hospital had been using a blood analyzer with a throughput of 80 samples/hour. However, with the instrument sometimes malfunctioning and an increasing number of new patients due to upgrading of the hospital, the blood analyzer could no longer handle the increased amount of samples. The HORIBA Group's hematology analyzer could process 120 samples/hour, fully satisfying requirements for processing 400 to 500 samples/day at the hospital. At the same time, the PENTRA DX120 supports several checkup processes, and supports speedy diagnosis and better follow-up by classifying in accordance with origins in the juvenile cells of five white blood cell items. Currently, this hospital has become a model for the HORIBA Group in Delta region of the Pearl River, and as a result we have been able to effectively promote sales of the product.

In response to an increase in the amount of reagents used in blood analyzers, local production of reagents is scheduled to be started for the first time in China by the end of the year. Production of this analyzer also is being studied.^[13] In the future, in China, the HORIBA Group will continue to advance into the high-end market, and proceed with plans for localization including the manufacture of products in response to local user needs.

Semiconductor Segment

In recent years, the production and market of the world's semiconductor industry has shifted to the Asian region, and the LCD panel, LED and solar panel industry, in particular, are growing at a rapid pace in the Northeast Asian region. Since several years ago, there has been an increased trend for solar panels worldwide including Europe. In China, too, the solar panel and LED lighting industries are attracting a lot of attention because of national policies to promote reusable energy and energy conservation. China's solar panel industry has grown rapidly to become the world's leader in terms of production capacity. Because of the considerable demand for domestic use and export of solar panels to Europe and America, local solar cell device manufacturers tend to adopt overseas' companies high-quality parts for production equipment. To satisfy the investment plans of China's domestic newly emerging production equipment manufacturers and build a speedy system of supply to local equipment manufacturers, a new production line was set up at a local factory of a HORIBA Group company where local production of mass flow controllers needed for panel manufacture was begun. Moreover, to ensure a broad response to China's mass flow controller market, HORIBA STEC Ltd. announced that it would be establishing a joint venture (Beijing HORIBA Metron) with a local company, Beijing Metron

Ltd., geared to its specialty, solar thermal conversion, and the sensor manufacturing industry in October of this year.^[14] As a result of China's industrialization, the use of mass flow controllers for general industrial use has increased, and the HORIBA Group business will be achieved quickly and more easily by localization efforts in local development, design and parts procurement, production and sales/services, for example.

Deliveries of HORIBA's chemical solution concentration monitor CS-100 series to the Chinese market for use in managing the concentration of etching solutions used in crystal type solar cell production processes are increasing. By managing the concentration of chemical solutions used in solar cell production equipment, the etching amount can be suitably controlled to improve the product yield.

In South Korea, HORIBA STEC Ltd. set up a production line vital for chip manufacturing at a local subsidiary, HORIBA STEC Korea at Gyeonggi-do, Jonan City and began pilot production in August of this year in order to respond to an urgent start of semiconductor and LED chip production.

Scientific Segment

Scientific technology has progressed in the Asian region along with economic development. In 2009, the need for analytical instruments for use in research at universities and government research institutions rose as a result of increased spending by the governments of rising countries. Policies for supporting innovation in scientific research and the industrial sector in China are being reinforced and government budgets also are increasing.

Researchers around the world are vigorously engaged in nanotechnology. The nano-particle size analyzer nano Particle SZ-100 series, that was released at BCEIA⁴ in 2009, can measure particle matter in the single nano order and incorporates the three important element measurements (nano-particle measurement, center potential measurement and determination of molecular weight) in a single unit for analyzing nano size characterizations. As a result, there have been many inquiries from universities and research institutions in China. Also, the laser diffraction/dispersion type particle size analyzer LA-950V2 uses a proprietary optical system to achieve a world-leading ultra-wide range of 10 nm to 3000 µm, and is being widely used in universities, research institutes and the industrial sector because of its high precision and good repeatability.

Environmental awareness is also increasing hand-in-hand with industrial development. The RoHS Directive⁵ in Europe was put into action in July 2006 for green procurement. Consequently, needs for inspecting toxic substances in electrical and electronic equipment exported from Asian countries to Europe have risen, and, in China, Ministry of Industry and Information Technology of People's Republic of China implemented the "Electronic Information Product Pollution Suppression Control Law" (Chinese version of RoHS) on March 1, 2007, and furthermore publicly disclosed related stipulations for this on October 9, 2009. The two regulations above cover six substances: cadmium (Cd), lead (Pb), mercury (Hg), hexavalent chromium (Cr), polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE). Since X-ray fluorescence analyzers have features for quickly and non-destructively inspecting toxic substances

in parts, about 500 units of the HORIBA XGT-1000WR and XGT-1700WR series of energy dispersive X-ray fluorescence analyzers and the X-ray analytical microscope XGT-5000 series have been adopted in various sectors in China to aid the inspection of toxic substances in components. Along with the progressing industrialization and urbanization of China, the iron and steel industry, too, has grown considerably, and currently the amount of iron and steel produced in China leads the world at over 500 million tons/year. For quality control in iron and steel production, HORIBA's EMIA series of carbon/sulfur combustion analyzers and EMGA series of oxygen/nitrogen/hydrogen analyzers are indispensable. The scale of China's nonferrous metal refining industry also has reached world-class levels, and about 400 units of these EMIA and EMGA analyzers have been delivered mainly to these industrial sectors in China. We aim to improve the level of automation of analyzers in the future in response to the need for field measurement.

*4: BCEIA: The Beijing Conference and Exhibition on Instrumental Analysis

*5: RoHS: The Restriction of the use of certain Hazardous substances in Electrical and Electronic Equipment

Summary

The United Nation predicts that, in 2050, the world's population will reach 9.3 billion people, with the population of the Asian region accounting for two thirds of the world's population.^[15] In 2009, the total combined population of China and India was around 2.5 billion people or over 30% of the world's population of 6.8 billion. It is predicted that the increase in the urban population between 2005 to 2025 in China and India will account for over 62% of the population concentrated in cities in the Asian region and 40% of the world's population concentrated in cities (approximately 400 million people in China and more than 200 million people in India).^[16] The enormous rural population will change to an urban population, prompting advances in industrialization, and the readying of a social capital infrastructure for assuring healthy and safe living will create the potential for long-term stable economic growth in the Asian sphere.

The Economic Cooperation Framework Agreement (ECFA) pivoting around the elimination of tariffs between China and Taiwan will become effective as of January 1, 2011. This will become the first instance of an economic agreement based mainly on tariff reductions between Northeast Asian countries and regions being concluded. There are apparent signs that regional economic cooperation agreements and agreements between countries and zones will increase in the future. From here on, it is considered that increased economic activity between Asian countries and zones will cause the need for measurement and analysis in the Asian region to increase even further. For the development of the Analysis business in various countries and regions, we must push forward with the effective use of existing products and development of field measurement applications, provide a steady response to diversified measurement needs and respond to diversifying demands in the Asian region by reliably grasping demands. Moreover, the implementation of product development, manufacturing and

services in the field and the building of long-term trust with customers will form the foundation of continued development of the Asian business for the HORIBA Group.

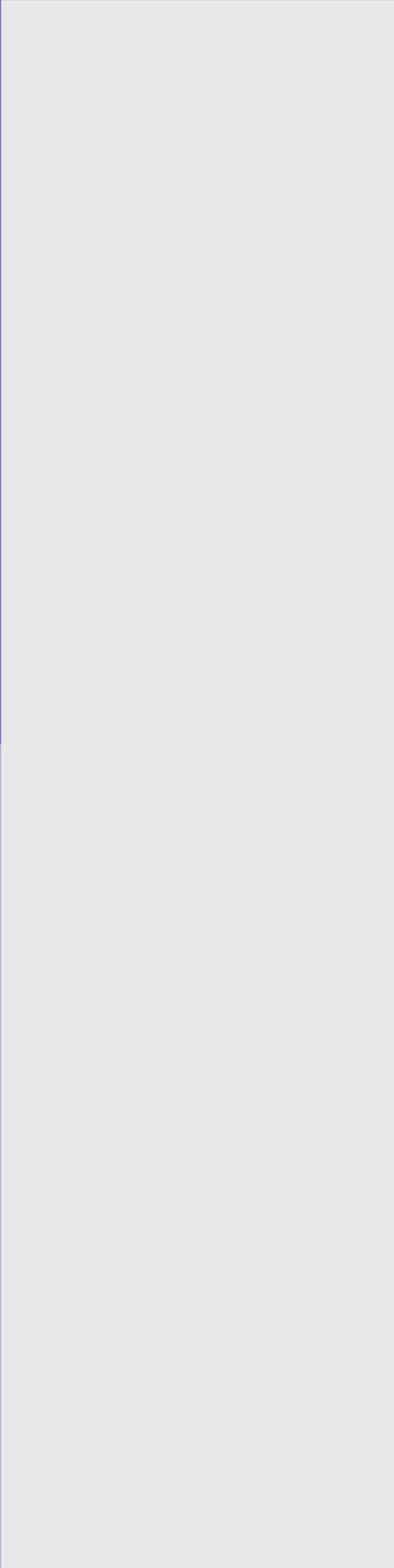
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