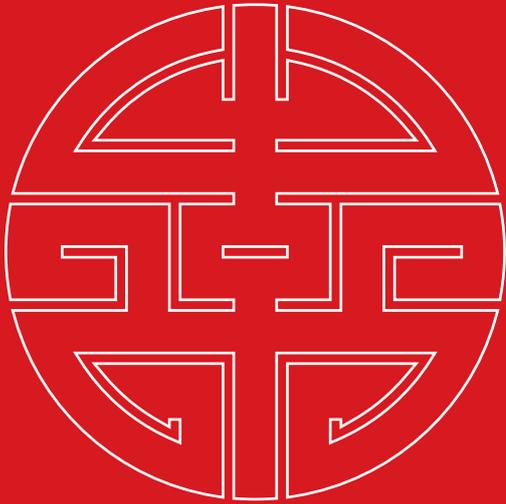


Marking the 50th Anniversary of UNIDO **UNIDO-China cooperation**





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UNIDO-China cooperation

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Foreword



Established in 1966, the United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability.

The mission of UNIDO, as described in the Lima

Declaration adopted at the fifteenth session of the UNIDO General Conference in 2013, is to promote and accelerate Inclusive and Sustainable Industrial Development (ISID) in developing countries and economies in transition. UNIDO's goal of achieving ISID is explicitly recognized and anchored within the 2030 Agenda for Sustainable Development, which was adopted by the United Nations General Assembly in September 2015. Through Sustainable Development Goal 9, the Member States of the United Nations call upon the international community to “build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. At all levels of development, industry can be the primary driver in fighting poverty, ensuring food security and preventing social polarization.

UNIDO supports countries' efforts to foster ISID through three programmatic fields: 1) creating shared prosperity; 2) advancing economic competitiveness, and; 3) safeguarding the environment. Under “creating shared prosperity”, UNIDO focuses on the development of agribusiness and rural entrepreneurship, increasing the participation of women and youth in productive activities, and improving human security in post-crisis situations. To help the Member States advance their economic competitiveness, UNIDO provides a range of services, including investment and technology promotion, SME and entrepreneurship development, competitive trade capacity building and corporate social responsibility promotion. In safeguarding the environment, UNIDO's work is concentrated in the following sectors: resource-efficient and low-carbon production; clean energy access for productive uses; and the implementation of multilateral environmental agreements. UNIDO's programmes are tailored to the country or regional contexts. UNIDO's cross-cutting functions include analytical and policy advisory work, standard setting and compliance, and convening stakeholders for knowledge transfer and networking.

UNIDO has a long history of cooperation with China ever since the People's Republic of China was recognized as a member of the Organization in 1972. Over the past five decades, UNIDO, in cooperation with the Government of China, has

implemented hundreds of technical cooperation projects. Through various UNIDO capacity-building projects, thousands of Chinese technicians have upgraded their technical skills and hundreds of technical centres and institutions have enhanced their capacity, contributing to structural transformation and inclusive and sustainable industrialization in China. China's role in fostering ISID in other developing countries and economies in transition through UNIDO's projects has also been reinforced.

This publication highlights the UNIDO-China cooperation in various areas. Over the years, UNIDO has partnered with a number of leading institutions in China, resulting in the successful implementation of a large number of projects in China and other developing countries, including Least Developed Countries.

The President of China, His Excellency Mr. Xi Jinping, highlighted in 2013 that China's cooperation with UNIDO had synchronized with China's reform and the process towards a greater openness, adding that UNIDO had made a positive contribution to this process. President Xi said UNIDO's new vision, focusing on Inclusive and Sustainable Industrial Development, fully concurred with China's priority for future development, as the country continues to promote industrialization and is ready to learn from

advanced international industrial development concepts and ideas. President Xi stressed that China has always supported the international development agenda within the framework of South-South cooperation. China is willing to work with UNIDO in a mutually beneficial spirit and based on a win-win principle, helping developing countries achieve the Sustainable Development Goals and contributing to international development and global prosperity.

The UNIDO-China cooperation is currently focusing on food safety and green industry, as well as on international cooperation on productive capacities. I am confident that with the firm support of the Government of China, the UNIDO-China cooperation will usher a new era and the best practice and success stories of China will benefit more people in the world, thus making our shared objective of eradicating poverty by 2030 a reality.

UNIDO Director General
Li Yong



China and UNIDO in five decades

In general, cooperation between UNIDO and the People's Republic of China has spanned three historical stages, namely from 1972 to 1978, from 1979 to 1999, and from 2000 onwards.



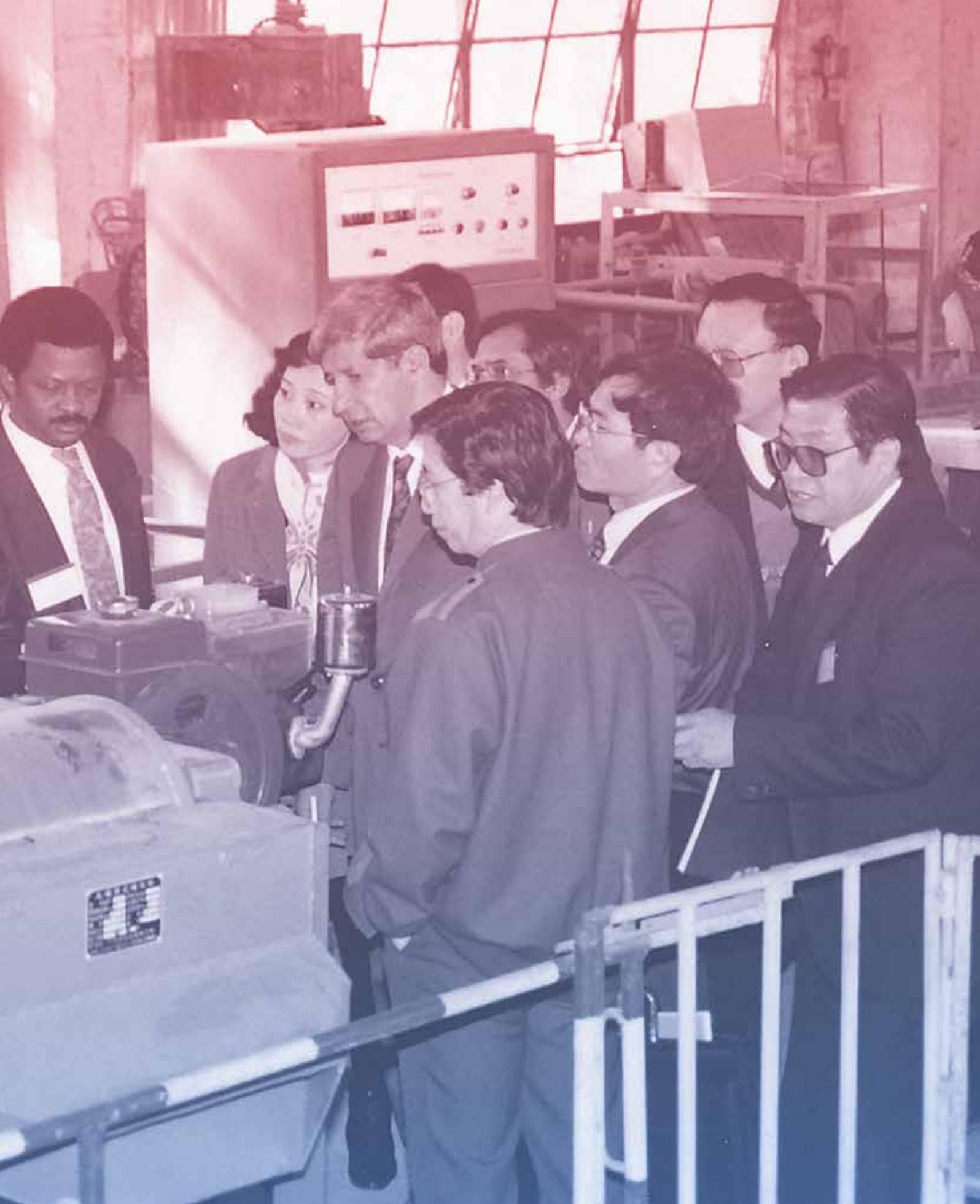




Photo: Jakub Halun



From 1972 – 1978

UNIDO and China's cooperation from 1972 to 1978¹

The people's Republic of China attended UNIDO's first session of the Permanent Committee as an observer in December 1972, and was elected in the same year as one of the 15 members of the Industrial Development Board of UNIDO. In September 1974, China set up its Permanent Mission to UNIDO in Vienna.

During these early years, China contributed funding to UNIDO but did not receive any technical assistance. On the contrary, China assisted UNIDO with the design and implementation of several pilot projects in other developing countries. For example, in 1975, China's voluntary contributions were used to finance projects aiming to promote the self-reliance of three developing countries:

In Mauritania, a joint UNIDO-China project helped establish a small-scale garment pilot plant. Following a feasibility study carried out by a team of experts from UNIDO and China, machinery and auxiliary equipment was installed with the guidance of Chinese experts. In the Lao People's Democratic Republic, a team of Chinese experts conducted a feasibility study on the establishment of a small-scale brick-making plant, while in Mali, as a result of a joint UNIDO-China project which began in 1973, a plant for repairing agricultural, transport and road-building equipment was constructed in December 1975.

In summary, the cooperation during this period could be described as China looking on UNIDO as an international platform on which it could express its point of view on the importance of industrial development, thereby gaining more attention from the international community.

¹ United Nations Industrial Development Organization, China Industrial Development Review (1996). The Economist Intelligence Unit.

From 1979 – 1999

China’s development from 1979 to 1999¹

In the late 1970s, China embarked on economic reform. The return of Deng Xiaoping to political prominence ushered in a period of dynamic growth of productive forces. Stimulated by the progressive lifting of controls on decisions about land use, coupled with a large rise in procurement prices for grain and industrial crops, agricultural output rose by an annual average of 5.5 per cent in the twelve years 1979-1990. This was the era in which peasant incomes boomed. Manufacturing, meanwhile, grew by 9.3 per cent a year in annual average terms over the same period, taking its share of GDP (at current prices) from a high 41 per cent in 1979 to a still substantial 33.6 per cent in 1990. Rapid growth in manufacturing output was stimulated by a number of factors associated with reform:

- » An emphasis on light industry, including consumer goods, to satisfy pent-up demand and absorb labour; the share of light industry in the gross value of industrial output rose from 43.1 per cent in 1979 to 47.1 per cent in 1985 and peaked at 49.4 per cent in 1990;
- » The progressive (but not complete) lifting of controls over the allocation of inputs, the output mix, prices and other areas of decision-making so that all enterprises moved closer to market;
- » Tolerance of the flowering of enterprise forms other than the paradigm state-owned enterprise (SOE), owned by the state and responsible to a central ministry or to the local government: collective and even private enterprises flourished during the 1980s, which saw the first waves of what would become a torrent of foreign capital, much of it invested in labour-intensive manufacture for export;

¹ United Nations Industrial Development Organization, China Industrial Development Review (1996). The Economist Intelligence Unit.

FIGURE 1 China: GDP and MVA (1979 – 1999)

Source: The World Bank

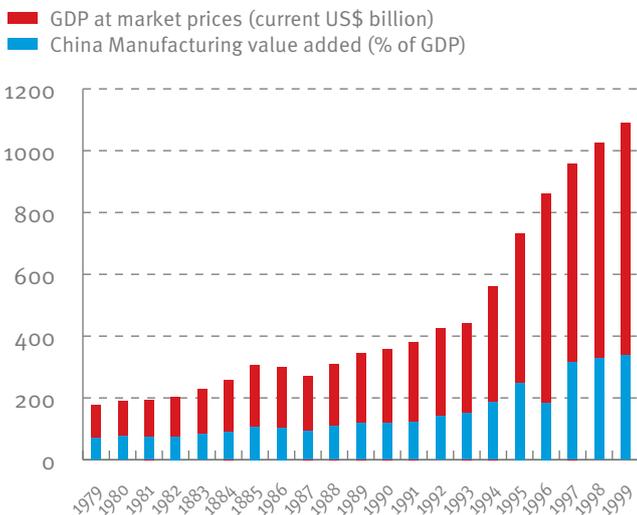
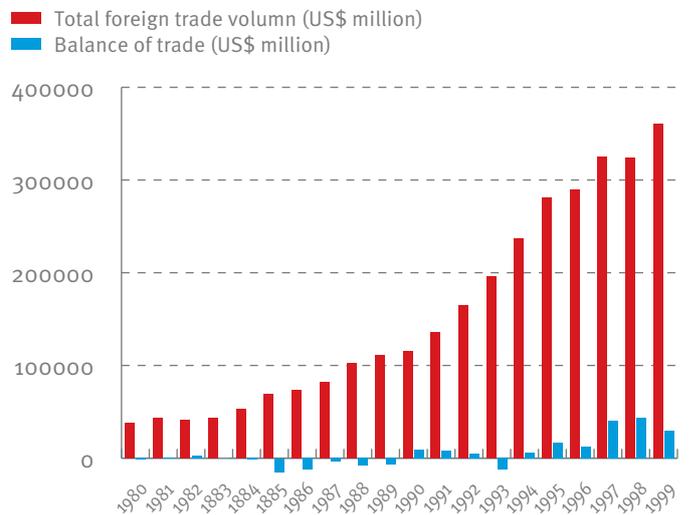


FIGURE 2 China: Export and Import (1980 – 1999)

Source: National Bureau of Statistics of China



Note: Positive figures represent trade surplus, whereas negative figures represent trade deficit

- » The establishment of China's first export processing zones in 1980. Four of these were set up along the south-east coast, near Guangdong and Hong Kong. Known as special economic zones (SEZs), they were so successful in attracting investment, especially from the Chinese diaspora, that 14 coastal cities along the eastern seaboard were designated to offer special terms for export-oriented foreign investment in 1984, and by the late 1980s virtually all provinces and large cities were competing to attract foreign capital.

Overall growth in the period of 1979-1990 was an impressive 8.7 per cent a year. By the end of the period, manufacturing accounted for 33.6 per cent of GDP, agriculture for 27 per cent and the services sector, still relatively underdeveloped, for only 31.4 per cent (all at current prices).

The years of 1991-1995, coinciding with the period of the Eighth Five-Year Plan, have been a period of unprecedentedly fast growth. In 1992, Deng Xiaoping went on a famous tour of the southern provinces and inspected the special economic zones (SEZs) of Shenzhen. His well-publicized words of praise for SEZs and for the economic achievements of the south-eastern seaboard, particularly the rapidly growing, export-oriented Guangdong Province, signalled a renewed commitment to reform, to decentralization of decision-making and to rapid growth.

The result of this renewed enthusiasm for speedy growth was, on the supply side, another burst of growth in industrial output, which accelerated from 12 per cent in 1985-1990 to 14.2 per cent in 1990-1995. Agriculture, meanwhile, started to suffer from diminishing returns.

The growth of exports and imports was especially fast after 1990. The volume of exports was estimated by the Economist Intelligence Unit to have grown by 19 per cent per year. Imports, meanwhile, grew by nearly 20 per cent a year in annual average terms over the same period. From this time onwards, environmental considerations began to make an impact on industrial policy in China.

UNIDO and China's cooperation from 1979 to 1999

From the time of its reform and opening up in 1979, China began to receive aid both from the United Nations Development Programme (UNDP) and from UNIDO, which began to assist with China's industrialization. The first recorded UNIDO project in China was "Advice to the Ministry of Petroleum and the Ministry of Chemical Industries on Technology Agreements" in 1979.

From 1979 to 1995², UNIDO's assistance to China was mainly provided through the programmes of the UNDP, which were run in parallel with China's Five-Year Plans and corresponded to the priorities and objectives of the Chinese government. During this period, UNIDO acted as an executing agency of UNDP in China and implemented over 140 projects, contributing to technological innovation, industrial upgrading and the economic development process.

In the initial years of this period, namely in 1979 and 1980, when China started to receive technical assistance from UNIDO, most of the programmes and projects took the form of official visits, study tours, training and experience exchange. Although the cooperation was limited, it offered a "window" for China to connect with international experts in the early days of reform and opening up, and to learn about technologies and development experiences in the developed countries. Some of the study tours, training and experience-exchange programmes facilitated China's important policy decisions, such as those related to the establishment of special economic zones (see Chapter 3) and industrial parks.

² UNDP's three country programmes were prepared in parallel with the country's Sixth, Seventh and Eighth Five-Year Plans (1981-1985, 1986-1990, and 1991-1995). From 1979 to 1980, there were no UNDP country programmes except an interim arrangement, providing US\$15m for projects.

From 1996, UNIDO was no longer an executing agency for the UNDP in China.



Through UNIDO's network, a Chinese delegation led by Wei Yuming, Vice Minister of Foreign Economics and Trade, is discussing potential cooperation with representatives of Voestalpine, a steel-based technology and capital goods group that is based in Linz, Austria and operates worldwide.

AUSTRIA, 1982

In 1981, UNIDO placed a senior field technical advisor in Beijing to oversee the cooperation projects in China. Within the framework of UNDP's country programmes (till 1995), UNIDO provided assistance that was closely aligned with the priorities of China's Five-Year Plans. Through **introducing advanced technologies, equipment and expertise**, UNIDO helped China with its agricultural and industrial development.

Regarding industrial development, UNIDO executed several projects which introduced advanced technologies and equipment in sectors of agriculture, metallurgy, machine tools, dyeing, chemicals, bearing, cement, locomotives, leather-making, pesticides, nuclear power and other industries. For example, in the 1980s and 1990s UNIDO introduced the application of computer aided design (CAD) and computer aided manufacturing (CAM) in China's industrial modernization process (Box 1). This was very important for the country's economic take-off in the early days of industrialization.



Second left is Wei Yumin, then Vice Minister of Foreign Trade and Economic Cooperation of China; third left is Wang Zichuan, the first Permanent Representative of China to UNIDO.

AUSTRIA, 1982



UNIDO provided the Zheng Zhou Light Metal Research Institute with advanced laboratory equipment for non-ferrous metal research and development.

HENAN PROVINCE, 1982



A UNIDO project provided technical assistance to the reliability- and life-testing laboratory for electronic components in Guangzhou.

GUANGZHOU PROVINCE, 1984

Box 1 | UNIDO and CAD/CAM projects in China

On China's request, UNIDO introduced many advanced technologies to China. A case in point was the application of computer technologies in industrial design and manufacturing.

In 1982, UNIDO assisted China with the expansion of the use of advanced technology in the fields of computer-aided manufacturing (CAM) and computer-aided design (CAD) in the agricultural machinery sector.

In 1985, similar assistance was given to the Service Centre of Testing Technology in East China through training on applying computer technologies in analytical instruments and inorganic material analysis. In the same year, a project on the training and development of microcomputer systems applications was implemented. A process control microcomputer system was designed for the Sichuan Pharmaceutical Factory to improve efficiency and control

the quality of tetracycline produced by the factory. The system was later popularized in the pharmaceutical industry.

In 1987, a project was initiated to facilitate the establishment of a CAD/CAM centre in Beijing, which aimed to introduce computer technology in industrial design and manufacturing. In the same year, UNIDO implemented another project to improve the design of a prototype locomotive diesel engine using computer technology. Completed in 1990, the project helped install a computer- and processor-controlled diesel locomotive roller test station that conformed to the international standard at the time.

In 1989, CAD/CAM was introduced to the metal sector to improve the quality and life span of tools. In the same year, a project executed by the Chinese Government involving technical cooperation with the

Hangzhou Bearing Test and Research Centre helped improve the vibration and noise testing of rolling bearings.

In 1990, the largest manufacturer of milling machines in China was given assistance with the installation of a computer-based manufacturing resource planning system. Extended applications of CAD/CAM techniques in manufacturing dies and fine blanking were also carried out in China. In 1991, UNIDO implemented five projects aimed at the modernization of the machine tool industry in China. These included computer numerical control development; foundry machinery industry; the establishment of flexible manufacturing facilities; the development of turrets for numerically-controlled lathes; and the introduction of modular design for small- to medium-sized machine centres.

Source: UNIDO Annual Reports

UNIDO also introduced advanced technologies in relation to biogas, GPS, shipbuilding, radio monitoring, optical fibres, food additives, silicone, carbon fibre, computers, remote sensing, satellite, weather forecasting, earthquake early warning, data exchange, solar energy, small hydro power, and many others. All these have contributed to the technological advancement of industrialization in China.³

In addition to technological assistance, UNIDO also assisted Chinese industries in **complying with international standards** to enable them to participate in global trade. Examples include standards regarding food hygiene and food safety (ISO 22000), as well as other important international systems standards such as quality management (ISO 9001), environmental management (ISO 14001), and social accountability (SA 8000).

As early as in 1983, UNIDO supported the Qualification and Surveillance Laboratory for Consumer Electronic Products of China in obtaining the full membership of the Inspection Coordination Committee for International Standards, thus enabling the laboratory to participate in international certification activities.

In April 1995, UNIDO and the China State Bureau of Technical Supervision co-sponsored an Expert Group Meeting on Quality, Standardization and Metrology for Developing Countries in Beijing. In the same year, Chinese experts were invited to participate in a workshop in Vienna on the potential effects of the ISO 9000 and ISO 14000 series and environmental-labelling on the trade of developing countries. These activities helped promote ISO standards in China, and facilitated China's entry into international trade.



Computer aided manufacturing technology was introduced to the Beijing No. 1 Machine Tool Plant.

BEIJING, 1995



The former Chairman of the Central Planning Committee visits the plant. Photo was taken in the "war room" where IT equipment for managing the project was placed.

BEIJING, 1995

In 1996, UNIDO supported the State Planning Commission in formulating regulation and establishing standard concession agreements for Build-Operate-Transfer (BOT) projects in the road, power and water sector.

Meanwhile, to help China overcome its **foreign exchange** shortages and promote the **inflow of foreign investment**, in October 1985, UNIDO and the Ministry of Light Industry co-organized a one-month training programme on foreign investment in Guangdong Province. Since then, UNIDO and local governments have organized many investment promotion activities in Fujian, Xi'an, Yingkou, Kunming

³ Yao Shenhong, Zhao Yongli, Li Kunxian, UNDP in China: History and Opportunities, China Commercial Press, 2014, first edition, page 21-22.



Chen Muhua, Vice Premier and Minister of Foreign Economic Relations and Trade, met UNIDO Executive Director, Abd-El Rahman Khane.

GUANGZHOU, 1982

and Tumen (Box 2), which all strongly promoted foreign direct investment in China. Some of them have become regional or global trade and investment fairs, such as the China International Fair for Investment and Trade (CIFIT). UNIDO offered professional technical service through these programmes and supported China in learning how to absorb foreign investment.

In 1992, UNIDO helped China develop a **“National Agenda 21 - White Paper on China’s Population, Environment and Development in the 21st Century”**. This followed the first UN Conference on Environment and Development held in Rio de Janeiro in the same year, which adopted the Rio Declaration on Environment and Development (Agenda 21) recognizing each nation’s right to pursue social and economic progress and assigning to states the responsibility for adopting a model of sustainable development. Agenda 21 also explicitly identified stratospheric ozone protection and actions under the Montreal Protocol as a basis for action related to Protection of the Atmosphere. In the same year, UNIDO became an implementing agency of the Montreal Protocol on Substances that Deplete the Ozone Layer.



Tian Jiyun, Vice Premier of the State Council held a meeting with UNIDO Director General Domingo L. Siazon Jr.

BEIJING, 1989



Panellists at the Expert Group Meeting on Quality, Standardization and Metrology for Developing Countries.

BEIJING, 1995

A leading group, consisting of UNIDO experts, a deputy minister of the State Science and Technology Commission and a deputy minister of the State Planning Commission, was established in August 1992 to organize and coordinate the formulation and implementation of China's Agenda 21, which was later approved by the State Council in March 1994. The State Council also issued a directive calling on government institutions at all levels to consider China's Agenda 21 as an overarching strategic guideline for the formulation of economic and social development plans, and particularly to integrate it into the Five-Year Plan (1996-2000), plans for the year 2010, and into day-to-day management.

Within this context, and coinciding with the fact that from 1996 UNIDO was no longer an executing agency of UNDP, UNIDO's technical assistance and policy advice in China started to shift its focus to **environmental programmes**. Climate-related projects started in 1997, when UNIDO introduced new energy-efficient technologies in township and village enterprises. In 1998, under the Montreal Protocol, UNIDO started a project to phase out ozone-depleting chlorofluorocarbons (CFCs) in the refrigeration sector in China.

Box 2 | Yanji-Tumen River Region International Investment and Trade Fair

In October 1995, the First Yanji-Tumen River Region International Investment and Trade Fair opened in Yanji, Jilin Province. The Fair was organized by UNIDO, the Ministry of Foreign Trade and Economic Cooperation, the Jilin Provincial Government and the Yanji City Government. Business groups and representatives from 29 countries and regions, including the United States, Canada, Japan, Republic of Korea and South Africa, attended the Fair.

Under the theme of "Communication, Cooperation and Development", the Fair covered topics on overseas investment, international trade, and investment negotiation. At the Fair, over 400 projects were introduced and over 100 contracts and agreements were signed. The total FDI attracted was over US\$600m. The Fair significantly helped to promote international cooperation in the Tumen River area, and created a favourable environment for investment and trade in northeastern China.

Source: Jilin Provincial Government



Since 1990, women have been engaged in industrial activities, in particular in SMEs.

During this period, UNIDO also took initiatives to engage more women in productive activities. In 1995, the Fourth World Conference on Women took place in Beijing, and under the guidance of the Conference's task force, UNIDO published five regional analyses on the participation and role of women in manufacturing. In 1996, UNIDO helped develop a training package to improve the managerial skills of female managers in township and village enterprises.

UNIDO also established several **technical centres** in China, such as the International Centre for Agricultural Machinery Industry in Beijing, established in 1980, which aimed to advance cooperation and experience exchange among developing countries and promote "twining" of appropriate programmes between developing and industrialized countries; the UNIDO-Beijing International Industrial Cooperation Centre set up in 1989 and fully operational in 1990; the International Centre on Small Hydropower (ICSHP) in Hangzhou established in 1994; and the China National Cleaner Production Centre (CNCPC) in Beijing, which opened in 1994, to carry out various research on cleaner production policies, laws and regulations and which has become one of



Wu Yi, then Vice Premier, at the Fourth World Conference on Women.
BEIJING, 1995

the key technical supporting institutes for the China National Development and Reform Commission (NDRC), the Ministry of Environmental Protection (MEP), and the Ministry of Industry and Information Technology (MIIT).

From 2000 onwards

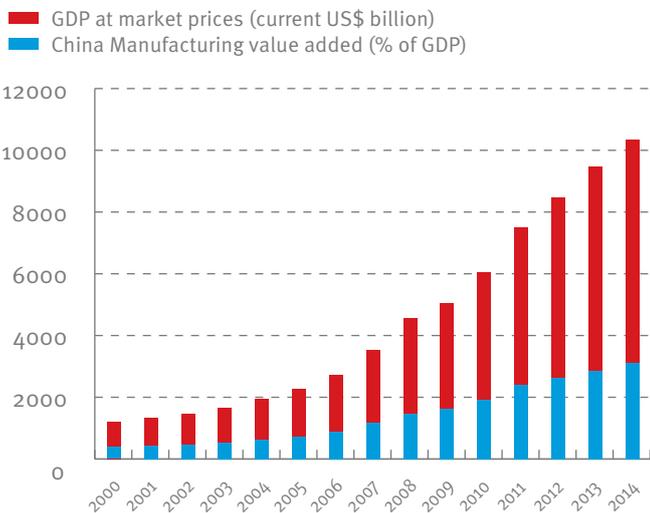
China's development since 2000

Since initiating market reforms in 1978, China has shifted from a centrally-planned to a market-based economy and has experienced rapid economic and social development. GDP growth has averaged nearly 10 per cent a year—the fastest sustained expansion by a major economy in history. As the economic reform deepened and opening-up level increased, China's economic and social development opened a new chapter after entering the 21st century.

In December 2001, China officially became a member of the World Trade Organization (WTO) after 15 years of arduous and prolonged negotiations. Since then, China has scored remarkable achievements in economic terms, especially in exports. In 2009, China became the world's biggest exporter, ahead of Germany. Manifestations of further advances were the massive imports of crude oil and a vast appetite for iron ore and copper.

FIGURE 3 China: GDP and MVA (2000 – 2014)

Source: The World Bank



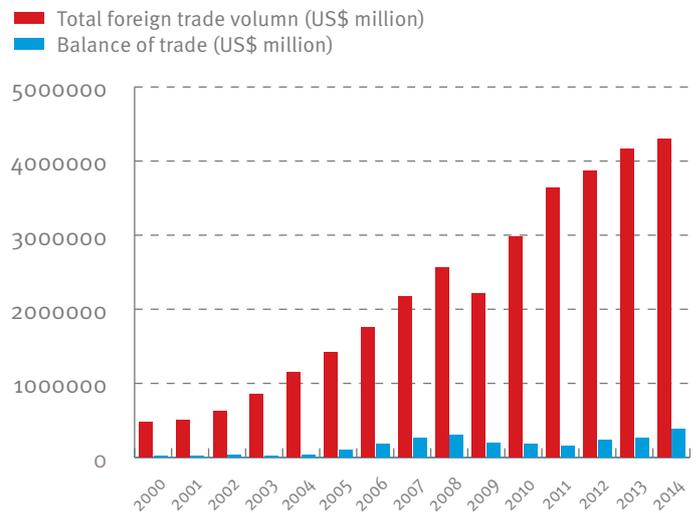
During this time, China has also become an industrial powerhouse, moving beyond initial successes in low-wage sectors, like clothing and footwear, to the increasingly sophisticated production of computers, pharmaceuticals and automobiles.

China recently became the world's second largest economy and is increasingly playing an important and influential role in the global economy. It has lifted more than 800 million people out of poverty. China reached all the Millennium Development Goals (MDGs) by 2015 and made a major contribution to the achievement of the MDGs globally.

Notwithstanding these considerable achievements, there remain a number of significant development challenges, including high inequality; rapid urbanization; challenges to environmental sustainability; and external imbalances. All these need to be addressed for China to achieve the SDG targets by 2030 and retain an equitable distribution

FIGURE 4 China: Export and Import (2000 – 2014)

Source: National Bureau of Statistics of China



Note: Positive figures represent trade surplus, whereas negative figures represent trade deficit

of development benefits. The sheer size of the country and its over 1.3 billion population make these challenges more complex and diverse, often requiring coordinated actions at national, regional and local levels.

Significant policy adjustments are required in order for China's growth to be sustainable. Experience shows that transitioning from middle-income to high-income status can be more difficult than moving up from low to middle income.

China's 12th Five-Year Plan (2011-2015) and the newly approved 13th Five-Year Plan (2016-2020) forcefully address these issues. They highlight the development of services and measures to address environmental and social imbalances, setting targets to reduce pollution, to increase energy efficiency, to improve access to education and healthcare, and to expand social protection. The annual growth target in the 12th Five-Year Plan was 7 per cent and the growth target in the 13th Five-Year Plan is 6.5 per cent, reflecting the rebalancing of the economy and the focus on the quality of growth, while still maintaining the objective of achieving a "moderately prosperous society" by 2020 (doubling GDP for 2010-2020)⁴.

Under the new leadership, headed by President Xi Jinping, China is now embarking on its road of revitalization. In 2012, President Xi proposed the "China Dream" - that is, the "great rejuvenation of China" - to the whole nation and called on the people to work for a modernized socialist country by the 100th Anniversary of the People's Republic of China.

UNIDO and China's cooperation since 2000

As UNIDO was not an executing agency for UNDP-funded projects from 1996, it began to tap into other multilateral

funding sources, such as the Global Environment Facility (GEF) and the Multilateral Fund for the Implementation of the Montreal Protocol, and these became the main extra-budgetary resources that have supported UNIDO's programmes and projects in China.

The programmes and projects have been implemented within the China-UNIDO Country Programme Framework. Since 2000, three Country Programme Frameworks have been adopted: The first Country Programme Framework (2001-2005), signed between China and UNIDO in 2001, focused on foreign investment introduction and technology transfer in the West, and on energy, environmental protection and information technology in the southeast coastal region. The second Country Programme Framework (2008 - 2010)⁵ assisted China in areas such as environmental protection, sustainable development, food safety, agro-business, South-South cooperation and human development. The current Country Programme Framework (2016-2020) focuses on green industry, food safety and international cooperation.

One of the significant features of UNIDO's activities in China was the shift of cooperation priorities:

- » from promoting industrial modernization and economic growth through the introduction of technology, equipment, expertise and investment in the 1980s and 1990s,
- » to developing clean energy and protecting the environment in the late 1990s and 2000s.

Since the late 1990s, environmental pollution has been recognized as a serious problem in China. Industry is by far the largest single source of pollution, and the environmental legislation and regulation in place recognizes and seeks to address this. There were, however, problems with enforcement of a system that relied on administrative

⁴ The World Bank. (2016). China Overview. <http://www.worldbank.org/en/country/china/overview>

⁵ There was no Country Programme Framework in 2006 and 2007.

command rather than incentives. Compliance with environmental regulation by non-state firms was also hard to enforce. Many township and village enterprises were run by managers whose remuneration was linked closely to short-term profit. Many local governments accorded job provision a higher priority than prevention of pollution.

Over the years, UNIDO has acquired a wealth of experience in China in providing technical assistance to abate industrial pollution. In particular, the assistance provided in this period focuses on the **promotion of resource-efficient and low carbon production, access to cleaner and renewable energy, and the implementation of international norms, protocols and conventions concerning environmental protection, as well as compliance with international standards.**

Resource efficiency and low-carbon production

Sustainable consumption and production is at the forefront of the international sustainable development agenda. At a global level, sustainable industrial development is an accepted practice and the key to it is Resource Efficient and Cleaner Production (RECP). In China, in cooperation with UNEP and relevant ministries, UNIDO started to promote the concept of RECP through the China National Cleaner Production Centre (CNCPC), which was established in 1994.

One example of the focus on sustainable production was UNIDO's work in industrial motor systems, starting in 2001. Industrial motor systems accounted for more than 50 per cent of overall industrial electricity use at the time. With funds from the United Nations Foundation and the United States Department of Energy, UNIDO initiated a project aiming to help China's electric motor systems achieve 20 per cent of energy saving on average.

In the same year, UNIDO introduced two software packages for waste management, one for the treatment of tannery effluents, and another specifically designed for municipalities

seeking to identify the best way to deal with the waste they collect. The latter was put to good use when UNIDO and the Ministry of Construction collaborated on a municipal solid waste management programme in five selected municipalities, focusing on the minimization of waste, the maximization both of environmentally sound recycling for reuse, and likewise of treatment and disposal. The programme was strongly supported by the Chinese Government, reflected in legislation and the inclusion of waste management elements in China's Agenda 21.

Meanwhile, UNIDO provided assistance to improve energy efficiency in some Chinese industries with the introduction of pollution prevention technologies. One such example was in the industrial heat systems. (Box 3 on page 21)

UNIDO's technical assistance helped China reduce the consumption of natural resources, industrial wastes, greenhouse gas and other emissions in industrial processes, as well as facilitating the transfer of new, low-pollution and low-energy-intensive technologies and processes essential to efforts to follow a sustainable path.

Implementation of multilateral environmental agreements

Together with the Foreign Economic Cooperation Office (FECO) of the Ministry of Environmental Protection, UNIDO carried out a series of activities that helped China implement multilateral environmental agreements. Since 1992, China and UNIDO have developed dozens of projects in the areas of phasing out ozone-depleting substances (ODS), reducing persistent organic pollutants (POPs) emissions and environmentally sound management of mercury. The implementation of these projects has played a significant role in promoting the transition to a green industry, as well as technology upgrading in sectors including refrigeration, foam, pharmaceuticals, agriculture, tobacco and smelting. (More details can be found in Chapter 3)

Box 3 | Promoting energy efficiency in industrial heat systems and high-energy consuming (HEC) equipment.

Following the promulgation of the Energy Conservation Law in 2007, regulations were issued specially for the management of high-energy-consuming (HEC) equipment. While there were certain existing national codes and standards for testing industrial and domestic boilers, a technical testing system was needed. Under the new system, the existing regulations needed to be revised, and the stakeholders involved needed to gain new skills.

Through the joint efforts of UNIDO, the Global Environmental Facility (GEF), the China Special Equipment Inspection and Research Institute (CSEI), and the Bureau of Safety Supervision of Special Equipment (SESA) of the General Administration

of Quality Supervision, Inspection and Quarantine (AQSIQ), a project titled “Promoting energy efficiency in industrial heat systems and HEC equipment” was implemented in 2008.

The project promoted energy efficiency in HEC equipment through the development of technical regulations, the establishment of national laboratories, the training of national experts and the demonstration of new technologies at the enterprise level. In particular:

- 1 It adopted an enhanced regulatory framework for testing standards and market promotion, which enabled HEC equipment users to adopt energy efficiency measures

and government institutions to monitor compliance.

- 2 It provided the government agencies with training to acquire the capacities required to enforce the technical regulations; trained practitioners of the national system of optimization from the public and private sectors to become technical experts; and increased the awareness of enterprises of energy efficiency measures, new technologies and financing mechanisms.

- 3 It also demonstrated new technologies at the national level which served as a case study for future investments.

Source: UNIDO

Renewable energy

As renewable energy has assumed a critical role in meeting the rising demand for energy, especially in industry in developing countries, UNIDO has been actively engaged in exploring and promoting renewable energy resources across the globe. In China, UNIDO established a solar energy centre and a small hydro-power centre to promote renewable energy technologies and products. The two centres, namely the International Centre on Small Hydropower (ICSHP), officially established in Hangzhou in 2000 (the entity was created in 1994 without a facility), and the International Solar

Energy Centre for Technology Promotion and Transfer (ISEC), established in Lanzhou in 2004, promote the application of renewable energy technologies in China and in other parts of the world. (More details can be found in Chapter 3.)

Compliance with International Standards

In addition to projects concerning renewable energy, cleaner production and the implementation of multilateral environmental agreements, UNIDO implemented several projects that further encouraged Chinese industries to comply with **international standards**. In 2008, UNIDO and the China

Standards Certification Centre convened an international working group for representatives of different countries which had prepared or were preparing standards or needed to assess the potential impact of such standards. The first meeting held in Beijing facilitated the harmonization of existing standards. The working group further developed the meeting to a forum where developing countries could contribute their inputs to the process of standards development.

UNIDO in China also carried out some projects concerning standards in food safety. For example, Fujian Province is a critical food exporter in China, and it was of paramount importance to strengthen the local enterprises' capability to comply with international food safety standards. In 2013, UNIDO, together with the provincial Department of Foreign Trade and Economic Cooperation, conducted trainings concerning the food safety management system (ISO 22000) and traceability in the feed and food chain (ISO 22005) for small- and medium-sized enterprises. As a result, the food safety management system was promoted among 225 food enterprises and the awareness of food safety was enhanced in the province.

As a demonstration of the strengthened capacity of Fujian Province, ten enterprises were certified with ISO 22000, which enabled them to become more competitive both on the domestic and export markets. UNIDO also raised the awareness of 200 Chinese enterprises on traceability in the feed and food chain (ISO 22005) in Fujian Province. As food safety is a key priority of the Government, a UNIDO-China Food Quality, Safety and Testing Training Facility was jointly established in Dali. So far, this training facility has trained 42 international participants from 14 countries across Asia and Africa, and 50 national participants from 9 provinces in China.

In recent years, UNIDO also implemented several projects to help foster **Corporate Social Responsibility (CSR)** among

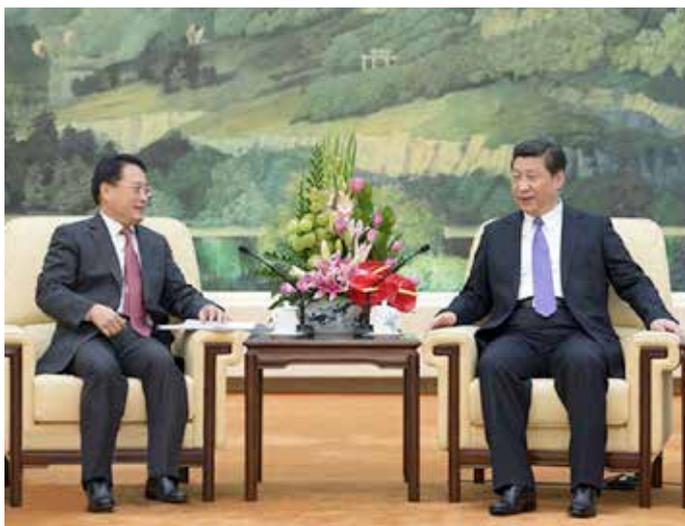


The UNIDO-China Food Quality, Safety and Testing Training Facility was established in Dali in 2011.

Chinese SMEs. In 2008, the Organization implemented a pilot project promoting CSR in the Chinese textile industry in partnership with ILO, the China National Textile and Apparel Council. The project focused on improving labour management, working conditions, environmental management and productivity in this sector. Meanwhile, it built up the Council's capacity to deliver comprehensive, integrated CSR training, advice and information to enterprises which wish to improve their labour and environmental standards.

In 2013, UNIDO, the China International Centre for Economic and Technical Exchanges (CICETE) and the China Construction Industry Association (CCIA) jointly launched a CSR project in the Chinese construction industry. The project is still ongoing. So far, it has completed a Chinese Construction Industry Social Responsibility Primer, compiled a Construction Industry Social Responsibility Assessment Standard and Guidelines for Social Responsibility Integration of Construction Industry, and carried out pilot projects in several construction enterprises in China. A Chinese Construction Industry CSR Blue Book is under preparation. The project will significantly promote CSR in China's construction industry.

Meanwhile, as part of its global forum function, UNIDO contributed to some significant economic steps in China. In December 2000, UNIDO, in cooperation with the Shanghai Municipal People's Government, the State Economic and



UNIDO Director General Li Yong with President Xi Jinping.
BEIJING, 2013

Trade Commission and the Ministry of Foreign Trade and Economic Cooperation of China, organized the Asia-Pacific Forum on Industrial Development in Shanghai. The Forum was attended by ministers of industry and trade and representatives of the private sector from 19 countries. After a review of the potential impact of China's entry to the World Trade Organization (WTO) on the productive sector in the region, the Forum concluded that China's entry into WTO would dramatically change the competitive prospects of the region's industry, as well as investment flows. It was suggested that China's entry would, in all probability, improve the bargaining power of developing countries as a whole and introduce greater equity in multilateral trade negotiations. UNIDO's then Director-General, Carlos Magariños, said that China's entry into the WTO would not only change China, but would also change the WTO and at the same time have important implications for the developing world. He presented a two-fold business plan that aimed to develop a systematic benchmarking of productivity performance and related policies across the industrial sector, and to implement technical cooperation programmes together with multinational private companies. In the following year, China became a member of WTO.

During this period, UNIDO set up many other centres and offices in China to facilitate and expand UNIDO's technical assistance and policy support to the country. These include Investment and Technology Promotion Offices (ITPOs),



UNIDO Director General with Premier Li Keqiang.
BEIJING, 2015

Industrial Subcontracting and Partnership Exchanges (SPXs), and the UNIDO Centre for South-South Industrial Cooperation (UCSSIC). (More details can be found in Chapter 4)

Since Li Yong took over the position of UNIDO Director General in 2013, UNIDO and China's cooperation has been further consolidated and expanded.

In conclusion, over the past 50 years, UNIDO's assistance to China has covered a wide range of complementary areas, such as technology and knowledge transfer; skills and expertise development; institutional strengthening and capacity building; trade and investment promotion activities, and, energy and environment management. This technical assistance and policy advice have played an important role in China's economic and social development.

In a meeting with UNIDO's incumbent Director General, Li Yong in 2013, President Xi Jinping pointed out that

“China's cooperation with UNIDO had synchronized with China's reform and process of openness, and UNIDO had made a positive contribution to this process (of reform and opening up).”

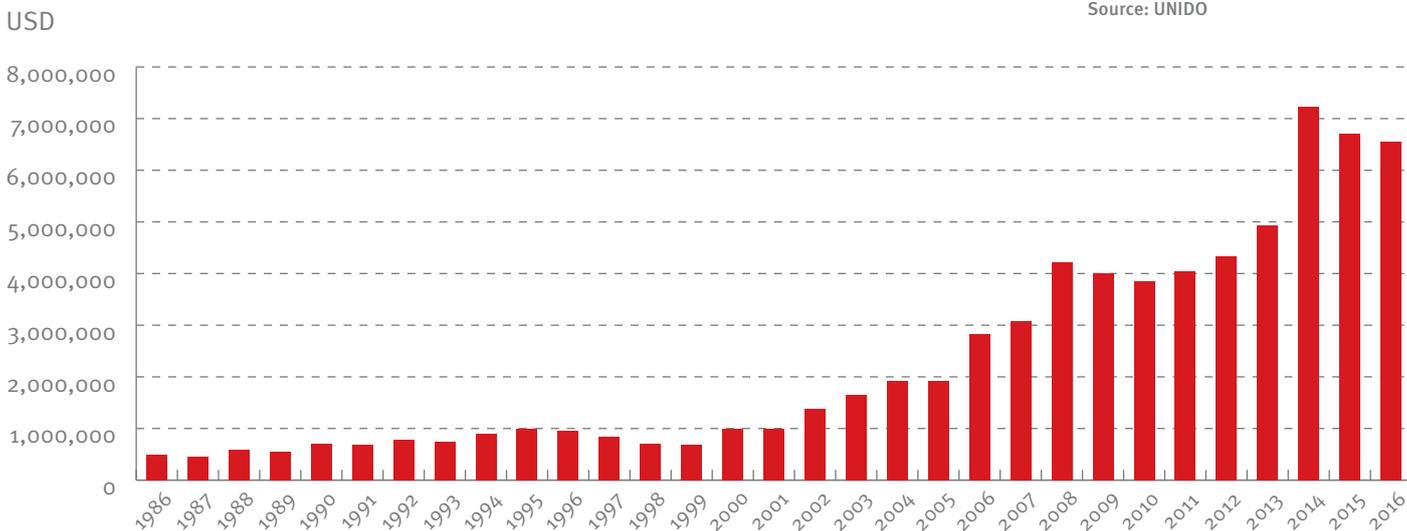
China's financial support to UNIDO

China's support to UNIDO started as early as in 1973. China makes contributions to UNIDO and pays its voluntary and assessed contribution on time. In the very early years of cooperation with UNIDO, though China was relatively poor, it contributed voluntary funds to UNIDO to support projects in other developing countries. Since the reform and opening up, UNIDO's assistance to China has been on the increase. China also participates in various UNIDO global forums, meetings and activities, through which it contributes to the industrial development of other developing countries.

China's annually assessed contributions to UNIDO

China has always made full payments of its assessed contribution on time. Currently, China's contribution to UNIDO accounts for around 8 per cent of UNIDO's total assessed contributions. Figure 5 shows China's assessed contributions since 1986.

FIGURE 5
China's Assessed Contribution Since 1986
 Source: UNIDO



China's contribution to the Industrial Development Fund

In addition to the annually assessed contributions, every year China contributes to the Industrial Development Fund (IDF) to promote industrial and technical advancement and accelerate China's technical exchanges with other countries. With its increasing economic might and industrial technical capability, China's contribution to the IDF has steadily increased since the mid-1990s. The amount in 2010 was 3.5 times higher than that of 1990 (see Figure 6). In June 2013, when Li Yong was elected as the Director General of UNIDO, China pledged to contribute US\$5m per year in the period 2013-2016 in support

of the Organization's activities. The fund is used to further advance technical cooperation and advisory services in Africa, Central Asia, and the Latin American and Caribbean region in line with UNIDO's new focus on inclusive and sustainable industrial development (ISID), as well as to promote activities that help advance South-South cooperation.

In addition, China provides various forms of assistance to the industrial development of other developing countries through UNIDO's activities and the UNIDO Centre for South-South Industrial Cooperation in China. (More details can be found in Chapter 4.)

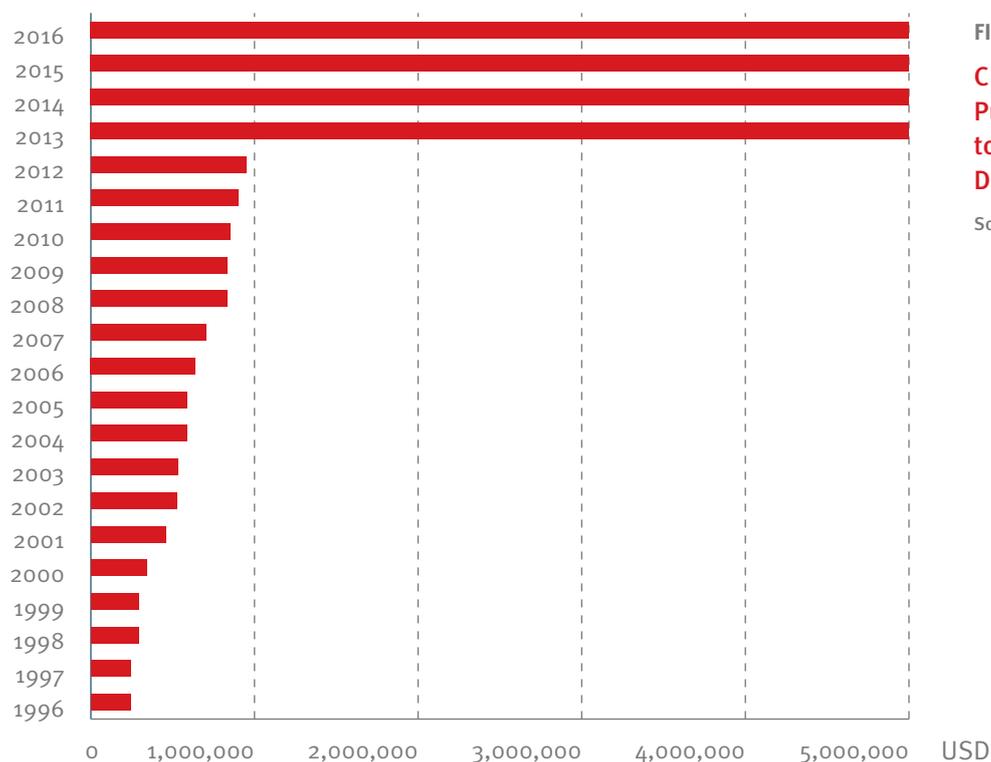


FIGURE 6

China's Special-Purpose Contributions to the Industrial Development Fund

Source: The Ministry of Commerce

UNIDO 1966 – 1975



Ibrahim Helmi Abdel-Rahman (Egypt) becomes first Executive Director.



A Light Industries Section established to provide technical assistance for textiles and garment-making, leather-tanning, woodworking, food-processing, ceramics, brick-making and other sectors.

UNIDO established

1966

17 November, UN General Assembly Resolution 2152 (XXI) establishes UNIDO.



1966

Ibrahim Helmi Abdel-Rahman

Identifying challenges

1968

Industrial Surveys and Studies programme focuses on problem areas in industrial development.



1969

Supporting light industries



Joint programme with UNEP helps preserve the environment without slowing down the rate of industrial development.



Second General Conference adopts Lima Declaration and Plan of Action on Industrial Development and Cooperation.

First biennial forum for African leaders and other stakeholders to review progress with Africa's industrialization.

Assisting African countries

Abd-El Rahman Khane

1973

1974

1975

1975

Encouraging economic and technical cooperation among developing countries.

Protecting the environment

New Executive Director, Abd-El Rahman Khane (Algeria) takes up office.

**The First Lima Declaration
First Conference of African
Ministers of Industry**



UNIDO 1978 – 1993

Export processing zones



Vienna International Centre (VIC) custom-built by Austrian Government.

Investment projects



UNIDO becomes a specialized agency under newly elected Director General, Domingo L. Siazon Jr (Philippines).

Integrated approach

Investment technology promotion

1978

UNIDO and regulatory authorities of export processing zones (EPZs) from 29 countries form World Export Processing Zones Association.



1979

New headquarters

1981

Analytical methodology with computer model (COMFAR) improves quality of investment projects in developing world.



1985

Domingo L. Siazon Jr

UNIDO strengthens links between industry and agriculture, and service sectors.

First investment promotion services introduced to become future network of Investment and Technology Promotion Offices (ITPOs).





International Centre for Genetic Engineering and Biotechnology opens facilities in Italy and India.

Unit for the integration of women in industrial development created.

1987

New technology centre
Women's empowerment

Preserving the ozone layer

UNIDO assists countries phase out use of ozone-depleting substances under Montreal Protocol.



Mauricio de Maria y Campos (Mexico) is elected Director General.

1993

Mauricio de Maria y Campos

Cooperation with EU

UNIDO and the European Union sign Cooperation Agreement.



1993



The first Multi-function Platform projects implemented to provide affordable and modern energy services to rural populations in Mali and Burkina Faso.

1993

The Multi-function Platform

UNIDO 1994 – 2006

SME cluster and network development



UNIDO and UNEP jointly establish the first National Cleaner Production Centres.

Build-Operate-Transfer (BOT)



Carlos Magariños (Argentina) is elected Director General.

Public-private partnerships

1994

New programme focuses on networking to develop small-scale enterprises (SME).



1995

Cleaner production centres

1996

Publication of Guidelines for Infrastructure Development through Build-Operate-Transfer Projects.



1997

Carlos Magariños

1998

UNIDO and Fiat agree to upgrade car component suppliers in India. Public-private partnerships with Microsoft, Hewlett Packard, Metro Group, AEON, Samsung and Volvo follow.





Partnership with Global Environment Facility enhanced with focus on persistent organic pollutants reduction and sound chemical management.

2000

Global Environment Facility

Stockholm Convention

UNIDO becomes major implementing agency under Stockholm Convention on Persistent Organic Pollutants.



UNIDO becomes key player in WTO-led Aid for Trade initiative.

The Kyoto Protocol establishes legally binding obligations for developed countries to reduce their greenhouse gas emissions.

2005

**Aid for Trade
Kyoto Protocol**

Kandeh Yumkella

Kandeh Yumkella (Sierra Leone) is elected Director General.



UNIDO Centre for South-South Industrial Cooperation established in China.

New programme to support the local production of essential medicines in developing countries.

2006

**South-South
Industrial
Cooperation Centre
Manufacture of
essential medicines**

UNIDO 2009 – 2013



Vienna Energy Forum Green Industry Conference

New policy on gender equality and women's empowerment adopted.

Network for Resource Efficient and Cleaner Production



Organization-wide change programme streamlines business processes and implements Enterprise Resource Planning system.

2009

2009

2010

2010

First Vienna Energy Forum (VEF) is held.

Government of the Philippines hosts first Green Industry Conference.

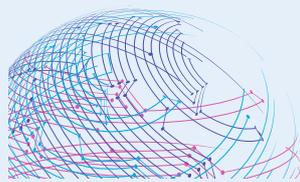


Gender equality policy

UNIDO helps form Global Network for Resource Efficient and Cleaner Production (RECPnet).

Change and organizational renewal





**ISO 50001 standard
Cleantech Innovation
Programme**

UNIDO Institute for Capacity Development established to provide training on key aspects of industrial development.

**Sustainable energy
initiative
Climate Technology Centre
and Network**



LI Yong (China) is elected Director General.

2011

2011

2012

2013

ISO 50001 standard on energy management developed with key support from UNIDO.

UNIDO and the Global Environment Facility GEF partner to launch Global Cleantech Innovation Programme for SMEs.



**Institute for Capacity
Development**

Ministerial Energy Forum in Ghana paves way for Global Network of Regional Sustainable Energy Centres.

Conference of Parties to UN Framework Convention on Climate Change entrusts UNIDO and UNEP with establishing Climate Technology Centre and Network.



LI Yong



2030 Agenda for Sustainable Development adopted, with 17 Sustainable Development Goals (SDGs). SDG 9 reflects UNIDO's mandate.

**Financing for development
Gender equality strategy**

**G20 highlights role of
industry**



2015	2015	2016	2016
-------------	-------------	-------------	-------------

Third International Conference on Financing for Development takes place in Addis Ababa, Ethiopia.

Strategy on gender equality and the empowerment of women introduced.

**Sustainable
Development Goals**

UNIDO presents Industrialization in Africa and Least Developed Countries report to G20.

**UNIDO celebrates
50 years**





In pictures: 50 years of UNIDO in China

This chapter contains images offering a visual representation of UNIDO's impact in China. The images were chosen to reflect the various fields that the Organization has been working on, covering areas of creative industry, food safety, productivity enhancement, standards and compliance, corporate social responsibility, environmental protection, cleaner production, energy efficiency, renewable energy and so on. In general, these areas can be categorized under three themes: **People | Prosperity | Planet**. However, it is important to note that these selected activities by no means reflect the full scope of UNIDO's engagement on the ground.







A woman from the
Miao ethnic minority is
making silver jewellery.
LEISHAN, GUIZHOU, 2010

*“I am very thankful
that these experts
have come to teach
us. They’ve helped
me improve my
skills. I hope our craft
products can reach
both domestic and
global markets in the
near future.”*

People | Creative Industry

In 2010, UNIDO implemented a project to promote creative industries in the provinces of Guizhou and Yunnan, where ethnic minorities have been practicing unique embroidery, textile and jewellery-making skills for centuries. UNIDO brought in international design experts to train artisans and entrepreneurs - most of them women - so that their design and business development skills can be improved, and their products can reach a bigger market.



Miao girls at a traditional festival.

GUIZHOU PROVINCE, 2010



Women from the Dai ethnic minority are weaving special textiles.

YUNNAN PROVINCE, 2010

“We found the training from these experts really inspiring. Now we are very confident in our textiles. We hope more and more tourists will like the Dai style clothing.”

People | Food Safety

In April 2012, a UNIDO project brought representatives of the China Food and Drug Administration and respective food industries to Austria. The delegation discussed experience on food safety with representatives of the Austrian Agency for Health and Food Safety and the Austrian Standards Institute, and visited several food production plants.

The participants said that they learnt a lot about efficient management models and food production quality control methods from the Austrian companies.



The delegation on a study tour to the Linauer Bakery in Vienna.

AUSTRIA, 2012

The first Vienna Food Safety Forum was organized in Vienna in September 2015 by UNIDO and the China Food and Drug Administration. On the agenda were the coordination of efforts in order to prevent, detect and respond to foodborne diseases, and the benefits of safe food for social inclusiveness, sustainability and industrial development.



The Minister of Food and Drug Administration, BI Jingquan, and UNIDO Director General Li Yong visiting a dairy farm near Vienna on the sidelines of the forum.

AUSTRIA, 2015

Prosperity | Productivity Enhancement

Starting in 1981, UNIDO placed a senior field technical advisor in Beijing to oversee the cooperative projects in China.



The UNIDO technical advisor Albertus Sissingh is discussing how to implement projects in China with national counterparts.

BEIJING, 1981

In 1982, UNIDO started a project to help China set up a National Sugarcane Industry Research Institute, thereby improving the yield and quality of sugarcane output.



UNIDO technical advisor Albertus Sissingh and national counterparts visit a sugarcane factory in Guangdong Province.

GUANGDONG PROVINCE, 1982





Participants of the Expert Group Meeting on Quality Standardization and Metrology for Developing Countries.

BEIJING, 1995

In 1995, Chinese companies attended a meeting organized by UNIDO during which they exchanged views with counterparts from other developing countries and gained knowledge about quality standardization and metrology.



After the meeting, participants visited a chemical company in Beijing.

BEIJING, 1995

Prosperity | Standards and Compliance

Since 1995, UNIDO organized several workshops on standards and compliance in China. Many companies, especially small and medium-sized enterprises (SMEs) benefitted from such and knowledge and experience exchanges. In 2013 alone, ten SMEs in Fujian received international standards certificates, including the ISO 9000 and ISO 14000 Series and environmental labelling.



The Fujian Fuqing Top Electronic Parts Co.Ltd was one of the enterprises which received ISO 14000 certification on environmental management thanks to the training provided by UNIDO. The picture shows the clean and organized working environment of the company that meets international standards.

FUJIAN PROVINCE, 2013

Prosperity | Corporate Social Responsibility

UNIDO started a project to promote corporate social responsibility in the Chinese construction sector. The project employed the current ISO 26000 Guidance Standard on Social Responsibility, as well as responsible business principles in line with the UN Global Compact and the OECD guidelines. In September 2015, the project organized a study tour for Chinese construction companies to Vienna and London, to learn about corporate social responsibility, green construction and anti-bribery standards from relevant Austrian and British institutions.



Participants of the study tour visit a construction site in London.

LONDON, 2015

Planet | Environmental Protection

Shandong Province produces about 90% of China's ginger. Previously, methyl bromide, an ozone depleting substance was widely used to fumigate the soil in ginger production. A UNIDO project replaced the use of methyl bromide with chloropicrin, a colourless liquid with a broad spectrum of fungicide, herbicide and insecticide effects but which does not damage the ozone layer. The use of this technology enabled farmers to produce ginger in an environmentally friendly manner. The project also raised farmers' awareness about the negative impact of using toxic chemical pesticides in production.

A woman in Anqiu County, Shandong Province, shows a ginger crop produced without using methyl bromide.

SHANDONG PROVINCE, 2009



A farmer in Mancheng County, Hebei Province, is applying chloropicrin to his field before planting strawberry seeds. The use of this technology has enabled farmers to produce strawberries in an environmentally sound manner. Strawberry is a cash crop, central for the economy of Hebei province and for thousands of farmers.

HEBEI PROVINCE, 2008

Polyurethane foam is widely used in several industrial sectors in China. But the traditional polyurethane foams, in particular extruded polystyrene foam products (XPS), contain CFC-11 and HCFC-141b, which are ozone depleting substances (ODS) and contribute to global warming. A UNIDO project helped replace CFC-11 and HCFC-141b with cyclopentane, a chemical element that doesn't release ODS into the atmosphere during XPS production.



A man in Langfang, Hebei Province, pulling out insulating board with cyclopentane as a main component.

HEBEI PROVINCE,
2009

Planet | Environmental Protection

UNIDO implemented a project in China to dispose of obsolete persistent organic pollutants (POPs) pesticides and other POPs waste in an environmentally sound manner. As a result, more than 6,300 tons of POPs pesticide waste was cleaned up and disposed of using the best available technologies.



Workers are excavating pesticide waste containing DDT at a former pesticide production plant. A total of 637 tons of DDT waste was excavated and transported to Hebei Jinyu Mangrove Environmental Co., where it was destroyed in cement kilns.

HEBEI PROVINCE, 2011

In the 1990s, UNIDO implemented a project that helped control pollution in the tanning industry in China. At the time, most of the tanning companies did not have the equipment or the technology for waste treatment: wastewater was diverted to nearby rivers directly, without being treated and solid waste was simply dumped in the landfill. To tackle this, the project introduced energy-efficient and clean technologies, as well as critical machinery and equipment in the industry. China's tanning industry was upgraded and made more environmentally friendly thanks to the project.

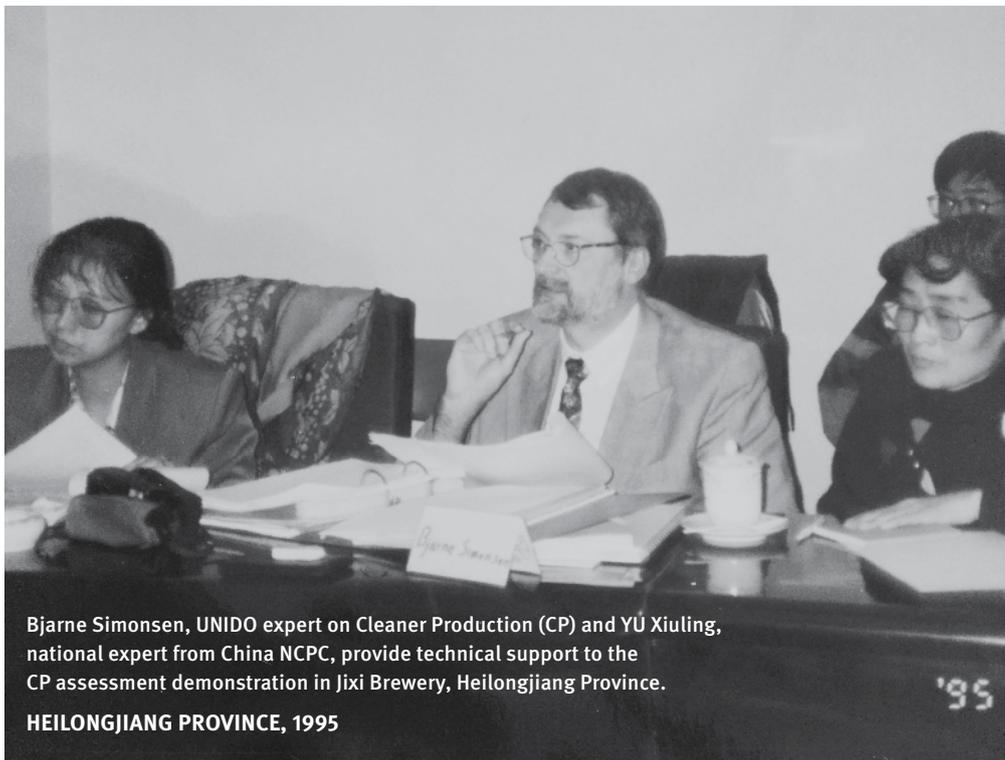


Shanghai hosted the 18th session of the UNIDO Leather and Leather Products Industry Panel.

SHANGHAI, 2012

Planet | National Cleaner Production Centre

UNIDO and UNEP jointly established the China National Cleaner Production Centre (NCPC) in 1994. As the leading organization for China's introduction and promotion of clean production strategies and technology, the Centre focuses on research into leading edge concepts, applicable theories, and technologies in the fields of clean production, eco-industry and circular economy. It also provides training for certification staff in clean production enterprises.



Bjarne Simonsen, UNIDO expert on Cleaner Production (CP) and YU Xiuling, national expert from China NCPC, provide technical support to the CP assessment demonstration in Jixi Brewery, Heilongjiang Province.

HEILONGJIANG PROVINCE, 1995

A project on resource efficiency and cleaner production was launched in Zhenjiang Economic and Technological Development Zone to foster eco-industrial development.

From left to right: Patrick Goettner, Project Officer of UNIDO; Ralf Bredel, Representative of UNIDO's Regional Office in China; Liu Xiangsheng, Deputy Director of Zhenjiang Economic and Technological Development Zone and Yin Jie, Division Chief of China NCPC, jointly launched the project.

ZHENJIANG,
JIANGSU PROVINCE, 2016



Planet | Energy Efficiency

Coal gangue is the waste left over from coal mining and is often dumped, creating huge hill-like mounds. The Government of China has been promoting coal-gangue brick production to promote the re-use of industrial wastes, as well as to protect agricultural land resources. UNIDO and the Ministry of Agriculture implemented a project to promote the application of waste-to-heat recovery power generation systems in this sector. These systems capture waste heat and turn it to electricity. The factories used the electricity on-site for their own needs, thereby cutting their electricity bills. In addition, thousands of tonnes of greenhouse gas emissions have been reduced each year.



The project helped Xinrong New Type Buildings Co. Ltd in Lingshi County, Shanxi Province, install a new boiler to recover waste heat.

SHANXI PROVINCE, 2010



Workers in Sichuan Guoli Energy Science & Technology Co. Ltd are making new boilers used to recover waste heat.

SICHUAN PROVINCE, 2010

Planet | Renewable Energy

The UNIDO International Centre for the Promotion and Transfer of Solar Energy Technology promotes the exchange of solar technology and enhances international cooperation among developing countries in this sector. Thanks to the Centre, in 2016, China became the world's largest producer of photovoltaic power. More than 50% of solar-powered houses in China were designed with the help of the Centre. Its solar water heaters, solar cookers and photovoltaic products hold an important share in the domestic market, and some products have been sold in the international market.

A woman is placing small reflecting mirrors on a parabolic plate to make a solar cooker, which directly uses solar power to heat, cook or pasteurize food.

LANZHOU, GANSU PROVINCE, 2008



A man is working to cement a solar cooker.

LANZHOU, GANSU PROVINCE, 2008

Together with UNIDO, Poly Solar Technologies (Beijing) Co. Ltd started the “Say goodbye to darkness, enjoy the sunlight” initiative in Africa, aiming to provide clean, cheap and reliable energy for people in Africa, especially those living in rural areas.



A 10kW solar power plant was built in the MAZESA school with the support of UNIDO and the Poly company. Teachers and students were very happy to have access to electricity for the first time in their lives.

TANZANIA, 2013



An engineer from the Poly company is installing a solar system for a rural community in Zambia. A local leader said:

“With electricity, children now can study when the sun goes down, and they can even watch television. You cannot imagine how happy they are!”

ZAMBIA, 2011

Planet | Renewable Energy



Shiwang'andu dam where a small hydropower plant was established.
**MUCHINGA PROVINCE,
ZAMBIA, 2012**

The UNIDO International Centre on Small Hydropower Plant (ICSHP) helped establish the Shiwang'andu Hydropower Plant in Zambia. This was part of a project funded by the Global Environment Facility (GEF) and Zambia Power Corporation (ZESCO). The plant provides clean and cheap energy to thousands of households in the rural communities and helps mitigate climate change in the country. The project was also a part of the "Lighting up rural Africa" project carried out by UNIDO and ICSHP.

In 2012, the State Council of China released the “Energy Saving and New Energy Vehicles (NEV) Development Plan (2012-2020)”, which set an ambitious target of placing 500,000 NEVs on the road in 2015 and 5 million in 2020. This plan provides an outline for the automotive sector to develop fuel-efficient vehicles and explore technologies using new energy sources.

UNIDO and several government entities developed three related projects on fuel-efficiency strategies for the Chinese automotive industry. These projects prepared a technology road map, raised awareness of fuel-efficient automobiles in China, identified the commercialization pathways for NEVs, drafted technical standards and guidelines to provide regulatory elements, and demonstrated technology integration in Yancheng and Shanghai.



Demonstration of new energy vehicles in Shanghai. SHANGHAI, 2015



The six biggest achievements

Helping China Open up to the Outside World

Sustainable Development for
Township and Village Enterprises

Multilateral Environmental Agreements

International Centre on Small Hydropower

International Solar Energy Centre

Policy Advice for China's Sustainable
Industrial Development





Helping China Open up to the Outside World



Planting the seed for the development of SEZs

As part of Deng Xiaoping's drive to open up the country to the rest of the world and cement China's place on the global stage as a major economic player, a grand economic reform termed "Socialism with Chinese characteristics" kicked off in late 1978.

Deng's reform aimed to increase the country's production by any pragmatic means. As he stated: "If we can increase production, it doesn't matter whether operations are run privately - just like as long as a cat catches mice, it doesn't matter whether it is white or black."

China's aspiration to establish special economic zones (SEZs) was one of the best examples of this pragmatic approach at play. In 1980, to encourage overseas investment in China and boost the country's economic growth, the government planned to establish a number of SEZs in the coastal provinces of Guangdong and Fujian. But before rushing into operation, the government wanted to gain a broader perspective by learning from the experiences of other countries.

These were the very early days of China's opening up, and the country had very limited interaction or cooperation with the outside world. Therefore, it was very difficult - if not impossible - for China to get a chance to study other countries' practices, especially those of the "Western world".

UNIDO was one of the few international organizations willing to play the role of bridging between the East and the West. Utilizing its international networks, it organized a six-week study tour for a team of eight senior government officials from Guangdong, Fujian and the State Council.

The delegation, led by Jiang Zemin (then Deputy Director of the State Import and Export Management Committee and later President of China from 1993 to 2003), visited SEZs in

six countries, namely Ireland, Malaysia, Mexico, Philippines, Singapore and Sri Lanka. They took part in dozens of meetings which focused on issues relating to special export zones such as fiscal incentives and physical infrastructure, as well as common facilities and services for foreign investors. In these meetings they obtained in-depth knowledge about export and investment promotion. UNIDO experts accompanied the group during the trip, offering independent observations and expertise.

At the end of the trip, the delegation submitted its recommendations to the State Council and the National People's Congress. **These inputs fed into the legislation concerning the operation of SEZs. In the same year (1980), China's first SEZs were established in Shenzhen, Xiamen, Zhuhai and Shantou.**

When it was given SEZ status, Shenzhen in southern China near the border with Hong Kong, was **just a small town. Now, 36 years on, it is a booming trade hub and one of China's largest cities. Its population grew from some 30,000 in 1979 to more than 10 million by the beginning of the 21st century.**

These first four SEZs contributed significantly to China's development. They permitted experimentation with market-oriented reforms, and acted as a catalyst for the efficient allocation of domestic and international resources. They have also deepened economic opening by attracting international capital, technology, and technical and managerial expertise that stimulated industrial development and helped China's greater integration into the global economy.

In the following years, the entire island province of Hainan and the city of Kashgar in Xinjiang Province were designated SEZs.

A World Bank study estimates that, as of 2007, the SEZs in China accounted for about 22% of national GDP, about 46% of FDI, and about 60% of exports - and generated in excess of 30 million jobs.



An industrial harbour in the Shekou Industrial Zone was under construction in full swing. The harbour was expected to have the capacity to accommodate ships carrying cargos of 5,000 tons.

SHENZHEN, 1984



The rapid economic development in the SEZs created great employment opportunities. Many young people from China's impoverished rural areas flooded into the SEZs to seek jobs and new opportunities. They were among the first generation of migrant workers.

SHENZHEN, 1992

Photos: Xinhua News Agency



Shenzhen is now a booming trade hub and one of China's largest cities.

SHENZHEN, 2008

Photo: Flickr/focus on aperture

In addition to the **six SEZs**, China opened **14 coastal cities to overseas investment**, and set up **15 free-trade zones**, as well as **32 state-level economic and technological development zones**. **Fifty-three new and high-tech industrial development zones have been established in large and medium-sized cities**. As a result, a multi-level diversified pattern of opening

and integrating coastal areas with river, border, and inland areas was formed in China.

In hindsight, the study tour organized by UNIDO back in 1980 planted the seed for China's SEZs development, and assisted with the country's further opening up reform.

Sustainable Development for Township and Village Enterprises

Energy conservation and greenhouse gas emissions reduction in Chinese TVEs

Township and village enterprises (TVEs) in China originated from rural handicraft enterprises which were owned by collectives or people’s communes. Since the economic reform in 1978, TVEs have been developing rapidly. **By 2005, there were 22 million TVE units, employing 130 million workers and generating 30% of China’s total gross domestic product.** Undoubtedly, the development of the TVEs has been playing an indispensable role in the development of the rural economy, increasing farmers’ income, absorbing redundant labour and speeding up industrialization in rural regions.

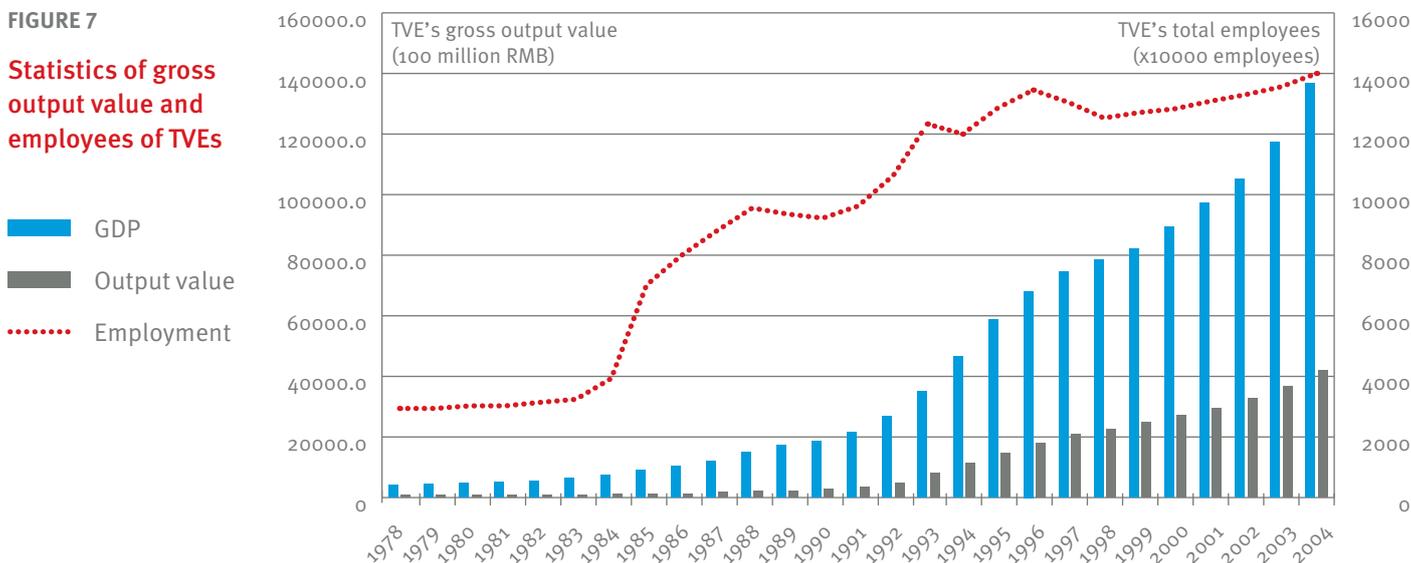
Despite the growth, a lack of access to finance, outdated production technology and poor management meant that the TVEs in general had serious energy waste and caused severe environmental pollution. Statistics from the Ministry of Agriculture (MOA) in the 1990s showed that **the energy**

consumption rate of TVEs was 30 to 60% higher than that of state-owned enterprises, and that it accounted for a staggering one sixth of the total industrial emissions of CO₂.

Brick-making, cement production, coking and metal-casting were the main industries in which the TVEs were involved. Over 70% of the total industrial output of the four sub-sectors was derived from TVEs. In this context, a US\$10m project was implemented by the Ministry of Agriculture, the Global Environment Facility, UNDP, and UNIDO from 2001 to 2006 to improve energy efficiency and reduce greenhouse gas emissions in the four sub-sectors by utilizing energy efficient technologies and products, and establishing mechanisms to remove key barriers to markets, policy, technology and finance.

In particular, the construction of pilot TVEs was a crucial component of the project. By introducing various energy efficient technologies to different TVEs, the project

FIGURE 7
Statistics of gross output value and employees of TVEs





Zhejiang Shenhe Cement Co. Ltd

demonstrated technical renovations in the four sub-sectors. At the same time, mechanisms innovated by the project played a significant role in providing services regarding finance, technology identification and policy coordination. The mechanisms not only assisted pilot plants by removing barriers, but also contributed to their capacity building. In total, over 100 pilot TVEs covering the four sub-sectors received such assistance.

In the cement sector, one of the pilot enterprises was the Zhejiang Shenhe Cement Co. Ltd. in Jiaxing City. Previously, the company was equipped with a low-tech shaft kiln. In 2003, **with the support of the project, the company constructed a rotary kiln equipped with modern technology, which greatly improved its production capacity. It also built a waste-heat power generation plant** onto the kiln, which effectively captured and **recycled energy during cement production**. Being the first of its kind in China, the waste-heat power generation technology was replicated in many other industries.



Gaoping Xinggao Coking Group Co. Ltd

In the coking sector, Gaoping Xinggao Coking Group Co. Ltd. located in the central Shanxi Province was one of the beneficiaries of the project. In the beginning, the company was equipped with refined indigenous coking ovens. In line with the adjustment of national industrial policy, as well as increasing environmental awareness, the company embarked on technical renovations. It replaced the outdated indigenous coking ovens with clean type coking ovens and built a waste-heat power generation plant.

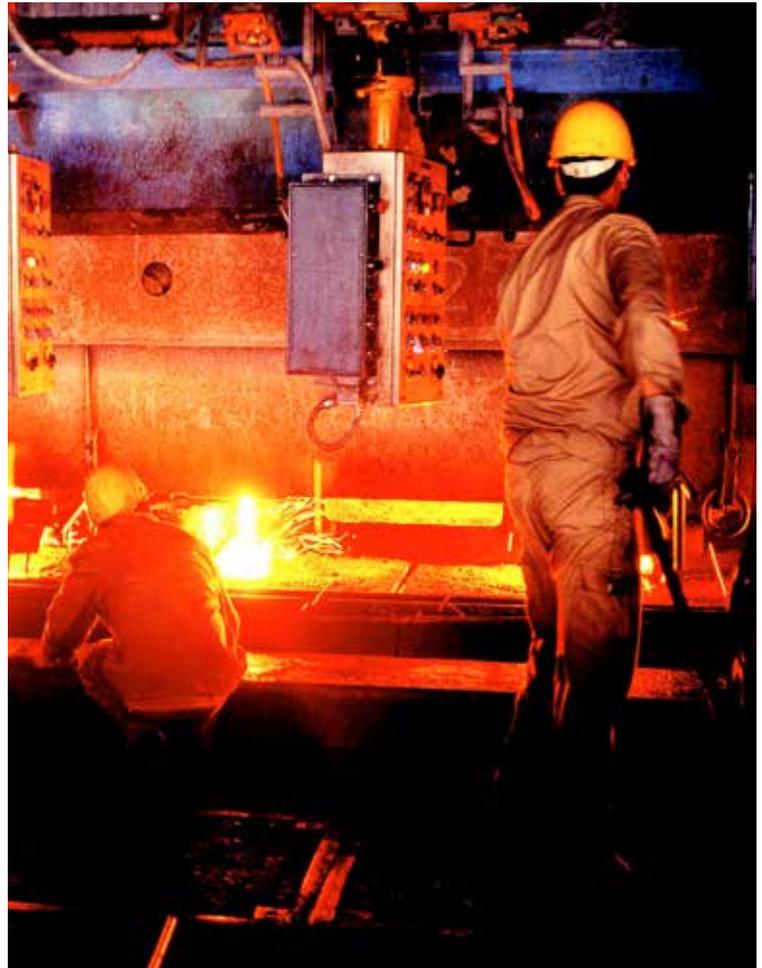
The power plant generated 120 million kWh of electricity and reduced 229,000 tons of CO₂ annually. In the meantime, the company invested over RMB20 million in introducing smokeless coal in the coking process. The success of the company's technical innovation attracted many counterparts, who came to visit the plant and learn from its experience.

Located in Nanjing city, the Nanjing Molding Foundry is one of the largest foundry TVEs in the city, with an annual capacity

of over 10,000 tons of castings. Since being identified by the project as one of the pilot TVEs, the foundry has been embarking on technical renovation and management update. It has renovated its production processes in melting, sand treatment, molding and coring, sand strip, heat treatment and machining, etc. **The renovations improved the working environment and the product quality, saved energy consumption significantly, and reduced CO₂ emissions by 5,000 tons annually.** In addition, in collaboration with Tsinghua University, the foundry established a product development centre to conduct technical research & development.

The Xi'an Liucun Hollow Brick Plant was selected as one of the pilot plants in the brick-making sub-sector. With an annual output of 50 million cubes, the plant was one of the largest wall material producers in Xi'an Province. In 2003, the plant, supported by the project, started to renovate its production process, including raw materials treatment, and green brick making and firing. As a result, the plant **conserved 1300 tons of coal equivalent (TCE) of energy, which was 15% of its total heat loss, and reduced over 3000 tons of CO₂ emissions annually.** In the meantime, the plant has responded actively to the government's call by taking the lead in producing rectangular-hole bricks, thereby laying a solid foundation for the production of energy-efficient bricks in the region.

By the end of 2008, over 200 TVEs were mobilized by the project to adopt energy efficient technology, resulting in saving more than two million tons of coal



Metal casting in Nanjing Moling Foundry.



A Chinese delegation visits Sun Coke Inc. in the USA.



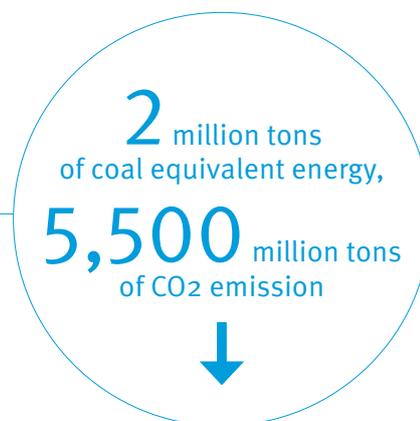
Workers making hollow bricks in the Liucun plant.



The Liucun plant replaced the original Huffman kiln with a new tri-arch energy-efficient Huffman kiln, for which the sidewalls and roof were built with heat insulation bricks, and the interior wall surface was plastered with heat insulation paint. By taking these measures, the heat insulation of the kiln has been improved significantly.

equivalent of energy, and reducing around 5,500 million tons of CO₂ emissions annually. The project also organized several overseas study trips for representatives of government entities and enterprises to learn advanced technologies and management skills from international counterparts.

Overall, the project established incentives and monitoring systems to strengthen existing regulatory programmes at the county level; helped TVEs build technical capacity for energy efficiency and quality improvement; created access to commercial financing for TVEs in the four sub-sectors; and commercialized the financing of energy conservation projects in TVE. The project also has a demonstration effect, with its practices being widely replicated throughout China and a dozen countries in Asia, Africa and the Middle East.



Multilateral Environmental Agreements

UNIDO supports countries in meeting their obligations under the major multilateral environmental agreements, such as the Montreal Protocol on Substances that Deplete the Ozone Layer, the Stockholm Convention on Persistent Organic Pollutants, and the Minamata Convention on Mercury. In China, UNIDO, with the support of the Foreign Economic Cooperation Office (FECO) at the Ministry of Environmental Protection, has been providing direct technical support to the Government on the implementation of these multilateral environmental agreements.

Since 1992, China and UNIDO have developed dozens of projects in the areas of phasing out ozone-depleting substances (ODS), reducing persistent organic pollutants (POPs) emissions and managing mercury in an environmentally sound manner. The implementation of these projects has played a significant role in promoting the transition to green industry.

Montreal Protocol on phasing out ODS

Ozone-depleting substances (ODS) damage the Earth's fragile ozone layer, which serves as a sunscreen, protecting humans and animals from the harmful effects of ultraviolet radiation. The thinning of the ozone layer is believed to have a variety of consequences such as increases in sunburn, skin cancer, cataracts, damage to plants, and a reduction in plankton populations in the ocean's photic zone. Many ODS gases are, at the same time, greenhouse gases that contribute to global warming.

To mitigate the hazardous influence of ODS, in 1989, a universal agreement, known as the Montreal Protocol on Substances that Deplete the Ozone Layer, entered into force. The Protocol was designed to reduce the production and consumption of ODS and, under it, each country has the obligation to phase out appliances that release ODS pollutants.

CHANGZHOU, JIANGSU PROVINCE, 2008

Working on a compressor part.



Vacuating a refrigerator compressor before charging it with the natural refrigerant gas.



One of the manufacturers that produce new equipment devices to optimize the production of XPS using green technologies.





The air conditioner production floor at Midea Group.
WUHAN, 2012

In 1991, China ratified the Protocol. Since then, UNIDO has helped the country implement over 50 projects to eliminate ODS in the refrigeration, foam, pharmaceuticals and agricultural production sectors.

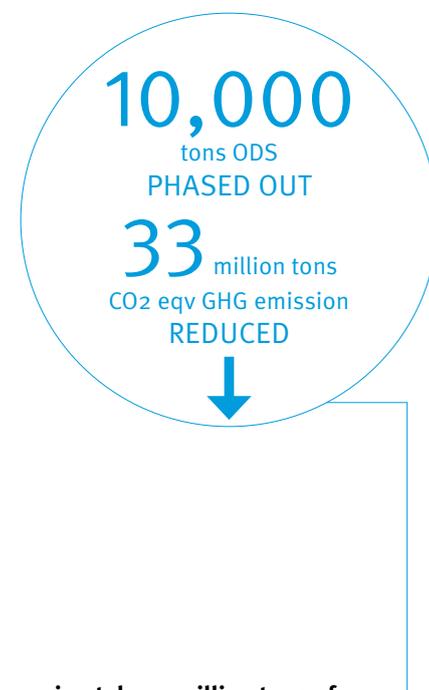
Starting in 2010, UNIDO implemented several projects to green the air conditioning sector in China by supporting manufacturers in converting their production lines using ozone- and climate-friendly technologies at the same time. Prior to the introduction of the new technologies, air conditioners were predominantly charged with HCFC-22 refrigerant, a substance that depletes the ozone layer and contributes to global warming. UNIDO helped the majority of production lines replace the use of HCFC-22 with propane (R-290), a hydrocarbon which does not deplete the ozone layer and has a very low global warming potential.

The projects benefitted some of the largest domestic electrical equipment manufacturers in China, such as the Hangzhou Huari Refrigerator Co and Midea Group, which received UNIDO's technical assistance in their refrigerator and air conditioner production. **In total, UNIDO's projects to green China's refrigerator and air conditioner sector phased out over 10,000 tons of ozone-depleting substances**

in this sector, reduced approximately 33 million tons of CO₂ equivalent in greenhouse gas emissions and helped the companies increase energy efficiency by up to 12 per cent. In addition, these projects demonstrated value for the safe manufacturing, installation and servicing of products with flammable refrigerants, and modified existing safety standards in the sector.

UNIDO also introduced environmentally friendly foaming agents to eliminate ODS in the extruded polystyrene foam (XPS) sector in several provinces in China. The global market for XPS foam has been growing to meet the demand for more stringent energy standards in the building industry. However, the technologies China used for manufacturing XPS material were harmful to the ozone layer. The sector opted for green technologies such as CO₂ and hydrocarbons to replace HCFCs and CFCs. In 2013, UNIDO and the German Gesellschaft für Internationale Zusammenarbeit (GIZ) assisted some Chinese technology manufacturers to develop specific equipment devices and configurations in order to optimize the spread of these green technologies in the local market.

UNIDO's technical assistance with phasing out the consumption and production of methyl bromide in the



A farmer is carefully measuring the amount of chloropicrin to be applied to his strawberry field.

**MANCHEN COUNTY,
HEBEI PROVINCE, 2008**



agricultural sector impacted millions of Chinese farmers and consumers. Methyl bromide is an ODS widely used in soil fumigation. The project introduced other technologies as alternatives, such as chloropicrin, a colourless liquid with a broad spectrum of fungicide, herbicide and insecticide effects but which does not deplete the ozone layer; and grafting, a method of uniting one plant's shoot or bud with another plant's rootstock or stem which does not require additional chemical pesticides to control soil-borne pathogens. Being a labour-intensive process, grafting also contributes to the creation of job opportunities in rural areas, particularly for women. The use of such technologies allowed farmers to produce vegetables and fruits in an environmentally friendly manner. The project also raised farmers' awareness about the negative impact of using toxic chemical pesticides in production.

These technical interventions have increased China's capacity to fulfill its commitment to the Montreal Protocol. The goal of completely phasing out CFC usage has been achieved two years ahead of the deadline (2010) and, at the 19th meeting of Montreal Protocol parties, China has committed to accelerating the phase-out of HCFCs. According to FECO, **between 2010 and 2015, China phased out 250,000 tons of ODS, which accounted for 55 percent of the total ODS phase out in developing countries.** UNIDO's cooperation with China has been instrumental in this process.

UNIDO, in cooperation with FECO and the State Tobacco Administration, replaced methyl bromide with floating tray technology.

TOBACCO SEEDLING NURSERIES IN GUIZHOU PROVINCE, 2007



Another method to replace methyl bromide soil fumigation is grafting technology.

Various crops benefitted from this technology, including tomato, cucumber, pepper, eggplant, melon and watermelon. In this photo, a woman is checking the quality of grafted melon seeds.

A GRAFTING HOUSE IN SHANDONG PROVINCE, 2009





A modified facility in this centre optimized operations to dispose of medical waste in a more environmentally friendly way.

**NANCHANG
CENTRALIZED
MEDICAL WASTE
DISPOSAL CENTRE,
JIANGXI PROVINCE,
2015.**

Stockholm Convention on phasing out POPs

The Stockholm Convention on Persistent Organic Pollutants is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods and that have harmful impacts on human health or on the environment.

Exposure to Persistent Organic Pollutants (POPs) can lead to serious health effects, including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and damage to the central and peripheral nervous systems.

In response to this global problem, the Stockholm Convention, which was adopted in 2001 and entered into force in 2004, requires its parties to take measures to eliminate or reduce the release of POPs into the environment. China, together with over 150 countries, ratified the new environmental treaty.

By 2007, UNIDO was helping the country develop a national implementation plan that reviewed the situation of POPs locally and developed detailed strategies and plans of action to deal with them, prioritizing those that presented the biggest threats to human health.

One of the key projects was the management and disposal of organic chlorinated pesticides. The project supported the government with the development of a five-year programme (2011-2015) for the prevention and control of pollution caused by POPs from major industries. It also supported the identification and assessment of new disposal technologies and adaptation of existing technologies for the environmentally sustainable management of hazardous wastes.

As part of the project's capacity-building and institutional-strengthening activities, a series of training workshops on policies and technical guidelines for POPs waste management were held for officials from environmental protection authorities at both central and local levels, as well as from hazardous waste disposal companies. Over 700 people from environmental authorities and affiliated agencies, and over 1,000 people from hazardous waste management enterprises, were trained.

In total, over 5,000 tons of stockpiled obsolete POPs pesticides, scattered around 105 sites in eight provinces and accounting for approximately 97 per cent of the total quantity of such stockpiles identified nationwide, were packaged, transported and disposed of in an environmentally sound manner.

Staff of the largest integrated hospital in China attend a site-inspection of BEP demonstration of medical waste management.

**FIRST AFFILIATED
HOSPITAL OF ZHENGZHOU
UNIVERSITY, HENAN
PROVINCE, 2015**



By the time it is completed in 2016, the project will have enabled the Chinese authorities to safely dispose of **at least 10,000 tons of obsolete POPs pesticides** and, through applying improved emissions-control technology, will avoid the emission of at least 8.97 g TEQ PCDD/PCDFs releases into the water and atmosphere. Above all, the country will also be armed with the necessary tools and regulations to manage the remaining POPs.

So far, UNIDO and China have jointly developed and implemented six cooperation projects with funds from the Global Environment Facility (GEF), worth a total of over USD 40 million. These projects play a significant role in China's implementation of the Stockholm Convention by:

1. clarifying the national objective, strategy and action plan;
2. enhancing the capacity of the central and local governments on POPs management;
3. carrying out demonstrations of POPs emission reduction and relevant waste disposal in key sectors, and eliminating the previous environmental risks;
4. exploring area-based eco-effective approaches for managing POPs and other toxic chemicals.

To date, China has managed to eliminate the intentional production, use, import and export of 17 POPs, cut down dioxin emissions in major industries by over 10%; disposed of about 5,000 tons of pesticide POPs waste and contaminated

soil from over 105 storage sites in eight provinces; and disposed of about 31,000 PCB-containing electrical devices and 13,000 tons of PCB waste and PCB contaminated soil from 17 provinces. UNIDO's projects greatly contributed to these achievements.

It is expected that China's experience with the management and disposal of POPs wastes will prove a good model for other developing countries.

Minamata Convention on controlling mercury

Mercury emission is a global problem that knows no national or continental boundaries. To tackle this, a global legally-binding treaty, called the Minamata Convention on Mercury, was adopted by governments in October 2013. The treaty aims to regulate anthropogenic emissions and releases of mercury and its compounds in order to protect human health and the environment.

China is the world's biggest producer, user and emitter of mercury. Although it has signed onto the Minamata Convention in 2013, it is not a ratified member yet, primarily due to big challenges faced in recycling mercury-containing products and controlling emissions from coal burning and smelting.

Since 2012, UNIDO and China have developed three projects, with a total funding of around US\$18m from

China is the only country in the world that uses Vinyl Chloride Monomer (VCM) to produce polyvinyl chloride (PVC). This sector consumes more than half of the total mercury supply in the country. Research showed that, in 2012, 10 million tons of PVC was produced by 94 companies using calcium carbide process, which consumed about 720 tons of mercury, accounting for 60% of the total use of mercury in China. UNIDO, together with FECO and GEF, is implementing a project to demonstrate low-mercury catalyst technologies and mercury-free alternatives in the Chinese PVC sector. The project aims to achieve 50% mercury reduction in the sector by 2020. It will contribute to reducing the potential risks of mercury on human health and the environment, as well as help China strengthen its capacity to eliminate high-mercury industrial products and promote alternatives.



A carbide-based PVC plant in China.

Source: Ministry of Environmental Protection.

China has the second largest reserves of zinc, and has been the world's largest zinc producer over the last 15 years. UNIDO's project on promoting sound chemical management in zinc smelting operations in China helped reduce mercury emissions resulting from the zinc smelting process in two plants.

In picture: Desulfurization towers at the exit of the volatilization kiln to reduce mercury emission in exhaust gas in one of the zinc smelting plants.



the Global Environment Facility (GEF). These projects are: 1) Reduction of mercury emissions and promotion of sound chemical management in zinc smelting operations; 2) Minamata Convention Initial Assessment in China; and 3) Demonstration of mercury reduction and minimization in PVC production.

The implementation of these projects has helped to foster environmentally sound management practices in the zinc smelting and PVC production sectors; to disseminate information on mercury pollution control technologies; to provide policy suggestions and support for Minamata Convention compliance; and to reduce the risks of mercury pollution.

UNIDO has not only provided direct technical assistance to China to comply with multilateral environmental agreements,

but has systematically built up the Government's capacity to manage the implementation of these agreements through regular staff exchange programmes. In particular, UNIDO and FECO have had a close staffing exchange over the past two decades. FECO staff have been delegated to the UNIDO Office in Beijing, as well as to UNIDO Headquarters in Vienna, to learn and improve their skills in the development, implementation and monitoring of projects. As a result of these and other measures, China has recently become a GEF project agency with direct access to GEF resources.

Last but not least, China and UNIDO also developed a Technology Transfer and Promotion Centre and a communication and coordination mechanism which facilitate the transfer of environmentally sound alternative technologies and of Chinese expertise to other developing countries and countries with economies in transition.

International Centre on Small Hydropower

The International Centre on Small Hydropower (ICSHP) promotes small hydropower technology around the globe. The Centre was created in Hangzhou, China, in 1994 through a UNDP/UNIDO technical assistance programme in cooperation with the Ministry of Water Resources and the Ministry of Commerce. The building for the ICSHP was constructed and inaugurated for use in 1998, with funding from the Chinese Government. In 2000, the legal status of the ICSHP was approved by the Central Institutional Commission and, with an official Trust Fund agreement between the Government of China and UNIDO, ICSHP came directly under the auspices of UNIDO. The establishment of ICSHP reflected the world demand for small hydropower and has been described as “one of the major achievements of China’s reform”.

The Centre actively promotes the development of small hydropower (SHP) by organizing international workshops, academic exchanges, trainings and conferences, and by providing research, technical support and financial aid. Over the past 20 years, the Centre has grown to become a central hub for knowledge and expertise-sharing, helping other countries understand and learn from China’s SHP technology, equipment and experience in rural electrification. Over the past 20 years, the Centre has:

- » **Assisted with the provision of electricity access to over 300 million people in China.**
- » **Helped set up national green evaluation standards and safe production assessments.**
- » **Trained over 1,000 engineers from over 60 countries.**
- » **Supported, designed and implemented over 100 small hydropower projects in over 60 countries.**

- » **Organized more than 50 international conferences on SHP both in China and abroad.**
- » **Developed the International Network for Small Hydropower with over 470 members from more than 80 countries.**

In 2013, the ICSHP and UNIDO published the first edition of the World Small Hydro Power Report. The report has been credited to be **a world-first compilation of global small hydropower data**. The report assessed SHP development in 149 countries across 20 regions. It found that while installed SHP was estimated at 75 GW, potential SHP was approximately 173 GW. Over 50% of the world’s potential SHP was found to be in Asia, however the report noted “it is possible in the future that more small hydropower potential might be identified both on the African and American continents”. A second, updated edition of the report will be published in 2016.

Since 2015, the Centre has been supporting the Ministry of Water Resources of China in broadening the scope of its current SHP upgrading activities and enhancing its technology and management practices. **It is estimated that around 2,500 SHP owners, developers and technicians will be trained by the end of the project.** In addition, the Centre is organizing trainings on green SHP and safety and protection regulation, as well as study tours for policymakers and technicians to help them establish networks in this field.

UNIDO and the ICSHP are also implementing a project aiming to harness renewable energy resources and foster sustainable SHP development by conducting resource assessments and feasibility studies in potential SHP sites in Ethiopia, Kyrgyzstan, Myanmar, Nigeria, and Peru, using technologies and business models that are suited to the local environment.



Representatives from Ethiopia, Nigeria, Kyrgyzstan, Guinea and Peru visit a small hydropower turbine manufacturing base in Jinhua. The President of the company gave the delegation a tour of the manufacturing compound and explained the company's operations.

ZHEJIANG PROVINCE, 2016



Study tour to one of the local SHP equipment manufacturers.

ZHEJIANG, 2016

With the help of ICSP, the Tunga Dam Power Station began electricity generation in 2014. Operated by Mambilla Beverages Nigeria Limited, the power station has supplied clean electricity to local factories and communities.

In picture: workers installing equipment for the power station.

TARABA STATE, NIGERIA, 2014

International Solar Energy Centre

The International Solar Energy Centre for Technology Promotion and Transfer (ISEC) was jointly established by UNIDO and the Chinese Government in December 2005 in Lanzhou, Gansu Province. The Centre is the sole body in China responsible for the promotion and transfer of solar energy technologies and products.

Since its establishment, the Centre has held over 70 training workshops in China, covering topics such as solar water heaters, solar cookers, solar buildings, solar photovoltaic techniques, energy saving and coal or firewood saving stoves. The Centre's international training programme has trained hundreds of solar energy specialists from different countries.

It has also sponsored or hosted more than 20 international conferences and product exhibitions. In total, **these events attracted more than 5,000 participants, including government officials, experts, scholars and entrepreneurs from 53 countries. More than 70 companies used this platform to showcase their latest technologies and new products**, which helped boost cooperation in the field of solar and wind.

The Centre also works to establish research & development bases and testing centres for solar technology industrialization in selected regions and enterprises in the world, particularly in developing countries.



International Forum on Solar Energy Technologies and South-South Cooperation.
Lanzhou, 2008

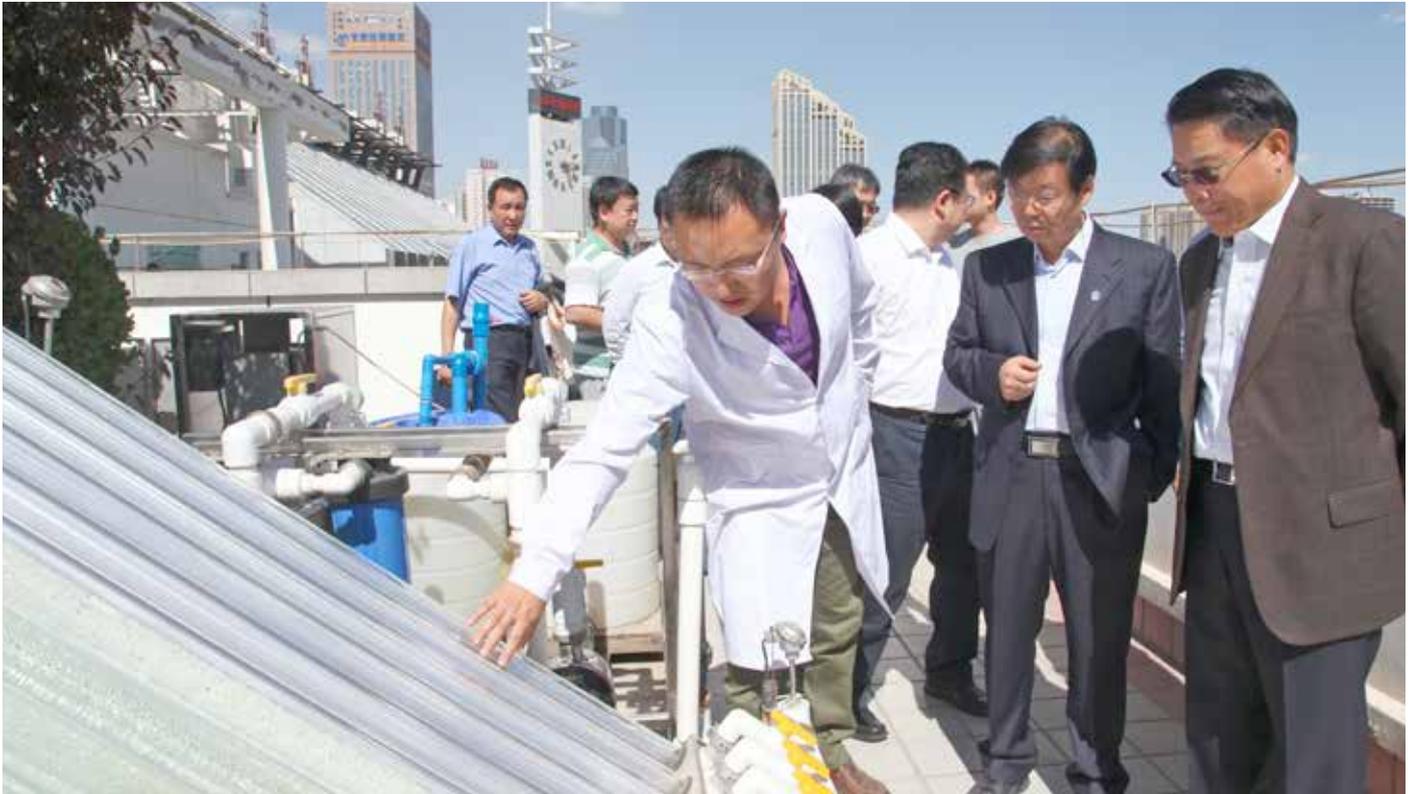


The premises of the International Solar Energy Centre in Lanzhou.



Since its establishment, the Centre has held over 70 training workshops, providing technical advice to participants from all over the world, especially from developing countries.

In 2014, UNIDO Director General visited the ISEC in Lanzhou.



So far, two solar PV industrialization research & development bases were built in Changzhou and Anyang, and two solar thermal industrialization research & development bases were established in Beijing and Luoyang. In addition, a new energy and environment protection base, a solar PV product testing centre, a solar thermal product testing centre, and the Institute for Integrated Solar PV and Thermal Buildings in Eastern China, as well as a trading platform on solar technology, products and information exchange, will be set up soon.

Over the years, the Centre has grown from a recipient of technology assistance into a successful technology provider. It has been working to transfer scientific research achievements into productive forces and industrialized products. **More than 50% of solar-powered houses in China are designed**

with the help of the Centre, and its solar water heaters, solar cookers and photovoltaic products hold an important share in the domestic market. Some products have been sold on the international market, among which products like the stainless steel, freeze-resistant solar water heater and solar cooker have gained particular recognition.

Besides providing technical assistance domestically, the Centre has helped Tanzania develop a national five-year plan for solar energy development, assisted Cote d'Ivoire in formulating a country-wide photovoltaic development and dissemination strategy, provided technical training on solar cookers and solar water heaters in Djibouti and Pakistan, and implemented an aid project to establish a solar PV production line in Cuba.

Workers making solar cookers. LANZHOU, GANSU PROVINCE, 2008



Policy Advice for China's Sustainable Industrial Development

The term sustainable development was first coined in the Brundtland Report, issued by the United Nations World Commission on Environment and Development in 1987. The Report defined sustainable development as development “that meets the need of the present without compromising the ability of future generations to meet their own needs”. Since then, the concept of sustainable development has been widely embraced by governments and multilateral organizations.

The next milestone was the 1992 UN Conference on Environment and Development or “Earth Summit” in Rio de Janeiro, which recognized that sustainable development would require countries to “build upon and harmonize the various sectoral economic, social and environmental policies and plans”. Most developing country governments have since made efforts to draw up national strategies for sustainable development that integrate the three dimensions (i.e. economic, social and environmental) of sustainable development, and increasingly so since the recent Rio+20 summit in 2012.

UNIDO has a long tradition of supporting developing countries in developing plans and policies for sustainable development and the uptake of environmentally sound technologies.

It is now generally accepted that, in any society, there seems to be an equilibrium among the economic, social and environmental aspects that when disrespected ends up provoking serious consequences, particularly in terms of human development within that given society. Therefore, UNIDO has been advocating the importance of integrating these aspects throughout its various support activities to developing countries.

In the case of China, due to the complexities of the country in terms of territorial extension, size of population and geographic conditions, there is not one single “model” in the world that China can simply copy. Therefore, it is vital to find

a solution that is unique to China, and that is integrated and involves the establishment of information and management systems.

In this context, in 2004, UNIDO implemented a project to support the Department of Development Planning (DDP) at the National Development and Reform Commission (NDRC) in developing its capacity to design, formulate, implement, monitor and revise sustainable industrial policies. The DDP is a government entity that is responsible for recommending strategies for national economic and social development and productivity allocation. It is also in charge of drafting China's Five-Year Plans, which provide the most important political, economic and social guidelines for China's development in the coming five years.

The project, titled “Evaluation and adjustment of China's sustainable industrial planning and policies”, was financed by a special contribution to UNIDO's Industrial Development Fund from the Dutch government through the Royal Netherlands Embassy in Beijing. It particularly aimed to increase the integration of environmental policies into economic planning, with a focus on the 10th Five-Year Plan.

In concrete terms, the project consisted of four major components:

General capacity-building, which involved a combination of analytical work carried out by national and international experts, and training and study tours for policymakers to Europe and North America. The analytical work focused on analyzing the experiences of six OECD countries in incorporating environmental policies in their process of economic development. Experts suggested that early preventive action on environmental issues was of interest to developing countries, particularly in complex economies as in the case of China, and that these early actions were less expensive than the mitigating procedures observed in industrialized countries. The training and study tours helped

enhance the analytical capacities of policymakers of the DDP primarily, but also those at the State Environment Protection Administration, Ministry of Science and Technology, the State Information Centre, the Energy Research Institute and selected State Bureaus responsible for heavy industries.

Model development. Models for sustainable industrial development policymaking were developed, tested and implemented. These models provided both quantitative information on the impacts of various policies and qualitative information on the mechanisms causing these impacts. These computerized tools further assisted policymakers in developing and evaluating sustainable industrial policies.

Case studies, which evaluated the sustainable development strategies and policies adopted in selected regional- and sector-specific cases. This component also focused on the introduction of international experiences and exchange of policy analysis and formulation tools through close cooperation between national and international experts.

Integrated sustainable industrial policy formulation, which consisted of an analysis of China's sustainable industrial planning and policies and introducing international know-how and best practices. Recommendations were put forward focusing on concrete areas for improvement and the important steps China should take towards sustainable industrial development. A report prepared by the Development Research Centre under the State Council and NCC Consultancy BV highlighted the vital importance of adopting policies which are integrated and allow a continuous reduction of the environmental impact in the process of economic growth.

At a result of the project, a consistent plan and integrated policies for sustainable development in the industrial sector were adopted and applied by NDRC, and were later approved by the State Council. Counterparts at DDP said that the project was **“instrumental in giving a clearer sustainable industrial development focus to the 10th Five-Year Plan”**. The project



also helped establish dialogues between key agencies on sustainable development in the industrial sector. The research results and recommendations continue to be useful for national policymakers, particularly to officials from the NDRC responsible for leading the process of designing strategic plans in the country. **Since then, the concept of sustainable industrial development has been closely integrated into China's national strategies.**

In addition, at the time, China was in the early stage of implementing the Great Western Development Strategy, which focused on the development of infrastructure, attracting foreign investment, increased efforts on ecological protection, the promotion of education, and the retention of talent flowing to richer provinces. The integrated policies recommended by the project served as a timely reference and guidance for the further implementation of this strategy, particularly helping ensure that environmental protection is taken into consideration when opening up and developing China's western region.

This project is a good example of UNIDO's role in China in that it is not only a technical projects-executing agency, but also a source of high-level advisory services to the Chinese Government in the area of sustainable and inclusive industrial development.



Partnership for Prosperity

UNIDO has many partners in China. During the past decades, UNIDO has systematically strengthened its cooperation with Chinese authorities in order to further the Organization's work within China and abroad.

Some of the most strategically important partners are introduced in more detail in this Chapter - first and foremost being the direct government counterparts. Together with these counterparts, UNIDO and China have also progressively expanded their cooperation over the years by setting up a number of joint centres and offices in China. These centres and offices provide national and international support in key areas serving UNIDO's mandate and are an integral part of the UNIDO family.
(This chapter includes a list of UNIDO partners in China.)





UNIDO's major partners in China

The Ministry of Commerce

The Ministry of Commerce (MOFCOM) was authorized by the central government as the Ministry to coordinate UNIDO's affairs in China. In particular, MOFCOM's Department of International Trade and Economic Affairs (DITEA) serves as the coordinating agency on the policy level. It has the following functions:

- » To formulate and implement policies on multilateral and regional trade and economic cooperation, and to handle relations with multilateral and regional trade and economic organizations;
- » To organize the implementation of Free Trade Area strategies, and to lead in multilateral and regional trade negotiations as well as FTA negotiations;
- » To manage, on the Chinese side, economic and technical cooperation with the United Nations and other international organizations, and multilateral and bilateral aid and donations to China (excluding grants provided by foreign governments and international financial organizations under financial cooperation agreements).

Directly under MOFCOM, the China International Centre for Economic and Technical Exchanges (hereafter referred to as CICETE) is an administratively autonomous agency, which was founded in 1983 with the approval of the State Council. CICETE's main function is to coordinate the cooperation between China, UNIDO, UNDP and the United Nations Volunteers (UNV) programme, including executing their assistance programmes to China, and implementing projects of general goods supply under the China-Aid programme to other developing countries.

Prior to 2008, almost all UNIDO projects in China were implemented by CICETE. However, in 2008, the policymaking

functions of CICETE were transferred to the DITEA-MOFCOM. In sum, CICETE implemented more than 200 projects with a total volume of more than US\$176m in China. These projects facilitated China's industrial modernization and economic growth.

With CICETE's coordination, China brought in advanced technologies and expertise, and gained experience in organizing trade and investment fairs, such as the China International Fair for Investment & Trade (CIFIT), the Tumen Investment Fair and many others. CICETE also facilitated the establishment of many UNIDO platforms, centres and networks in China. In recent years, CICETE also implemented some projects funded by China's Industrial Development Fund (IDF) contribution.

Under the coordination of MOFCOM, UNIDO has maintained close collaboration with other ministries in China, such as the Ministry of Industrial and Information Technology, the National Development and Reform Commission, the Ministry of Finance, the Ministry of Water Resources, and the China Food and Drug Administration.

The Ministry of Environmental Protection

The second major partner of UNIDO in China is the Ministry of Environmental Protection (MEP). Under MEP, the Foreign Economic Cooperation Office (FECO) was founded in 1989 and is mandated to coordinate and manage project funds dedicated to implement multilateral environmental agreements, as well as to deal with other foreign cooperation activities in the field of environmental protection. Over the last 20 years, FECO gradually established a unique operation pattern focusing on the following areas:

- » Implementation of Multilateral Environmental Agreements (MEAs);

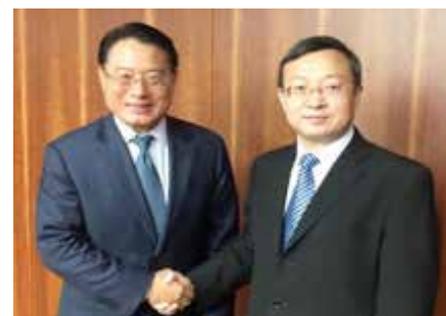


Gao Hucheng, Minister of MOFCOM with Li Yong, Director General of UNIDO

BEIJING, 2016

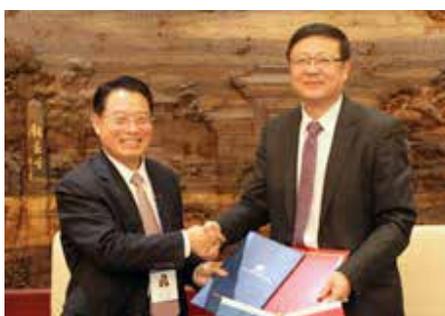


Carlos Magariños, UNIDO DG, appointed Long Yongtu, former Vice Minister of MOFCOM, a Goodwill Ambassador in 2006.



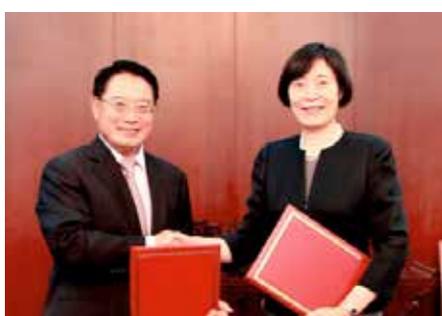
Wang Shouwen, Vice Minister of MOFCOM with Li Yong, Director General of UNIDO

BEIJING, 2016



Li Yong, UNIDO Director General signed an MoU with Chen Jining, Minister of Environmental Protection

BEIJING, 2015



UNIDO Director General Li Yong and Hu Xiaolian, the Chairperson of the Export-Import Bank of China, signed a memorandum of understanding to enhance cooperation and promote inclusive and sustainable industrial development in different regions of the world.

BEIJING, 2015

Source: UNIDO

- » Bilateral and multilateral cooperation;
- » Global environmental policy studies;
- » International consultancy services.

FECO is UNIDO's most important partner in China in the area of environmental protection. Since 1992, FECO and UNIDO have developed around 60 projects in the fields of phasing out ozone-depleting substances (ODS) and persistent organic pollutants (POPs), and reducing mercury emissions, with total funds worth USD 0.34 billion. The implementation of these projects is playing a significant role in promoting a green transmission and technology upgrading in the refrigeration, foam, pharmaceuticals, agriculture, food, tobacco and smelting sectors.

Since Li Yong assumed the position of UNIDO's Director General, the cooperation between UNIDO and MEP has

been further expanded. In November 2015, based on the ongoing successful cooperation, UNIDO and MEP signed a memorandum of understanding (MoU) in Beijing, which aimed to formalize a strategic partnership and provide an overarching framework for further cooperation.

Both sides affirmed that there were many potential areas of cooperation, including in the areas of 1) environmental policy support and institutional framework development; 2) implementing multilateral environmental agreements; 3) cleaner production and pollution prevention and control; 4) eco-design and ecological civilization, including sustainable cities development; 5) utilizing industrial solid wastes and renewable resources; 6) industrial emissions control and air quality management; 7) bilateral and multilateral cooperation on inclusive and sustainable industrial development, human resources development and capacity-building in the field of green development; and 8) South-South and triangular cooperation.

UNIDO's Partnership with Development Banks in China

UNIDO has formed partnerships with the Import and Export Bank of China (EXIMBANK) and the China Development Bank (CDB) to carry out cooperation in shared development areas.

In June 2015, UNIDO and EXIMBANK signed a MoU in Beijing, to enhance cooperation and promote inclusive and sustainable industrial development. Both sides agreed that there were many potential areas for cooperation, such as in industrial development planning, system upgrading, development of light industry including agro-industry, renewable energy development, private sector development, industrial parks and zones, and experience sharing through South-South cooperation and triangular cooperation.

In July 2015, UNIDO and CDB also signed an MoU in Ethiopia to promote inclusive industrial development in Africa, as well as in the rest of the world. Both sides agreed that there were many potential areas for cooperation, in particular in the areas of industrial zones and parks, infrastructure development, manufacturing capability and structural transformation, private sector development, small and medium-sized enterprise development, investment and technology transfer, eco-design and green industry, resource efficiency and cleaner production, energy efficiency, climate change, environmental pollution control and essential drugs, and human resources development. Both sides agreed to start the cooperation by promoting networks and industrialization projects in Africa.

UNIDO also signed a similar MoU with the China Africa Development Fund in December 2015. Both sides agreed to cooperate in terms of developing industrial zones, railways, roads, airports, seaports, agro-business, food safety, quality infrastructure, etc.

A list of UNIDO partners in China

Ministries:

- » Ministry of Commerce
- » Ministry of Finance
- » Ministry of Foreign Affairs
- » Ministry of Industry and Information Technology
- » Ministry of Environment Protection
- » National Development and Reform Commission
- » Ministry of Science and Technology
- » Ministry of Agriculture
- » Ministry of Water Resources
- » State Forestry Administration
- » China Food and Drug Administration
- » The General Administration of Quality Supervision Inspection and Quarantine

Governmental organizations:

- » China Council for Promotion of International Trade
- » Development Research Center of the State Council
- » Chinese People's Association for Friendship with Foreign Countries
- » China International Center for Economic and Technical Exchanges/Ministry of Commerce
- » Foreign Economic Cooperation Office/Ministry of Environment Protection
- » Shanghai Academy of Social Sciences
- » Chinese Research Academy of Environmental Sciences

Provincial governments:

- » Fujian, Shanghai, Xinjiang, Sichuan, Gansu, Zhejiang

Development Finance Institutions:

- » China Development Bank
- » Export and Import Bank of China
- » China-Africa Development Fund
- » China-Africa Fund for Industrial Cooperation

Universities:

- » Peking University
- » Qinghua University
- » Beijing Normal University
- » University of International Business and Economics
- » Tongji University
- » Nankai University

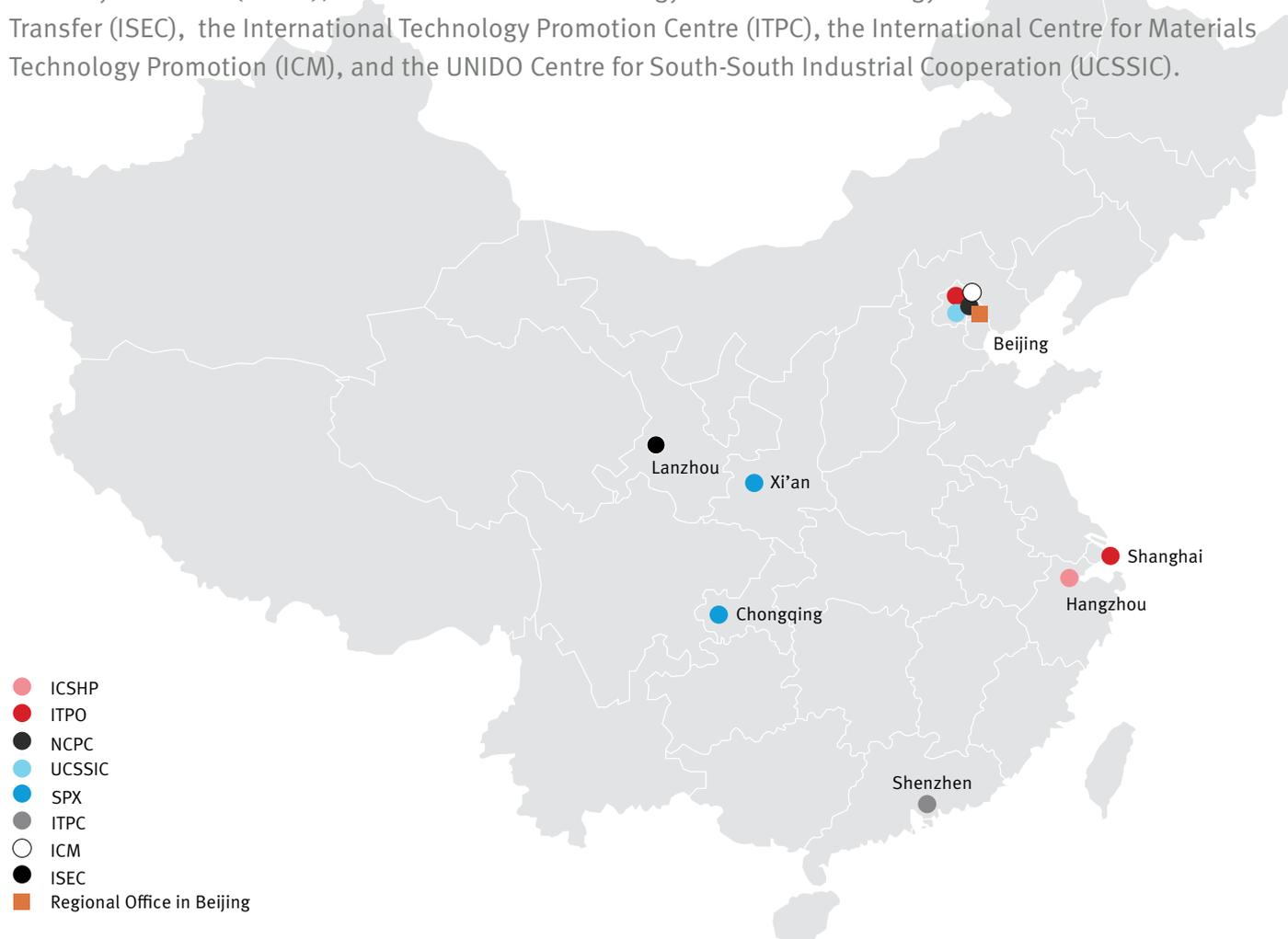
Industry associations:

- » China Construction Industry Association
- » Society of Automobile Engineers of China
- » Asian Manufactures Association
- » China Federation of Industrial Economics

UNIDO Platforms, Centres and Networks in China

In terms of its own institutional infrastructure, UNIDO has a Regional Office in Beijing responsible for coordinating programmes and activities in China, the Democratic People's Republic of Korea and Mongolia.

In addition, UNIDO also has a national network of subsidiary offices, including the Investment Technology Promotion Centres (ITPOs), the China National Cleaner Production Center (NCPC), Industrial Subcontracting and Partnership Exchanges (SPXs), the International Centre on Small Hydro Power (ICSHP), the International Solar Energy Centre for Technology Promotion and Transfer (ISEC), the International Technology Promotion Centre (ITPC), the International Centre for Materials Technology Promotion (ICM), and the UNIDO Centre for South-South Industrial Cooperation (UCSSIC).



Investment and Technology Promotion Offices (ITPOs)

The UNIDO-Beijing International Industrial Cooperation Centre was opened in November 1989, and was renamed in 1996 the “UNIDO-China Investment and Technology Promotion Office” (ITPO)¹. In 2001, UNIDO set up a second ITPO in Shanghai.

The ITPOs have provided a wide range of professional investment advisory services which facilitated China’s access to international expertise, marketing and managerial skills, as well as investment and technology transfer. With their experience in industrialization and a worldwide network of contacts, including through UNIDO’s global network of ITPOs, the offices became ideal partners for inbound and outbound investment and technology promotion efforts in China.

So far, the both ITPO offices have organized countless investment promotion activities in China, and offered consultancy services for Chinese enterprises investing abroad, for example, in Africa.

Through the ITPOs, UNIDO has been very active in co-organizing and supporting conferences, symposia and forums in China. They have also acted as co-sponsors of several high-level global forums or regional forums, including the China International Fair for Investment and Trade in Xiamen, the Northeast Asia Economic Forum in Changchun, the China Eurasia Expo in Urumqi, the China-ASEAN Expo in Nanning, the China (Shanghai) International Technology Fair, and the China International Industrial Fair in Shanghai.

UNIDO’s participation in such forums promotes knowledge and information exchange, increases the Organization’s visibility, extends its network of contacts and raises interest in its services. It also provides an important platform for Chinese enterprises to interact with UNIDO.



UNIDO Deputy Director General, Yo Maruno; Investment & Technology Promotion Department Director, Liang Dan; and UNIDO delegation participated in the inauguration ceremony of the Shanghai Investment Promotion Centre (SIPC).

SHANGHAI, OCTOBER 2001



UNIDO Director General Li Yong hosted the UNIDO Day event at the 2nd China (Shanghai) International Technology Fair (CSITF). UNIDO, through the Shanghai Investment Promotion Centre (SIPC), has been supporting the organization of the Fair since its inception.

SHANGHAI, 2014

¹ Available at <http://www.unidoitpo.org.cn>



During the 10th China International Fair for Investment and Trade in Xiamen, Wu Yi, the former vice Premier of China, presented golden keys to five international organizations, including UNIDO, to acknowledge their contribution to China's development.

XIAMEN, 2006



During the 19th China International Fair for Investment and Trade, Director General Li Yong met Ma Yun, Chairman of Alibaba Group.

XIAMEN, 2015



Director General Li Yong speaks at the opening of the China International Fair for Investment and Trade (CIFIT).

XIAMEN, 2015

China National Cleaner Production Centre (NCPC)

The China National Cleaner Production Centre (China NCPC) was established in 1994 with the approval of the Ministry of Environmental Protection (MEP). The Centre was one of the first national cleaner production centres supported by UNIDO and UNEP both financially and technically. The Centre has since kept close cooperation with UNIDO in the past 20 years.

Focusing on implementing the national strategy of pollution prevention, the Centre conducts studies and activities in the area of resource efficiency and cleaner production (RECP). Furthermore, the Centre provides technical support for RECP training and consulting in the Asia-Pacific Region and other developing countries.

During 1995 to 1998, with the help of UNIDO, the China NCPC started to provide cleaner production services, including cleaner production audits, relevant training and advocacy events, which all helped promote cleaner production activities in China. In doing so, the China NCPC gained great national recognition and prestige in the field.

During 2007 to 2011, the Centre assigned many experts to support the implementation of a number of UNIDO/ILO joint projects, focusing on environmental management, cleaner production, green jobs and sustaining competitive and responsible enterprises.

The Centre was one of the pioneers of the RECP-Net initiated by UNIDO and UNEP in 2009, and was elected as the representative for the Asia-Pacific Region and a member of the RECP-Net Executive Committee. In the framework of the RECP Programme and RECP-Net, it launched several cooperation projects with UNIDO, in the fields of eco-industrial parks, industrial waste minimization, low-carbon production and RECP methods and tools.

To date, the China NCPC has grown to be the leading agency in providing RECP services in China, and the scope of its business has also expanded rapidly. It is also an important technical supporting institute for UNIDO's activities in China. Since its establishment, the Centre has supported UNIDO in implementing many projects in the area of resource efficient and cleaner production.

In addition to supporting UNIDO activities domestically and globally (through international cooperation), the China NCPC also provides other key services as below:

Policy advice: As one of the key technical supporting institutes to the China National Development and Reform Commission (NDRC), the Ministry of Environmental Protection (MEP), and the Ministry of Industry and Information Technology (MIIT), the China NCPC carries out various research on cleaner production policies, laws and regulations. In addition, together with FECO, it carries out a series of activities that help China implement many important international conventions and norms.

Capacity building: The China NCPC delivers high-quality training services for cleaner production management and technical professionals nationwide. By 2015, it had trained over 35,000 professionals who are playing critical and active roles in promoting cleaner production in China.

Assessment and Consulting: The China NCPC is a renowned consulting service provider. Apart from conducting cleaner production assessments in a dozen of industrial sectors, it also provides services like environmental verification, energy audits, feasibility research reports and industrial park planning for local governments, industrial parks and individual companies.

Technology R&D: The China NCPC also carries out many research and development activities in the application of cleaner production technology. It develops, demonstrates and promotes cleaner production technologies and processes in typical industries, such as lighting, metallurgy and the cassava starch processing/production industry.

UNIDO Centre for South-South Industrial Cooperation

The UNIDO Centre for South-South Industrial Cooperation in China (UCSSIC) was established in July 2008 in Beijing with the aim to promote South-South cooperation in industrial development between China and other developing countries around the world. In particular, the Centre is mandated to provide services in such fields as:

1. Sharing of experience in industrial policy formulation and implementation;
2. Enterprise networking among developing countries for enhancing productive capacities, trade, technology and investment flows;
3. Replicating best practices through industrial development and grassroots innovations;
4. Strengthening capacity to commercialize new knowledge;
5. Promoting regional trade and investments and regional integration.



In 2009, with the support of UNIDO and UCSSIC, representatives of the Ministries of Urbanization and Housing of Morocco and Bahrain visited the China Building Materials Academy (CBMA). UCSSIC also arranged a feasibility study for a CBMA delegation to investigate local conditions for construction in Morocco and Bahrain. On this basis, low-cost houses were built in Bahrain.



UCSSIC, through the UNIDO enterprise development and investment promotion programme, introduced Bahrain's enterprise development modules which combine entrepreneurship development, training, consultation and financial services, and help increase employment in other developing countries.



To assist with knowledge sharing in milk products testing among ASEAN countries, in 2011, UCSSIC, in cooperation with UNIDO and the local government of Dali, China, set up the Dali Comprehensive Technical and Inspection Centre which provides training programmes to laboratory technicians from these countries.



UCSSIC provided support to the UNIDO Round Table on Development of the Silk Road Economic Belt held at the fourth China-Eurasia Expo in Urumqi in 2014. Edward Clarence-Smith, former UNIDO Representative in China and the Director General of China International Centre for Economic and Technical Exchanges, Yao Shenhong, presented plaques to two pilot green industrial parks.



During the first Maritime-Continental Silk Road City Alliance (MCSRCA) Cities Forum held in May, 2016 in Fuzhou, China, UCSSIC organized a special session on cooperation for green industrial parks. *In picture*: The opening ceremony of the first MCSRCA Cities Forum.



Director General Li Yong attended the Leadership Round Table on Scaling up South-South and Triangular Cooperation for Sustainable Development at the Global South-South Development Expo 2014 in Washington D.C.

So far, the UCSSIC has served as a platform for a number of cooperative activities in China, such as small- and medium-sized enterprise promotion, green industrial park development, and trade capacity building. These activities entail building partnerships for trade and investment flows, developing standards and guidelines for eco-industrial parks, and strengthening capacity for technology promotion and transfer between China and other developing countries.

The Centre has also been implementing a number of projects to promote UNIDO's inclusive and sustainable industrial development mandate among countries along the Maritime and Continental Silk Road.

Subcontracting and Partnership Exchange

UNIDO establishes Subcontracting and Partnership Exchanges (SPXs) with the objective of helping local enterprises to successfully meet the challenges of globalization and to take advantage of the emerging opportunities that evolve from industrial subcontracting, outsourcing and supply chain opportunities. The UNIDO SPX Network thus serves to provide an important platform for the matchmaking of suppliers and buyers across the globe.

Currently, SPX offices in China are located in Chongqing and Xi'an. These offices promote industrial subcontracting in the local cities and provide job openings for the local manufacturing sector.



In 2014, UNIDO organized a training session to assist the benchmarking of Xi'an Angelson Electric Co. Ltd. *In picture:* UNIDO expert Mark Modena visits the company to provide advice.

For example, the office in Chongqing was established in 2004 in cooperation with the Chongqing Municipal Government with the aim of helping to develop long-term partnerships between industrial enterprises. It built up a database containing data of more than 50,000 Chinese enterprises in the mechanical manufacturing field. It successfully helped international enterprises such as Bosch, Honeywell, Toyota Tsusho, Vestas, Grainger, and Eastman to find appropriate business partners in China.

UNIDO global forums

The global forum function is one of the core functions on which UNIDO's services are based. On the one hand, as a global forum itself, UNIDO generates and disseminates industry-related knowledge and provides a platform for various actors to enhance cooperation, establish dialogue and develop partnerships. On the other hand, UNIDO initiates global forum activities to exchange and disseminate knowledge and information, as well as facilitate partnerships which increase the understanding of sustainable industrial development. In particular, through the global forum activities, UNIDO actively participates in the process of disseminating technological advancements and global trends, and promotes public-private and research-industry partnerships, as well as fosters South-South, North-South and triangular cooperation. China has been actively engaged in UNIDO's forums, covering various topics.

At the Rio+20 in 2012, UNIDO launched the Green Industry Platform, which aims to serve as a global, multi-stakeholder partnership forum to catalyze, mobilize and mainstream action on Green Industry around the world. The Platform provides a framework to bring governmental, business and civil society leaders together to secure concrete commitments

and action in support of the Green Industry agenda, which aims to green existing manufacturing processes and creating new green industries for the production of goods and environmental services. So far, UNIDO has organized four Green Industry Conferences through the Platform.

In addition, in 2014, the Green Industry Platform Project Management Office was formally established at the School of Economics and Resource Management of Beijing Normal University. The Office helps expand the influence of the Green industry Platform in China, and coordinates communication between UNIDO Headquarters and members of the Platform. It also works to promote the concept, technology and achievements of green industry, as well as to introduce the latest progress made in the field. Currently, the Office focuses on developing a green industry index and ranking system and on organizing training, workshops and academic exchanges.

Another important global forum activity was the Food Safety Forum held in Vienna in 2015. The event, organized within the partnership framework between UNIDO and the China Food and Drug Administration (CFDA), was attended by over 160 participants from some 50 countries, representing a wide spectrum of stakeholders engaged in food safety governance and the food industry.



UNIDO, together with the Ministry of Industry and Information Technology of the People’s Republic of China (MIIT), organized the third Green Industry Conference, with a focus on promoting the rapid uptake of green industry, in harmony with the Earth’s ecosystems, in the Chinese city of Guangzhou in 2013. The event brought together some 700 participants, including high-level government officials, representatives of the private sector, civil society, academics and experts in the field.

At the opening of the third Green Industry Conference. *From left to right:* SU Bo (Vice Minister of Industry and Information Technology, China), Li Yong (Director General, UNIDO), Chen Changzhi (Vice Chairman of the Standing Committee of the National People’s Congress of China), Miao Wei (Minister of Industry and Information Technology, China), and Zhu Xiaodan (Governor of Guangdong Province).



UNIDO Director General Li Yong and Bi Jingquan, Minister of the China Food and Drug Administration, together with Andrä Rupprechter, Minister of Agriculture of Austria.

Director General Li Yong and Minister Bi Jingquan at the opening of the Vienna Food Safety Forum. Sitting at the far left is Cenk Gurol, Chairman of the Global Food Safety Initiative (GFSI).

Looking forward

New International Context

The global context for development cooperation has changed significantly in the past years – both in terms of “what” the international community hopes to achieve in the next fifteen years and “how” it will go about it.

In July 2015, the Addis Ababa Action Agenda was adopted at the United Nations Third International Conference on Financing for Development held in the Ethiopian capital. The Action Agenda marks a critical step forward in building a sustainable future for all in that it contains more than 100 concrete measures. It went far beyond narrow financing measures, also covering cooperation on a range of other issues, including technology, science, innovation, trade, capacity building and more. As one concrete measure, Member States agreed to create a Technology Facilitation Mechanism, and UNIDO is one of the UN agencies tasked to develop proposals for the different components of this mechanism. The Addis Ababa Action Agenda also recognizes that “inclusive and sustainable industrialization” is one of a few key cross-cutting enablers, which will have a large transformative effect for other development areas.

In September, 2015, at the UN Summit, world leaders adopted the 17 Sustainable Development Goals (SDGs) as part of the

2030 Agenda for Sustainable Development, which marks a historical milestone in international development cooperation for the next 15 years. With these new universal SDGs, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind.

If the Addis Ababa Action Agenda defines the “how” or the means to achieve the 2030 Agenda, then the SDGs define the “what” or the areas of international development cooperation in the future. Both the Action Agenda and the SDGs build on the success of the Millennium Development Goals (MDGs), but they go distinctly further. They provide equal weight to all three dimensions - social, economic and environmental - of sustainable development. They are also universal and hence call for actions from all countries to promote prosperity, while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs, including education, health, social protection, and job opportunities, while tackling climate change and environmental protection. SDG 9 on “resilient infrastructure, inclusive and sustainable industrialization and innovation” provides fresh impetus to UNIDO’s mandate of inclusive and sustainable industrial development and invites the Organization to increase its support to Member States in the future, including China.



Sustainable Development Goals
 Picture source: <http://www.globalgoals.org/>

New National Context

During the past decades, China has delivered exceptional levels of growth and human development progress, obtaining remarkable results in its effort to achieve the MDGs and create a *Xiaokang* (moderately prosperous) society. MDG 1 - to half the number of poor people in the world by 2015 - was achieved in large measure due to China's impressive success. Nevertheless, the country still faces a number of challenges, among which, the most prominent are social and economic inequality, food safety, environmental degradation and dependence on fossil fuels.

The Chinese Government has adopted a strategic, prudent and scientific approach to tackle these challenges. It formulates policies on the basis of sound evidence and credible data, and implements pilot initiatives, which are to be scaled up if proved successful. This strategic vision is expressed and synthesized in the 13th Five-Year Plan 2016-2020.

The Plan wishes to maintain GDP growth and acknowledges that people's quality of life is the be-all and end-all of economic growth, and more should be done to tackle problems in education, employment, income growth, social security, health care and food safety. The Plan includes, among other things, five key development concepts and

priorities that will guide China's development over the coming five years: innovation, greening, opening, sharing and coordinating.

- » **Innovation:** The economy should be driven by consumption, investment and exports, instead of only by investment and exports. China will shift from relying on secondary industries alone to reliance on the primary, secondary and tertiary industries, turning away from resource consumption and towards technological upgrading through innovation so as to realize the promises contained in its "Made in China 2025" initiative.
- » **Greening:** Strengthened ecological conservation capacities, and coordination of growth with green development will be the focus, with the aim of creating an "ecological civilization".
- » **Opening:** China will strengthen its international cooperation, including through the "One Belt, One Road" initiative and enhanced engagement in Africa.
- » **Sharing:** There is a need to ensure that China's prosperity is shared among the entire population with inclusive development that expands social services.

» **Coordinating:** Reform should be the ultimate power to cultivate and unlock market potentials and boost the sustainable and healthy growth of the economy and society, and hence government efficiency should be improved.

In terms of strengthened international cooperation, China has proposed a series of measures to help other developing countries achieve the SDGs. During the UN Summit held at United Nations Headquarters in New York on September 26, 2015, President Xi Jinping announced that China would (1) set up a fund, with an initial contribution of US\$2bn, to support South-South cooperation and assist developing countries in implementing the post-2015 development agenda; (2) do its best to raise its investment in least developed countries (LDCs) to US\$12bn by 2030; (3) exempt the debt of the outstanding intergovernmental interest-free loans due by the end of 2015 owed by relevant LDCs, landlocked developing countries and small island developing countries; (4) establish an international development knowledge centre to facilitate studies and exchanges regarding theories and practices of development suitable to each country's respective national conditions; and (5) propose discussions on establishing a global energy network to facilitate efforts to meet the global power demand with clean and green alternatives.

Meanwhile, at the High-level Roundtable on South-South Cooperation, also held on September 26, 2015, President Xi announced that in order to help other developing countries to grow economically and improve people's livelihood, China would carry out the "Six 100s" initiative. Over the next five years, China will make available to other developing countries 100 poverty reduction programmes, 100 agricultural cooperation projects, 100 trade promotion and aid programmes, 100 environmental protection and climate change programmes, 100 hospitals and clinics, and 100 schools and vocational training centres. In the next five years, China will provide 120,000 training opportunities and 150,000 scholarships for citizens of other developing countries, and help nurture 500,000 professional technicians. China will also set up an Academy of South-South Cooperation and Development.

New perspectives for UNIDO-China Cooperation

In the past decades, the cooperation between UNIDO and China has witnessed enormous achievements. China's ownership and leadership has always been instrumental, and cooperation projects have been focused on priorities agreed by both sides. In the new national and international contexts, as China is quickly expanding its economic capacity and international influences, UNIDO and China will further strengthen their cooperation in the years to come.

The UNIDO-China Country Programme 2016-2020 has been adopted and features three major areas for cooperation to support the implementation of the 13th Five-Year Plan. In accordance with the pillars of the United Nations Development Assistance Framework (UNDAF) 2016-2020, and in line with UNIDO's Lima Declaration (adopted by Member States in 2013), Sustainable Development Goal 9 (SDG 9) and the UNIDO-China Strategic Cooperation Framework 2014-2016, the Country Programme focuses on promoting inclusive and sustainable industrial development (ISID) by providing policy advisory and technical cooperation services, and convening global forums for industrial cooperation and standard-setting. More specifically, the following three areas will be addressed:

1. Achieving high-quality, low-carbon economic growth and transitioning to a green economy;
2. Ameliorating the situation of food safety; and
3. Strengthening international cooperation.

Both sides are also cooperating closely in the context of the Group of 20 (G20), where the Chinese Presidency during the year 2016 is placing major emphasis on industrialization in Africa and LDCs, and on advancing the "New Industrial Revolution" in developed and developing countries.

Looking ahead, UNIDO's inclusive and sustainable industrial development approach and its Programme for Country Partnership (PCP) will provide concrete mechanisms with which to advance on these important subjects in the years to come.





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