

## Boeing in China

Boeing has a long-standing relationship with Chinese airlines, the Chinese aviation industry, the Civil Aviation Administration of China (CAAC) and the Chinese government. The history of cooperation between Boeing and China's aviation industry traces back to 1916. The first engineer that William Boeing hired was China-born Wong Tsoo, who helped design the company's first commercial success: the Model C bi-wing airplane. Wong later returned to China and played an important role in early Chinese aviation.

For more than 45 years, Boeing has been privileged to serve in the development of China's air transport system. In 1972, the historical visit by President Richard Nixon to China led to the introduction of Boeing aircraft to this market.

Today, Boeing China Co., Ltd., is the holding company for Boeing's China operations and is based in Beijing. Staff work in key corporate and business unit functions, including Government Affairs; Marketing and Communications; Business Development; Commercial Airplane Sales; Law; Human Resources; Commercial Aviation Services; Boeing Training & Flight Services; Engineering, Operations & Technology; Boeing Capital Corporation; and Jeppesen. There are about 280 Boeing employees throughout China and more than 6,000 employees at Boeing's various businesses, subsidiaries and joint ventures.

## Advancing China's Aviation Industry and Partnering With China for Mutual Benefit

The heritage of mutual benefit and joint contribution between China and Boeing continues today. The State Council of the People's Republic of China has declared that aviation will remain a critical component of China's continuing economic development. Boeing forecasts that over the next 20 years, China will need 7,690 new airplanes that are worth \$1.2 trillion. China will also need to purchase \$1.5 trillion in commercial services to support the country's growing fleet of airplanes. This demand will make China Boeing's largest commercial airplane customer. In turn, Boeing equity investment in China's aviation industry is considerable, with Boeing being the leading commercial purchaser.

Today, more than 50 percent of the commercial jetliners operating in China are Boeing airplanes. At the same time, more than 10,000 Boeing airplanes fly throughout the world with parts and assemblies built in China. China has a role in every one of Boeing's commercial airplane models: the 737, 747, 767, 777 and the newest and most innovative airplane, the 787 Dreamliner.

Boeing activity in China contributes more than \$1 billion annually in direct support of China's economy, including procurement from our extensive supply base, joint venture revenues, operations, training, and research and development investment.

China builds horizontal stabilizers, vertical fins, the aft tail section, doors, wing panels, wire harnesses and other parts on the Next-Generation 737. China also produces the rudder for the 737 MAX, a more fuel-efficient version of the best-selling 737 Classic. China contributes trailing edge wing ribs, horizontal stabilizers, vertical fins, ailerons, spoilers and inboard flaps for the 747-8. In addition, China has an important role on the 787 building the rudder, wing-to-body fairing panels, leading edge and panels for the vertical fin, and other composite parts.

China is the first conversion location for the new 747-400 Boeing Converted Freighter. Parts and assemblies are built in China; conversion, test and certification are performed in China; and airplanes are delivered from Xiamen, China. Boeing partners with more than 35 major Chinese firms as direct contractors on this production and also with hundreds of Chinese subcontractors.

### **Collaborating to Reduce Aviation's Environmental Footprint**

With the support of the Chinese and U.S. governments, Boeing and other industry leaders are helping to establish a sustainable aviation biofuel industry in China that will provide broad-based economic and environmental benefits throughout the world, but particularly in the United States and China — the world's two largest aviation markets.

In 2010, Boeing established the Joint Research Lab for Sustainable Aviation Biofuels with Qingdao Institute of BioEnergy and Bioprocess Technology (QIBEBT).

In October 2011, Air China conducted China's very first biofuels flight in a Boeing 747-400.

In August 2012, Boeing and the Commercial Aircraft Corporation of China (COMAC) opened the Boeing-COMAC Aviation Energy Conservation and Emissions Reductions Technology Center in Beijing, recently renamed Boeing-COMAC Sustainable Aviation Technology Center. The center works with Chinese universities and research institutions in developing technologies, such as sustainable aviation biofuels, to improve aviation efficiency and reduce carbon emissions. The technology center's first research project was exploring ways to refine waste cooking oil, or "gutter oil," into aviation biofuel.

In March 2015, Boeing, Hainan Airlines and Sinopec celebrated China's first passenger flight with sustainable aviation biofuel by a Next-Generation 737-800 airplane, another key environmental milestone for China's commercial aviation industry.

### **Expanding Strong and Innovative Partnerships**

In September 2015, Boeing and COMAC announced that they would partner to open a facility in China for the interiors completion, paint and delivery of Boeing 737 aircraft to

Chinese customers. The joint-venture facility will significantly expand Boeing's collaboration with China's aviation industry while also enabling future production rate increases at Boeing's 737 final assembly factory in the U.S. In October 2016, Zhoushan of Zhejiang Province was selected for the 737 completion and delivery center, and construction of the facility started in May 2017. The center, which consists of a completion center under a joint venture between Boeing and COMAC, and a delivery center owned by Boeing, is expected to open in late 2018 and begin performing cabin installation, painting, flight testing and aircraft maintenance.

In September 2011, Boeing signed a 10-year contract with Shanghai Aircraft Manufacturing Co. (SAMC) for 737 horizontal stabilizers. It is the largest contract Boeing has ever had with a Chinese supplier. In November 2011, the Aviation Industry Corporation of China (AVIC) and Boeing opened the AVIC-Boeing Manufacturing Innovation Center in Beijing, China, to increase AVIC's efficiency and capacity to supply high-quality parts for Boeing airplanes. Subsequently two branches of the center were opened in Xi'an and Shenyang.

Boeing's large China investments include Boeing Tianjin Composites Co., Ltd., in Tianjin (a joint venture with AVIC) and Boeing Shanghai Aviation Services Co., Ltd. (a joint venture with China Eastern Airlines and the Shanghai Airport Authority). Boeing Tianjin is the largest aerospace employer in Tianjin and manufactures interior parts and composite structures for Boeing commercial airplanes. Boeing Shanghai is a maintenance, repair and overhaul (MRO) center based in Shanghai, performing line maintenance, heavy maintenance and airframe modifications as well as upgrades for airplane interiors, avionics and in-flight entertainment systems.

In February 2016, Boeing launched the Next-Generation 737-800 Boeing Converted Freighter (BCF) at Boeing Shanghai. Over the next 20 years, Boeing forecasts customers will need more than 1,000 converted freighters the size of the 737, with China's domestic air freight carriers accounting for nearly one-third of the total market.

In addition, Boeing is minority joint venture partner in the Taikoo (Xiamen) Aircraft Engineering (TAECO) MRO center in Xiamen and operates a number of wholly owned subsidiaries, including Boeing Shanghai Aviation Flight Training Co. (a training business for pilots, crews and mechanics), Aviall, Inc. (an aviation spare parts distributor), and Jeppesen (the world's leading provider of flight and navigation information services).

In summer 2016, China Eastern Airlines teamed with Jeppesen to gain the authorization to operate in a fully digital capacity using Jeppesen FliteDeck Pro as part of its electronic flight bag (EFB) solution. This was a milestone authorization: China Eastern is the first airline in China to achieve paperless operating status.

### **Investing in the Future Through Training and Research**

Boeing has long worked with China in areas such as safety, aviation quality practices, business and executive training, and technical support. Since 1992, in cooperation with Chinese airlines, CAAC and industry, Boeing has provided enhanced professional

training to about 75,000 Chinese aviation professionals in pilot techniques, flight operations, maintenance engineering, regulatory, air traffic management, executive management, airline management and marketing, manufacturing, quality assurance, finance and industrial engineering. Boeing considers this training an investment in the future of Chinese commercial aviation and provides it at no charge to China.

In 2009, Boeing established Boeing Research & Technology China. Later that year, Boeing partnered with the Chinese Academy of Sciences on Research Collaborations. In 2010 Boeing established a joint research center with Tsinghua University to develop technologies in aircraft cabin environments, advanced materials, computer science and industrial designs. In 2012, Boeing joined the Center for Cabin Air Reformative Environment (CARE), which deepened its partnership with Tianjin University and six other prestigious Chinese universities on aircraft cabin air environment research projects.

The Boeing Academy in China, launched in 2012, created an integrated platform to further enhance the training initiatives in China.

### **Supporting Trade Relations**

Boeing successfully promoted U.S. approval of China's accession to the World Trade Organization and congressional approval of normal trade relations between the United States and China. The company is recognized as an industry leader in supporting a strong and robust U.S.–China trade relationship and remains committed to demonstrating the value of bilateral trade and advocating its continued growth. In addition, Boeing is a leader in creating the U.S.–China Aviation Cooperation program, an initiative of U.S. government and American aviation companies, working with CAAC and airlines to help advance China's commercial aviation.

### **Educating Tomorrow's Scientists Through Corporate Citizenship**

Good corporate citizenship has always been an essential part of The Boeing Company. In China, the company's vision for corporate social responsibility is to stretch Boeing expertise and commitment to the science, technology, engineering and mathematics (STEM) education of Chinese youth from elementary school to college.

At the elementary level, Boeing launched Soaring With Your Dream, an aerospace education project, in Beijing in 2009. Now more than 120,000 students from more than 1,400 schools across the country have participated. Starting in 2011, the project expanded to the more areas of China, including Tianjin, Hebei, Shaanxi, Tibet area, Sichuan, Guangzhou, Guizhou, Gansu, Inner Mongolia, Hunan and Chongqing.

At the high school level, Boeing supported the introduction of the *FIRST* Robotics contest among high school students in Beijing to inspire young people's interest and participation in science and technology. Hundreds of students have participated in the contest in China, and the winners join students from other countries and the United States to compete for the annual global championship.

At the college level, in 2008, Boeing identified four strategic partnering universities (Peking University, Tsinghua University, Civil Aviation University of China and Civil Aviation Flight University of China) and committed total funding and program sponsorship at these institutions. Projects include scholarships, faculty training, student technology projects (such as a new environment standard study for a Boeing joint venture), and course development in areas such as lean manufacturing and software outsourcing. Starting from 2010, Boeing has launched seven student aviation clubs at Chinese universities (Peking University, Tsinghua University, Civil Aviation University of China and Civil Aviation Flight University of China, South China University of Technology, Sun Yat-sen University and Nanjing University of Aeronautics and Astronautics).

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