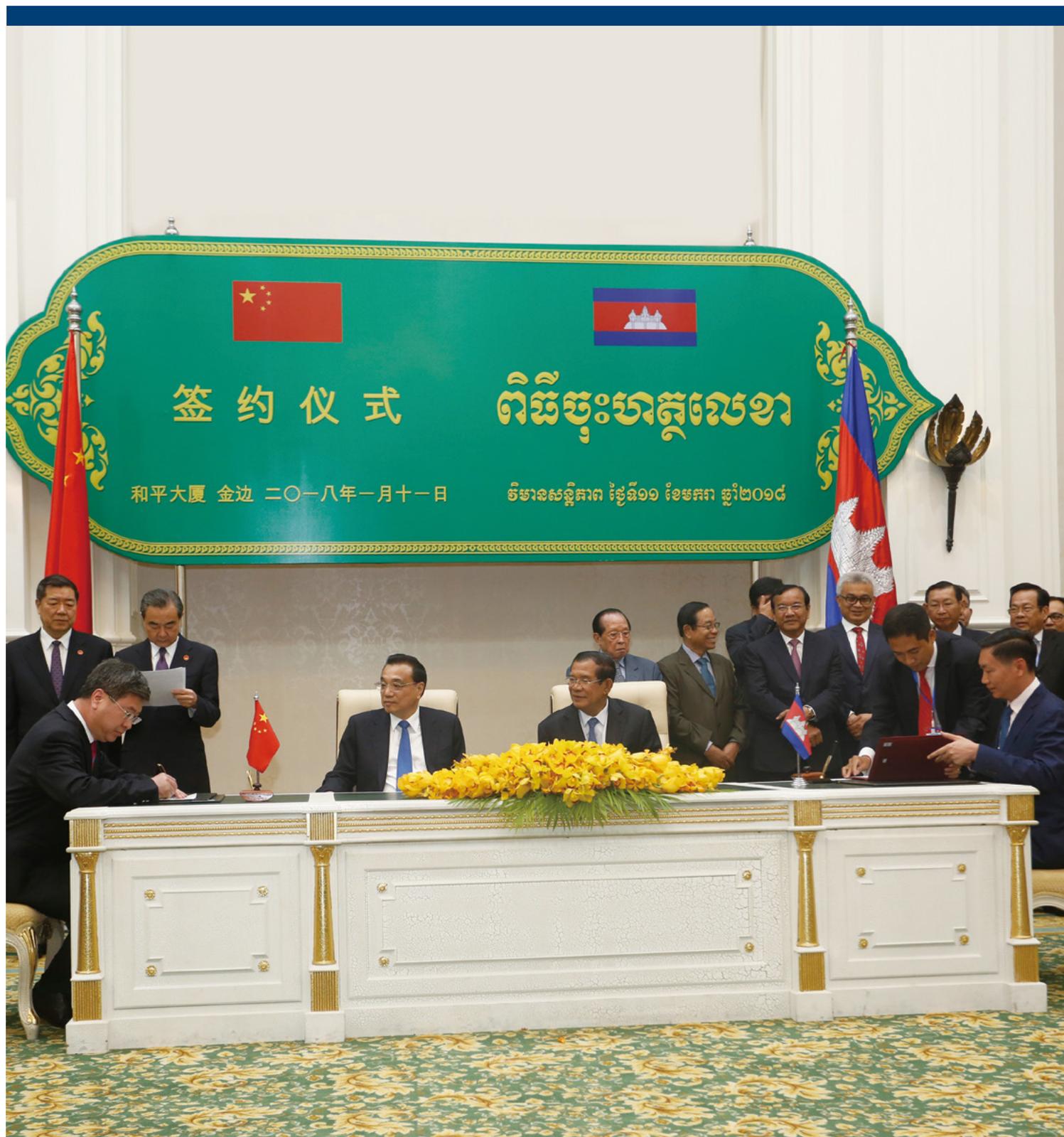


# SINOMACH TODAY

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**VOL**

**43**

NO.1 Mar. 2018



## SINOMACH Completes 1,200 Projects in Belt and Road Countries

Ren Hongbin Chairman of SINOMACH

Themed “Creating a Shared Future in a Fractured World,” the 48th Annual Meeting of the World Economic Forum was held in Davos, Switzerland from January 23-26, 2018. In the context of increasing geopolitical competition among countries, the significance of international cooperation was reaffirmed, and major issues of common interests, such as international cooperation, environmental protection and global economy, were discussed. I had the honor to attend this meeting and share my views:

The Belt and Road Initiative will address the issue of uneven and unstable world development. China National Machinery Industry Corporation (SINOMACH) has completed more than 1,200 overseas projects across multiple industries. There are many completed and ongoing projects in 48 countries along the Belt and Road, bringing maximum benefits to participants. In cooperation, we are providing more reliable, usable and affordable clean energy.

Despite both challenges and opportunities in overseas construction, we pursue win-win cooperation, coordinated development and common prosperity by integrating with various countries’ policies and development strategies, focusing on value creation, and deepening pragmatic cooperation. In the construction of infrastructure projects in countries along the Belt and Road, SINOMACH has worked with local governments as well as excellent enterprises from third-party countries to build a number of high-quality projects. SINOMACH has also focused on employee investment, transfer of knowledge and technology, and continuation of benefits. We will unswervingly promote green growth, develop green infrastructure construction, and seek better quality and benefits. In the Belt and Road construction, we must adhere to sustainable social responsibility.

It now appears that many countries are lagging behind due to poor infrastructure,

and the construction of infrastructure can give new impetus to their development. The Belt and Road Initiative has created a new platform for international cooperation, which has provided an excellent foundation and guarantee for the development drivers of some less developed countries, bringing them new development opportunities. By virtue of the development experience and construction speed of China’s infrastructure, SINOMACH will build a platform for interconnection, mutual benefit, win-win cooperation and joint growth together with all countries. We bring Chinese technologies, equipment, funds and services to underdeveloped countries, and develop extensive cooperation with developed countries using new ideas and new methods to seek opportunities for common development.

(An excerpt from the speech made by Ren Hongbin during the “Belt and Road Impact” panel discussion at Davos forum)

# CONTENTS



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#### Four Main Businesses

R&D and Manufacture  
Project Contracting  
Trade and Services  
Finance and Investment

#### Market Position

Ranked 334<sup>th</sup> among Fortune Global 500  
Ranked 1<sup>st</sup> among China's Top 100 Enterprises in Machinery Industry  
Ranked 31<sup>st</sup> among Top 250 International Contractors  
Ranked 64<sup>th</sup> among Top 225 International Design Firms  
Ranked 17<sup>th</sup> among China's Top 500 Foreign Trade Enterprises  
Rated as Class A in central enterprise performance appraisal

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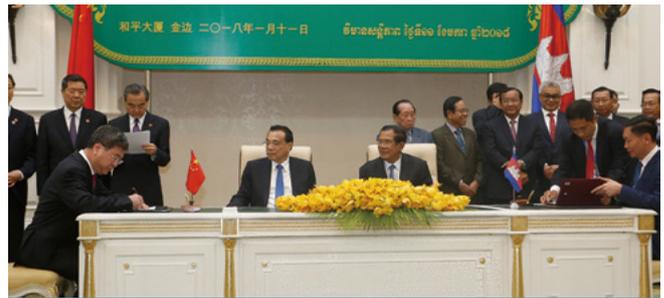
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## FEATURE STORIES

- 04 SINOMACH Reports Operating Revenue of RMB286.1 Billion with 34% Increase
- 05 Overall Strength Significantly Enhanced in Five Years
- 06 Noticeable Optimization of Business Structure
- 07 SINOMACH Endeavoring to Realize an 8% Profit Growth in 2018, to Move Forward with the Strategy of "Remaking an Overseas SINOMACH"



## FOCUS POINTS

- 08 The Prime Ministers of China and Cambodia Witness Signature and Inauguration of SINOMACH's Projects
- 10 Ren Hongbin Attends and Addresses China-France Business Council Inauguration Ceremony & First Meeting
- 11 SINOMACH Wins Four State Science & Technology Awards
- 12 SINOMACH Reaches Strategic Partnership with Schneider Electric
- 13 SINOMACH Exchanges
- 14 Accelerating Development of the China-Belarus Industrial Park in 2017 with Great Achievements
- 16 SINOMACH Drives China to Make New Breakthroughs in Research on Vibration Control in Industrial Engineering



## GRAND PROJECTS EXECUTED BY SINOMACH

- 18 “A Project Executed by Chinese” Printed on the Banknote–  
Puttalam Coal-fired Power Plant in Sri Lanka
- 



## COOPERATION AND COMMUNICATION

- 25 SINO-HEAVYMACH Attends IRAN METAFO2017
- 25 CMEC EXPO Ranks No. 1 among Outbound Exhibition Or-  
ganizers in China for 6 Consecutive Years
- 



## PROJECT PROGRESS

- 20 CNEEC Signs a Turnkey Contract of Moldova 500MW  
Combined Cycle Power Plant Project
- 21 CMEC Signs Contract on Cameroon’s Ngoila Hydropower  
Station
- 22 CHMC Signed the Contract of Nepal Langtang Khola Hy-  
dropower Project
- 22 CAMCE Signs Business Contract for Zimbabwe O/T 400kV  
Power Transmission and Transformation Project
- 23 CMEC Successfully Undertakes Power Generation Project  
of 26 Maldives Islands
- 23 CHMC Officially Kicks off the Nam Ngum 4 Hydropower  
Station Project in Laos
- 24 Groundbreaking Ceremony for Pakistan’s Punjab Power  
Plant
- 



## SINOMACHERS OVERSEAS

- 26 Zhang Ri: A Pioneer in the Design of Overseas Projects with  
Chinese Aid
-

# SINOMACH Reports Operating Revenue of RMB286.1 Billion with 34% Increase

In 2017, China National Machinery Industry Corporation Ltd. (SINOMACH) realized an annual operating revenue of RMB 286.1 billion, paying taxes of RMB14.62 billion, increasing year on year by 34% and 53% respectively. The record has been hit a new high in these metrics, SINOMACH has reached all targets set by the State-owned Assets Supervision and Administration Commission of the State Council ("SASAC").

# 286.1

RMB

Billion

Annual operating revenue of RMB 286.1 billion in 2017

34%  
increase over last year

# 14.62

RMB

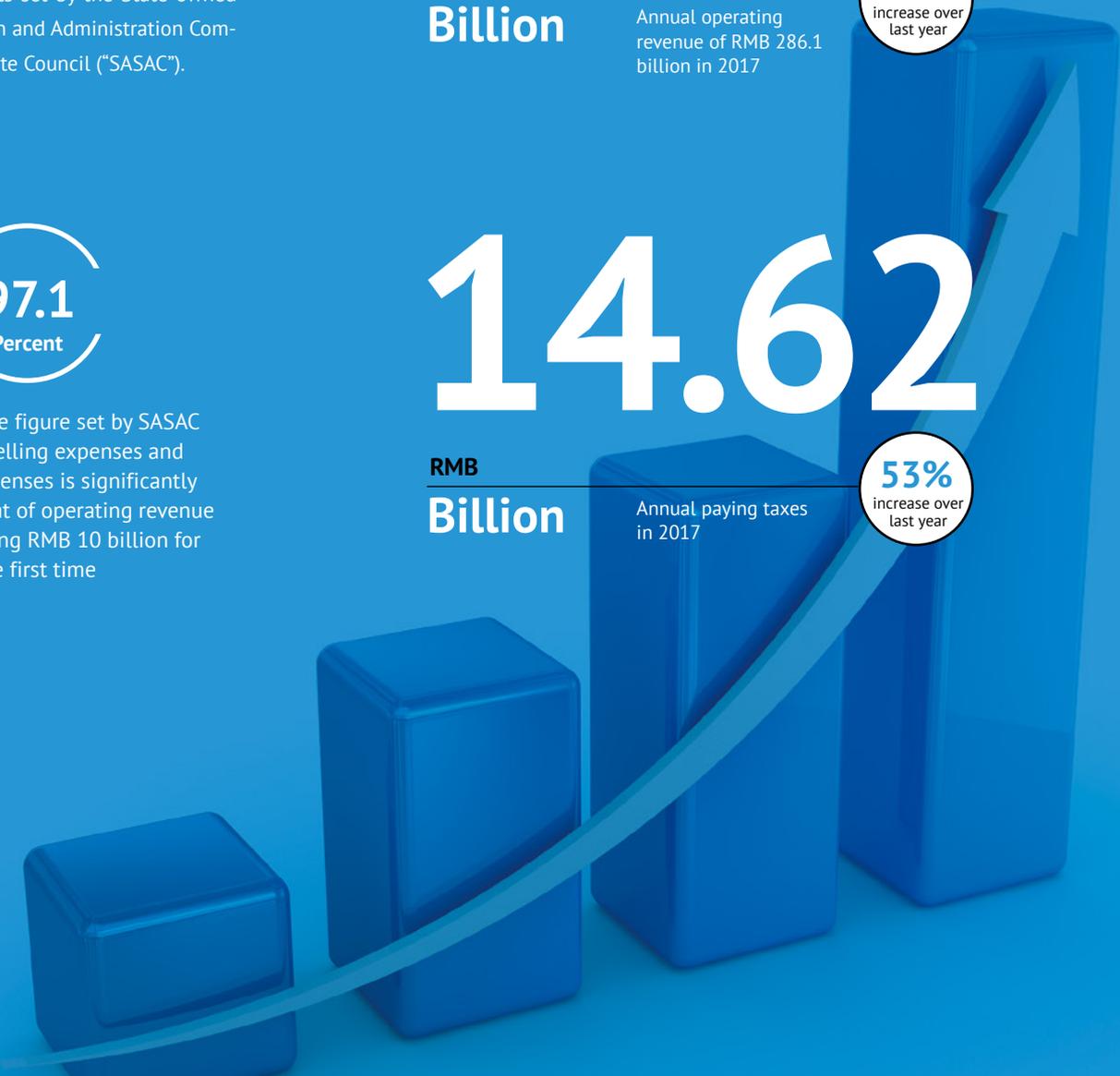
Billion

Annual paying taxes in 2017

53%  
increase over last year

97.1  
Percent

lower than the figure set by SASAC  
Growth of selling expenses and overhead expenses is significantly slower than that of operating revenue  
Profit exceeding RMB 10 billion for the first time



# 01 Overall Strength Significantly Enhanced in Five Years

## Significant enhancement of technological strength

Data from the last five years



Investment in science and technology

RMB **23.3 billion**



Awards

**1679**



Issued patents

**6724**



Standards developed and revised

**3646**

With the quality of some products and the technologies up to the leading position domestically and advanced world standard, SINOMACH enjoys significantly greater development. With great efforts in energy conservation and emissions reduction for lowering costs and increasing efficiency, overall gross margin and productivity have been growing steadily with energy consumption and emissions declining on a comparable basis.

SINOMACH is consistently improving its management ability. It is strengthening its strategic management, improving its strategic controlling system, and fostering and enhancing its competitiveness. With ever

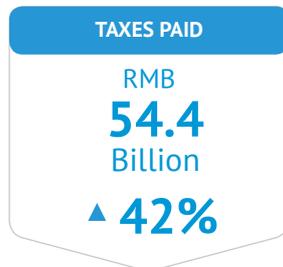
increasing efforts in the development and management of human resources, it now has roughly a thousand national experts such as academicians of the Chinese Academy of Sciences, the Chinese Academy of Engineering, experts from the Thousand Talents Program, the Ten Thousand Talents Program, more than 50,000 technical personnel working on various areas, providing strong support of intelligence and talents for all causes of the SINOMACH. It is enhancing financial management, expanding financing channels, improving fund usage efficiency, and lowering fund costs. With enhancement of management on informatization, the function of informatization in leading the innovation and development of the company is

promoted constantly, giving it an important role in the transformation, upgrading, quality and efficiency boosting of the company. SINOMACH is also steadily carrying out work on safe production, performing further social duties, and pushing forward the development of its culture and brand.

The leading role of SINOMACH is expanding constantly. With outsourced auxiliaries as the bridge, its subsidiary equipment manufacturing company has forged a supply chain system with private companies and SMEs and built a landscape of good interaction in which SINOMACH drives development of companies manufacturing auxiliaries through its own development and prompts upgrading of product quality, technologies, and management of these companies with the upgrading of its own products. The subsidiary industrial and trading company of SINOMACH, with the overseas market as a platform, actively facilitates the export of equipment, products, technologies as well as labor services and promotes “going global” for Chinese enterprises in clusters. The manufacturing company and the scientific research institute under SINOMACH, leveraging their industrial and technological advantages, have formed partnerships with more than 100,000 SMEs on “Four Aspects of Technologies” (namely development, transfer, consulting, and services of technologies), with an amount of projects having totaled RMB30 billion and nearly RMB100 billion of revenue generation by SMEs through the partnership.

## Economies of scale with stable growth

Latest five years VS previous five-year period



## 02 Noticeable Optimization of Business Structure

### More reasonable market structure

- ▶ Carrying out intensive work on the traditional markets of Asia, Africa, and Latin America and trying to expand in developed countries
- ▶ Facilitating the shift to high-end products and services with constant innovation and upgrading
- ▶ Deep tapping of individual market potentials and effectively exploring new businesses

**307** 307 overseas branches

**1 Billion** Profit of overseas subsidiaries exceeding RMB one billion for the first time

“remaking an overseas SINOMACH” strategy. It is making great efforts to expand in developed markets including Europe and the USA, trying to get hold of a position in premium markets, and effectively exploring new businesses. The ability of SINOMACH in leveraging both domestic and overseas markets and resources is further enhanced with its internationalized management further promoted.

The SINOMACH business structure is further improved. Focusing on “equipment manufacturing and modern manufacturing services,” SINOMACH carries out structural adjustment of primary businesses in an orderly manner. It grows in R&D and manufacturing of equipment while maintaining rapid development of engineering contracting, trade, and services and focuses on fostering financial and investment businesses besides primary businesses. Therefore, SINOMACH has shifted from the simultaneous development of “the three primary businesses” to a development driven by the “four wheels” of manufacturing, engineering, trade, and financing. A development with complementary and synergistic businesses, diversified operations, and multiple commercial activities is realized, laying the foundation for SINOMACH to build a multi-business transnational group with global competitiveness in the equipment manufacturing industry.

The asset structure of SINOMACH is further

optimized. It regrouped three central and local companies and completed 21 mergers and acquisitions with amounts of involved assets totaling RMB 116.7 billion, further expanding its scale and strength. Twenty-one internal regroupings were carried out with a total amount of RMB168 billion. Various resources such as funding, technology and talent are driven toward competitive enterprises, dominant businesses, and outstanding business operators in SINOMACH. Business units with strong abilities in system integration and overall competitive edge are forged. With a major focus on primary businesses, enterprises under second tier subsidiaries are either restructured or eliminated and there are significantly less enterprises under third tier subsidiaries. Therefore, management efficiency is boosted.

The market structure of SINOMACH is further rationalized. Actively merging into the overall economic and diplomatic picture of the country, SINOMACH, based on the Belt and Road Initiative, implemented its

### The asset structure of SINOMACH is further optimized.

Completed  
**21**  
Mergers

It regrouped three central and local companies and completed 21 mergers

RMB  
**116.7**  
Billion

Acquisitions with amounts of involved assets totaling RMB 116.7 billion

## 03 SINOMACH Endeavoring to Realize an 8% Profit Growth in 2018, to Move Forward with the Strategy of “Remaking an Overseas SINOMACH”

Major objectives for SINOMACH in 2018 include stable growth of revenue, profit growth of 8% year on year or even 10%, further lifting of rate of value preservation and appreciation and ROI for state-owned assets, further increase of turnover ratio of working capital, and further declining of debt to assets ratio.

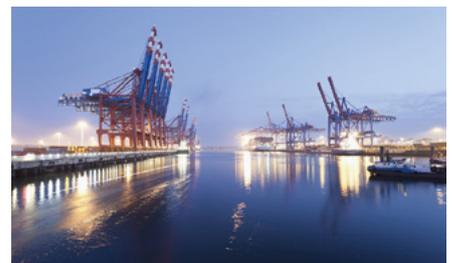
Regarding international markets, SINOMACH will move forward with the strategy of “remaking an overseas SINOMACH” and foster new advantages for competition and cooperation.

**1. It will actively participate in the Belt and Road Initiative and accelerate expansion in overseas markets.** It will specifically use strategic strongholds along the Belt and Road region as starting points to gradually forge a system which crosses Asia, Europe, and Africa. It will comprehensively leverage its advantages in areas including engineering and trade to promote its overseas investment and cooperation and expand export of high-end products with high added value. It will also accelerate the “going global” of its agricultural businesses.

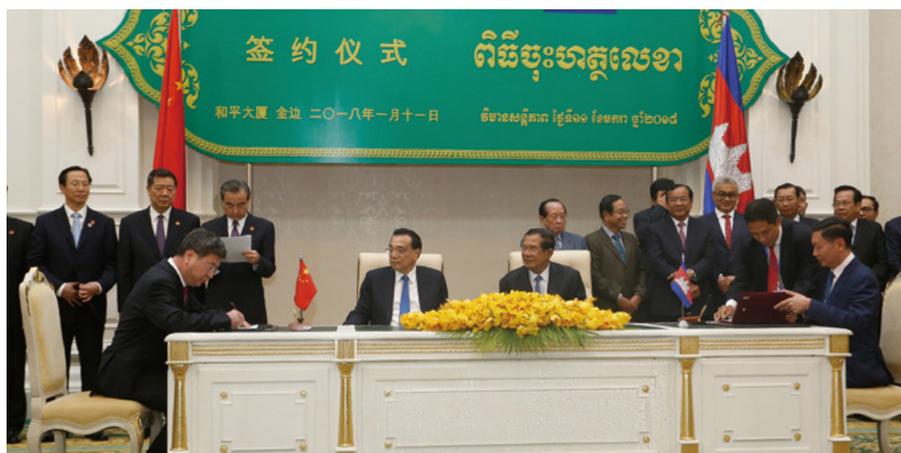
**2. SINOMACH will actively promote resource sharing and realize transformation and upgrading of its internationalized management.** It will facilitate the development of EPC+ and PPP projects and of overseas industrial parks with exploration and make great efforts in launching major projects. It will deepen multi-dimensional and mutually beneficial cooperation both among its subsidiaries and with other companies via such means as information sharing and opening of platforms. It will also enhance man-

agement on overseas offices and effectively give play to and expand the overall role of the Group’s overseas marketing network.

**3. SINOMACH will launch overseas mergers and acquisitions in due course and push the industry chain of the Group to a high-end level.** It will take full advantage of “domestic and overseas markets and resources” to consistently search for excellent overseas companies with great potential development and launch overseas mergers and acquisitions in due course to accelerate its internationalization, optimize its strategic layout, and complete its industry chain. With its primary businesses as the core, it will carry out mergers, acquisitions, and equity cooperation with a view to acquiring advanced overseas technologies, top talents, strategic resources, and branding channels, and make direct overseas investment in areas such as equipment manufacturing.



# The Prime Ministers of China and Cambodia Witness Signature and Inauguration of SINOMACH's Projects



Invited by Cambodian Prime Minister Hun Sen, Chinese Prime Minister Li Keqiang attended the Second Lancang-Mekong Cooperation (LMC) Leaders' Meeting in Phnom Penh, Cambodia and paid an official visit to Cambodia from January 10 to 11, 2018. They witnessed the conclusion of 19 bilateral cooperation documents involving in the fields of politics, economy and trade, health, forestry, agriculture and culture.

Among these cooperation documents include the contract for the Cambodian 500 kV Main and Regional Grid Power Transmission and Transformation EPC Project signed between China National Heavy Machinery Cooperation (CHMC), an affiliate of China National Machinery Industry Corporation (SINOMACH), and Electricité Du Cambodge (EDC), and the Preferential Buyer's Credit Agreement for the EPC General Contracting Project of CHMC, that is, the

Cambodian 230kV Power Transmission and Transformation Project Phase II (for the rest of the southwestern and eastern looped network).

The former involves the first 500kV power transmission line scheduled to be built in Cambodia. It includes the extension construction of two power transmission lines respectively connecting the western and eastern areas of Phnom Penh and the Cambodia-Laos border and Stung Treng Province, as well as the terminal substation. This symbolizes that Cambodian state grid is to formally upgrade to the maximum voltage in Southeast Asia and serve as the fundamental guarantee for the power interflow between Cambodia and its neighboring countries, including Thailand, Laos, and Vietnam, thus providing a very important strategic significance to Cambodian power development.

The signature of the latter marks that the project comes formally into effect. This project covers the building of five substations including Kampong Thom and Phnom Penh (east), extensions for nine substations, including Stung Treng and Kratie, and the construction of an 85-km 230kV power transmission line from Tatai to Bridge No. 2 and a 72-km 115kV power transmission line from Rehm to Jancaron.

After completion, the 230kV power transmission line in Cambodia will achieve connectivity. The 230kV main power grid will begin to take shape, greatly increasing Cambodia's power transmission capacity and significantly improving power transmission around Phnom Penh and in the northeastern and western parts of Cambodia. Nearly 250,000 users will gain access to power and the project will meet the demands of about 850,000 users for power utilization.

Tbong Khmum Provincial Hospital ▶



◀ China-Cambodia Friendship Preah Kossamak Hospital

Also on January 10, the grand inauguration ceremony of the China-Cambodia Friendship Preah Kossamak Hospital and Tbong Khmum Provincial Hospital was held in Phnom Penh. Premier Li Keqiang and Prime Minister Hun Sen officiated the two celebrations. Both projects represented China's to aid Cambodia. China IPPR International Engineering Co., Ltd., affiliated with SINOMACH, is responsible for the design and whole-process management of the two hospitals. Ding Jian, Chairman of China IPPR, attended the ceremony.

It is said that China-Cambodia Friendship After completion, it will become the first public hospital with modern medical concepts in Cambodia. Located in the new administrative district of Tbong Khmum, It will mainly serve province residents and those in surrounding areas.

The project design plans of the two hospitals combine Chinese modern architectural styles with local Cambodian traditional architectural style, fully considering Cambodian local climate characteristics. It effectively reduces operation energy consumption and reflects the concepts of green building design. The completion of the two hospitals will be a new historical testament to China-Cambodia friendship, promoting the cooperation of the "Belt and Road" initiative and "Lancang-Mekong Cooperation." China and Cambodia will continue to deepen the exploration of innovative cooperation modes in the health field.

**400**  
Beds

Preah Kossamak Hospital is designed to be a comprehensive hospital with 400 beds.

**300**  
Beds

Tbong Khmum Provincial Hospital is a 300 bed comprehensive teaching hospital.

# Ren Hongbin Attends and Addresses China-France Business Council Inauguration Ceremony & First Meeting

## Members of China-France Entrepreneurs Council

### Chinese Members of the Council

- Bank of China (Chairman Unit of China)
- China National Nuclear Corporation
- China National Machinery Industry Corporation**
- Commercial Aircraft Corporation of China, Ltd.
- China Investment Corporation
- Dongfeng Motor Corporation
- China National Building Materials Group Corporation Poly Group
- China General Nuclear Power Group
- China National Chemical Corporation
- China Mobile Communications Group Co., Ltd.
- Alibaba Group
- Huawei Technologies Co., Ltd
- JD Group
- ZTE Corporation

### French Members of the Council

- Schneider Electric (Chairman Unit of France)
- Air Liquide
- Airbus
- Areva
- Biomerieux
- BNP Paribas Danone
- Dassault Systèmes EDF
- Fives
- Groupe SEB LVMH
- Michelin
- PMU
- Sanofi
- Sodexo
- Suez



The China-France Business Council Inauguration Ceremony & First Meeting was held in the Great Hall of the People on January 9, 2018. Chinese President Xi Jinping and French President Macron met both parties' entrepreneur council representatives. Ren Hongbin, Chairman of SINOMACH, was invited to attend the meeting as a Chinese member of the council.

Ren Hongbin made a speech at the meeting. He reviewed cooperation achievements of SINOMACH and French enterprises in fields including agricultural machinery and power engineering. He stressed that SINOMACH will further deepen its cooperation with French enterprises under the “Belt and Road” initiative in aspects of equipment technological research and development, production efficiency management, intelli-

gent manufacturing and green development, take a global perspective, maximize respective advantages, develop the third-party market jointly and actively seek for diversified cooperation.

After Macron was elected president of France in 2017, the two heads of state held a meeting during the G20 Summit in Hamburg. Both parties agreed to commit to expanding trade investment for mutual benefit and win-win cooperation at a higher level. To implement the consensus of the two heads of state, establish a platform for direct exchange of enterprises in both countries and provide a channel for effective communication between the government and enterprises, the Chinese Ministry of Commerce, French Ministry of Economy and Economic and Commercial Counselor's Office of the

## SINOMACH Wins Four State Science & Technology Awards

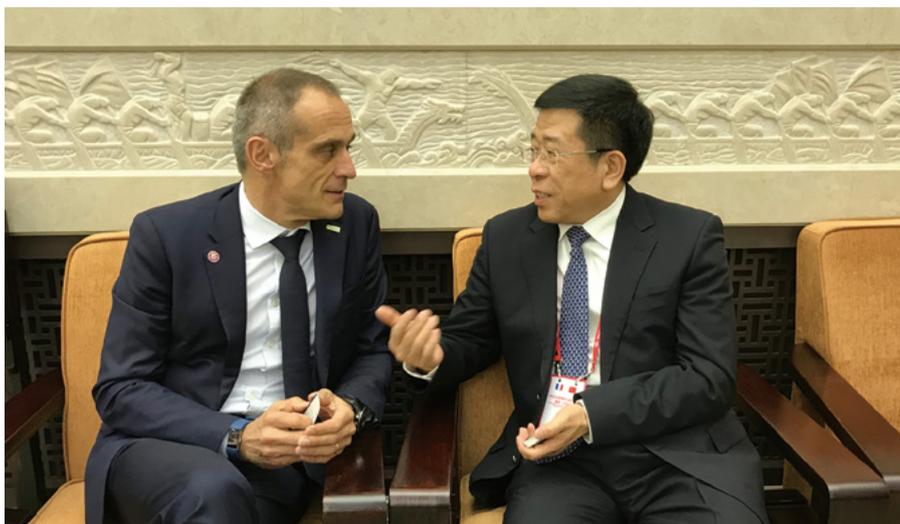
Embassy in China agreed to establish the mechanism of the China-France Business Council after numerous interactions. The China-France Business Council takes the Chinese Ministry of Commerce and French Ministry of Economy as the governmental guidance departments. It has a council consisting of 15 Chinese enterprise representatives and 17 French enterprise representatives. SINOMACH is among the Chinese enterprise representatives.

Enterprise representatives present at the meeting are first-class in both countries, covering various fields including advanced manufacturing, agriculture & food, bio-medicine and financial services. They not only highlight the demonstration effect of China-France cooperation in traditional fields including nuclear energy, aviation and automotive, but also indicate the potential of cooperation in new fields such as financial services, cross-border E-commerce, energy saving and environmental protection.



On January 8, 2018, the State Science and Technology Award Conference was held jointly by the CPC Central Committee and the State Council in Beijing. Leaders of the country and the Party including General Secretary Xi Jinping attended the conference and presented awards to representatives for the winners. Premier Li Keqiang delivered a speech commemorating the occasion. Winners of the second prize in the State Science and Technology Advancement category included SINOMACH and China United Engineering Corporation (Research on Key Vibration Controlling Technologies for Industrial Buildings and Their Application), Hefei General Machinery Research Institute (Key Technologies for Lightweight Design and Manufacturing of Heavy Pressure Vessels and Their Application in Engineering), and Chengdu Tool Research Institute (Design, Preparation, and Application of Cutting Tools with High Efficiency). And one of the winners of the second prize in the National Technology Invention category was YTO Group Corporation (Method of Manufacturing and Assembling of Complex Castings with Dieless Compound Forming).

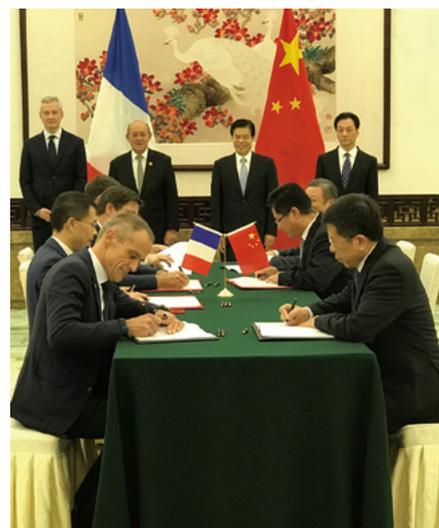
# SINOMACH Reaches Strategic Partnership with Schneider Electric



On January 9, 2018, Ren Hongbin signed a strategic cooperation memorandum with Jean-Pascal Tricoire, President and CEO of Schneider Electric on behalf of their own companies, witnessed by Zhong Shan, Chinese Commerce Minister, Wang Chao, Chinese Deputy Foreign Minister, Jean-Yves Le Drian, French Minister for Europe and Foreign Affairs and Bruno Le Maire, French Minister of Economy and Finance. The signature was held in the Great Hall of the People. It is one of many major achievements by French President Macron in deepening economic and trade cooperation between both countries during its first state visit to China.

Schneider Electric is an international power

equipment manufacturer with a history of more than 180 years. It is a leading enterprise engaged in global energy efficiency management and digital transformation in the field of automation. Schneider Electric has maintained a long-term close partnership with SINOMACH affiliates in international power projects in Africa, South America and Southeast Asia. As both parties reach a strategic partnership, they will fully implement their respective advantages, develop Chinese and overseas markets jointly and further deepen and expand their cooperation in overseas projects, technical research and development, energy efficiency management, intelligent manufacturing, international talent exchange and training, and other fields.

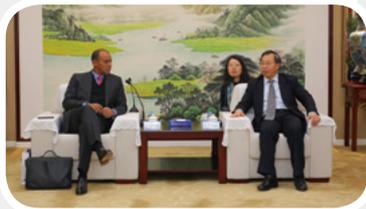
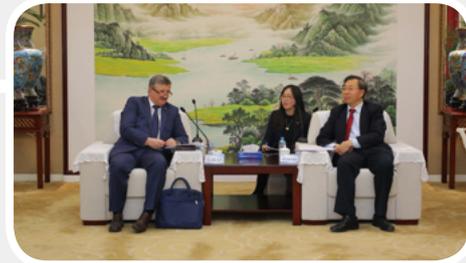


# SINOMACH Exchanges



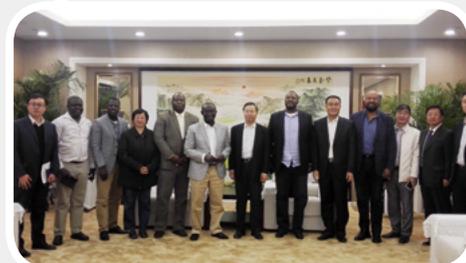
## Liu Jingzhen , Vice President of SINOMACH, Meets Foreign Guests

**Theme:**Liu Jingzhen,met with Economy Minister of the Republic of Belarus Vladimir Zinovskiy in the headquarters on February 11, 2018. Both parties had an in-depth exchange of views on China-Belarus Industrial Park and other projects.



**Theme:**Liu Jingzhen met with the visiting delegation of Cote d' Ivoire including the Petroleum and Energy Minister M. Thierry TANOH on February 7, 2018. Both parties had an in-depth exchange of views on further strengthening cooperation in infrastructure, power and other fields.

**Theme:**Recently, Liu Jingzhen met with Andy Appiah-Kubi, Executive Vice Minister of Ghana Ministry of Transportation Development, Ghana Parliament Representative Hon. Daniel Okyem Aboagye and other related personnel. Both parties had an in-depth exchange of views on cooperation in infrastructure construction including urban transportation in Ghana.



# Accelerating Development of the China-Belarus Industrial Park in 2017 with Great Achievements



2017 was an important year that witnessed the accelerated development of the China-Belarus Industrial Park. With joint efforts from China and Belarus, an all-round progress of the park was gained with positive results. Great emphasis and support are constantly put on the park from both governments. During the Belt and Road Forum for International Cooperation, President Xi and President Lukashenko met in Beijing and reiterated the importance of developing the park. Zhang Dejiang, Chairman of the Standing Committee of the National

People's Congress, Xiao Yaqing, SASAC Chairman, and Fu Ziyang, Deputy Minister of Commerce (official of ministerial rank), have visited the park on different occasions. A number of state leaders including President Xi have provided important instructions regarding the park. With an ever changing appearance, constantly increasing impact on the society, and more and more attention attracted, the park has become a landmark project in the Belt and Road Initiative.

## Amount of Investment Agreements Totaling USD 993 Million

By the end of February 2018, a total of 28 companies had entered the park (15 in 2017 and 5 in 2018). Investment agreements have totaled USD 993 million. There were 16 companies wholly or partly owned by Chinese entities, 7 by Belarusians, 1 by Americans, and 4 by Europeans. A total of 159 hectares of land were leased (purchased), standard plant buildings with a total area of 7,693 sqm were leased, office buildings with a total area of 1,232 sqm were purchased, and office buildings with a total area of about 10,000 sqm were leased.

In 2017, 38 special marketing events for the park were held with more than 1,600 participating companies. More than 150 delegations from China and 58 from Russia, Germany, Finland, and Italy were received



in the park. More than 50 companies within China were visited for attracting investment with accurate targets.

In 2017, new breakthroughs have been made regarding investment attraction and certain achievements were made with regard to investment attraction on the international market. Besides companies from China and Belarus, companies from the USA and EU also made investments. Great development



of the park has been realized with strong support from both governments and close cooperation between China-Belarus joint ventures and the two large-sized companies owned by the Chinese Central Government, namely SINOMACH and the China Merchants Group, through aggressive exploration. With recent issuance of No. 166 Presidential Decree, the period for tax preference was extended and the entry threshold for investment was lowered.

## Four Completed Projects and Three Projects Just Launched



So far, revision of detailed rules for the first phase of the park has been completed. In terms of infrastructure, roads, water supply networks, gas pipeline networks, water pump stations, water supply stations, and the main body of 6 switching stations in the starting area of the first phase have been accepted and delivered. The delivery of a rainwater treatment plant, rainwater pumping station, and rainwater pipe network and the equipment debugging of the sewage treatment plant is underway. The preliminary design of the development area of the first phase has been completed and approved by the government.

Currently, the logistics and warehousing facilities, with an area of 100,000 sqm, in the China-Belarus commerce & logistics park of the China Merchants Group, the R&D center for supercapacitors of Chengdu Xinzhu Corporation, the office building with an area of 12,500 sqm, and the standard

plant building with an area of 8,000 sqm are completed and put into use. Three projects, including the standard plant building with an area of 10,000 sqm invested and built by China-Belarus joint ventures and the projects of Zoomlion and Weichai, have started and the groundbreaking ceremony has been held. Preliminary design of the residential area of the first phase and the China-Belarus center for commercialization of research findings and cooperation has been completed and submitted to the government for approval in December.



100,000  
sqm

Warehousing facilities, with an area of 100,000 sqm

12,500  
sqm

Office building with an area of 12,500 sqm

8,000  
sqm

Standard plant building with an area of 8,000 sqm

# SINOMACH Drives China to Make New Breakthroughs in Research on Vibration Control in Industrial Engineering

## Xu Jian, President and Chief Engineer

- ▶ On January 8, 2018, Xu took second prize in the State Science and Technology Advancement category with a project titled *Research on Key Vibration Controlling Technologies for Industrial Buildings and Their Application* on the State Science and Technology Award Conference for 2017.
- ▶ In 2014, Xu won the same prize with a project titled *Research on Key Technologies for Vibration Control in Industrial Engineering and Their Application*. The prize taken in 2018 marks a new breakthrough for China in research on technologies for vibration control in industrial engineering and their application.

What has driven a senior official of a company owned by the Central Government to be so persistent in scientific research and win two prizes within three years? With this question, our reporter visited SINOMACH, approached the research team led by Professor Xu Jian, and listened to their stories of tackling key technological challenges.

Vibration control in industrial engineering is a cross-discipline subject covering areas such as civil engineering and mechanics. It provides important guarantees for safe use of industrial buildings, normal operation of in-

dustrial equipment, and the health of production staff. There is a trend of high-end industrial equipment manufactured within China towards precision and large dimensions with machining precision of assemblies measured in nanometers and impact pressure of large equipment up to tens of thousands of tons. Therefore, the requirement regarding vibration control in the production environment is more and more rigid and controlling of vibration has become a key technology in industrial engineering.

Development of vibration controlling technologies in China once lagged behind that of domestic industrial engineering. Related technologies for high-end equipment were largely imported with high expense and limitations on key technologies involving national security and high-technology, severely impeding the development of the equipment manufacturing industry in China.

To tackle issues regarding key technologies of vibration control in industrial engineering and to meet requirements for developing the manufacturing of high-end equipment in China, a research team under the leadership of Xu Jian with members from key enterprises in China specializing in research on vibration control technologies embarked on a joint research project which lasted more than 20 years. It tackled key technological challenges regarding vibration control in industrial engineering and significantly enhanced the vibration control level in Chi-

nese industrial engineering. It established a system for standards on vibration control technologies for industrial engineering, developed a number of national standards, and acquired related proprietary intellectual property rights. Its research findings have been proven via expert evaluation held by relevant institutions of the Ministry of Housing and Urban-Rural Development as on par with advanced world standards, with some of the findings enjoying a globally leading position.

Regarding basic theories on vibration control technologies, the team led by Xu Jian developed a method for analyzing impacts from industrial equipment and ambient vibration through analysis and research on the laws by which vibration transmits along industrial engineering medium. The team proposed equivalent quantization technologies for vibration sources excitation, determined the method for detailed design of vibration control for industrial equipment, and established a system for evaluating vibration control which integrated testing techniques, design methods, and permissible standards. It created a method for theoretical analysis on control of multivariable vibration caused by complex excitation from industrial equipment, completed the design of quantitative vibration control by steps, and developed a comprehensive vibration control technology with integrated analysis on the foundation, base, structure, equipment, and controlling units to be widely used in industrial engineering.

In respect to packaged technologies of vibration control for precision equipment, the team proposed a fast calculation of similarity ratio among vibration transfer functions and a self-correction method for numerical analysis models, and enhanced efficiency and accuracy of analysis on control of complex vibration for precision equipment. It developed a technology of dynamic configuration for intelligent optimization and tackled the technological challenge of accurately matching vibration control systems. It also developed a database covering loads and models of vibration control for precision equipment and provided an efficient approach for analyzing vibration control.

Regarding impact from centroid motion of precision equipment on the dynamic property of vibration control systems, the team proposed a technology for analyzing de-coupling in degrees of freedom, established a method for designing vibration control with distribution characteristics of stable low-frequency modes through targeted optimization of parameters of primary vibration modes, and tackled the technological challenge of designing vibration control systems with optimized performance for precision equipment. It proposed the method on integrated design of vibration control systems against complex vibration sources and solved the problem of interaction between complex internal and external vibration sources in towering and overlength precision equipment. It also developed high-performance air-floating

vibration control units and highly sensitive automatic tracking and leveling systems with proprietary intellectual property rights and realized domestic production of micro vibration control units, overcoming blockades on related technologies by foreign countries.

Regarding packaged technologies of vibration control for large equipment, the team, through research on reasonable setting of boundary conditions among large equipment, controlling units, and basic structures, developed a technology of integrated analysis which has taken account of accessory equipment, accurate simulation of loads, and interaction between foundations. It performed optimized analysis on key areas which were susceptible to fatigue damage on vibration control systems for large impact equipment, and proposed a method for analyzing service life under safe conditions of vibration control systems. It also developed a technology of simulating equivalence principle on mechanical parameters of vibration control units and gravitational effect of low-rigidity pre-tightening forces through experiments and research on models of vibration control systems for large revolving equipment, and realized accurate prediction and evaluation on vibration control performance during the design period.

The team, through on-site measurement and research on geologic conditions and theoretical analysis on vibration properties of the equipment, proposed a method for analyzing

and predicting vibration transmission on large impact equipment and tackled the technological challenge of optimization and design of environmental protection and vibration control systems in industrial areas so that the impact on the surrounding areas due to vibration from large impact equipment was prevented and the technology on precise control of impact vibration was enhanced.

The team has developed packaged technologies for vibration control in industrial engineering based on their research findings and acquired related proprietary intellectual property rights. It has realized engineering and industrialization of its findings and applied them in projects including manned space flights, meteorological satellites, space telescopes, large grating ruling, nuclear submarines, large three-coordinate measuring machines, nuclear power plants, thermal and hydro power plants, pressing machines with ten thousand tons of force, and automobile equipment, providing strong guarantees for enhancing technological strength of industrial equipment within China and increasing international competitiveness of Chinese equipment manufacturers.

(Note: this article is an abridged excerpt from Science and Technology Daily.)



## “A Project Executed by Chinese” Printed on the Banknote – Puttalam Coal-fired Power Plant in Sri Lanka

Puttalam Power Plant is the first and by far only operating coal-fired power station in Sri Lanka. It covers about 40% of the country’s total output and is the largest and the most important power plant in the country.

On February 4, 2011, coinciding with Sri Lanka’s Independence Day, the Central



Bank of Sri Lanka issued a series of new banknotes with the theme of Development, and Prosperity, featuring Sri Lankan Dancers. An aerial view of the Puttalam Coal-fired Power Plant (3×300MW) was printed on the front side of the new 100 rupee note. People of Sri Lanka genially call the plant Lakvijaya (meaning Victorious Lanka).



The power plant is on the Kalpitiya Peninsula along the northwestern coast of Sri Lanka. Adjacent to the coastal line, it is 130km away from the capital city Colombo. With a total capacity of 3×300MW, its first phase, including a 1×300MW power plant and supporting facilities, was completed and delivered to the owner for commercial operation on July 24, 2011. The second phase, including a 2×300MW power plant and supporting facilities, was completed and put into commercial operation in 2014. The final acceptance certificate was issued in July 2017.



 Signature

## CNEEC Signs a Turnkey Contract of Moldova 500MW Combined Cycle Power Plant Project



Recently, China National Electric Engineering Corporation (CNEEC) signed a turnkey contract of Burlaceni 500MW Combined Cycle Power Plant Project in Moldova amounting to 310 million Euros.

With total installed capacity of about 500MW, this project adopts a 2-on-1 com-

combined cycle system with two gas turbine generators and one steam turbine. It uses Siemens gas turbines and steam turbines as well as exhaust heat boilers and other related systems and devices made in China. In July 2017, CNEEC completed the technical plan of the project according to the owner's requirements and obtained proprietary approv-

al. In late 2017, the project team reached the final consensus with the owner on the project business contract and established contract terms. Now the project team is actively cooperating with the owner to promote the implementation of project.

Euros  
**301** Million

Cycle Power Plant Project in Moldova amounting to 310 million Euros

## CMEC Consortium Signs a Turnkey Contract on the Construction of 3,000 Telecommunication Towers in Myanmar

On December 21, 2017, the consortium, consisting of China Machinery Engineering Corporation (CMEC), Sinland Development (a wholly-owned subsidiary of CMEC) and Shanghai Electric Power Transmission & Distribution Engineering Co., Ltd., signed a turnkey contract with Eco Friendly Tower Company Limited on the construction of 3,000 telecommunication towers. The project is composed of two phases, each involving 1,500 towers.

As the contractor, the consortium will be responsible for the procurement, civil engineering, installation, commissioning and other work of the project. The total contract value amounts to USD 384.8 million. For CMEC and Sinland Development, the corresponding contract amount is approximately USD 200 million. The project will be started upon the satisfaction of certain conditions precedent, and is expected to be completed in 36 months.

USD  
**384.8** Million

The total contract value amounts to USD 384.8 million

## CMEC Signs Contract on Cameroon's Ngoila Hydropower Station

Recently, CMEC signed the EPC contract with the Cameroonian Ministry of Water and Energy on the Ngoila Hydropower Station Project in Yaounde, the capital city of Cameroon. The contract is worth USD 398.2 million and includes the construction of an 84MW hydropower station and the supporting power transmission and transformation lines. As the EPC contractor, CMEC will be responsible for the design, equipment purchase, construction, installation, debugging

and staff training of the project. The construction is expected to last 57 months.

After completion, the Ngoila hydropower station will be able to ease power shortages in Cameroon, boost local economic development and help CMEC firmly consolidate its presence in the Cameroonian market.

USD  
**398.2** Million

The contract is worth USD 398.2 million

## SINOMACH Heavy Industry Makes a Good Start for Overseas Business

China SINOMACH Heavy Industry Corporation (SINOMACH Heavy Industry) received a steady flow of good news regarding its overseas business at the beginning of the New Year. Orders of more than 160 units were placed, as an auspicious start, in 10 days, with contract values nearing USD 10 million.

Reports indicate that the new orders include about 110 series loaders, more than 40 dumpers, 10 graders, and several road rollers and excavators, covering all countries and regions along the "Belt and Road" in South-east Asia, Africa and Central Asia.

Later, SINOMACH Heavy Industry signed

an additional contract of exporting 24 mining trucks to the Democratic Republic of the Congo, with the total amount of 148 million yuan. The 24 mining trucks will be delivered in two batches. The first batch will be shipped in March, and the second in late May. With the gradual implementation of the project, SINOMACH Heavy Industry will expand the scope of cooperation with the project owner. SINOMACH Heavy Industry will fully participate in the whole process of the project including commercial operation, comprehensive services and on-site parts supply, laying a solid foundation for further expansion of overseas business.

USD  
**10** Million

Contract values nearing USD 10 million

## CHMC Signed the Contract of Nepal Langtang Khola Hydropower Project



Recently, CHMC officially signed the contract of Nepal Langtang Khola 201MW Hydropower Station Project with Yeti Langtang Hydro Power Pvt. Ltd. in Katmandu, the

capital of Nepal.

This project lies in the Langtang area, the northern part of Nepal, close to the Chinese border. It possesses an excellent natural environment. After completion, it will become the hydropower station with the highest water head (1300 meters) in Asia. Currently, the owner has finished the environmental assessment, and received necessary construction permits. On July 15, 2017, CHMC and Yeti Langtang Hydro Power Pvt. Ltd., signed

the Project MOU, defining that CHMC will exclusively formulate the technical plan, and this project will be implemented by means of EPC+F (financing) by Chinese financial organizations. Later CHMC made careful arrangements to push the project ahead, conducted multiple technical exchanges with the owner, organized Chinese technical experts to make an on-the-spot survey and drew up related technical plans, which were accepted by the owner.

## CAMCE Signs the Apsheron Agricultural Park Project in Azerbaijan

On February 6, 2018, Liu Jingzhen, Deputy General Manager of SINOMACH, attended the Trans-Caspian East-West Trade and Transit Corridor Forum in the “Belt and Road” initiative. Witnessed by Liu Jing-

zhen, Luo Yan, Chairman of China CAMC Engineering Co., Ltd. (CAMCE), and Sahin Movsumov, Chairman of Azerbaijan AS Investment Group, signed the cooperation agreement on the Apsheron Agricultural

Park Project in Azerbaijan at the forum. The agreement defines the division of labor and follow-up working plans of both parties for the joint construction of a 120-hectare agricultural park.

## CAMCE Signs Business Contract for Zimbabwe O/T 400kV Power Transmission and Transformation Project



CAMCE signed a business contract with Zimbabwe Electricity Transmission & Distribution Company for the Zimbabwe O/T 400kV Power Transmission and Transformation Project on December 15, 2017. With the contract value of USD 145,653,300, the project is located in Manicaland and Mahingee Province, Zimbabwe, covering the construction of a new 400kV power transmission line that is about 300 km long and the upgrading

of three substations. The construction phase is to last 30 months.

USD  
**145.65** Million

With the contract value of USD 145.65 million

## CMEC Successfully Undertakes Power Generation Project of 26 Maldives Islands



Recently, CMEC signed the turnkey contract for the SHAVIYANI and NOONU ATOLL Power Generation Projects of Maldives with Thoriq Ibrahim, Maldives Minister of Energy.

As another major achievement of SINOMACH International in actively responding to the

call of the “Belt and Road,” this project will contribute to the upcoming signature of China-Maldives bilateral free trade agreement, mainly including the transformation of power supply lines as well as design, supply, installation, operation and maintenance of solar power systems and diesel generators on 26 Maldives islands.

### Commencement

## CHMC Officially Kicks off the Nam Ngum 4 Hydropower Station Project in Laos

On January 25, 2018, the Kick-off Ceremony of the Laos Nam Ngum 4 Hydropower Station Project, contracted by CHMC, was held in the Nam Ngum riverside in the Xieng Khuang Province of Laos.

In the Ceremony, Khammany Inthirath, Minister of Laos Energy and Mines, and Sisavath Thiravong, General Manager of Electricite du Laos (EDL), highly praised the important role of the practical cooperation between China

and Laos in the electrical power industry in promoting social and economic development of Laos in their speech. They fully affirmed the success achieved by CHMC in the earlier stage of the project construction, and expressed their thanks to all parties for their hard work. They required related departments and units to continue to support and push ahead smooth and timely project construction.

The Nam Ngum 4 Hydropower Station Project

is to install three sets of Francis turbine generators (each 80MW), with a total capacity of 240MW. The total time limit for the project is 66 months.

# 240 MW

Francis turbine generators (each 80MW), with a total capacity of 240MW.

## China-Russia Yamal LNG Project with SINOCONST Participation Enters Formal Operation

Yamal LNG (Liquefied Natural Gas) Project, the first ultra-large overseas project of the “Belt and Road” with CMMEC (China Machinery Engineering & Construction Corporation, an affiliate of China Machinery Industry Construction Group, SINOCONST for short) entered formal operation.

Russian President Vladimir Putin made a special visit to the project site to offer his congratulations. In his speech he said it is an unprecedented energy project with such a large scale both for Russia and worldwide. Bringing the first phase into operation is a major event in the Russian energy field. It is of great importance to the development of the Arctic and utilization of the northern sea route.

It is the first whole industrial chain cooperation project integrating the upstream, mid-stream and downstream in the oil and gas industry for China and Russia. CMMEC participated in the construction of core process modules known as the “heart” of LNG plants and 36 core process modules were constructed at COOEC site in Qingdao. With rich experience in module construction and international project implementation, CMMEC successfully completed the construction of 7 modules and the installation of electric heat tracing and tower internals for 36 modules within 25 months, mostly including process piping construction, machinery/equipment installation, installation of electrical instrumentation, outfitting and ventilation, and

collaboration in loading and sea-fastening, etc.

Yamal project is the project with the highest technical level and strictest execution standards contracted by China so far. Its smooth completion will effectively boost and promote upgrading and technical innovation of relevant industries. It is a key step for China to enter international high-end oil and gas equipment market, and an important step for China to implement the strategy of internationalization.

## Groundbreaking Ceremony for Pakistan’s Punjab Power Plant



On December 9, 2017, the groundbreaking ceremony of the Punjab Power Plant in Pakistan was held. This project was signed on September 29, 2017 with a total price of about USD 520 million. The SGT5-8000H heavy-duty gas turbine used by the plant was

the very first air-cooled H-class gas turbine in the world. As the first H-class gas turbine power plant built by China Machinery Engineering Corporation (CMEC), the 1263MW Punjab combined-cycle power plant has a strategic significance in deeply exploring the

traditional market of Pakistan and enhancing CMEC’s ability to contract power plant projects, especially in terms of its track records and influence regarding large gas turbines.

## SINO-HEAVYMACH Attends IRAN METAFO2017

China National Heavy Machinery Research Institute Co., Ltd. (SINO-HEAVYMACH) attended the 14th International Exhibition of Metallurgy (IRAN METAFO2017) held in Tehran, Iran from December 4 to 7, 2017. IRANMETAFO is the most professional exhibition of metallurgy in the Middle East. It is held in Tehran International Exhibition Center yearly, covering themes of iron and steel, mine metallurgy, founding, nonferrous metallurgy, refractory materials, projects and valves.

It is the first time that SINO-HEAVYMACH has attended the exhibition. SINO-HEAVYMACH mainly demonstrated its steel making, continuous casting, plate and strip rolling and finishing, heavy metal-forming and squeezing, environmental protection and energy saving, long product rolling and finishing equipment and technology as well as its typical metallurgical projects in Iran. During the exhibition, main steel and metallurgy companies in Iran including Mobarakeh Steel, Esfahan Steel, Hormuz Aluminum, Iran National Iron and Steel Engineering

Technology Company, Hormozgan Steel, Seven Diamond Industries and many other potential customers related to iron and steel visited the booth of SINO-HEAVYMACH. After the exhibition, the exhibition personnel from the institute actively contacted visiting customers and carried out exchanges with Iranian iron and steel enterprises with which the institute has maintained continuous cooperation, to further strengthen the relationship with customers through proactive visiting.

## CMEC EXPO Ranks No. 1 among Outbound Exhibition Organizers in China for 6 Consecutive Years



CEFCO 2018 was held in Qingdao on January 11, 2018. China Council for the Promotion of International Trade (CCPIT) released the 2017 Annual Report on China's Exhibition Industry. CMEC International Exhibition Co., Ltd. (CMEC EXPO) ranks number one among outbound exhibition organizers in China in terms of the number of annual exhibition projects. CMEC EXPO has ranked number one for six consecutive years since 2012.

According to statistics, 100 exhibition organizers across China have organized exhibitions and expositions in 70 countries, and participated in 1,549 exhibitions, with an exhibition area of 849,800 square meters, a year-on-year increase of 1.77%; and 59,000 exhibitors, a year-on-year increase of 1.72%. CMEC EXPO has focused on outbound exhibition organization for 66 years. It organized 110 exhibitions in 2017, accounting

for 7.1% of total outbound exhibitions. The actual exhibition area reaches nearly 50,000 square meters, accounting for 5.7% of total outbound exhibition area. The number of exhibitors is about 4000, accounting for 7% of total outbound exhibitors.

The year 2017 has seen a steady increase of Chinese enterprises participating in exhibitions in countries along the "Belt and Road." CMEC EXPO has executed 80 exhibition projects in 20 countries along the "Belt and Road," and held 32 events related to economic and trade cooperation, exchange, business connections, promotion, releases and contract signatures. CMEC EXPO is committed to creating more international, specialized and market-oriented exhibitions, building a one-stop service platform for Chinese enterprises to "go global" and shaping the first brand in China's outbound exhibition field.

# Zhang Ri: A Pioneer in the Design of Overseas Projects with Chinese Aid

*Zhang Ri, Director of China IPPR Architectural Engineering Design & Research Institute, has always been committed to engineering design and management. For more than 20 years, he has led and completed more than a hundred design projects, among which one received the national award and 16 received ministerial awards. In 2015, he was named "National Model Worker" as the only candidate recommended by SINOMACH.*



As a big developing country, China has been unremittingly giving foreign aid while pursuing its own development, which is of positive significance to both the country and the world. In 2003, Zhang Ri and his team

formally started to work on foreign aid design projects, including the Pakistan-China Friendship Center, assistance for Guinea-Bissau, the stadium project in Ghana, as well as schools, residences, and government

office buildings in Suriname and other countries, from which they have gained valuable experience. Zhang Ri and his team have made positive contributions to China's foreign aid work and China IPPR.

## Great Role in Construction Aid Projects

What does a company that grows basically linearly need to do and what is its objective in the context of rapidly changing economic environment?

The business environment underwent unprecedented changes after 2012, many design institutes laid off employees and their activities plummeted. China IPPR Architectural Engineering Design & Research Institute also noticed such changes.

However, Zhang Ri and his team were not trapped.

Thanks to the enabling environment of reform advocated by the Ministry of Commerce, Zhang and his team actively explored reform experiments and tried various new models by summarizing the experience of previous foreign aid projects. They completed a number of DB and EPC foreign aid projects, including the Lao International Trade Exhibition and Convention Center, the repair and reconstruction of Chinese Garden of Serenity in Malta, the reconstruction and expansion of the Presidential Palace of Cape Verde, and the reconstruction and expansion of a Macedonian school.

In 2015, the Ministry of Commerce officially published the Administrative Measures on Foreign Aid (Trial) and deliberated and adopted the Reform Program for Deepening the Foreign Aid Management System, leading to fundamental changes in the model of operating foreign aid package projects. Zhang Ri and his team once again stood at the forefront of reform and undertook the first transformation project after reform—the Lubumbashi General Hospital of the Democratic Republic of the Congo (DRC), and the first management project featuring Chinese party’s external supervision on of the aid-



ed party’s self-built project —the CHONE Hospital for Post-Disaster Reconstruction in Ecuador.

Through the reform attempts in these proj-

Lao International Trade Exhibition and Convention Center ▼



ects, Zhang Ri and his team have highlighted the next move of reform in foreign aid projects through efforts and practice. They have also blazed a trail for the development of enterprises.

## To Realize the ‘Chinese Speed’ through Innovation on Design

▼ The China-Aid Morodok Techo National Stadium Project of Cambodia



The Lao International Trade Exhibition and Convention Center is the main venue for the Ninth Asia-Europe Meeting held in Laos. Sixteen months were only scheduled for the design and construction of the project, so the difficulty was as large as one could imagine.

After taking over this task, Zhang Ri and his

team conducted field surveys in Vientiane in the daytime, then discussed and analyzed the survey data at their residence at night. During this period, they often went to sleep at around three o’clock in the evening.

Western Children’s Hospital in Jamaica constructed with Chinese aid ▼



Zhang Ri took the lead in modifying the sketches overnight. After fastidious comparison, he had finalized two plans.

When the new plans were put forward at the



▲ Renovation of Don Chan Palace Hotel in Vientiane, Laos



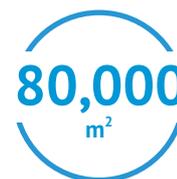
▲ Whole-process cost management for the construction of the office building by Vientiane Branch of the Industrial and Commercial Bank of China Limited



Morodok Techo National Stadium Project of Cambodia covers an area of about 14.2 hectares



with 60,000 seats



with a floor area of about 80,000 m<sup>2</sup>

meeting of the Lao Prime Minister’s office, everyone was amazed and could not help but heap praise with such words as “astounding,” “magical” and “irreplaceable.” Their admiration was clear, “This is Chinese speed and this is Chinese quality!”

The China-Aid Morodok Techo National Stadium Project of Cambodia is the largest and highest-grade stadium of its kind aided by the Chinese government. The national stadium covers an area of about 14.2 hectares and has 60,000 seats, with a floor area of about 80,000 m<sup>2</sup>. Zhang Ri personally led the investigation and demonstration of technical difficulties. He and other designers used simple but modern design techniques to

show the symbolic design elements extracted through an in-depth understanding of Cambodia’s rich ethnic elements and traditional spirit. They eventually created the simple but meaningful image of a modern stadium. It was highly praised by the Cambodian government, enhancing China’s international image and establishing a good brand image and strong technical strength as a Chinese enterprise .

As an old saying goes, “There is nothing difficult for us to do in the world. If we do it, that which is difficult will be easy; if we don’t, that which is easy will be difficult.” As the design leader of China IPPR’s foreign aid projects, Zhang Ri and his team active-

ly pursued transformation and upgrading despite an array of tribulations encountered in the process of moving toward the international market, thus blazing a new trial for the company’s foreign aid projects and setting up a model for the company’s strategic development.





# Create value for customers and stakeholders

- High-end equipment
- Agricultural engineering
- IT and services



Chinese Academy of Agricultural Mechanization Sciences (CAAMS), founded in 1956, is one of the subsidiary companies of China National Machinery Industry Corporation (SINOMACH), which is among the 500 Fortune Global enterprises. CAAMS is the first groups of national innovation-oriented hi-tech enterprises with over 5000 employees, 6 wholly-owned subsidiary companies and 13 shareholding companies.

CAAMS has formed an industrial pattern of high-end equipment, agricultural engineering, IT and services, including agricultural and animal husbandry equipment, special equipment, auto parts, agro-products and food engineering, cold chain and environmental engineering, survey, design and construction, publication and media, IT and precision agriculture, standard and testing, etc. It has become a nation-wide center for technical R&D, strategic planning, product promotion and international cooperation through its advantaged industry positions and resources, including national key laboratories, national research centers, and national-wide Innovation Alliances, etc.

Guided by the concept of "value-oriented CAAMS", CAAMS is dedicated to building an "innovation-oriented, knowledge-driven, and people-first!" enterprise with superior international competitiveness to leading the upgrading of agricultural mechanization in China.



CAAMS signed the MOU with the United Nations Industrial Development Organization (UNIDO)



Six-rows cotton harvester



Teff production mechanization in Ethiopia



SP series paver



Production line of electronic universal testing machine



Agricultural equipment manufacturing factory in Venezuelan



# 400,000 T/A PULP MILL IN BELARUS:

The largest-scale EPC project between  
China and Belarus, contracted by  
CAMCE.

