



BRAZILIAN CENTER FOR  
INTERNATIONAL RELATIONS

ASIA PROGRAM, XIII MEETING, YEAR II

# ASIA PROGRAM

## XIII CHINA ANALYSIS GROUP MEETING

RIO DE JANEIRO, AUGUST 21, 2019

Videoconference connection hubs: Beijing,  
Brasília and São Paulo

Other connection points: Lima and Salvador

Speakers: Adalberto Maluf, Jiao Jiwen, Li Yan

Commentators: Anna Jaguaribe, Jorge Arbache,  
Pan Wei

Coordinator: Tatiana Rosito

### MAIN THEME

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Chinese-Brazilian partnerships  
in digital economy and  
innovation

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The Brazilian Center for International Relations (CEBRI) is an independent think tank that contributes to establishing an international agenda for Brazil. For over twenty years, the institution has engaged in promoting pluralistic and proposal-oriented debate on the international landscape and Brazilian foreign policy.

CEBRI prioritizes themes with the greatest potential to leverage the international insertion of Brazil into the global economy, proposing pragmatic solutions for the formulation of public policies.

CEBRI is a non-profit institution, headquartered in Rio de Janeiro and internationally recognized, that mobilizes a worldwide network of professionals and organizations. Its almost 100 members represent diverse interests and economic sectors. CEBRI has an active Board of Trustees composed of diplomats, intellectuals and businessmen.

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Report by: **Gabriel Torres**

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# Chinese-Brazilian partnerships in digital economy and innovation

SUPPORT:



# ASIA PROGRAM

The Program promotes a systematic monitoring of matters relevant to international relations and Brazilian development, particularly those related to China.

Special attention has been given to monitoring the ongoing economic reforms and political transformations in China, considering their global effects and impacts in Latin America and Brazil. This continuous examination allows CEBRI to provide information and analysis to its members and partners and to the Brazilian government, contributing to the construction of Brazil's strategic position towards China, as well as helping increase knowledge about China within Brazilian society.

## PREVIOUS EDITIONS:



REPORT I, YEAR I  
SEPTEMBER 22, 2017



REPORT II, YEAR I  
OCTOBER 19, 2017



REPORT III, YEAR I  
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REPORT IV, YEAR I  
JANUARY 24, 2018



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JUNE 26, 2018



REPORT IX, YEAR I  
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REPORT XI, YEAR II  
MAY 08, 2019



REPORT XII, YEAR II  
JUNE 16, 2019



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**Tatiana Rosito**

Ms. Tatiana Rosito is a diplomat and an economist, having worked over ten years in Asia, five of which at the Brazilian Embassy in Beijing, as Minister-Counsellor. She is currently Chief-Representative of Petrobras in China and General Manager for Business Development in Asia. At CEBRI, she is a Senior Fellow and the coordinator of the China Analysis Group. Previously, she was Executive Secretary at the Brazilian Foreign Trade Board (CAMEX) and Special Advisor to the Ministers of Finance and Planning, among other roles in the public service. She holds a Master in International Development degree from Harvard Kennedy School and an Executive MBA degree from INSEAD and Tsinghua University.



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Julia is CEBRI's executive director since 2015. Previously, she worked for 10 years at the Brazil-China Business Council (CEBC), where she occupied the position of executive secretary. Recently, she was chosen by the U.S. State Department to participate in the Young World Leaders program.

# Table of Contents

---

## REPORT

GUIDING QUESTIONS	06
-------------------	----

XIII MEETING REPORT	07
---------------------	----

Chinese leadership in the areas of e-commerce, digital economy and other disruptive technologies (biotechnology and environmental technologies) offers potential opportunities to Brazil. How has the Chinese national innovation system helped produce the current environment for science, technology and innovation in China? How could we best describe the interactions between the Chinese government, universities and private companies?	07
--	----

Besides official cooperation through government agencies, which institutions could be instrumental in fostering scientific and technological bridges between Brazil and China? The example of Chinese investors and universities.	10
---	----

How best could Brazilian companies tap the Chinese service industry and approach potential Chinese partners? The role of start-ups.	12
---	----

BIOGRAPHIES	13
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## ATTACHMENTS

ATTACHMENT I: THEMATIC GUIDELINES	15
-----------------------------------	----

ATTACHMENT II: XIII MEETING PARTICIPANTS	18
--	----

## GUIDING QUESTIONS

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Chinese leadership in the areas of e-commerce, digital economy and other disruptive technologies (biotechnology and environmental technologies) offers potential opportunities to Brazil. How has the Chinese national innovation system helped produce the current environment for science, technology and innovation in China? How could we best describe the interactions between the Chinese government, universities and private companies?

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How best could Brazilian companies tap the Chinese service industry and approach potential Chinese partners? The role of start-ups.

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## XIII MEETING REPORT

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### **CHINESE LEADERSHIP IN THE AREAS OF E-COMMERCE, DIGITAL ECONOMY AND OTHER DISRUPTIVE TECHNOLOGIES (BIOTECHNOLOGY AND ENVIRONMENTAL TECHNOLOGIES) OFFERS POTENTIAL OPPORTUNITIES TO BRAZIL. HOW HAS THE CHINESE NATIONAL INNOVATION SYSTEM HELPED PRODUCE THE CURRENT ENVIRONMENT FOR SCIENCE, TECHNOLOGY AND INNOVATION IN CHINA? HOW COULD WE BEST DESCRIBE THE INTERACTIONS BETWEEN THE CHINESE GOVERNMENT, UNIVERSITIES AND PRIVATE COMPANIES?**

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**A**t its 13th meeting, CEBRI's China Analysis Group promoted in-depth discussions on the main features of the Chinese national innovation system, addressing the underpinnings of the digital economy in China – as well as current challenges in the process of transitioning from technological catching-up to an innovation-driven economy. First of all, as an illustration of the overall prosperity of the Chinese digital economy, participants highlighted the fast transformation of Shenzhen into a global hub for entrepreneurship and innovation, becoming a reference for business models in Silicon Valley itself. Notably, the recent establishment of a pilot demonstration zone for socialism with Chinese characteristics in Shenzhen illustrates the city's key role in Chinese innovation and industrial development policy.

The progress of the digital economy in China cannot be disassociated from the trajectory of Chinese science, technology and innovation policy since 1985. From a historical perspective, participants noted that Chinese industrialization process during the second half of the 20th century occurred in parallel with the fragmentation of information technology worldwide – an enabling condition for Chinese leapfrogging in digital technologies. Underlying the prosperity of Chinese digital economy, participants highlighted three key factors or drivers: consumers, market forces, and government incentives.

First, consumer habits and preferences constitute a central driving force for the development of innovative solutions and applications in China, particularly considering trends towards customization and personalization. According to participants, with Chinese rapid growth and urbanization process, new consumer habits have emerged and created numerous business opportunities to be exploited within the digital economy. Second, in regard to the dynamics of Chinese markets, participants stressed the colossal market power exerted by Chinese enterprises – directly assisted by capital from financial markets – and often focused on attending short-term consumer demands through business model innovations.

Third, a key factor underlying the prosperity of Chinese digital economy refers to government policies and incentives, which tend to allow flexibility through a “trial-and-error approach” – testing possibilities in strategic locations before expanding nationwide. As observed in overall policymaking in China, this approach is illustrated by the case of Shenzhen: Besides representing one of the first Special Economic Zones, Shenzhen is currently facilitating the set-up of sci-tech enterprises by foreign nationals and promoting research and development in strategic industries, as a result of its status as pilot zone for socialism with Chinese characteristics. Thus, participants noted the fundamental distinction between the role of government in Chinese and European digital economies – in the latter, precautions with consumer privacy restrict experimentation, in accordance with the General Data Protection Regulation (GDPR).

Furthermore, competition between local governments constitute an additional driver for innovation in China. According to participants, as provinces and municipalities are pressured to increase GDP growth rates, local measures are often adopted in order to attract investment and stimulate new businesses – as clearly observed in coastal provinces such as Zhejiang and Guangdong. It is noteworthy, though, that there are major contrasts between the innovation paradigms adopted in different Chinese provinces and cities: while research in Beijing stems from a network of prestigious universities, for example, Shenzhen’s research is concentrated on private enterprises. In this particular case, specific policy instruments have been adopted to address Shenzhen’s limited university-based research, including the creation of industrial institutions in partnership with Beijing universities.

Despite the success stories of Chinese progress in the digital economy –symbolized by the cases of Baidu, Alibaba and Tencent – challenges persist in response to both internal and external factors. First, participant stressed the continuing dependence of China on imports of so-called “bottleneck technologies”, despite growing efforts towards self-sufficiency. These technologies include flights engines, microchips and operating systems – as targeted by U.S.’ restrictions on Huawei’s suppliers, in the context of the bilateral trade dispute.

Second, a key challenge refers to the transfer of technologies from university laboratories to Chinese markets and society. In order to address this issue, participants noted recent initiatives aimed at facilitating the commercialization of new technologies directly from scholars, reducing bureaucratic approval processes within universities and local governments. In fact, the commercial application of innovative technologies represents a central goal of the triple helix model that underscores Chinese national innovation system, comprising “university, company and government”. This basic axis is supplemented by the interactions between “technology, capital and industry”, as materialized in China’s Science & Technology Industrial parks – which combine government resources with private sector technology talent in close proximity. Additionally, participants highlighted that the degree of commercial application of new technologies is highly influenced by the scale of markets, naturally benefiting countries with large populations such as China

and India. Finally, a central challenge faced by the digital economy and overall national innovation system in China relates to the process of transitioning from technological catching-up to the consolidation of an innovation-driven economy. In this respect, participants highlighted frequent criticism, from both internal and external actors, towards China's crisis of originality in R&D. Indeed, Chinese original research is highly concentrated on fields such as nanotechnology and biotechnology, with a lot of room for improvement in other research fields. To emphasize the importance of scientific discovery and capabilities for original innovation, Chinese State Council has recently issued guidelines to strengthen scientific integrity and to better develop Chinese basic research.

Ultimately, as China transitions to an innovation-driven economy, participants stressed the challenging exercise of defining new metrics for future innovation, questioning the adequacy of current instruments and planning methods. In this new phase, it would be necessary to move beyond short-term consumer demands and focus on the upper end of innovation chains, exploring fields such as agricultural technology.

## **BESIDES OFFICIAL COOPERATION THROUGH GOVERNMENT AGENCIES, WHICH INSTITUTIONS COULD BE INSTRUMENTAL IN FOSTERING SCIENTIFIC AND TECHNOLOGICAL BRIDGES BETWEEN BRAZIL AND CHINA? THE EXAMPLE OF CHINESE INVESTORS AND UNIVERSITIES.**

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**D**espite the contrast between Chinese and Brazilian innovation ecosystems – featuring different levels of engagement with the digital economy – participants noted numerous opportunities for bilateral technological exchange and for mutual investments, including in sectors such as bioenergy and electrical mobility.

First, the Brazilian market was described as promising for investments targeted at better exploring its vast consumer base: although smartphone penetration rates in China surpass those observed in Brazil (83% vs. 71%), Brazilian internet penetration rates outrank those observed in China. In addition, Brazilians spend, on average, more time in the internet than counterparts in China and the US – around 9 hours a day. It is noteworthy, though, that 83% of the time Brazilians spend online corresponds to online chatting, with only 4% dedicated to online shopping. In this scenario, considering Chinese experience in the field of mobile payments, participants encouraged Chinese investments in Brazilian businesses related to the expansion of e-commerce – possibly adapting successful business models to Brazil.

Furthermore, considering the long-standing Brazilian infrastructure gap – which extends to the field of information technology – participants highlighted opportunities for investments in infrastructure underlying the digital economy, including related to 5G technology. In particular, as Brazil still lags behind China in high-speed internet, participants suggested investment opportunities for Chinese companies in this field.

Within the context of the global energy transition to low carbon economies, participants also highlighted investment opportunities in sectors such as electric mobility and solar energy – in which Chinese leadership and competitiveness can match Brazilian expanding market. In these sectors, the opportunities posed by the Brazilian market – the second largest truck market in the world and a major automobile producer – have already attracted companies such as BYD.

A pioneer in electric vehicles' production, BYD initiated activities in Brazil in 2015, with substantial investments in solar panels and electric vehicles' manufacturing, particularly electric buses. In 2019, BYD achieved the landmark of selling 1 GW of solar energy in Brazil, corresponding to around one third of total solar energy generation in the country. However, participants stressed key challenges faced by operations in Brazil, associated to the political-bureaucratic system, coupled with a lack of incentives towards further developing the national electric vehicle and solar energy industry. In this respect, participants stressed

the impact of a series of erratic policy measures in past years: First, the cancelling of auctions for solar panels' equipment, in 2017, directly impacted business plans in the sector. Second, the decision to lower import taxes for solar panel components, even though approved, was never fully implemented; and third, the approval of subsidized lines of credit for imported panels further hindered the competitiveness of national solar panel production.

Nonetheless, BYD's survival and expansion attests not only to successful marketing strategies, but also to fruitful partnerships: On the one hand, partnerships with local companies in the sectors of engines and vehicles – such as WEG and Marco Polo – but also with universities. In this regard, participants highlighted BYD's role in the creation of a laboratory for solar energy R&D in the University of Campinas, focused on the development of new materials. In fact, through partnerships with universities, BYD Brazil invests around 5% of revenues in research and development.

As such, in addition to investment opportunities, participants highlighted the potential for cooperation between Chinese and Brazilian universities towards innovation in the field of renewable sources, particularly bioenergy. In this context, a concrete example of a mutually beneficial academic partnership refers to the China-Brazil Center for Climate Change and Energy Technology Innovation, a partnership between Tsinghua University and Coppe/UFRJ. Initially focused on wind energy and biodiesel, the Center has expanded and renewed its mandate until 2022.

Finally, at the governmental level, participants highlighted the possibility of strengthening intergovernmental cooperation frameworks, including by drawing inspiration from existing structures. For instance, the China-Israel Industrial R&D Cooperation Framework, as well as the China-Israel Joint Committee on Innovation Cooperation, were noted as examples of mutually beneficial structures for partnerships between universities, companies and cities – which could represent templates for innovation cooperation between Brazil and China. Furthermore, given the centrality of R&D for agricultural technologies in China-Israel innovation cooperation, trilateral cooperation initiatives with Brazil were noted as feasible and increasingly requested by parties involved.

## HOW BEST COULD BRAZILIAN COMPANIES TAP THE CHINESE SERVICE INDUSTRY AND APPROACH POTENTIAL CHINESE PARTNERS? THE ROLE OF START-UPS.

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Despite the increasing presence of Chinese companies in the Brazilian market, the participation of Brazilian tech companies in China is still incipient – in spite of the growing interest of Brazilian start-ups in Chinese markets and business models. Nonetheless, participants argued that there is plenty of room for bilateral cooperation within the digital economy, considering the potential for new technologies and solutions to enhance productivity and sustainability in sectors that underscore China-Brazil cooperation – including, but not limited to, energy and agriculture.

Moreover, despite Brazilian maturing start-up ecosystem, it was stressed that there are still many obstacles for entrepreneurship in Brazil – as illustrated by Brazilian 109th position in the World Bank's 2018 Doing Business Ranking, out of 190 economies. Additionally, structural constraints in Brazil, including low savings rates and slow economic growth, do not favor the development of new industries. On the other hand, China – ranked as 46th – has been actively engaged in initiatives aimed at facilitating the setting-up of new companies and the development of new industries. In this context, it was also noted that many digital technologies often require legal innovations and adaptations – which, in their turn, require functioning and efficient institutions, in order to allow businesses to thrive.

If Brazilian business environment is generally unfavorable to entrepreneurship, the characteristics of Brazilian consumer market place numerous opportunities for collaboration with Chinese companies within the digital economy – especially in the field of mobile payments and online shopping. Despite featuring comparatively high internet penetration rates, Brazilian e-commerce is not nearly as widespread as in China. Although Chinese experience in the field of mobile payments could provide references and lessons for Brazilian companies and policymakers, participants noted potential obstacles in transplanting business models and policy instruments from China, considering key differences in both countries' administrative structures. Another major difference between Brazil and China, relevant for technological cooperation, refers to the main locus of innovation: while R&D in Brazil occurs mainly in universities, Chinese research is mostly enterprise-centered.

Overall, given the major development challenges still faced by both countries, participants reiterated the opportunities for bilateral innovation cooperation and stressed Chinese openness for partnerships with Brazilian enterprises and start-ups. Ultimately, solutions from the digital economy in strategic sectors could significantly contribute to leapfrogging development stages in both countries.

## BIOGRAPHIES

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### **Adalberto Maluf**

Adalberto Maluf is the Director for Marketing, Sustainability and New Businesses for BYD (Build Your Dreams) Brazil. He is also a member of the board of directors of ABVE (Brazilian Association of Electric Vehicles) and member of ABSOLAR's board (Brazilian Association of Photovoltaic Solar Energy). Adalberto holds a bachelor's degree in International Relations and an MSc in Internal Political Economy from the University of São Paulo (IRI/USP). Adalberto worked with climate change mitigation projects at subnational governments with a focus on energy, sustainability and urban mobility. Prior to BYD, Adalberto worked for the City of São Paulo (2006-2007) and was the City Director for the Clinton Climate Initiative (CCI), in partnership with C40.

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### **Jiao Jiwen**

Mr Jiao Jiwen is Director of International Cooperation Dept of Tus-Clean Energy Group, with a rich experience on renewable energy, especially on solar thermal, solar PV, biomass and energy efficiency field. He has made great efforts to push the technology from Lab to commercial market through incubation and acceleration, building different models of cooperation between company and university, institute, GOV and customer, pushing renewable technology transfer and application.

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### **Li Yan**

Researcher at the Chinese Academy of Science and Technology for Development (CASTED), a think tank supporting S&T policy making for Chinese Ministry of Science and Technology (MOST). His current research interests include national innovation system, Chinese S&T policy and S&T-oriented NGOs. Dr. Li obtained his doctor's degree in macroeconomics from Renmin University, China, and he was a lecturer at the Capital University of Economics and Business before joining CASTED.

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### **Pan Wei**

Professor Pan Wei is the Director of the Center for Chinese and Global Affairs at the School of International Studies, Peking University. He has a B.A. (1982) and an M.A. (1984) from Peking University's Department of Political Science, and a Ph.D. from the Department of Political Science, University of California, Berkeley. His main research interests are comparative politics, Chinese politics and international politics. Professor Pan Wei has written over 7 books, amongst them *The Spirit of Intellectuals* (2019), *Trust in People—The Chinese Communist Party and Tradition in Chinese Politics* (2017), and *Behind China's Economic Miracle – Coalition of Rural Collective Industries & Grassroots Authorities* (2015).

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### **Anna Jaguaribe**

Director of the Brazil-China Studies Institute (IBRACH). She is also currently a visiting professor at the Federal University of Rio de Janeiro's Public Policy, Strategies and Development Program. Previously, she worked at the United Nations in New York, and was a consultant at the United Nations Conference on Trade and Development (UNCTAD) in Geneva. She lived and researched in China and in Italy for several years. She received a bachelor's degree in psychology and social sciences from Brandeis University, a master's degree and a PhD in sociology from New York University, and carried out postgraduate work at the École Pratique des Hautes Études in Paris.

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### **Jorge Abache**

Vice-President for the Private Sector at the Development Bank of Latin America (CAF). Previously, he was Secretary for International Affairs in the Ministry of Planning, Development and Management. Mr. Arbache is also Professor of Economics at the University of Brasília. He holds a bachelor's degree in Law (Instituto Vianna Jr.), and in Economics (UFJF), a master's degree in Economics (UnB), a PhD in Economics (University of Kent) and a Postdoc WIDEr UNU, Finland.

# ATTACHMENTS

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## ATTACHMENT I: Thematic guidelines

At the start of 2019, on January 3rd, China announced that the Chang'e 4 spacecraft named Yutu 2 had landed on the far side of the moon, which was described by NASA as a "first for humanity and an impressive accomplishment." Undoubtedly China is already among the leading nations in new technologies and on a steady pace to be home to scientific breakthroughs in various fields. As argued by the Economist magazine in its 12th January edition, although there are not many Chinese Nobel-prize winners yet, China's achievements in the last two decades are impressive and span a growing number of industries, even if its innovation ecosystem is very different from that prevailing in the US and other European nations. Also, it is possible that the Chinese system will simply trump what has been deemed as the conducive environment for innovation in the West, including by maintaining many of its specificities while allowing for ample collaboration and exchanges, and by attracting more foreign brains in the future.

The China Analysis Group discussed the issue of innovation through the lens of the Trade War and Made in China 2025 at its VII Meeting, in June 2018 (see full report in the reading suggestions). While the debate about "who will dominate science and innovation" has since then been at the spotlight as a result of the US-China Trade War and its ramifications on intellectual property and technology competition (e.g. Huawei), it overlooks much of the concrete progress taking place in China or by Chinese companies abroad, especially in everything linked to the digital economy. Companies like Baidu, Alibaba and Tencent, mostly the last two, have been spreading fast their original advantages in e-commerce or gaming and social media to new domains and investing abroad. As Geromel points out in a recent article (see reading suggestions), the brutal competition among Internet firms in China means that they grow very fast and *"successful Chinese entrepreneurs tend to build octopi with many more tentacles from the get-go. As a result, the successful Chinese startups grow bigger, faster, and China created a unicorn every 38 days on average in 2018"*. Moreover, as he points out, *"The key term that represents this new stage is Chuhai, a Chinese word that literally refers to entrepreneurs venturing businesses overseas. A new era in our global digital economy is about to begin in which Chinese internet companies will take their capital, innovation and technology to the world. As the Chinese domestic market arguably approaches saturation, an increasing number of Chinese internet giants are now eyeing emerging markets to keep growing."* Besides the BAT, companies such as Didi Chuxing, Bytedance, Meituan-Dianping are growing fast in emerging markets. In addition to those companies that are closer to consumers, there are other Chinese companies that have joined the very selective club of AI in the past years, such as SenseTime and YiTu (face recognition) and iFlytek (voice recognition), whose clients are mostly Chinese, but they are also aiming at new ventures.

Another area in which Chinese firms and technology have rapidly displaced or brought fierce competition to rival players is alternative energy sources like wind and solar (Trina, Jinko JA Solar, Goldwind, Guodian, Shanghai Electric, entre outras) and electric vehicles and batteries (BYD). But the list goes on to include the construction of nuclear reactors, the transformation of garbage into electric energy and many more technologies related to smart cities and environmental economy, including smart grids. Other promising areas are genome sequencing and new materials, health applications and fintech.

What does it all mean for Brazil? Some of the Chinese giants in the digital or service economy have already established themselves in Brazil directly or by acquiring other companies. Alibaba, Didi Chuxing and BYD have activities in Brazil. Other companies in the clean energy domain all have offices or representatives in Brazil or other South American countries. In the power sector, State Grid is one of the largest investors in the country. Also, many Brazilian companies and start-ups look up to their Chinese peers in trying to tap new domains of the digital economy, by taking part in specialized conferences and visiting China.

The idea of this meeting is to facilitate a debate on the current status of the Chinese innovation ecosystem and try to identify concrete models of cooperation with Brazil in the areas of digital economy and new energy (clean energy, EV, batteries, etc.) by listening directly from Chinese players at the government, university and entrepreneurial domain.

## Reading Suggestions

CEBRI – China Analysis Group (2018). Report of the VII Meeting, which took place on June 26th, 2018. “Beyond the Trade War: Made in China 2025, Innovation and the 4.0 Industrial Revolution”. [http://midias.cebri.org/arquivo/Asia\\_7Reuniao.pdf](http://midias.cebri.org/arquivo/Asia_7Reuniao.pdf)

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Tai Ming Cheung et al. “Planning for Innovation: understanding China’s Plans for Technological, Energy, Industrial, and Defense Development”. A report prepared for the U.S.-China Economic and Review Commission. University of California.

The Economist (12th January, 2019 edition). “Red Moon Rising – Will China Dominate Science?” Science and Technology - The Great Experiment.

## ATTACHMENT II: XIII Meeting Participants

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In September 2019



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