

ICEE-Institutional Innovation for ENGINEERING A BETTER FUTURE FOR ALL

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Strategic Exert
International Centre for Engineering Education

24 September 2018, London, U.K.

OUTLINE



1

Background of ICEE

2

What does ICEE do

3

Vision for ICEE



Background

Engineering becomes more complex. The world is increasingly connected and engineering is growing systematic and intricate, pushing the reform of engineering education.

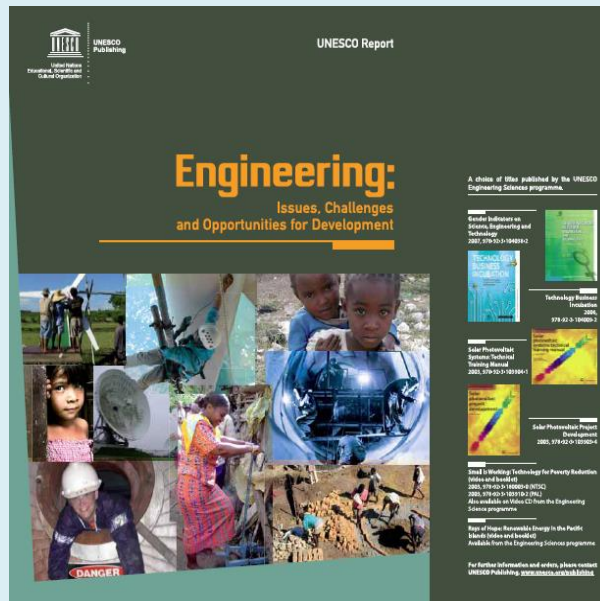
Lack of innovative personnel and social recognition. Innovative personnel are badly needed for engineering innovation and Industrial development. **But** engineers have a low social status worldwide. Some brilliant school-age youths are escaping from engineering。





Background

Severe shortage of engineers/technicians in developing countries.

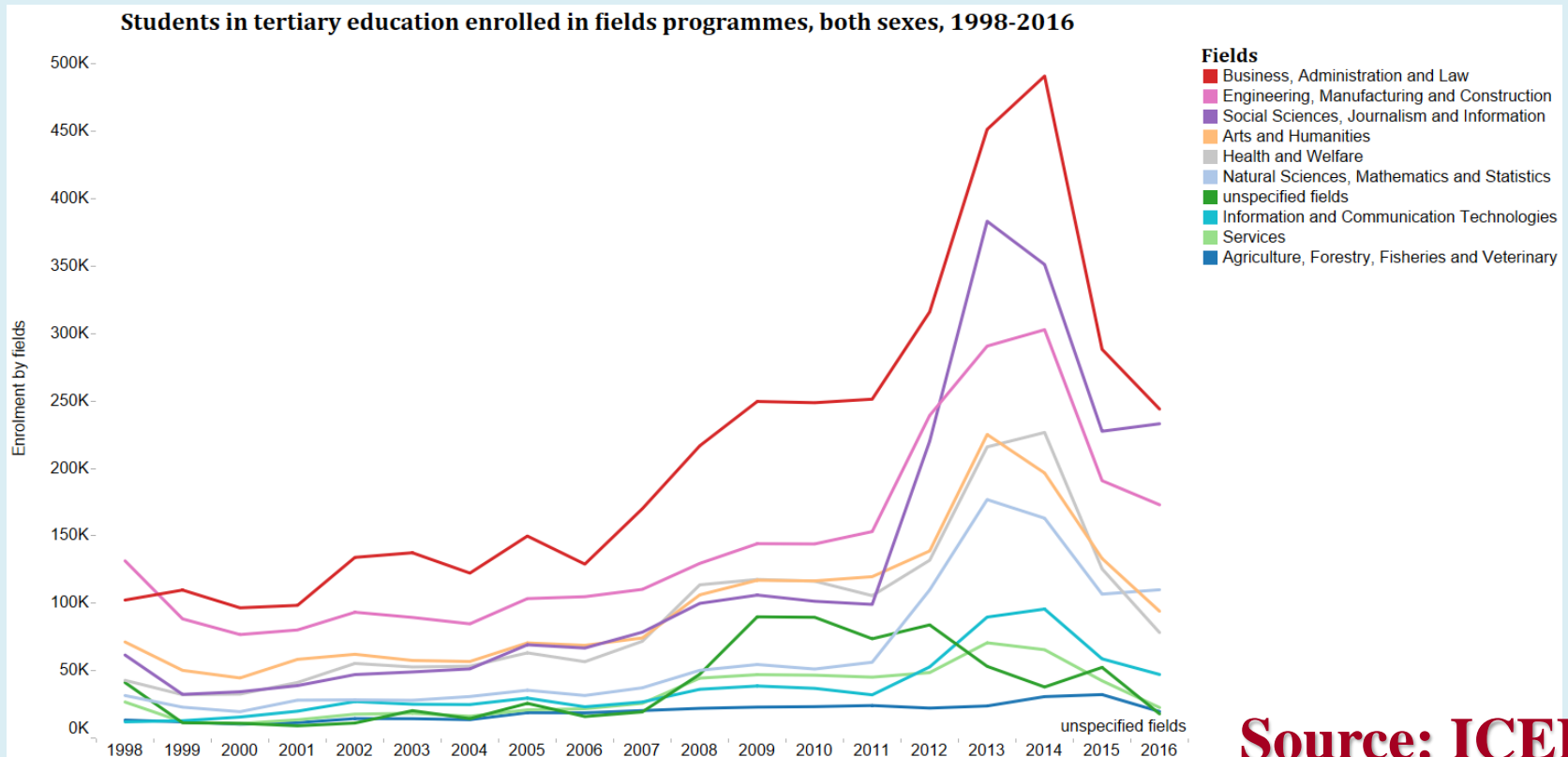


UNESCO data shows that developed, industrialized countries have between twenty and fifty scientists and engineers per 10,000 population, compared to around five scientists and engineers on average for developing countries, down to one or less for some poorer African countries.

– UNESCO Engineering Report, pp 16. 2010

Background

■ Engineering Education is facing global challenges



Source: ICEE



Background

Women have more difficulties in accessing engineering education and technical profession. There still exists prominent gender discrimination in engineering areas, as shown by lower percentage of females studying engineering and going for an engineering career.





Background

Necessity

All the problems show two major issues in global engineering education: **quality** and **equity**.

Failure to address these challenges effectively in the new century would present a real threat to the sustainable development of the world.



Background

- **UN Agenda 2030 sustainable development goals**
- **Engineering education provides human resources to support UN SDGs**



International Context

Financial Crisis and Failure of
Virtual Economy Worldwide
calling for
strengthening **Real (Solid) Economy**

China Faced with Two Pressures

◆ High-end manufacturing and core techs still dependent upon developed economies

◆ Mid & low-end manufacturing shifting to other lower-cost developing and emerging economies

Timeline Targets

- By 2025, narrow the gap with breakthroughs in certain major areas and enter the rank of strong manufacturing economies;
- By 2035, consolidate its position and rise to the middle range among the strong manufacturing economies;
- By 2050, become an innovation leader and a true global manufacturing power.

China in Dire Need for ETs

- ◆ ET fostering since R&O
- ◆ High-end engineers training
- ◆ Skilled technicians with experience
- ◆ Need for Inter-disciplinary engineering talents

True Also in the World

- ◆ Developed countries
- ◆ Middle-income countries
- ◆ Less developed countries
- ◆ Countries along B&R,
especially in Africa

Background



“We stand ready to work with other countries to jointly solve problems and create a better future.”
— Mr. Xi Jinping (President of P.R. China)



ICEST in June, 2014, Beijing





Background

Necessity

Chinese Academy of Engineering(CAE) and Tsinghua University proposed jointly to set up an UNESCO Cat II Center for Engineering Education.



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Ms. Irina Bokova
Director General
United Nations Educational, Scientific and Cultural Organization

October 15, 2014

Your Excellency,

I would like to recall your kind attention to your visit to China to attend the 2014 International Conference on Engineering Sciences and Technology in June, during which we had the honor that HE Mr. Xi Jinping, the Chinese President, and Your Excellency honored the Conference by delivering your keynotes on the keynote session, followed by your unveiling in person the International Knowledge Centre for Engineering Sciences and Technology the other day. I would say this Conference was a great success, jointly for both of us! Taking this opportunity, please allow me to thank you for your kind presence and personal contribution!

During the Conference as well, I mentioned to Your Excellency that we intended to set up a new UNESCO Category 2 centre for engineering education in China. We all agreed on the importance of this initiative. On behalf of the Chinese Academy of Engineering, it is my great pleasure to write to you to officially apply for the establishment of an UNESCO category 2 Institute named International Centre for Engineering Education Research and Development in Beijing, China.

As indicated in the UNESCO's first report on engineering in 2010, engineering, in the long journey of human civilization in past thousands of years, has played a very critical role to create, innovate and build things for continuous improvement of the quality of human life. The rapid growth of China over the past 30 years testifies again the role of engineering to drive our society forward.

However, as we acknowledge the great achievements and impact of engineering on our society, we should also be aware of the issues, challenges and opportunities engineering community is facing today. The proposed Centre will aim to organize, facilitate, coordinate and support activities in strategic research, training, exchange and collaborations in engineering education transformation and development in this region and the world. The Centre will provide a platform for cooperation between member states and agents of UNESCO in the engineering education field, between engineering education and industries, and between engineering education

and other professional educations. We believe such a Centre will make contributions to the global and regional economy. We hope this Centre can help to address, in engineering approach, such issues as poverty reduction, sustainable development, climate change and other UN Millennium Development Goals.

Furthermore, Engineering is also facing numerous additional challenges of its own, for example, strengthening the educational institutions in terms of engineering ethics, insufficient qualified engineering graduates, serving and impacting the needs of society and industries, attracting and retaining younger generations, particularly females, enhancing engineering targets on innovation, entrepreneurship and job creation, and promoting increased public awareness and supporting for the engineering enterprises. All these challenges are interrelated and associated with Engineering Education, which we expect the Centre can make its own and unique contribution to.

Please allow me to quote Chinese President, Mr Xi Jinping, "Talents are the key factor for innovation. Knowledge is strength, and talents are the future. Innovation and development of engineering depend on the innovation and development in engineering education as well as the young engineering talents generation after generation." I think China should play a key role in this process because China has the largest scale of engineering education in the world, possesses the richest student resources for engineering study, and faces the greatest demand for engineering talents from rapidly growing industries.

Your support will be greatly appreciated.

With my best regards,
Yours,

Zhou Ji
President
Chinese Academy of Engineering

cc: Mr. Abhimanyu Singh, Director and Representative, UNESCO Beijing Office



UNESCO ICEE

- **Vision:** promoting equality, inclusiveness, development, and an all-win global community for E.E.
- **Mission:** strong base for talent training, think-tank consulting and international academic exchange
- **Pathway:** industry-academia partnership, innovation-driven, benefit LDCs

2015.03

Government approval

2015.1

Approval by UNESCO 38th General Meeting

2016.6.6

Agreement signing in Beijing

2017.5.22

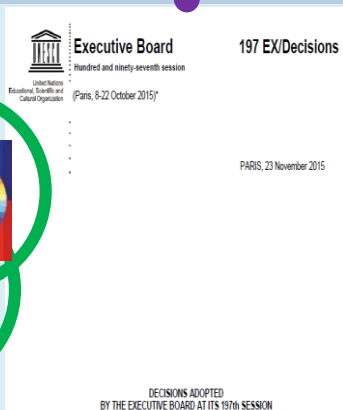
ICEE Council meeting

2017.9.26-27

《ER2》 launch



多方合作模式



UNESCO执行局文件



博科娃、周济、邱勇、
吴启迪为中心揭牌



邱勇校长担任中心理事长



UNESCO科技助理总
干事Flavia参会

联合国教科文组织国际工程教育 签约暨揭牌仪式

Signing and Unveiling Ceremony

International C Engineering Education Under the



北京

Beijing China

2016年6月

June 2016

联合国教科文组织国际工程教育 签约暨揭牌仪式

Signing and Unveiling Ceremony

International C Engineering Education Under the Ausp



北京
Beijing China

2016年6月

June 2016



联合国教科文组织国际工程教育 签约暨揭牌仪式

Signing and Unveiling Ceremony

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Beijing China

2016年6月

June 2016



联合国教科文组织国际工程教育中心 签约暨揭牌仪式

Signing and Unveiling Ceremony

International Center for Engineering Education Under the Auspices of UNESCO

中国北京
Beijing

2017年6月







OUTLINE



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Background of ICEE

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What does ICEE do

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Vision for ICEE

What Does ICEE Do

- ◆ International Academic Events
- ◆ Experience Sharing
- ◆ Technical Visits
- ◆ Socialisation and Profile Raising
- ◆ Seeking Support from International Engineering Community
- ◆ Project Design, Organisation, Implementation
- ◆ Fund Raising

Brief Chronology 2017

- ◆ Governing Board and Advisory Board working conference
- ◆ ICEE Working Conference
- ◆ First GB/AB meeting at Tsinghua
- ◆ International Engineering Education Forum on Future Engineering Education and Engineering Capacity Building
- ◆ Kick-off meeting of UNESCO Global Engineering Report II
- ◆ Training programme on engineering education
- ◆ Training Workshop for students from Africa



2017 International Forum on Engineering Education
Global Engineering Education and Engineering Capacity Building for the Future

2017国际工程教育论坛
面向未来的工程教育与工程能力建设

Hosted by Chinese Academy of Engineering
Tsinghua University
International Centre for Engineering Education under the auspices of UNESCO
13th - 15th Floor, Tsinghua University, Beijing, China

ICEE
Tsinghua University, Beijing, China
April 22-23, 2017

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United Nations
Educational, Scientific and
Cultural Organization

联合国教育、
科学及文化组织

ICEE

International Centre for
Engineering Education
under the auspices of UNESCO

国际工程教育中心
联合国教科文组织支持

联合国教科文组织国际工程教育中心 理事会暨顾问委员会会议

GOVERNING BOARD/ADVISORY BOARD MEETING





联合国教科文组织国际工程教育中心 理事会暨顾问委员会会议

GOVERNING BOARD/ADVISORY BOARD MEETING

中国清华大学 Tsinghua University, Beijing, China



2017 国际工程教育论坛 面向未来的工程教育与工程能

Hosted by CAAE Academy of Engineering
Tsinghua University
International Engineering Education Forum
主办：中





2017 International Forum on Engineering Education
Global Engineering Education and Engineering Capacity Building for the Future
2017国际工程教育论坛
面向未来的工程教育与工程能力建设

Hosted by Chinese Academy of Engineering
Tsinghua University
International Centre for Engineering Education
主办：中国工程院
在联合国教科文组织工程教育国际中心
的赞助下

UNESCO
ICEE
United Nations
Educational, Scientific and
Cultural Organization
联合国教育、科学及文化组织
International Centre for
Engineering Education
under the auspices of
国际工程教育中心
在联合国教科文组织工程教育国际中心的赞助下

University, Beijing, China
2017

C.D. Mote

吕国凯





ICEE meeting in Beijing on 21-23 May 2017

CAETS Energy Committee Meeting

April 30, 2017 Beijing





Prof. Lord Broers (RAEng) and Dr. Hideaki Koizumi (EAJ) visiting ICEE in Beijing on 28 May, 2018

What Does ICEE Do

Engineering Report II

OUTLINE



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Background of ICEE

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Vision for ICEE

UNESCO Leadership & Guidance

**Mobilising a wide range of international
resources**

Solid government commitment

Item 5. Capacity Building Initiative

Effective International Collaboration

- ◆ Council of Academies of Engineering and Technological Sciences (CAETS)
- ◆ World Federation of Engineering Organisations (WFEO)
- ◆ International Society for Engineering Education
- ◆ Other Centres of Engineering Education

Actions: Bilateral & Multilateral

U.K. –China—Africa

UK&China--Same Direction

- ◆ Working with African countries for common development and prosperity
- ◆ One-Belt-One-Road Initiative

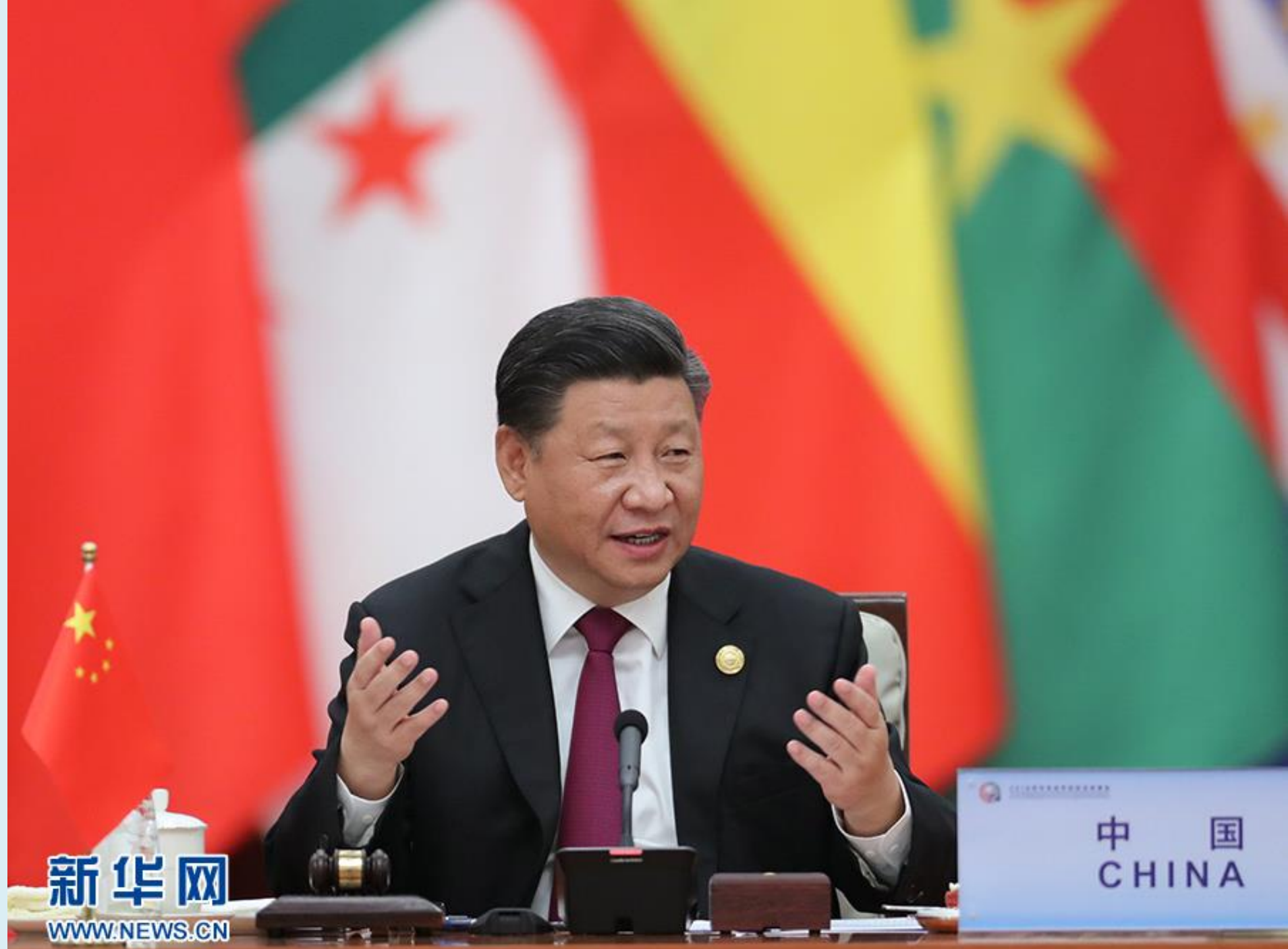


Prime Minister Theresa May in South Africa, Nigeria and Kenya in August 2018



新华网
WWW.NEWS.CN

Beijing Summit of the Forum on China-Africa Cooperation, 3-4 September, 2018



新华网

WWW.NEWS.CN





2018年中英智慧农场科技创新合作会议

2018 UK-China Smart Farm Science and Technology Innovation Cooperation Conference

2018年9月 中国·北京
BEIJING·CHINA SEPTEMBER 2018

指导单位/Supports

中华人民共和国科学技术部
Ministry of Science and Technology of the
People's Republic of China

英国驻华使馆
British Embassy Beijing

主办单位/Sponsors

中国农村技术开发中心
China Rural Technology Development Center

英国创新署
Innovate UK

承办单位/Co-organizers

国家农业信息化工程技术研究中心
China National Engineering Research Center for Information
Technology in Agriculture

国家农业智能装备工程技术研究中心
China National Engineering Research Center of Intelligent
Equipment for Agriculture

中国农业大学
China Agricultural University



Areas in Engineering Education

- ◆ Infrastructure building & maintenance
- ◆ Health and Medicine
- ◆ Agriculture
- ◆ Information
- ◆ Management

Forms in Engineering Education

- ◆ University engineering education
- ◆ Vocational training
- ◆ Academic symposia, workshops
- ◆ Field technical visits
- ◆ Problem solving at worksite

S&T and Innovation

—A Driving Force for Realising the Chinese Dream

China Innovation Association

Kang Jincheng

the Westernisation Drive

1861--1895

A self-saving and self-strengthening movement aimed at empowering the country by introducing advanced science and technology from west while maintaining the existing political system and traditional Chinese culture and



Séminaire à l'intention des personnels des médias de la République de Côte d'Ivoire

2018年科特迪瓦新闻媒体人员研修班

ire à l'intention des personnels des médias de la République de Côte d'Ivoire en 2018

35年筑梦路：携手入中科技 开启新时代

...ve de 35 ans : Entre... nouvelle... io... e sino-ivoiri...





Reactions to Talk

- ◆ Long for development
- ◆ Useful experiences for reference
- ◆ Learning from past mistakes
- ◆ Areas for cooperation
- ◆ Most pressing problems

- ◆ Bright future
- ◆ Daunting Task
- ◆ Long journey

The UN 2030 Agenda

The AU Agenda 2063

The Belt and Road Initiative

ICEE

It is truly an institutional innovation, a platform and a hub for international engineering education and technical training. It is never too much to elaborate on its significance.

Engineering Education

COMMON LOGIC

- ◆ Development is on top of priority agenda
- ◆ Education and S&T a basis for development
- ◆ Development without human talent is but wishful thinking
- ◆ A strong pool of engineering talents is a must
- ◆ Engineering talents drawn from both university education and solid skill training

Let's learn from ants, together with a large engineering community, we collectively work hard on engineering education toward a better and bright future for all.

Thank You & Happy Mid-Autumn Day!

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