

ICEE-Institutional Innovation for ENGINEERING A BETTER FUTURE FOR ALL

KANG Jincheng
Strategic Expert
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.

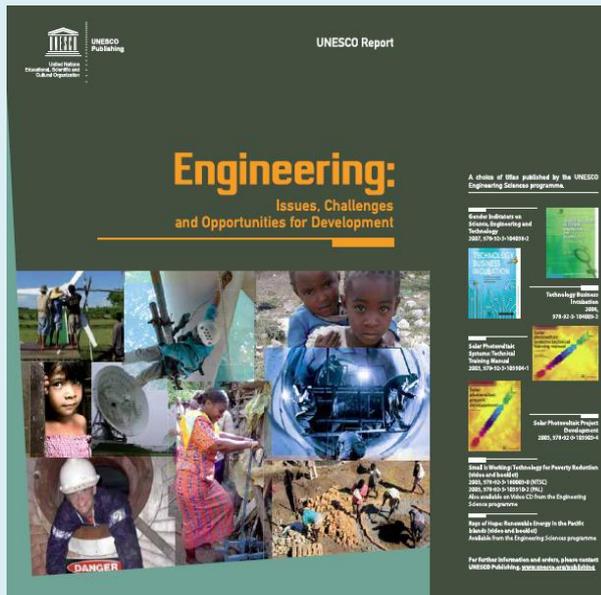
Lack of innovative personnel and social recognition. Innovative personnel are badly needed for engineering innovation and Industrial development. **But** engineers have a low social status worldwide. Some brilliant school-age youths are escaping from engineering。





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.

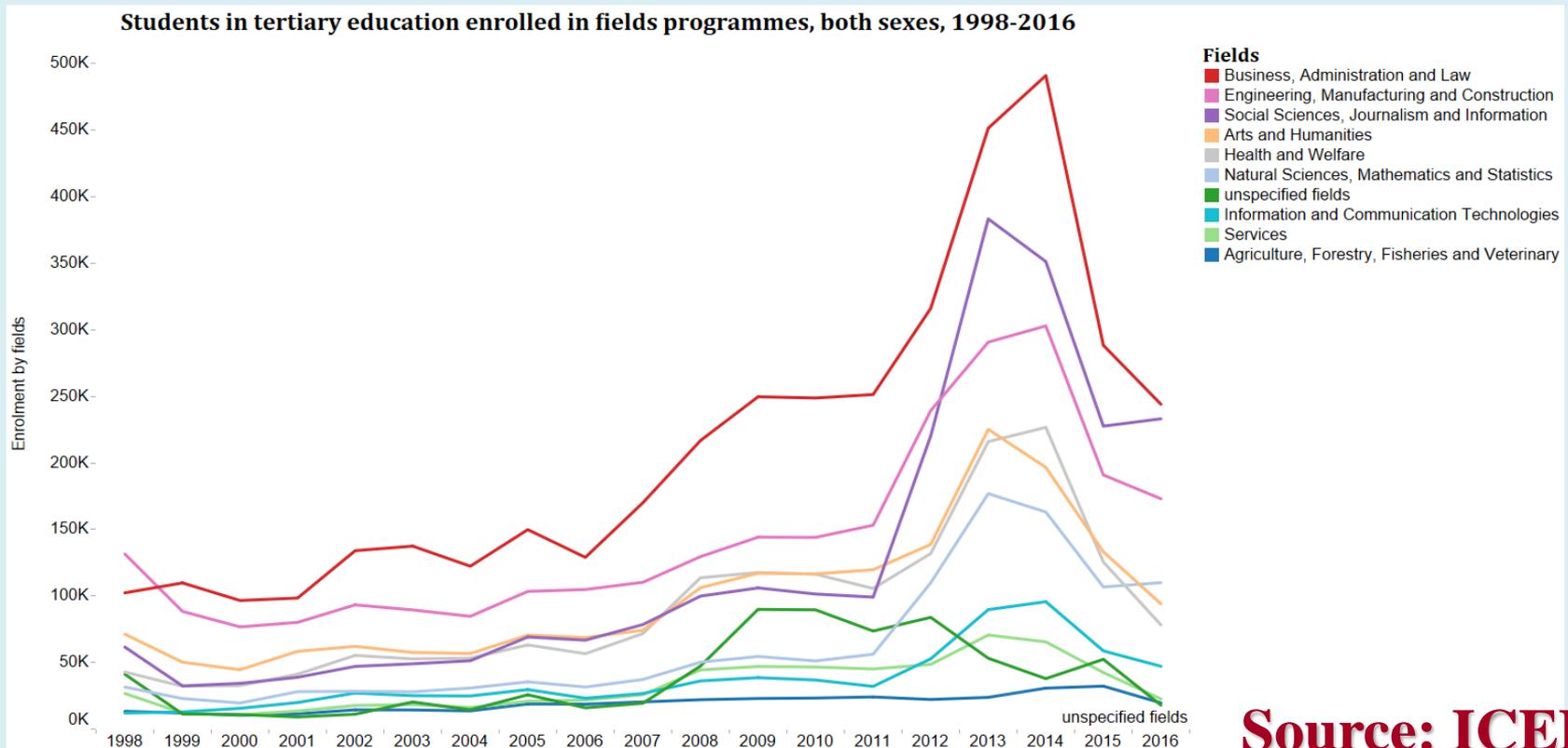
– UNESCO Engineering Report, pp 16. 2010



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

Co-sponsors

	United Nations Educational, Scientific and Cultural Organization (UNESCO)
	International Council of Academies of Engineering and Technological Sciences (CAETS)
	Chinese Academy of Engineering





Background

Necessity

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



2 Bingjiaokou Hutong, Beijing 100088, China
Tel: +86 10 5930 0276, Fax: +86 10 5930 0140
E-mail: info@cae.cn, http://www.cae.cn

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 of 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 in 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**

2015.0

3
Government approval

2015.1

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 16



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
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 A...



京

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

2019年6月



联

心



ICEE

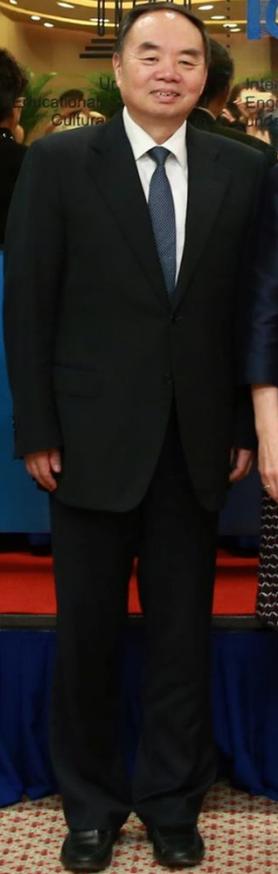
United Nations
Educational, Scientific and
Cultural Organization

International Centre for
Engineering Education
under the auspices of UNESCO



Internationa

es of UNESCO



联合国教科文组织国际工程教育中心

约暨揭牌仪式



OUTLINE



1

Background of ICEE

2

What does ICEE do

3

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







ICEE

United Nations
Educational, Scientific and
Cultural Organization

International Centre for
Engineering Education
under the auspices of UNESCO

联合国教育、
科学及文化组织

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



清华大学 Tsinghua University, E



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

中國清華大學 Tsinghua University, Beijing, China



国际工程教育论坛 面向未来的工程教育与工程能

Hosted by Chinese Academy of Engineering

Tsinghua

International

办：中

pieces of U



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
International Centre for Engineering Education
at the auspices of UNESCO
教育中心



吕国凯

C.D.Mote



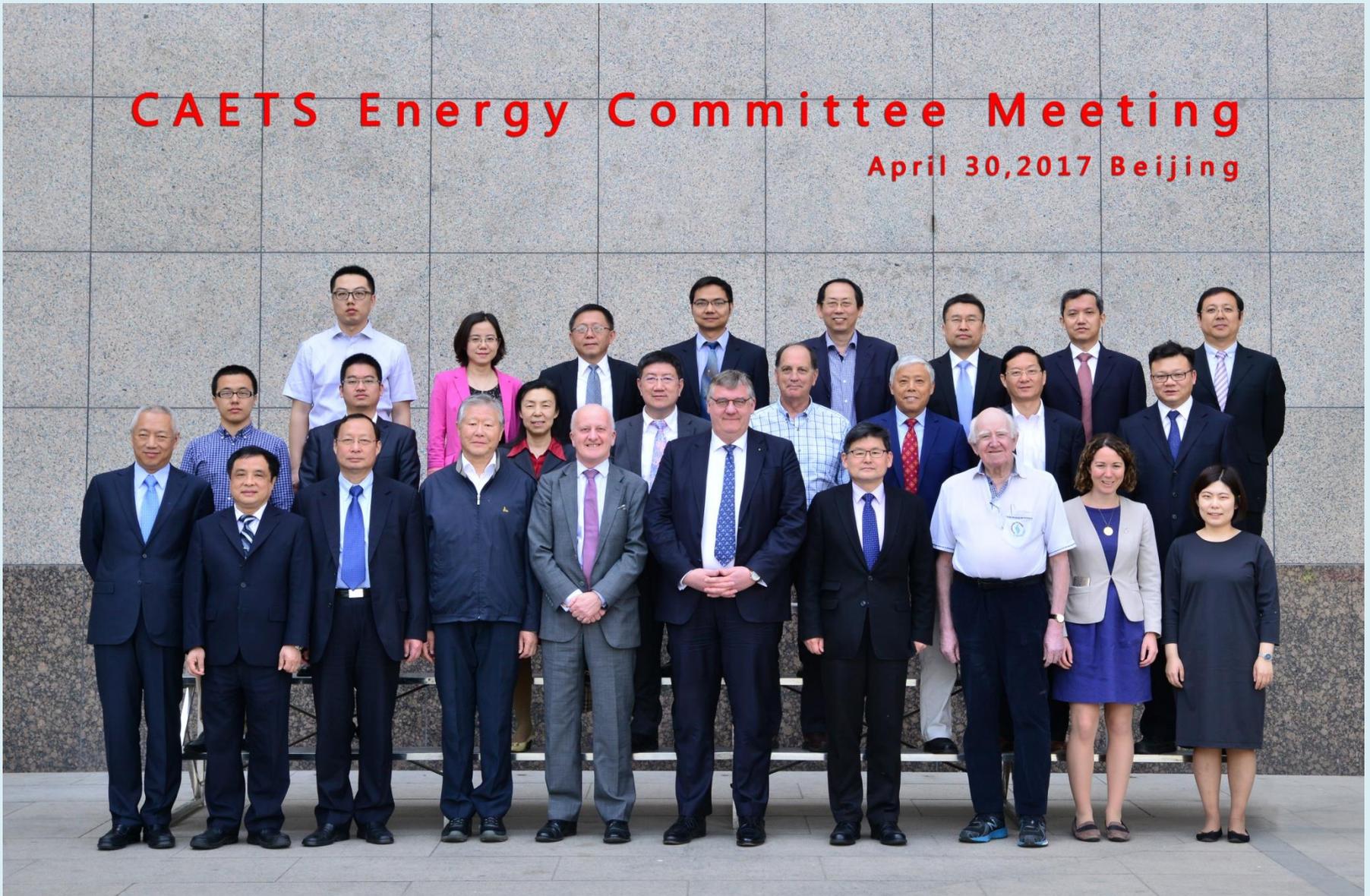


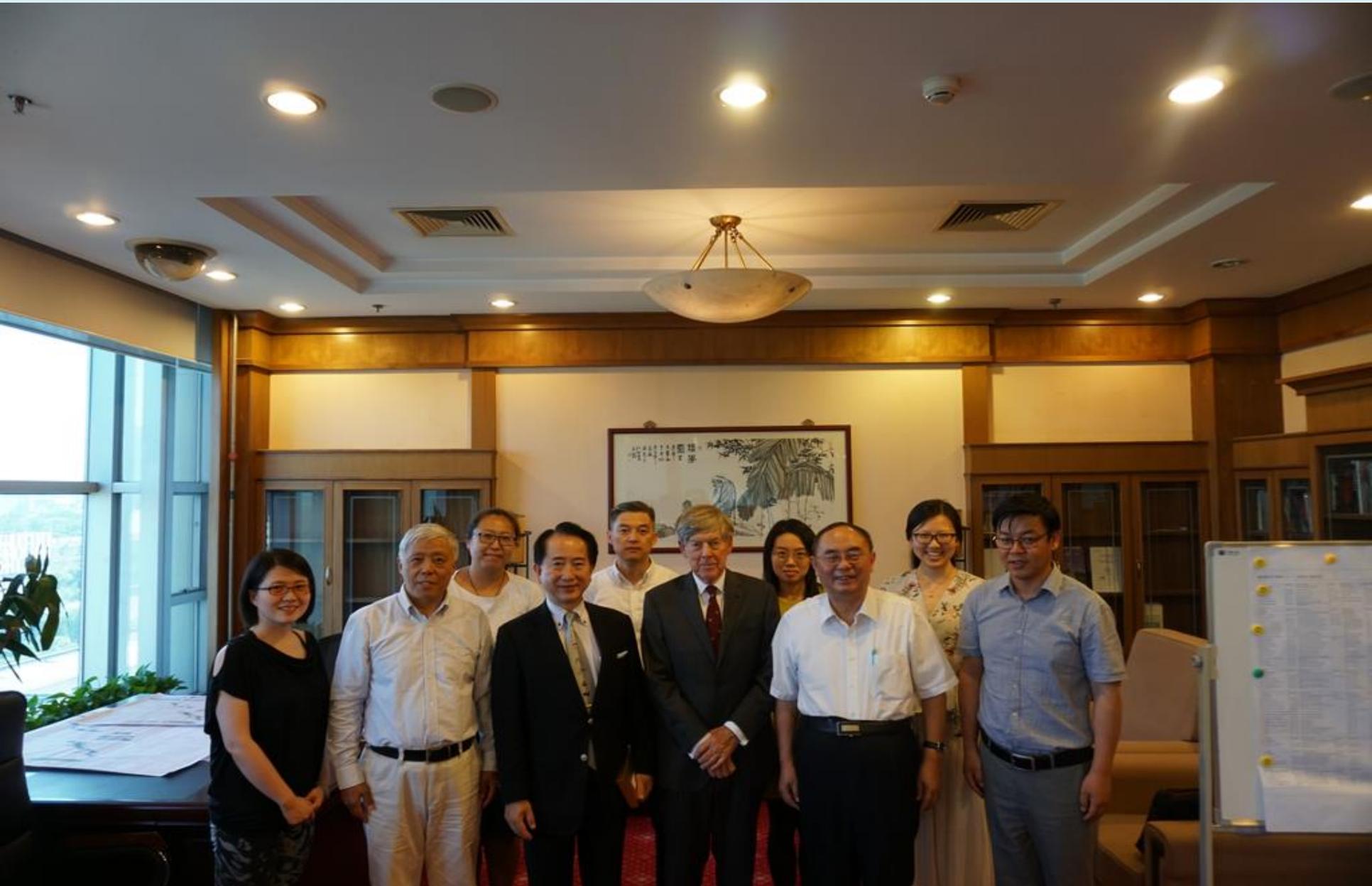


ICEE meeting in Beijing on 21-23 May 2017

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



1

Background of ICEE

2

What does ICEE do

3

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

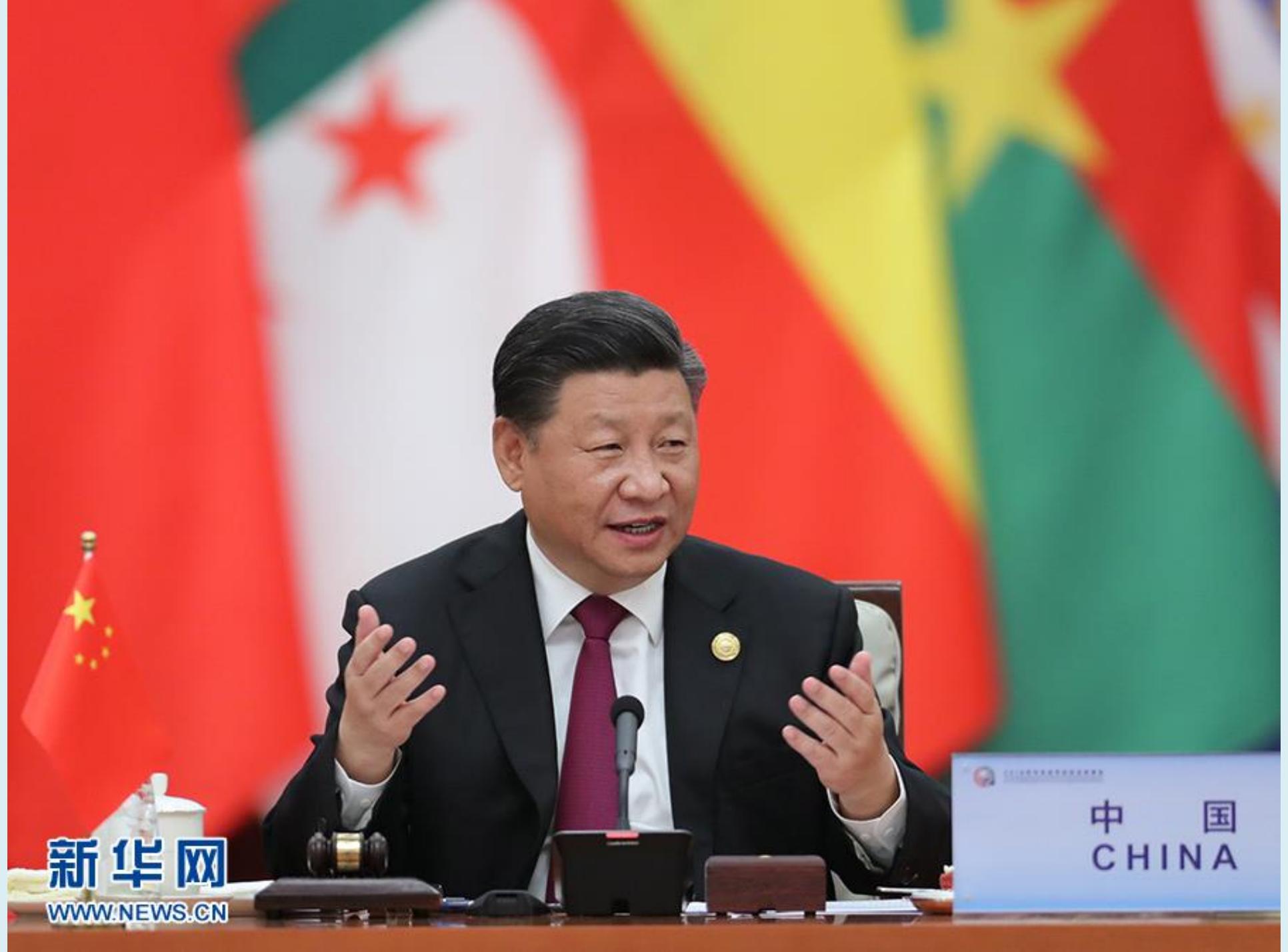
- ◆ Working with African countries for common development and prosperity
- ◆ One-Belt-One-Road Initiative



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



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



新华网

WWW.NEWS.CN

中国
CHINA





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 Education 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.



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

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

5年筑梦路：携手共入新时代

Entrepreneurs de 35 ans : Entrepreneurs de nouvelle génération

2018年11月



泰国媒体高级人员研修班
Seminar for Media Senior Staff of Thailand

媒体合作：共谱中泰友谊新篇章
Media Cooperation: Open a New Chapter of China-Thailand Friendship

2018年7月17日至7月31日 中国·北京
Jul. 17th - Jul. 30th, 2018 Beijing

主办：中华人民共和国商务部
Ministry of Commerce of the People's Republic of China
承办：国家广播电视总局研修中心
Organizer: Research and Training Center of the State Administration of Radio, Film and Television



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!

Contact details:

KANG Jincheng

Bing Jiao Kou Hutong

Xicheng, Beijing 100088

China

email: kangjincheng@hotmail.com

Mobile: +86 13501037540

