

How To Eat An Elephant...



Ed Craig

ECCL, University of Edinburgh



Edinburgh
Global



A Global University

One of the world's leading research universities,
1st in Scotland and 4th in the 2014 UK Research
Excellence Framework (REF)

Ranked 17th in the World by QS World University
Rankings 2014-15

Over 33,000 students, more than 21,000
undergraduates, 11,000+ postgraduates

Over 1,000 international research collaborations

Innovative and quality assured teaching standards

**Over 13,000 international students from more
than 150 countries**



National & Global HUB for knowledge, practices and networks required to BROKER & CATALYSE action towards a sustainable, low carbon future

Form & accelerate IMPACT from world leading research, ideas & exemplars

Engage & Employ ALL Partner Groups to deliver practical solutions

Provide safe spaces for idea and partnership development & deployment

Create a GLOBAL network & actively enable knowledge & resource exchange



The UNIVERSITY of EDINBURGH

The University's mission is the creation, dissemination and curation of knowledge

Global Challenges

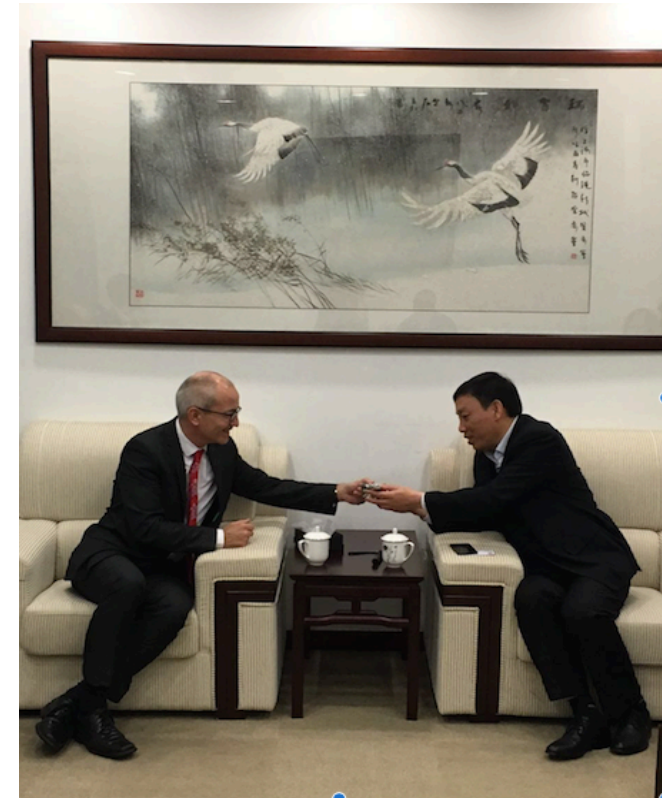


New Technologies



University Strategy

- 2025- Global experience required for ALL students
- 2020- 50% or more International students (43% at present)
- Select small no, deeper relationships- CHINA is key
- Enhance pathways to income/impact
- Tie in University products e.g. MOOC





A Global University

International Student Enrolment 2014-2015 | THES Global Top 20 Universities

Institution	Overseas Intake
Caltech	600
Harvard	4,823
Oxford	7,270
Stanford	3,600
Cambridge	6,415
MIT	3,320
Princeton	1,500
UC Berkeley	6,372
Imperial College London	7,480
Yale	2,477
University of Chicago	3,100
UCLA	3,736
ETH Zurich	6,300
Columbia	9,579
John Hopkins University	600
University of Pennsylvania	6,024
University of Michigan	6,000
Duke University	7,000
Cornell University	4,392
University of Toronto	11,894

University of Edinburgh

13,725



The Edinburgh
Experience



Research with Global impact

83% of University's research activity classified as **world leading/internationally excellent** (REF 2014)

Scotland's leading research institution attracting record levels of investment in its pioneering work

£270 million awarded to the University for research in 2013/14

Over 1,000 international research collaborations

Our scientists:

- created Dolly the Sheep
- developed the first genetically engineered hepatitis B vaccine
- pioneered the first automated industrial assembly robot
- devised technology used in today's smartphones
- discovered how particles acquire their mass (Higgs boson)

Internationalisation Research Trends

Interdisciplinary – multi-skilled teams
grappling with complex issues

Interactive – working in partnership with
universities, civil society, governments,
communities

Impactful – problem solving increasingly a
focus, problems are increasingly global

- Global reach/local insight
- Committed & complementary partnerships
- Desire to generate knowledge & innovation



*The University of
Edinburgh: rated as the
best place to be in the UK
by international students*

ISB Survey

Edinburgh
Global



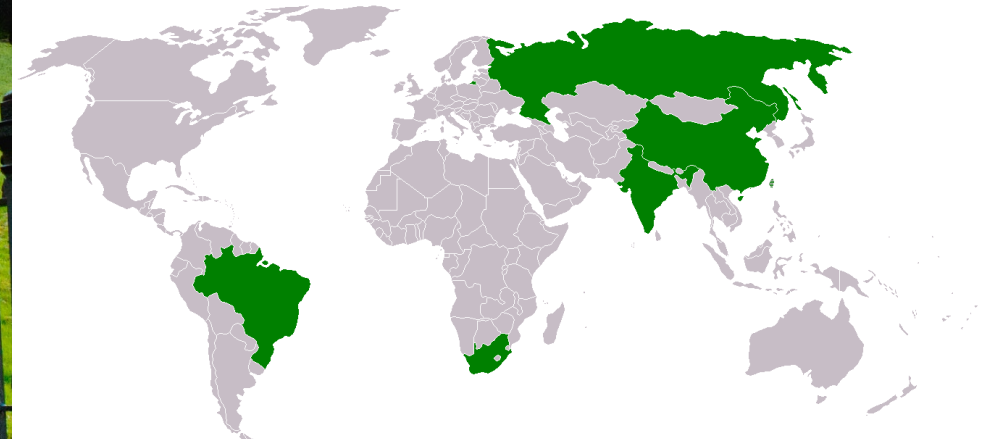
Internationalisation Global Trends

Shifts in centres of gravity *Where do we work?*

Shifts in knowledge production *Who do we work with?*

Shifts in research needs *How do we work?*

Ever complex international context...



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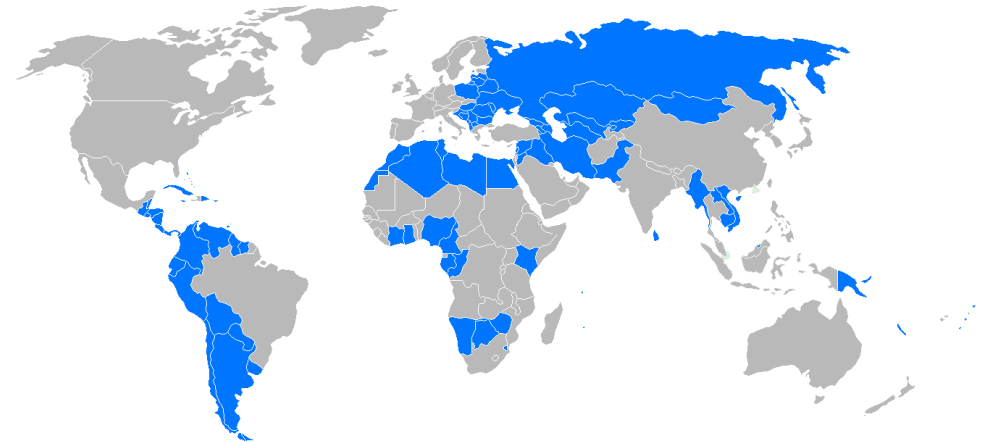
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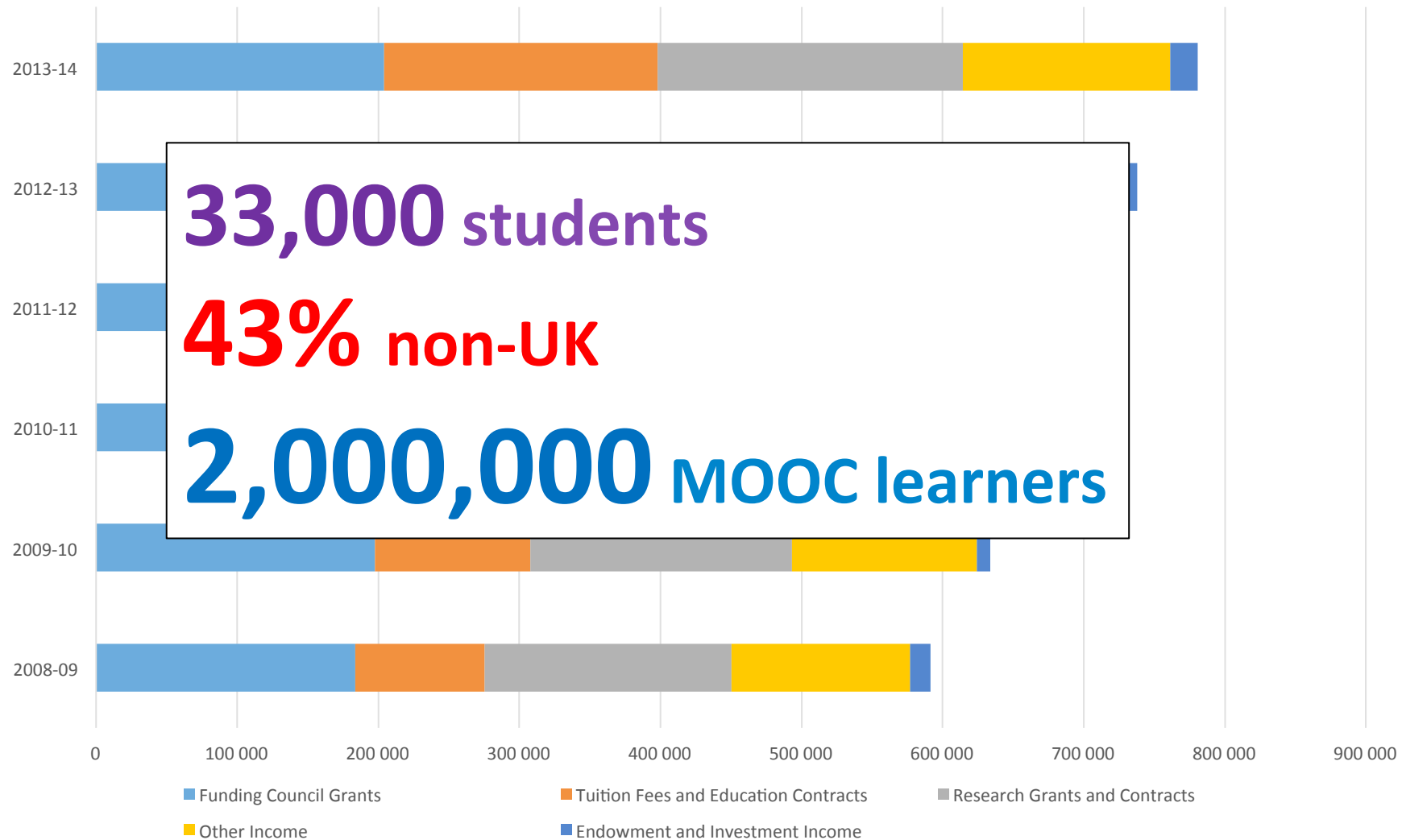
Ever complex international context...



University of Edinburgh by Numbers



University income

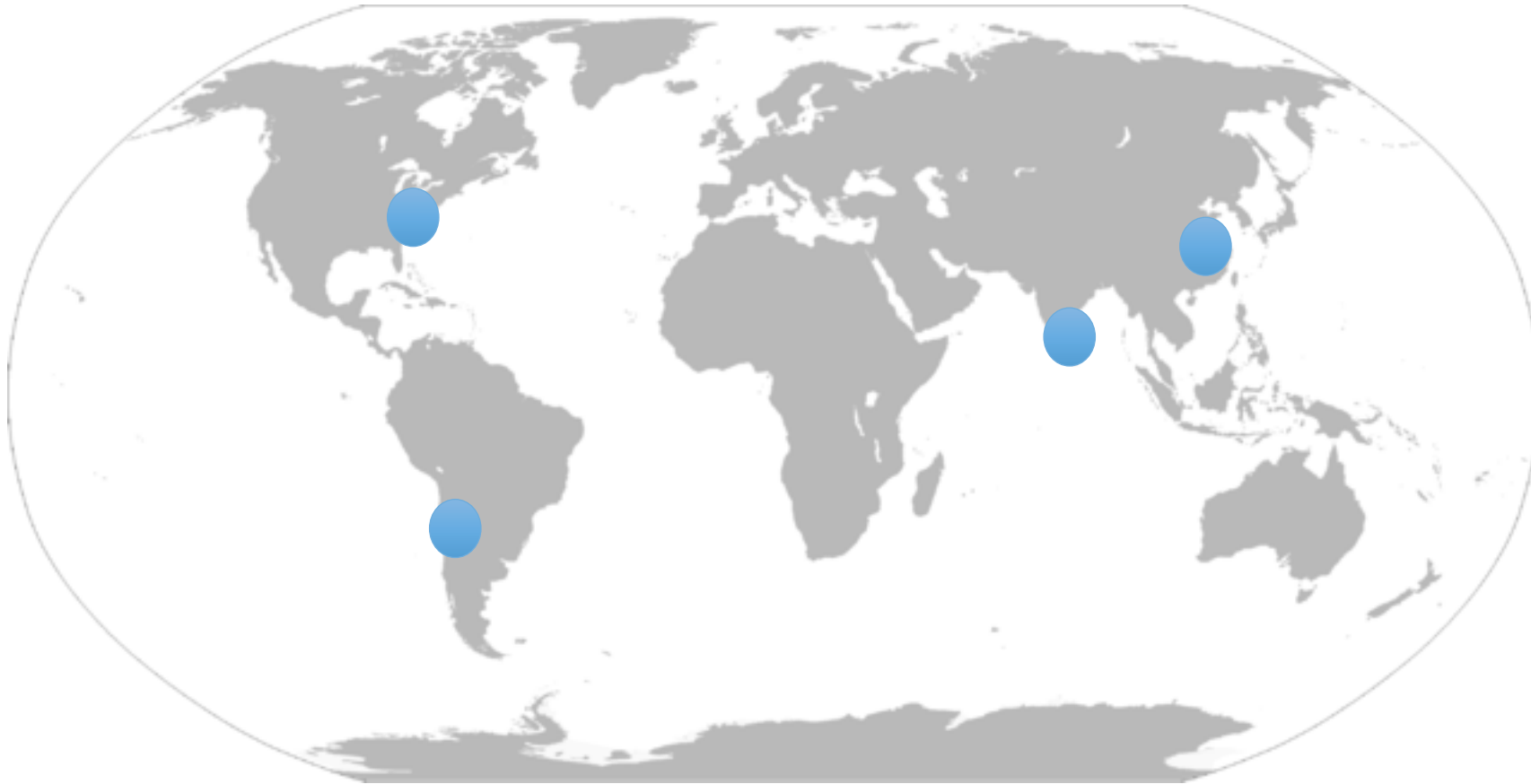


Where we do **not** have MOOC learners



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Relationships: Global Gateways and Regional Networks



Regional Focus China & Hong Kong

Global Gateway – Office in Beijing and an emerging presence in Hong Kong

First European university to admit and graduate a student from China, in 1850

Currently over 1700 students from China studying in Edinburgh

800 alumni in Hong Kong

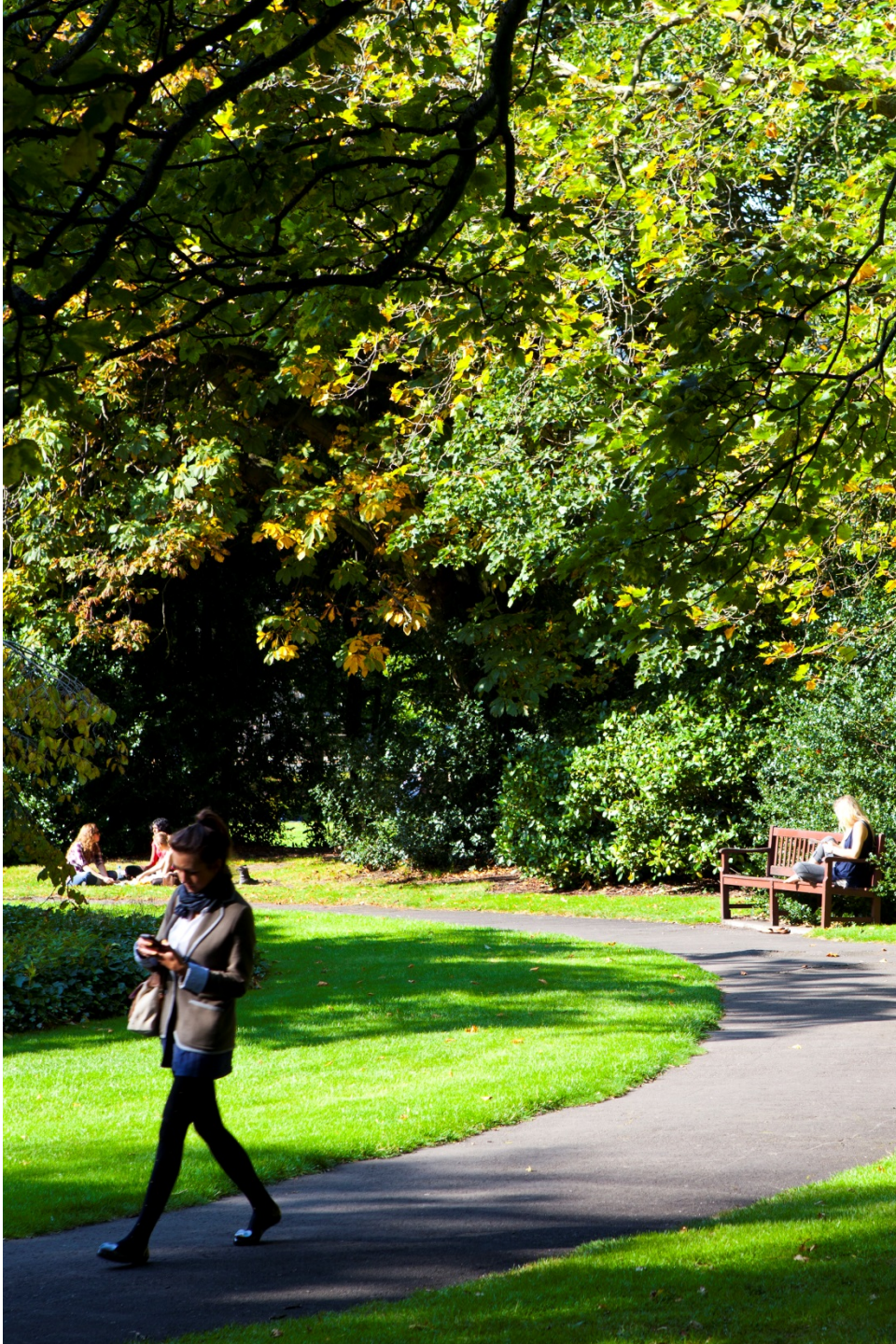
Host a Model Confucius Institute

Establishing regular partnership visits

Over 30 MOUs signed with Chinese Universities

Attended C9 in April 2016





Edinburgh Centre for Carbon Innovation

Impact Through Partnership

- Global reach, combined with local insight
- Committed and complementary partnerships
- Desire to generate knowledge and innovation

Nowhere is this triumvirate more important than in addressing climate change

The **ECCI** is a blueprint for how our university can generate positive change

Change MUST be THINK GLOBAL and ACT LOCAL

Where else to start, but with the biggest Challenge...

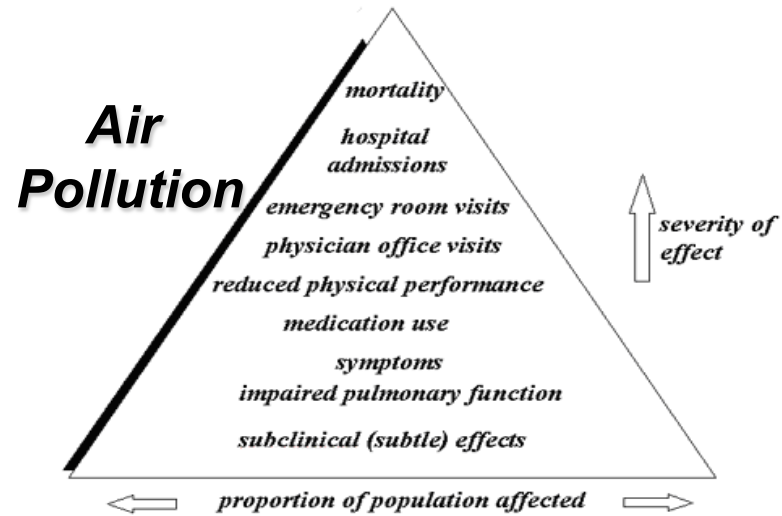
CHINA



Hong
Kong



Why is Sustainable Development Important?



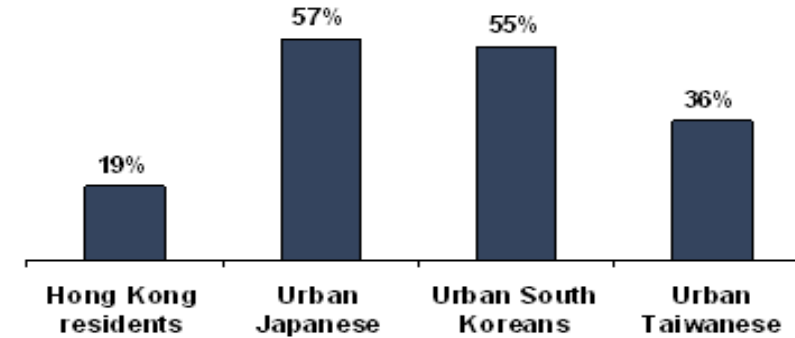
- Quality of Life
- Prevent Disaster
- Opportunity



IPCC report to warn ASIA will be hit hardest by climate change



Are you satisfied or dissatisfied with the quality of air in your country?
Percent "satisfied"



Dec. 2006



New report from authoritative **Intergovernmental Panel on Climate Change** (IPCC) published in April 2014 states that;

"...coastal Asia is very vulnerable to climate change." (Cleanbiz.asia, 30/03/14)

The First Bite: Why Hong Kong?

- Policy- *Legal, education & business values*
MOU between Hong Kong & Scotland
- The location *Perfect base & gateway into PRD*
- The experience *Exemplars of success*
- The culture *Strong historic and live links e.g. Alum*
- The vibrancy *'Can do' attitude*



Low Carbon Opportunities in Hong Kong

- **Key Low Carbon Challenges**
 - Air Quality
 - Water & Waste management
 - Energy Efficiency
 - Sustainable construction
- **MOU with HKSTP**
 - To address key areas above
 - Framework for cooperation, KE and R&D Collaboration
 - Smart Cities & Sustainable Islands
 - LC Finance, Policy & Skills agendas



“The primary subjective... is to develop a framework for cooperation and KT between Scotland & Hong Kong in the low carbon sector by inviting leading Scottish companies & organisations to collaborate with HKSTP and consider locating in the Park.”

Hong Kong Partnership

Core UK Partners

University of Edinburgh

Edinburgh Napier

BRE Scotland

Scottish Development

RBS Group

HK Collaborators

Major Corporates

HK Universities

HKSTP

HK Jockey Club

HK PolyU

Invest HK



Our award winning centre in Edinburgh...

Key Partners & Support in Hong Kong



THE UNIVERSITY *of* EDINBURGH

Edinburgh Napier
UNIVERSITY



Hong Kong 香港科技園
Science & Technology Parks



Case Study: Global Influence

- Opened New Centre in Hong Kong: July 2015
- Launch New Business HKCCI & partnership
- Provide **Gateway** and **Pathway** for Scottish low carbon services & **Influence** key market

Key Services

- Introduce incubate Ideas, products & business
- Deliver skills & education
- Facilitate knowledge exchange
- New relationships & partnerships
- Design & deliver projects
- Engage with Alumni



Second Bite: Shanghai



LinGang New City

Why Shanghai?

- Powerhouse of China
- Investment & Carbon Centre
- Academic excellence
- Huge population growth
- Living Lab of Lingang
- Relationships....



Two bites of the Elephant



Shanghai Jiao Tong



Lingang New City

Shanghai- LinGang City

Locating in the southeast side of Pudong New Area of Shanghai, LinGang New Area, whose total area is 315 sq.km, is a key area of strategic layout and future development of Shanghai government. Being 75 km away from the center of Shanghai, 27 km away from Pudong International Airport in the north and 32 km away from Yangshan Deep-water Port in the south, it is in the cross of S2, S20, S30 and the expressway connecting two ports. MODEL 'SMART CITY' DEVELOPMENT FOR CHINA.

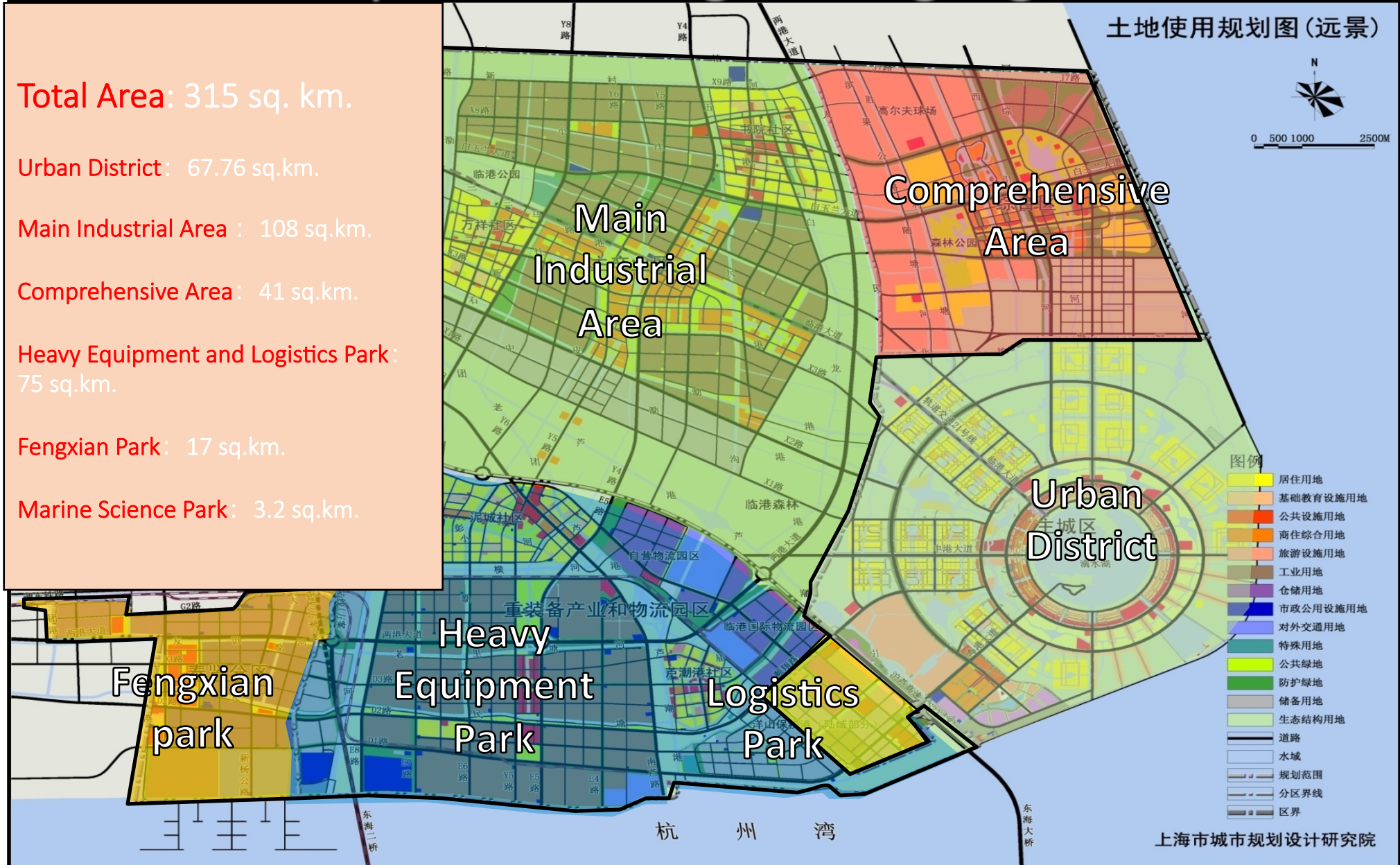


National Strategy to Shanghai-LinGang 'new' city

- ◆ Urbanisation of China – pressure on major Cities
 - ◆ Lingang one of 6 satellite cities of Shanghai
 - ◆ Grow from 50,000 to 1 million by 2020
 - ◆ £15Bn spent on industrial development 2005-15
- ◆ Focus on Trade, Logistics & Transport
 - ◆ Shanghai free trade area, Logistics Park & heavy industry
 - ◆ Major port & transportation hub for China
 - ◆ High speed rail & linkages to Pudong Airport
 - ◆ Linked to 'one belt one road' strategy
- ◆ Selected as 'low carbon zone' for Shanghai & China
 - ◆ Specific operator code for industry & commerce
 - ◆ Low Carbon construction & mobility opportunities
- ◆ Other Key Attributes of Lingang
 - ◆ Financial institutions intensive area
 - ◆ Academic & international education (c80,000 students)
- ◆ SEEKING ACADEMIC, INNOVATION PARTNERSHIP



Functional Layout of Shanghai-Lingang Area



Education Resources in Shanghai-Lingang



Shanghai High School

——municipal key school; floor area: 150mu, building area: 80,000 sq.

Shanghai Lingang Foreign Language Experimental Primary School

——includes one state-run middle school and one state-run elementary school; floor area: 85mu, total building area: 28,000 sq. Scale: 6 classes in each grade, 54 classes in total

Shanghai Maritime University

——a multi-discipline university characterized by aviation technology, economy and management with a large variety of disciplines, such as engineering, management, economics, law, literature and natural science

Shanghai Ocean University

——a multi-discipline university characterized by ocean, aquatic product and food with self-contained education system; LinGang campus covers an area of over 1,600mu and 586,000 sq. construction area.

Shanghai Dianji University

——a general full-time university specialized on engineering; total area: over 900mu, total building area: 260,000 sq.---aiming at cultivating advanced engineering talents

Shanghai Lingang S&T School

——a national key secondary vocational school; two open practical training centers: “Digit Control Technique Application” and “Chinese and Western Cuisine”

Shanghai Jianqiao University

——a general private full-time multi-discipline university specialized on cultivating first-line application-oriented talents in production and management

Shanghai JiaoTong University

----- New 20,000 sq m facility to develop low carbon courses and executive education

Lingang worker's culture hall

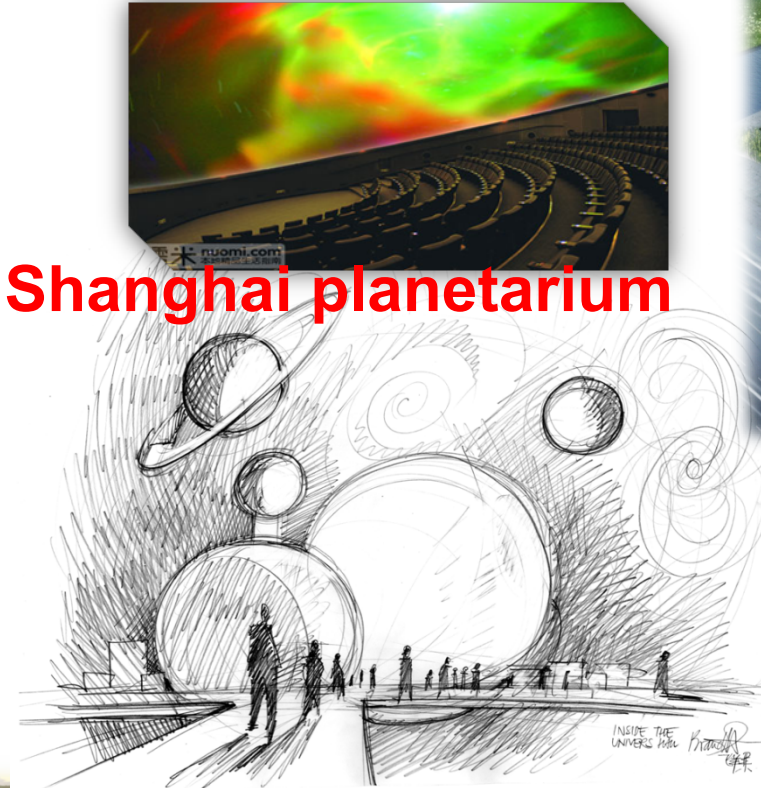


Cultural Resources in Lingang

Polar ocean park



Shanghai planetarium



Xiechen Art Museum & University



Lingang international convention center



imported cars sale center



Tourism Resources in Lingang

Dishui Lake Crowne Plaza Hotels & Resorts---five-star hotel currently with 330 guest rooms

Binhai Golf Club---currently 36 holes, to be increased to 54 holes, the largest golf courses in Shanghai

Shanghai Flower Port---the largest tulip show in China

China Maritime Museum---includes four exhibition areas: navigation history, navigation technology, navigation ancillary support and culture and military.

LinGang Forest Park---an important guarantee of building “an ecological metropolis with fresh water, blue sky and green trees” in LinGang Area

Disney---the largest Disney theme park in the world opening in June 2016....



Shanghai-LinGang Engagement

- Enterprise & Academic Missions
- Host Chinese Delegations
- Use of Knowledge, Brokerage & Model
 - Academic Research Funding
 - Technical Pilots Funding
 - Executive Education Funding
 - Clean Path facility and partnership
 - Sino-UK Carbon College



The Second Bite..

Shanghai Jiao Tong University



Partnership with Shanghai JiaoTong University



- SJTU Status & Top performing schools
 - Top performing University in China- regularly ranked third; Top in Asia for Engineering....
 - School of Environmental Engineering: Earth Science; Urban Science; Human Science
 - School of Management & Economics and School of Law- highly regarded
- Innovative approach:
 - Multiple international and flexible partnerships- Australia, Canada
 - Innovative & Pro-active 'new' Dean of EE- Willing to shape and redesign existing
- Campus Life:
 - 45,000 students; 2 major campuses; Largest Campus in China (7km²);
 - 5% international students, Specific International dorms; English taught;
- Current Relationship:
 - Existing MOU signed in January 2016 regarding education, research and impact partnerships
 - Building JOINT activities: Summer School, Research Forum & Fund; Joined UG/PG; Facilities
 - Linked interest in Shanghai-Lingang regarding
- People: (see appendices)
 - Top Researchers in World (Engineering, Economics, Carbon, Chemistry, Law)
 - Good Match to UoE: Air Pollution; CCS; Env. Engineering, Soil & Water Pollution; Env. Chemistry & technology; Env. Monitoring, management, economics and planning



University of Edinburgh visit to SJU

April 2016



April 5-8th Charlie Jeffery lead

- *Carbon Valley Lingang Agreement*
 - *Charlie Jeffery & Natascha Gentz*
 - *Sign partnership Sino-UK College*
- **120th Anniversary of SJTU**
 - Charlie Jeffery & Natascha Gentz
 - Sign Research Fund Partnership
 - 6th April
- **C9 Annual Meeting & Partnership**
 - Charlie Jeffery & Natascha Gentz
 - C9 Top Chinese & World Universities
 - 7th April
- **D&A Partner Meetings**
 - 8th April

April 11-15th Ed Craig lead

- Interview for new HK Director
 - AK, EC, SS in Hong Kong 11th April
- **SJTU Visit by UoE Academics (5-8)**
 - GeoSciences; Chemistry; Engineering; Business; Economics
 - First Research Group Meeting
 - 12th April
- **Conference Lingang Day 1 (5-10)**
 - Sign Research Contracts with LCV
 - Sign UoE-SJTU-LCV Partnership
 - Announce Technical Projects
 - 13th April
- **Business & Education Conference Day 2**
 - Enterprise & Academic Presentations
 - Pitching & Partnership building
 - Launch of Clean Path China- ECCI residence
 - 14th April



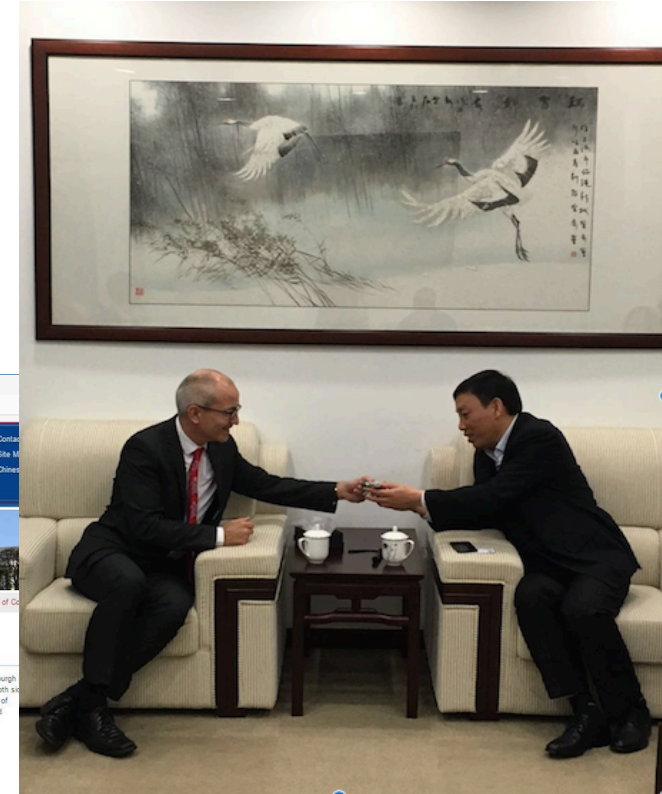
Agreements & Contracts



- UoE – SJTU MOU - (signed February 2016)

In Progress

- UoE – SJTU Postgraduate / Undergraduate
- Summer School & bursaries
- Research Forum & Fund
- Executive Education & MOOCs
- Sino-UK Carbon College
 - Scotland
 - London, UK & Europe



The partnership between the two universities will create opportunities that draw on the research expertise and innovation of Edinburgh's School of Geosciences and the Edinburgh Centre for Carbon Innovation.

Experts from China and the United Kingdom will collaborate on research projects in sustainable construction, air quality, energy efficiency and smarter cities. Courses at the college will include carbon finance and management, carbon capture, and storage and environmental sustainability.

The institutions will explore opportunities for joint undergraduate and doctoral education programs and will operate an exchange program for faculty members, support staff and graduate students.

"The Sino-UK low carbon college will be an active player in the low-carbon valley initiative in Shanghai's Lingang region. The initiative aims to deploy and demonstrate low-carbon solutions nationally and globally," said Ed Craig, head of enterprise and innovation for carbon center.



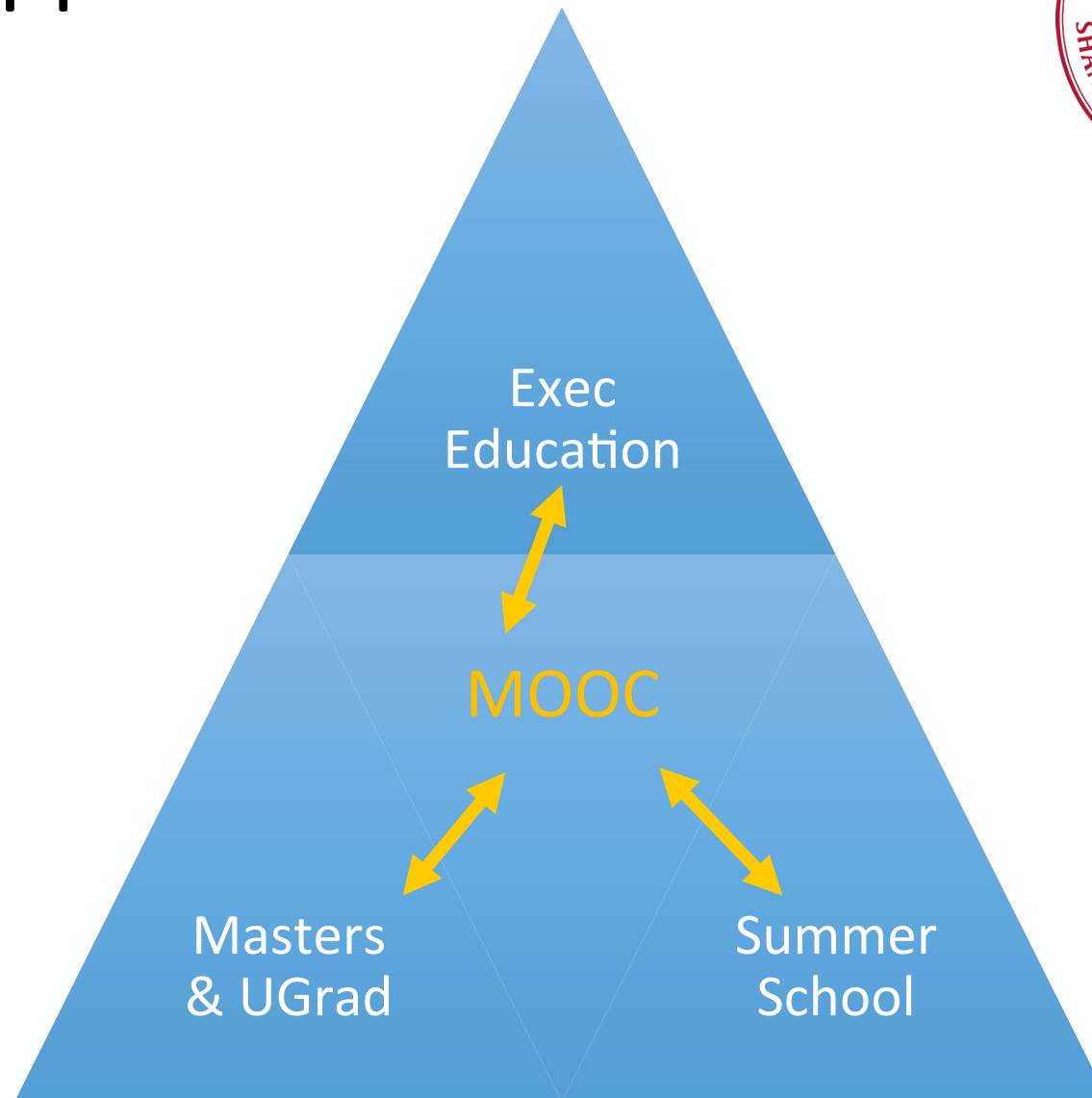
Education Opportunities with SJTU



- Postgraduate
- Undergraduate
- Dual Supervised PhDs
- Summer School
- MOOCs & Online
- Executive Education
 - Need, Length & Location
- Student Experience

THEMES INCLUDE:

- Carbon Management, Finance, Economics, Law, CCS, Engineering and Chemistry



Mapping Low carbon research at the University of Edinburgh

Carbon Management, Auditing & Planning

Construction

Prof Dave Reay - Carbon management

Dr Simon Shackley - Carbon Policy

Dr Heather Lovell - Climate change policy and politics, low energy housing, socio-technical change.

Dr Dan van der Horst - Energy & Society, Energy Landscapes, Valuing Nature,
Ecosystem Services & Land Governance, Socio-Technical Innovations in Resource Enclosure and Allocation.

Energy/Carbon Capture and Storage

Prof Stuart Haszeldine - Energy and resources

Dr Stuart Gilfillan – CCS

Dr Mark Wilkinson - CCS

Soil and Water Management

Prof Kate Heal - Environmental geochemistry/water

Dr Margaret Graham - Environmental geochemistry

*Coordinated through
School of GeoSciences*

Mr Ed Craig - Head of
Enterprise & Innovation, ECCI

Prof Hugh Sinclair –
Director of Internationalisation

Engineering solutions

Dr Ondrej Masek - Engineering systems/Biochar

Dr T Chatzisyneon – water & contamination

Dr Andrea Semiao - Environmental Engineering

Urban climate modelling

Prof Simon Tett - Aerosol and climate modelling

Dr Ruth Doherty - Air quality and human health

Carbon Finance

Dr Francisco Ascui- Carbon Market Designs

Dr Xi Liang- Finance & Risk of LC Technology

RE & Energy Storage

Prof Robin Wallace

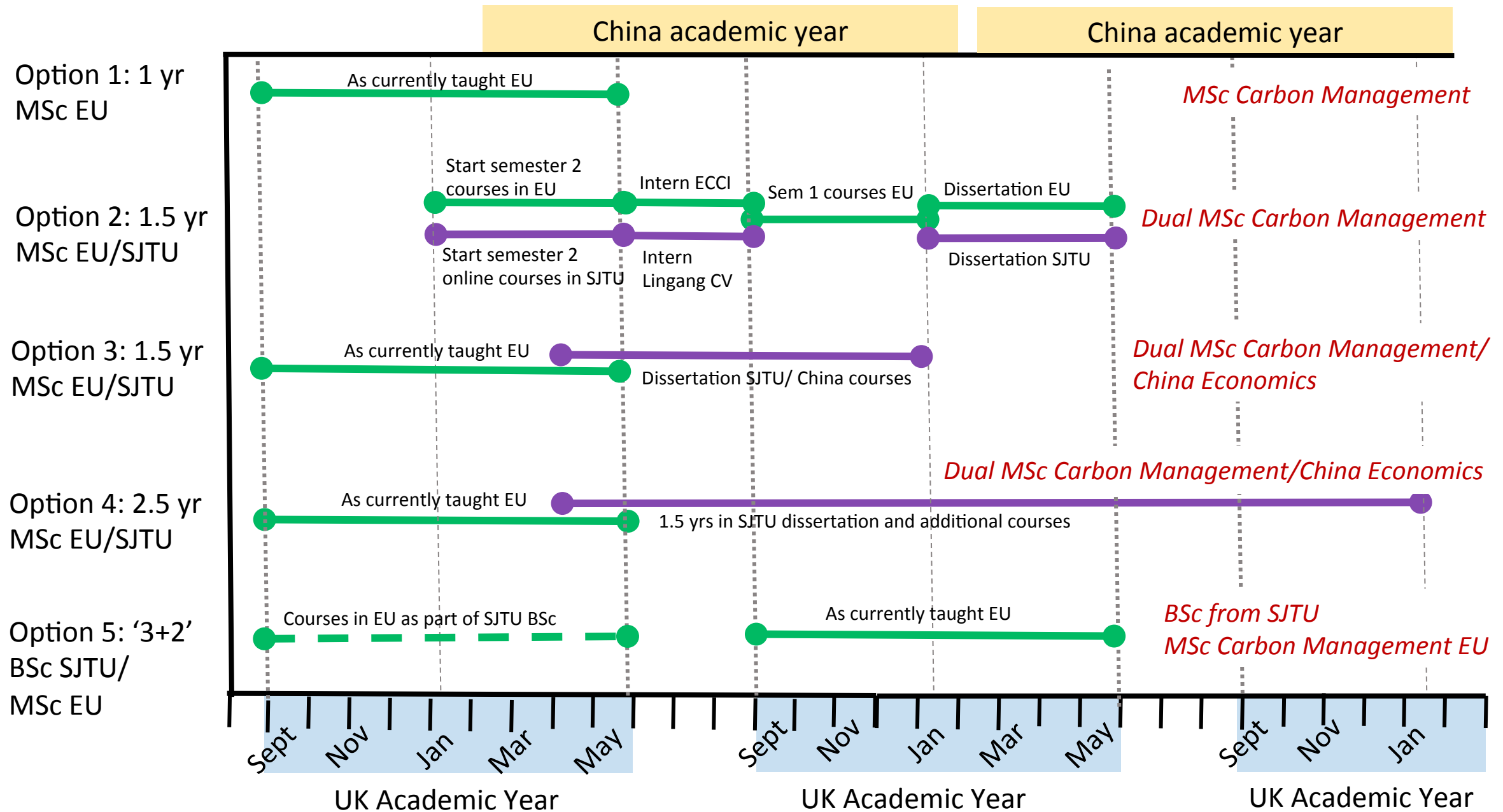
Prof Marcus Muller

Green Chemistry

Dr Francisco Ascui- Carbon Market Designs

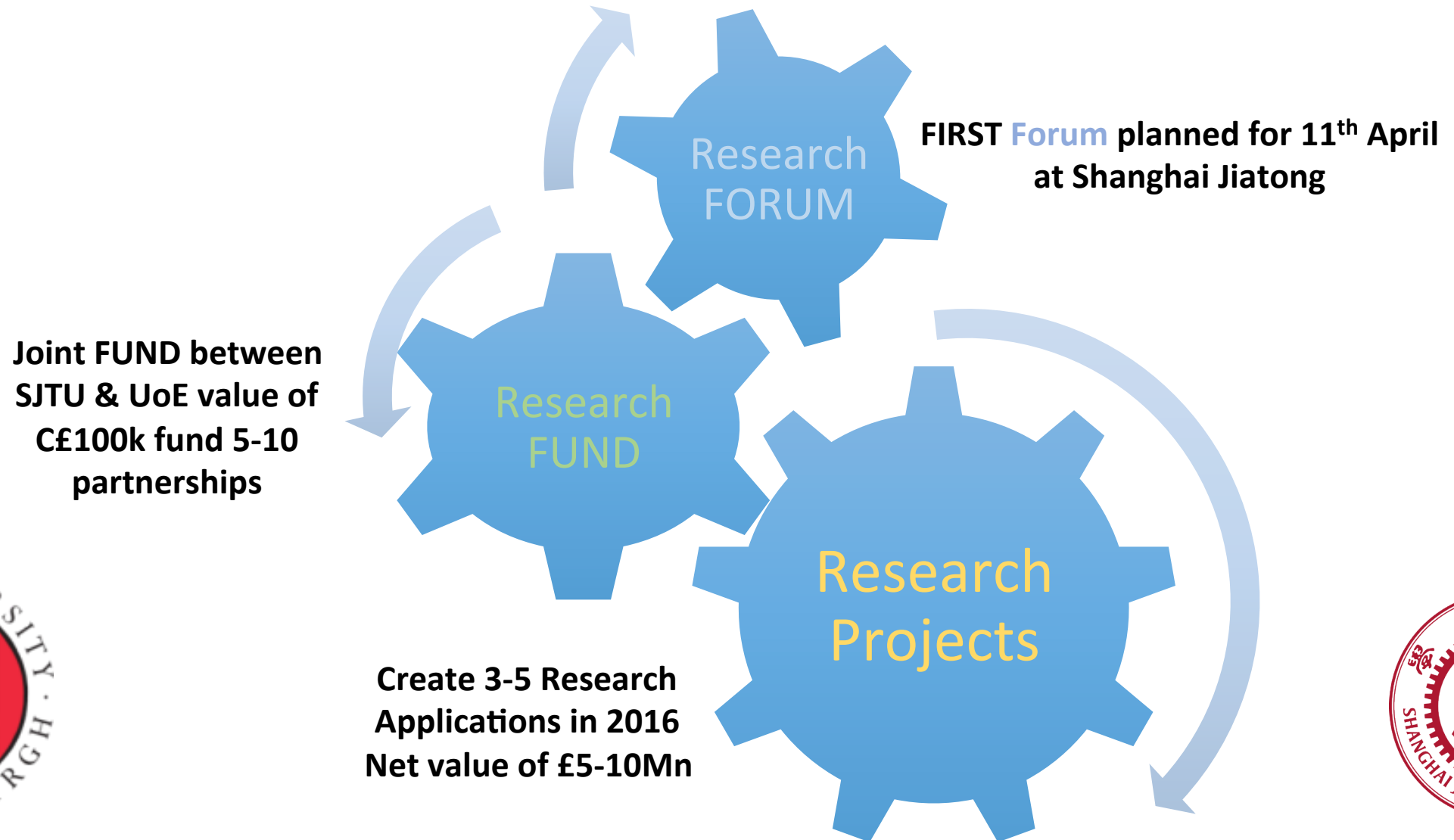
Dr Xi Liang- Finance & Risk of LC Technology

Models for degrees in Carbon Management: SJTU and Uoe



Research Partnership

Shanghai JiaoTong & University of Edinburgh





Research Funding Opportunities

Partnerships with SJTU



Fund Name

- **UoE / SJTU Research Fund**
- **Prosperity Fund:**
- **UNEP-British Council**
- **Newton Fund**
- **Asian Development Bank:**
- **Ministry for Science & technology**
- **MOST – Innovate UK**
- **H2020** and China: new agreement
- **BNP Paribas Fund** on climate change

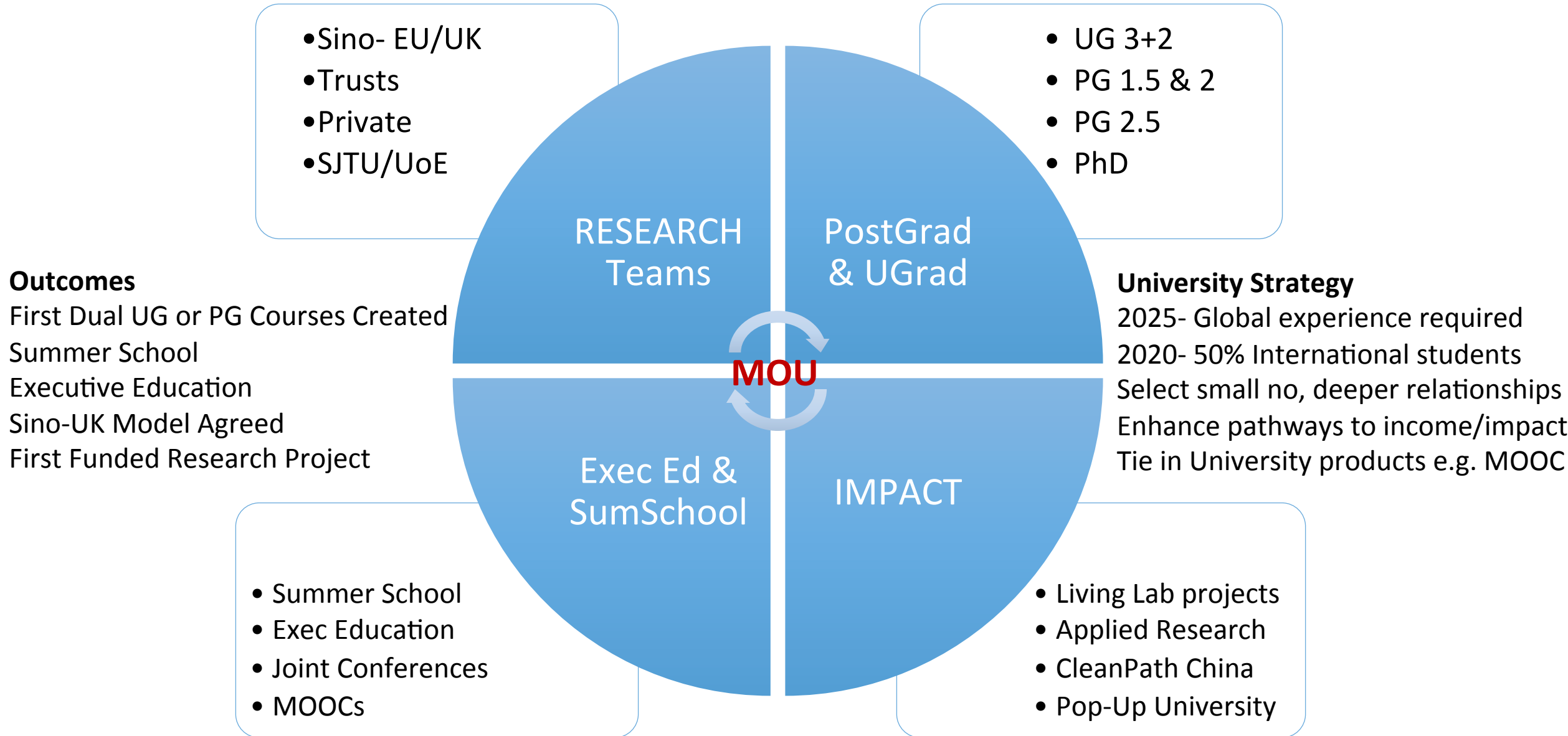
Fund Details

- £50-100k to forge 5-10 partnerships
- Ongoing, £100k; Feb 2017
- Sustainable Lifestyle Fund 10 years; March 2016
- £200-400k; April 2016- ongoing
- New CCS Project and Carbon Management focus
- Dec 2016; Global warming, impact focus; £300k
- March 31, 2016, Energy & Urban, Ag health & Food
- China will match funds (existing projects - apply)
- Typical awards £800K

• **National Science Foundation** for China

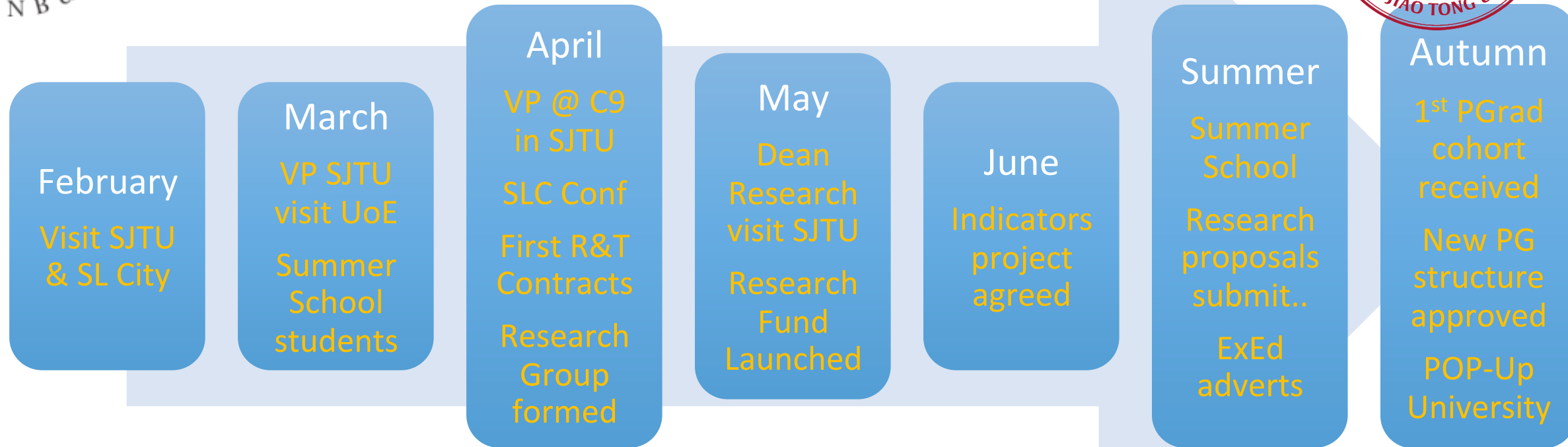
- May 2016 call (Dec deadline); £300k pa for 2 years; urban transitions / Low Carbon focus
- **IIES** (Institute for Innovate Environmental Sciences) led by Ontario University, Canada
 - £150Mn budget; 17 university partners into Research Group (including now UoE)- call Summer 16

IMPACT MODEL: SJTU – Edinburgh





Time Line & Next Steps



- Establish Research Forum, Meet Schedule & Fund
- Agree new models for Post Graduate & Undergraduate Collaboration
- Finalise two-way summer school participation
- Identify opportunities for Executive Education
- Submit NEW research funding applications



Current Activities

Shanghai Jiatong University

- Research Priorities
- Dual Degrees
- Executive Education
- New Building
- Summer School
- Impact for students & business
- Contracts & Agreements

Lingang Carbon Valley

- New Clean Path model
- Research Indicators
- SDI Mapping & Support
- SME Technology Contracts
- Executive Education
- Marine & Universities
- Clean Path Centre Partnership
- Scaling Model

Thoughts...

