

UK-China Science Bridges: R&D on (B)4G Wireless Mobile Communications (UC4G) **Project Progress**

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Outline

- I. Overview of the UC4G Project
- II. Project Progress
- III. EPSRC Mid-term Review and Feedback
- IV. Future Development

I. Overview of the UC4G Project

- **Aim:** To create a *UK-China Joint R&D Centre for Future Wireless Communication Networks*, enabling long-term sustainable collaboration between the UK and China
- **Duration:** 3 years (01/08/2009-31/07/2012)
- **Funding:** £1,134,442 (fEC) or £907,554 (RC contribution)
- **Collaboration Consortium:**



10 UK Universities



7 Chinese Universities



1 UK Company (Mobile VCE, with 13 BigCo members)



6 Chinese Companies

Work Packages (WPs) and Work Plan

WP	YEAR 1 (1/8/2009-1/7/2010)				YEAR 2 (1/8/2010~7/2011)				YEAR 3 (8/2011~7/2012)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP1	Visit China											
WP2		Exchange of 30 Researchers										
WP3		Joint International Workshops										
WP4					Prototype development and testing							
WP5									Commercialisation			
WP6												Visit UK

M0 M1

01/08/2009

M2

01/02/2011

M3

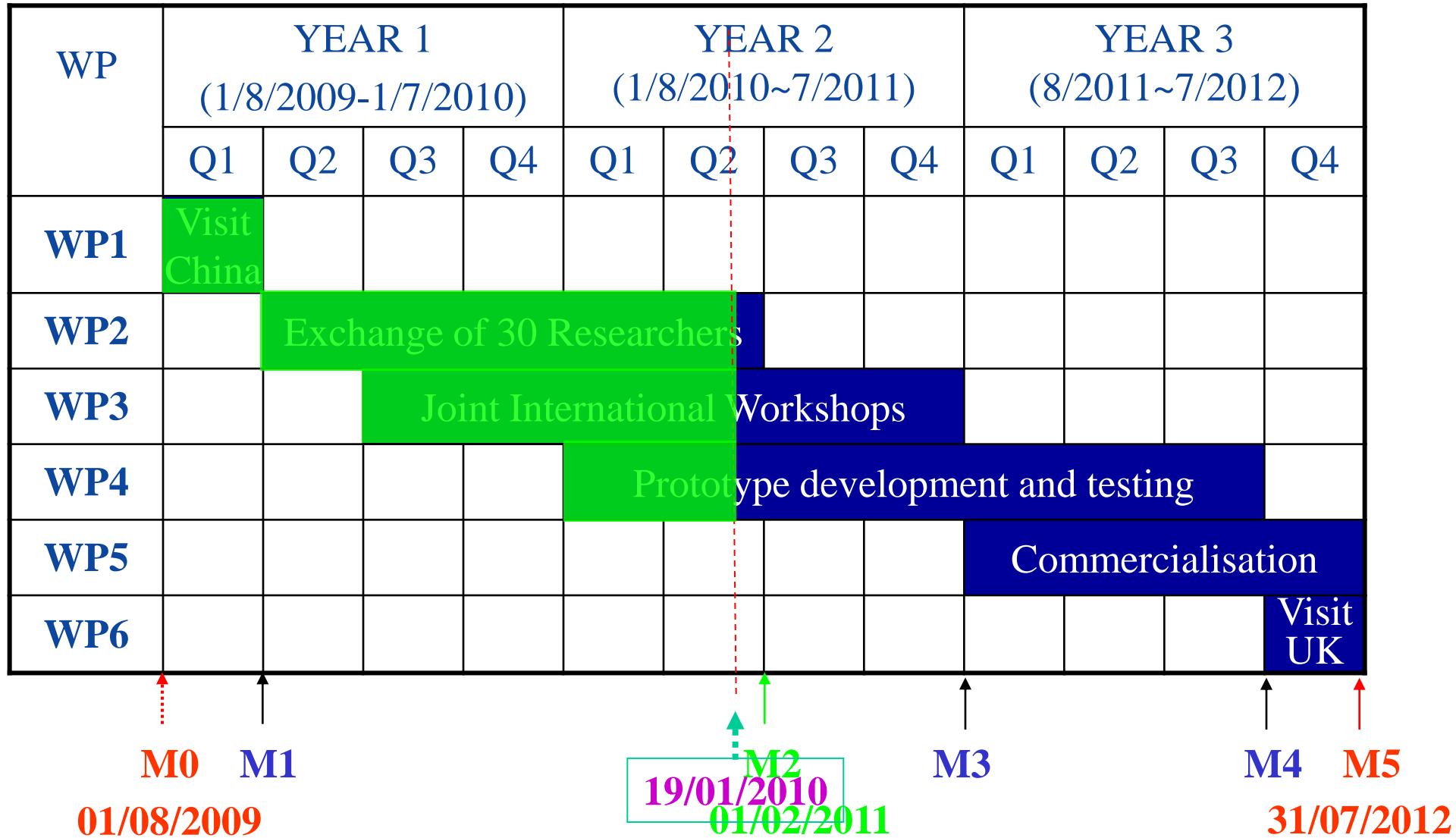
M4 M5

31/07/2012

Outline

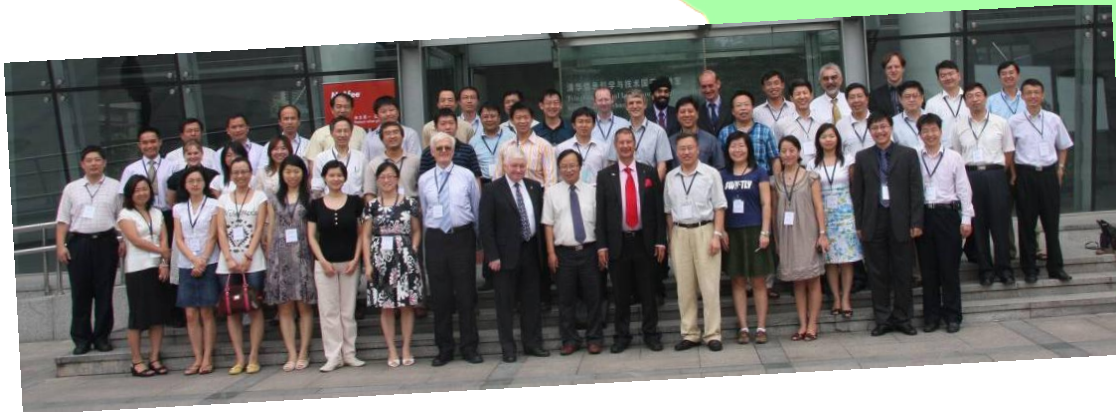
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II. Project Progress



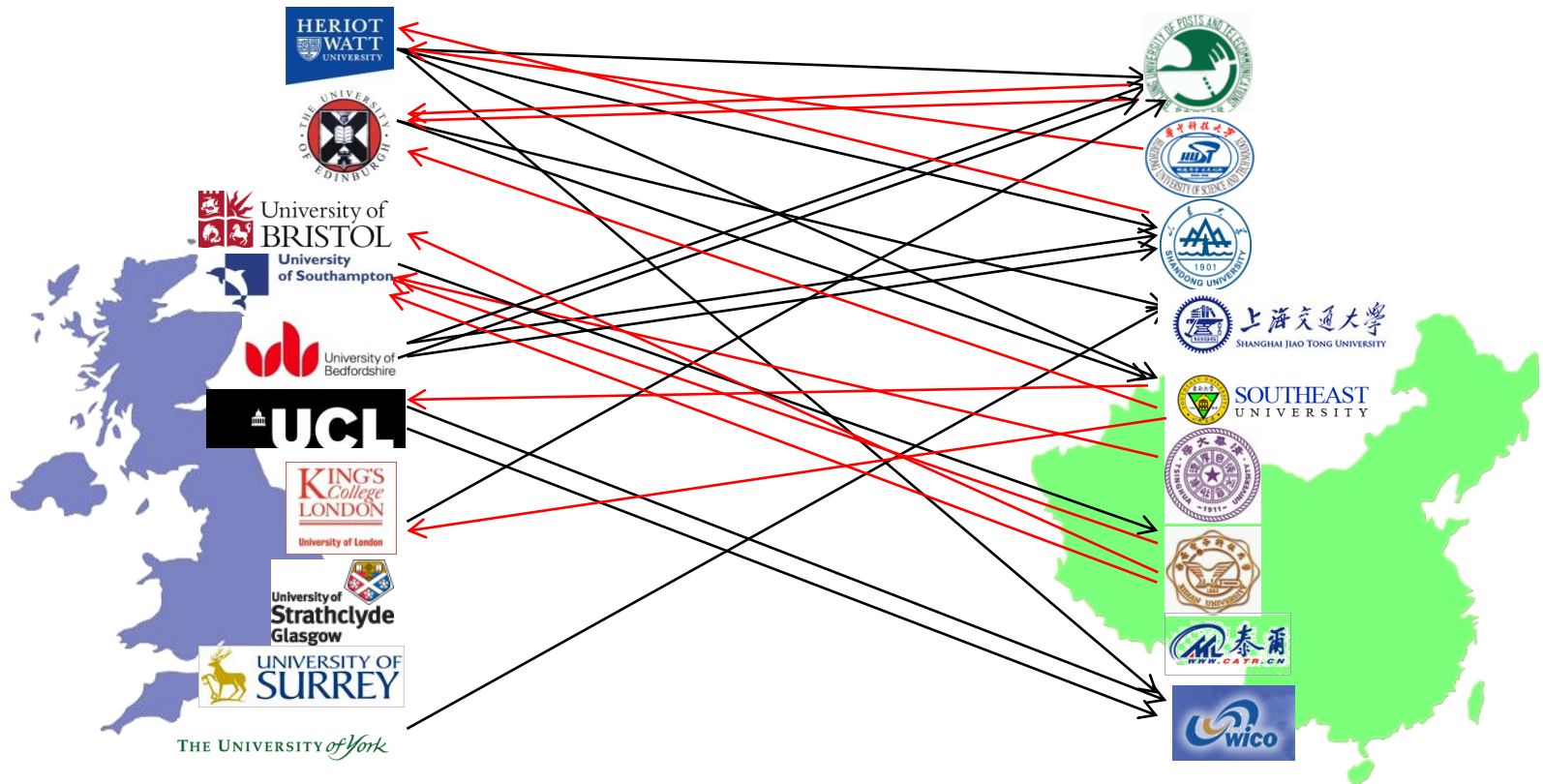
Overview of WP1 (Completed)

- 22 UK delegate members (6 from industry)
- 2-weeks visit to 12 Chinese partners in 6 cities
- 2.5-days workshop: 70 attendees
- Deliverables:
 - ✓ WP1 report (83 pages)
 - ✓ Collaboration agreement
 - ✓ Project website
 - ✓ Workshop presentation slides



Progress of WP2

- 3 rounds of Call for Proposals (CFPs) completed: 5 Mar., 31 May, 30 Sept. 2010
- 31 applications received; **20 fellowships awarded** (10 out to China, 10 into the UK), involving 8 UK universities and 7 Chinese universities + WiCO
- Success rate: 60%**
- Remaining 11 fellowships:** 6 for the testbed, 5 open (Round 4 CFP: **15 Feb. 2011**)?



Distribution of Awarded WP2 Fellowships (Institutions)

	Host (in)	Visit (out)	Total		Host (in)	Visit (out)	Total
HWU	2	2	4	BUPT	2.1	2	4.1
Edinburgh	2+2/3	1	3+2/3	HUST	-	1	1
Bristol	1	-	1	SDU	2.1	1	3.1
Southampton	3	0.3	3+0.3	SEU	1.3	2	3.3
Bedfordshire	-	2	2	SJTU	0.6	-	0.6
UCL	1	0.7*2	2.4	THU	-	1	1
KCL	1/3 (+travel)	1	1+1/3	XDU	0.3	3	3.3
Strathclyde	-	-	-	CATR	-	-	-
Surrey	-	-	-	WiCO	1.9	-	1.9
York	-	0.6	0.6	Total	8.3	10	18.3
Total	10	8.3 (10 persons)	18.3				

Distribution of Awarded WP2 Fellowships (Research Areas)

	Round 1	Round 2	Round 3	Total
Antenna & Propagation	1	1	1	3
Radio access	3.5	3	6	12.5
Networking	1.5	1	2	4.5
Application	-	-	-	-

- WP2 deliverables
 - ✓ 26 collaborating partnerships/links between the UK and China
 - ✓ 5 completed WP2 summary reports (25 more expected)
 - ✓ A number of joint publications, posters, project applications, IPR applications, and (B)4G standard proposals

Progress of WP3



London workshops (8 July 2010 & *19 Jan. 2011*)



Beijing workshop (23-24 Aug. 2010)

■ WP3 deliverables

- 110+ attendees
- 51 technical presentations
- 12 invited talks from industry
- 8 invited talks from academia



Shanghai workshop (12-13 Sept. 2010)

Progress of WP4 (1 Aug. 2010 – 30 Apr. 2012)

■ Objectives:

- Verify research findings using wireless testbeds and enable proof of concepts
- Facilitate technology transfer and commercialisation

■ WP4 testbed progress

- Testbed initial set-up
 - Dr Xuemin Hong visited China and conducted a feasibility study on the UC4G testbed.
 - Multiple testbed vendors have been contacted and their offers have been compared.
 - Dr Jian Sun from Shandong University will visit HWU to help with the testbed implementation (1 Mar.-31 May 2011).
- 2 proposals received for B4G candidate technologies for demonstration
- 6 more visiting fellowships allocated to HWU for testbed implementation

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III. EPSRC Mid-term Review and Feedback

- **Submissions by 23 Sept. 2010:** 4-page report + 2-page annex + 3-minute video
- **4-page report (7 sections):** summary to date; knowledge generation; knowledge deployment; impact; collaboration and partnerships; future development
- **2-page annex:**
 - 13 journal papers (10 published/accepted; 3 submitted);
 - 7 conference papers (1 invited; 1 best paper award);
 - 1 patent in application (UCL+SEU);
 - 2 joint projects from MOST, China:
 - Datang, BUPT, & Surrey, “Cognitive Radio Research Based on TD and Evolutionary Technologies,” MOST, China, RMB 5.5M, 2010-2013.
 - WiCO, UCL, & BT, “Analysis, Modelling and Demonstration of Future Wireless Broadband Traffic and LTE-TDD Relay Technologies,” MOST, China, RMB 5.03M, 1/12/2008-30/11/2011.
- **3-minute video:** project highlights

EPSRC Review Feedback on 6 Dec. 2010

- “The Chair of the Panel wished the feedback to note that **the Panel was divided** during the assessment and discussion of this Bridge.”
- Report and Bridge working were well-defined and logical; good evidence for knowledge generation; The links between centres in the UK are established and strong; impacts in publications and publicity in terms of media coverage; The Bridge had added value by its operation.
- Sought further clarification on actual tangible outputs and achievements to date; The report and video covered the activities, but had less detail on actual deliverables; There was evidence of a ‘genuine Bridge’ being in place but the report would be strengthened by more detailed evidence of knowledge generated and utilised. Similarly, a comment reflected the view that future reporting must concentrate on measurable deliverables and outputs.

EPSRC Review Feedback on 6 Dec. 2010 (Cont.)

- “Overall, the Panel felt that **the Bridge was adding value, but lacks strong evidence for activities.** In moving forward, the Bridge must plan carefully for the future and ensure that it maintains a trajectory for measurable impacts and outputs.”
- “As an overall grade, the Bridge was felt to be **‘Partially Meeting Objectives.’**
 - ‘Exceeding objectives’
 - ‘Fully meeting objectives’ (4 Bridges in this category)
 - ‘Broadly meeting objectives’ (2 Bridges in this category)
 - **‘Partially meeting objectives’ (4 Bridges in this category)**
 - ‘Not meeting objectives’
 - ‘Failing’”
- Frequent observations for Bridges placed in the ‘Partially Meeting Objectives’ category related to the **lack of evidence presented in the report for progress** and that the Panel were unable to assess the clear added value of Bridge funding. It did not imply that the Bridge was not performing good work and delivering as expected against objectives.

Some Strategies for Improvement

- Improve the project website for better publicity
 - Seek help from professional website designers
 - Make project outcomes accessible to the public
 - WP1 report? WP2 project description and deliverables? Workshop presentations?
- Closely monitor the deliverables/reports of WP2
- Involve EPSRC and RCUK officials in future events
 - WP3 workshops; Events of (B)4G technology demos
- Attract more buy-in for WP4 and WP5 from all project (industrial) partners
 - More B4G candidate technologies for demonstration; standardisation proposals; commercialisation
- Learn from other Science Bridges projects
- Other suggestions

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IV. Future Development

- WP2 (present – 31 December 2011)
 - **11 more fellowships:** 6 for the UC4G testbed, 5 open (Round 4 CFP: **15 Feb. 2011**)?
 - Improve project website and make project outcomes accessible to the public
- WP3 (present – summer 2011)
 - Organise 1 international workshop in the UK in 2011 and invite EPSRC /RCUK officials
- WP4 (present – 30 April 2012)
 - Buy equipments and setup a UC4G testbed at HWU
 - Demonstrate selected (B)4G technologies
- WP5 (1 August 2011 – 31 July 2012)
 - Promote advanced (B)4G technologies to standards and commercialisation
- WP6 (1 May – 31 July 2012): Chinese delegates visit the UK; final project workshop

Testbed Development Issues to be Discussed

- Are NI and Lyrtech solutions able to meet the technique requirements of the two existing WP4 proposals?
- Which solution is preferred? NI or Lyrtech?
- What are the time scale and required resources for the implementations of the two WP4 proposals?
- Can channel emulators at Bristol, Surrey, and WiCO be used?
- Can we consolidate testbed resources in the UK by, e.g., linking the UC4G testbed with testbeds in Bristol and Surrey?
- Should we encourage more proposals for B4G candidate technologies for demonstration at the UC4G testbed in the future?
- Ofcom license

Other Issues to be Discussed

- What contents can be made public on the project website?
 - WP1 report? WP2 visiting fellowships, project descriptions, and deliverables? Workshop presentations?
- How to better manage/monitor the deliverables of WP2?
- 2011 WP3 workshop
 - Suggestion of programme, date, and location?
- Attract more buy-in for WP4 and WP5, particularly from industry
- **New members** of the UC4G project and/or to-be-established UK-China Joint R&D Centre for Future Wireless Communication Networks

**UK-China Science Bridges:
R&D on (B)4G Wireless Mobile Communications (UC4G)**

Thank You!

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