

European and External Affairs Committee

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Bangor University

PURPOSE

This briefing paper is provided by Bangor University in response to an invitation to contribute to the National Assembly for Wales Committee on European and External Affairs Inquiry into Welsh participation in European Union research, innovation and lifelong learning programmes during the period 2007-2013.

This paper provides an overview of Bangor University's participation in the EU funded lifelong learning programmes of Grundtvik, Leonardo da Vinci, Erasmus, Erasmus Mundus and Tempus, and an overview with exemplars of the University's participation in Framework Seven, with benchmarking against other Universities in the UK, and a consideration of the benefits and disbenefits of involvement.

This paper identifies:

- success stories and projects which have particular significance and relevance to Wales and the strategic priorities of the Welsh Assembly Government;
- the perceived benefits of involvement in the various programmes from the perspective of the academics concerned and the University both to addressing global challenges and regional concerns;
- barriers to participation that result from the way funding policy decisions are made by the Commission and the structuring and financing of the schemes;
- examples of the experience of European and international collaboration;
- links the enabling effect of external and internal pump-priming funds and Structural Funds to the development of bids and successful projects in the Framework programme;
- recommendations for changes Bangor University would like to see in future programmes.

BACKGROUND

Bangor University's mission is to be a world-class research-led university, to provide teaching and learning of the highest quality, and to contribute to the development of the economy, health and culture of a sustainable Wales and a sustainable world. The University is embedded in the city of Bangor and in the wider North Wales community as a provider of higher education, a hub for research of national and international importance, a leader in technology transfer activities, a catalyst for inward investment and a key component of social and economic development and regeneration.

Bangor University is structured into five Colleges of:

- Health and Behavioural Sciences,

- Natural Sciences,
- Physical and Applied Sciences,
- Arts, Education and Humanities,
- Business, Social Science and Law

and has a strong research base across a spectrum of academic disciplines.

Research is carried out either directly in the Schools, in Research Units, Centres and Institutes associated with one or more Schools or through the Aberystwyth-Bangor Partnership.

Our goal as a University is to become more research-intensive and to produce a productive, vibrant and sustainable research culture through reducing our reliance on government funding and growing our independence via a diversity of funding streams, building partnerships to enhance opportunities for research activities, and increasing inter-sectoral mobility for staff leading to enhanced employability for graduates and career progression for researchers.

Bangor is responding to the emergence of complex research issues reflecting global challenges that require new interdisciplinary approaches and skills through building European (and international) research collaborations through projects funded by the European Union.

LIFELONG LEARNING PROGRAMMES (*Erasmus, Grundtvig and Leonardo*), TEMPUS & ERASMUS MUNDUS

Funded by the European Commission and managed nationally by the British Council, the Lifelong Learning Programme aims to enhance the learning and training of individuals at all pedagogical stages through international mobility and cooperative projects. The European Commission has fostered educational cooperation through student exchanges since 1981, and the current LLP was preceded by Socrates until 1994 and Socrates II until 2007. The LLP will run until 2013 and will be replaced by a similar programme. For the period 2007-2013, the LLP has a budget of €6.9bn, 40% of which has been allocated to Erasmus. It is anticipated that the LLP (and its replacement) will be heavily relied upon in future years to achieve the 20% target that the EU's Leuven Communiqué (2009) sets as the number of graduates that should have had a period of international mobility.

Erasmus is an exchange programme which represents the principal component of the Lifelong Learning Programme (LLP). The programme funds and provides a framework for eligible students and staff, both academic and administrative, to study or work in the European Union and its accession countries. 90% of European HEIs engage in Erasmus activities and Bangor has participated in the programme since its early beginnings.

Grundtvig focuses on the non-vocational adult education sector whilst Leonardo is designed to fund opportunities for vocational learners and professionals.

Tempus is designed to help the process of social and economic reform and/or development through in the Western Balkans, Eastern Europe and Central Asia, North Africa and the Middle East by focussing on the development and

modernisation of higher education systems in these countries through cooperation with institutions from the EU Member States.

Erasmus Mundus is a cooperation and mobility programme funded and administered centrally by the European Commission as part of the European Union's Lisbon Strategy. The overall aim of the Lisbon Strategy was to position Europe as the world's leading knowledge-based economy with the highest quality of education. These aims are realised through Erasmus Mundus Masters/Doctoral courses which require multinational cooperation, scholarships and projects to promote mobility (both within Europe and beyond) and the attractiveness of the European Higher Education Area. Bangor has participated as an active partner in two Erasmus Mundus courses with interest in a number of schools for more.

The value of funding awarded to Bangor across the various Lifelong Learning programmes has been increasing since 2007 with Erasmus representing the largest stream. The majority of projects at Bangor in Leonardo and Grundtvig have been partnership projects (both learning partnerships and multi-lateral partnerships).

Table 1: LLP, Tempus and Erasmus Mundus Awards 2007-2009

	2007		2008		2009	
	Number	Value	Number	Value	Number	Value
Erasmus	n/a	£128,837	n/a	£201,559	n/a	£220,515
Leonardo	2	£37,768	0		0	
Grundtvig	1	£10,170	1	£37,855	1	£649
Tempus					1	£46,901
Erasmus Mundus					1	£171,216

We currently have 106 Erasmus exchange agreements with universities in 18 countries. The agreements are used to enable student mobility and to foster academic and research links between staff.

Table 2: Erasmus Mobilities (work and study placements)

	2007	2008	2009
Outward	65	83	85
Inward	88	107	121

Every college within the University participates in Erasmus with Arts & Humanities being the most active. Whilst this represents a small imbalance re subject areas involved, it is in line with the majority of UK HEIs.

Outgoing Bangor students participating in the programme develop broader transferable skills, benefit from greater international contacts and demonstrate increased employability. This positive differentiation also adds to Bangor's international reputation.

Incoming students help to diversify Bangor's student population and internationalise its curricula. Additionally, incoming Erasmus researchers in areas such as Biology, Chemistry and Psychology actively contribute to research.

The Erasmus programme also funds exchanges for academic staff to share expertise and enable other activities such as research collaboration or discussions on future cooperation. In 2009/2010, 18 staff mobilities took place.

Case Studies

- a) The '**Cross-Cooking and Learning**' Grundtvig Partnership grant led by Bangor University (Lifelong Learning) involved Partner organisations from Finland, Germany and Italy. The project preserved generations of food knowledge and cookery skills by bringing older learners (50+) from the partner countries together with younger learners to share their knowledge about traditional food preparation and cookery with the younger learners helping them to record their knowledge using modern technology.

The project brought social benefits to the local learners through the cross-generational engagement and through the exchange with learners in other countries and brought benefits to the institution through the transfer of knowledge and best practice. As a result of the project a cookbook in 4 languages, containing some of the cooking techniques and recipes has been published.

- b) Bangor University is involved in the 3 year Tempus funded project '**Development of the Model for Professional Recognition of Foreign Qualifications in Russia (PRIMO_RF)**' along with partners in Italy, the Netherlands and Russia coordinated by the Ural State Technical University. The project is working towards the recognition of foreign qualifications in Russia in order to attract professionals into Russia from overseas.

Primo_RF is providing an opportunity for staff at Bangor to cement established links with Russian institutions and build partnerships elsewhere and to act altruistically to foster structural changes in Russia and disseminate good practice.

- c) The Erasmus Mundus funded MSc course in '**Sustainable Tropical Forestry (SUTROFOR)**' is a two-year integrated programme aimed at qualifying graduates to deal with the challenges of contemporary tropical forestry. The project involves partners in Denmark, Germany, France and Italy with students spending each year of their studies in a different university and country leading to a *SUSTROFOR* double degree. The Erasmus Mundus funded '**Sustainable Forest and Nature Management (SUFONAMA)**' MSc has a similar structure and involves a group of partners from Denmark, Germany, Sweden and Italy.

In both Erasmus Mundus projects students benefit through the exchange provided by the programme and by having access to the best tropical forestry research-based teaching in Europe.

Barriers to Participation

1. Bangor University accepts more incoming Erasmus students than outgoing students. Many UK students do not view study or work mobility as the norm so the activity is viewed both educationally and culturally as secondary and exceptional.
2. For many UK students lack of foreign language ability limits both their motivation and choice of destination for study or work placements abroad under the Erasmus scheme.
3. Removal of the tuition fee waiver for full-year outgoing Erasmus students may reduce still further the interest from UK students in Erasmus study or work placements.
4. The funding schemes of the Erasmus Mundus and Tempus programmes have a poor fit with UK University financial systems and provide a low financial return against effort with limited funds to cover university overheads. This is a disincentive to institutional support for the schemes.
5. Erasmus Mundus Masters and PhD programmes require the establishment of double or joint degree programmes and a consistent level of tuition fee charging across the consortia. In some countries in Europe national legislation prohibits one or the other mode of degree and/or the charging of tuition fees limiting the opportunities for partnership building through these schemes.

FRAMEWORK PROGRAMME (FP7)

The Framework Programme is a major source of external research funding for Universities outside of national schemes and has been effectively used by Bangor University to strengthen its international research cooperation with other universities and between the university and external partners in industry and other agencies.

At Bangor the Framework Programme has funded knowledge creation activities and knowledge transfer into the region through the Cooperation programme, incoming and outgoing student and researcher mobility around Europe through the People programme and knowledge creation through the Ideas programme.

The level of funding Bangor has secured through the Framework Programme is, and has been, important to support its international research portfolio and demonstrate research excellence.

To date, in Framework 7, Bangor has been involved in 25 FP7 projects and is coordinating 6 of these:

- FishPopTrace - Fish Population Structure and Traceability (*FP7-KBBE-2007-1*)
- MAMBA - Marine Metagenomics for New Biotechnological Applications (*FP7-KBBE-2008-2B*)
- ELDEL - Enhancing Literacy Development in European Languages (*FP7 - PEOPLE-2007-1-1-ITN*)
- MARMEDIV - Marine meiofauna diversity explored using environmental DNA sequencing (*FP7-PEOPLE-2009-IIF*)
- MATE – Maternal Effects from Environment through to the molecular and individual level, and back to population Ecology (*FP7-PEOPLE-IEF-2008*)
- Neurosemantics: the human brain as a meaning processor (*ERC-2007-StG*)

The value to Bangor of FP7 projects to date is £6,615,858.

Table 3 – FP7 Awarded Values

Programme	No. of projects	Value of Awards £
Cooperation	19	4,693,751
Ideas	1	712,562
People	5	1,209,545
Totals	25	6,615,858

This compares favourably with competitor universities in the UK and the rest of Wales. Table 4 ranks Bangor University's performance in attracting EU research funds and other research funds from the financial year 2006/2007 to 2008/2009 against all UK HEIs and benchmarks performance against the 10 UK Universities immediately above and below Bangor in the Times Higher RAE 08 results table.

Table 4 – EU Government Awards since 2006/07

Institution	EU		Ranking		EU		Value of EU Awards 06/07 to 08/09	Value by Academic FTE
	2006 07	Total 06 07	EU 2007 08	Total 07 08	EU 2008 09	Total 08 09		
Strathclyde	26	29	27	29	24	29	9361	7.24
Cranfield	24	28	28	28	35	28	8530	13.78
Ulster	22	36	32	40	48	41	7675	5.50
Bangor	27	50	30	50	55	50	6849	10.31
Hull	41	58	42	58	63	61	4700	5.39
Brighton	47	79	61	79	54	77	4033	4.61
Hertfordshire	70	80	59	71	38	60	3899	3.15
Heriot-Watt	48	42	60	49	62	49	3774	6.18
Aston	61	67	62	64	58	63	3286	7.08
Stirling	82	64	83	67	80	66	1551	2.54
Keele	77	62	89	60	82	54	1535	2.41
<i>Total HEIs</i>		<i>170</i>		<i>166</i>		<i>165</i>		

Bangor has a strong research base across a spectrum of academic disciplines, from the arts through to the sciences, engaging in research at national and international levels with the Colleges of Health and Behavioural Studies, Natural Sciences and Physical and Applied Sciences holding the majority of awards from the European Union (8, 14 and 4 respectively).

The Welsh Assembly Government priority areas of digital economy, low carbon economy, health and biosciences and advanced engineering and manufacturing match existing strengths of the University of Bangor. These priority areas are therefore at the forefront of our thinking on research strategy for the University but it is too early for support given in these priority areas to have resulted in successful grant applications in FP7.

Facilitating involvement in FP7

Bangor has been actively supporting large proposals that have the potential to improve our performance in the Research Excellence Framework through an Academic Research Development Fund (ARDF) intended to target resources to support staff in the preparation of large research grant proposals (from any funder) and to increase the volume and success rate of large, multi-disciplinary grant applications with external collaborators led by Bangor staff. The fund can be used to buy out investigator time, for additional administrative support and for other activities crucial to proposal development such as consortia building meetings.

For proposals which can benefit from external project development funds such as the Welsh European Collaboration Fund, ARDF funds can be used to match-fund or top-up these external grants.

The School of Electronic Engineering at Bangor has received £30,000 for FP7 bid preparation from Academic Research Development Funds; Social Sciences £3,000; Creative Industries £10,000 and Chemistry £7,000.

As well as using ARDF to support proposal writing, Bangor staff have received funds from the Wales European Collaboration Fund managed by Enterprise Europe Network Wales from both the travel fund and the proposal preparation fund (£3,418 for travel and £23,734 for proposal preparation).

The University has also made use of the opportunity generated by Structural Funds to initiate and stimulate potential partnerships leading to participation in collaborative research such as within the Framework programme. The results will be long lasting as partnerships develop at their varying paces and have yet to peak as programmes of activity are ongoing.

Structural funds have enabled an increased in the volume and contexts of interactions with companies in Wales resulting in the transfer of knowledge and technology into the company base and exposing our research to the culture, needs and technologies of the marketplace – a mutually beneficial process. This increased and improved interaction has been further supported by improved infrastructure in the form of equipment and expertise frequently funded by Structural Funds.

As a result Bangor has been able to approach collaborative research with an enhanced network of potential company partners from within Wales, and with more confidence in its own capability to deliver. For example, the University are in discussion with Ecoparc Mon, an Anglesey company, in the development of a current Stage 1 proposal in the FP7 NMP Theme SICA programme. The project will explore a technology developed in Brazil identifying new sources of PHA using anaerobic digestion methods, a core technology area for Ecoparc Mon.

FP7 Case Studies

- a) In the **ALPHA** project (**Architectures for flexible Photonic home and access networks**) Dr Jianming Tang of the School of Electrical Engineering at Bangor University is involved in a consortia of 15 University and Industry partners from Denmark, Spain, Italy, Belgium, France, the Netherlands, Austria and Poland addressing the challenges of bringing high-speed networks into all types of home and office environments by dynamically utilising the resources of an optical network infrastructure to support a heterogeneous environment of wired and wireless technologies.

The ALPHA project will further consolidate Bangor's world leading position in optical telecommunication research and has the potential to result in exploitable IP through incorporating demonstration of a device newly invented at Bangor University which introduces widely adopted wireless techniques into the optical domain to address the challenges of building the next generation of high-speed home networks.

This new device and technique, which could cost the consumer no more than current broadband prices, will dramatically increase the speed at which information can be transmitted without replacing existing cabling and transform the way we use communications in our homes and make remote working far easier. *"The device and technique could have many other applications such as supporting older people in their homes, enabling applications such as tele-medicine to flourish,"* explains Dr Tang.

- b) Marketa Caravola of the School of Psychology at Bangor University is leading a Marie Curie Initial Training Network, **ELDEL (Enhancing literacy development in European languages)** funded through the People programme. With a consortia of 6 other partners from the Czech Republic, France, Slovakia and Spain, ELDEL provides a state of the art training environment for early-stage researchers interested in the scientific study of literacy development.

The multidisciplinary network includes partners with expertise in developmental, educational and clinical psychology, experimental psycholinguistics, speech and language therapy, and an industrial partner specialising in the creation of software for the assessment and training of literacy skills.

Highly trained and qualified researchers are a necessary condition to advance science. ELDEL brings early career researchers from across Europe and from Australia, South America and the USA to Bangor and to the partner countries so the researchers may benefit from the synergies available through the network and broaden their scientific and generic skills including those related to technology transfer and entrepreneurship.

The research programme comprises overlapping cross-linguistic studies designed to reveal the language-specific and language-general factors affecting literacy development. The aim is to produce a model elucidating the relationships among psychological and environmental factors determining the development of literacy skills in European languages and to uncover the key

components of an effective, culture-appropriate intervention program for the prevention and remediation of literacy problems in the languages under study.

- c) ***MAMBA (Marine Metagenomics for New Biotechnological Applications)*** is a collaborative project coordinated from Bangor University by Professor Peter Golyshin of the School of Biological Sciences which involves 10 University and Industry Partners from Spain, Canada, Italy, France and Germany. The Project aims to mine for and use new microbial activities, in particular for targeted production of fine chemicals, antioxidants and anti-cancer drugs.

This Project builds upon the previous efforts of European Framework Programs and National research initiatives for exploiting the catalytic activities of marine microorganisms and microbial communities to gain new knowledge on the mechanisms of survival of living organisms in extreme environments.

Professor Golyshin is employed at Bangor based in the Centre for Integrated Research in the Rural Environment (CIRRE) set up under the HEFCW funded Bangor/Aberystwyth Partnership with the intention of developing international links, strengthening the focus and effectiveness of the Bangor/Aberystwyth research base and consolidating research excellence through the recruitment of top researchers.

Benefits of engagement in the Framework Programme

To be a strong outward facing University Bangor needs to conduct research of global significance. Collaboration at an international level is necessary to enable scientists to deal with global challenges and to deal with those research questions best tackled with a greater geographical spread. Research has become increasingly interdisciplinary with more resources, both staff and facilities, needed to take projects forward. Access to research facilities which are unavailable at Bangor and cannot be purchased for a single research project or programme may be required.

The Framework Programme supports collaborative research and trans-national research activities on a scale that is greater than national programmes and provides the necessary mechanism for pooling facilities and perspectives. Academics at Bangor welcome the international exposure, recognition and reputational benefits that involvement in EU funded research brings. Pan-european research fosters the cross-fertilization of ideas and has made it possible for academics to access resources and expertise not necessarily available in Wales or the UK.

High-level European and international collaborations have made Bangor more attractive to the best researchers from around the world and the financial resources available through EU projects have made it possible for Bangor to strengthen our science base by recruiting high quality researchers and attracting top scientists from abroad to visit Bangor. The University has attracted a number of overseas researchers to come to Bangor through Marie Curie Individual Fellowship schemes in both FP6 and FP7 who benefit by acquiring new skills while the University benefits from the opportunity to employ researchers with the potential to be leaders in their field.

Those that have coordinated projects welcome the chance to select the best partners in Europe who will contribute to the delivery of high quality results. Scientists report that collaborative research brings more robust results and leads to better quality outputs, both publications and exploitable results. Whereas, academics who have less experience of seeking funding for their research from Europe look to schemes such as COST and Marie Curie ITNs to establish links, form networks through the exchange of staff, and create partnerships that will lead to further collaborative research.

In general academics who have a track record of winning EU grants to support their research report that they find the collaboration intellectually very rewarding.

Barriers to Participation

There are several common factors reported by academics and departmental heads as barriers to participation in the Framework Programme.

Historically participation in Framework activities has involved a high administrative burden. FP7 simplification bringing more flexibility, coherence and rationalisation to administration, financing and reporting has reduced this burden but academics and their administrators continue to report bureaucracy and administrative and financial complexity as a disincentive to involvement, in particular in relation to mobility and networking projects (Marie Curie, COST, NoEs). In relevant groups there is also concern about the difficulties that institutions in third countries face complying with the reporting requirements of FP7. Academics and their administrators would like to see more consideration given for the difficulties that such institutions and businesses face.

There are financial disincentives to involvement in the Framework Programme and while individual academics are largely unconcerned by the poor financial return in some programmes, Heads of Schools and Colleges and finance staff report concerns about exchange rate risk and non-recoverable VAT as issues that need careful consideration.

Most academics at Bangor report lack of time for proposal development and the ratio of effort required for proposal development to the chance of success as a disincentive. The majority of Call deadlines fall in the Autumn and early winter. For most academics this is their busiest time of year and almost all report this as a problem. For many the long time-scale from proposal writing through to project start is a disincentive particularly where the planned research is topical, although others see the necessity for long-term planning as a positive. Those with little experience of bidding for European grants are disincentivised by the different set of skills and knowledge required and the perception that there will be limited support available to them.

While many academics welcome the opportunity for international collaboration others are concerned about the reputational risk of partner, or partnership failure. In many disciplines collaboration is seen as a positive promoter of excellence but in Arts, Humanities and Social Science disciplines some academics are concerned that collaboration will result in a lack of intellectual purity.

Framework Projects in the Collaboration Programme normally require a minimum of 3 legal entities to be involved from a minimum of 3 Member or Associates States. There is an expectation that it will be an equal partnership both scientifically and financially so no single country benefits disproportionately more than another resulting in a disincentive to the inclusion of multiple partners from a single state.

Framework Project Consortia are self-selecting groups with partners frequently chosen from within informal international networks of institutions and individuals who have worked together before 'freezing-out' those that are not so well connected. While some academics at Bangor are already well-connected, those that are not report lack of time and the funds for building up such networks as a barrier to involvement. Almost all report lack of funds for consortium building as a problem.

Academics report that the interface with Commission officers who rarely remain in post for the duration of a project can be difficult resulting in inconsistent advice and direction. While this is not considered a barrier to participation it is felt that funded projects would benefit from more continuity in Commission officers.

Recommendations for the future and for FP8

The introduction of the European Research Council programmes in FP7 was a welcome development providing the opportunity for high-quality, internationally significant, ideas-led, bottom-up research. However, there continues to be too great an emphasis on the top-down definition of research priorities within the Cooperation programme. Academics report a random appearance of Activity Areas in consecutive WorkProgrammes. In future FP7 and in FP8 academics would like to see topics not specified so strictly and more continuity of topics between WorkProgrammes.

There is concern about the lack of transparency in how topics are chosen for inclusion in WorkProgrammes and how the topic descriptions are written. Academics would welcome more direct opportunity to influence the contents of WorkProgrammes.

Within Wales, the Wales European Collaboration Fund is an important resource and Bangor University is keen that this fund continues to be available in particular to support consortium building.

*Sheila Mathison, University European Officer
on behalf of Bangor University
November 2010*

Annex 1

FP7 Funded Projects

Programme	Project Title	Award Value £
Collaboration	WATERSAFE	173,572
	ALPHA	597,984
	Fish PopTrace	341,283
	SEARISE	217,172
	EUROIDENTITIES	151,404
	HIVE	275,074
	ABC	289,954
	FIRE	510,802
	SAF	242,511
	MAMBA	428,373
	BENWOOD	59,765
	ProMine	122,274
	REPROSEED	246,375
	THESEUS	140,975
	INCREASE	204,170
	SensorART	150,000
	UMBRELLA	106,222
BoostEff	212,661	
MAGICPAH	223,182	
	4,693,751	
Ideas	NEUROSEMANTICS	712,562
	712,562	
People	MARMEDIV – Marie Curie IIF	148,104
	FUNMOLES – Marie Curie ITN	150,319
	ELDEL – Marie Curie ITN	651,036
	Gastrotrich – Marie Curie IIF	130,549
	MATE- Marie Curie IEF	129,536
	1,209,545	
	Total FP7	6,615,858
Other non-FP	COST Action - Pulse Radiolysis of Rigid Aromatic Models	1,156
	EuropeAid - Farmer preferred technologies for food security in Eritrea	189,971
	191,126	