SCIENCE COMMUNICATION AND THE POTENTIAL OF SUSTAINABLE RESOURCES

Outputs from the EPOBIO project

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EPOBIO: Realising the Economic Potential of Sustainable Resources - Bioproducts from Non-food Crops

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EXECUTIVE SUMMARY

EPOBIO is an international project to realise the economic potential of plant-derived raw materials by designing new generations of bio-based products that will reach the market place 10-15 years from now.

The EPOBIO process has demonstrated the effectiveness of an integrative approach, combining the analysis of science and technological issues with assessment of environmental impact, economic case and social attitudes. The project's communication activities have supported this approach by applying current practice in science communication to provide news items to the media, disseminating project information to other audiences, analysing project-related and issue-specific media coverage and making recommendations to further develop good practice. The outputs of the communications workpackage are:

- international media coverage on the potential of non-food crops as renewable resources;
- the creation of an information resource for the media and other non-specialist audiences providing background information on biorenewables;
- increased awareness of the project reports as resources to inform discussion, policy decisions and public engagement in the field of bio-based renewable resources;
- a contribution to science communication guidelines based upon communication activities;
- an analysis of the UK print media to survey the coverage of biorenewable issues; and,
- recommendations to inform the development of future strategies to communicate the potential of the emerging bio-based economy.

The EPOBIO communication strategy engaged a range of audiences, expert and non-specialist, in order to disseminate project outcomes and raise awareness of the potential of non-food crops and bioproducts in delivering environmental, economic

and other societal benefits. EPOBIO communication materials such as press releases and fact sheets focused on the benefits offered by plant-derived resources compared to non-renewable fossil fuel resources.

To inform the communication activities, the existing evidence-base in science communication and industry-based practice was explored and the UK media coverage of non-food crops and bioproducts was sampled. The use of guidelines for media and communication activities was shown to be an effective mechanism to ensure quality of service and disseminate good practice. Hence, the guidelines used to inform the EPOBIO communication strategy are included in the report (Section 2) for consideration by others in addition to the EPOBIO communication recommendations for the emerging bioeconomy (Section 6). The media analysis indicated that media coverage of non-food crop issues is generally assigned to specialist sections of the media such as business and finance rather than forming part of the mainstream news. Low impact and poor competition with other science stories are some of the challenges to be overcome in promoting biorenewable issues to the media. Media impact can be maximised by selecting relevant key messages for target audiences, good media communications and use of networks.

Communication material was disseminated via the media and other networks. The usefulness of project partner networks and press offices was demonstrated by the print, online and broadcast media coverage received by the project.

The report's recommendations address communication mechanisms using the media and networks and specific issues relating to the bioeconomy such as:

- the importance of demonstrating relevance, considering how issues are presented and the use of language when identifying key messages and developing content for different audiences;
- the effectiveness of centrally co-ordinating communication activities which are undertaken at a national level. This provides access to media networks, and ensures appropriateness of style and content.

- the need for more information on specific non-food crop applications and the positive and negative impacts of the bioeconomy, such as job creation and establishment of rural-based industry.

These recommendations take into account the results of the EPOBIO survey of social attitudes which is published as a separate report.

In conclusion, this workpackage demonstrates that in order to realise the potential of renewable resources and establish bio-based products in future society, there is a need for effective communication at local, national and international level.

1 INTRODUCTION

A social dilemma exists, society has become accustomed to a continuously accelerating pace of development while at the same time becoming increasing aware of the impact our actions have on the environment. There is a growing realisation that our current state of existence is unsustainable and that we are placing an increasing burden on the earth's resources. In the context of concerns about fossil oil supplies and commitments to reduce environmental impacts, the potential of a bio-based society and bioeconomy is increasingly being recognised as a solution to these major concerns. The bioeconomy can be defined as an economy where the feedstocks and raw materials for industry and energy are derived from plants as a renewable resource. The use of renewable resources presents not only challenges for industry, agriculture and government but affects other areas of society in public acceptance of the technologies involved, increased awareness of the use of agriculture for non-food purposes and demonstrations of the benefits of bio-based renewables over conventional products.

The founding objectives of EPOBIO were to undertake a comprehensive analysis of the use of non-food crops in three flagship areas: plant cell walls, plant oils and biopolymers. These areas offer improved biorefinery processing, bioproducts with maximum benefits to society and the development of industrial crop platforms to meet the requirements of bio-based industry. These combined applications create a strong foundation for the creation of a bio-based economy. In addition to the scientific and technical analysis of individual applications, environmental impact, agronomy, economic issues and social expectations and communication have been integrated to form a process involving consultation and input from experts in each of the theme topics, identification of priority areas, evaluation of these areas and dissemination of the results. The EPOBIO process establishes the evidence-base required for successful development of biorenewables and the supporting regulatory frameworks. The process also informs decision-making by policy makers and funding agencies to underpin the future development of sustainable products of high utility to benefit society. By performing an integrated analysis it is hoped that the

obstacles preventing the use of non-food crops and development of bioproducts will be identified and overcome, resulting in applications of acceptance to the whole supply chain.

The communication activities formed one of the project's support themes in combination with EPOBIO's analysis of social attitudes and expectations. The objective of the communication activities was to raise awareness of the potential of non-food crops by presenting the findings of the Flagship analyses and highlighting their potential benefits and impact on society. The communication activities of the project were guided by an evidence-based approach, building on existing good practice guidelines for science communication, with a focus on using the media as a mechanism for science communication. Raising the profile of bio-based renewable resources during 2006 and 2007 was timely as climate change, alternative energy and society's impact on the environment were issues of current policy and media debate.

Strategic targets for a reduction in carbon dioxide emissions and increased use of biofuels and renewable energies are gradually integrating elements of the bioeconomy into everyday industry and society. In addition to these policy-driven activities, society needs to be engaged with the issues, benefits and impacts of biorenewables in order to secure their support and awareness of bio-based industries, associated technologies and the resulting bioproducts. In a recent public consultation by the EC on heating and cooling from renewable resources, a lack of public awareness was identified as a social obstacle to the development of renewable energy sources in the heating and cooling sector [1]. The results from the EPOBIO social attitudes survey undertaken by the project's social attitudes and expectations workpackage present a valuable opportunity to benchmark current awareness and opinion of biorenewables, attitudes towards the technologies involved and acceptance of resulting bioproducts.

This report covers a review of the project's communication activities set in the context of current (science) communication practices by academia and industry and

also considers issues related specifically to the development of a bio-based economy. The report concludes with recommendations to guide future science to society communication of the issues associated with developing a sustainable bio-based society, in parallel to these issues being addressed at policy level.

2 EVIDENCE-BASED GUIDELINES TO INFORM THE DESIGN OF A COMMUNICATION STRATEGY

A strategy for EPOBIO communications was designed based upon information and practices derived from:

1. existing published material;
2. consultations with science communication experts and press officers; and
3. analysis of UK media science coverage.

A detailed review of existing publications and guidelines was undertaken (see Appendix 1). At the same time, expert opinion on science communication through the media was obtained from interviews with representatives at the UK's Science Media Centre, Science Museum and the European news resource AlphaGalileo. The consultations covered individual experiences of communicating science to the media, useful resources and networks and personal recommendations for maximising impact. To ensure appropriate media reception of EPOBIO communications material, an analysis of the UK media's portrayal of non-food crops and biorenewable issues was also undertaken (Section 4). The results informed good practice on how to ensure relevance to current media and public issues and helped develop an awareness of the coverage received on similar issues.

Information obtained from the three routes was useful in identifying current thinking on the issues surrounding the communication of science to the media and in developing an awareness of the practicalities of engaging the media and other audiences.

2.1 EPOBIO Communication Strategy Guidelines

Defining the media strategy:

- establish clearly defined objectives [2-4]
- agree key messages [5]

- identify target audiences and the most effective way to reach them via the media [3, 6]
- identify appropriate representatives and spokespeople for interviews and agree coordination amongst project partners and those acting as sources of information [4-6]

Use of networks:

- direct material to target audiences via established mailing and contact lists of related networks [3, 5]
- utilise the communications resources of the project partners, including media contacts [5]
- use European Commission and other external resources [5]

Establishing media networks:

- become familiar with target media [3-5, 7]
- compile and maintain a media contact list and develop key contacts [4-6]
- utilise press facilities at events as an opportunity to develop new contacts [5]

Communication tools and content

- utilise a range of communication tools, matching communication format with audience and objective [6]
- provide material in easily useable, accessible and understandable formats [6-7]
- identify key messages and focus on benefits and achievements [5-6]
- in communicating key messages, for example in press releases, have a defined line of reasoning (key issue, supporting arguments and information) [3]
- emphasise social and personal relevance of the research findings [3, 12]
- communicate risk in a factual and comparative manner [7, 9]
- include photographs wherever possible [3-4]

- maintain a wide view, taking advantage of and being flexible about the choice of topics and related activities which may be used to achieve the communication's objectives [12]

Effective media and public communications:

- develop a 'brand' associated with high-quality information [6]
- provide information in a reliable, rapid, accurate and media-friendly manner [8] and respond rapidly to requests for information [5]
- establish in what context information is sought by the journalist [7, 9]
- provide a contact for the press in the case of further enquiries / last minute checks [7, 9]
- provide relevant background material [7, 9]
- facilitate use of material by the media by making relevant documents, good quality images (graphics, pictures and photographs) [5] and contact details available from a website [10], press section [6] and provide a press pack [5]
- have an update strategy for press and public areas of website [5]

Maximising exposure:

- use websites involved in the reporting of science and media communications [5]
- tailor information to the intended outlets [5] and plan media approaches with consideration of the message to be conveyed [4]
- be proactive, respond to opportunities offered by the coverage of similar stories in the media [2, 4, 5, 11, 12]
- become familiar with current areas of science discussion in the media and link news items with these where possible - activities related to national and EU news and debates [6, 10]
- maintain a regular output of information rather than sporadic announcements [5, 12]
- simultaneous issue of press releases in partner countries, with local contacts for follow-up by journalists [5]

- work with an awareness of the media process, be aware of print and broadcast deadlines [5, 7]
- plan the circulation of press releases in advance, directly to journalists where possible [5]

Evaluation of impact:

- monitor the coverage received and maintain a record [5]
- monitor use of websites [5]

3 EPOBIO COMMUNICATIONS

3.1 Objectives and aims

The main objective of the communications workpackage was to disseminate the results of the EPOBIO project to target audiences, in particular the print media.

The specific aims of the support theme were to:

- communicate the results of the EPOBIO project to agriculture, industry and policy makers through the development of targeted literature;
- increase the public's awareness of the potential of biorenewables and the use of non-food crops;
- promote the EPOBIO reports as resources to inform discussion on the contribution of bio-based renewable resources to sustainable development at a range of levels including future policy decisions, research, development of media content and science engagement activities;
- establish media and other networks as routes for communication and dissemination; and,
- make recommendations to the development of good practice for science communication through the media.

This chapter describes the key elements of EPOBIO communications in detail:

- target audiences;
- content and key messages;
- communication tools and activities; and
- evaluation methods and results.

3.2 Audiences

Audiences targeted for communication with the EPOBIO process were divided into 5 categories:

- media; including the European media, mainstream press, broadcast media, specialist press, news agencies and press officers;
- research organisations, including academics, industry and industrial organisations;
- science stakeholders, including research funders, government ministries, agencies and councils and other biotechnology / bioenergy / environmental organisations;
- policy makers in the UK and European Parliament; and,
- science centres and museums.

The development of networks involved a combination of identifying and approaching individuals, liaising with points of contact to utilise existing networks (press office media lists, industry partners and advisors) and identifying relevant organisations and individuals from other published sources. Contact databases for the networks were expanded as relevant organisations were identified.

3.2.1 Media

International media coverage of EPOBIO was achieved by targeting activities on three different areas; UK, Europe and world-wide. To enable effective communication through the media, a database of relevant media contacts was developed. This was essential to ensure full coverage and targeting of news items, including to the specialist media.

One of the main aims of the workpackage was the use of the media to convey messages to a wide, general audience. Fact sheets and news releases for the general media presented the project in non-technical language with a focus on

general issues of relevance to a non-specialist audience. In addition, technical news releases were prepared for the specialist press.

UK media coverage was enabled by existing knowledge of the UK media and journalists; in particular:

- utilising existing UK media contacts and cultivating relationships with journalists;
- support of the University of York Communications Office; and,
- direct promotion of news items to networks.

European coverage was achieved through liaison with partner press offices and use of partner and other relevant networks.

- Country-specific press releases were used to emphasis the involvement of the local partner. These were provided to the press office in the local language and English.
- Press releases were also frequently listed on the partner's homepage and were available from the EPOBIO website.

World-wide coverage was achieved through online news services and from the gathered momentum of European coverage.

- Press releases were disseminated by the AlphaGalileo and Cordis news services which both have a focus on European research news, and EurekAlert, which covers both European and American scientific research news.

3.2.2 Research organisations and science stakeholders

The main objective of communication activities targeting these audiences was to increase awareness of EPOBIO publications and events. These activities served to invite participation and obtain expert input into defining the EPOBIO Flagship projects and also ensured that the project outputs were communicated back to the research community and those involved in influencing the research agenda,

including EPOBIO networks of research funders, research organisations, government agencies and industry.

Project news was disseminated to those involved in the project and registered subscribers via the project website, newsletter and electronic mailshots. A wider audience was reached via distributing leaflets at conferences and meetings, listing workshop details in the event calendars of webpages and newsletters of relevant networks, organisations and research news services and through media coverage of project reports.

3.2.3 Policy makers

Communication with the European Commission was greatly facilitated by the assistance and advice of the EC's project officer who was able to direct information to the most appropriate outlets. Information was submitted to Cordis, EU-AgriNet and SCAR (Standing Committee on Agricultural Research portal) as appropriate to ensure wide dissemination of project news through Commission-related networks.

Regional UK members (Yorkshire and Humber) of the European Parliament were approached to discuss sponsorship of a Parliamentary-based presentation of the project (UK and European) in an attempt to discuss the policy implications of the project and to raise awareness of the project resources. These approaches were unsuccessful, possibly due to the sheer volume of correspondence received by the MEPs. A similar problem was encountered when inviting UK MPs and MEPs to attend EPOBIO workshops. Other avenues for communication were explored, such as liaising with an environmental policy group who work to promote discussion of environmental issues in UK government (SERA - Socialist Environment and Resources Association) who regularly held parliamentary briefings on for civil servants, MPs, ministers and policy advisers and in researching existing opportunities to engage policy makers with environmental issues at a European level. To aide communication with policy makers, a short briefing paper was

prepared to highlight the project's relevance to current strategic targets and policy discussions on the bio-based economy.

3.2.4 Science centres and museums

The EPOBIO reports were promoted as a source of expert knowledge for developers of science communication material discussing renewable resources and the creation of a sustainable society. This audience included The Eden Project (UK), Royal Botanic Gardens Kew (UK), Science Museum (UK), Centre for Life (UK) and the wider European science communication community through the Ecsite (European Collaborative for Science, Industry and Technology Exhibitions) network of science centres and museums, Xplora (European gateway for science education), ESCIN (European Science Communication & Information Network) and Euroscience (European Association for the Promotion of Science and Technology) networks.

3.3 Content and key messages

Flagship reports, current scientific literature and input from the other EPOBIO desk researchers were used to create a context for the communication content and concepts. The complex scientific and technical information presented in the EPOBIO reports was distilled to emphasise issues of individual, social and strategic relevance for the target audiences. Communication materials were largely targeted towards a non-scientific audience and so focused on issues of relevance to society, such as energy prices, the oil-dependent aspects of daily life and the environmental impact of mineral oil. All EPOBIO news releases had a set of key messages:

Examples of key messages from reports 1-3 (published November 2006)

1. EPOBIO is an international project, funded by the European Commission, to identify the ways in which plants can provide the most useful benefits to society in 10-15 years time.

2. Alternative sources of energy, fuel and chemicals are required to replace the use of fossil fuels, which are a limited, and increasingly expensive, resource.
3. Plants offer a sustainable way to make many useful products. They are 'green factories' using energy from sunlight. They can also help us achieve environmental goals such as reducing carbon dioxide emissions.
4. The EPOBIO project has three focus areas:
    - Biopolymers - the use of products made by plants, for example, starch, cellulose and rubber.
    - Plant cell walls -their use as an abundance resource to produce energy, biofuels and useful chemicals.
    - Plant oils - their use as lubricants to replace the use of petroleum-derived oils.

Although the scope and distribution of communication materials was diverse, it was important to establish central key messages so that all media contact communicated a shared theme. Therefore, prior to the release of news items, an internal document was circulated to agree key points, communication objectives and identify local contacts and project spokespeople.

In addition, the effectiveness of the integrative 'EPOBIO process' and the potential of the reports as a resource for others also formed the key focus of some communication activities, for example to policy makers and science communication organisations.

3.4 Communication tools and activities

3.4.1 Media section of EPOBIO website

A dedicated media section of the EPOBIO website was developed to direct the media to press releases and a series of fact sheets on the project, flagship areas and report topics. The media section also included contact details for members of the consortium and an image gallery containing a range of attractive, high-resolution

images suitable for use by the print and online media. The media section was accessibly directly from the main webpage and was also promoted in the EPOBIO newsletter, issue 4, March 2007.

A series of fact sheets were developed to be complementary to the scientific analysis and issues presented by the Flagship reports and provide the background to EPOBIO, the Flagships and Flagship topics to a non-specialist audience (Table 1). The fact sheets were available to view online or download from the website.

Table 1 Fact sheet series.

Factsheet title:	**Objective:**
1. EPOBIO	background information
2. EPOBIO quick facts	briefing document
3. EPOBIO management and consortium	presentation of key figures
4. Biopolymers	background to Flagship theme
5. Plant oils	background to Flagship theme
6. Plant cell walls	background to Flagship theme
7. Alternative sources of natural rubber	background to the first Flagship project
8. Plant oils as lubricants	background to the first Flagship project
9. Improving cell wall degradation	background to the first Flagship project
10. Ten ways plants may change your life	summary of the potential impact of plant-based resources
11. Ten ways in which plants may help future Christmases be green	summary of the potential impact of plant-based resources on the environmental impact of Christmas

3.4.2 Press releases

Press releases were issued to promote the publication of EPOBIO reports. These were designed to communicate the key findings of the reports to a non-specialist audience via the mainstream media and to direct interested parties to the EPOBIO

website for further information. The strategy for the first series of reports centred on communicating key messages, opportunities and issues.

Press releases in 6 languages (Dutch, English, French, German, Greek and Swedish) were issued across Europe using EPOBIO partner press offices and the news services AlphaGalileo (distribution to over 3000 journalists), EurekAlert (over 5000 journalists and 4,300 information officers registered for access) and EC research news information service, Cordis.

3.4.3 Other communication tools and activities

EPOBIO leaflets were developed to provide a wide-ranging audience with an introduction to the project. The leaflet was distributed at a range of stakeholder meetings and conferences, such as ManagEnergy's annual conference 2007, held during the EU's Sustainable Energy Week, and was also included in EPOBIO mailings.

The EPOBIO project had a range of wider dissemination material such as newsletters and posters. The project's newsletter was circulated to approximately 6000 subscribers. Project posters on the individual Flagship and Support Themes were displayed at both EPOBIO workshops held in May 2006 and 2007.

The Communications workpackage also participated in discussions on science communication and engaging the public with industrial biotechnology. These took the form of a closed meeting held at the first EPOBIO workshop in May 2006 with the workpackage advisors and media representatives and also participation in the Third Focus Workshop of the Sustainable Chemistry Technology Platform (Identifying Future Issues in Industrial Biotechnology, June 2006).

In addition, individual desk researchers and project partners undertook further communication activities when relevant to their attendance at meetings and international conferences.

3.5 Evaluation and measuring impact

Evaluation of the project's communication activities was primarily achieved by:

- monitoring the use of media-targeted material made available through the media section of the EPOBIO website; and,
- monitoring and recording media coverage received using Google Alerts and the media monitoring services of partner press offices.

3.5.1 Use of the media section of the EPOBIO website

Use of the online media resource was monitored throughout the duration of the workpackage. EPOBIO website statistics show the visits and use of material available from the media section of the website from November 2006 onwards (see Table A2, Appendix 2). From an analysis of the media coverage received in response to the announcement of the first series of EPOBIO reports, 36% of printed and online coverage was illustrated by a photograph. Of the illustrated coverage, 66% used a photograph sourced from the EPOBIO image gallery. Pageviews and download statistics also demonstrate the effectiveness of this resource due to the high correlation between page visits and image downloads.

3.5.2 Media coverage received in response to communication activities

Qualitative evaluation of the media coverage received was performed by tracking target publications for coverage, monitoring the use of press releases and assessing the coverage of key messages. This was affected by the media monitoring practices used by different press offices and also the range of languages coverage was received in. Quantitative media evaluation such as keyword tracking and word count was applied to printed and web media where possible. Other quantitative evaluation methods such as advertising cost equivalents were difficult to apply due to the majority of coverage being web-based. There are currently no established methods for evaluating the impact of online media coverage although accessing news online is becoming more popular. Due to the placing of news items in prominent 'headline'

sections and on homepages it can be assumed that the audiences reached were not insubstantial. Additionally, news items were well represented by dedicated science and research news websites which suggests that the release of EPOBIO reports was well communicated to the scientific communities in both academia and industry, raising the project profile accordingly.

The release of the first EPOBIO reports in November 2006 received a minimum of 82 pieces of coverage: 24 printed articles - 2 national and 18 regional newspapers, 4 specialist publications, 1 national radio broadcast and 57 articles online (see Appendix 2, Table A3 for details). In an analysis of the printed or online coverage, 67% of the coverage received was a dedicated news piece focusing on the EPOBIO project and reports.

Coverage was mainly from online news sites (general and science, technology or research focused). Monitoring of international coverage (restricted to print media only) was mostly by direct contact with press offices and access to the results from their individual monitoring services. Web-based coverage was monitored using internet searches and news alert services with a combination of relevant keywords.

The content of the media coverage was evaluated against the key messages relevant to the individual press release. In the majority of cases, the media coverage resulting from the release of the first EPOBIO reports was successful in presenting EPOBIO as an international project, identifying the local lead partner, explaining the potential of plants to replace fossil fuels and introducing the three Flagship areas and their corresponding reports. The results of quantitative media evaluation of printed and web media using keywords are shown below:

- 100% of news items contained reference to EPOBIO
- 90% of news items mentioned the release of the EPOBIO reports
- 79% of news items identified the local project partner
- 46% of news items identified the EC as the project funder

The project was commonly identified as European and involving an international consortium. Due to the reductionist process of media editing of press releases, it is not uncommon for less essential information to be excluded which explains the reduced number of articles identifying the EC as the funding source. In instances where media coverage was received by countries not represented in the EPOBIO Consortium (such as Italy, Chile and America), the lead partner (CNAP, University of York) was identified and quoted in the news item which explains the slightly reduced percentage of coverage identifying the local project partner.

4 UK MEDIA COVERGE OF NON-FOOD CROPS

4.1 Media analysis objectives

A media analysis was performed to assess how non-food crops and biorenewable issues were portrayed in the media. A UK-focused analysis was undertaken as a small-scale but comprehensive assessment of the media rather than a less effective but wider analysis of the European media. This approach was also strengthened by familiarity with the national media and ease of assessment of media coverage, without the need for translation.

The objectives of the media analysis were to:

- analyse the coverage of renewable resources and products in the UK media; and,
- explore how the media portrays renewable resources and how the information and issues related with this area are communicated.

4.2 Methodology and tools used

Sources

Six UK newspapers were included in the media analysis; The Financial Times, The Guardian, The Independent, The Daily Telegraph, The Times and The Daily Mail. These newspapers were selected due to complementarities between the publications' audiences and a number of our identified target audiences; the educated public, science professionals and decision makers from government and funding agencies. The circulation and readership figures for the 6 selected newspapers are shown overleaf (Table 2). Table A4 in Appendix 3 shows the circulation and readership figures for the main UK press.

Table 2 Circulation and readership figures.

Newspaper	circulation	readership
Daily Mail	2,157,567	5,456,000
Daily Telegraph	847,959	2,081,000
Financial Times	134,337	348,000
Guardian	330,496	1,175,000
Independent	200,957	731,000
Times	612,998	1,853,000

Circulation figures were taken from the Audit Bureau of Circulations (ABC) [13] Standard Certificate of Circulation for the period of 29th May - 2nd July 2006, and represent number of copies distributed on an average day. Readership figures were taken from the National Readership Survey (NRS) [14] for the period of April 2005 - March 2006 and represent the number of people reading a title on an average day in this period.

Search parameters

The occurrence of keywords was used to analyse content in order to effectively identify news items relating to renewable resources and products. The keywords used were: biofuel, biorefineries, non-food crops, industrial crops, vegetable oils, biomass, bioenergy, bioproducts, renewable and bio-based. The searches were restricted to articles published in June 2006.

Search tools

Two search approaches were used to ensure a thorough study of the media coverage. A first search of each of the newspapers was performed with Google News (http://news.google.co.uk/). This search engine scans online news sources using keywords. The search can be further defined by specifying country, dates and source. In the case of the media analysis, individual sources corresponding to the online website of each of the selected newspapers were searched for articles containing any of the keywords and published between 1st June and 30th June 2006.

Secondly, the individual search facilities of the online websites of each of the newspapers were used to search for news items containing any of the keywords. Using the advanced search options, it was usually possible to restrict the search to the specified time period.

4.3 Analysis of search results

Regardless of the search approach used, the results were subsequently analysed in the same way. Where access to an article was permitted (no subscription required), the article was first read to assess relevance and then scored as related or unrelated in the context of renewable resources. Relevant articles were further analysed by recording the word count, section where published and noting the presence of any other keywords. This also allowed for cross-referencing between search results and provides a method for evaluating the relevance of the articles to the general topic of biorenewables, based upon the frequency and co-occurrence of keywords in the text. The Independent and The Financial Times' website, ft.com, required a subscription to view full articles. Therefore, these articles were assessed for relevance using the headline and summary text only. Recording the section in which the new article appeared was used as a framing method to gauge the focus of the media coverage and indicate how non-food crop issues were categorised.

4.4 Results

The combined used of both search approaches, newspapers and keywords returned a total number of 391 search hits. Further analysis of the search results to rate the news items as relevant or unrelated, reduced the total search results to 171 relevant keyword hits. Discounting duplications between the two search approaches, this amounted to a total of 96 individual news items (including 6 duplications between The Financial Times and ft.com website).

Table 3 shows the search results categorised into newspaper and keyword used.

Table 3 Search results, limiting dates (1st June - 30th June 2006), keywords and source.

	newspaper	biofuel	non-food crops	vegetable oils	biomass	renewable	bio-based
	Times	8 (/10)	0	0 (/1)	1 (/3)	11 (/32)	0
	Telegraph	9 (/14)	0	0 (/1)	6 (/10)	19 (/56)	0
	Independent	7 (/7)	0	1 (/2)	5 (/6)	20 (/25)	0
	Guardian	10 (/16)	0	0	4 (/7)	22 (/63)	0
	Financial Times	23 (/30)	2 (/2)	0 (/1)	3 (/4)	20 (/53)	0 (/1)
	Daily Mail	0	0	0	0	0 (/47)	0
search results	total: 391	77	2	5	30	276	1
relevant	total: 171	57	2	1	19	92	0

The table shows both the number of relevant news items and total search results returned, shown in the format: relevant (/ total number of results). The keywords ‘biorefineries’, ‘industrial crops’, ‘bioenergy’ and ‘bioproducts’ were unsuccessful at returning results and so were excluded from the table.

According to The Daily Mail's website search facility, the newspaper did not appear to publish any relevant news items during the period included in the media analysis and so the newspaper was not included in further comparisons and analyses.

4.4.1 Keyword searches

From the selection of ten keywords used, three were most effective at returning results. These were 'renewable' (featured in 70% of news items identified), 'biofuel' (33% news items), and 'biomass' (14%). The keyword 'renewable' was largely used alone but also occurred with the 'biofuel', 'biomass', and 'non-food crops' keywords. The use of the keywords, individually and in combination with other keywords is shown in Figure 1.

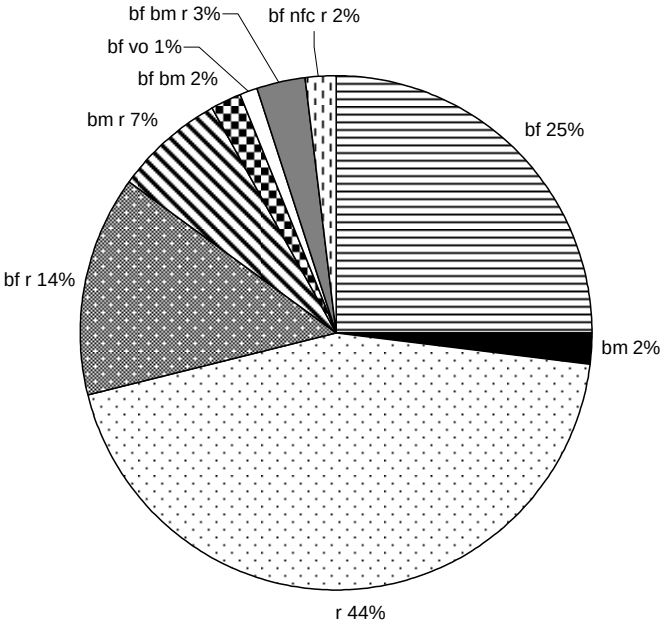

Figure 1 Chart showing the keywords found in the text of the 96 articles returned from the media analysis. Abbreviations: **bf** - biofuel, **bm** - biomass, **r** - renewable, **vo** - vegetable oil, **nfc** - non-food crops

The keywords ‘vegetable oil’ and ‘non-food crops’ did identify a small number of articles (3%) also identified using the ‘biofuel’ keyword. Therefore, although the use of these keywords did not significantly contribute to the number of news items found, they did assist in evaluating the context of other articles identified. The keywords ‘biorefineries’, ‘industrial crops’, ‘bioenergy’, ‘bioproducts’ and ‘bio-based’ did not return any results when used to search Google News or the online versions of the selected newspapers.

4.4.2 News items

Figure 2 shows the number of news items published (online and in print) in each of the newspapers, divided into the main categories of news represented by the search results (Business, Finance, News, Politics, Comment and Columnists, Letters, miscellaneous (home, property, motoring etc) and no category).

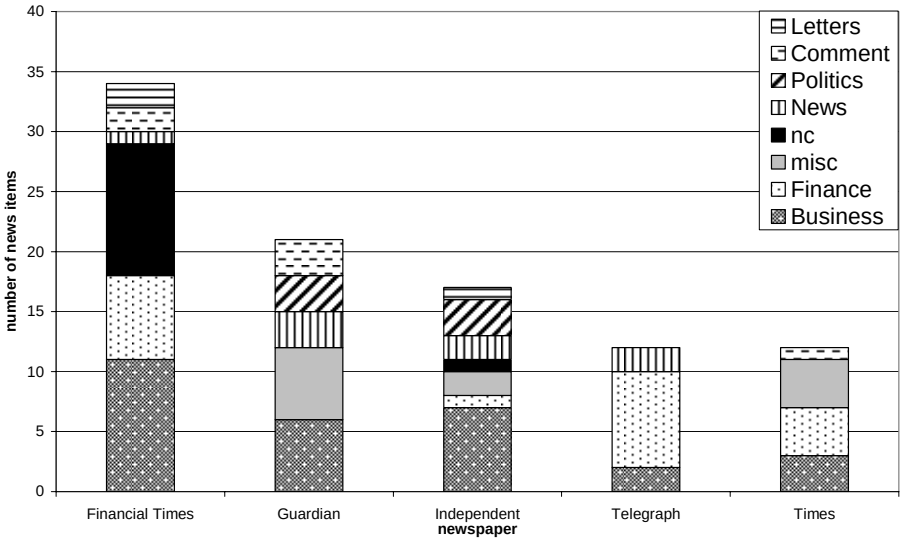

Figure 2 Number of news items published in each newspaper and categorised into news sections. nc - no category, misc - miscellaneous

Figure 3 shows total number of articles classified into each category. This provides an indication of what type of biorenewables information is currently covered by the media, and therefore what people's awareness and perceptions of this area might be, based upon the information presented to them.

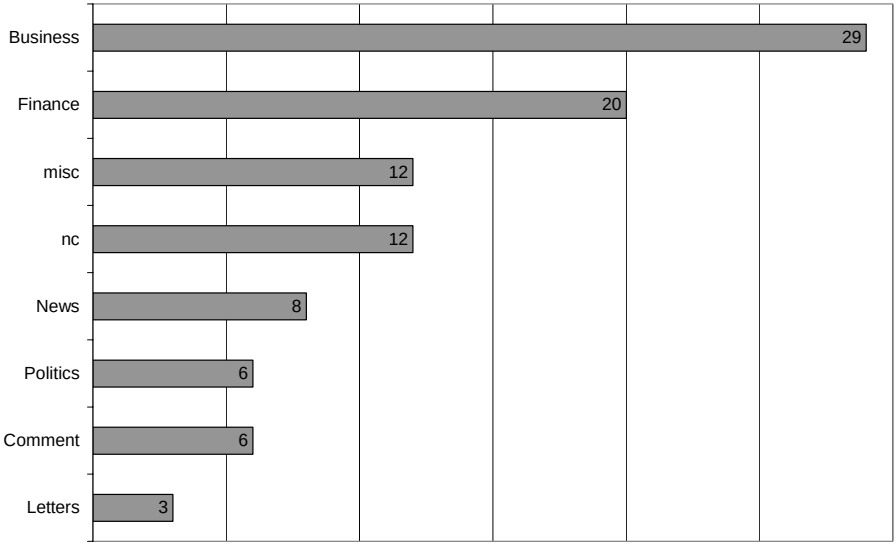

Figure 3 Analysis of the types of news items associated with biorenewable topics. nc - no category, misc - miscellaneous

During June 2006 (the survey period), The Financial Times published more news items than the other five newspapers included in the analysis. As may be expected, a large proportion (18 out of 34) of the news items were categorised as business or financial news, representing market reports or news about individual companies. From the relevant news items identified in the remaining newspapers, business and financial news was also repeatedly well represented (29 and 20 items out of 96 respectively, see Figure 3).

The Guardian and The Independent were the only newspapers to cover discussions on biorenewable issues in the politics news (3 items each). The News, Comment

and Letters sections were represented by only a small number of articles. The lack of news and feature articles on issues related to biorenewables suggests that these issues are not well represented in the key news sections.

The Financial Times contained the largest proportion of news items which were not categorised into any of the news sections (nc). This was mainly associated with news articles published on The Financial Times' website, ft.com. News items grouped into the miscellaneous category were largely from specialist sections of the newspapers, such as motoring, property, society and education.

The occurrence of relevant news items over the time period of the media analysis was investigated (Figure 4). The number of news items identified by the presence of keywords increased towards the end of the month. In some instances, peaks in the number of items could be linked to particular events discussed in the news. On 20th June, Associated British Foods announced a deal with BP and DuPont to produce biobutanol which stimulated news items about biofuels and generated some financial and business news about how this announcement affected share prices (ABF press release 20/06/06 and BP press release 20/06/06) [15-16]. Earlier in the month, the announcement by BP that the company planned to invest $500 million in a biofuel research centre was covered in The Guardian and The Daily Telegraph on 14th and 15th June (BP press release 14/06/06) [17]. Toward the end of the month, the energy regulator Ofgem announced that the development of the Britain's energy networks and adaptation to integrate the use of renewable energy would require over £4 billion over the next 5 years (Ofgem press release 26/06/06) [18]. Another topic widely discussed in the news throughout June was the Government's decision to support nuclear power for future energy generation, involving discussion about alternatives sources of energy, including energy derived from renewable sources.

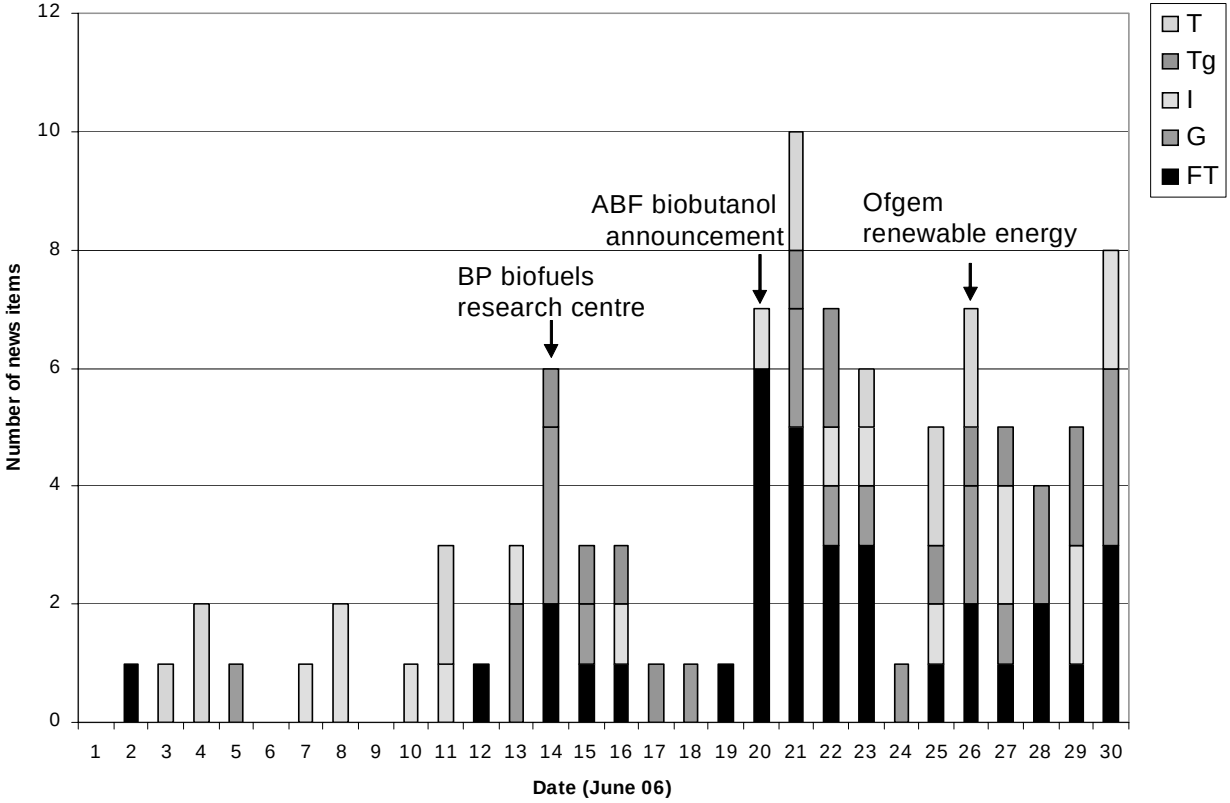

Figure 4 News items containing keywords published 1st - 30th June 2006.

T - The Times, **Tg** - The Daily Telegraph, **I** - The Independent, **G** - The Guardian, **FT** - The Financial Times

4.5 Conclusions and recommendations

The selected keywords varied in their effectiveness at identifying news items. The more specialist keywords ‘biorefineries’, ‘industrial crops’, ‘bioenergy’, ‘bioproducts’ and ‘bio-based’ did not return any results. This could be explained by the specialised nature of these words which makes it unlikely that they would be widely used in the mainstream media. However, their lack of use also indicates, and contributes to, a lack of awareness of these terms and concepts. The keywords ‘renewable’ and ‘biofuel’ were most widely featured in the news items found, relating to the debate about nuclear energy and discussions about future fuels, both of which formed major ongoing news subjects in June 2006. Words associated with biofuels, such as ‘green / future / alternative fuels’, ‘bioethanol’ and ‘biodiesel’, were also commonly featured in articles which may not have included the keyword ‘biofuel’ despite being relevant to the subject. Therefore, to maximise media impact, consideration should be given to how ‘media-friendly’ the content is with minimal use of unfamiliar or technical language where possible.

To conclude, the media analysis has demonstrated that although the UK media does cover issues relating to renewable resources (largely limited to renewable energy and biofuel), these issues are commonly covered by the business and finance sections of the newspapers. This suggests that these areas are viewed positively by investors and industry as areas of potential. Despite contributing to an awareness of the activities and developments in this field, these types of articles tend to concentrate on market facts and figures and do not assist in promoting a wider general understanding of the concepts involved. The lack of articles in main news sections dedicated to discussion of renewable resources and biological alternatives to the use of mineral oil suggests that these issues are not currently major news areas. This could be due to several factors, including:

- lack of interest or awareness of journalists;
- lack of provision of accurate and interesting information and resources relating to these topics; and,
- perception of the topics as low relevance or low interest

To address this issue and the factors mentioned above, a mechanism is required to establish an information resource and media communication route to assist in raising the profile of biorenewable resources in the media as areas for discussion and potential in meeting society's requirements in the future.

The results of the UK media analysis indicated that non-food crop issues have regular coverage by the mainstream media. In assessing the preliminary UK results, it was decided a wider analysis of the European media was likely to reflect a similar trend while requiring significant resources. Therefore, the UK results were used to gauge a baseline of media activity, identifying the non-food crop issues which received most media coverage. The EU-funded MESSENGER project undertook a Europe-wide analysis of science representation in the media [7]. This large scale approach allowed a comparative analysis to be performed in identifying cross-national differences in the framing of issues by the media. In the reporting of similar topics, the focus of the media coverage varied from agricultural issues, scientific and technological aspects, application and exploitation of science, business and commercial aspects and environmental issues. An appreciation of these differences should be considered when developing a communication or media strategy with European impact.

5 INDUSTRY'S ROLE IN COMMUNICATING THE BIOECONOMY

5.1 Industry approach to communication

In exploring science communication practices for engaging both the public and the media, published guidelines and shared experiences tended to come from a predominantly academic background. Communication is also an important part of industry's activities, to promote brands and secure consumer awareness and acceptance of the company's activities and products. As industry will also be involved in communicating issues associated with bio-renewable resources, such as how this will affect products reaching the public or other customers, it is interesting to compare industry practice with common science and media communication strategies. The communication activities of EPOBIO's industry partners and advisory board members were mapped using a simple multiple choice questionnaire. The ten companies represented were AVEBE, BASF, Biogemma, BioTrend, British Sugar, DSM, Novamont, Plantechno, Syngenta and VTT. To avoid misinterpretation of views and company positions, responses are not attributed to individual participants. In each case, the main objectives of the questionnaire were to establish the company's main audiences, the forms of communication most commonly used, whether communication material contained scientific information, how communication activities were managed by the company and the company's engagement with the media.

5.2 Results

The returned questionnaires gave an overview of the communication activities of a range of companies, from SMEs to international corporations. Communication activities were largely performed on an international scale although with activities coordinated individually at national levels or with a focus on European countries. The management of communication activities tended to vary according to the size of the company. In the majority of cases, communication was managed in-house, with some external expertise being involved in some circumstances. For the larger and

established companies, it was common for there to be established guidelines for both public communication and media communication activities and employed press officers. Smaller companies and SMEs tended to not have either guidelines or press officers. Differences in the provision of resources to support communication activities appear to correlate with the size of the company represented. This may be explained by issues such as the availability of resources including staffing, which means that communication activities are integrated with the other business of the smaller companies and not handled by dedicated departments.

The main objective of industry-based communication activities was promotion, either of the company to other areas of industry, customers and potential investors or of the company's products, services and technologies. The need to provide information to explain the activities of the company was also commonly selected as an objective. To explore what types of information were presented, the questionnaire asked whether industry's communication activities involved presenting scientific concepts or issues. All respondents replied that their communication activities involved scientific content but in the majority of cases, scientific information was usually only presented to a specialist or technical audience. Four of the companies involved in the survey provided scientific information in a format designed for a non-specialist audience.

The key audiences of each company were selected and ranked in order. In compiling the information, commercial customers and other sectors of industry were frequently selected (9 out of 10 responses) and highly ranked. Audiences also varied depending on the activities of the company and their position in the supply chain which determined their involvement with different audience, for example, the research community for those closely linked to R&D, or agriculture, or the public for companies producing consumer products. In terms of the public, the general public was regarded as a more important audience than the public as consumers. Other target audiences were identified as politicians and shareholders.

The range of communication methods used was also surveyed. All methods of communication suggested (paid advertising, company website, dedicated website sections, news releases, company-organised events, and other organised events) were used to some degree. The use of news releases was rated as being one of the most commonly used communication tools (9 out of 10 responses) with all responses also listing the company website. Attendance at events, either those organised by the company themselves (given examples of events included lectures, open days and school visits) or externally organised events such as exhibitions and conferences were also frequently selected. In comparison with the passive provision of information such as news releases and website content, this demonstrates an industry involvement in practical communication activities.

The questionnaire specifically focused on communication activities targeted at the general public. Of the ten companies represented, eight undertook specific public-orientated communication activities. Of the two companies which did not, both stated that the general public was not a target audience of the company. One representative commented that their public communication activities were limited by the relevance of the public as a target audience and also by financial restrictions. As for industry's wider communication objectives, the main purpose for public-orientated communication was to provide information on the company's activities, included the company's products. This was mainly achieved via the company's website (6 out of the 8 companies involved in communication with the general public). Of these six companies, two used specialised website sections targeted at the general public. Media coverage was also used as a mechanism to reach the public. Printed material produced by the company, such as fact sheets were also selected as communication tools in addition to industry presence at organised events attended by the general public. In assessing which forms of communication were viewed as being most effective, media coverage and general internet-based communication were most commonly selected

In order to gauge the industry's attitude to public engagement, the questionnaire asked whether the company associated any risks or negative consequences with

undertaking public communication activities. The responses were varied with five companies stating that they perceived no negative consequences associated with public engagement (although one company had also stated that they did not undertake any actual public-orientated communication activities). Two companies were uncertain on this issue although one of these also did not undertake any public-orientated communication so perhaps this lack of experience affects their ability to comment. Of the three remaining companies, each stated risks associated with publicising GM field trials and attention from anti-GM and environmental campaign groups as negative consequences of public engagement.

Finally, industry's attitude and involvement with the media was assessed. When questioned about the usefulness of the media as a communication tool, each industry representative positively responded by selecting that the involvement of the media was viewed as either a very useful or quite useful component of their communication activities. The most common form of media engagement was the release of press releases for specific announcements. In addition to providing information to the media, nine out of ten industry representatives stated that the company was often or sometimes approached by members of the media requesting information, interviews or visits.

5.3 Conclusions

Different strands of communication are still evident in industry communication practices, including web presence, media coverage and personal involvement at events. It appears that there are differences in the objectives of industry-based or dedicated science communication activities. Rather then providing information to increase understanding and awareness, industry communication is targeted to using particular types of information for a more specific purpose, such as raising the profile of the company, its activities and products. This might explain the lesser involvement of industry in providing information for a non-specialist or non-related audience as these activities are not linked to a demonstrable target outcome.

As in many science communication activities, media coverage and general internet-based communication was widely utilised by industry. These approaches have the benefits of reaching a wide audience, including different audience sectors, providing such material does not require extensive resources and information can be easily updated.

Media activities were viewed positively and functioned in several areas of communication as a mechanism for reaching the public, via the release of press announcements and responding to media enquiries and requests. This also demonstrates the value of proactively engaging the media and cultivating good media relations which result in the company becoming a media resource rather than simply a media provider.

6 CONCLUSIONS AND RECOMMENDATIONS

With increasing governmental commitment to the use of renewable resources at national and European level, it is important to engage society in debate and dialogue about the potential, realities and impact of the bioeconomy. Communication will be vital in order for public awareness to keep pace with research and technical developments and this engagement process should lead to social acceptance and support for emerging products and technologies. The conclusions and recommendations of this report are intended to contribute to future communication activities relevant to the bioeconomy by promoting effective communication channels and instruments, highlighting steps needed to engage the public and identifying obstacles to awareness and public acceptance. The recommendations are based upon the results of the EPOBIO communication activities and are also informed by the results of the EPOBIO social attitudes survey [19].

6.1 Communication methods

6.1.1 Use of the media and media portrayal of non-food crops

The media is an effective communication route and although coverage of biorenewable issues is not often mainstream, it has an impact on public perception.

The project used the media as a key communication route to access a range of audiences including the general public and decision makers from industry, government and science. The results from the social attitudes survey support the use of the media in communicating scientific information. The majority of European citizens aware of the potential to use plants as renewable resources identified newspapers as a main source of information on those topics.

Media portrayal of scientific issues has commonly been categorised into ‘breakthrough’ or ‘crisis’ positions and portrayal is closely linked to the position

adopted by the majority of media consumers. Perhaps due to the lack of overtly beneficial or controversial issues and poor competition with other science news stories, media coverage of biorenewable issues is largely confined to specialist media sections. However, respondents to the EPOBIO social survey perceived the media coverage on the uses of plants for industrial purposes to be largely positive. In cross-tabulating trends between the perception of media coverage and individual's attitudes towards biorenewables, a statistically significant relationship was found. Positive media representation correlated with an increased likelihood that the general public also felt optimistic about industrial biotechnology applications. Conversely, public optimism was reduced when media portrayal was perceived as being negative. This relationship demonstrates the power of the media in influencing public opinion as those who were optimistic about biorenewables were more likely to have encountered a positive media message.

6.1.2 Utilising networks for maximum impact

Communication activities have a much greater impact and relevance if performed with an awareness of the local and national media resources and other relevant networks with a remit for communications on the bioeconomy. For example, EPOBIO communication activities benefited from the involvement of project partners to ensure wide media coverage by increasing relevance to the country's regional and national media and use of the partner's networks. This approach also helped overcome barriers associated with unfamiliarity with the project and its international partners by providing material to the media through a trusted source. Local press offices can maximise impact by advising on the established press release formats which vary nationally and providing guidance on adapting key communication messages and format to take into account cross-national differences. In addition, they target the press release to the most relevant journalists and publications, with whom they frequently have established contact, and provide a local point of contact for media enquiries.

Information can be further disseminated to those with a less focused interest in the use of renewable resources but who nevertheless may find the project process, activities or outputs of interest. For example, by considering how the project outputs could have impact in a wider context, the EPOBIO communication strategy engaged with the science communication and education communities to promote the project reports as sources of expert and current information on the bioeconomy and its impact on society.

6.2 Engaging the public and other audiences

In communicating any scientific issue, there is a need to make relevant links between research, policy issues and public interests in order to support public involvement and ensure democratic governance by facilitating public engagement and dialogue.

The analysis of the UK media coverage of biorenewable issues identified that policy-driven issues such as biofuels or consumer interest issues such as energy prices received the greatest amount of coverage. The media profile of issues related to biorenewables and their classification into specialist media sections such as finance and business suggests that these issues are not well represented in the key news sections and are therefore not reaching the mainstream media audience. In addition to the higher profile issues such as biofuels or the debate about future energy sources, the public need to be engaged with the less well known concepts and applications, such as biorefineries, and the wider issues, benefits and impacts of a bio-based society. In order to satisfy the public that sustainable resources offer deliverable benefits and not just alternative problems, integrated analysis such as that undertaken in the EPOBIO process will be of increasing value.

The EPOBIO social survey found that public support for the development of plant-derived products was mainly attributed to a need to achieve environmental targets, reduce dependence on petroleum and the opportunity to enhance the employment market. As these objectives appear to be key factors in the public's support for

industrial uses of plants, they provide a guide to targeting communications to meet the public's expectations of these technologies. Accordingly, consumer attitude towards plant-derived alternatives to motor engine lubricants, daily consumables (inks, solvents and detergents), cosmetics and plastics was very positive with the majority of respondents willing to pay a higher price for these products compared to existing products. This indicates that as long as the contribution of biorenewables to these strategies is communicated, support is likely to be high.

The social survey confirmed that scientists are most trusted as a source of information, with decreasing levels of trust in the media, industry and politicians respectively. The EPOBIO communication materials were developed with input from the project's desk researchers and project leaders. In addition to ensuring the accuracy of the information, quotes and references to experts and figures of authority raises the profile of the information being communicated to the media or the public and reinforces the source of the information as authentic or familiar.

Targeting relevant information provides an effective mechanism to communication with a range of audiences. Raising public awareness of the potential of biorenewables is important as they will be the end-users of the product in many cases. Respondents involved in a renewable energies consultation strongly supported the need for specific actions to raise public awareness to fully inform the public on the applications of renewable resources and associated benefits in terms of reduced carbon dioxide emissions and energy savings [1]. However, in addition to the general public, other relevant groups should also be targeted including industry-based end-users, groups with a commitment to renewable energies and minimising environmental impact and professionals involved in estate or procurement management to increase the visibility of successful use of bioproducts and renewable technologies.

6.3 Issues to be addressed in communicating the potential of renewable resources

Although the majority of the European public are aware of the potential to use plant-derived resources as industrial feedstocks, awareness of specific applications is much lower. If the three EPOBIO Flagship applications are taken to be representative of other industrial uses of plants, this illustrates a gap between communicating overarching concept themes with demonstrations of tangible products for society. This will have to be addressed if the development of a bio-based industry is to have public support. The communication of potential benefits of biorenewables in the absence of visible bioproducts and resources presents a barrier to public awareness as the issues appear to be removed from society. Communication of case study applications is also affected by the poor awareness of traditional oil-based industrial processes and supply chains. This means that the link between oil consumption, oil price, consumer product and market value is not obvious to the majority of the public.

The social survey explored the public's opinion of usefulness, risk and moral acceptability for three issues associated with the industrial uses of crops. These were genetic engineering, combusting plant-derived products to generate energy and the use of food crops for non-food uses. Approval of the three applications was generally given if acceptable regulation and control could be assured. However, the use of genetic engineering was perceived more negatively than the other two applications. The risk associated with the use of genetic engineering was also perceived as being higher than for the other two applications. Therefore, in terms of securing support and acceptance of plant products, the use of genetic engineering still represents a significant barrier and these issues will have to be carefully communicated to the public and managed at policy level to demonstrate effective regulation and risk management.

6.4 Recommendations for communications and the bioeconomy

In addition to the EPOBIO communication strategy guidelines (Section2), the following issues have emerged as being important to the establishment of the bioeconomy:

- The integrative EPOBIO approach has been valuable in combining scientific, social, environmental and economic issues and this has been reflected in the project's communication activities. An appreciation of the wider issues surrounding the communication objective creates a stronger context for communication and increases the potential for links to other topics.
- In order to effectively communicate with the media and their audiences, consideration should be given to the use of appropriate and accessible language in describing new technologies and applications. A survey of similar media coverage can be helpful in identifying familiar and unfamiliar terms and concepts.
- It is important to develop an awareness of drivers of public interest and try to address these in public communications.
- News items should be targeted to specific media outlets, such as agricultural, science / research and environmental focused publications by emphasising areas of relevance to their interests, mission and activities.
- The media analysis demonstrated that one large-impact news story increases coverage of related issues. Therefore, peaks in media interest present an opportunity to obtain media coverage on related issues.
- As local networks are most effective at generating media coverage, ways to establish trust and access local media resources and networks should be explored.
- In large EU projects, all partners should have a role to play in communications but this should be coordinated centrally to ensure that key messages are consistent. This approach facilitates an expanding local to national communication route.
- Input from experts, use of networks and reference to the involvement of known organisations helps develop trust with the media and media

audiences. Scientists are generally trusted by the public as sources of information and so have a role to play in communicating the potential of the bioeconomy.

- The creation of biorenewable / bioeconomy information resources, whether at an individual project level or on a European scale will support the provision of accurate and relevant information from scientists to the media and general public.
- Dissemination of information should be widened by using existing networks and proactively including others involved in science communication, such as science centres and developers of educational material.
- There should be direct communication with relevant policy makers and communication materials should be designed to highlight areas of strategic relevance and the potential of biorenewables to address risks such as the security of supply of fossil oil.

6.5 Communication outcomes and benefits for the bioeconomy

Effective communication strategies will establish the knowledge base and understanding necessary for the future strategic development of the bioeconomy. They are essential if the potential of renewable resources for society is to be realised. Strengthening communication between science and society will deliver positive benefits and outcomes including:

- increased awareness of biorenewables research, including communication of the requirements of and benefits to policy makers, interested parties and funding sources on a EU and national scale;
- a strengthening of connections between science, policy and public interest in the discussion of biorenewables;
- democratic governance by equipping citizens to make an informed choice on the role of bio-based renewable resources in society;
- development of communication networks to facilitate the dissemination of knowledge and products generated by non-food crop research in order to secure their useful exploitation;

- active contribution to the establishment of a knowledge-based society by increasing awareness and positive perception of bioproducts, renewables and their applications; and,
- positive market reception associated with increased public awareness and support for new products and technologies.

7 REFERENCES

1. Results of the Public Consultation on the EU Initiative on heating and cooling from Renewable Energy Sources Authors: Arnaud Mercier, Stathis D. Peteves, European Commission, Directorate-General for Energy and Transport, published November 2006.
   http://ec.europa.eu/energy/res/consultation/doc/2006_10_10_heating_cooling/2006_11_27_public_consultation_analysis_en.pdf
2. Science Communication in Europe
   European Science Foundation Policy Briefing, March 2003, number 20
   http://www.esf.org/publication/153/ESPB20.pdf
3. Communicating Science - A Scientist's Survival Kit. Giovanni Carrada, DG-Research, 2006
   http://ec.europa.eu/research/science-society/pdf/communicating-science_en.pdf
4. Dealing with the media' guides, part of the media and communication resources available from the Media Trust, UK
5. A Guide to Successful Communications
   EC, Information and Communications Unit, Research DG, published 2004
   http://ec.europa.eu/research/conferences/2004/cer2004/pdf/rtd_2004_guide_success_communication.pdf
6. Best practice guides: Developing a media strategy
   Economic and Social Research Council
   http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/about/CI/CP/best_practice_guides/
7. Media, science & society; engagement & governance in Europe. Final report from the MESSENGER project, published August 2006.
   http://www.sirc.org/messenger/Final_Report_Draft_1.pdf
8. Consultation Report, Science Media Centre, produced March 2002
9. Guidelines on science and health communication
   Prepared by the Social Issues Research Centre in partnership with the Royal Society and the Royal Institution of Great Britain, published November 2001
   http://www.sirc.org/publik/revised_guidelines.pdf

10. Article ‘Form and content’
EC. RTD Info, Special edition ‘Talking Science’, p7-9, September 2002
http://ec.europa.eu/research/rtdinfo/pdf/rtdspecial-media_en.pdf
11. Article ‘Misguided or Misunderstood?’
EC, RTD Info, Special edition ‘Talking Science’, p4-6, September 2002
http://ec.europa.eu/research/rtdinfo/pdf/rtdspecial-media_en.pdf
12. Science and Society Forum, session ‘Towards a culture of science communication’.
EC organised forum March 2005, session notes by George Gaskell, April 2005
http://ec.europa.eu/research/conferences/2005/forum2005/docs/report_session3_en.pdf
13. Audit Bureau of Circulations (ABC) www.abc.org.uk
14. National Readership Survey (NRS) www.nrs.co.uk
15. ABF press release 20/06/06
‘Associated British Foods announces a collaboration with BP and DuPont on UK biofuel production’
http://www.abf.co.uk/media/press_release.asp?pr=20060620_1
16. BP press release 20/06/06
‘BP and DuPont Announce Partnership to Develop Advanced Biofuels’
http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7018942
17. BP press release 14/06/06
‘BP Pledges $500 Million for Energy Biosciences Institute and Plans New Business to Exploit Research’
http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7018719
18. Ofgem press release 26/06/06
‘Ofgem proposes investment boost for Britain’s energy networks’
http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/15504_r31_26june06.pdf?wtfrom=/ofgem/press/pressrelease-list.jsp
19. Public attitudes towards the industrial uses of plants: The EPOBIO survey, EPOBIO 2007
20. Special Eurobarometer 224 ‘Europeans, Science and Technology’, part of Eurobarometer 63.1, EC, published June 2005
http://ec.europa.eu/public_opinion/archives/ebs/ebs_224_report_en.pdf

21. Eurobarometer 55.2: Europeans, Science and Technology
EC, DG Research, published December 2001
http://ec.europa.eu/public_opinion/archives/eb/ebs_154_en.pdf
22. Towards a better map: Science, the public and the media
Authors: Professor Ian Hargreaves, Professor Justin Lewis and Tammy Speers. Economic and Social Research Council, published 2002.
http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/Images/Mapdocfinal_tcm6-5505.pdf
23. Special Eurobarometer 225 'Social values, Science & Technology', part of Eurobarometer 63.1, EC, published June 2005
http://ec.europa.eu/public_opinion/archives/ebs/ebs_225_report_en.pdf
24. Presidency Conclusions of the Lisbon European Council on 24 March 2000
http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm
25. Science and Society - Action plan. EC, published 2002
http://ec.europa.eu/research/science-society/pdf/ss_ap_en.pdf
26. MEDIA Plus programme
http://ec.europa.eu/avpolicy/media/index_en.html
27. A road map for the establishment of a European research media service
Communiqué Initiative, November 2005
http://www.communique-initiative.org/docs/roadmap.pdf
28. Implementing a European research media service, Communiqué Initiative, July 2006
http://www.communique-initiative.org/assets/File/Final_Implementaion_Plan_English.pdf
29. Implementing Communiqué: a European research news support network, Communiqué Initiative, October 2006
http://www.communique-initiative.org/assets/File/Structure3.pdf
30. Newspaper Marketing Agency www.nmauk.co.uk

8 INSTITUTIONS, ORGANISATIONS AND PERSONS CONTACTED

Institution / organisation	Persons contacted	Country
AlphaGalileo Foundation	Peter Green	UK
AVEBE UA	Dr Peter Bruinenberg Research Manager	NL
BASF Plant Science	Dr Anja Klatt	D
Bayer BioScience NV	Ingrid Cazaerck Communications	B
Bioenergy Network of Excellence		
Biogemma	Dr Jeroen Wilmer	F
BioTrend	Dr Bruno Sommer Ferreira	P
British Association for the Advancement of Science	Craig Brierley Press Officer	UK
British Sugar	Gary Punter Head of Technology Development	UK
Centre for Life, Newcastle	Andy Lloyd Exhibitions Manager Ian Simmons Head of Science Development	UK
Cordis News	Catherine Brett Reporter	B
DSM Life Science Products	Dr Colja Laane	NL
The Eden Project	Dr Tony Kendle Head of Science Coordination	UK
Engineering and Physical Sciences Research Council (EPSRC)	Dr Claire Graves Public Affairs Manager	UK
EU AgriNet		
EuropaBio European Association for Bioindustries		
European Association for the Promotion of Science and Technology (Euroscience)		
European Biomass Industry Association		

Institution / organisation	Persons contacted	Country
European Federation of Biotechnology	Dr David Bennett	NL
European Plant Science Organisation	Dr Karin Metzlaff Professor Marc Zabeau	B
European Renewable Energy Council	Christine Lins Secretary General	B
European science communication network (Ecsite)	European and UK branch	
European Science Communication & Information Network (ESCIN)		
The Financial Times	Fiona Harvey Environmental correspondent	UK
IEA Bioenergy		
Imperial College London	Tom Miller Head of Communications	UK
Interactive European Network for Industrial Crops and their Applications (IENICA)		
Intute science communication network (host of psci-com science communication gateway)		UK
Max-Planck Institute for Plant Molecular Physiology, Potsdam-Golm	Joachim Rinder Public Relations Officer Ursula Ross-Stitt Public Relations Officer	D
Metabolic Explorer	Professor Philippe Soucaille	F
National Non-Food Crop Centre	Dr Alison Hamer Communications and Information Manager	UK
Novamont SpA	Dr Francesco Degli Innocenti	I
The Observer	Juliette Jowit Environmental editor	UK
Radio 4 ‘Material World’ programme	Sarah Roome Producer	UK
Royal Botanic Gardens Kew	Education and Schools Programme, Adult Educations and Outreach teams	UK

Institution / organisation	Persons contacted	Country
Plant Research International - Wageningen UR	Kees van Nes Communication Erik Toussaint Communications Manager of the Plant Sciences Group	NL
Plantechno Srl	Dr Wendy Pline-Srnic	I
The Press, York	Stephen Lewis Feature writer	UK
Roquette	François Mabille Brand Image Manager	F
Science Media Centre	Claire Bithell Senior Press Officer	UK
Science Museum and Dana Centre	Lauren Gildersleve Senior Press Officer	UK
Socialist Environment and Resources Association (SERA)	Jessica Sherlock Parliamentary Officer	UK
SUPERGEN (EPSRC funded UK consortium)		UK
Sustainable energy policy network	Kate McGeevor	
Swedish University of Agricultural Sciences	Mikael Jansson Press Officer Carin Wrange Press Office	S
Syngenta	Garry Nisbet R&D & Internal Communications Manager	UK
University of Lausanne	Nadine Richon Attachée de presse	CH
University of York Communications Office	David Garner Press Officer	UK
VTT Biotechnology	Paula Bergqvist Communications Officer	FI
The Wellcome Trust	Vivien Goldsmith Media Officer	UK
Xplora, science education portal	Dr Karl Sarnow Project manager and coordinator	

9 APPENDIX 1 REVIEW OF GOOD PRACTICE IN SCIENCE COMMUNICATION VIA THE MEDIA

Issues affecting the communication and dissemination of European research have been identified in past and ongoing consultations. These include the poor representation of European research in the European and worldwide media, the lack of awareness of some areas of European research by the European public and the difficulties of dissemination on a European scale. It has been recognised that these issues will be addressed by supporting science communication activities and by defining and promoting good practice.

In defining good practice, studies and consultations have been performed on media consumption, sources of science information, science areas which stimulate the greatest interest, the representation of EU research in the media and the role of the media in science communications. These activities have involved the general public, professional science communicators, researchers and media professionals, representing the opinions of each stage of the media process - news production, processing, presentation and consumption.

9.1 How science stories are consumed by the European public

9.1.1 The role of the media in science communication

A 2001 Eurobarometer assessing Europeans' interest, perception and knowledge of science, analysed the public's main sources of scientific information [21]. The Barometer showed that for the vast majority of the European public, television was the main source of information about science and technology although use of the press as a source of information was particularly common in Germany, the Netherlands, Austria, Finland, Sweden and the UK (Table A1). When the preferences for sources of information were related to the age and education of those surveyed:

- those more educated were less likely to name television as an information source;
- elderly people were more likely to listen to the radio;
- the general press and scientific journals were more commonly used by those with further educational qualifications; and,
- younger people and students were most likely to use the internet or obtain scientific information from educational institutions.

The results of the Eurobarometer were supported by a UK survey and media analysis commissioned by the Economic and Social Research Council (ESRC) to relate media coverage of science and science-related issues with public understanding of science [22]. The survey found that television was used as the main source of scientific information (59%), followed by newspapers (22%), radio (7%) and the internet (5%). A later Eurobarometer confirmed the use of articles in newspapers, magazines and the internet as sources of scientific information. 59% of EU25 respondents used articles in the printed and online media to inform themselves on science and technology issues [20].

Table A1 Results adapted from the Eurobarometer 2001 showing the most commonly used sources of scientific information.

	B	DK	D	GR	E	F	IRL	I	L	NL	A	P	FIN	S	UK	EU15
TV	63.6	60.6	67.7	62.2	52.5	64.6	61	48.8	42.3	59.4	64.6	59.1	59.1	66.2	60.4	60.3
press	37.7	39.3	43.9	30.1	25.8	34.7	39.1	28.1	29.5	49.2	41.2	22.8	50	46.4	42.2	37
radio	29.7	22.7	25.5	33	33.6	33.7	39.6	15.9	24.4	35.7	41	28.3	21.4	24.6	25.6	27.3
school/ uni	24.8	27.9	14.2	28.7	24.7	17.4	20.5	34.3	19.1	26.9	14.3	19.1	26.6	23	22.9	22.3
science journals	20.9	16.9	15.4	13.2	16.9	20.8	14.4	33.1	13.9	21.2	16.1	8.1	22.4	21.2	18.7	20.1
internet	18.4	15.8	13.7	10.4	13.5	9.5	20.3	23.7	14.3	23.3	16.4	13.7	18.3	14.1	22.8	16.7

The Eurobarometer surveyed approximately 1000 people per member state. Figures given for EU15 are a weighted average of the national figures. B - Belgium. DK - Denmark, D - Germany, GR - Greece, E - Spain, F - France, IRL - Ireland, I - Italy, L - Luxembourg, NL - Netherlands, A - Austria, P - Portugal, FIN - Finland, S - Sweden, UK - United Kingdom.

9.1.2 Areas of greatest public interest

The 2001 Barometer identified that news items relating to medical and environmental issues were of the greatest interest (60.3% and 51.6% of EU15 respectively). This was again supported by the ESRC media survey which followed the media coverage of three scientific areas receiving significant media attention at the time of the survey - climate change, the MMR vaccine debate and cloning/genetic medical research. Public awareness, understanding and opinion was assessed prior to and following the media coverage.

In an analysis of the media coverage given to different aspects of science (for example, GM plants, the environment, scientists, medical/health topics), it was apparent that stories with a medical or health-related focus received the greatest coverage (34% over 7 month period). In analysing how the three science topics were handled differently by the media, being reported by news reporters or science correspondents, it was noticed that science stories reported as news attracted more media coverage (longer articles, increased comments and reader letters). Conversely, specialist science features appeared to have less impact on the public domain, quickly losing the media's and audience's interest.

In its conclusions, the report commented that establishing clear connections between science, policy and the public interest was central in increasing the public's understanding of science via media coverage.

9.1.3 Public opinion of the media as a source of science information

When investigating opinions on the quality of information provided by the media (Eurobarometer 2001), 36.5% of Europeans agreed that science and technology was portrayed too negatively by the media (39.5% disagreed with this) and just over half of the respondents (53.3%) believed that journalists lacked the required scientific understanding to write about science issues. Combining these opinions indicated that a quarter (23.6%) of Europeans believed that science is negatively

reported by insufficiently qualified journalists. A more recent Eurobarometer found a similar segregation of opinion on whether science and technology was presented too negatively in the media [20]. 32% of respondents agreed, 31% disagreed and 30% did not agree or disagree. Such variations in the perception of media coverage are perhaps unexpected but could be explained by differences in personal optimism and attitudes to science. Despite differences in the perception of negative media coverage, a large majority of European citizens believed that science and technology reporting in the broadcast and printed media had a positive effect on society (86% for television and radio reporting, 83% for newspaper and magazine coverage) [23].

9.1.4 The media status of EU research

The European Science Foundation Policy Briefing paper 'Science Communication in Europe' presented the views of a group of professional science communicators on the status of science communication in Europe [2]. In Europe, there is competition between European and American research. In a survey of media coverage of astronomy and space stories in European national newspapers, several of newspapers mentioned American research as opposed to national or European research. Only in Denmark, France and the UK were there more references to national research rather than the American research. The lack of mention of European research performed by other European countries in national newspapers also highlights the weak appreciation for the European dimension of science and research.

Within Europe, success in science communication is affected by national relevance and an appreciation of differences in culture, history and development. Other barriers include language differences and varying levels of scientific literacy. As experienced by trans-European popular science publications, public interest is greatest when news items have a national angle or are closely aligned with national interests, culture and traditions. Therefore, national institutions are particularly well-placed to communicate science in a relevant and appropriate style.

The Briefing Paper's recommendations to increase science communication at a European level were:

- increased funding for Science in Society activities;
- promotion of a European scientific press agency;
- increased dialogue between the scientific community and the European media;
- development of high quality print and broadcast material;
- promotion of national science events with emphasis on the European dimension of research; and,
- ongoing monitoring of science communication events to assess public impact.

9.2 Good practice in science-media communication

9.2.1 Promoting European research

The Lisbon Strategy forms a collective commitment to establish the European Union as the "most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" [24]. The purpose of the Strategy is to prepare Europe for a successful transition to a knowledge-based economy and society and to ensure that Europe is positioned to compete in the global market. The European Research Area is viewed as a central element of the Strategy as scientific and technical progress strengthen international competitiveness. Investment in research and innovation requires support from society, industry and research. Therefore, communication is vital in order to achieve the steps necessary to advance European research and innovation and realise its potential in contributing to the Strategy's strategic goals.

Part of the EC's 2002 Science and Society action plan addressed how to best promote scientific education and culture in Europe and support the strategic goals laid out in the Lisbon Strategy [25]. It was recognised that the media, in addition to researchers and research organisations, have a vital role in providing

understandable and reliable information. To fulfil this role, the EC recognised that independent sources of information must be supported and agreed to establish a study group of journalists and press representatives to identify how best to ensure efficient dissemination of scientific information at a European level (leading to the existence of the Communiqué Initiative). The EC also made a commitment to assess ways of communicating science through multimedia formats as part of the MEDIA Plus programme [26].

As part of a consultation process, the Communiqué Initiative has defined a road map, implementation plan and suggested structure for the creation of a European research media service [27-29]. In evaluating the coverage of European research news in the media (European and worldwide), the Communiqué Initiative identified that this was not representative of the research's significance and has hindered Europe's attempts to meet the objectives of the Lisbon Strategy. The initiative identified the following barriers to effective information dissemination:

- a focus on internal communication with research peers;
- reluctance to communicate with the mass media; and,
- separation of provision of information and input into policy decisions.

The result of these barriers is that the European public are largely unaware of some areas of European research and this low visibility also affects the profile of EU research in other important sectors such as global commerce. As a step to counter this effect, the Initiative proposed that a European research media service should be created to facilitate research-media interaction by providing advice, distribution, translation, mediation and training services.

9.2.2 Meeting the needs of researchers and journalists

The creation of a European research media service would assist in improving media relations by the European research community by providing media expertise to researchers and media-friendly material for the European media to support science journalism.

Suspicion, unwillingness and a lack of understanding of each other's roles are all factors which have been identified in preventing effective science communication through the media [7, 8, 11]. Progress has been made in equipping the media and scientists with an understanding of how science and the media environments operate, how they can benefit each other, and in reviewing how the needs of each can best be met.

The 'Guidelines on science and health communications' arose from the combination of the guidelines resulting from the SIRC/RI Forum and resulting guidelines and the Royal Society's publication 'Scientists and the media: Guidelines for scientists working with the media and comments on a Press Code of Practice' [9]. These guidelines have recently been updated and developed as part of the EU funded MESSENGER project which also undertook a large-scale analysis of science reporting in the European media during the period 2000-2005 [7]. In addition to the results of the media analysis, the project's report includes guidelines for science communication via the media, material to support journalists' portrayal of science, in particular risk communication and a layperson's guide to understanding and evaluating science stories.

9.2.3 Defining a science communication and media strategy

A wealth of information exists to guide science communication to the media and the development of communication strategies. Good practice guides and demonstration of effective media strategies and techniques were utilised to ensure the maximum success and efficiency of the EPOBIO media strategy. This included a range of reports, published guidelines and the results of consultation and discussion forums including:

- a Science and Society Forum organised by the EC and held in Brussels in March 2005 included a session 'Towards a culture of science communication', which aimed to address the relationship between scientists and journalists [12].

- the European Science Foundation Policy Briefing Paper which presented the views of professional science communicators of various science communication approaches in Europe to order to identify ‘best practice’ at national and European levels [2].
- the resource ‘Communicating Science - A scientist’s survival kit’ written by a journalist to improve communication practice to the public and also the media [3].

Consultation with specialist science correspondents by the Science Media Centre (SMC) identified that there is not a shortage of news-worthy science stories, with these mainly being sourced from peer-reviewed journals, scientific establishments and online research news services including AlphaGalileo and EurekAlert. This emphasised the need for an effective media strategy to compete successfully for media coverage with other science stories.

10 APPENDIX 2 MONITORING MEDIA IMPACT

10.1 Use of media material from the EPOBIO website

Table A2 Pageviews and downloads of the media resources made available via the EPOBIO website.

	up to 08/12/06 [a]	up to 28/03/07 [a]
Media section	100	558
Material		
First series of reports:		
23rd November 2006		
UK release (mainstream)	23	189
UK release (trade)	19	150
EU release (English)	28	211
Dutch release	29	259
German release	12	223
Greek release	24	335
Swedish release	14	151
Swiss release (French)	42	314
Christmas press release	-	317
20 December 2006		
Image gallery	57 [b]	177 [b]
image downloads	32 [c]	172 [c]
Factsheets		
10 ways plants may change your life	10	76
Ten ways for a green Christmas	-	234

EPOBIO	13	58
EPOBIO Quick facts	12	85
EPOBIO Consortium	6	55
Biopolymers flagship	15	87
Plant cell wall flagship	7	82
Plant oils flagship	7	64
Alternatives to natural rubber	10	68
Cell wall degradation	6	41
Plant oils as lubricants	12	59

a - Figures shown indicate the number of HTML pages, PDF files and Word documents viewed and/or downloaded, except for the image gallery.

b - Figures shown indicate pageviews of the image gallery webpage

c - Figures shown indicate the number of images downloaded.

10.2 Coverage breakdown for EPOBIO reports

Table A3 Record of media coverage received for the first series of EPOBIO reports released 23rd November 2006.

UK and English language

Regional press:

Publication	Date	Section	Details
Yorkshire Post	24/11/06	p9, main news	327 words, article also included online
University magazine	Dec '06 / Jan '07	p10, Research	based on press release text, 245 words, photo

Internet:

webpage	Date	Section	Details
University of York homepage	23/11/06	Latest news	tagline link to press release and photo

EPOBIO homepage	23/11/06	Homepage - News	link to press release and media section
National Non-Food Crops Centre	15/12/06	News	tagline and paragraph, link to website
EU-AgriNet	18/12/06	Latest news	tagline link to press release, paragraph and photo
EU-AgriNet		Project Report - Article	article, 3 photos, links to exec summaries and full reports
SCAR	18/12/06	What's New on SCAR	tagline, photo and link to EU-AgriNet article
AlphaGalileo	23/11/06	Press releases	press release text
Eurekalert	24/11/06	Press releases	press release text
Bioscience York	24/11/06	News	press release text
Science Daily	30/11/06	Latest news	press release text
SeedQuest	23/11/06	News - front page link	press release text
Cordis News	24/11/06	Front page - News highlights	tagline link to article, paragraph and photo
Cordis News	24/11/06	News online	article and photo
HERO	December 2006	Business	article and photo, web links to EPOBIO and CNAP
Biopact weblog	27/11/06	Homepage	press release and photo
Biofuel review	30/11/06	News	press release text
What's next in science & technology?	30/11/06	Homepage	press release text
Junk Science	28/11/06	News	tagline link and paragraph, link to full EurekAlert article
Energy Daily	28/11/06	Energy	press release and photo (website's own)
Tech News Watch	27/11/06	Energy and Environment	press release

Secondary sources

DTI Global Watch Service	30/11/06	Technology News	press release text - sourced from Science Daily
Mediaport	28/11/06	News	press release and photo - sourced from Biopact.com, links to report pdfs
bioplastics24.com	28/11/06	Latest News	Cordis article
Forest Conservation Portal	24/11/06	News	Cordis article
Climate Ark portal	24/11/06	News	Cordis article
Feedbite.com	24/11/06	Environmental news	link to Cordis webpage

Germany

Internet:

webpage	Date	Section	Details
Innovations report	23/11/06	Agricultural- and forestry science news	press release - German
Innovations report	24/11/06	Agricultural- and forestry science news	press release - UK release
CO_2 Handel.de	23/11/06	News	press release
Informationdienst Wissenschaft	23/11/06	Press release	press release
Life Science Bavaria Network	27/11/06	News	press release and logo
Interconnections	23/11/06		press release
LDH Magazin	23/11/06	eNews - raw materials	press release and photo (website's own)
Uni-protokolle.de	18/12/06	News	press release
Beo	23/11/06		press release
vdbiol	09/01/07	News	press release and photo

Switzerland

National press:

Publication	Date	Section	Details
Le Temps	28/11/06	p24	text, 114 words

Regional press:

Publication	Date	Section	Details
L'Agence Télégraphique Suisse (sda-ats)	27/11/06	p40	298 words, press release adapted from EPOBIO release
24 heures	28/11/06	p25	text, 212 words
L'Agefi	28/11/06	p11	text, 211 words
Le Matin Bleu	28/11/06	p2	text, colour photo (newspaper's own), 74 words
20 minutes	28/11/06		text and photo (newspaper's own), 72 words
20 minutes	28/11/06	p5	text, 56 words
Le Quotidien Jurassien	28/11/06	p16	text, 33 words

Radio broadcasts:

Station	Date	Section	Details
Radio Suisse Romande – La Première	27/11/06	'Journal' programme	radio interview with Yves Poirier

Internet:

webpage:	Date	Section	Details
French-language			
University of Lausanne press office page	27/11/06		press release

swiss info	27/11/06		ats press release
Romandie News	27/11/06		ats press release
German-language			
Landi	24/11/06	Agricultural news	press release text

The Netherlands

Regional press:

Publication	Date	Section	Details
Apeldoornse Courant	24/11/06		text, 365 words
Dagblad Flevoland	24/11/06		text, 365 words
Deventer Dagblad	24/11/06		text, 365 words
Gelders Dagblad	24/11/06		text, 365 words
Nieuw Kamper Dagblad	24/11/06		text, 365 words
Veluws Dagblad	24/11/06		text, 366 words
Zwolse Courant	24/11/06		text, 365 words
Dagblad Tubantia / Twentsche Courant	24/11/06	Economy	text, 211 words
Der Gelderlander	24/11/06	Economy	text, 357 words
Agrarisch Dagblad	23/11/06		text, 313 words

Internet:

webpage	Date	Section	Details
PRI Wageningen website	23/11/06	Homepage - News	tagline link to press release
Agri Holland	23/11/06	News	press release text
ZIEZO	23/11/06	News	press release text and photo
AgriMedia / ZIEZO	23/11/06	News	press release text

Sweden

Internet:

webpage	Date	Section	Details
SLU website	23/11/06	Homepage - News	tagline link to press release, paragraph
chemicalnet.se	29/11/06	News	tagline link to press release, paragraph

Greece

National press:

Publication	Date	Section	Details
Naftemporiki (daily business newspaper)	05/01/07	Small and medium-sized enterprises section p16	626 words, photo

National Hellenic Research Foundation-associated publications:

Publication	Date	Section	Details
NDC Newsletter for Research and Technology	15-31 Dec '06 (vol 97)	item 5	distributed to over 4000 subscribers Greek - 87 words
'Innovation, Research and Technology' magazine	Issue 57, Nov - Dec 2006	Full page article (Greek, p7)	distributed to over 5,500 subscribers Greek - 622 words
'Innovation, Research and Technology' magazine - English summary	Issue 57, Nov - Dec 2006	Highlights (English summary, p32)	English - 137 words

Internet:

webpage	Date	Section	Details
National Document Centre homepage	28/12/06	R&D News	text and photo (EPOBIO webpage) Greek and English
National Document Centre website	28/12/06	R&D News article	text and photo (EPOBIO webpage)

			Greek and English
Greek portal of Cordis	01/02/06	R&D News	text and photo (EPOBIO webpage)
Technological Educational Institution of Chalkis, Liaison and Technology Transfer Office	08/01/07	News	text (Greek) and link to NDC website

Other

Internet:

webpage	Date	Section	Details
HEOS (Italian)	02/12/06	News	Cordis article
AlimentaPress.it (Italian)	30/11/06	News - Research and Innovation	Cordis article
Molecular lab (Italian)	28/11/06	News	Cordis article and photo (website's own)
Brescia network (Italian)		home page link	Cordis article and photo
Marketpress (Italian)	28/11/06	News	Cordis article
Torino Scienza	29/11/06		Cordis article
Chile Potencia Alimentaria (Spanish)	29/11/06	Biotechnology in action	Cordis article

Notes on media evaluation: Duplicate stories appearing in different geographical editions of regional newspapers or on different websites were counted as separate stories. An article was defined as a dedicated news item focussing on the project and the messages presented in the news release.

11 APPENDIX 3 UK MEDIA ANALYSIS

Table A4 Circulation and readership figures for the main UK press.

Newspaper title	Type	Circulation	Readership
The Sun	Popular	3,207,430	8,073,000
Daily Mail	middle-market	2,389,236	5,427,000
Daily Mirror	Popular	1,600,151	3,884,000
Daily Telegraph	Quality	897,416	2,061,000
Daily Express	middle-market	833,145	1,809,000
Daily Star	Popular	797,132	1,784,000
The Times	Quality	667,496	1,580,000
Financial Times	Quality	423,548	1,158,000*
The Guardian	Quality	370,612	757,000
The Independent	Quality	250,761	348,000

Circulation and readership figures were taken from the Newspaper Marketing Agency [30]. Circulation figures refer to the period 3rd-30th July 2006, and represent number of copies distributed on an average day. Readership figures represent the number of people reading a title on an average day in the period October 2005 - March 2006.

* Financial Times readership figures are for the period of April 2005 - March 2006 (source NRS).