



“Midterm Report On DICONET Exploitation And Dissemination Plans Including Contribution To Standards”

D7.2

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Partner Name	Short name	Country
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Research and Education Laboratory in Information Technologies	AIT	GR
Center of REsearch And Telecommunication Experimentations for NETworked communities	Create-NET	IT
Groupe des Ecoles des Telecommunications	ENST	FR
Huawei Technologies Deutschland GmbH	Huawei	DE
Interdisciplinair Instituut voor Breedband Technologie, VZW	IBBT	BE
Research Academic Computer Technology Institute	CTI	GR
University of Essex	UEssex	UK
Universitat Politècnica de Catalunya	UPC	SP
ADVA AG Optical Networking	ADVA	DE
Deutsche Telekom AG	DTAG	DE
Alcatel-Lucent France	ALF	FR
ECI Telecom	ECI	IL

Abstract:

This deliverable intends to set out the terms for the Use and Dissemination of the Knowledge and to provide a cumulative overview of the project's undertaken and planned dissemination activities

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Executive Summary

In this document, we intend to set out the terms for the Use and Dissemination of the Knowledge arising from the DICONET project in accordance with the partners interests (Article II.34.1 of the contract).

It aims at providing a cumulative overview of the project's undertaken and planned activities; as it is an evolving document, it will be updated by the end of the project (June 2010 – D7.4) The final plan for Using and Disseminating the Knowledge that should be provided at the end of the project will also provide information on the future route to full use (exploitation or use in further research) and dissemination of the knowledge.

This deliverable is divided within 2 main parts:

Part I is dedicated to the description of the dissemination measures, including any scientific publications relating to foreground. Its content will be made available in the **public domain** thus demonstrating the added-value and positive impact of the project on the European Community.

Part II is specifying the exploitable foreground and provides the plans for exploitation. It will be **kept confidential** and will be treated as such by the commission.

Table of Content

Executive Summary	4
2 References	5
3 Definition	6
4 PART 1 - Description of the dissemination measures	7
4.1 List of dissemination activities	7
4.1.1 International and National Conferences and Workshops	7
4.1.2 Dissemination at Concertation and Cluster Meetings	8
4.1.3 Connections with Technology Platforms	9
4.1.4 Dissemination through other relevant projects	9
4.1.5 Publications, magazines etc	9
4.1.6 Project Website	14
4.1.7 Liaison and dissemination in the appropriate standard bodies	14
4.1.8 Universities and colleges	15
4.2 Partner internal dissemination	15
4.3 list of scientific (peer reviewed) publications	16
5 PART 2 - Specifications of the exploitable foreground	20
5.1 List of applications for patents, trademarks, registered designs, etc.	20
5.2 Overview table with exploitable foreground	Erreur ! Signet non défini.
5.3 Intermediate report on societal implications	25

1 References

- [1] Project Contract GA 216338 and Annex II (General Conditions)
- [2] Project Contract - Annex 1 "Description of the Work" (DoW-revised Feb 15, 2009)
- [3] Consortium Agreement (CA)
- [4] Rules for Participation (RfP) - Regulation (Ec) No 1906/2006 Of The European Parliament And Of The Council

2 Definition

All definitions are listed either in the Annex II – General Conditions to the Grant Agreement – or in the Consortium Agreement. [1][2][3]

Some essential definitions are reminded or complemented below.

“Confidential Information” means any and all information that is disclosed or otherwise made available by the disclosing Party to the receiving Party pursuant to the Consortium.

Agreement including, without but not limited to: Background, Sideground and/or Foreground; financial information, such as but not limited to pricing and customer lists; technical information, such as but not limited to research, development, algorithms, procedures, software and know-how; business information, such as but not limited to operations, planning, marketing interests and products.

Such information may be disclosed or made available orally, in written (including but not limited to, fax, e-mail, text message (SMS)) or machine readable format or other tangible including but not limited to raw materials, components, models, prototypes or any tool or equipment whatsoever) or intangible form (including but not limited by visual inspection during any tour of the disclosing Party’s facilities or premises).

"Dissemination" means the disclosure of foreground by any appropriate means other than that resulting from the formalities for protecting it, and including the publication of foreground in any medium;

“Use” means the direct or indirect utilization of Foreground in further research activities other than those covered by the project, or for developing, creating and marketing a product or process, or for creating and providing a service. Direct utilization is done by the participant owning the Foreground (e.g. through further research or commercial or industrial exploitation in its own activities) while indirect utilization is done by other parties (e.g. through licensing).

3 PART 1 - Description of the dissemination measures

3.1 List of dissemination activities

Dissemination of project visions and results has huge importance in the DICONET project. The mentioned impact can be realized only if there is a large consensus among the scientific and industrial communities about the concepts, architecture and system investigated by the DICONET project.

In order to make the DICONET vision becoming a reality in the future, information about the proposed changes will be brought on to the research community and the decision-making actors in the market via several channels.

As a general tool for dissemination and in order to help in the communication, The DICONET factsheet has been produced and, at the same time, a poster presenting DICONET "at a Glance" was designed and printed.

3.1.1 International and National Conferences and Workshops

The dissemination activities that were performed or are planned by the project are in International and National Conferences and Workshops as shown in the table below and as well as in standard activities. Project results were and will be published through articles and papers at various international and national conferences and workshops. There are a huge number of such conferences, thus the partners keep a critical eye on the quality of these in order to make a qualified selection of appropriate conferences to participate at. The papers accepted and /or presented during those events are listed in the table on page 10.

The events that have been attended from the project start in January 2008 till end of June 2009 are

- OFC 2008 (March 2008 San Diego, USA)
- ICTON 2008 (June 2008 in Athens, Greece)
- CNSDSP 2008 (July 2008 in Graz, Austria)
- During ECOC 2008, (September 2008 in Brussels, Belgium) a workshop called “All-Optical versus OEO Networks” has been organized under the auspices of EU Network of Excellence BONE and the support of EU projects TRIUMPH & DICONET
- IEEE GLOBECOM 2008 (December 2008 in New-Orleans, USA)
- During ONDM 2009, (February 2009 in Braunschweig, Germany) DICONET sponsored a technical session (Session 6: Provision and physical layer impairments) that has been chaired by Matthias Gunkel, Deutsche Telekom, Germany
[http://www.ida.ing.tu-bs.de/noncms/ondm2009/schedule/final_program.php].
- OFC 2009 (March 2009 – in San Diego, USA)
- IEEE INFOCOM 2009 (April 2009 in Rio de Janeiro, Brazil)
- IEEE ICC 2009 (June 2009 in Dresden, Germany)
- ICTON 2009 (June 2009 - Island of São Miguel, Azores, Portugal)

The events that have been targeted in 2009 and where publications should be presented are:

- ECOC 2009 (September 2009 in Vienna, Austria) a symposium called “**Dynamic Multi-Layer Mesh Network ... Why, How, and When?**”
 - ✓ **Organizers:**
Sander Jansen, Nokia Siemens Networks
Yvan Pointurier, Athens Information Technology (AIT)
Brandon Collings, JDSU
 - ✓ **Abstract**
The ever-increasing demand for increased capacity and level of service at a lower cost are key drivers fueling the evolution of core optical networks from statically provisioned optical links interconnected with electronic switching and regeneration to more complex and flexible, optically switched mesh topologies with dynamic provisioning. The major advantages of these flexible networks include prompt and efficient system deployment and commissioning, removal of expensive and inflexible optical-electrical-optical equipment, and rapid wavelength and service provisioning. This evolution from point-to-point links to reconfigurable optical networks is enabled by many technologies, such as physical layer photonic cross connects to the control and management techniques such as GMPLS and multi-layer network design. This symposium will give an overview of the implementations, challenges and benefits of current and next generation dynamic multilayer optical mesh networks. Major network operators will detail their motivation to transition to dynamic multi-layer mesh networks and comment on the timeframe for such transitions. Component suppliers and network designers will describe current and future implementations and capabilities of these networks.
- BROADNETS 2009 (September 2009 in Madrid, Spain)
- GRIDNETS 2009 (September 2009 in Athens, Greece)
- IEEE GLOBECOM 2009 (December 2009 in Hawaii, USA)
- IEEE ANTS 2009 (December 2009 In New-Delhi, India)
- A special issue of IEEE Network is guest-edited by DICONET partners on the relevant topics

The consortium will keep a particular attention to the upcoming events: it will make its endeavor to present the DICONET vision and progress at any event organized in its technical domain of interest.

3.1.2 Dissemination at Concertation and Cluster Meetings

The DICONET project actively participates at Concertation and Cluster meetings arranged by EC. It allows the project to share his vision through the EC community

- The events that have been attended from the project start in January 2008 till end of June 2009 are
 - **The Future of Internet** – [www.fi-bled.eu/]
31 March – 4 April 2008, Bled, Slovenia
 - **ICT-Mobile Summit 2008** [http://www.ict-mobilesummit.eu/2008/]
10 - 12 June 2008, Stockholm, Sweden
 - The 2nd FP7-FP6 Concertation Meeting “**The Network of the Future**”
September 30 & October 1-2, 2008, Brussels, Belgium
 - **ICT-2008 Event**, 25-27 November 2008, Lyon, France
[http://ec.europa.eu/information_society/events/ict/2008/index_en.htm]

- **The Future of Internet** - [www.future-internet.eu/home/future-internet-assembly/madrid-dec-2008.html]
9 – 10 December 2008, Madrid, Spain
- **The 3rd Concertation Meeting of ICT-FP7-FP6** “The Network of the Future”
17 February, 2009, Brussels, Belgium
- **Future Internet Assembly** [www.fi-prague.eu/]
11-13 May 2009, Prague, Czech Republic
- **ICT-MobileSummit 2009** [<http://www.ict-mobilesummit.eu/2009/>]
10 - 12 June 2009, Santander, Spain

The events that will be attended in 2009 are targeted as follows:

- **The 4th FP7-FP6 Concertation meeting** “The Network of the Future”
29th September 2009, Brussels, Belgium
- **Future Internet Assembly** [www.fi-stockholm.eu]
23-24 November, Stockholm, Sweden

The provisional calendar for 2010 being not yet defined, the consortium will keep a particular attention to the upcoming events making its endeavor to present every time it will be possible the DICONET vision and progress.

3.1.3 Connections with Technology Platforms

Close collaboration with the European Technology Platforms (ETPs – e.g. NEM) and the various think-tanks (e.g. EIFFEL group) established by EU are fostered. Several partners and individual members of our consortium are closely following the activities of the ETPs and therefore assist in relevant dissemination.

Diconet has been represented in the FIRE and EIFFEL initiatives of the EC: Jean-Charles Point participated to the EIFFEL think tank meeting (Frankfurt, 30 September - 1 October 2008) and to the FIRE technical expert group meetings (Paris, 10-11 Sept 2008, Brussels 8-9 Jan 2009). A poster of Diconet activities has been presented during the 2008 NEM summit [<http://www.nem-summit.eu/>] held on 13-15 October 2008, Saint-Malo, France. Diconet will be also represented at **2009 NEM summit** [<http://www.nem-summit.eu/>] to be held in September 28-30, 2009, Saint-Malo, France so as the **2010 NEM summit** [date and location not yet available].

3.1.4 Dissemination through other relevant projects

The active communication and interactions with other EU and National projects are undertaken in order to promote the dissemination of the project activities and outcome.

The following close contacts with FP7 projects (BONE, COST-291, TRIUMPH, SARDANA, PHOSPHOROUS, NOBEL) and with other international projects (DRAGON, MANGO) are in an active status.

3.1.5 Publications, magazines etc

Relevant publications like technical magazines, IEEE transactions as well as newspapers are used to disseminate project visions and results. Though we focus on technical

publications, it is assumed to be quite as important to address commercial publication as well as those addressing the general public.

All partners contributed in the writing of a Press Release that can be found on the partners' websites, as well as on the Cordis website; in addition, independent publications expressed their intention to relay information about the DICONET project when results are concretised.

Publications that are prepared, proposed and or accepted are listed in the table below

Authors	Paper title/ Tutorial title	Name of journal, conference, etc.	Vol., no., pages, location	Date	Ref (Y/N)
I.Tomkos	Network Planning for Dynamic Impairment Constraint Optical Networking: The Activities of DICONET EU Project.	OFC/NFOEC 2008 Planning Tools for Transparent Optical and Multilayer Networks (OsUc) Workshop	N/A	24 Feb. 08	N
I.Tomkos, S. Azodolmolky, D. Klonidis, M.Angelou, K. Margariti	Dynamic Impairment Aware Networking for Transparent Mesh Optical Networks: Activities of EU project DICONET	ICTON 2008 (Conference)	Vol. 1, pp. 6-12. Athens, Greece	22-26 June 08	Y
T. Zami	Robustness of Quality of Transmission Estimators for IC- RWA to Uneven Channel Powers in Core Optical Networks	ICTON 2008	TuB1.3, Athens, Greece	22-26 June 2008,	N
D. Monogios, K. Vlachos	On the use of genetic algorithms for solving the RWA problem employing the maximum quantity of edge disjoint paths	ICTON 2008	Vol 3., pp 154-157 Athens, Greece	22-26 June 2008,	Y
K. Manousakis, K.Christodoulou os, E. Varvarigos	Avoiding Adjacent Channel Interference in Static RWA	CNSDSP 2008	pp. 552-556 Graz, Austria	23-25 July 2008,	Y

Authors	Paper title/ Tutorial title	Name of journal, conference, etc.	Vol., no., pages, location	Date	Ref (Y/N)
K.Christodouloupoulos, K.Manousakis, E. Varvarigos	Comparison of Routing and Wavelength Assignment Algorithms in WDM Networks	IEEE GLOBECOM 2008	ON04W1-2 New Orleans, U.S.A.,	30 Nov. – 3 Oct, 2008	Y
T. Zami, A. Morea, F. Leplingard, N. Brogard	The relevant impact of the physical parameters uncertainties when dimensioning an optical core transparent network	ECOC 2008	Paper Wed.3.D.2, Brussels, BELGIUM	24 Sept. 2008	N
I. Tomkos, S.Azodolmolky, M. Angelou, D. Klonidis, Y. Ye, C.V. Saradhi, E. Salvadori, A. Zanardi, R. Piesiewicz	Impairment Aware Networking and Relevant Resiliency Issues in All-Optical Networks	ECOC 2008	Vol.3, pp 183-186, Wed.3.D.1, Brussels, BELGIUM	24 Sept. 2008	N
K.Christodouloupoulos, K. Manousakis, E. A. Varvarigos M. Angelou, I. Tomkos	A Multicost Approach to Online Impairment-Aware RWA	IEEE ICC 2009	To appear Dresden, Germany	Jun 14-18, 2009,	Y
K. Vlachos A. Siokis	A Service-Transparent and Self-Organized Optical Network Architecture	IEEE ICC 2009	To appear Dresden, Germany	Jun 14-18, 2009,	N
K. Vlachos, D. Monoyios, M. Angelou, I. Tomkos	On the use of Multi-Objective Optimization Algorithms for solving the Impairment Aware-RWA problem	IEEE ICC 2009	To appear Dresden, Germany	Jun 14-18, 2009,	Y
S. Azodolmolky, Y. Pointurier, M. Angelou, J. Solé Pareta, and I. Tomkos	An Offline Impairment Aware RWA Algorithm with Dedicated Path Protection Consideration	IEEE/OSA Optical Fiber Communication Conference (OFC)	San Diego, CA, USA	24-26 March 2009	Y
K. Manousakis, K.Christodouloupoulos, E. Varvarigos	Impairment-Aware Offline RWA for Transparent Optical Networks	IEEE INFOCOM 2009	To appear Rio De Janeiro, Brazil	April 19-25, 2009,	Y

Authors	Paper title/ Tutorial title	Name of journal, conference, etc.	Vol., no., pages, location	Date	Ref (Y/N)
S. Azodolmolky M. Klinkowski E. Marin D. Careglio, J. Solé Pareta, I. Tomkos	A Survey on Physical Layer Impairments Aware Routing and Wavelength Assignment Algorithms in Optical Networks	Computer Network journal	Volume 53, Issue 7, Pages 926- 944	May 2009	Y
M. Yannuzzi, M. Quagliotti, G. Maier, E. Marín-Tordera, X. Masip-Bruin, S. Sánchez-López, J. Solé-Pareta, W. Erangoli, G. Tamiri	Performance of translucent optical networks under dynamic traffic and uncertain physical- layer information	13th International Conference on Optical Networking Design and Modeling (ONDM 2009)	Braunschwei g, Germany	18-20 February 2009	Y
V. S. Chava S. Subramaniam	Physical Layer Impairment Aware Routing (PLIAR) in WDM Optical Networks: Issues and Challenges	IEEE Communication s Society Surveys and Tutorials	To appear	2009	Y
V. S. Chava A. Zanardi, S. Dalsass, E. Salvadori and R. Piesiewicz	Performance of Impairment Aware End-to-End Failure Recovery in Transparent WDM Optical Networks	IEEE/OSA Optical Fiber Communication Conference (OFC)	To appear	24-26 March 2009	Y
F. Leplingard, A. Morea, T. Zami, N. Brogard	Interest of an Adaptive Margin for the Quality of Transmission Estimation for Lightpath Establishment	IEEE/OSA Optical Fiber Communication Conference (OFC)	San Diego, CA, USA	24-26 March 2009	Y
S. Azodolmolky, M. Klinkowski, E. Marin, D. Careglio, J. Solé-Pareta, Y. Pointurier, M. Angelou, I. Tomkos	On The Offline Physical Layer Impairment Aware RWA Algorithms in Transparent Optical Networks: State-of- the-Art and Beyond	13th International Conference on Optical Networking Design and Modeling (ONDM 2009) [invited paper]	Braunschwei g, Germany	18-20 February 2009	Y
A. Morea, T. Zami, F. Leplingard	Introduction of Confidence Levels for Transparent Network Planning	ECOC'2009	Vienna, Austria	Sept. 2009	

Authors	Paper title/ Tutorial title	Name of journal, conference, etc.	Vol., no., pages, location	Date	Ref (Y/N)
V. S. Chava , E. Salvadori, A. Zanardi, S. Dalsass, R. Piesiewicz, I. Tomkos.	Control Plane Issues in Cross-layer Optimized Dynamic Optical Networks	ICTON'2009 [invited]	Azores, Portugal	Jun/July 2009	Y
V. S. Chava , E. Salvadori, A. Zanardi, S. Dalsass, R. Piesiewicz.	Impairment aware GMPLS-based control plane architectures to realize dynamically reconfigurable transparent optical networks	Photonics in Switching	Pisa, Italy	Sept. 2009	Y
V. S. Chava , E. Salvadori, A. Zanardi, S. Dalsass, R. Piesiewicz.	Hybrid control plane architecture for dynamic impairment-aware routing in transparent optical networks	Photonics in Switching	Pisa, Italy	Sept. 2009	Y
N. Sambo, Y. Pointurier, F. Cugini, P. Castoldi, I. Tomkos	Lightpath establishment in PCE-based dynamic transparent optical networks assisted by end-to-end Quality of Transmission estimation	ICTON 2009	Azores, Portugal	Jun. 2009	N
N. Sambo, Y. Pointurier, F. Cugini, L. Valcarenghi, P. Castoldi, I. Tomkos	Lightpath establishment in distributed transparent dynamic optical networks using network kriging	ECOC 2009	Vienna, Austria	Oct. 2009	Y
I. Tomkos	Impairment aware dynamic optical circuit switched networks	Photonics in Switching	Pisa, Italy	Sept. 2009	N
D. Staessens, D. Colle, M. Pickavet, P. Demeester	Cost efficiency of protection in future transparent networks	ICTON2009	Azores, Portugal	June 2009	Y

Authors	Paper title/ Tutorial title	Name of journal, conference, etc.	Vol., no., pages, location	Date	Ref (Y/N)
D. Staessens, D. Colle, M. Pickavet, P. Demeester	Dissemination of Monitoring Information in Transparent Optical Networks	ECOC2009	Vienna, Austria	September 2009	Y
D. Staessens, D. Colle, M. Pickavet, P. Demeester	Dissemination of Impairment Monitoring Information in PCE- routed Optical Networks	Globecom 2009	Honolulu, Hawaii	Nov-Dec, 2009	Y
K.Christodoulopoulos, K. Manousakis, E. Varvarigos, M. Angelou	Considering Physical Layer Impairments in Offline RWA	IEEE Network Magazine, Special Issue on: "Protocols and Algorithms for Future Cross-Layer and Hybrid Optical Networks"			Y
K. Manousakis, K. Kamitsas, K.Christodoulopoulos, I. Tomkos, E. Varvarigos	Offline Impairment Aware Routing and Wavelength Assignment Algorithms in Translucent WDM Networks	IEEE/OSA Journal of Lightwave Technology			Y

The list of scientific (Peer reviewed) publications is available page 18

3.1.6 Project Website

This Diconet website (www.DICONET.eu) has been set up just after the kick off meeting and was officially delivered to the EC (Deliverable D7.0) in January, 2008. This website that is regularly updated with all public information is intended to facilitate contacts and exchanges with other research and industrial initiatives on the relevant topics. This web site is continuously being kept updated about general public project information, public deliverables and other results that may interest the public. Our intention is to present valuable information about the general news in the area, the events in the domain and the important headings of the European Commission and other related projects.

3.1.7 Liaison and dissemination in the appropriate standard bodies

See the "Control Plane Extensions and Standardization (T7.2)" document provide as Annex 1 to this report.

3.1.8 Universities and colleges

In total 7 of the partners in the project have close relations to university and colleges. These partners ensure that project visions and results are disseminated among educational staff and students. The intention is that project ideas are included in different training activities as student projects, incorporation into lectures etc.

AIT hired 2 Ph.D. students specifically to participate in the DICONET project (including 1 female student) and 3 M.S. students, 2 of which will write a thesis on a topic directly related to DICONET, and 1 will participate in DICONET as a research assistant supervised by AIT faculties. In addition, outcomes and issues of the DICONET project were presented to the student body during a research seminar, and a faculty from AIT will hold a session on the DICONET topics during the EUROFOS summer school on July 9, 2009.

UESSEX assigned two research staffs in the DICONET project. One of whom is dedicated for the project. The DICONET project was well presented to the large amount of visitors of undergraduate students of the school, internal and external scholars, and university exchanging and industry researchers.

3.2 *Partner internal dissemination*

All partners in the project will disseminate project results internally in their organizations (through their own communication tools: newsletter, website, ...)

3.3 list of scientific (peer reviewed) publications

LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES

NO.	Title	Main author	Number, date or frequency	Publisher	Year of publication
1	A Survey on Physical Layer Impairments Aware Routing and Wavelength Assignment Algorithms in Optical Networks Elsevier	S. Azodolmolky, M. Klinkowski, E. Marin, D. Careglio, J. Sole-Pareta, I. Tomkos	ISSN: 138 -1286	Elsevier	
2	A Dynamic Impairment Aware Networking Solution for Transparent Mesh Optical Networks	Siamak Azodolmolky, Dimitris Klonidis, Ioannis Tomkos, Yabin Ye, Chava Vijaya Saradhi, Elio Salvadori, Matthias Gunkel, K. Manousakis, K. Vlachos, and E. Varvarigos, Reza Nejabati, Dimitra Simeonidou, Michael Eiselt, Jaume Comellas, Josep Solé-Pareta, Christian Simonneau, Dominique Bayart, Dimitri Staessens,		IEEE Communication Magazine	2009

		Didier Colle, Mario Pickavet			
3	Offline Impairment Aware RWA Algorithms for Cross-Layer Planning of Optical Networks	P. Pavon-Mariño, S. Azodolmolky, R. Aparicio-Pardo, B. Garcia-Manrubia, Y. Pointurier, M. Angelou, J. Solé Pareta, J. Garcia Haro, I. Tomkos			
4	Robustness of Quality of Transmission Estimators for IC-RWA to Uneven Channel Powers in Core Optical Networks	Thierry Zami		ICTON 2008 (Conference)	2008
5	Avoiding Adjacent Channel Interference in Static RWA	K. Manousakis, K.Christodouloupoulos, E. Varvarigos		CNSDSP 2008 (Conference)	2008
6	The relevant impact of the physical parameters uncertainties When dimensioning an optical core transparent network	Thierry Zami, Annalisa Morea, Florence Leplingard, Nicolas Brogard		ECOC 2008	2008
7	Comparison of Routing and Wavelength Assignment Algorithms in WDM Networks	K.Christodouloupoulos, K. Manousakis, E. Varvarigos		IEEE GLOBECOM 2008 (Conference)	2008
8	A Survey on Physical Layer Impairments Aware Routing and Wavelength Assignment Algorithms in Optical Networks	S. Azodolmolky, M. Klinkowski, E. Marin, D. Careglio, J. Sole-Pareta, I. Tomkos	ISSN: 1381286	Computer Networks (Elsevier)	
9	Interest of an Adaptive Margin for the Quality of Transmission Estimation for Lightpath Establishment	Florence Leplingard, Annalisa Morea, Thierry Zami, Nicolas Brogard		IEEE Communications Society Surveys and Tutorials	
10	Physical Layer Impairment Aware Routing (PLIAR) in WDM Optical Networks: Issues and Challenges	Chava Vijaya Saradhi and Suresh Subramaniam		OFC 2009	2009
11	Performance of Impairment Aware End-to-End Failure Recovery in Transparent WDM Optical Networks	Chava Vijaya Saradhi, Andrea Zanardi, Sergio Dalsass, Elio Salvadori, and		OFC/NFOEC 2009	2009

		Radoslaw Piesiewicz			
12	An Offline Impairment Aware RWA Algorithm with Dedicated Path Protection Consideration	Siamak Azodolmolky, Yvan Pointurier, Marianna Angelou, Josep Sole-Pareta, Ioannis Tomkos		IEEE INFOCOM 2009	2009
13	Impairment-Aware Offline RWA for Transparent Optical Networks	K. Manousakis, K.Christodouloupoulos, E. Varvarigos		IEEE ICC 2009	2009
14	On the use of Multi-Objective Optimization Algorithms for solving the Impairment Aware-RWA problem	K. Vlachos, D. Monogios, M. Angelou, I. Tomkos		IEEE ICC 2009	2009
15	A Multicost Approach to Online Impairment-Aware RWA	K. Christodouloupoulos, K. Manousakis, E. Varvarigos, M. Angelou, I. Tomkos		The Future of the Internet Conference, Prague, Czech Republic, May 2009	
16	DICONET: future generation transparent networking with dynamic impairment awareness	I. Tomkos, Y. Pointurier, S. Azodolmolky, M. Eiselt, T. Zami, R. Piesiewicz, C.V. Saradhi, M. Gunkel, U. Mahlab, M. Chen, Y. Ye, M. Pickavet, M. Gagnaire, E. Varvarigos, J. Solé-Pareta, R. Nejabati, Y. Qin, and D. Simeonidou		IEEE Communication Magazine	
17	A Dynamic Impairment Aware Networking Solution for Transparent Mesh Optical Networks	Siamak Azodolmolky, Dimitris Klonidis, Ioannis Tomkos, Yabin Ye, Chava Vijaya Saradhi, Elio Salvadori, Matthias Gunkel, K. Manousakis, K. Vlachos, and E. Varvarigos, Reza Nejabati, Dimitra Simeonidou, Michael Eiselt, Jaume Comellas, Josep Solé-Pareta, Christian Simonneau,		IEEE Network Magazine, Special Issue on: "Protocols and Algorithms for Future Cross-Layer and Hybrid Optical Networks"	

		Dominique Bayart, Dimitri Staessens, Didier Colle, Mario Pickavet			
18	Considering Physical Layer Impairments in Offline RWA	K. Christodoulopoulos, K. Manousakis, E. Varvarigos, M. Angelou		IEEE Network Magazine, Special Issue on: "Protocols and Algorithms for Future Cross Layer and Hybrid Optical Networks"	
19	Offline Impairment Aware Routing and Wavelength Assignment Algorithms in Translucent WDM Networks	K. Manousakis, K. Kamitsas, K. Christodoulopoulos, I. Tomkos, E. Varvarigos		IEEE/OSA Journal of Lightwave Technology	
20	Offline Impairment Aware RWA Algorithms for Cross-Layer Planning of Optical Networks	P. Pavon-Mariño, S. Azodolmolky, R. Aparicio-Pardo, B. Garcia-Manrubia, Y. Pointurier, M. Angelou, J. Solé Pareta, J. Garcia Haro, I. Tomkos		IEEE Communication Magazine	

PART 2 - Specifications of the exploitable foreground

This section provides the plans for exploitation. **It will be kept confidential** and will be treated as such by the Commission.

3.4 List of applications for patents, trademarks, registered designs, etc.

Type of IP Rights: Patents, Trademarks, Registered designs, Utility models, etc.	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant (s) as on the application)
<p>No Patents, Trademarks, ..., information available for the time being. Information to be updated in a revised version to be provided asap.</p>			

Forecasted activities including exploitable foreground

JCP

JCP, in charge of the management part of the project, does not perform any technical activity and as such has no particular exploitable foreground to report on.

AIT

AIT will evaluate the potential to establish a start-up company based on the DICONET results and the techno-economic study. In particular, AIT will evaluate what parts of DICONET can be used as a basis for a start-up company, and where additional work will be needed to reach this goal. AIT will write a business-plan for this potential start-up company.

Create-NET

Create-Net will exploit the expertise built during this project to have some collaborations with industry and future EC projects. CN will also build an emulator with the results from DICONET project to demonstrate the need for impairment-aware GMPLS control plane.

ENST/IT

Information to be updated in a revised version to be provided asap.

HUAWEI

As one of the telecommunication equipment vendors, Huawei is interested in exploring the latest research results from DICONET project to either develop new products or improve current products with new functions. Specially, Huawei is the task leader of T7.2 on standardizations and we will actively contribute to control plane standardization bodies by proposing the most important results from Diconet project WP2 and WP5. Though Huawei is not actively involved in WP4, the output on IA-RWA and failure localization algorithms will help the company's network planning software and management system. The Technoeconomic studies in T7.3 could also help us to optimize the cost by considering both CAPEX and OPEX in the network.

IBBT

One of the objectives in the mission of IBBT is to train highly competent specialists in different domains of broadband technology in order to support and strengthen the Flemish industry, government and international position. The knowledge gained through the DICONET project clearly falls within the technological competence domains.

Up till now, already one PhD student is involved in DICONET: the dissertation that will come out will cover issues directly related to DICONET. In addition, one project engineer and three post-doc researchers are involved and thus gained knowledge on DICONET related issues. Through internal discussions and brainstorming with these people, a few other persons became aware on the technical content of DICONET.

On a longer-term, the IBCN research group (part of IBBT) will include this expertise in the master courses it is responsible for at Ghent University: the courses “Communicatienetwerken” (3rd bachelor year in Computer Science Engineering and Electro-technical Engineering and in Informatics) and “Multimedianeetwerken” (1st master year) reaching yearly around 80 students are the best candidates for integrating the knowledge gained through the DICONET project. This opens the opportunity for further training of professionals in this field and possibly starting other PhDs in this area.

In addition to the creation of human capital, IBBT actively participates in the dissemination of the project results meanwhile increasing its international visibility. IBBT will also seek opportunities for applying the knowledge gained through the DICONET projects in future international and national research collaborations and with industry.

IBBT will also investigate opportunities for exploiting the PCE implementation developed by IBBT within the DICONET project. One possibility might be to make part of the implementation open source, facilitating collaborations with others on PCE-related issues and/or further completing the implementation.

RACTI

Selected results from the research in DICONET will be used for updating the material of existing courses and for organizing short courses for PhD students on related topics. The enhanced knowledge and competence obtained through the participation in the DICONET project, will be exploited and used for participating in new EU projects and setting up partnerships in other EU projects.

UESSEX

UESSEX will exploit the expertise gained throughout the DICONET which includes the knowledge of different fields learned from other partners during collaboration, a universal HW/SW acceleration platform and various IP cores. These will be used directly in the future research activities, e.g. EU and national projects, collaboration with industry and university/institute.

UPC

The successive results obtained by UPC during the project will lead to scientific and technical publications which can stimulate the demand for the DICONET explored technologies. On the other hand and even considering that we are a non-profit organization, UPC is open to collaborate with companies which would be interested in the exploitation of DICONET results, always taking into account the project IPR rules. As GMPLS controlled networks seem to be in a pre-commercial stage, it is foreseeable to get some co-operation agreements with companies interested in the development of the DICONET outputs. On the other hand, the experimental results obtained during the project, are expected to give us the opportunity of clearly improve our publication record. From the academic point of view, UPC will pay attention to include selected results from the research activities in University curricula in order to prepare the next generation of skilled scientist/engineers. This will be achieved, for example, by updating the material of existing courses with results coming from the project and by organizing short courses for PhD students on specific topics. This is of great importance in order to guarantee continuity, to educate the next generation of skilled engineers as well as to foster a long-term, sustainable technological lead and excellence within European Union.

ADVA

Within ADVA Optical Networking, there are two main application areas of the DICONET results. First, ADVA is involved in the more physical layer oriented work packages of the project. Measurements have been performed in the framework of the project, and numerical simulations have been carried out, which mainly gave input to the evaluation of the Q-tool developed within the project. The knowledge, data and experience gained during this project will help ADVA's systems engineering group to explore the limits of ADVA's products and to expand the specification of optical systems. This, in turn, will make ADVA's products more attractive to customers and will allow a more cost efficient use of the optical transport systems.

Secondly, while ADVA is not actively involved in work packages 4 and 5, the knowledge base on IA-RWA and G-MPLS extension, which is generated in the course of the project, will still be used during current control plane development projects within the company.

DTAG

As an incumbent network operator Deutsche Telekom (DT) is interested in latest research on how to build future optical transport networks. Hereby, DT focuses on transparent networking enabling cost savings both in terms of CapEx and OpEx. With near future Optical Transport Networks (OTN) flexible transport and service delivery is foreseen. Several key questions of the design of these networks are currently under research of the Diconet partners. With the knowledge base of work packages 4, 5 and 7.3, guidelines for DT's transparent network topologies and architectures will be derived under the evaluation of techno-economic constraints. The jointly achieved project foreground of work package 4 will be further evaluated by internal network groups which are responsible for network architectures, migration scenarios and the strategic decision making process. Furthermore, the foreground may be exploited by DT internal software engineering groups to define and assemble improved high-performance interfaces to existing management systems.

The experience gained in joint laboratory or testbed experiments will seamlessly influence future network equipment roll-outs. Finally, DT influences and actively contributes to standardization bodies reflecting the main outcomes of the Diconet project.

ALF

Alcatel-Lucent's Bell Labs in France participate in the European DICONET project with its "Optical Network" research domain. In collaboration with universities, telecommunication operators and other equipment vendors, Alcatel-Lucent provides guidance on optical channel monitoring technologies and associated experimental characterizations. Thus Alcatel-Lucent conducts experiments on the physical layer architectures defined in the project to meet the requirements of dynamic and transparent networks. These results will feed the future physical impairment-aware control plane. These studies complete the internal Alcatel-Lucent's Bell Labs studies in order to achieve the three main key goals that are : more transmitted capacity, more transparency to be more flexible and less power-consuming and more automation. All these results will be helpful to establish the engineering rules of the next "Zero touch" Alcatel-Lucent's optical network, meaning that the network should be able to provision new connections, tear down existing connections and trigger the protection/restoration processes without any human intervention.

ECI

ECI is the leader of WP7 which is the dissemination and exploitation of DICONET outcomes. In general the marketing department in ECI is aware of the activities done in DICONET and as such when relevant ECI customer visits ECI premises they are exposed to DICONET project goals and its current achievements.

Some of ECI contributions to DICONET were focus on the optical monitoring issue. This issue will be extremely important mainly when we will shift to 100Gbps networks which are going to be in the near future. For this bit rate a further investigation of monitoring technique will be mandatory. This investigation will be based on the activities done in DICONET under WP3 on optical channel monitoring technologies as well as to use them for the dynamic and transparent networks. .

ECI may use the results provided by the research done in the universities toward the IA-WRA algorithm, and the research that will be done in failure localization algorithm for network planning software and management system.

The cost is also an important issue and via the techno economic studies in T7.3 an additional perspective will be provided on this issue mainly to optimize the cost by considering the network's CAPEX and OPEX.

3.5 Intermediate report on societal implications

Replies to the following questions will assist the European Commission to obtain statistics and indicators on societal and socio-economic issues addressed by projects. The questions are arranged in a number of key themes. As well as producing certain statistics, the replies will also help identify those projects that have shown a real engagement with wider societal issues, and thereby identify interesting approaches to these issues and best practices. The replies for individual projects will not be made public.

A General Information		
Grant Agreement Number:	216338	
Title of Project:	DICONET	
Name and Title of Coordinator:	POINT Jean-Charles, Ceo, JCP-Consult	
B Ethics		
1. Did you have ethicists or others with specific experience of ethical issues involved in the project?	<input type="radio"/>	Yes
	<input checked="" type="radio"/>	No
2. Please indicate whether your project involved any of the following issues (tick box) :		
INFORMED CONSENT		
• Did the project involve children?	-	
• Did the project involve patients or persons not able to give consent?	-	
• Did the project involve adult healthy volunteers?	-	
• Did the project involve Human Genetic Material?	-	
• Did the project involve Human biological samples?	-	
• Did the project involve Human data collection?	-	
RESEARCH ON HUMAN EMBRYO/FOETUS		
• Did the project involve Human Embryos?	-	
• Did the project involve Human Foetal Tissue / Cells?	-	
• Did the project involve Human Embryonic Stem Cells?	-	
PRIVACY		
• Did the project involve processing of genetic information or personal data (eg. health, sex, lifestyle, ethnicity, political opinion, religious or philosophical conviction)	-	
• Did the project involve tracking the location or observation of people?	-	
RESEARCH ON ANIMALS		
• Did the project involve research on animals?	-	
• Were those animals transgenic small laboratory animals?	-	
• Were those animals transgenic farm animals?	-	
• Were those animals cloning farm animals?	-	
• Were those animals non-human primates?	-	
RESEARCH INVOLVING DEVELOPING COUNTRIES		
• Use of local resources (genetic, animal, plant etc)	-	
• Benefit to local community (capacity building ie access to healthcare, education etc)	-	
DUAL USE		
• Research having potential military / terrorist application	-	

C Workforce Statistics - JCP		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader	1	1
Experienced researcher (i.e. PhD holders)		
PhD Students		
Other	1 (legal matters)	
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		
Of which, indicate the number of men:		
Of which, indicate the number of Women:		
D Gender Aspects		
5 Did you carry out specific Gender Equality Actions under the project?	<input type="radio"/>	Yes
	<input checked="" type="radio"/>	No
6 Which of the following actions did you carry out and how effective were they?		
	Not at effec	Very effective
<input type="checkbox"/> Design and implement an equal opportunity policy	X	○ ○ ○ ○ ○
<input type="checkbox"/> Set targets to achieve a gender balance in the workforce	X	○ ○ ○ ○ ○
<input type="checkbox"/> Organise conferences and workshops on gender	X	○ ○ ○ ○ ○
<input type="checkbox"/> Actions to improve work-life balance	X	○ ○ ○ ○ ○
<input type="radio"/> Other: <input style="width: 200px;" type="text"/>		
7 Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?		
<input type="radio"/> Yes- please specify <input style="width: 150px;" type="text"/>		
<input checked="" type="radio"/> No		

C Workforce Statistics - AIT		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		1
Work package leader		1
Experienced researcher (i.e. PhD holders)		2
PhD Students	1	1
Other	1	2
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		3
Of which, indicate the number of men:		2
Of which, indicate the number of Women:		1

C Workforce Statistics – Create-NET		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader		1
Experienced researcher (i.e. PhD holders)		1
PhD Students		
Other		2
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		
Of which, indicate the number of men:		2
Of which, indicate the number of Women:		

C Workforce Statistics – ENST		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		1
Work package leader		
Experienced researcher (i.e. PhD holders)	2	
PhD Students		
Other		
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		
Of which, indicate the number of men:		
Of which, indicate the number of Women:		

C Workforce Statistics – Huawei		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader		
Experienced researcher (i.e. PhD holders)		2
PhD Students		
Other		3
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		
Of which, indicate the number of men:		2
Of which, indicate the number of Women:		

C Workforce Statistics – IBBT		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		1
Work package leader		1
Experienced researcher (i.e. PhD holders)	1	2
PhD Students		1
Other		1
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		
Of which, indicate the number of men:		
Of which, indicate the number of Women:		

C Workforce Statistics – RACTI		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		1
Work package leader		1
Experienced researcher (i.e. PhD holders)		3
PhD Students		4
Other		
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		
Of which, indicate the number of men:		
Of which, indicate the number of Women:		

C Workforce Statistics – Uessex		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader		
Experienced researcher (i.e. PhD holders)	1	1
PhD Students		
Other		2
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		1
Of which, indicate the number of men:		1
Of which, indicate the number of Women:		

C Workforce Statistics –UPC		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader		1
Experienced researcher (i.e. PhD holders)	1	3
PhD Students		2
Other		
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		0
Of which, indicate the number of men:		
Of which, indicate the number of Women:		

C Workforce Statistics - ADVA		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader		
Experienced researcher (i.e. PhD holders)		2
PhD Students		
Other		3
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		2
Of which, indicate the number of men:		2
Of which, indicate the number of Women:		

C Workforce Statistics - DTAG		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		1
Work package leader		
Experienced researcher (i.e. PhD holders)		1
PhD Students		
Other		
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		0
Of which, indicate the number of men:		
Of which, indicate the number of Women:		

C Workforce Statistics - ALF		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader		
Experienced researcher (i.e. PhD holders)	1	2
PhD Students		
Other		
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		
Of which, indicate the number of men:		
Of which, indicate the number of Women:		

C Workforce Statistics - ECI		
3 Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).		
Type of Position	Number of Women	Number of Men
Scientific Coordinator		
Work package leader		
Experienced researcher (i.e. PhD holders)		3
PhD Students		
Other	1	2
4 How many additional researchers (in companies and universities) were recruited specifically for this project?		0
Of which, indicate the number of men:		
Of which, indicate the number of Women:		

E Synergies with Science Education -		
8	Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?	
	<input type="radio"/> Yes- please specify <input style="width: 150px; height: 20px;" type="text"/>	
	<input checked="" type="radio"/> No	
9	Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVD)	
	<input type="radio"/> Yes- please specify <input style="width: 150px; height: 20px;" type="text"/>	
	<input checked="" type="radio"/> Not Yet	
F Interdisciplinarity		
10	Which disciplines are involved in your project? [See drop –down menus]	
	<input checked="" type="checkbox"/> Main discipline	
	<input type="radio"/> Associated discipline [Menu]	<input type="radio"/> Associated discipline [Menu]
G Engaging with Civil society and policy makers		
11a	Did your project engage with societal actors beyond the research community? (if 'No', go to Question 14)	<input type="radio"/> Yes <input checked="" type="radio"/> No
11b	If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?	
	<input type="radio"/> No	
	<input type="radio"/> Yes- in determining what research should be performed	
	<input type="radio"/> Yes - in implementing the research	
	<input type="radio"/> Yes, in communicating /disseminating / using the results of the project	
11c	In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	<input type="radio"/> Yes <input type="radio"/> No
12	Did you engage with government / public bodies or policy makers (including international organisation)	
	<input type="radio"/> No	
	<input type="radio"/> Yes- in framing the research agenda	
	<input type="radio"/> Yes - in implementing the research agenda	
	<input type="radio"/> Yes, in communicating /disseminating / using the results of the project	
13a	Will the project generate outputs (expertise or scientific advice) which could be used by policy makers	
	<input type="radio"/> Yes – as a primary objective (please indicate areas below- multiple answers possible)	
	<input type="radio"/> Yes – as a secondary objective (please indicate areas below - multiple answer possible)	
	<input type="radio"/> No	
13b	If Yes, in which fields?	

Agriculture Audiovisual and Media Budget Competition Consumers Culture Customs Development Economic Monetary Affairs Education, Training, Youth Employment and Social Affa	Energy Enlargement Enterprise Environment External Relations External Trade Fisheries and Maritime Affa Food Safety Foreign and Security Policy Fraud Humanitarian aid	Human rights Information Society Institutional affairs Internal Market Justice, freedom and security Public Health Regional Policy Research and Innovation Space Taxation Transport	
13c If Yes, at which level? <input type="radio"/> Local / regional levels <input type="radio"/> National level <input type="radio"/> European level <input type="radio"/> International level			
H Use and dissemination			
14 How many Articles were published/accepted for publication in peer-reviewed journals?	20		
15 How many new patent applications (“priority filings”) have been made? <i>("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).</i>	/		
16 Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark		
	Registered design		
	Other		
17 How many spin-off companies were created / are planned as a direct result of the project? <i>Indicate the approximate number of additional jobs in these companies</i>			
18 Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project: <input type="checkbox"/> Increase in employment, or <input type="checkbox"/> Safeguard employment, or <input type="checkbox"/> Decrease in employment, <input checked="" type="checkbox"/> Difficult to estimate / not possible to quantify	<input type="checkbox"/> In small & medium-sized enterprises <input type="checkbox"/> In large companies <input type="checkbox"/> None of the above / not relevant to the project		
19 For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (FTE = one person working full for a year) jobs: Difficult to estimate / not possible to quantify	<i>Indicate figure:</i> <input type="checkbox"/>		

I Media and Communication to the general public	
20	As part of the project, were any of the beneficiaries professionals in communication or media relations <input type="radio"/> Yes <input checked="" type="radio"/> No
21	As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public? <input type="radio"/> Yes <input checked="" type="radio"/> No
22	Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?
<input checked="" type="checkbox"/> Press Release	<input checked="" type="checkbox"/> Coverage in specialist press
<input type="checkbox"/> Media briefing	<input checked="" type="checkbox"/> Coverage in general (non-specialist) press
<input type="checkbox"/> TV coverage / report	<input type="checkbox"/> Coverage in national press
<input type="checkbox"/> Radio coverage / report	<input type="checkbox"/> Coverage in international press
<input checked="" type="checkbox"/> Brochures /posters / flyers	<input checked="" type="checkbox"/> Website for the general public / internet
<input type="checkbox"/> DVD /Film /Multimedia	<input checked="" type="checkbox"/> Event targeting general public (festival, conference, exhibition, science café)
23	In which languages are the information products for the general public produced?
<input type="checkbox"/> Language of the coordinator	<input checked="" type="checkbox"/> English
<input type="checkbox"/> Other language(s)	

Question 10: Drop down menu will include the Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES

- 1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]
- 1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)
- 1.3 Chemical sciences (chemistry, other allied subjects)
- 1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)
- 1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2. ENGINEERING AND TECHNOLOGY

- 2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)
- 2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]
- 2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

- 3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)
- 3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)
- 3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

- 4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)
- 4.2 Veterinary medicine

5. SOCIAL SCIENCES

- 5.1 Psychology
- 5.2 Economics
- 5.3 Educational sciences (education and training and other allied subjects)
- 5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organization and methods, miscellaneous social sciences and interdisciplinary, methodological and historical SIT activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

- 6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, paleography, genealogy, etc.)
- 6.2 Languages and literature (ancient and modern)
- 6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and

- End of document -