THEME [Fission-2013-3.4.1]
[Support to the strengthening of pan-European research initiatives on the impact of radiation on the environment, including the food chain and the protection of non-human species]

Grant agreement for: Combination of CP & CSA*

Annex I - "Description of Work"

Project acronym: COMET

Project full title: " COordination and iMplementation of a pan-European instrumenT for radioecology "

Grant agreement no: 604974

Version date:

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Part A

Workplan Tables

A1:
Project summary

Project Number [1]	604974	Project Acronym [2]	COMET

One form per project

General information

Project title [3]	COordination and iMplementation of a pan-European instrumenT for radioecology		
Starting date [4]	01/06/2013		
Duration in months [5]	48		
Call (part) identifier [6]	FP7-Fission-2013		
Activity code(s) most relevant to your topic [7]	Fission-2013-3.4.1: Support to the strengthening of pan-European research initiatives on the impact of radiation on the environment, including the food chain and the protection of non-human species		
Free keywords [8]		Pan-European platform, Mechanisms for Joint Programming and Implementation, Radioecology, Post-accident Management, Low Dose Risk Research, Observatories, Accident Sites	

Abstract [9]

COMET will strengthen the pan-European research initiative on the impact of radiation on man and the environment by facilitating the integration of radioecological research. COMET will build upon the foundations laid by the European Radioecology Alliance (ALLIANCE) and the on-going FP7 STAR Network of Excellence in radioecology. By collaborating with the European platforms on nuclear and radiological emergency response (NERIS) and low dose risk research (MELODI), COMET will significantly aid preparation for the implementation of the Horizon 2020 umbrella structure for Radiation Protection.

In close association with STAR and the ALLIANCE, COMET will take forward the development of a Strategic Research Agenda as the basis for developing innovative mechanisms for joint programming and implementation (JPI) of radioecological research. To facilitate and foster future integration under a common federating structure, research activities developed within COMET will be targeted at radioecological research needs that will help achieve priorities of the NERIS and MELODI platforms. These research activities will be initiated in collaboration with researchers from countries where major nuclear accidents have occurred. Flexible funds, unallocated to specific tasks at project initiation, have been included within the COMET budget to facilitate RTD activities identified through the JPI mechanisms developed that are of joint interest to the ALLIANCE, NERIS and MELODI. It will also strengthen the bridge with the non-radiation community. Furthermore, COMET will develop strong mechanisms for knowledge exchange, dissemination and training to enhance and maintain European capacity, competence and skills in radioecology.

The COMET consortium has 13 partners, expanding from the organisations within the FP7 STAR project. In particular, COMET partners from countries which have experienced major nuclear accidents (i.e. Ukraine and Japan) and/or who hold Observatory sites.

A2:
List of Beneficiaries

Project Number [1]	604974	Project Acronym [2]	COMET

List of Beneficiaries

No	Name	Short name	Country	Project entry month[10]	Project exit month
1	STUDIECENTRUM VOOR KERNENERGIE	SCK•CEN	Belgium	1	48
2	SATEILYTURVAKESKUS	STUK	Finland	1	48
3	NORWEGIAN RADIATION PROTECTION AUTHORITY	NRPA	Norway	1	48
4	INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	IRSN	France	1	48
5	NATURAL ENVIRONMENT RESEARCH COUNCIL	NERC	United Kingdom	1	48
6	CENTRO DE INVESTIGACIONES ENERGETICAS, MEDIOAMBIENTALES Y TECNOLOGICAS-CIEMAT	CIEMAT	Spain	1	48
7	STOCKHOLMS UNIVERSITET	SU	Sweden	1	48
8	BUNDESAMT FUER STRAHLENSCHUTZ	BFS	Germany	1	48
9	UNIVERSITETET FOR MILJO OG BIOVITENSKAP	UMB	Norway	1	48
10	GLOWNY INSTYTUT GORNICTWA	GIG	Poland	1	48
11	STATE SCIENTIFIC AND RESEARCH INSTITUTION CHORNOBYL CENTER FOR NUCLEAR SAFETY RADIOACTIVE WASTE AND RADIOECOLOGY	Chornobyl Center	Ukraine	1	48
12	NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE	NUBIP	Ukraine	1	48
13	NATIONAL UNIVERSITY CORPORATION FUKUSHIMA UNIVERSITY	Fukushima University	Japan	1	48

A3:
Budget Breakdown

Project Number [1]	604974	Project Acronym [2]	COMET

One Form per Project

Participant number in this project [11]	Participant short name	Fund. % [12]	Ind. costs [13]	Estimated eligible costs (whole duration of the project)						Requested EU contribution
				RTD (A)	Coordination (B)	Support (C)	Management (D)	Other (E)	Total A+B+C+D+E	
1	SCK•CEN	75.0	A	223,993.05	182,052.20	0.00	974,168.69	31,797.94	1,412,011.88	1,298,416.54
2	STUK	75.0	A	64,199.00	246,269.00	0.00	26,637.00	21,424.00	358,529.00	261,369.88
3	NRPA	75.0	A	192,050.00	39,800.00	0.00	23,900.00	28,900.00	284,650.00	0.00
4	IRSN	75.0	A	248,636.00	122,757.88	0.00	32,979.36	9,352.80	413,726.04	303,322.89
5	NERC	75.0	A	175,447.98	130,287.00	0.00	33,869.34	174,004.46	513,608.78	406,655.30
6	CIEMAT	75.0	A	43,420.00	93,925.60	0.00	8,753.00	50,169.36	196,267.96	138,934.16
7	SU	75.0	T	186,770.40	76,750.02	0.00	36,218.48	31,837.60	331,576.50	259,460.45
8	BFS	75.0	S	50,444.80	47,884.80	0.00	11,265.60	11,425.60	121,020.80	92,547.76
9	UMB	75.0	T	461,120.00	144,640.00	0.00	35,520.00	194,080.00	835,360.00	0.00
10	GIG	75.0	A	70,475.03	84,369.06	0.00	8,315.77	38,865.24	202,025.10	169,479.27
11	Chornobyl Center	50.0	A	77,816.00	35,755.00	0.00	5,152.50	36,225.00	154,948.50	109,068.50
12	NUBIP	75.0	T	77,984.00	44,320.00	0.00	7,600.00	18,800.00	148,704.00	114,527.00
13	Fukushima University	75.0	A	177,800.00	61,620.00	0.00	12,000.00	61,150.00	312,570.00	257,218.00
Total				2,050,156.26	1,310,430.56	0.00	1,216,379.74	708,032.00	5,284,998.56	3,410,999.75

Note that the budget mentioned in this table is the total budget requested by the Beneficiary and associated Third Parties.

*** The following funding schemes are distinguished**

Collaborative Project (if a distinction is made in the call please state which type of Collaborative project is referred to: (i) Small of medium-scale focused research project, (ii) Large-scale integrating project, (iii) Project targeted to special groups such as SMEs and other smaller actors), Network of Excellence, Coordination Action, Support Action.

1. Project number

The project number has been assigned by the Commission as the unique identifier for your project, and it cannot be changed. The project number **should appear on each page of the grant agreement preparation documents** to prevent errors during its handling.

2. Project acronym

Use the project acronym as indicated in the submitted proposal. It cannot be changed, unless agreed during the negotiations. The same acronym **should appear on each page of the grant agreement preparation documents** to prevent errors during its handling.

3. Project title

Use the title (preferably no longer than 200 characters) as indicated in the submitted proposal. Minor corrections are possible if agreed during the preparation of the grant agreement.

4. Starting date

Unless a specific (fixed) starting date is duly justified and agreed upon during the preparation of the Grant Agreement, the project will start on the first day of the month following the entry info force of the Grant Agreement (NB : entry into force = signature by the Commission). Please note that if a fixed starting date is used, you will be required to provide a detailed justification on a separate note.

5. Duration

Insert the duration of the project in full months.

6. Call (part) identifier

The Call (part) identifier is the reference number given in the call or part of the call you were addressing, as indicated in the publication of the call in the Official Journal of the European Union. You have to use the identifier given by the Commission in the letter inviting to prepare the grant agreement.

7. Activity code

Select the activity code from the drop-down menu.

8. Free keywords

Use the free keywords from your original proposal; changes and additions are possible.

9. Abstract

10. The month at which the participant joined the consortium, month 1 marking the start date of the project, and all other start dates being relative to this start date.

11. The number allocated by the Consortium to the participant for this project.

12. Include the funding % for RTD/Innovation – either 50% or 75%

13. Indirect cost model

A: Actual Costs
S: Actual Costs Simplified Method
T: Transitional Flat rate
F :Flat Rate

Workplan Tables

Project number

604974

Project title

COMET—COordination and iMplementation of a pan-European instrumenT for radioecology

Call (part) identifier

FP7-Fission-2013

Funding scheme

Combination of CP & CSA

WT1
List of work packages

Project Number [1]	604974	Project Acronym [2]	COMET

LIST OF WORK PACKAGES (WP)

WP Number [53]	WP Title	Type of activity [54]	Lead beneficiary number [55]	Person-months [56]	Start month [57]	End month [58]
WP 1	Project Management and Coordination	MGT	1	30.00	1	48
WP 2	Joint Programming and Implementation – Expanding Alliance	COORD	2	106.50	1	48
WP 3	Improving and validating radioecological models	RTD	3	80.50	1	48
WP 4	Shared challenges in chronic low dose effects and risk assessment, and beyond	RTD	4	97.50	1	48
WP 5	Knowledge exchange	OTHER	5	46.00	1	48
			Total	360.50		

WT2:
List of Deliverables

Project Number [1]	604974	Project Acronym [2]	COMET

List of Deliverables - to be submitted for review to EC

Delive-rable Number [61]	Deliverable Title	WP number [53]	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D1.1	Periodic Report	1	1	6.00	R	RE	18
D1.2	Flex Funds Report and amended workplan	1	1	1.00	R	RE	21
D1.3	Periodic Report	1	1	6.00	R	RE	36
D1.4	Flex Funds Report	1	1	1.00	R	RE	48
D1.5	100 page Project Report	1	1	14.00	R	RE	48
D1.6	20 page Summary Report	1	1	1.00	R	RE	48
D1.7	5 page Summary Report	1	1	1.00	R	RE	48
D2.1	First phase ALLIANCE RTD implementation plan as input for the preparation of the Competitive Call organised in collaboration with OPERRA	2	1	4.00	R	RE	6
D2.2	Description of the protocols for access and mechanisms for research prioritization and assignment for the Radioecological Observatories as well as other large infrastructures	2	6	14.00	R	RE	24
D2.3	Inventory on national research projects related to radioecology - description of national	2	2	24.00	R	RE	42

Delive-rable Number [61]	Deliverable Title	WP number [53]	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
	programmes, funding schemes and requirements for radioecological research in Europe						
D2.4	Updated version of the SRA	2	1	12.00	R	RE	48
D2.5	Report on developed innovative mechanisms for joint programming and implementation for future research in radioecology	2	1	24.00	R	PU	48
D2.6	Description of training and education coordinated platform	2	9	14.50	R	PU	48
D2.7	Blueprint of ALLIANCE functioning and interaction mechanisms: internally and with the outside world	2	2	14.00	R	PU	48
D3.1	Detailed plan for the COMET WP3 Initial Research Activity	3	3	3.00	R	CO	5
D3.2	COMET Initial Research Activity on improved parameterization of key processes for transfer and dynamic modeling approaches: Results and Impact	3	9	53.50	R	PU	32

WT2:
List of Deliverables

Delive-rable Number [61]	Deliverable Title	WP number [53]	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D3.3	COMET WP3 New Joint Research Activities: midterm report	3	3	14.00	R	CO	33
D3.4	COMET WP3 New Joint Research Activities: results from execution of the Competitive Call	3	7	10.00	R	PU	47
D4.1	Detailed plan for the COMET WP4 Initial Research Activity	4	4	4.00	R	CO	3
D4.2	COMET WP4 New Joint Research Activities: midterm report	4	1	11.00	R	CO	33
D4.3	COMET Initial Research Activity on trans - generational effects and role of epigenetics: Results and Impact	4	1	76.50	R	PU	46
D4.4	COMET WP4 Joint Research Activities: Results from execution of the Competitive Call	4	5	6.00	R	PU	47
D5.1	Public website - open website for the COMET project	5	5	13.50	O	PU	3
D5.2	Communication plan – outline of how project outputs will be communicated	5	6	6.00	R	RE	6
D5.3	Workshop 1 report (to include overview of topic	5	5	4.00	R	PU	12

WT2:
List of Deliverables

Delive-rable Number [61]	Deliverable Title	WP number [53]	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
	background, objectives, summary of discussion, consensus statements, if appropriate and recommendations)						
D5.4	Workshop 2 report (as for D5.3)	5	5	4.00	R	PU	21
D5.5	Workshop 3 report (as for D5.3)	5	3	4.00	R	PU	36
D5.6	Workshop 4 report (as for D5.3)	5	5	3.00	R	PU	43
D5.7	Training activities during COMET - successes, lessons learned and suggestions for the future	5	9	11.50	R	PU	43
			Total	360.50			

WT3:
Work package description

Project Number [1]	604974	Project Acronym [2]	COMET

One form per Work Package

Work package number [53]	WP1	Type of activity [54]	MGT
Work package title	Project Management and Coordination		
Start month	1		
End month	48		
Lead beneficiary number [55]	1		

Objectives

The overall objective of WP1 is the coordination of the project and the consortium, applying best management practices ensuring correct positioning of the project (and radioecology) within the emerging radiation protection platforms as we move towards Horizon 2020.
This includes:
• All legal, contractual and administrative issues before and during the project
• Communication with the Commission and external bodies
• Financial management of the project
• In collaboration with OPERRA, streamlined organisation and administration related with Competitive Call to strengthen the pan-European research in the field of radioecology based on the mechanism defined in WP2 and the priorities set in WP3-WP4, and in collaboration with the Scientific Committee and Management Board
• Setting up and supporting the project management structure
• The assessment of project progress and quality, controlling project outcome and impact

Description of work and role of partners

Task 1.1 Legal, contractual and administrative management (Lead: SCK•CEN)
The aim of this task is to keep up-to-date the EC Grant Agreement (ECGA), the Consortium Agreement (CA) and to deal with all other legal issues during the project, including Intellectual Property Rights (IPR). The coordinator will handle the pre- and post-processing tasks of the full consortium meetings organised within the project and will be responsible for adequate document management during and after the project. Task 1.1 also covers the official reporting to the Commission, including the Periodic Reporting, submission of the Deliverables and all issues that need to be communicated or discussed with the Commission. To ensure uniformity, templates (for reports, presentations, letters, etc.) will be provided to the partners.
To allow for an integrated approach to project and programme management, a streamlined and standardised reporting system will be designed. Relevant project data and reports will be uploaded in a web-based tool (see WP5) to simplify the reporting exercise. To ensure uniformity, templates (for reports, presentations, letters, etc.) will be provided to the partners.

Task 1.2. Financial management and association of Competitive call projects within COMET (Lead: SCK•CEN)
This task covers the monitoring and management of the financial situation of the project and partner budgets (Periodic financial reporting to EC: months 18, 36, 48; internal financial reporting: months 12 and 24). It also covers the preparation of the financial part of the periodic reporting (including controlling the correctness and compliance of the partners' contribution, with respect to the Grant Agreement and Annex I). To ensure uniformity, partner specific financial templates will be made.
COMET foresees funds that will be allocated to a Competitive Call (B2.4). To strengthen pan-European research in the field of radioecology a Competitive Call (covering two topics) will be organised in collaboration with OPERRA and selected projects will be administratively handled in WP1, in consultation with the Management Board and the joint COMET/ALLIANCE Steering/Scientific Committee based on the mechanisms of joint programming and implementation developed under WP2 and applied by WP3 and WP4 to prioritise a multidisciplinary and integrative RTD call. Preliminary criteria for a Competitive Call and the decision and review processes, performed in collaboration with OPERRA are presented in B.2.1.

Task 1.3. Management of the project consortium and bodies (Lead: SCK•CEN)
The coordinator will lead the consortium with the greatest care to optimise the outcome of the project, supported by the management structure defined in Part B.2.1. The different management bodies (Executive Committee, Management Board and a joint COMET/ALLIANCE Steering/Scientific Committee) will be set up and appropriate internal terms of reference established. The joint COMET/ALLIANCE Steering/Scientific Committee will include key representatives of the NERIS and MELODI associations and the projects PREPARE and OPERRA. The Management Board and Steering Committee will be invited to the annual meetings.
In addition, the coordinator will ensure adequate interaction with FP7 STAR so that maximal complementarity is achieved, thereby avoiding any redundancy. Where possible the planned meetings will be organised jointly. The coordinator will further ensure that cross-cutting objectives to enable a broader and more effective implementation of the European Research Area in the field of Radiation Protection are met.

Task 1.4. Project assessment and adjustment (Lead: SCK•CEN)
The project progress will be measured against the Gantt Chart, deliverables, milestones, key steps and performance indicators (see B1.3.2, B2.1.1, Annex 1, A1.8.2, A1.8.4) enabling the Coordinator in collaboration with the management bodies to compare the qualitative outcome of the project with the expectations and adjust the project's course to success if required.
During the project life-time there are likely to be occasions where contingency plans are needed. The contractors will notify the co-ordinator and Management Board without delay on any major changes concerning unexpected difficulties in the work, the availability of infrastructures, the departure of key personnel or any condition that could jeopardize the schedule or content of the project workplan. Alternative arrangements will be actively searched for by co-ordinator and Management Board.

Person-Months per Participant

Participant number [10]	Participant short name [11]	Person-months per participant
1	SCK•CEN	20.00
2	STUK	1.50
3	NRPA	1.50
4	IRSN	1.50
5	NERC	1.50
6	CIEMAT	0.50
7	SU	0.50
8	BFS	0.50
9	UMB	0.50
10	GIG	0.50
11	Chornobyl Center	0.50
12	NUBIP	0.50
13	Fukushima University	0.50
	Total	30.00

List of deliverables

Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D1.1	Periodic Report	1	6.00	R	RE	18

WT3:
Work package description

List of deliverables

Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D1.2	Flex Funds Report and amended workplan	1	1.00	R	RE	21
D1.3	Periodic Report	1	6.00	R	RE	36
D1.4	Flex Funds Report	1	1.00	R	RE	48
D1.5	100 page Project Report	1	14.00	R	RE	48
D1.6	20 page Summary Report	1	1.00	R	RE	48
D1.7	5 page Summary Report	1	1.00	R	RE	48
		Total	30.00			

Description of deliverables

D1.1) Periodic Report: Document as foreseen in Art. 4 of the Grant Agreement, including a publishable summary, the project objectives, progress and achievements, the project management and the financial statement of the first 18 months. [month 18]

D1.2) Flex Funds Report and amended workplan: This report describes the use of the flexibility funding foreseen in COMET: general plans, procedures and amended work plan [month 21]

D1.3) Periodic Report: Document as foreseen in Art. 4 of the Grant Agreement, including a publishable summary, the project objectives, progress and achievements, the project management and the financial statement for the second periodic reporting. [month 36]

D1.4) Flex Funds Report: This report describes the actual use of the flexibility funding foreseen in COMET [month 48]

D1.5) 100 page Project Report: Description of the main project results, the potential impact (including socio-economic impact of the project) and the main dissemination activities [month 48]

D1.6) 20 page Summary Report: A summary description of project context and objectives and major results and achievements [month 48]

D1.7) 5 page Summary Report: Executive summary of the COMET project [month 48]

Schedule of relevant Milestones

Milestone number [59]	Milestone name	Lead benefi-ciary number	Delivery date from Annex I [60]	Comments
MS11	Kick-off meeting	1	1	Minutes of the kickoff meeting
MS12	Amended grant agreement with EC and new partners	1	15	Amendments to GA
MS13	Amended consortium agreement between "old" and "new" COMET partners	1	16	Amendments to CA

WT3:
Work package description

Project Number [1]	604974	Project Acronym [2]	COMET

One form per Work Package

Work package number [53]	WP2	Type of activity [54]	COORD
Work package title	Joint Programming and Implementation – Expanding Alliance		
Start month	1		
End month	48		
Lead beneficiary number [55]	2		

Objectives

The overall objective of this work package is to build upon the foundations laid by the FP7 STAR NoE and the European Radioecological Alliance (ALLIANCE) to strengthen the pan-European research initiative on the impact of radiation on environment and man. To achieve this objective we will:
• Further develop the strategic research agenda (SRA) created under STAR/ALLIANCE in light of advances in knowledge, identification of new priority needs and to better align it with the SRAs of other radiation protection platforms.
• Develop innovative mechanisms for joint programming and implementation of radioecological research in close collaboration with the ALLIANCE and the platforms of allied fields such as emergency management (NERIS) and low dose research (MELODI). These mechanisms should progress to be consistent with the mechanisms developed within OPERRA for the Radiation Protection Federating Association.
• Identify and integrate national radioecology programmes to create a framework for future research activities in close collaboration with the OPERRA and PREPARE projects.

Description of work and role of partners

Task 2.1. Evolving towards a pan-European network (Lead: STUK)
The focus is on the elaboration of a European joint programming instrument and organising the radioecological research in Europe by optimising the operating mode of the ALLIANCE association, consistently with the other platforms governance. The scope and role of the ALLIANCE with respect to the functioning of the future federating association will be clarified and strengthened. Stakeholders' views on the role of the ALLIANCE can be gathered, e.g. via seminars bringing together representatives of research organisations, universities, national competent authorities, stakeholders, Eastern European, Associate and Third Countries, international interest organisations (IUR, IAEA, ICRP, UNSCEAR) as well as other platforms (NCoRe). The participation of new member states in the ALLIANCE will be enhanced, thereby supporting a more broad and effective implementation of the European Research Area in the field of nuclear fission and exploiting the full potential of institutes, universities and other organisations in these countries as regards their infrastructure, human resources and overall competences. The progress made under the FP7 project OPERRA to enhance integration of new Member States will also be followed closely to avoid overlapping work. In addition to Europe, the connections to and collaboration with relevant networks or organisations outside Europe (e.g. in Japan, US and Canada) will be enhanced. The connections to the existing platforms/networks (MELODI, NERIS, EURADOS and perhaps others) as well as OPERRA will be enhanced to proceed together towards a single umbrella network in the field of radiation protection, radioecology being one of the cornerstones. By the end of COMET, the results of the joint activities carried out under WP3 and 4 will be evaluated and a final workshop will be held together with the ALLIANCE-NERIS- MELODI and PREPARE and OPERRA to integrate the new knowledge to give recommendations for future research lines of the Horizon 2020 programme.

Task 2.2. Developing mechanisms for joint programming and implementation (Lead: SCK•CEN with IRSN)
The objective of this task is (1) to work together with OPERRA to develop innovative mechanisms of joint programming and implementation by establishing criteria and processes for priorisation of programming research and applying them under COMET specifically to the Radioecology research arena and (2) to set up sustainable implementation processes jointly with the ALLIANCE and in close interaction with the broader Radiation Protection arena represented by OPERRA. The task will include development of criteria to prioritize research areas, writing a first phase implementation planbasis for the Competitive Call topic area and

description, selecting the projects identified and developing an overall integrated research implementation plan. This work includes prioritising among the key topics/areas identified in the SRA based on a set of criteria that will be established in close interaction with OPERRA. A workshop will be organized following the integration of the Paris STAR/ALLIANCE SRA workshop comments in the STAR/ALLIANCE SRA to which the ALLIANCE, NERIS, MELODI and OPERRA and PREPARE will be invited. Criteria for topic prioritisation will be discussed, research priorities defined and an initial ALLIANCE RTD roadmap will be developed and presented to OPERRA for presentation to the Gobetween Administrator Operator (GAO). This ALLIANCE RTD roadmap will form the basis for the writing of the COMET Call topics by the Independent Board of Experts (see B2.3.2) .The COMET Management Board and Steering Committee will select COMET related projects based on the ranking provided by the expert panel and the budget will be assigned and the GA amended.
The initial ALLIANCE RTD-roadmap will evolve, reflecting SRA developments and the contribution potential from laboratories across Europe and beyond.
Together with OPERRA, COMET will work towards criteria and mechanisms for joint programming and implementation. The proposed mechanisms for joint programming are common for radiation protection research, of which radioecology is a cornerstone. Based on these common mechanisms, COMET will develop a specific joint programming and implementation plan for the radioecological research area (through interaction with the radiation protection research communities). The emphasis needs to be put on sustainability of the proposed work after projects such as STAR, COMET and OPERRA. Following interaction at workshops and sister networks, and the advancement of science, a need to update the SRA may arise. Thus, the task will also include updating the SRA, initiated by the FP7 project STAR, in close collaboration with the ALLIANCE.

Task 2.3. Infrastructures – evolving from STAR to the ALLIANCE (Lead: CIEMAT with CEH and NUBIP)
The focus of this task is to assure the smooth evolvement from STAR&COMET to ALLIANCE. This will be achieved by ensuring adequate exchange of information, databases, relevant content and links in websites etc. between STAR, COMET and ALLIANCE in the overlapping period and to draft procedures for accessing the large infrastructures (including collaboration at the Radioecological Observatories). Under STAR, catalogues of databases and sample banks as well as information on analysis methods and facilities are being created. These catalogues and databases will be updated with the information obtained from the new COMET and ALLIANCE partners. At the end of COMET, the ALLIANCE will maintain the databases.
An overview on large infrastructures important for radioecological research within Europe and beyond will be formed. This will be done in close collaboration with the ALLIANCE and it will build on the work accomplished under STAR. The work includes searching for information on conditions of access to the large facilities and finding the best solutions for the optimal use of the facilities and identification of requirements for new infrastructure and its optimal localization. Some infrastructures are of importance to COMET and OPERRA and for defining optimal use, close collaboration is foreseen.
A prominent task of the FP7 project STAR is the creation of Observatories for Radioecological Research. Two contaminated field sites namely areas near Chernobyl and a previous mining and processing site in Poland have been selected as the most promising options as Radioecological Observatories. In addition to these sites, a process of establishing an observatory in the Fukushima area in Japan will be commenced. A draft for mechanisms and procedures to conduct joint research at the Radioecological Observatories by the pan-European research community as well as other large infrastructures and to prioritise the research carried out in these facilities/observatories will be formulated. The results of the work will be utilised in developing the joint Radiation Protection Federating Association.

Task 2.4. Co-ordination with national programmes (Lead: STUK with CIEMAT and GIG-SCRS)
The aim of this task is to get an overview of national programmes, funding schemes and requirements for radioecological research in Europe and begin the integration of national radioecology programmes to create a common framework for future research activities in collaboration with the FP7 project OPERRA. Joint research areas in radioecology in Europe will be identified utilizing the information collected under FP7 project STAR. The STAR inventory will be updated on publicly and, if possible, privately funded radioecological research projects in recent years, including funding information on agencies and funding schemes. The list of projects will be evaluated and compared to the SRA. This will give a first overview as to what extent nationally funded projects could assist in reaching the overall goals of SRA at the European level. The national funding bodies will be encouraged to take into account the research lines indicated in the SRA. A long-term plan towards integration of the national radioecology programmes to create a framework for future research activities will be created. The plan will be utilised in developing the joint Radiation Protection Research platform.

Task 2.5. Co-ordination with training and educational platforms (Lead: UMB with SU)

WT3:
Work package description

The main focus of this task is to maintain the platform established under STAR and to further sustain and develop competence within radioecology, in collaboration with particularly the CINCH II, DoReMi/Melodi and ENETRAP II platforms. The task will implement training and educational solutions that will encourage the streamlining of the European education system in respect to the provision of radioecology and allied discipline courses at post-graduate level, and will encourage the move towards the creation of a standardized certification system for postgraduate qualifications throughout the EU. This, in turn, will enable the identification, by employers, of personnel with the specific skills that meet their needs. This will maximize the use of disparate existing resources through the sharing of personnel and facilities. The project will reduce the duplication of expensive course modules and encourage optimisation of resources (human resources, tools, investments). It will also encourage collaboration and increased utilisation of joint resources with other training and education providers such as IAEA and ENEN.

Person-Months per Participant

Participant number [10]	Participant short name [11]	Person-months per participant
1	SCK•CEN	9.00
2	STUK	13.00
3	NRPA	3.00
4	IRSN	7.00
5	NERC	8.00
6	CIEMAT	9.00
7	SU	6.50
8	BFS	4.00
9	UMB	7.00
10	GIG	12.00
11	Chornobyl Center	11.00
12	NUBIP	11.00
13	Fukushima University	6.00
	Total	106.50

List of deliverables

Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D2.1	First phase ALLIANCE RTD implementation plan as input for the preparation of the Competitive Call organised in collaboration with OPERRA	1	4.00	R	RE	6
D2.2	Description of the protocols for access and mechanisms for research prioritization and assignment for the Radioecological Observatories as well as other large infrastructures	6	14.00	R	RE	24

WT3:
Work package description

List of deliverables

Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D2.3	Inventory on national research projects related to radioecology - description of national programmes, funding schemes and requirements for radioecological research in Europe	2	24.00	R	RE	42
D2.4	Updated version of the SRA	1	12.00	R	RE	48
D2.5	Report on developed innovative mechanisms for joint programming and implementation for future research in radioecology	1	24.00	R	PU	48
D2.6	Description of training and education coordinated platform	9	14.50	R	PU	48
D2.7	Blueprint of ALLIANCE functioning and interaction mechanisms: internally and with the outside world	2	14.00	R	PU	48
		Total	106.50			

Description of deliverables

D2.1) First phase ALLIANCE RTD implementation plan as input for the preparation of the Competitive Call organised in collaboration with OPERRA: First phase ALLIANCE RTD implementation plan as input for the preparation of the Competitive Call organised in collaboration with OPERRA [month 6]

D2.2) Description of the protocols for access and mechanisms for research prioritization and assignment for the Radioecological Observatories as well as other large infrastructures: Description of the protocols for access and mechanisms for research prioritization and assignment for the Radioecological Observatories as well as other large infrastructures including information on applying and selection of the research projects to be conducted as well as internal rules for carrying out joint research. [month 24]

D2.3) Inventory on national research projects related to radioecology - description of national programmes, funding schemes and requirements for radioecological research in Europe: Inventory on national research projects related to radioecology – Description of national programmes, funding schemes and requirements for radioecological research in Europe giving a first overview on to what extent nationally funded project could assist in reaching the overall goals of SRA on the European level. [month 42]

D2.4) Updated version of the SRA: Updated version of the SRA – The Strategic Research Agenda (SRA), which has been created within STAR project and provides a long term vision of radioecological research needed within EC, will be updated to take into account the needs arising via interactions with stakeholders, sister networks as well as the scientific community. [month 48]

D2.5) Report on developed innovative mechanisms for joint programming and implementation for future research in radioecology: Report on innovative mechanisms for joint programming and implementation for future research in radioecology – Description of the mechanisms for joint programming and implementation developed during the project including development of mechanisms to prioritize research areas, identifying the Competitive Call topics, setting up an evaluation process, selecting projects and developing an overall integrated research implementation plan. [month 48]

D2.6) Description of training and education coordinated platform: Description of the training and education coordinated platform with information on all relevant COMET course modules and course modules available at other collaborative platforms that can be utilized for professionals and ordinary student recruitment [month 48]

D2.7) Blueprint of ALLIANCE functioning and interaction mechanisms: internally and with the outside world: Blueprint of ALLIANCE functioning and interaction mechanisms –Description of the outline for functioning and interaction mechanisms of the STAR ALLIANCE developed during the project. Interaction mechanisms include both internal interaction and interaction with research organisations, universities, national competent authorities, stakeholders, international interest organisations as well as other platforms. [month 48]

Schedule of relevant Milestones

Milestone number [59]	Milestone name	Lead beneficiary number	Delivery date from Annex I [60]	Comments
MS21	Workshop NERIS-ALLIANCE/STAR-MELODI and OPERRA to prioritize topics for organising a Compet. Call	1	5	Workshop programme and list of participants
MS22	Initial COMET RTD roadmap	1	6	Meeting agenda and roadmap
MS23	Competitive Call launched by OPERRA	1	7	Call text published
MS24	Selection of competitive research projects by MB + SC	1	12	Invitation letters to selected projects
MS25	Explore submission of a radioecology MSc application to Erasmus Mundus	9	24	Decide submission of application
MS26	Evaluation of the joint research work carried out under WP3 and 4	1	46	Evaluation report
MS27	ALLIANCE-NERIS-MELODI workshop to integrate new knowledge and recommendations to Horizon 2020	1	48	Workshop programme and list of participants

WT3:
Work package description

Project Number [1]	604974	Project Acronym [2]	COMET

One form per Work Package

Work package number [53]	WP3	Type of activity [54]	RTD
Work package title	Improving and validating radioecological models		
Start month	1		
End month	48		
Lead beneficiary number [55]	3		

Objectives

The overall objectives of WP3 are to
• Strengthen pan-European links between the radioecology and the emergency and post-accident communities.
• Undertake joint research activities to improve and validate radioecological models of interest to both communities for a better protection of humans and the environment in existing, planned and emergency exposure situations.

Description of work and role of partners

Task 3.1 Initial Research Activity (Lead: UMB with NUBIP)
Most of the environmental models currently used in radiological risk assessment assume that equilibrium conditions are valid and that representative radionuclide-specific parameters such as Kd, TF, TC, BCF, etc. can be described by equilibrium constants. This is usually adequate for continuous constant release situations, but it is not appropriate for accident situations, rapid pulsed releases or contamination caused by enhanced natural radioactivity exhibiting non-linearity in transfer. Neither is it appropriate if the radionuclide speciation changes over time (e.g. due to particle weathering), or if environmental and ecological factors (e.g. changes in temperature and biomass) or sequential decay (e.g. for NORM) lead to non-equilibrium conditions in the environment. For such situations, a dynamic, process-oriented modelling approach with proper time and space dependent transfer parameters are required to estimate consequences within acceptable uncertainties.
Following interaction with the NERIS platform and the coordinator of the EC project PREPARE (started 1/2/2013), it is clear that joint areas of interest include:
(1) obtaining better parameter values for Decision Support Systems for emergency situations; and
(2) comparing the performance and robustness of model predictions for short and medium/long term after an accident between existing modelling tools and the next generation dynamic models.
An initial research activity will be performed focusing on improved parameterisation of key processes controlling the transfer of radionuclides, with a specific focus on dynamic modelling approaches.
Through review of previous (VAMP, BIOMASS, EMRAS, etc.) and ongoing (MODARIA, UNSCEAR, etc.) work and models, and in close connection with the STAR and PREPARE consortiums, the most important parameters will be identified and evaluated with respect to the available information. Based on this evaluation, radionuclides, processes and parameters for further study will be selected. The work will be divided considering both the initial phase and the medium/long term after accidental release since both the relevant radionuclides and parameters vary with time.
As COMET progresses it may be possible to test the applicability of these dynamic parameters to the post-Fukushima situation in Japan. Both the Chernobyl Observatory Site and the foreseen Fukushima field study site would be very useful in this work which strongly relates to emergency and post-accident management. The STAR observatory in Upper Silesia, Poland offers the opportunity to consider pulsed Ra discharges to the terrestrial and freshwater environments and will be used to investigate how important parameters could be characterized for dynamic modelling relevant to environmental management of the many NORM industries.
Statistical analyses of data arising from the Observatory Sites, literature information, and expert knowledge will benefit for the most advanced probabilistic methods, including Bayesian statistics. Advanced statistics will be useful especially when empirical data are either absent or scarce, and/or when the number of parameters in the considered models becomes increasingly large.

Task 3.2 Identification of common research needs for the radioecology and the emergency and post-accident communities (Lead: NRPA with STUK)
This task will critically review the SRA of the ALLIANCE in parallel with that of NERIS to further identify the most important common research topics for radioecology (including NORM) and emergency and post-accident management. A workshop will be arranged early in the project period, following the finalisation of the SRA on radioecology in STAR, to explore more in detail the research needed to improve existing predictive models and evaluate the modelling needs of environmental protection in an emergency preparedness context. The outcomes of the workshop will form the basis for a Competitive Call (under WP2) organised in collaboration with OPERRA for a research projects that would target the priority research issues.

Task 3.3 Innovative research execution (Lead: SU with CIEMAT and SCK)
The research activities selected under the Competitive Call will be implemented in this task after formal approval by the EC. The work plan and the grant agreement will be modified before starting the new research. Proposals that include research or validation of results at the foreseen STAR/COMET Observatory/Field Sites (Chernobyl, Upper Silesia, Fukushima) will be of particular interest. The task leaders will oversee the delivery of the funded projects, and the final dissemination as part of Task 3.4.

Task 3.4 Integration, validation and implementation of RTD results (Lead: BfS with GIG-SCRS)
A workshop will be held at the end of COMET to encourage integration of the new knowledge in both the radioecological, NORM and emergency and post-accident communities. The research conducted in Task 3.1 and 3.3 is expected to improve the modelling capability of the radiation protection community. Intercomparison between existing and new modelling approaches will be performed. Where relevant, the improved modelling approaches will be validated using Observatory/Field Sites. Where appropriate we will work with the IAEA MODARIA programme to maximise impact.

Person-Months per Participant

Participant number [10]	Participant short name [11]	Person-months per participant
1	SCK•CEN	3.00
2	STUK	4.50
3	NRPA	11.50
4	IRSN	6.00
5	NERC	5.50
6	CIEMAT	4.00
7	SU	5.50
8	BFS	3.00
9	UMB	9.00
10	GIG	8.50
11	Chornobyl Center	6.00
12	NUBIP	9.00
13	Fukushima University	5.00
	Total	80.50

WT3:
Work package description

List of deliverables

Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D3.1	Detailed plan for the COMET WP3 Initial Research Activity	3	3.00	R	CO	5
D3.2	COMET Initial Research Activity on improved parameterization of key processes for transfer and dynamic modeling approaches: Results and Impact	9	53.50	R	PU	32
D3.3	COMET WP3 New Joint Research Activities: midterm report	3	14.00	R	CO	33
D3.4	COMET WP3 New Joint Research Activities: results from execution of the Competitive Call	7	10.00	R	PU	47
		Total	80.50			

Description of deliverables

D3.1) Detailed plan for the COMET WP3 Initial Research Activity: Detailed plan for the COMET WP3 Initial Research Activity – list of research projects and goals, participants and timing [month 5]

D3.2) COMET Initial Research Activity on improved parameterization of key processes for transfer and dynamic modeling approaches: Results and Impact: COMET Initial Research Activity on improved parameterization of key processes for transfer and dynamic modelling approaches. Report summarising the results and advances [month 32]

D3.3) COMET WP3 New Joint Research Activities: midterm report: COMET WP3 New Joint Research Activities: midterm report on the progress of the research projects initiated after the Competitive call [month 33]

D3.4) COMET WP3 New Joint Research Activities: results from execution of the Competitive Call: COMET WP3 New Joint Research Activities: results from execution of the Competitive Call [month 47]

Schedule of relevant Milestones

Milestone number [59]	Milestone name	Lead benefi-ciary number	Delivery date from Annex I [60]	Comments
MS31	Evaluation of available transfer and modeling data in view of the upcoming Competitve Call	3	5	Evaluation summary as input to MS22
MS32	Validation of research results using Observatory sites	3	46	Validation results summarized as input to Final workshop (MS27)

WT3:
Work package description

Project Number [1]	604974	Project Acronym [2]	COMET

One form per Work Package

Work package number [53]	WP4	Type of activity [54]	RTD
Work package title	Shared challenges in chronic low dose effects and risk assessment, and beyond		
Start month	1		
End month	48		
Lead beneficiary number [55]	4		

Objectives

The overall objectives of WP4 are two-fold:
• to strengthen pan-European links and implement research-sharing mechanisms between the radioecology and radiobiology communities studying biological effects of ionising radiation,
• to test the effectiveness of the joint programming mechanisms for road map establishment and implementation, and to give feedback for improvement if needed.

Description of work and role of partners

Task 4.1 Initial Research Activity (Lead: IRSN with SCK•CEN)
From initial discussions with key-people involved in the establishment of the ALLIANCE and MELODI SRA, a first set of common research lines in the field of low dose effects was identified, one of which was epigenetic and transgenerational effects (other topics included extrapolation of biological effect patterns from acute to chronic exposure, multicontaminants, internal contamination and advanced dosimetry). Within task 4.1 the two communities will collaborate on this research line through an initial research activity (IRA) dealing with epigenetic effects and their possible role in adaptation and transgenerational effects in organisms experiencing chronic low dose exposure. The IRA will characterize the mechanisms governing the activation or the repression of the epigenome of organisms exposed chronically to radionuclides, and will seek to associate these effects with changes in phenotypes and fitness for the exposed and future generations.
To establish initial patterns of epigenetic change, the first subtask will be undertaken under laboratory controlled conditions in model plant (e.g., Arabidopsis) and animals (e.g., earthworm, frogs and zebrafish) species, of which at least one is relevant to both ALLIANCE and MELODI. This subtask will aim at characterizing global DNA methylation following radiation exposure but also specific mechanisms governing epigenetic changes and the links with fitness changes.
Numerous mechanisms for non-genetic transgenerational transfer of traits have been identified, but this task will focus on assessing global DNA methylation. Additionally, more specific approaches will also be used, by studying hypo/hypermethylation of key functional and ecologically relevant genes (e.g. metabolic gene such as LPLase, reproduction gene such as aromatase), and also effector enzymes responsible for maintaining genome methylation levels (e.g. SAM, DNMT, TET1), using transcriptome studies and/or mutants. The tissue patterns of DNA methylation will help identifying diagnostic biomarkers. The sensitivity of early-life stages to epigenetic modifications and the implications for their fitness will be explored.
A second subtask will be undertaken in parallel, dealing with field studies of autochthonous species (e.g. frogs, plants, earthworms) to evidence DNA methylation in wildlife and relate these changes to species phenotype/fitness. These studies will be undertaken in the Chornobyl Exclusion Zone (CEZ) and in the Fukushima affected area. Here studies will assess responses such as overall hypo/hypermethylation, changes in the methylation profile of the genome as measured using approaches such as methylation sensitive amplified fragment length polymorphism as well as the activities of genes identified as being responsible for the regulation of genome methylation. Relating the changes in the epigenetic parameters will allow a greater understanding of the role of epigenetic adaptive response to field based radionuclide exposure. For plants, epigenetic response will be compared with cytogenetic response (e.g. mitotic index, chromosome aberrations) for which a wealth of information is available.

Task 4.2 Implementation of joint programming mechanisms in the field of low dose effects and beyond (lead SCK•CEN with SU)

This task will critically review in more detail SRAs (from STAR/ALLIANCE and from MELODI), with the aim of establishing a clear view of the potential added value of combining or closely interacting on a number of research priorities and sharing the results on identified topics. Discussion should lead to the emergence of new joint-research lines, and will cover common needs in infrastructure, skills and knowledge from COMET-ALLIANCE and MELODI. The workshop organized by WP2 following the finalisation of the STAR/ALLIANCE SRA will address the mutual exchange and identification of joint research issues between the ALLIANCE and MELODI. Based on the mechanisms of joint programming developed by WP2, priority research topics for the Competitive Call to be executed under task 4.3 will be identified. Potential areas of mutual interest that are common to the ALLIANCE and the MELODI SRAs have already been highlighted in task 4.1. Key topics for the Competitive Call could also include a further development of the IRA, through the inclusion of additional disciplines (population genetics, systems biology). Tool-specific topics could also be shared (e.g., biological models and methods to characterise biological damage of ionising radiation, modeling dose-response curves, tackling biological scaling issues).The outcomes of the workshop will help to prioritize topics for a Competitive Call that will be organised by OPERRA by applying the joint programming mechanism developed by WP2.

Task 4.3 Innovative research execution (lead CEH with IRSN)
The research activities selected during the Competitive Call will be implemented. The work plan and modification of the grant agreement (under WP1) will be accomplished before starting Research. This will include the research and communication plans. This task will deliver RTD results from the activities accepted under the Competitive Call.

Task 4.4 Integration, validation of RTD results (lead IRSN with UMB)
This final task will elaborate recommendations for low dose effects joint programming: i) to avoid redundancy in research implementation, limit the fragmentation of research topics and optimize use of infrastructure; ii) to share the latest strategic and scientific information, and promote high-level research on mechanistic aspects; iii) to focus on predictive tools and approaches for radiological risk assessment; and iv) to develop the use of ad hoc observatory sites to enhance and practice radioecological expertise in the field of wildlife radioprotection. A final workshop will be held at the end of COMET (WP2) to share, in close interaction with OPERRA feedback on the joint programming mechanisms implemented as demonstrated by both COMET-WP3 and WP4. The expected impact will be to secure the preparation of Horizon 2020 by adjusting the mechanism proposed by COMET by integration of the lessons learnt during the course of the project.

Person-Months per Participant

Participant number [10]	Participant short name [11]	Person-months per participant
1	SCK•CEN	15.50
2	STUK	0.00
3	NRPA	3.00
4	IRSN	19.50
5	NERC	8.00
6	CIEMAT	0.00
7	SU	9.50
8	BFS	1.00
9	UMB	12.50
10	GIG	0.00
11	Chornobyl Center	16.50
12	NUBIP	6.00
13	Fukushima University	6.00
	Total	97.50

WT3:
Work package description

List of deliverables

Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D4.1	Detailed plan for the COMET WP4 Initial Research Activity	4	4.00	R	CO	3
D4.2	COMET WP4 New Joint Research Activities: midterm report	1	11.00	R	CO	33
D4.3	COMET Initial Research Activity on trans - generational effects and role of epigenetics: Results and Impact	1	76.50	R	PU	46
D4.4	COMET WP4 Joint Research Activities: Results from execution of the Competitive Call	5	6.00	R	PU	47
		Total	97.50			

Description of deliverables

D4.1) Detailed plan for the COMET WP4 Initial Research Activity: This deliverable will include at least : - (1) an updated state-of-the-art on the topic of epigenetics and transgenerational effects in the context of chronic low-dose exposure. - (2) A baseline description of work that will be done in the laboratory and in the field including schedule, objectives, good laboratory practices and protocols [month 3]

D4.2) COMET WP4 New Joint Research Activities: midterm report: This deliverable will include at least : - (1) Initial objectives defined - (2) Work performed and results achieved in the period concerned - (3) Difficulties encountered and solutions - (4) Publications and communications [month 33]

D4.3) COMET Initial Research Activity on trans - generational effects and role of epigenetics: Results and Impact: This deliverable will include at least : - (1) Initial objectives defined - (2) Work performed and results achieved in the period concerned - (3) Publications and communications - (4) Conclusions (a) scientific advances in the field of low dose effects (b) consequences in terms of regulatory output [month 46]

D4.4) COMET WP4 Joint Research Activities: Results from execution of the Competitive Call: This deliverable will include at least : - (1) Initial Competitive call description - (2) Number of projects received and financed - (3) Valorization of selected projects: Publications and communications, other valorization factors, personnel recruited on fixed-term contracts, financial status, lessons learnt. [month 47]

Schedule of relevant Milestones

Milestone number [59]	Milestone name	Lead benefi-ciary number	Delivery date from Annex I [60]	Comments
MS41	Proposition of biomarkers of epigenetic changes for Arabidopsis, zebrafish, earthworm, frogs.	4	18	Report on biomarkers of epigenetic changes for Arabidopsis, zebrafish, earthworm, frogs
MS42	Onset of field experiments in CEZ	5	25	Field validation of biomarkers of epigenetic changes for arabidopsis, earthworm, frogs; first results for CEZ

WT3:
Work package description

Schedule of relevant Milestones

Milestone number [59]	Milestone name	Lead beneficiary number	Delivery date from Annex I [60]	Comments
MS43	Onset of field experiments in Fukushima affected area	4	32	Field validation of biomarkers of epigenetic changes for Arabidopsis, earthworm, frogs; first results for Fukushima affected area

WT3:
Work package description

Project Number [1]	604974	Project Acronym [2]	COMET

One form per Work Package

Work package number [53]	WP5	Type of activity [54]	OTHER
Work package title	Knowledge exchange		
Start month	1		
End month	48		
Lead beneficiary number [55]	5		

Objectives

The overarching objective of this work package is to enhance and maintain European capacity and skills in radioecology by establishing a dynamic interaction promoting effective collaboration between researchers, tool developers, regulators and industry. This will ensure (i) more effective 'take-up' of scientific advances by the user community and (ii) that radioecological research is better focused to address the needs of users. Key to this will be effective links including other networks, projects and platforms (e.g. STAR, OPERRA, ALLIANCE, MELODI, NERIS, CINCH-II).
The specific objectives which will be met to achieve this are:
• Establishing an interactive website for COMET including supporting materials for the user community providing informed and regular updates of developments.
• Facilitate discussion of topical radioecological issues between researchers and users to support radiation protection in Europe.
Develop training packages to maintain and enhance professional competence

Description of work and role of partners

To ensure the success of the COMET project it is essential that we effectively communicate with the wider community; this WP will ensure that COMET has mechanisms in place to achieve this. Limited flexible funds will be included in WP1 to enable any new partners joining COMET to contribute to WP5 activities.

Task 5.1. Website and knowledge management (lead NERC-CEH with CIEMAT)
The project website will be an essential component of our communication strategy. A flexible website will be delivered early within the project using a wiki platform. This better facilitates input from all consortium partners and people outside of the consortium (e.g. to continue dialogue initiated within workshops) than 'traditional webpages' as it more readily allows open access to 'blog' or even add/edit pages. Social media accounts (e.g. Twitter, Facebook) will be initiated with links to the website.
The COMET website will be focused on the activities and outputs of the project specifically and provide a mechanism for dialogue on these. The Radioecology Exchange (www.star-radioecology.org) developed by the STAR NoE has a wider remit of collating and making available relevant information and datasets. We will not duplicate this effort, rather where appropriate the COMET website will link to and share pages with the Radioecology Exchange. This WP will ensure that the Radioecology Exchange is maintained after the conclusion of STAR (September 2015) so that valuable resource such as the PhD Research School, education and training course modules, databases and the virtual laboratory, are further developed. In collaboration with WP2, a focus will be placed on securing the long-term availability of knowledge associated with the observatory sites and Fukushima including translation of local language reports (e.g., many important documents on the Chernobyl zone are not available in English).
This task will also: (i) prepare the COMET Communication Plan; (ii) establish a website with access restricted to project partners to better facilitate project planning, communication between participants, and document sharing and archiving; a site for the SC will also be created.

Task 5.2. Focused workshops on key radioecology related issues (lead NERC-CEH with NRPA)
Previous Coordination Actions (e.g. PROTECT) have shown the value in bringing together the different communities involved in radiation protection to debate topical issues ensuring better focusing and exploitation of scientific research. COMET will run a series of workshops to focus on issues which are of current

interest/concern to industry and regulators, and public (media) with an emphasis on interaction with the NERIS, MELODI and potentially IGD-TP platforms. The topic areas will be developed as the project progresses and resources for 4 workshops have been assumed. Potential topics for workshops include:
1) Implementing the revised Basic Safety Standards in the particular context of EC-regulation within Euratom and taking into account other environmental legislation – issues with available tools/approaches to assess risk to the environment/wildlife, including estimation of uncertainties.
2) Interpretation of field observations of the effects of radiation on the environment – how do we use these in risk assessment and can we learn from epidemiology and field ecology?
3) Fukushima accident – what have we learnt that may have implications for Europe: short and long-term remediation strategies, uncertainties in transfer, exposure and effects.
The structure of the website will enable an open dialogue to be maintained following the workshops. Resources have been included to invite and fund 12 external key contributors over the four workshops. The topics of the workshops will be identified in collaboration with the other WPs, inputs from OPERRA, NERIS and MELODI, and consultation with the wider community initiated via the website. In setting the workshop agendas we will consider including relevant socio-ethical issues.

Task 5.3 Maintaining and enhancing competence (Lead UMB with SU)
This task will be focussed on the needs of the user community to support the retention and enhancement of knowledge. Consultation with users (including industry and regulators) during the STAR project (STAR Deliverable 6.1 www.star-radioecology.org) identified training requirements with respect to radioecology. Those of particular relevance to COMET included:
• Informed application of models and tools
• Laboratory courses that provide hands-on instrumental training.
• Field studies that provide opportunities for different disciplines to work together
Recognising the demands on users, time efficient mechanism of delivering training will be developed including: courses associated with conferences, webinars and e-learning. Consideration will be given to how to best interact with the on-going training activities of other projects, in particular CINCH II, ENTRAP-II, DoReMi and with organisations such as IAEA and ENEN, as well as updating training and education course modules developed by STAR. We will consider how we can most effectively interact with organisations such as IRPA who include 'refresher courses' aimed at industry/regulators during conference schedules.
We will explore implementing the European Credit System for Vocational Education and Training (ECVET) the developing European system to facilitate the recognition and accumulation of work-related skills (http://ec.europa.eu/education/lifelong-learning-policy/ecvet_en.htm). Field studies courses will be run in collaboration with STAR NoE training activities at the two radioecological observatory sites to which the Polish and Ukrainian partners will bring a wealth of expertise and local knowledge (these course will be open to appropriate PhD students and professionals).

Person-Months per Participant

Participant number [10]	Participant short name [11]	Person-months per participant
1	SCK•CEN	1.50
2	STUK	1.50
3	NRPA	2.00
4	IRSN	0.50
5	NERC	10.00
6	CIEMAT	4.50
7	SU	2.50
8	BFS	0.50
9	UMB	6.50
10	GIG	4.50
11	Chornobyl Center	5.00

WT3:
Work package description

Person-Months per Participant

Participant number [10]	Participant short name [11]	Person-months per participant
12	NUBIP	3.50
13	Fukushima University	3.50
	Total	46.00

List of deliverables

Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
D5.1	Public website - open website for the COMET project	5	13.50	O	PU	3
D5.2	Communication plan – outline of how project outputs will be communicated	6	6.00	R	RE	6
D5.3	Workshop 1 report (to include overview of topic background, objectives, summary of discussion, consensus statements, if appropriate and recommendations)	5	4.00	R	PU	12
D5.4	Workshop 2 report (as for D5.3)	5	4.00	R	PU	21
D5.5	Workshop 3 report (as for D5.3)	3	4.00	R	PU	36
D5.6	Workshop 4 report (as for D5.3)	5	3.00	R	PU	43
D5.7	Training activities during COMET - successes, lessons learned and suggestions for the future	9	11.50	R	PU	43
		Total	46.00			

Description of deliverables

D5.1) Public website - open website for the COMET project: This deliverable will be the web site for the project. It will include : 1) Open access to information about COMET 2) Open access to the outputs of COMET, including relevant data sets and reports. 3) Links to the Radioecology Exchange and the ERA website 4) Access to training-related activities in COMET [month 3]

D5.2) Communication plan – outline of how project outputs will be communicated: This deliverable is a requirement of the EC and will outline how project outputs will be communicated. The plan will: 1) Define the goals of the communication 2) Identify the target audiences 3) Allocate available resources 4) Identify key messages 5) Determine the channels of communication 6) Describe evaluation mechanisms [month 6]

D5.3) Workshop 1 report (to include overview of topic background, objectives, summary of discussion, consensus statements, if appropriate and recommendations): A summary document will be produced following each of the COMET workshops. The report will include: 1) Overview of topic background and workshop objectives 2) Summary of discussion 3) Consensus statements if appropriate and recommendations on the COMET web site 4) Links to Presentations given at the workshop on the COMET web site [month 12]

D5.4) Workshop 2 report (as for D5.3): A summary document will be produced following each of the COMET workshops. The report will include: 1) Overview of topic background and workshop objectives 2) Summary of discussion 3) Consensus statements if appropriate and recommendations on the COMET web site 4) Links to Presentations given at the workshop on the COMET web site [month 21]

D5.5) Workshop 3 report (as for D5.3): A summary document will be produced following each of the COMET workshops. The report will include: 1) Overview of topic background and workshop objectives 2) Summary of discussion 3) Consensus statements if appropriate and recommendations on the COMET web site 4) Links to Presentations given at the workshop on the COMET web site [month 36]

D5.6) Workshop 4 report (as for D5.3): A summary document will be produced following each of the COMET workshops. The report will include: 1) Overview of topic background and workshop objectives 2) Summary of discussion 3) Consensus statements if appropriate and recommendations on the COMET web site 4) Links to Presentations given at the workshop on the COMET web site [month 43]

D5.7) Training activities during COMET - successes, lessons learned and suggestions for the future: The deliverable will outline the successes, lessons learned and suggestions for the future under the ERA platform. The report will include: 1) Refresher course 2) Field courses 3) Training based resources [month 43]

Schedule of relevant Milestones

Milestone number [59]	Milestone name	Lead beneficiary number	Delivery date from Annex I [60]	Comments
MS51	Members internal website	1	3	Internal communication and file sharing web site
MS52	Agree topics for WP5 workshops 1 & 2	5	4	Decision - posted on websites
MS53	Agree training events	9	6	Programme of activities posted on websites
MS54	Ukrainian field studies course	12	11	Course materials and feedback from participants on website
MS55	Agree topics for WP5 workshops 3 & 4	5	22	Decision - posted on websites
MS56	Review training activities	5	24	Report presented at M24 annual meeting.
MS57	Polish field studies course	10	31	Course materials and feedback from participants on website

WT4:
List of Milestones

Project Number [1]	604974	Project Acronym [2]	COMET

List and Schedule of Milestones

Milestone number [59]	Milestone name	WP number [53]	Lead beneficiary number	Delivery date from Annex I [60]	Comments
MS11	Kick-off meeting	WP1	1	1	Minutes of the kickoff meeting
MS12	Amended grant agreement with EC and new partners	WP1	1	15	Amendments to GA
MS13	Amended consortium agreement between "old" and "new" COMET partners	WP1	1	16	Amendments to CA
MS21	Workshop NERIS-ALLIANCE/STAR-MELODI and OPERRA to prioritize topics for organising a Compet. Call	WP2	1	5	Workshop programme and list of participants
MS22	Initial COMET RTD roadmap	WP2	1	6	Meeting agenda and roadmap
MS23	Competitive Call launched by OPERRA	WP2	1	7	Call text published
MS24	Selection of competitive research projects by MB + SC	WP2	1	12	Invitation letters to selected projects
MS25	Explore submission of a radioecology MSc application to Erasmus Mundus	WP2	9	24	Decide submission of application
MS26	Evaluation of the joint research work carried out under WP3 and 4	WP2	1	46	Evaluation report
MS27	ALLIANCE-NERIS-MELODI workshop to integrate new knowledge and recommendations to Horizon 2020	WP2	1	48	Workshop programme and list of participants
MS31	Evaluation of available transfer and modeling data in view of the upcoming Competitve Call	WP3	3	5	Evaluation summary as input to MS22
MS32	Validation of research results	WP3	3	46	Validation results summarized as input to Final workshop (MS27)

WT4:
List of Milestones

Milestone number [59]	Milestone name	WP number [53]	Lead beneficiary number	Delivery date from Annex I [60]	Comments
	using Observatory sites				
MS41	Proposition of biomarkers of epigenetic changes for Arabidopsis, zebrafish, earthworm, frogs.	WP4	4	18	Report on biomarkers of epigenetic changes for Arabidopsis, zebrafish, earthworm, frogs
MS42	Onset of field experiments in CEZ	WP4	5	25	Field validation of biomarkers of epigenetic changes for arabidopsis, earthworm, frogs; first results for CEZ
MS43	Onset of field experiments in Fukushima affected area	WP4	4	32	Field validation of biomarkers of epigenetic changes for Arabidopsis, earthworm, frogs; first results for Fukushima affected area
MS51	Members internal website	WP5	1	3	Internal communication and file sharing web site
MS52	Agree topics for WP5 workshops 1 & 2	WP5	5	4	Decision - posted on websites
MS53	Agree training events	WP5	9	6	Programme of activities posted on websites
MS54	Ukrainian field studies course	WP5	12	11	Course materials and feedback from participants on website
MS55	Agree topics for WP5 workshops 3 & 4	WP5	5	22	Decision - posted on websites
MS56	Review training activities	WP5	5	24	Report presented at M24 annual meeting.
MS57	Polish field studies course	WP5	10	31	Course materials and feedback from participants on website

WT5:
Tentative schedule of Project Reviews

Project Number [1]	604974	Project Acronym [2]	COMET

Tentative schedule of Project Reviews

Review number [65]	Tentative timing	Planned venue of review	Comments, if any

WT6:
Project Effort by Beneficiary and Work Package

Project Number [1]	604974	Project Acronym [2]	COMET

Indicative efforts (man-months) per Beneficiary per Work Package

Beneficiary number and short-name	WP 1	WP 2	WP 3	WP 4	WP 5	Total per Beneficiary
1 - SCK•CEN	20.00	9.00	3.00	15.50	1.50	49.00
2 - STUK	1.50	13.00	4.50	0.00	1.50	20.50
3 - NRPA	1.50	3.00	11.50	3.00	2.00	21.00
4 - IRSN	1.50	7.00	6.00	19.50	0.50	34.50
5 - NERC	1.50	8.00	5.50	8.00	10.00	33.00
6 - CIEMAT	0.50	9.00	4.00	0.00	4.50	18.00
7 - SU	0.50	6.50	5.50	9.50	2.50	24.50
8 - BFS	0.50	4.00	3.00	1.00	0.50	9.00
9 - UMB	0.50	7.00	9.00	12.50	6.50	35.50
10 - GIG	0.50	12.00	8.50	0.00	4.50	25.50
11 - Chornobyl Center	0.50	11.00	6.00	16.50	5.00	39.00
12 - NUBIP	0.50	11.00	9.00	6.00	3.50	30.00
13 - Fukushima University	0.50	6.00	5.00	6.00	3.50	21.00
Total	30.00	106.50	80.50	97.50	46.00	360.50

WT7:
Project Effort by Activity type per Beneficiary

Project Number [1]	604974	Project Acronym [2]	COMET

Indicative efforts per Activity Type per Beneficiary

Activity type	Part. 1 SCK•CEN	Part. 2 STUK	Part. 3 NRPA	Part. 4 IRSN	Part. 5 NERC	Part. 6 CIEMAT	Part. 7 SU	Part. 8 BFS	Part. 9 UMB	Part. 10 GIG	Part. 11 Chornob	Part. 12 NUBIP	Part. 13 Fukushi	Total
1. RTD/Innovation activities														
WP 3	3.00	4.50	11.50	6.00	5.50	4.00	5.50	3.00	9.00	8.50	6.00	9.00	5.00	80.50
WP 4	15.50	0.00	3.00	19.50	8.00	0.00	9.50	1.00	12.50	0.00	16.50	6.00	6.00	97.50
Total Research	18.50	4.50	14.50	25.50	13.50	4.00	15.00	4.00	21.50	8.50	22.50	15.00	11.00	178.00
2. Demonstration activities														
Total Demo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Consortium Management activities														
WP 1	20.00	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	30.00
Total Management	20.00	1.50	1.50	1.50	1.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	30.00
Work Packages for Coordination activities														
WP 2	9.00	13.00	3.00	7.00	8.00	9.00	6.50	4.00	7.00	12.00	11.00	11.00	6.00	106.50
Total Coordination	9.00	13.00	3.00	7.00	8.00	9.00	6.50	4.00	7.00	12.00	11.00	11.00	6.00	106.50
4. Other activities														
WP 5	1.50	1.50	2.00	0.50	10.00	4.50	2.50	0.50	6.50	4.50	5.00	3.50	3.50	46.00
Total other	1.50	1.50	2.00	0.50	10.00	4.50	2.50	0.50	6.50	4.50	5.00	3.50	3.50	46.00
Work Packages for Support activities														
Total Support	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

WT7:
Project Effort by Activity type per Beneficiary

Total	49.00	20.50	21.00	34.50	33.00	18.00	24.50	9.00	35.50	25.50	39.00	30.00	21.00	360.50

WT8:
Project Effort and costs

Project Number [1]	604974	Project Acronym [2]	COMET

Project efforts and costs

Beneficiary number	Beneficiary short name	Estimated eligible costs (whole duration of the project)						Requested EU contribution (€)
		Effort (PM)	Personnel costs (€)	Subcontracting (€)	Other Direct costs (€)	Indirect costs OR lump sum, flat-rate or scale-of-unit (€)	Total costs	
1	SCK•CEN	49.00	407,553.30	2,000.00	717,171.49	285,287.09	1,412,011.88	1,298,416.54
2	STUK	20.50	176,919.00	10,000.00	27,700.00	143,910.00	358,529.00	261,369.88
3	NRPA	21.00	189,000.00	0.00	20,050.00	75,600.00	284,650.00	0.00
4	IRSN	34.50	201,020.16	0.00	53,900.00	158,805.88	413,726.04	303,322.89
5	NERC	33.00	216,225.61	1,000.00	56,375.00	240,008.17	513,608.78	406,655.30
6	CIEMAT	18.00	85,493.80	0.00	11,600.00	99,174.16	196,267.96	138,934.16
7	SU	24.50	157,735.31	0.00	49,500.00	124,341.19	331,576.50	259,460.45
8	BFS	9.00	61,938.00	0.00	13,700.00	45,382.80	121,020.80	92,547.76
9	UMB	35.50	397,600.00	0.00	124,500.00	313,260.00	835,360.00	0.00
10	GIG	25.50	130,303.71	0.00	25,100.00	46,621.39	202,025.10	169,479.27
11	Chornobyl	39.00	82,110.00	0.00	44,100.00	28,738.50	154,948.50	109,068.50
12	NUBIP	30.00	66,240.00	0.00	26,700.00	55,764.00	148,704.00	114,527.00
13	Fukushima	21.00	186,500.00	0.00	69,400.00	56,670.00	312,570.00	257,218.00
Total		360.50	2,358,638.89	13,000.00	1,239,796.49	1,673,563.18	5,284,998.56	3,410,999.75

1. Project number

The project number has been assigned by the Commission as the unique identifier for your project. It cannot be changed. The project number **should appear on each page of the grant agreement preparation documents (part A and part B)** to prevent errors during its handling.

2. Project acronym

Use the project acronym as given in the submitted proposal. It cannot be changed unless agreed so during the negotiations. The same acronym **should appear on each page of the grant agreement preparation documents (part A and part B)** to prevent errors during its handling.

53. Work Package number

Work package number: WP1, WP2, WP3, ..., WPn

54. Type of activity

For all FP7 projects each work package must relate to one (and only one) of the following possible types of activity (only if applicable for the chosen funding scheme – must correspond to the GPF Form Ax.v):

• **RTD/INNO =** Research and technological development including scientific coordination - applicable for Collaborative Projects and Networks of Excellence

• **DEM =** Demonstration - applicable for collaborative projects and Research for the Benefit of Specific Groups

• **MGT =** Management of the consortium - applicable for all funding schemes

• **OTHER =** Other specific activities, applicable for all funding schemes

• **COORD =** Coordination activities – applicable only for CAs

• **SUPP =** Support activities – applicable only for SAs

55. Lead beneficiary number

Number of the beneficiary leading the work in this work package.

56. Person-months per work package

The total number of person-months allocated to each work package.

57. Start month

Relative start date for the work in the specific work packages, month 1 marking the start date of the project, and all other start dates being relative to this start date.

58. End month

Relative end date, month 1 marking the start date of the project, and all end dates being relative to this start date.

59. Milestone number

Milestone number:MS1, MS2, …, MSn

60. Delivery date for Milestone

Month in which the milestone will be achieved. Month 1 marking the start date of the project, and all delivery dates being relative to this start date.

61. Deliverable number

Deliverable numbers in order of delivery dates: D1 – Dn

62. Nature

Please indicate the nature of the deliverable using one of the following codes

R = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

63. Dissemination level

Please indicate the dissemination level using one of the following codes:

• **PU =** Public

• **PP =** Restricted to other programme participants (including the Commission Services)

• **RE =** Restricted to a group specified by the consortium (including the Commission Services)

• **CO =** Confidential, only for members of the consortium (including the Commission Services)

• **Restreint UE =** Classified with the classification level "Restreint UE" according to Commission Decision 2001/844 and amendments

• **Confidentiel UE =** Classified with the mention of the classification level "Confidentiel UE" according to Commission Decision 2001/844 and amendments

• **Secret UE =** Classified with the mention of the classification level "Secret UE" according to Commission Decision 2001/844 and amendments

64. Delivery date for Deliverable

Month in which the deliverables will be available. Month 1 marking the start date of the project, and all delivery dates being relative to this start date

65. Review number

Review number: RV1, RV2, ..., RVn

66. Tentative timing of reviews

Month after which the review will take place. Month 1 marking the start date of the project, and all delivery dates being relative to this start date.

67. Person-months per Deliverable

The total number of person-month allocated to each deliverable.

"PART B"

COordination and iMplementation of a pan-European instrumenT for radioecology

Proposal acronym:

COMET

Type of funding scheme:

Combination of Collaborative Project, Coordination and Support Action

Topics addressed

Fission-2013-3.4.1. Support to the strengthening of pan-European research initiatives on the impact of radiation on the environment, including the food chain and the protection of non-human species

Name of the coordinating person: **Vandenhove Hildegarde**

SCK•CEN

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List of Participants

Participant no.	Acronym	Organisation name	Country
1	SCK•CEN	Studiecentrum voor Kernenergie/Centre d'Etude de l'Energie Nucléaire	Belgium
2	STUK	Sateilyturvakeskus	Finland
3	NRPA	Norwegian Radiation Protection Authority	Norway
4	IRSN	Institute de Radioprotection et de Surete Nucleaire	France
5	NERC	Natural Environment Research Council	UK
6	CIEMAT	Centro de Investigaciones Energetical, MedioAmbientales y Tecnologicas	Spain
7	SU	Stockholms Universitet	Sweden
8	BfS	Bundesamt für Strahlenschutz	Germany
9	UMB	Universitetet for Miljo og Biovitenskap	Norway
10	GIG-SCRS	Glowny Instytut Gornictwa	Poland
11	Chornobyl Center	Chornobyl Center for Nuclear Safety, Radioactive Waste and Radioecology, International Radioecology Laboratory	Ukraine
12	NUBIP	National University of Life and Environmental Sciences of Ukraine	Ukraine
13	Fukushima University	Fukushima University	Japan

Table of contents

PROPOSAL

B1. Scientific and/or technical quality

B1.1. Concept and objectives

COMET (**COo**rdination and i**M**plementation of a pan-**E**uropean instrumen**T** for radioecology) will strengthen the pan-European research initiative on the impact of radiation on man and the environment by facilitating the integration of radioecological research, including both the human food chain and the protection of wildlife. The project will build upon, and compliment, the foundations laid by the European Radioecology Alliance (ALLIANCE: www.er-alliance.org) and the ongoing FP7 STAR Network of Excellence in radioecology (www.star-radioecology.org, 2011-2015). The science of radioecology underpins our ability to predict the exposure of humans and non-human species to radioactivity along with the potential biological effects and associated risks for wildlife for a wide range of environmental situations. Predicting the effectiveness of remediation measures which may be used in post accident situations is one example of application of such skill and knowledge. By collaborating with the European platforms[1] on nuclear and radiological emergency response and recovery (NERIS: http://www.eu-neris.net/) and low dose radiation risk (MELODI, http://www.melodi-online.eu/), and relevant training networks (e.g. EUTERP: http://www.euterp.eu/, ENEN: http://www.enen-assoc.org) we will significantly aid preparation for the implementation of *Horizon 2020*. In the context of the future *Horizon 2020* approach, the European Commission (EC) is looking for umbrella structures (legal entities/associations) to delegate some of the tasks related to the management of Community research programmes to third parties. Such umbrella structure for Radiation Protection will be prepared by OPERRA (Open Project for the European Radiation Research Area, submitted under FISSION-2013. 3.1.1).

The ALLIANCE initiated the first step towards integrating European Radioecology in 2009, when the directors of eight organisations signed a Memorandum of Understanding stating their commitment to the long-term integration of radioecology within Europe. The STAR network of excellence (NoE) took forward the process of initiating a sustainable integration of radioecology primarily amongst its nine partner organisations. It also developed the first version of a strategic research agenda (SRA, Hinton et al., 2013) for radioecology which has attracted large interest with the wider radioecology community as demonstrated by the 110 responses that were submitted to an online survey prior to an SRA discussion workshop organised in November 2012 (all responses and discussion points are available on www.star-radioecology.org). Furthermore, with the intention of growth, the ALLIANCE, as a legal entity (an Association under French law), has recently published details of how to apply for membership (www.er-alliance.org) and at the time of writing 3 additional organisations have applied for membership. The timing of COMET is therefore opportune to further bring together European radioecology and begin working towards achieving the SRA goals in collaboration with allied European platforms which rely upon radioecology for their underpinning science. The COMET consortium expands on the organisations of STAR and the ALLIANCE. In particular, COMET facilitates links with countries which have experienced major nuclear accidents (i.e. former Soviet Union states and Japan).

In close association with STAR (during the expected ~2 year overlap period) and the ALLIANCE, we will take forward the SRA developed under STAR as the basis for developing innovative mechanisms for joint programming and implementation (JPI) of radioecological research. COMET will establish its JPI mechanisms in close interaction with OPERRA. In summary, COMET will provide OPERRA with efficient and coherent JPI mechanisms tested for the field of radioecology and as such, it will constitute a key element to ensure the integration under a common federating umbrella structure. To facilitate and foster future integration under this common federating structure, the research activities developed within COMET will be targeted at those research needs from the radioecology SRA that will also address priorities of the emergency management (NERIS) and low dose (MELODI) platforms. These research activities will be initiated in collaboration with researchers from countries where major nuclear accidents have occurred to exploit the opportunities offered by contaminated sites and maximise impact and exchange of knowledge and experience. Sustainable interaction with international organisations and networks outside of Europe will also be pursued by striving towards Memoranda of Understanding (MoU) between the ALLIANCE and those international organisations/networks.

Funds have been allocated for two projects under one Competitive call organised in collaboration with OPERRA, which comprises ~18% of the total budget of COMET. These funds will be used to facilitate RTD activities identified

[1] Platforms like ALLIANCE, NERIS, MELODI are legal associations of research institutes, universities and authorities that develop and coordinate scientific policies in respectively the domain of Radioecology, Emergency Management and Low Dose

through the mechanisms developed for joint programming and implementation. This will ensure a flexible mechanism to start answering priority needs identified by the SRA developed under STAR (which will be further developed by COMET) with a focus on those which are synergistic with the ones of the allied emergency management and low dose communities. The use of these funds in a Competitive Call will not only allow research to address the identified needs but also provide a means of attracting and integrating further members to the consortium and, subsequently, potentially to the ALLIANCE through new memberships. This mechanism will promote the participation of partners from fields of research other than radioecology and as such, strengthen the link between EURATOM and non-EURATOM environmental science communities. In addition, COMET will help ensure sustainability of the ALLIANCE by securing the European radioecological research by endeavouring to liase with all national research and funding initiatives.

B1.1.1. COMET objectives

The overall objective of the COMET project is to strengthen the pan-European research initiative in radioecology. This will be achieved by meeting the following specific objectives:

- Develop innovative mechanisms for joint programming and implementation (JPI) for radioecological research in concert with the mechanisms for JPI developed by OPERRA for the *Horizon 2020* proposed Radiation Protection Federating Association.
- Initiate highly innovative research on the key needs jointly identified by the radioecology community and the (post) emergency management (NERIS) and low-dose research communities (MELODI), and strongly engage with collaborators from countries where major nuclear accidents have occurred.
- Under an enlarged consortium and facilitated by the funds allocated for the Competitive Call further conduct priority research identified following the joint programming mechanisms developed under COMET.
- Develop strong mechanisms for knowledge exchange and dissemination to enhance and maintain European capacity, competence and skills in radioecology.

The approach, achievability and timeliness to reach these objectives are detailed in section A1.8 and further below in B1.3.

B.1.1.2: Approach to achieve the objectives

Strengthen the pan-European research initiative in radioecology

Maintaining capacity, competence and skills in radioecology will be most effectively achieved at a pan-European level, whilst, solving the uncertainties required to robustly predict exposure, effects and risk to man and the environment. This requires integrated input from many scientific disciplines. The European Radioecological Alliance (ALLIANCE) was established by 8 European organisations with the purpose of providing a platform to coordinate and promote European research on radioecology. The ALLIANCE is an organisation open to membership from any qualifying European organisation/scientist, though non-European organisations can also become members. In close collaboration with the ALLIANCE, COMET will develop initiatives to encourage organisations from the European radioecological research community to join the ALLIANCE to help realise the identified priorities for radioecological research. The priorities identified in the SRA developed by the STAR NoE in partnership with the ALLIANCE can only be realised by an enlarged consortium. Guidelines for interaction internally and with the international radioecological community and the Radiation Protection Federating Association (to be created by OPERRA) will be established. Mechanisms used to attract and integrate new partners will include the Competitive Call for research activities enabled by the flexible funds (WP1 and WPs 2-4) and several workshops which will bring together the different communities involved in radiation protection to debate topical issues ensuring better focusing and exploitation of scientific research efforts avoiding duplication (WP5).

Develop innovative mechanisms for joint programming and implementation (JPI) for radioecological research in concert with the mechanisms for JPI developed by OPERRA for the *Horizon 2020* proposed Radiation Protection Federating Association

The ALLIANCE and the STAR NoE have taken the first steps towards joint programming of research activities in radioecology. ALLIANCE/STAR organisations have begun to harmonise their research through common activities on an integrative system for human and wildlife protection, multiple stressor research and wildlife effects research. Significantly, they have also begun to explore infrastructure sharing and joint capacity development. Moreover, in

interaction with the ALLIANCE, STAR has developed an SRA which has been generally well received and has been the subject of an open meeting in November 2012.

Mechanisms for joint research programming will be developed under COMET based on:

- the scientific requirements identified in the STAR/ALLIANCE SRA;
- learning from the EC expertise in programme definition and development of evaluation criteria;
- consensus seminars; and
- interaction with experts.

An implementation plan will be put forward in collaboration with the ALLIANCE and the allied platforms on low dose and emergency management research. Under the COMET project, it was our initial intention to apply these mechanisms of joint programming and implementation to the definition of topics relevant under WP3 and WP4 for a Competitive Call. The Competitive Call that will be organised jointly with OPERRA needed to be advanced in time from that envisaged in our proposal; consequently the call topic selection will be based on preliminary defined JPI mechanisms. The JPI will be developed consistently with those developed by OPERRA and implemented under the Radiation Protection Federating Structure. This process will be easily implemented because of the close interaction between the two leading partners of COMET (SCK•CEN) and OPERRA (IRSN). Communication and collaboration will subsequently be improved through an iterative process including interaction with the other radiation protection platforms.

As part of the implementation plan, COMET will identify ongoing or future national initiatives for radioecological research. National funding bodies will be consulted to best ensure optimisation of, and support for, co-operation and joint programming. The setting up of Memoranda of Understanding between the national funding authorities and the ALLIANCE will be explored as a mechanism of ensuring long-term sustainability of the JPI's.

Initiate highly innovative research on the key needs identified by the radioecology community, the (post) emergency management and low-dose research communities, and engage with partners from countries where major nuclear accidents have occurred.

Radioecology is a truly multidisciplinary science which has many capacities and objectives; it studies the transfer of radionuclides in the biosphere, atmosphere and geosphere-biosphere interaction zone to predict radiation exposure to man and the environment and its resulting potential impact on both human health and ecosystems. This expertise is needed to understand and predict accidental and routine releases and existing exposure scenarios. Such knowledge is required to ensure the safe operation or management of nuclear industry (from mining through to long-term disposal), the NORM industries, releases from hospitals and research institutes, and legacy sites contaminated by past activities. A component of this is the development of remediation measures for application in post-accident situations to reduce the exposure and ensure normal living/commerce can be maintained as far as possible. Radioecology also studies the effect of ionising radiation on wildlife and ecosystems.

The development of a pan-European Radiation Protection Federating Association will require the collaboration of the various communities which will comprise its key components: radioecology (ALLIANCE), low-dose (MELODI), emergency and post emergency management (NERIS), dosimetry (EURADOS) and radiochemistry (CINCH-II). To help initiate this, COMET will focus its research towards the joint needs of radioecology, post emergency management and low-dose radiation risk.

Experience during the STAR NoE has shown that RTD activities foster integration between partners. Consequently, to promote an immediate effective integration of the partners from countries where major nuclear accidents have occurred COMET will initiate a small initial research programme. The SRA's of the three scientific communities (radioecology, low-dose, emergency) have been initially evaluated during the preparation of this proposal and after discussion with senior representatives of MELODI and NERIS initial joint RTD topics have been identified as being of mutual interest. Moreover, the Initial Research Activity (IRA) will allow for immediate integration of the partners from countries where major nuclear accidents occurred. RTD under WP3 and WP4 is organised as an IRA which under WP3 runs for 2 years and under WP4 for the duration of the project. A Competitive Call will be organised for RTD activities under WP3/WP4 which are highlighted as key after the detailed analysis of the SRAs of ALLIANCE, NERIS and MELODI. This call will help to bridge with non-radiation research communities (e.g. ecology, genetics, systems biology).

Initial research activities linking radioecology and the emergency /post-accident community

Following interaction with the NERIS platform the common key research initiative of improving the radioecological models developed for emergency/post-emergency management was identified with the following specific objectives being highlighted:

(1) obtain better parameter values including those associated with human food-chain modeling for the Decision Support Systems for emergency situations (e.g. RODOS and ARGOS); and

(2) compare the performance and robustness of model predictions for short and medium/long term after an accident between existing modeling tools and the next generation dynamic models.

COMET intends to advance this scientifically challenging and important area in WP3 by an IRA and subsequently a Competitive Call for research activities based on the emerging needs in radioecology and emergency/post-accident research identified in a joint ALLIANCE-NERIS workshop in October 2013 (associated with a STAR workshop where their final SRA will be presented). Within the IRA (WP3.1) we will focus on improving parameterization of key processes controlling the transfer of radionuclides, with a specific focus on characterising parameters of importance for dynamic modeling approaches. Regulators use generally relatively simplistic models whereas better and more flexible approaches have recently been developed. Involvement of the experienced STAR partners and new partners with experience of and access to Radioecology Observatory sites (see below) in the COMET consortium will advance the research to incorporate the most innovative science. The Observatories will also be of great value in validation of existing and improved models.

Initial research activities linking radioecology and low dose radiation risk communities

Epigenetic processes and transgenerational effects induced by ionising radiation have been put forward as priority research areas in the SRAs of both the ALLIANCE and MELODI. Epigenetic changes are hereditary traits which do not involve a change in the DNA sequence. As well as being under genetic control, gene expression is regulated by epigenetic processes such as DNA methylation, micro-RNA interaction and histone modifications. Difference in the level of expression of genes is one of the factors contributing to the phenotype. Epigenetic states and certain environmental responses in mammals and spermatophytes (seed plants) can persist in the next generation. Epigenetic processes are induced by stressors (like radiation) and may lead to altered/less fit phenotypes or off-spring. Epigenetic changes may, however, also lead to increased resistance to adverse conditions. For example, hypermethylation may be viewed as a defence strategy of plants that prevents genome instability and 'reshuffling' of the hereditary material, allowing survival in extreme environments (including high radiation environments).

There are few studies that analyse in detail the involvement of DNA methylation and other epigenetic mechanisms in the complex process of radiation stress for man and wildlife. COMET intends to advance this innovative and scientifically challenging area. Experiments will be conducted under controlled laboratory conditions with results obtained in the laboratory being supported by field observations in the Chernobyl and Fukushima affected areas (WP4.1).

Initial research activities and observatory sites

Key to the proposed IRA is collaboration with institutes holding Observatory Sites or field sites in the Chernobyl Exclusion Zone (CEZ) or Fukushima affected areas of Japan and the STAR NoE's Polish Observatory Site impacted by the NORM industry. This collaboration is essential for new data collection connected to the two IRAs and for the meta-analysis of existing environmental time-series for quantification of key processes and variables that influence dynamic radionuclide transfer and exposure. The outcome would be better parameterisation and validation of dynamic models. Similarly, these sites represent unique opportunities to enable the proposed epigenetic and transgenerational effects studies to be conducted.

<u>Under an enlarged consortium, facilitated by the flex funds for Open Calls, further perform priority research following the mechanisms of joint programming being developed</u>

Within the actual COMET consortium, the core group of STAR partners has been expanded to include partners that hold strong connection to sites impacted by severe nuclear accidents (Chernobyl, Fukushima) or partners in countries where the STAR Observatory sites are located (Chernobyl and the NORM site in Poland).

Additionally, a relatively large fraction (~18 %) of COMETs funds will be used as flexible funds. Additional research activities will be identified, based on an actualised STAR/ALLIANCE SRA (that considers the outcome of the STAR consultation process), in discussion with NERIS/PREPARE and MELODI/OPERRA and the wider community early on in the project (October 2013; Month 5). Flexible funds are set aside to support key research through a Competitive Call and thereby provide a mechanism of attracting new partners with complementary expertise to the process of strengthening pan-European research initiatives. Hence, these research activities will fulfil two purposes: (i) begin to address the priorities of the radioecology SRA in collaboration with the needs of the low dose and emergency response communities: (ii) engage more partners in the process of strengthening pan-European research initiatives. A Competitive Call will be launched during month 7 in collaboration with OPERRA; the call focus will be identified based on preliminary mechanisms of joint programming and implementation developed under WP2.

Develop a strong mechanism for knowledge exchange and dissemination to enhance and maintain European capacity and skills in radioecology

Recognising the essential nature of knowledge exchange including the exploitation of results, spreading of excellence and capacity building to the success of COMET we have dedicated a work package to this issue (WP5). The work done under this WP will include: establishing a website providing open access to the outputs of COMET and maintaining the *Radioecology Exchange* site after the FP7 STAR project finishes (summer 2015); use of other web-based technologies (e.g. social networks); organising a series of open topical workshops to stimulate discussion on radioecology related issues of current interest/concern to industry and regulators, and public (media) with an emphasis on interaction with the other radiation protection platforms; supporting the retention and enhancement of knowledge through training activities focussed on professionals. We will follow best practice strategic communication, as recommended in EC (2012), ensuring we target our different audience through appropriate media. Our approaches to be used to 'spreading excellence, exploiting results, disseminating knowledge, and management of intellectual property' are more fully described in section B3.2.

B1.1.3. Relevance to the call objectives

The COMET project fully addresses the call objectives (underlined phrases below) and will help prepare for the implementation of *Horizon 2020* as follows:

Support to the strengthening of pan-European research initiatives on the impact of radiation on the environment, including the food chain and the protection of non-human species

A key objective of COMET is to strengthen and enlarge the European Radioecological Alliance (ALLIANCE). The key study domain of radioecology is the impact on and protection of humans (especially exposure via food-chain) and the environment. Mechanisms for enlarging the ALLIANCE will be established under WP2. One of these will be the flexible funds which will allow new partners to join the consortium via the Competitive Call. Workshops on themes of pan-European interest will further aid integration and attract new ALLIANCE members. COMET will collaborate where possible with other radiation protection platforms and OPERRA and thus prepare for the future integration of EU programs, under the *Horizon 2020* policy.

Building up an innovative mechanism for the joint programming (and implementation) of research in radioecology in Europe with strong links with the Radioecology Alliance

The COMET consortium is uniquely placed to co-ordinate with the Radioecology Alliance with seven of the eight ALLIANCE organizations being partners in COMET. Furthermore, the COMET consortium includes within its members all of the STAR partners who developed the radioecology SRA in collaboration with the ALLIANCE and have begun the process of integrating their research and resources. Mechanisms for research prioritization and joint programming will be developed under WP2 and mechanisms for joint research implementation will be established in collaboration with the ALLIANCE. Here again, consistency with OPERRA will be strived for and easy to manage since COMET and OPERRA leading institutes are both highly committed in the present European research platforms. The joint programming is expected to lead to (1) socio-economic benefit (e.g. more robust dose assessment in emergency-post emergency phase leading to optimized relocation areas); (2) to a stronger European Radioecology (only through trans-national collaboration can we establish a European Centre of Excellence in Radioecology); (3) to better science (since multidisciplinary research is made possible); (4) to more efficient use of resources (people,

infrastructure) since complementarities are sought for and duplication is avoided, and; (5) to a wider dissemination and take up of research results.

Better coordination and integration of national research efforts in the field of radioecology, while extending national funding opportunities.

COMET will endeavour to optimize co-operation and joint programming with national funding and/or programming bodies. Co-ordination with national research efforts and funding schemes is addressed in WP2.4. At its initiation, part of COMET's RTD activities will rely on national and institute funding as some of the work will be realised through 3 PhDs that are only partially (25-35 %) financed by COMET (and all RTD under WP3 and WP4 is only funded at maximally 75 % as standard EC rule) and also by sharing national funded facilities and analytical equipment existing among the COMET partners. Additionally, most partners will be adding extra (self-funded) 'senior' man months in WP3 and WP4 to realize the set objectives.

Proposed activities should aim at building up an innovative mechanism for the joint programming (and implementation) of research in radioecology in Europe with strong links with the community of emergency and post-accident management.

Part of the Initial Research Activities are targeted at collaboration with NERIS on common priority research topics as highlighted by our respective SRAs (WP3); the other remaining IRA is directed at research priorities that radioecology has in common with the low-dose community (MELODI) (WP4). We anticipate that a significant component of the RTD that will be proposed for the Competitive Call will have strong links with MELODI and NERIS.

Forecast the flexibility of integrating new partners if needed during the implementation of the project.

COMET has set aside 600 kEUR or ~18 % of its proposed budget for flexible funds, which will be allocated to key RTD activities identified by the JPI mechanisms through which new organisations can join COMET. This will allow new partners with key expertise required for executing the open calls to be integrated. Part of the call budget will be allocated to allow the new partners to fully integrate within COMET (to execute the common tasks under WP2, to attend the COMET Management board meetings, to attend workshops etc.), to allow for efficient integration of the new science within COMET and to allow for adequate collaboration/interaction between the "old" and "new" partners.

International links with countries in which nuclear accidents occurred will be considered as essential.

COMET has already established strong links with countries in which nuclear accidents occurred. (1) Two Ukrainian organisations, UIAR NUBiP and Chornobyl Centre' are COMET consortium partners. They will be strongly involved in RTD activities under WP3 and WP4. Several of the European COMET partners already have long-standing collaborations with these institutes. (2) Fukushima University is a Japanese partner in the consortium who will be responsible for the co-ordination of field studies in the Fukushima affected area. The University of Fukushima has become responsible for the Institute for Environmental Radioactivity that will deal with issues of land contaminated by the Fukushima accident. The Institute for Environmental Radioactivity will attract radioecologists from all over Japan and beyond. Furthermore, many COMET partners have bilateral collaboration projects or interactions with Japanese institutes dealing with the consequences of the Fukushima accident.

B1.2. Progress beyond the state-of-the-art

B1.2.1. Description of state-of-the-art and baseline data against which expected progress and achievements will be measured

Towards a pan-European association in radioecology connecting with the future European broader Radiation Protection Federating Association

In the context of *Horizon 2020*, the European Commission is looking for umbrella structures for its RTD activities. An umbrella structure would include the major research networks and institutions in Europe in the respective research areas. In the field of radiation protection the umbrella would cover the thematic research areas of radioecology, radiological emergency preparedness, low dose health effects and dosimetry. Networking structures have already been established in these areas, namely the ALLIANCE in radioecology, MELODI in low dose health effects, NERIS in

radiological emergency preparedness and EURADOS in dosimetry. Each of these networks has set up frameworks in parallel facilitating the development of SRAs and priority setting in the respective fields of research, the maintenance of infrastructures for RTD in Europe and dissemination in the specific fields and the promotion of education and training and mechanisms for linking the activities under these different networks are to be established.

Approach and added value of WP2

The overall objective of the proposed COMET project is to build upon the foundations laid by the FP7 STAR NoE and the European Radioecological Alliance (ALLIANCE) to strengthen the pan-European research initiative in radioecology thereby proceeding towards a single umbrella (or 'federating') structure in the field of radiation protection in preparation for the *Horizon 2020* programme. The identity, scope and role of the ALLIANCE as an entity and with respect to the functioning of the future federating structure will be formalised and strengthened. Innovative mechanisms for joint programming and implementation of radioecological research based on the SRA in progress will be developed by COMET in close collaboration with the ALLIANCE and the platforms for other fields such as emergency management (NERIS) and low dose research (MELODI). These mechanisms will progress to be consistent with those developed for the whole Radiation Protection Federating Association represented by FP7 project OPERRA.

The common priority research needs for radioecology, emergency preparedness and low dose research will be identified together with the ALLIANCE, NERIS/PREPARE, MELODI/OPERRA and joint research projects will be launched. The results of these joint research activities will be evaluated together with ALLIANCE, NERIS and MELODI. The new knowledge gained will be integrated to give recommendations for future research lines of the *Horizon 2020* programme. The radioecology SRA will be reviewed together with stakeholders to ensure that the research recommendations made and potential impact on future calls remain relevant for the scientific and user community, and correspond to genuine and achievable priority research needs.

The participation of new member states in COMET and the ALLIANCE will be encouraged, thereby supporting a more broad and effective implementation of the European Research Area in the field of nuclear fission and exploiting the full potential of institutes, universities and other organisations in these countries with regard to their infrastructure, human resources and overall competences. The increase in ALLIANCE membership may be seen as a clear measure of success. In addition to enhanced networking within Europe, connections to, and collaboration with, relevant networks or organisations outside Europe will be enhanced. The interest from the outside world in developments of radioecology in Europe was clearly demonstrated by 58 out of 110 respondents to the STAR-SRA questionnaire being from non-EU member states. This clearly shows that European radioecology is playing a world-leading role in setting the future research agenda, and this has only been achieved by joining forces under STAR/ALLIANCE. This positive evolution will be strengthened under COMET such that it can be continued under the ALLIANCE in collaboration with the Radiation Protection Federating Association in the future.

Improving and validating radioecological transfer and exposure models for risk assessment and emergency and post-accident situations - reducing the uncertainties[2]

The emergency and post-accident community has over the years developed many predictive models for atmospheric, terrestrial, aquatic and urban dispersion of radionuclides in accident or malevolent situations. Some of these models include food chain and human exposure modelling, while environmental impacts are considered less. Though a number of models for application to accidents have some non-equilibrium components (e.g. wash-off, biological half-life) most of the environmental models currently used in radiological risk assessment assume conditions of equilibrium between the various components of the environment and use radionuclide-specific parameters accordingly (Oughton et al., in press; Strand et al., 2009; Beresford et al., 2008; Brown et al., 2008; Hosseini et al., 2008).

The Fukushima accident clearly showed the inadequacy of using equilibrium constants for predicting the transfer and uptake of radionuclides in the marine and terrestrial environment and the food chain (Psaltaki et al., in press; Honda et al., 2012). It also revealed our inability to correctly predict the external dose contribution from groundshine as an input to evacuation or relocation considerations.

For non-equilibrium situations (eg. accidents, pulsed releases, NORM contamination, climate change), a dynamic, process-oriented modelling approach with proper time and space dependent transfer parameters is required to estimate consequences within acceptable uncertainties.

Approach of WP3 and added value of networking between ALLIANCE and NERIS [2]

Very few studies have been performed where a truly dynamic and process-oriented approach has been used (Vives i Batlle et al., 2008; Cox et al., 2005; Gillett et al., 2001) yet such an approach would significantly improve the accuracy of our model predictions.

Within the Initial Research Activity (WP3.1) we will therefore focus on improving parameterisation of key processes controlling the transfer of radionuclides in terrestrial and aquatic systems, with a specific focus on dynamic modeling approaches. The challenge lies in merging well-understood processes and reliable empirical relationships into practical, process-oriented models describing the transfer of radionuclides in the environment. Involvement of the experienced STAR partners and new partners with use of Observatory sites to study the movement and fate of radionuclides and validate our understanding will advance the research beyond the current state-of-the-art. Experimental and monitoring approaches as well as modelling approaches will be combined to improve the understanding of the transport processes at different temporal scales (days up to multiple years) and various spatial scales (local, catchment, regional).

We will hence apply a evidence-based analysis approach: data sets (existing and collected) and former studies will be analysed and summarized to establish improved models that are tested and validated at, e.g., the Observatory Sites, and that will allow us to extrapolate or make predictions for future trends and other scenarios (e.g. applying remedial actions).

For the initial phase (days-months) after an accident, both Chernobyl and Fukushima data will be used to establish better rate constants for characterizing processes such as transfer, uptake and exposure in both freshwater and terrestrial, including agricultural, environments based on measurements performed in the early stages after the respective accidents. The focus will be on the main dose forming radionuclides and exposure pathways for humans and the environment. The Ukrainian and Japanese partners would bring valuable input as countries where nuclear accidents have occurred. Fukushima data will also be valuable for predictions of transfer and exposure in the marine environment which has not been covered by the Chernobyl research and is generally an understudied research area in radioecology. The EC PREPARE project has an important research component on marine distribution of radionuclides after nuclear accidents. This work will not be duplicated in COMET which will focus on uptake and exposure research in terrestrial and freshwater environments as a logical sequence.

For the medium/long term (months-decades) after deposition, the Ukrainian and other European partners have long time data series for the aquatic, terrestrial and agricultural environments that could be collated and reanalyzed taking the temporal and spatial aspects of transfer properly into account. Again, the focus will be on the main dose forming radionuclides and exposure pathways for humans and the environment. As COMET progresses it may be possible to test the applicability of these parameters and dynamic approaches to the post-Fukushima situation in Japan.

The STAR observatory in Upper Silesia, Poland, offers the opportunity to consider pulsed Ra (and U) discharges to the terrestrial and freshwater environments (Chałupnik et al., 2001) and will be used to investigate how important parameters could be characterized for dynamic modelling relevant to environmental management of the many NORM industrial sites across Europe (and world-wide).

Statistical analyses of data arising from the observatory sites, literature information, and expert knowledge will benefit from the most advanced probabilistic methods, including Bayesian statistics. Advanced statistics will be useful especially when empirical data are either absent or scarce, and/or when the number of parameters in the considered models becomes increasingly large (Hosseini et al., submitted; Tarsitano et al., 2011).

This work will make use of the IAEA model intercomparison studies EMRAS (http://www-ns.iaea.org/projects/emras/emras2/) and MODARIA (http://www-ns.iaea.org/projects/modaria/) (and preceeding programmes) and other studies where issues of dynamic modelling have been considered, although not solved (e.g. process modelling in STAR and the on going UNSCEAR environmental study in Fukushima (http://www.unscear.org/unscear/en/fukushima.html; Weiss, 2012). We will also work in close interaction with PREPARE (joint workshops) to achieve maximum complementarity and impact.

A joint workshop between the radioecological and emergency/post-accident communities will be arranged to discuss common research needs based on the respective SRAs and identify key topics to be addressed in a Competitive Call of COMET. Following the Competitive Call, we expect to initiate research activities that will significantly advance our ability to address important issues highlighted in the SRAs such as for example:

[2] For references cited within B1.2 – see Annex 4

(i) Better parameterisation of the most important radioecological factors in predictive models for
- remediation at farm or collective farm scale level to assess optimal land-use with time
- marine and freshwater dynamic transfer of radionuclides, impact and recovery periods in the environment
- urban contamination and remediation.

(ii) Improving the approach used for calculating groundshine as an external dose contributor as a function of topography and vertical and horizontal migration of radionuclides with time.

(iii) Evaluating efficiency of countermeasures applied in Japan and how these data can be used in models.

(iv) Developing means for accounting for complex societal - environmental interactions and processes in models describing transfer and impact of radionuclides.

The expected impacts and the added value of networking between the COMET and NERIS partners in WP3 are:

- Through the IRA, WP3 will substantially advance our currently inadequate understanding of how temporal, spatial and environmental processes affect radionuclide distribution, thus improving predictive model capacity for better protection of humans and the environment in emergency and post-emergency situations
- Improved models will provide a more robust basis for guiding adequate actions on evacuation, relocation and countermeasures.
- Networking between COMET/ALLIANCE and NERIS will ensure that the improved radioecological models will be fed directly into European emergency response tools, and the development of future common research lines and a Joint Programme of Activities and Implementation Plan will increase efficiency, leading to the optimized use of research funds and an improved and holistic approach to related research
- Establishing a bridge with the non-EURATOM community (e.g. ecotoxicology) will make use of expertise on spatio-temporal variation of other pollutants and the impact of environmental factors on this variation

Need for joint research on low dose effects between the ALLIANCE, MELODI and beyond the EURATOM field[3]

Evaluating the effects of low dose radiation on organisms is clearly a shared challenge in research on human and non-human species. Particularly, understanding the role of primary mechanisms at the cellular and sub-cellular level when organisms are exposed to low dose will help to explain the potential consequences on pathologies and physiological functions at the individual (and population) level.

One of COMET-WP4 overall objectives is to strengthen pan-European links and implement research-sharing mechanisms on the biological effects of ionising radiation between the radioecology and radiobiology communities. To accomplish these objectives, WP4 follows a similar approach as WP3 by establishing an Initial Research Activity on a specific selected topic of common interest to radioecology and radiobiology, as well as prioritising low-dose effect research through a further detailed examination of the SRAs from the ALLIANCE and MELODI and announcing a Competitive Call for the selected topics.

For the WP4-IRA, based on initial discussions with key people involved in the ALLIANCE and MELODI SRAs, the selected focus is on epigenetics and transgenerational effects. While this is the area of research chosen for the IRA, it is only one topic within the shared challenges in chronic low dose effects in radiobiology and radioecology. As said above, justification of the choice of other potentially innovative research topics will be provided in due time during the course of the project and in combination with the Competitive Call.

The stable transfer of potentially heritable traits to (a) subsequent generation(s) can be achieved by the introduction of mutational events in genomic DNA. In addition to this, numerous so called epigenetic mechanisms for non-genetic transgenerational transfer of traits have been identified (Berger, 2009). They include covalent modification of dinucleotide sequences (CpG islands) in promoter regions of genes by DNA methyl-transferase enzymes (DNMTs), direct modifications of histones and nucleosomes via deacetylation and/or methylation reactions by histone deacetylase (HDACs) and methyltransferase enzymes (HMTs) and post-translational modifications along with transcriptional repression of mRNAs and (retro)transposons by various interfering RNAs (Hala et al., 2012; Ho and Burggren, 2009; Henikoff, 2008; Jin et al., 2011). These mechanisms may alter phenotype as methylation patterns are closely associated with transcriptional activity of genes, a heavily methylated region corresponding generally to transcriptional silencing (Suzuki and Bird, 2008).

[3] References to this section – see Annex 4

Many contaminants have been shown to alter methylation patterns in promoter regions of genes in vertebrates, such as mice, rats, fish, invertebrates (Li et al., 1997; Contractor et al., 2004; Aniagu et al., 2008; Wang et al., 2009; Strömqvist et al., 2010, Santoyo et al., 2011) and in plant species (Chinnusamy and Zhu, 2009). Hypermethylation of DNA has been observed in pine trees (*Pinus sp*.) and *Arabidopsis thaliana* exposed to ionising radiation at Chernobyl (Kovalchuk et al., 2003, 2004). These authors suggest that adaptation to ionising radiation exposure is a complex process involving epigenetic regulation of gene expression and genome stabilization that improves plants' resistance to environmental mutagens. Such epigenetic mechanisms were also mentioned in the study of Hiyama et al. (2012), who showed that F1 offsprings from female butterflies exposed in the Fukushima impacted area had more severe abnormalities than F0, and that these abnormalities were inherited by the F2 generation. To identify whether the observations of Hiyama et al. (2012) above were truly due to genetic damage into the germ-line cells rather than epigenomic effects on F0 from acute radiation exposure, or due to germ-line/epigenetic effects occurring only due to the long-term exposure of the F1 and F2 generations requires detailed study.

Radiation effects' research and added value of networking among ALLIANCE and MELODI

This brief state-of-the art highlights the relevance of better understanding the role of epigenetic adaptive responses in chronic low dose radionuclide exposure. The key questions studied within the IRA will be: (1) What is the biological and evolutionary significance of epigenetic changes following exposure to ionising radiation?; (2) Do epigenetic changes contribute to or form the basis for long-term or transgenerational effects of radiation exposure in different organisms? These questions can only be answered by starting synergistic collaboration between radiobiologists and radioecologists within the COMET consortium.

The IRA will start by performing laboratory controlled exposure experiments to test hypotheses on the role of epigenetic changes in the alteration of physiological functions– this work will be conducted on laboratory models with fully sequenced genome and will include at least one species relevant to both ALLIANCE and MELODI; the tools and concepts studied under controlled conditions will also be tested on field studies on autochthonous species to investigate DNA methylation in wildlife within contaminated areas (Chernobyl exclusion zone, Fukushima 100-km area). This research program involving different species, both field and laboratory exposure conditions, and with possible connections to human radiobiology, can only be achieved by close collaboration between different groups in a multidisciplinary setting.

Through the IRA substantial advances will be made in understanding mechanisms and risk implications of low dose effects in wildlife which will mirror of the effects induced in humans. Understanding the induction of long-term or transgenerational effects of environmentally relevant radiation exposure situations is needed to correctly assess the risk of current exposure to radiation for future generations and to enhance the scientific robustness of screening values currently used. Together with further analysis of the ALLIANCE and MELODI SRA's the IRA findings will help prioritise future research activities and to elaborate on recommendations for low dose effects joint programming. Within WP4, COMET will also announce a topic under the Competitive Call that is of common interest to radioecology and radiobiology. A number of workshops will also be held focusing on such issues of joint interest in order to enhance communication between the disciplines and promote the emergence of common ideas.

More generally for WP4, the expected advances and the added value of networking among the ALLIANCE and MELODI partners are multiple: (i) Through its IRA, WP4 will contribute to answer the question of whether epigenetic mechanisms (and to which extent and under what exposure conditions) are playing a role in species fitness (phenotype) and the adaptive strategy of wildlife subjected to low dose exposure situations. The expected advance is to identify links between phenotype and genotype (if any) and highlight the functional basis of adaptive traits (by identification of links between genotype and phenotype if any). This issue is highly relevant for assessing health risks for offspring and future generations. (ii) Networking between ALLIANCE and MELODI has a high degree of synergism allowing more profound conclusions to be reached faster since animal models used in ecotoxicology/radioecology exhibit shorter life cycles than those traditionally used in toxicology/radiobiology, which allows more rapid multigenerational testing of chronic low dose effects. (iii) Establishing a stronger bridge with the non-EURATOM community where the research on long term and transgenerational effects in organisms exposed to chronic and environmentally realistic concentrations of pollutants is considered highly relevant and innovative. (iv) Finally, contributing to the understanding of the general public, stakeholders and scientists of where effects of ionising radiation exposure observed in wildlife is relevant to relate to human health effects and where it is not relevant.

Observatories: breeding grounds for innovative research

The STAR NoE has identified two Radioecological Observatories: the Chernobyl Exclusion Zone and an area in Poland impacted by NORM activities. STAR has also initiated the site characterisation and existing data collection. The rules/mechanisms to use these sites as real tools for long term observation of ecosystems will be further established and tested by COMET. The Observatory sites allow for the validation and efficient improvement of the predictive capability of radioecological models through testing hypotheses under realistic conditions. In COMET they will provide a focus for collaborative research fostering the sharing of expertise, ideas, data and resources, thus maximizing the knowledge gained and advancing radioecology more rapidly. The complementary characteristics of the Radioecological Observatories make it possible to investigate a broad range of scientific issues, including the consequences of non-radioactive co-contaminants, the effects of low dose rates on populations of a large diversity of species and the chronic exposures under post-accidental conditions (Chernobyl and/or Fukushima if the latter is feasible). Mechanisms for the use of the Radioecological Observatories will be defined and a process for increasing the number of Observatory sites will be initiated.

Education and training

COMET (WP5) will enhance retention and knowledge transfer through training and education activities focussed on professionals. Recognising the demands of users, tailor-made training will be developed and offered including: refresher courses preferentially associated with conferences, webinars and e-learning. We will explore implementing the European Credit System for Vocational Education and Training (ECVET), the developing European system to facilitate the recognition and accumulation of work-related skills. To ensure the future of education in radioecology we will develop links to other training/educational platforms, in particular to the CINCH II, DoReMi/MELODI and ENETRAP II platforms, explore efficient mechanisms for joint degrees and if feasible, submit a joint MSc application to Erasmus Mundus (WP2). In all training/education activities we will create strong links with the user community (to identify needs and facilitate future work placement opportunities for students) and with other radiation protection training programmes provided by international organizations such as IAEA and ENEN.

Open access radioecology

A strategic goal of COMET (through WP5) is to develop the sustainable capability to provide open access to as much of the relevant, high quality, compiled data, knowledge and training resources as possible. Open access to research outputs developed under COMET is foreseen. An "embargo period" of 6-12 months is likely between original paper publication and the release of the information contained in the paper as recommended by EUROHORC. COMET also foresees access to underlying raw data or elaborated data sets following publication, though this will always be evaluated on a case-by-case basis. This activity will be built on the foundation of the considerable resources and expertise of COMET partners and the STAR Radioecology Exchange (which will be maintained by COMET after STAR finishes in summer 2015). COMET will work with the ALLIANCE to ensure that information gained is not lost and continuity of the Radioecology Exchange into the future.

B1.2.2. Performance/Research Indicators

Whilst the project progress as a function of time will be measured on the basis of the Gantt Chart, deliverables, milestones and key-steps, additional quality assessment using performance indicators (PI) will be established. The PI are measurable and should allow assessment of the impact and value added from COMET. In our opinion, the performance indicators should be measures that indicate that objectives of the call are attained, that the research results are attained and that the expected impact is achieved. This additional self-assessment using performance indicators will enable the Coordinator in collaboration with the management bodies to compare the qualitative outcome of the project with the expectations and eventually adjust the project's course to success. Together with the COMET Steering Committee the PI will be further discussed and elaborated.

Table B1.2.2.-1. Preliminary list of performance indicators

Success factor	Performance indicator
Management	
Efficient and transparent decision making	Regular EC and MB meetings with minutes made available to the consortium
Financial balance	Prompt allocation of funds to partners; transparent record keeping; effective use of flexibility budget Actually spent meets anticipated spent at key stages of the project
Milestones and deliverables	Schedule as specified in the DoW adhered to, or delivered early
Integration and joint programming and implementation of activities	
Joint/integration activities	Number of new partners to COMET and the ALLIANCE Collaboration with relevant networks or organizations outside Europe Collaboration with relevant partners or organisations within Europe
Sustainability after EC funding	Effective merger of COMET into the ALLIANCE Preparedness for *Horizon 2020* programme Effective response to other calls for proposals Expansion of ALLIANCE with new members
Impact on society	Feedback from stakeholders and from other platforms and networks; updated SRA
Optimization of the use of funding	Level of integration of national radioecology programmes
Research and Development	
Research achievements	Improved parameterisation of key processes controlling the transfer of radionuclides in terrestrial and aquatic systems, with specific focus on dynamic modeling approaches Better rate constants for characterizing processes such as transfer, uptake and exposure in freshwater and terrestrial environments Better understand role of epigenetic adaptive responses in chronic low dose radionuclide exposure Understand mechanisms and risk implications of low dose effects in wildlife and enhanced scientific robustness of screening values Identify links between phenotype and genotype (if any) and highlight the functional basis of adaptive traits
Relevance of research	Research results are used in Emergency and Post-Emergency DSS Research results used in the setting of refined screening values for wildlife Research results published in well-respected, peer-reviewed journals (based in part on impact factor of journals) Replies to Competitive Call are of a high scientific quality
Exploitation of results by end-users	Open interdisciplinary workshops International collaboration Number of attendees at workshops
Research at Observatory Sites	Establishment of field research and involvement of new partners Interest of wider scientific community to collaborate Number of collaborations outside COMET
Training and education	
To have provided courses focused on user requirements which meet the expectation of participants	Attract course participants and receive good feedback on courses (which will be published on COMET website)
Knowledge managent and dissemination	
Improve the focus and exploitation of radioecological research via workshops	Demonstrable impact of new collaborative projects and joint analyses of data Publication within refereed literature.
Have a well-used on-line presence	Active contributions to website and on-line discussions by partners and wider community

B.1.3. S/T methodology, and quality and effectiveness of the co-ordination mechanisms, and associated work plan

B.1.3.1. Overall strategy of work plan

Our vision is that COMET will in collaboration with the European Radioecology Alliance (ALLIANCE) establish a pan-European Centre of Excellence for Radioecology, with a programme of activities supported by the radioecological community. Strong ties will be created with European stakeholders (including regulators, industry and allied sciences), the wider international radiological sciences and ecotoxicology communities. Through COMET, the ALLIANCE will be positioned as a strong component of the *Horizon 2020* Radiation Protection Federating Association.

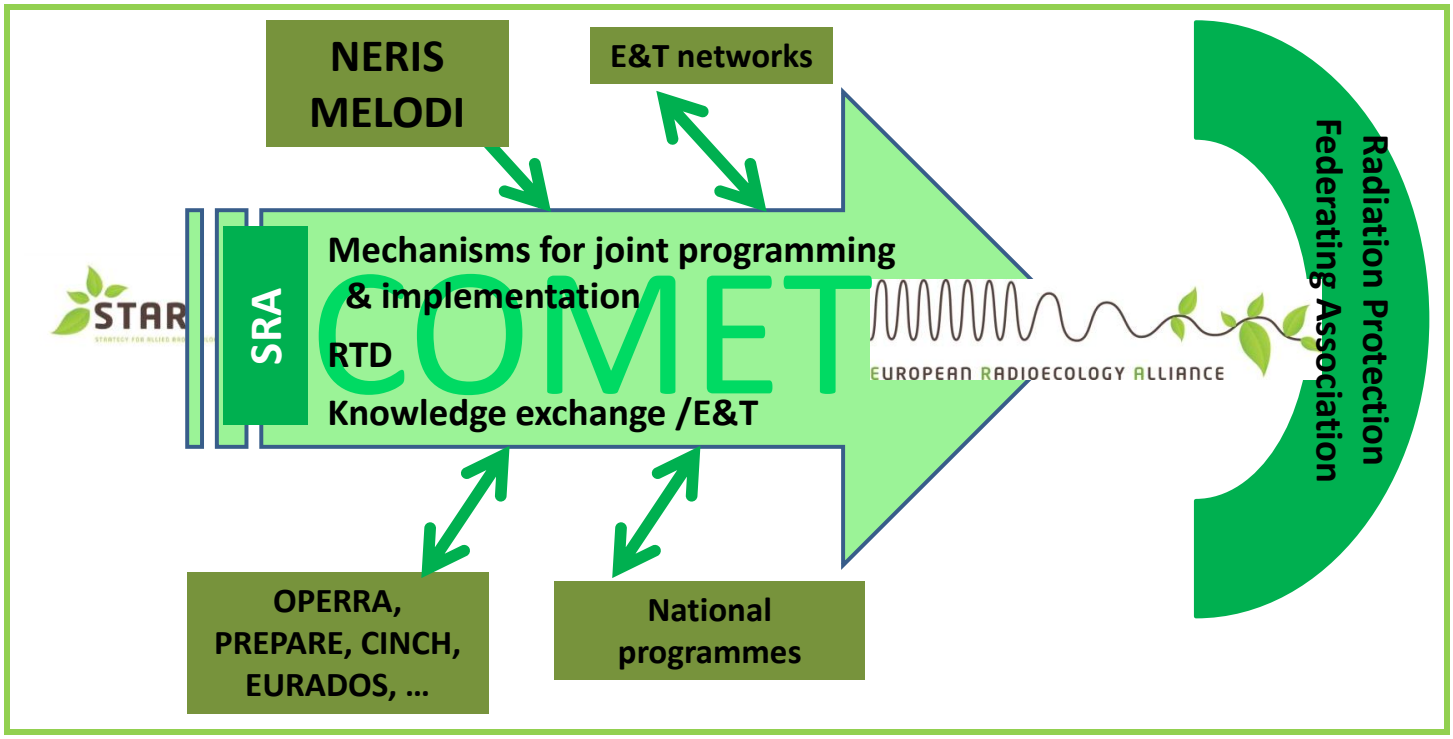


Figure B1.3.1-1. Simplified scheme of progress of COMET from STAR and of the interactions of COMET with the allied European research platforms/networks and national programmes in radioecology to strengthen the position of the ALLIANCE as a key component of the future Radiation Protection Federating Association

COMET will build upon foundations laid by the on-going FP7 STAR project and in particular on the Strategic Research Agenda (SRA) STAR is developing in consultation with the ALLIANCE and stakeholders including the wider radioecological community. COMET will form the nucleus to bring together European radioecology and begin to work towards achieving the goals of the SRA in collaboration with those of allied European platforms (in low dose effects and post-accident management) which rely upon radioecology for their underpinning science. Coherence with the joint programming and implementation (JPI) mechanisms to be developed by OPERRA (Open Project for the European Radiation Research Area) is a key aim.

The ALLIANCE initiated the first step toward integrating European Radioecology in 2009; following up on STAR, COMET will begin to realise the ambitions of the ALLIANCE on a larger pan-European scale and prepare for *Horizon 2020*.

In close collaboration with the ALLIANCE, COMET (WP2.1) will encourage organisations from the European radioecological research community to join the ALLIANCE to help realise the identified priorities for radioecological research; these can only be accomplished by an enlarged and committed network. More formal mechanisms of interaction (e.g. Memorandum of Understanding) with the international radioecological community and interest groups will be established. We envisage that an effective mechanism of attracting new partners will be via the Competitive Call enabled by the flexible funds (WPs 2-4) and the workshops which will bring together the different communities

involved in radiation protection to debate topical issues ensuring better focusing and exploitation of scientific research (WP5). The COMET consortium expands on organisations in STAR and fosters links with countries which have experienced major nuclear accidents (i.e. former Soviet Union states and Japan) and new member states which hold Observatory sites for research (one such, Poland, is included within the COMET consortium from the onset).

Initial Research Activities are put forward to begin to answer priority needs highlighted by the SRA developed under STAR (and evolved during COMET, in interaction with NERIS (WP3) and MELODI (WP4)). 'Flexible funds' will be used to further facilitate RTD activities identified through the mechanisms developed for JPI (WP2). The funds will ensure a flexible mechanism to continue to answer key-research needs highlighted by the SRA, with a focus on those which are synergistic with the needs of the allied emergency management and low dose communities. Through these flexible funds, we aim to attract specialised partners to the consortium and consequently the ALLIANCE. Sustainability of the ALLIANCE and radioecological research will be further secured by endeavouring to ally national research initiatives and funding initiatives.

All activities will be underpinned by strong mechanisms for knowledge exchange and dissemination to enhance and maintain European capacity and skills in radioecology (WP5) facilitated through interactive and open access website, workshops and trainings.

Workplan

Section 1.8 of Part A describes in detail the workplan and associated Milestones and Deliverables which timing is represented in Part B1.3.2. We here present only the objectives of the work packages.

The overall objective of WP1 (Project Management and Coordination) is the coordination of the project and the consortium, applying best management practices ensuring correct positioning of the project within the emerging radiation protection platforms as we move towards *Horizon 2020*. This includes: (1) All legal, contractual and administrative issues before and during the project; (2) Communication with the Commission and external bodies; (3) Financial management of the project; (4) Streamlined adminstration related with Competitive Call to strengthen the pan-European research in the field of radioecology based on the mechanism defined in WP2 and the priorities set in WP3-WP4, and in collaboration with the Scientific Committee and Management Board and OPERRA; (5) Setting up and supporting the project management structure; (6) The assessment of project progress and quality, controlling project outcome and impact

WP2 (Joint Programming and Implementation – Expanding ALLIANCE) aims to build upon the foundations laid by the 7FP STAR NoE and the European Radioecological Alliance (ALLIANCE) to strengthen the pan-European research initiative on the impact of radiation on environment and man. To achieve this objective we will: (1) Further develop the strategic research agenda created under STAR/ALLIANCE in light of advances in knowledge, identification of new priority needs and to better align it with the SRAs of other radiation protection platforms; (2) Develop innovative mechanisms for joint programming and implementation of radioecological research in close collaboration with the ALLIANCE and the platforms of allied fields such as emergency management (NERIS) and low dose research (MELODI). These mechanisms should progress to be consistent with the mechanisms developed for the Radiation Protection Federating Association; (3) Identify and integrate national radioecology programmes to create a framework for future research activities in close collaboration with the OPERRA and PREPARE projects.

The overall objectives of WP3 (Improving and validating radioecological models for risk assessment and for emergency and post-accident situations) are to: (1) Strengthen pan-European links between the radioecology and the emergency and post-accident communities; (2) Undertake joint research activities to improve and validate radioecological models of interest to both communities for a better protection of humans and the environment in existing, planned and emergency exposure situations

WP4 (Shared challenges in chronic low dose effects and risk assessment, and beyond) endavours: (1) To strengthen pan-European links and implement research-sharing mechanisms between the radioecology and radiobiology communities studying biological effects of ionising radiation; (2) To test the effectiveness of the joint programming mechanisms for road map establishment and implementation, and to give feedback for improvement if needed.

The objective of WP5 (Knowledge exchange) is to enhance and maintain European capacity and skills in radioecology by establishing a dynamic interaction promoting effective collaboration between researchers, tool developers, regulators and industry. This will ensure (i) more effective 'take-up' of scientific advances by the user community and (ii) that radioecological research is better focused to address the needs of users. Key to this will be effective links

including other networks and platforms (e.g. STAR, MELODI, NERIS, the ALLIANCE, and proposals CINCH-II and OPERRA. The specific objectives which will be met to achieve this are: (1) Establishing an interactive website for COMET including supporting materials for the user community providing informed and regular updates of developments; (2) Facilitate discussion of topical radioecological issues between researchers and users to support radiation protection in Europe; (3) Develop training packages to maintain and enhance professional competence

The interdepencies between the different workpackages is presented in Figure B1.3.1.2.

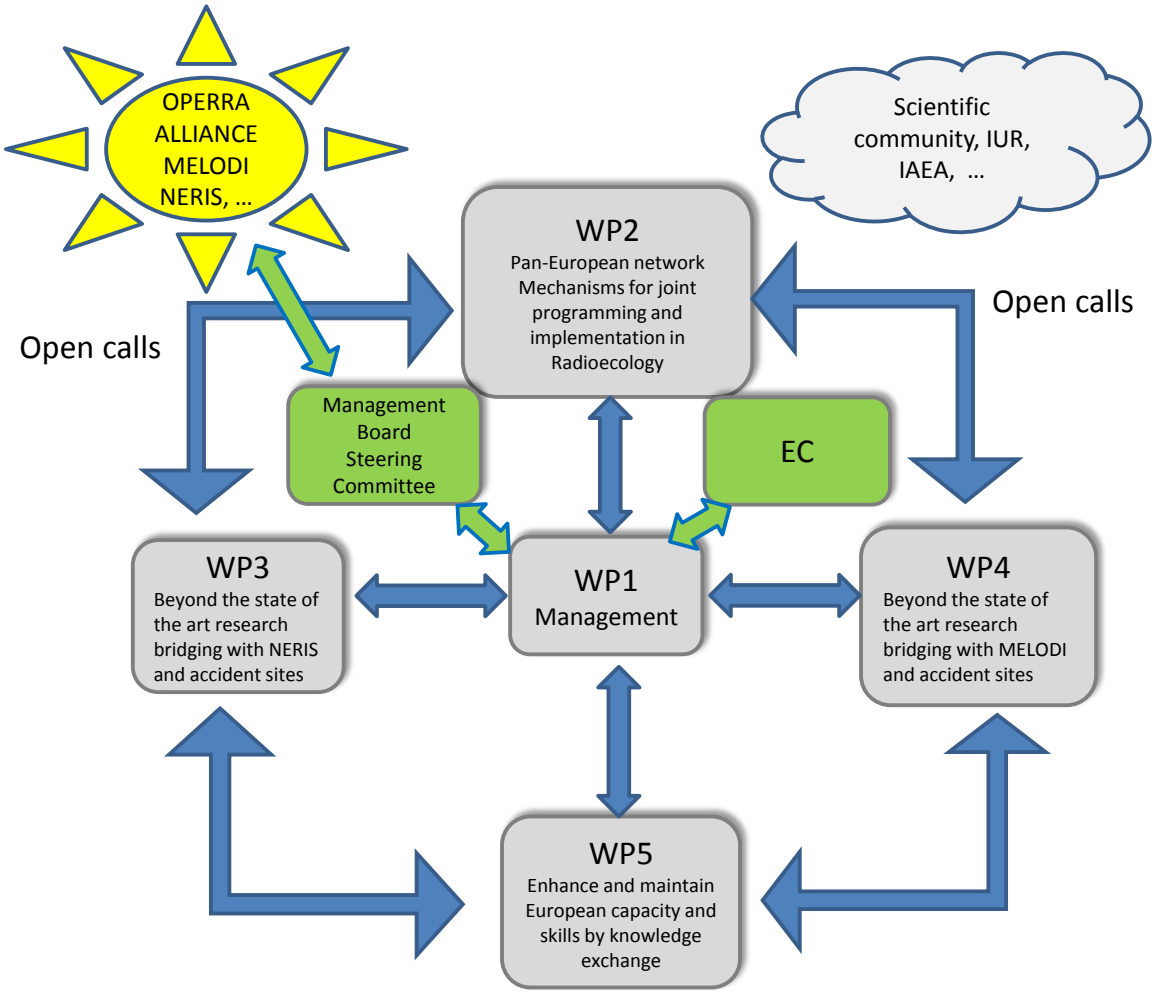


Figure B1.3.1-2. Graphical presentation of COMET work package interdependencies

Table B1.3.1-1.Description of any significant risks, and associated contingency plans.

Description of Risk	**Probability (1=LOW; 5=HIGH)**	**Severity (1=LOW; 5=HIGH)**	**Contingency plan**
No interest to join the ALLIANCE	**1**	**4**	Judged by demand for organisations to join the ALLIANCE and international interest in the STAR SRA and associated workshop to be held Nov 2012. COMET includes a number of mechanisms to attract–additional members into the consortium and/or the ALLIANCE
WP2 - No consensus on the first phase ALLIANCE RTD implementation plan is	1	4	The first-phase ALLIANCE RTD implementation plan will serve as basis for the description of the Call topics for the COMET COMPETITIVE Call. If no agreement is obtained between ALLIANCE/COMET – NERIS – MELODI/OPERRA on the first

reached			phase implementation plan the MB and SC will provide the final plan.
WP2 - Insufficient stakeholder involvement especially in the fields of emergency preparedness and low dose research	1	3	A specific task group will be set up within WP2 to promote and attract participants if necessary. To overcome budgetary issues a number of experts will be invited on cost of COMET.
WP2,3,4 - No reply to Competitive Call topics	1	4	COMET has a multi-disciplinary consortium and very likely will be able to accomplish most of the Call content certainly when assisted by appointed key-experts
WP3 - Lack of involvement from the emergency and post-accident community	1	4	Several of the COMET partners are organisations that also work on emergency and post-accident issues. If the community fails to involve themselves in workshops and research projects organised by COMET, at least these organisations could bring valuable input and take the research further. However, with the established link between NERIS and COMET in the management structure, this should be of very low probability.
WP3 - Not all suggested Observatory/Field Sites will be operational for COMET	2	2	Two Observatory/Field Sites are proposed as a follow up of STAR (Chernobyl, Upper Silesia) and one will be established under COMET (Fukushima) if circumstances allow. It is unlikely that all of these would encounter problems such that they are discontinued. If one site would fail, we still have two Observatories for our research and validation. We could also look to establish another dedicated site if necessary.
WP3 - The research in Task 3.1 shows significant datagaps so that the research goal is not fully reached.	2	2	Research tasks to fill the data gaps can be part of the Competitive Call .
WP3/4 – Risk of failure to reach IRA goals	2	4	Failure by one partner can be covered by bringing in new partners via the Competitive Call that can cover necessary scientific competence or (partially)2 by the actual partners since apart from being complementary there is also common expertise.
WP5 - Website crash	2	5	Daily website back-ups should limit damage; open website will use a system which saves all files versions/previous page versions.
WP5 – Lack of participants for field courses	2	2	Course will be planned well in advance and advertised on web-sites and via appropriate fora. Courses are timetabled such that we have the flexibility to reschedule.
One partner exits COMET	1	3	All COMET team members has expressed their dedication to collaborate in the project by signing a Letter of Intent. In case one partners exists, revision of workload and re-allocation of budget will be performed accordingly after MB and European Commission approval.
No adequate PhD for research under WP4	1	3	If necessary, SCK•CEN and IRSN are ready to involve more permanent staff to perform the activities at their expense. To attract high quality students posts will be advertised widely including on STAR, COMET and OPERRA websites and through contacts in national and international radioecology/radiation protection associations.
No access to CEZ	1	3	Highly unlikely: the Chornobyl Center has established working practices and good links to the appropriate ministry. If it would

			happen, we can concentrate the research on other affected areas in Ukraine or Belarus or on the other Observatory sites for our RTD.
No permit to export samples out of CEZ/FEZ	1	5	Unlikely COMET some partners already have permissions to do this. High-level negotiations with Ministries, JAEA with whom many institutes have high-level contacts will be established to secure transport of samples.
Financial problems	2	3	The co-ordinator and WP leaders will monitor budgetary spends to identify any issues early and hence enable solutions to be sought.

B.1.3.2. Timing of the different WPs and their components

WP	Tasks	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47	M48
WP 1	**1 Coordination**																		D1.1			D1.2														D1.3													D1.4-7
	1.1 Legal, contractual and administrative management																																																
	1.2 Financial management and organisation of competitive calls																																																
	1.3 Management of the project consortium and bodies																																																
	1.4 Project assessment and adjustment																																																
WP 2	**WP 2 Joint programming and implementation – expanded Alliance**						D2.1																		D2.2																			D2.3						D2.4-7
	2.1 Evolving towards a pan-European network																																															
	2.2 Developing mechanisms for joint programming and implementation																																																
	2.3 Infrastructures – evolving from STAR&COMET to ALLIANCE																																																
	2.4 Co-ordination with national programmes																																																
	2.5 Co-ordination with training and educational platforms																																																
WP 3	**Improving and validating radioecological models**					D3.1																											D3.2	D3.3												D3.4		
	3.1 Initial Research Activity																																																
	3.2 Identification of common research needs for radioecology and the emergency and post-accident community																																																
	3.3 Innovative research execution																																																
	3.4 Integration, validation and implementation of RTD results																																																
WP 4	**Shared challenges in chronic low dose effects and risk assessment, and beyond**			D4.1																														D4.2												D4.3	D4.4	
	4.1 Initial Research Activity																																																
	4.2 Implementation of joint programming mechanisms for low dose effects a																																																
	4.3 Innovative research execution																																																
	4.4 Integration, validation of RTD results																																																
WP 5	**Knowledge Exchange**			D5.1			D5.2						D5.3									D5.4															D5.5									D5.6-7					
	5.1 Website and knowledge management																																																
	5.2 Focused workshops on key radioecological related issues																																																
	5.3 Maintaining and enhancing competence																																																

B.2. Implementation

B.2.1. Management structure and procedures

The various management and administrative structures of COMET are depicted in Figure B2.1-1. The Coordinator is the intermediary person with the European Commission, and has overall responsibility for project management. The management structure is set up to best assist the coordinator. The most important bodies in this management structure are the Executive Committee and the Management Board. Aligned to this internal structure, a Steering Committee (SC), to which experts external to the project will be appointed, will provide external evaluation of the project and give advice on the decision processes.

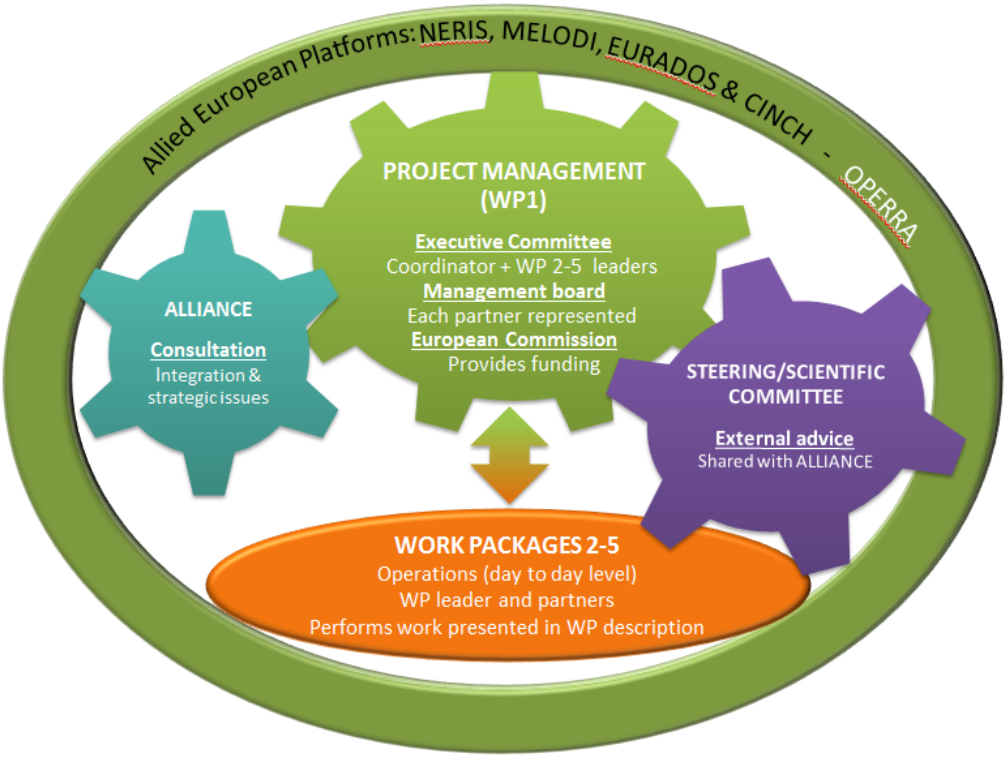


Figure B2.1-1. Relationship of the various administrative and management structures of the COMET project and its connection with ALLIANCE and International Community

Regulating mechanisms

The management structure is set up to optimize the project management, which not only includes the administrative and practical project management (such as planning and budget), but also: the evaluation of the project progress and quality of output and needs for adjustment; the assessment of the expected impact and appropriateness to the EURATOM Work Programme; and the promotion of a good team spirit between the project partners.

The coordinator will assure follow-up of the projects progress against measures such as the Deliverables, Milestones (A1.8.2, A1.8.4) and Key Steps (Annex 1). These are tools to help keep the project on track or detect any deviations from the project plan as soon as possible. They will be used as such by (1) the responsible beneficiary, (2) the task leader, (3) the WP leader and (4) the coordinator. Additionally quality assessment using performance indicators (PI) will be established. The PI's are measurable and will allow assessment of the impact and value added from COMET (see B1.3.1).

Each WP leader will be responsible for monitoring of work, budgets and progress in their work package. The leaders of the five WPs will organise the activities in each WP, follow the progress achieved and be responsible for taking necessary measures in the event of any problems in their WP. WP leaders will interact with each other for activities in which several WPs are involved.

To maintain an overview of the whole project, the coordinator will chair the Executive Committee, consisting of the WP leaders. This body will be responsible for the day-to-day follow-up of the project progress and the quality of the work performed. The Executive Committee will meet at least twice a year and will report to the Management Board.

Regular Executive Committee video conferences will ensure co-ordination between the WPs and the most efficient utilisation of resources (e.g. timetable of joint WP meetings/workshops – Annex 2).

The Management Board will consist of one representative per beneficiary, and will meet at least once a year during the Annual Meeting of the project. The Management Board will be chaired by a person who will be appointed during the Kick-off Meeting, and who may be different from the Coordinator. Each beneficiary will delegate one person to attend the Annual Meeting, but if needed, additional experts from within the consortium will be invited to the Annual Meeting

The fourth management body is the Steering Committee which will give independent advice on the project progress and help ensure interaction with MELODI and NERIS. The COMET Steering Committee (SC) will be selected in consultation with the ALLIANCE and we aim to have the same SC for COMET and the ALLIANCE (the COMET Steering Committee will function within the ALLIANCE as Scientific Committee which to date has not been established – therefore the COMET Steering Committee is sometimes annotated as Steering/Scientific Committee).

The SC will provide COMET with external review relative to the goals, progress and impact expected by the COMET project as well as on the Competitive Call. The SC will be comprised of six to nine experts preferably external to COMET organisations. In order to prepare for the joint programming as foreseen in the *Horizon 2020* objectives, the Steering Committee will not only consist of experts from the field of radioecology. The chairperson of NERIS (R. Mustoonen) and the coordinator of PREPARE (W. Raskob) have already agreed to sit on the SC. Additionally, the president of the MELODI Scientific committee (still to be assigned) will be asked to join the COMET SC.

In addition to the above mechanisms, the management structure of this CP-CSA project has some additional tasks, bearing in mind the evolving structure of the Radiation Protection Community on a European Level, in line with expectations for *Horizon 2020*. The management of this CP-CSA project will need to additionally consider the following issues:

- Establish effective collaborations with the other pillars of the Radiation Protection Community. Where appropriate, research of common interest will be defined in consultation with the different radiation protection platforms. This will be initiated under the Initial Research Activities established by WP3 and WP4 and it will be strengthened by the RTD executed through the Competitive Call.
- Alignment the planning of COMET and OPERRA to maximise resources and avoid duplication of work.
- Continuing from STAR, COMET will assist the ALLIANCE in achieving long-term sustainability.

COMET will organise an Annual Meeting which is also to be considered as a General Meeting, since all beneficiaries will be represented at last through the Management Board. At this Annual Meeting, Work Package leaders will present the progress in each of the respective work packages to the Management Board (with representatives of each member of the consortium) and the Steering Committee (SC). The coordinator will provide an update of any administrative, logistic and financial aspects. For the latter, the partners will be asked to present to the coordinator an update of the financial balance. The MB is required to be present (assigned MB member or person who is assigned to replace him/her) at the Annual/General meeting. A time slot of 1 day at the event of the annual meeting will be allocated to discussions between the SC and the Executive Committee (EC – WP leaders). Work Packages may decide to have a WP specific meeting joint to the Annual Meeting.

Specific roles of the management bodies:

Project Coordinator

The project coordinator is responsible for overall project management. The Coordinator is the chair of the Executive Committee.

The coordinator:

- Is the intermediate between the project consortium and the Commission
- Prepares the Consortium Agreement, based on the DESCA model, defining the internal organisation of the consortium, and adapted to special requirements specific to the COMET project (e.g. as regards the Competitive Call). The Competitive Call organised in collaboration with OPERRA will lead to additional partners, leading to amendments to the Grant Agreement and the Consortium Agreement. The Coordinator is in charge of preparing all these documents
- Follows up the compliance by the Participants of their obligations as defined in this Description of Work, and will prepare any amendment requests if needed

- Is responsible for the financial management and reports to the Commission on the distribution of the payments to the beneficiaries
- Is responsible for, organises and reports to the Commission about the Competitive Call to attract new beneficiaries
- Is responsible for liaising with the EC and agreeing grant amendments when new partners are joining
- Will lead the assessment of the expected impact as defined above as a task for the whole project
- Will assure that the goals of the EURATOM Work Programme are met
- Is responsible for the official document and information management, and for transmission or distribution of documents or information to the Commission or to the Participants
- Organises the Management Board, Executive Committee and Steering/Scientific Committee meetings, providing the necessary budget for the chairing and invitation of external experts
- Manages the team, supports a good team spirit, fosters collaboration

Organisational levels

Each level of management will have well-defined responsibilities. The day-to-day management is executed by the Executive Committee, which will be accountable to the Management Board. Each participant is represented by one vote on the Management Board. The organisation structure of the COMET consortium comprises the following main bodies (see also Figure B.2.1.1.):

The Executive Committee will be responsible for the day-to-day management of the project. It is chaired by the Coordinator and is responsible for

- Consideration of the recommendations formulated by the Steering Committee,
- Coordination and approval of the work schedules between and within work packages,
- Possible changes in the tasks within work packages,
- Proposal and approval of training and dissemination activities,
- Detection and resolving of any problems related to the project and reported by the Participants,
- Reporting of scientific or budgetary difficulties within a Work Package or as member of the consortium,
- Review and approval of the deliverables of the COMET project,
- Follow up of the intellectual property matters, or other contractual issues, and reporting these issues to the Management Board, by formulating proposals to be decided by the Management Board.

The Executive Committee will meet at least two times a year, once via web conference or linked with another COMET event (workshop or meeting), once in a meeting just before the Management Board meeting. Additionally, it is foreseen to have two-monthly teleconferences and to organise EC meetings on request by WP leaders.

Management Board: This body is responsible for the uppermost decision-making and arbitration. Each participant will be represented in the Management Board by one person, and will have one vote. The voting rules will bebe set out in the Consortium Agreement that will be mainly based on the DESCA model available at http://www.desca-fp7.eu During the Kick-off Meeting, which will take place in the first month of the project, the Chair Person will be elected.

Being the uppermost decision-making body of the consortium, the Management Board is responsible for:

- Decisions on changes of the content, the finances and intellectual property rights,
- Decisions on the evolution of the consortium,
- Decisions on eventual changes of the consortium plan or budget,
- Eventual alteration of the consortium agreements,
- The premature completion or termination of the project.
- Assist in defining criteria for RTD call definition and assist in ranking proposal applications from the Competitive Call

The Management Board will meet every 12 months, at the event of the annual meeting, and will be preceded by an Executive Committee meeting that will be responsible for providing all necessary documentation on the execution of the COMET project to the Management Board.

If needed and/or upon request of the Executive Committee, extra Management Board meetings will be organised.

Steering Committee: Members of the Steering Committee (composition discussed above) will be invited to attend the Annual Management Board Meetings of COMET. Organisation of the SC meetings will be the responsibility of the COMET Coordinator. The SC will:

- Make recommendations to the COMET Management Board based on periodic review of COMET progress; evaluations will be based on performance indicators that the SC will finalise together with the COMET Management Board at their first meeting,
- Evaluate deliverables, quality of work performed, COMET's methods and progress towards Joint Programming and Implementation at each Annual Meeting
- Assist in defining criteria for RTD call definition and assist in ranking proposal applications from the Competitive Call

The SC will not have decision-making powers within the project: it is an advisory organ.

By establishing effective review mechanisms, the Coordinator and the Executive Committee will be able to detect problems that might jeopardize the successful execution of the project in due time and within the budgetary limits before they become critical. The Executive Committee and the Management Board will then be able to take appropriate decisions to alleviate the problem and minimise the impact Rules for taking these decisions (by voting) will be set out in the Consortium Agreement, based on the DESCA model.

B.2.2. Individual participants

Partner 1: Belgian Nuclear Research Center (SCK•CEN), Belgium

The Belgian Nuclear Research Centre, SCK•CEN, is a foundation of public utility with more than 700 employees. The statutory mission gives the priority to research on problems of societal concern; safety of nuclear installations, radiation protection, safe treatment and disposal of radioactive waste, safeguards. SCK•CEN has a reputation as an outstanding centre of education and training. SCK•CEN is member of the ALLIANCE (President), MELODI (Secretary) and NERIS (President R&D Committee). Work for COMET will be undertaken by several research units: (1) Biosphere Impact Studies (BIS), key research group involved, has strong expertise in terrestrial, freshwater and marine radioecology, biological effects of ionising and mixed contaminant exposure conditions on plants and is strongly involved in human and environmental impact assessments. The group coordinated and participated in several European research and expert projects (e.g. RECOVER, PHYTOR, CARE, TACIS-Kyrgyzstan) dealing with contaminated land/site management and impact assessments. The group is WP-leader in the STAR project. Its members have been actively involved in e.g. the IAEA BIOMASS and EMRAS programmes. (2) Crisis Management and Decision Support (CMD) has been involved in several national and European R&D programmes related to nuclear emergency management and/or decision support (e.g. EURANOS, RODOS MIGRATION, FARMING, DAONEM, SAMEN, MOSES, TMT, DETECT) and is actually participant in PREPARE. (3) Radiobiology (RDB) has a long experience in radiation biology, co-ordinates CEREBRAD and contributes to e.g. DOREMI, PRO-CARDIO and are strongly involved in MELODI. SCK•CEN will co-ordinate the COMET project and will contribute to all WPs.

Staff members contributing to COMET

Dr. Hildegarde Vandenhove, has 20 years experience in terrestrial radioecology (soil-plant transfers, remediation, effect and multiple stressor studies, EIA); since 10 years head of BIS and since 6 year also Deputy Institute Manager of Environment Health and Safety (EHS). Has coordinated several European projects (e.g. RECOVER, PHYTOR, CARE, TACIS). Involved in/coordinates national human and environmental impact assessment projects. WP-leader in STAR and FUTURAE. Assists Frank Hardeman, SCK•CEN, in his function as President of the ALLIANCE. Seats in governing board of IUR, active participant of IAEA programmes. Will Co-ordinate the COMET project (WP1), contributes mainly to WP2.2 and co-ordinates SCK•CEN work within COMET.

Dr. Nathalie Impens, with 10 years experience in project management and coordination in waste management and low dose research, will be responsible for the administrative coordination of the COMET project. Being strongly involved in the MELODI Association's Secretariat and in the OPERRA proposal, she will ensure together with **Dr. Frank Hardeman**, Institute director of EHS at SCK•CEN, President of the ALLIANCE, Secretary to MELODI, that the progress in COMET and OPERRA are fine-tuned, to ensure efficient apprach.

Dr. Nele Horemans is plant physiologist with a longstanding expertise in mechanisms of plant responses to various stresses. Within BIS, she is responsible for assessing effects of radionuclides, radiation and mixed contaminants on two model plants (*A. thaliana* and *L. minor*) on physiological as well as molecular level. Strongly involved in STAR. She will lead work for SCK•CEN in WP4 and contribute to WP2.

Dr. Lieve Sweeck has more than 15 years' experience in modeling of radionuclide distribution and transport in the environment. Involved in several international collaborative studies on biosphere modeling (BIOMASS, RESTRAT, EMRAS) and national safety assessment studies of radioactive waste disposals. Strongly involved in STAR. Contributes mainly to COMET WP3 and WP2.

Dr. Nathalie Vanhoudt is experienced in stress response mechanisms on molecular and genetic level in *A. thaliana* after exposure to uranium, ionizing radiation and heavy metals. In addition, she gained knowledge in multiple stressor research. Strongly involved in STAR. She will mostly contribute to WP4.

Dr. Johan Camps, PhD in nuclear and radiation physics has 20 years experience in radiation dosimetry, radioactivity measurements and atmospheric dose and dispersion modeling. Head CMD. Acts as radiological expert in the framework of the Belgian federal nuclear emergency plan. WP leader in PREPARE. Involved in WP3.

Dr. Sarah Baatout is head of the Radiobiology Unit and has more than 15 years experience in cell biology and biochemistry and radiobiology and has been/is involved in many EC projects (e.g. DOREMI, CEREBRAD, EPI-CT).

Dr. Catrinel Turcanu, PhD in multi-criteria decision analysis, has 18 years expertise in emergency management, radiological evaluations, DSS, decision-aid methods, agricultural countermeasures, stakeholder involvement, public opinion research. Participated in several EC projects in the domain of nuclear emergency management. She and **Gaston Meskens** will contribute to mostly concensus meetings and ethical issues (WP2,WP5).

Partner 2: Radiation and Nuclear Safety Authority (STUK), Finland

STUK is both a research centre and a national authority in radiation protection and nuclear safety. STUK is conducting research related to terrestrial, freshwater and marine radioecology, natural radiation, environmental radioactivity, emergency management, biological and health effects of ionising and non-ionising radiation, medical radiation and radiation metrology and dosimetry. STUK is an accredited laboratory in radioactivity measurements and has trained new Member States in establishing quality systems for environmental laboratories as well as environmental monitoring.

STUK has participated in numerous European research and expert projects [FP4, FP5, FP6 (EURANOS, FUTURAE, ERICA, RISC-RAD, TMT Handbook, INTERPHONE, NOTE, RADINSTAB, SEMIPALATINSK), FP7 (DETECT, DoReMi, CARDIORISK, SecurEau, NERIS-TP, STAR, KOLARCTIC ENPI CEEPRA), Inco Copernicus, TACIS and PHARE] and other EC funded projects, has acted as a coordinator for a number of these. Research and Environmental Surveillance department is involved in studies on radioecology and is also responsible for carrying out the nation-wide radiation surveillance programme and for maintaining and developing operational emergency preparedness.

Within COMET STUK will lead WP2 (Joint programming – expanded Alliance). STUK will contribute to project management activities via WP1 and participate in the WPs 3 and 5. Key staff who will be involved in COMET are:

Dr. Maarit Muikku, the head of Environmental Research Laboratory has a strong experience in assessment of internal doses, development of methods to determine internal doses as well as in radiation protection and emergency preparedness. She has been involved in several EU and other international research projects. She will lead WP2 and co-ordinate STUK activities in COMET.

Dr. Tarja K. Ikäheimonen is director of the Department of Research and Environmental Surveillance managing the department. She has been involved in several EU and other international (e.g. within Nordic Cooperation, AMAP and Baltic Sea Protection) research projects, as well as an expert in several EU Phare and Tacis projects. She has long-term, extensive experience in marine and terrestrial radioecology, nuclide analytics, emergency preparedness and quality management. She will contribute to WP2.

Dr. Tiina Rasilainen works as a researcher and a chemist in the Regional Laboratory of Northern Finland and has experience in radiochemical analyses of environmental samples. She is also involved in an international project in the area of environmental radiation protection and research as a scientific secretary, being responsible e.g. for preparing information brochures and web page texts for general public. She will contribute to WP5.

M.Sc. (Eng) Juhani Lahtinen is a senior scientist at the Laboratory for Environmental Surveillance and Preparedness. He has worked primarily in the fields of radiation monitoring and emergency preparedness and has participated in several European and Nordic research projects. He has a long experience especially in atmospheric dispersion and dose calculations as well as in performing threat and consequence analyses. He will contribute to WP3.

M.Sc. Tuomas Peltonen is an inspector at the Laboratory for Environmental Surveillance and Preparedness. His expertise is focused on development of data management and GIS systems needed in emergency situations. He also has some experience with dispersion models, dose assessment models and decision support systems. He will contribute to WP3.

Partner 3: Norwegian Radiation Protection Authority (NRPA), Norway

The NRPA is the competent national authority in the area of radiation protection and nuclear safety in Norway. It is responsible for *inter alia* monitoring of natural and artificial radiation in the environment, and increasing our knowledge of the occurrence, risk and effects of radiation. NRPA is leader of the Norwegian Nuclear and Radiological Emergency Organisation. NRPA has been involved in numerous EC projects since FP4. It has a team of dedicated researchers in the field of radioecology and emergency preparedness and response, with substantial experience in the field of post-accident management (e.g. STRATEGY, TMT Handbook), rehabilitation (e.g. EURANOS), environmental protection (e.g. EPIC, FASSET, PROTECT) and modeling (e.g. ERICA). Lately, NRPA has had an active involvement in the STAR and NERIS-TP projects and will be an active partner in the upcoming PREPARE project.

Staff members contributing to COMET

Head of section Astrid Liland is a nuclear chemist with 13 years experience in research related to emergency preparedness, recovery, radioecology and radiation in society. She is leading the Section for health and environmental assessment with 15 dedicated scientists mostly devoted to RTD projects in emergency preparedness and recovery, radiation protection, whole body measurements and radioecology. She has substantial experience in EC projects, most lately in STAR and NERIS-TP. She has wide international experience and excellent project management skills. She will lead WP3 and co-ordinate NRPA activities in COMET.

Senior researcher Justin Brown has been involved in the co-ordination of large scale research projects at a national and international level. He has been involved in numerous EC projects including since FP4, including the FASSET, ERICA, PROTECT and STAR projects. He has wide experience in marine and terrestrial radioecology, dosimetry and environmental protection. He has a consistent and extensive record in the peer reviewed literature.

Senior researcher Lavrans Skuterud has 20 years research experience in radioecology, countermeasure strategies, whole body measurements and public information. He served as an expert on food contamination, monitoring and countermeasures for FAO in Rome after the Fukushima accident. He has been involved in numerous national and international research projects in radioecology and post-accident management and rehabilitation, and will also contribute in the upcoming PREPARE project.

Senior researcher Mikhail Iosjpe has nearly 20 years experience in radioecology and marine modeling of radioactive contamination. He has developed the NRPA box model for marine transport of radionuclides from routine discharges or accident situations and has an extensive record of publications in marine radioecology and modeling. He has participated in numerous EC projects and will also contribute in the upcoming PREPARE project.

Other participating scientists: **Dr. Ali Hosseini** (physicist) specialist in radioecology, wild life dosimetry and Bayesian statistics; **Dr. Håvard Thørring** (environmental chemist) specialist in radioecology, terrestrial ecosystems and post-accident rehabilitation. **Dr. Geir Rudolfsen** (zoologist) specialist in low-dose risk research, in particular lab and field experiments.

Partner 4: Institute for Radiological Protection and Nuclear Safety (IRSN), France

Institute for Radiological Protection and Nuclear Safety (IRSN) is a public establishment on an industrial and commercial nature under the joint auspices of the Ministers of the Environment, Health, Research, Industry and Defence. IRSN carries out research, analysis and work within the fields of nuclear safety, protection against ionising radiation, and the control and protection of nuclear and sensitive materials. The institute plays an active role in providing information to the public in its field of expertise but does not exert authority control. IRSN participated in the 5th framework FASSET project, leaded the work package devoted to risk characterisation in the 6th framework ERICA project and was involved in the PROTECT CA as a partner. IRSN has a strong experience in ecological and human risk assessment methodologies. Moreover, IRSN was coordinator of the 6th framework FUTURAE CA. The objective of FUTURAE was to evaluate the potential for establishing deeper and sustainable collaboration of European radioecology, possibly in the form of a network of Excellence. IRSN is also heavily involved in the 7th framework DoReMi project on low-doses. IRSN is the coordinator of the 7th framework STAR (Strategy for Allied Radioecology) NoE. The objective of STAR is to efficiently integrate important organisations, infrastructures, and research efforts into a sustainable network that contributes to a European Research Area in radioecology. IRSN is a founding member of the ALLIANCE.

Staff members contributing to COMET

Dr. Christelle Adam-Guillermin has a 15-year experience in the study of radionuclide fate in aquatic ecosystems, using different biological models from algae to bivalves and fish. She is the Head of Laboratory on radionuclides ecotoxicology, aiming at characterizing radionuclide effects on non-human biota, from molecular to ecosystems. She published ca. 40 peer-reviewed papers. She will lead WP4.

Dr. Karine Beaugelin-Seiller is an 20-year experienced expert in environmental risk assessment, especially regarding wildlife exposure to radionuclides (50+ peer-reviewed papers). She is involved in the conception and development of methods and tools in the field of radioprotection of the environment. She will be involved in WP5.

Dr. Philippe Calmon is a veterinary and has been working for IRSN for more than 15 years. He is an expert in the modeling of radionuclides transfer in the environment with a special emphasis on transfer in forests. He acted as IAEA coordinator for the updating of TRS-472. He will be involved in WP3.

Dr. Celine Duffa joined IRSN about 10 years ago after a PhD dedicated to the study of the behaviour of plutonium in the environment. She is a specialist in the modeling of transfer in marine compartment and she is currently in charge of the development of a tool dedicated to assess the consequences of radioactive releases in sea during a nuclear accident. She will be involved in WP3.

Dr. Laureline Février has 10 years of experience in metals and radionuclides biogeochemistry, with a focus on bioavailability. Other interest concerns the impact of soil microorganisms on radionuclides distribution in terrestrial ecosystems and their temporal evolution, and the impact of radionuclides on the diversity and structure of soil bacterial communities. L. Février contributes to the STAR EC project as researcher and as coordinator assistant for the whole project. She will be involved in WP1 and WP5.

Dr Jean-Christophe Gariel, has worked at IRSN for more than 20 years, and is at present Director in charge of Environment in the Radiation Protection Division at IRSN since 2012. He supervises three departments dealing with: research and expertise on environmental risks, field radioecological studies and environmental radioactivity monitoring, environmental samples processing and radioactive metrology. He acted as the FUTURAE coordinator. He is the ALLIANCE treasurer. He will be involved in WP2.

Dr. Jacqueline Garnier-Laplace has been working for IRSN for 20 years. She is Head of Department on Research and Expertise on Environmental Risks and was involved in the EC funded projects FASSET, ERICA, PROTECT, FUTURAE, STAR. With 80+ peer-reviewed papers, her field of expertise deals with low dose effects in wildlife and ecological risk assessment for radioactive substances. She will be involved in WP2 and WP4.

Dr. Thomas Hinton, formally a Senior Scientist with the University of Georgia's Savannah River Ecology Laboratory (USA) joined IRSN in 2009. He has developed a broad, diverse knowledge in radioecology with 60+ peered-reviewed manuscripts He is currently the Coordinator of the STAR EC project.

Dr. Marie Simon-Cornu has about ten years of experience in risk assessment, more specifically in human exposure modeling through food ingestion. She has co-authored 40+ peer-reviewed papers. She joined IRSN in 2010 and is currently Head of the Laboratory of Modeling for Environmental Expertise. She will be involved in WP3.

Partner 5: Natural Environment Research Council - Centre for Ecology and Hydrology (NERC-CEH), UK

The Natural Environment Research Council's (NERC) Centre for Ecology & Hydrology (CEH) employs *circa* 450 staff at four sites. It is the UK's Centre for Excellence for integrated research in terrestrial and freshwater ecosystems and their interaction with the atmosphere. The Radioecology group has extensive experience in the development and testing of approaches to demonstrate radiological protection of the environment (e.g. ERICA, PROTECT, IAEA EMRAS chairs), spatial transfer model development (e.g. SAVE), farm animal radioecology (e.g. IAEA TRS472), and countermeasure development and strategies (e.g. STRATEGY). The group is currently developing training packages in environmental radiological assessment for regulators and industry (http://wiki.ceh.ac.uk/x/pIHJBg). NERC-CEH lead the Knowledge and Data Dissemination WP of the STAR NoE and have developed the Radioecological Exchange website as part of this; the organisation was one of the founding members of the ALLIANCE. NERC-CEH is highly experienced in large international, multi-partner projects and will collaborate effectively to ensure suitable co-operation to maximise the use of available resources. Projects management is based on the PRINCE-2 project management system.

Within COMET NERC-CEH will lead WP5 (Knowledge Exchange) and within that WP will be responsible for initiating and maintaining web-based outputs and take the leading role in the planning, running and dissemination of the open workshops. NERC-CEH will contribute to project management activities via WP1 and participate in the other three WPs. The lead NERC-CEH scientists within COMET have good established working links with the Chornobyl Center and a number of institutes in Japan. Key staff who will be involved in COMET are:

Dr. Brenda Howard is a highly experienced radioecologist who was awarded an MBE in 2003 for services to radioecology. She is a member of the Committee on Medical Aspects of Radiation in the Environment (COMARE) which offers independent advice to government. She has extensive experience of participation in multi-institute projects, including co-ordinating seven EC funded projects and is chair of a number of IAEA groups. She has published > 140 refereed papers. She will lead WP-5 and co-ordinate NERC-CEH activities in COMET.

Dr. Nick Beresford is a radioecologist of 28 years experience with 130 published refereed papers. His primary areas of research are the development and testing of approaches to assess the exposure of wildlife, the transfer of radionuclides to farm animals and development/testing of remediation techniques. He was a full member of the ICRP Committee 5 working group (73) on radionuclide transfer to non-human biota and the working group leader of the IAEA EMRAS II Biota Modeling Group. He will contribute to WPs 2, 3 and 5.

Dr Dave Spurgeon is an ecotoxicologist focusing on the fate, behaviour and effects of chemicals in the environment. He has conduct experimental work on multi-contaminants effects, the development of practical tools for ecological risk assessment and the analysis of genetic and epigenetic adaptive responses to environmental pollution. In STAR he is providing knowledge transfer from ecotoxicology to radioecology by advising on experimental procedures and data interpretation. He will contribute to WP4 and lead Task 4.3.

Cath Barnett is an experienced radioecologist and manager of the Radioecology Exchange website and a UKAS accredited gamma facility. She has contributed to the development of important international radioecological databases and is responsible for the CEH radioecology websites and wiki pages. She will contribute to WPs 2, 3 and 5 (taking a leading role in Task 5.1).

Dr. Dave Howard is currently a NERC Knowledge Exchange Fellow for Environmental Monitoring and the Lancaster Environmental Centres director for Sustainable Energy. He is a GIS specialised who has previously used his skills in the modeling of pathways for exposure of radionuclides to humans and wildlife. He will contribute to WP3.

Partner 6: Centro de Investigaciones Energéticas Medio Ambientales y Tecnológicas (CIEMAT), Spain

CIEMAT is a Public Research Institution belonging to the Spanish Ministry of Science and Innovation. It promotes and carries out research and technological development projects in the field of energy, keeping as far as possible close connections with other national and international research groups with similar objectives. Likewise, it is the link between basic research and the national industry, acting when requested as an adviser of our national authorities in the fields of technology and energy strategy. CIEMAT acts as technical supporter for regulators and operators, providing methodologies, tools, analytical services and performing radiological impact assessments for solid waste disposal, effluent releases and "ad hoc" situations of environmental contamination. Its activities in radiological protection extend to the public and the environment through studies on radioecology, evaluation and reduction of radiological impacts, environmental radioactivity measurement, as well as personal and environmental dosimetry. CIEMAT has an important activity in training/education of professionals (radiation protection, radioactive waste management, nuclear safety), and a wide experience in organizing workshops.

CIEMAT has participated in many relevant international projects (BIOMOVS-II; BIOMASS; TARRAS; CREAM; BIOPROTA; FUTURAE; FASSET; ERICA; EMRAS-II). The organization is partner of the European NoE STAR, and is one of the founding members of the ALLIANCE.

Within COMET, CIEMAT will participate in all WPs but WP4. CIEMAT will co-lead 3 Tasks within the project: Task 2.3. Infrastructures – evolving from to the ALLIANCE (together with CEH and UIAR NUBiP); Task 2.4. Co-ordination with national programmes (together with STUK and GIG-SCRS); and Task 5.1 Website and knowledge management (together with NERC-CEH). Key staff who will be involved in COMET are:

Dr. Almudena Real. PhD in Biological Sciences (Radiobiology). Research scientist at CIEMAT. Over 20 years of experience in radiation protection and radiobiology (effects of radiation in experimental models; risk assessment methodologies for radiogenic and non-radiogenic carcinogens). Participation in over 20 research projects. Research training periods in laboratories of USA (NIH), UK (Paterson Inst; NRPB) and Germany (GSF). Member of ICRP Committee 5 (2005-2013).

Beatriz Robles. MSc in Biological Sciences (Environment). Over 20 years of experience in Radioecology in CIEMAT (chemical, physical and transport processes of contaminants from waste disposal facilities and effluent releases (routine and accidental) and developing models and methodologies). At present, leads the Unit "Radiation Protection of the Public and the Environment" in CIEMAT. Spanish representative in UNSCEAR.

José Gutiérrez. Master Degree in Chemistry. Actually is R&D Adviser in CIEMAT. 30 years of experience in radioecology, radiation protection, environmental radioactivity, monitoring and post-accident management. Director of CIEMAT Energy Environmental Impact Department (1997-2004) and Deputy Director of CIEMAT Environmental Department (2004-2009). President of the Spanish Society for Radiological Protection (2004-2006). Manager of European and National projects. Spanish representative in CRPPH/NEA and EURATOM CCE Fission

Juan Carlos Mora. MSc in Atomic and Nuclear Physics. Since 2004 works in CIEMAT, in the Radiation Protection for the Public and the Environment Group. Over 9 years of experience in environmental radioactivity measurements and radiation protection (spectrometric and counting techniques for alpha, beta and gamma measurements, application and development of models and methodologies for routine releases from nuclear and NORM industry). He is a member of the IAEA Group for SRS-19 revision

Partner 7: Stockholm University (SU), Sweden

With over 5200 employees, 1800 doctoral students and 50000 undergraduate and master students, Stockholm University is one of the largest universities in Sweden. The new Department of Ecology, Environment and Plant Sciences (EMB) has a staff of around 180 people, including senior scientists, postdocs, postgraduates and technical staff. The research focus is on marine and brackish water ecosystems, plant sciences, and environmental disturbances, including pollution. EMB is well set up for experimental work using aquatic organisms and plants. The ecotoxicology group's research covers both the fate and effect of contaminants, including radionuclides, with a strong focus on realistic environmental scenarios. The Radioecology Research Group at EMB is a partner in the STAR Network of Excellence in Radioecology. The Department of Molecular Biosciences, The Wenner-Gren Institute (MBW)) has a research staff of about 170 persons including senior scientists, PhD-students and technicians. The research areas range from projects on environmental factors involved in cancer, radiation biology to the development of new cancer drugs. Researchers at both departments are founder members of the Centre for Radiation Protection Research (CRPR), an independent unit engaging scientists working in the fields of radiation biology, radioecology and radiation dosimetry at Stockholm University as well as Karolinska Institute. CRPR focuses on low dose risk research and is a partner in the MELODI network on low dose radiobiology. CRPR has a unique set up of radiation facilities specially designed for investigations of effects of low doses of low and high LET radiation. CRPR also provides university training and education in radiobiology, radioecology and radiation dosimetry at the levels of BSc, MSc and PhD.

Staff members contributing to COMET

Assoc. Prof. Clare Bradshaw. Marine ecologist, ecotoxicologist, radioecologist. Expertise in fate and effects of pollutants in marine and brackish ecosystems. Focus on realistic multispecies, multistressor and low dose situations. Supervisor of PhD students and involved in teaching in environmental sciences, marine biology and radioecology. Principal investigator from SU in the STAR network, actively involved in IUR. She will coordinate the activities of SU within COMET and she will be mainly involved in WP4 and WP3.

Dr. Karolina Stark. Radioecologist, aquatic ecologist. Expertise in field validation of radiation doses to organisms, including use of biota phantoms, and dose model comparisons. Newer projects include spatial variation in exposure of amphibians and radiation effects in aquatic organisms. Involved in the STAR network and the IAEA's MODARIA programme. She will be mainly involved in WP3 and WP4.

Lena Konovalenko. PhD student. Ecosystem modeller. Seven years experience working with modeling of transfer of radionuclides in aquatic ecosystems. Will be mainly involved in WP3.

Prof. Andrzej Wojcik. Professor in radiation biology and head of a radiobiology group. Expertise in cellular effects of mixed high and low LET beams, markers of individual sensitivity and biological dosimetry. Coordinated TENEB (working towards a European Network of Excellence in biological dosimetry (www.teneb.eu)) and currently coordinates MULTIBIODOSE (www.multibiodose.eu). Participant in DoReMi and MELODI. Supervisor of PhD students and involved in teaching in radiobiology. Mainly involved in WP4.

Dr. Siamak Haghdoost. Radiobiologist. Developed assays for low dose stress response marker 8-oxo-dG. Expertise in genetic and epigenetic changes caused by low dose gamma and UV, and in biomarkers of oxidative stress and their application for assessment of individual radiosensitivity. Participant in DoReMi and MELODI. Mainly involved in WP4.

A **new postdoc or PhD** will also be involved in COMET.

Partner 8: Bundesamt für Strahlenschutz (BfS), Germany

BUNDESAMT FUER STRAHLENSCHUTZ (BfS) is the federal authority for radiation protection in Germany. It is the scientific-technical superior federal authority for radiation protection in Germany and is supervised by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). BfS is divided into four departments: "Nuclear Safety", "Nuclear Waste Management", "Radiation Protection and Health", and "Radiation Protection and the Environment". BfS works for the safety and protection of man and the environment against damage due to ionising and non-ionising radiation. It conducts in-house research and initiates, funds and supervises radiation protection research within the national research program of BMU. BfS is a member of many international organisations, involved in several EU funded projects and in the German-Japanese cooperation FAIRDO (Fukushima Action Research on Effective Decontamination Operation). BfS is founding member of the ALLIANCE.

Staff members contributing to COMET

Dr. Klaus Gehrcke is currently Head of the Department "Radiation Protection and the Environment". It comprises the two divisions "Radioactivity in the Environment" and "Emergency Preparedness". Its scientific work focuses on monitoring of natural and artificial radionuclides in the environment and on predicting exposures to man and biota using radioecological models. Dr. Gehrcke is a specialist for the registration, investigation and evaluation of NORM residues and has an in-depth knowledge of national and international NORM legislation. Dr. Gehrcke is the Secretary of the Working Group on "Natural Radioactivity" of the German-Swiss Association for Radiation Protection.

Dr. Liebetraud Edelhäuser-Hornung is Head of the Section "Radioecology". Current fields of action include concepts for the protection of wildlife, the realistic assessment of radiation exposure and modeling radioecological processes related to the clearance of low-level radioactive waste. She is a member of the Committee on Radioecology of the German Radiation Protection Commission and was deputed as a national expert to the European Commission (2000 to 2002).

Bianka Denstorf is experienced in quality management (internal auditing, accompanying ongoing accreditation processes etc.), in project management and evaluation.

The three staff members mentioned above will contribute to WPs 2, 3 and 5.

Dr. Martin Steiner (WPs 1, 2, 3, 5) focuses his research on key processes relevant for the mobility and transfer of radionuclides in the environment and advanced techniques of process-oriented modeling. He was awarded a research fellowship in radioecology by the Japanese Science and Technology Agency.

Christine Willrodt (WPs 2, 3, 5) has been supervising radiation protection research within the national research program and participating in several international projects (ERICA, PROTECT, EMRAS).

Dr. Eva Kabai (WP 3) is a senior radiochemist developing and publishing new and combined methods for the determination of natural and anthropogenic radionuclides in different matrices.

Dr. Rainer Merk (WP 3) has expertise in groundwater contaminant modeling, notably radionuclide transport through porous media and in computer simulation and mathematical modeling.

Karin Wichterey (WP 3) and **Michael Kümmel** (WP 3) are senior scientists with long-term expertise in radon, NORM and radioactive legacies of former uranium and traditional ore mining.

Dr. Ulrike Kulka (WPs 2, 4, 5) is Head of the Section "Biological Radiation Effects and Biological Dosimetry". She is specialised in cellular and cytogenetic radiation damage and in biological dose reconstructions after radiological accidents. She is involved in several EURATOM EU projects and platforms like DoReMi, Epi-Ct, RENEB (coordinator) and MELODI. Within the DoReMi Education & Training Committee she is in charge of the training course "Interdisciplinary Radiation Research".

Partner 9: Norwegian University of Life Sciences (UMB), Norway

The Norwegian University of Life Sciences is Norway's leading research and education establishment in the Environmental and Life Sciences. The Department of Plant and Environmental Science at UMB carries out education and research activities, funded through both governmental research budgets and external research contracts.

The Department of Plant and Environmental Sciences (IPM) at UMB has an internationally recognized expertise in environmental risk assessment of radionuclides and other pollutants, and especially source-term speciation, radioecology and social and ethical aspects of risk management. The department has been actively involved in EU projects within the nuclear education and training area (EURAC, ENEN-II, CINCH), and in other EURATOM projects within 3rd - 7th FP (ARMARA, ADVANCE, REMOTRANS, ESTABLISH, ERICA, STRATEGY, EURANOS, PROTECT, STAR, DoReMi, CINCH), and has experience from more than 50 national, bilateral and international projects (NATO, IAEA etc.) during the last 15-20 yrs. They will bring this experience to activities in WP1, 2, 3, 4 and 5.

Staff members contributing to COMET

Professor Brit Salbu is Head of Isotope Laboratory and of the Environmental Chemistry Section within the Department of Plant and Environmental Sciences at UMB. She has more than 25 years of experience in radiochemistry, radioecology and environmental impact assessment, and published about 190 articles in peer review literature. She has been a member of a series of national and international research committees, has participated in more than 50 national, bilateral and international projects – including 15 EU projects. She has also been chair of the NATO Nuclear/radiological Expert Group. She is member of the Norwegian Academy of Science and fellow of the Royal Society in chemistry. Her main contribution to COMET will be to WP1 and WP3, leading task 3.1.

Ass. Prof Dr Lindis Skipperud is deputy head of Isotope Laboratory/ Environmental Chemistry Section with 17 years of experience within environmental chemistry, radiochemistry and radioecology, and has published over 100 papers in the international literature, more that 40 is in peer-review journals. She is responsible for managing courses and laboratory training at the Isotope Laboratory and is substantially involved in post-graduate education including the European MSc program in Radioecology. She has been actively involved in EU projects within nuclear education and training area (EURAC, ENEN-II, STAR and CINCH) and also other EURATOM projects (ARMARA, ADVANCE, REMOTRANS, ESTABLISH). Her main contribution to COMET will be to WP2 and WP5, leading tasks 2.5 and 5.4.

Prof Deborah Oughton has a PhD in radiochemistry (Univ of Manchester, 1989) and is professor in Environmental Chemistry, head of the PhD Research School in Ecotoxicology, and the ethics co-ordinator at the UMB. She was lead contractor in the EU projects ERICA (where she managed the 50 member end-user stakeholder group), PROTECT, STRATEGY and, and is currently involved in the 7th FP NERIS (on the NERIS management board), STAR and DoReMi/Melodi (on the E&T board of Melodi). She has worked on assessment of the effects of ionizing radiation on non-human biota since the late 1990s, and has published over 130 papers in the international literature. Her main contribution will be to WP3 and WP4, leading the task 4.4.

Ass. Prof Dr Ole Christian Lind has 15 years of experience within environmental chemistry, radiochemistry and radioecology with 16 peer reviewed articles. He is responsible for the Co-60 gamma irradiation facility at UMB. His main expertise is speciation of radionuclides including characterization of radioactive colloids and particles and also has experience with implementing properties of radioactive particles into atmospheric transport models. His main contribution will be in WP4.

Scientist Turid Hertel-Aas has a PhD in radioecology/biology and her main expertise is related to ecotoxicology. She has been working with earthworms for over 9 years and has experience from both uptake (radiolabelled nanoparticles and radionuclides) and effect studies. She has been involved EU projects ERICA, PROTECT and STAR. Within ERICA she was responsible for studying the effects of chronic gamma irradiation on reproduction endpoints and DNA integrity in earthworms exposed during two generations. Her main contribution will be into WP4.

Partner 10: Główny Instytut Górnictwa, Śląskie Centrum Radiometrii Środowiskowej (GIG-SCRS), Poland

GIG is located in Katowice, the administrative centre of Silesia, a mining and industrial region in southern Poland. GIG is research and development institute, working for mining industry, local authorities and environment protection business. The mission of the Institute is to create modern, energy-saving and clean technologies, technical solutions and undertake measures towards the creation of desired relationship: industry – environment – people. Waste management, water and air protection related to mining industry restructuring are current specific research areas of GIG. The tasks related to radioprotection and radioecology, mainly in the context of enhanced natural radioactivity (NORM) are run by the Silesian Centre for Environmental Radioactivity (SCRS), a well equipped GIG's department. The SCRS' team has been involved in the problems caused by NORM at industrial and post-industrial areas for many years. It results in extensive experience in radiation measurements, occupational risk assessment and monitoring of the environmental impact related to the enhanced natural radioactivity. One of significant achievement of this team is the complete system of radioprotection, including all, measurement methods, risk evaluation and regulations implemented in all Polish underground mines in 1989. After the system had been enforced in mining industry the main scientific activity of SCRS was directed into protection widely comprehended environment against ionising radiation, including e.g. non-human biota, effects related to the simultaneous presence of other toxic metals and different environmental conditions or radon and radon progeny at homes. During the last few year SCRS participated in EU projects ERRICCA II, TENORM-HARM, WATERNORM mainly focused on radiation protection and environmental effects related to an activity of a non-nuclear industry. SCRS has experience in training of industry operators in radiation protection and NORM waste management and can provide excellent condition for trainings and exercises focused on radiation protection and radioecology. SCRS disposes almost all measurement techniques useful in radiation protection and radioecology (i.e. high resolution gamma spectrometry, alpha spectrometry, liquid scintillation spectrometry, radiochemical lab and TLD dosimetry). Due to recent development the capabilities of SCRS were completed with the equipment allowing exposure to different radiation (X, γ, β and neutrons) under controlled conditions in wide range of doses. The SCRS team is supported by other GIG's departments, ready to measure concentrations of non-radioactive constituents and to perform classical chemical analyses. Within the PORANO project, SCRS tightly cooperated with Faculty of Biology, Silesian University on the investigation of critical endpoints in plant cells exposed to enhanced natural radiation. Within COMET GIG will contribute to project management activities via WP1 and support the consortium in all issues related to NORM. Especially, GIG will participate in the WP 2 in close relation to researches conducted in WP 3, *tasks 3.1 and 3.3*, will be co-leader of *tasks 2.4. and 3.4* and, in WP 5, GIG will contribute to the planning and running of field trainings and open workshops.

Staff members contributing to COMET

Bogusław Michalik D.Sc., professor GIG, has 25 years' experience in radiation protection and radioecology. He is highly qualified expert in the field of radiation protection in non-nuclear industry (NORM). Author about 80 scientific articles and monograph entitled: *Radioactive contamination of environment caused by an activity of underground mines*. Will co-ordinate GIG work within COMET and participate in the WP 2 in close relation to researches conducted in WP3.

Małgorzata Wysocka D.Sc., professor GIG, head of SCRS, for more than 25 years has been involved in investigations in the field of radiometry, geology, radon in soil gas and in indoor atmosphere, radon exhalation rates, radioprotection in non-uranium mines and rehabilitation of NORM contaminated sites. The main scientific area of last years: observations of migration of radon in geological environment in industrial and postindustrial zones. Author of about 60 publications. Will contribute to the *task 2.3. Infrastructures* and *2.4. Co-ordination with national programmes.*

Krystian Skubacz, Dr., more than 25 years experience in radiometry and radiation protection, application of nuclear techniques in research and industry, measurement techniques like alpha spectroscopy and TLD dosimetry, investigations of atmosphere, radon and radon daughters, development of new measuring devices and software related to radiation protection. Besides activities in frame of WP 3, he will be involved in open workshop running within WP5.

Other participating scientists: M. Bonczyk M.Sc. (physicist) specialist in HGRS and mathematical modeling; I. Chmielewska M.Sc.(radiochemist) specialist in radionuclides speciation analysis.

Partner 11: Chornobyl Centre, International Radioecology Laboratory, (IRL), Ukraine

The Chornobyl Center has as a mission to create and implement new knowledge and advanced technologies, provide engineering, scientific and technical services in the area of nuclear energy safe utilization for the benefit of the Ukrainian people and Slavutych. They render expert, engineering, scientific and technical services in the area of ensuring nuclear and power facilities` safety at all stages of their life cycle.

In July 1998, Ukraine and USA signed an agreement on establishing the International Radioecology Laboratory (IRL) . Since the IRL started its operation, the Chornobyl Center expanded its area of expertise and started rendering services in the area of radioecology and radiobiology, conducting research with its Ukrainian and foreign colleagues within the Chornobyl Exclusion Zone. The Projects Monitoring Center (PMC) was established in August 2000 as a Chornobyl Center's division in the area of nuclear safety, radioactive waste, and radioecology. In February 2002, 2 years after the Chornobyl NPP closure, the headquarters of the Chornobyl Center was transferred from Kyiv to Slavutych. Today the Chornobyl Center employs approximately 61 people. 68.8% are MD; 9.8% – Ph.D.; 29.5% – are young people under 30. Interesting expertise of the Chornobyl Centre for COMET are Radioecology research and Emergency response.

The Chornobyl Center has important technical capabilities. The Chornobyl Centre has the database on the Chornobyl catastrophe consequences available, which was developed under the French-German Initiative (FGI) for Chornobyl covering the following three topic areas: "Sarcophagus Safety", "Radioecological consequences of the Chornobyl accident", "Health consequences of the Chornobyl accident" of which the latter two are interesting for COMET.

The IRL's unique technical base enables to conduct radioecological and radiobiological studies, in particular within the Chornobyl Exclusion zone. The IRL makes use of mobile spectrometry laboratory to carry out research activities within the Chornobyl Exclusion Zone and automatic photo cameras are used to picture the wild animals. There is a lab base in the Chernobyl exclusion zone.

IRL's major contribution in the project is collaboration with the field studies established under WP4 and contribution identification of robust dynamic parameter values (WP3). They will be actively involved in the organization of workshops under WP5 and some field training. They will also be involved in WP2 partially because they are asked to add own institute information to the different data bases (Infrastructure, models, involvement in projects, ..) that were developed under STAR.

Staff members contributing to COMET

Mikhail Bondarkov - Highest degree of PhD in nuclear physics with a rich experience in radioecology.

Sergey Gashchack - PhD. Deputy Director, International Radioecology Laboratory, Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology. PhD in Radiobiology and Radioecology of Agricultural Animals. Collaborated in last 5 years in several international research projects: e.g. (1) Savannah River Ecology Laboratory (USA), University of Liverpool (UK) projects on Population genetic, radiobiology, radioecology. Scientific & technical assistance, responsible executor; (2) Set of projects in framework of the agreement between IRSN (France) and IRL on assessment of consequences of the Chernobyl accident in biological systems on the contaminated territories

Andrey Maksimenko - Head of department for spectrometric and radiochemical measurements. High-qualified specialist with long-term experience, responsible for the quality of the radionuclide assays. He organises yearly training courses at the Chornobyl Center for foreign specialists, workshops on nuclear safety and radiation protection. He is our key specialist. In his team there are several assistants with high education, who perform spectrometric and radiochemical analysis.

Renata Maksimenko - Ph.D. Biologist. She is a leading researcher. Cytology, histology, biochemistry – are in her field of her expertise. She is now head of a special lab (recently established) for the biochemical, immunological and haematological assays for people for the local hospital.

Yulya Maklyuk Ph.D. Biologist. Experience with field studies in Chernobyl (small mammals, contamination, effects, cytology). Participates in organisation of training courses..

Igor Chizhevsky Ph.D. Radioecologist with experience in radioecology of agricultural animals, countermeasures, etc. Good knowledge of Chernobyl zone. Regularly participates in field studies

Partner 12: National University of Life and Environmental Sciences of Ukraine (NUBiP), Ukraine

National University of Life and Environmental Sciences of Ukraine (NUBiP of Ukraine, http://nubip.edu.ua/en) is one of the leading educational, scientific and cultural establishments of Ukraine. Over 37000 students and more than 600 PhD, Doctoral students and Students-seekers are studying at 21 faculties of Kyiv Territorial Center, at Southern Affiliate "Crimean Agro-Technological University" and at 12 regional high education institutions.

The COMET tasks will be performed by Ukrainian Institute of Agricultural Radiology, UIAR NUBiP, of Ukraine (http://uiar.org.ua), which has been a structural part of NUBiP since 2005. UIAR was established in June 1986 for the evaluation of the radiation situation and solving the problems in agriculture at the radioactive contaminated territories. Since then, UIAR has significantly broadened the area of its competence to cover now a wide spectrum of the radioecological issues. At the various phases of the Chernobyl accident UIAR carried out the studies of the physical-chemical forms of the radioactive fallout, dynamics of transformation of the fuel particles in the natural conditions, regularities of the radionuclides soil-to-plant and foliar transfer, radionuclides migration in the environment, including their transportation during fires, radionuclides transfer into animals and fish, efficiency of various countermeasures and many others. UIAR took part in the numerous international projects including the early ECP projects, IAEA, NATO, STCU projects, and bilateral projects with the European and Japan institutes. Within the IRSN-UIAR projects two experimental sites were created and equipped in the Chernobyl zone, which can be used for the research planned in COMET.

UIAR NUBiP of Ukraine will contribute to all WPs of COMET and will co-lead 2 tasks within the project: Task 2.3. Infrastructures – evolving from to the ALLIANCE (together with CIEMAT and CEH); and Task 3.1. Initial Research Activity (together with UMB).

Staff members contributing to COMET

Dr. Valery Kashparov is a highly experienced radioecologist and the director of UIAR NUBiP of Ukraine. He is a member of: the National Commission for the Radiation Protection of Ukraine, IUR, the Scientific Committees of the State Inspection on the Nuclear Regulation of Ukraine and the State Agency of Ukraine on Exclusion Zone Management, the Ukraine-Japan inter-governmental group, and the IAEA expert. He has published > 80 refereed papers. He will contribute to all WPs taking a leading role in Task 2.3.

Dr. Vasyl Yoschenko is a radioecologist of 23 years experience with approx. 100 published papers including approx. 30 in refereed international journals. He is a head of lab at UIAR NUBiP of Ukraine. His primary areas of research are the radionuclides biogenic migration, development of approaches to assess the exposure of wildlife, and effects of radiation to non-human biota. He has the experience of participation and management of the international projects. He will contribute to all WPs and coordinate the UIAR works in COMET.

Dr. Yuri Ivanov is a highly experienced (40 years) radioecologist with approx. 300 published papers including approx. 30 in refereed international journals. He is a member of IUR, of the Nuclear Society of Ukraine and of the 2 editorial boards in Ukraine. His primary areas of research are the radionuclides geochemical migration, behaviour of transuranium elements in the environment, long-term dynamics of the radionuclide transfers in the ecosystems, auto-rehabilitation processes. He will contribute to WPs 2, 3 and 5.

Dr. Svjatoslav Levchuk is a radioecologist of 23 years experience with approx. 100 published papers including approx. 30 in the refereed international journals. He is the IAEA technical expert and a head of lab at UIAR NUBiP of Ukraine. His primary areas of research are the radionuclides geochemical migration, soil-to-plant and foliar transfer of radionuclides, and radioecological monitoring. He has the experience of participation and management of the international projects. He will contribute to WPs 2, 3 and 5.

Anna Rusavs'ka, MSc in radioecology and radiobiology, a new post-graduate student at UIAR NUBiP of Ukraine (since October 2012). She will contribute to the cyto/genotoxicity studies performed within WP4.

Partner 13: Fukushima University, Japan

Fukushima University is a national university located in Fukushima City, 58 km northwest of the Fukushima Daiichi Nuclear Power Plants. As the region's only national university, it has contributed to the revitalization efforts of the prefecture following the Great East Japan Earthquake by conducting research and surveys on topics requiring immediate attention. In April of 2011, it called for the implementation of the East Japan General Assistance Project (urgent survey and research topics), wherein a total of 35 survey and research topics were initiated under the program, in fields related to natural disaster science, disaster broadcasting, nuclear disaster prevention science, revitalization assistance, assisting children and disaster health and medicine. Through this project, the university supplied radiation dosage maps to relevant localities, assisted evacuated residents and raised issues associated with suspending production and delivery of farm produce.

Work for COMET will be undertaken by several research units: (1) Faculty of Symbiotic Systems Science, the key research group involved, has strong expertise in a) human support systems, including robotics and sensor technology, b) industrial systems, including decontamination techniques, and c) environmental systems management, including extremely small quantities analysis for water and environmental influences of radioactive substances. Its members have actively collaborated with organizations such as the Japan Atomic Energy Agency (JAEA), National Institute of Radiological Sciences (NIRS) and other Japanese Universities. (2) Fukushima Future Center for Regional Revitalization (FURE), established in 2011, supports the reconstruction of Fukushima from the standpoint of Economics, Administration, Education and Technology. FURE has a close relationship with local governments in Fukushima prefecture, and the relationship is beneficial for running investigations smoothly. (3) The Institute of Environmental Radioactivity, planned for establishment in 2013, will play the role of integrating results from investigations on the environmental influences of radiation following the Fukushima Daiichi Nuclear Power Plants accidents, in particular, in collecting several samples, e.g. soil, water, air-filter, plantation including crops and fruits, animals including cattle.

Staff members contributing to COMET

Prof. Dr. Takayuki Takahashi, has 20 years experience in robotics including development of waterproof robots for radiation survey under ponds and lakes, and 3 years experience as the vice president of Fukushima university with strengthening the research organization management system of the university. He has been planning to establish the institute of environmental radioactivity in the university in order to research the various influences on the environment due to the Fukushima Daiichi Nuclear Power Plants accidents. He will contribute to the COMET project as a leader representing Fukushima University especially for WP1 and WP2.

Prof. Dr. Kenji Nanba, has 20 years experience in micro-biology including research on the influences of radioactive substances. After the Fukushima Daiichi Nuclear Power Plants accidents, he has energetically investigated water and soil contaminated with radioactivity through collaboration with many researchers in Japan. He will contribute to WP3 and WP4 based on a Fukushima area investigation.

Prof. Dr. Hirofumi Tsukada has 30 years experience in radioecology, with an emphasis on geochemistry and health physics, including: study on cycling and transfer mechanisms of the radionuclides in the atmospheric environment and in the soil-plant system, determination of transfer parameters and influencing soil properties, environmental risk assessment and counter-measures. He will contribute to WP3 and WP4.

Prof. Dr. Katsuhiko Yamaguchi has 20 years experience in solid state physics including the development of radiation sensors, e.g. Plastic Fiber Scintillation (PSF). He has applied the sensor technology to investigate radiation levels under ponds and lakes. He also progresses the education of radiation for general citizens including school students in Fukushima prefecture. He is the division leader of environmental energy including the radiation countermeasure section for FURE. He will contribute to WP3 and WP5 through sensor techniques and education methodology.

Prof. Kencho Kawatsu has 30 years experience in administration of nuclear power plants in Fukushima prefecture. He is the section leader of the radiation countermeasure department for FURE. He has coordinated relations between local governments and researchers while maintaining an adequate balance between the demands of local administration and research projects. He also has been integrating information concerned with decontamination of radioactive pollution. He will contribute to WP3 and WP5.

B.2.3. Consortium as a whole

COMET: A multidisciplinary, complementary strong research team perfectly positioned to establish a pan-European Centre of Excellence that will play a key-role in the Horizon 2020 Radiation Protection Federating Structure

At its start, the COMET consortium will have thirteen partners; eight from EU member states (Belgium, Finland, France, UK, Sweden, Spain, Germany and Poland), two from Norway, two from Ukraine and one from Japan. Seven of the COMET partners are founding members of the ALLIANCE (SCK•CEN, STUK, IRSN, NERC-CEH, NRPA, BfS, CIEMAT); the remaining project partners have applied for membership or intend to do so. Several COMET partners are also members of the NERIS and MELODI platforms. As such an effective exchange between radioecology, radiation biology and emergency management will be assured.

The STAR NoE has laid effective foundations for COMET to succeed; all nine STAR partners are also partners in COMET to assure continuity. The Ukrainian and Polish partners have collaborated with STAR having proposed the Radioecology Observatory sites. Fukushima University will provide access to field sites in the Fukushima affected area, will play a leading role in the field studies and has existing strong links with several European COMET partners. Fukushima University is an essential addition to our team to ensure we are able to learn lessons from the post-Fukushima accident situation and have an effective exchange of knowledge.

The COMET team has expressed their dedication to collaborate in the project by signing a Letter of Intent.

The consortium comprises approximately 65 key people, ranging from senior scientists with considerable experience through to post graduate/doctoral researchers. Their competences and expertise provide the multi-disciplinary and complementary team which is essential to fulfill the requirements of the CP-CSA. The multidisciplinary team covers key required disciplines in radioecology, radiobiology, emergency management, dosimetry, ecotoxicology, ecology and training. Importantly, the coordinator and all WP leaders have extensive experience of managing large-scale, multi-national projects. Furthermore, the consortium has in place the administrative and financial support and infrastructure to ensure the successful management of a project of this size and complexity.

By building upon STAR the consortium has an established and effective on-going network which we will be able to develop through COMET and the ALLIANCE into a Centre of Excellence for Radioecology with a shared strategic research agenda and committed implementation plan. Through the involvement of several of the partner organisations in the other relevant, on-going, platforms/projects MELODI, NERIS, EURADOS, CINCH, ENETRAP and the OPERRA project, the required links and networking to evolve towards a Radiation Protection Federating Structure are in place. This will be further secured by our close collaboration and joint activities with these platforms and the inclusion of key people from them within the COMET steering committee.

The consortium has wide experience in delivering different types of radioecological expertise to users at European, international and national levels and through the provision of training and education to a range of stakeholders (regulators, industry, students etc.).

The partners in the consortium coordinate substantial national resources for radioecological research and manage the wide range of infrastructures and research platforms that are needed in radioecological research. COMET also includes three universities SU (Sweden), UMB (Norway) and the University of Fukushima which all have training and/or educational programmes related to radioecology. Furthermore, UIAR is integrated with the National University of Life and Environmental Sciences of Ukraine (NUBiP).

A competence table demonstrating that the complementary expertise required for the successful execution of this project is in place is presented in Table B2.3-1. The table is not exhaustive (e.g. it does not include the radioanalytical or monitoring capacity, molecular biology analysis capacity etc …) but it clearly illustrates the capability of COMET partners to perform key research activities and to effectively disseminate and exchange the knowledge acquired during the project and beyond. It also shows the ties with other platforms through several COMET organisations.

Table B2.3-1.: Consortium competence table restricted to those competences required for the successful execution of the COMET project

Competence / Infrastructure Table	SCK•CEN	STUK	NRPA	IRSN	NERC-CEH	CIEMAT	BfS	SU	UMB	GIG-SCRS	Chornobyl Center	UIAR NUBiP	Fukushima University
Connections to ALLIANCE	■	■	■	■	■	■	■	■	■				
Connections to NERIS	■	■	■	■		■	■		■				■
Connections to MELODI	■	■		■			■	■					
Connections to EURADOS	■	■		■		■	■						
STAR partner	■	■	■	■	■	■	■	■	■				
Experience in launching and conducting external calls at the European level		■											
Experience in evaluating research projects to be funded by national or international programmes	■	■		■	■	■		■					
Third Country with nuclear accident											■	■	■
Long time series available	■	■	■	■	■	■	■	■	■	■	■	■	■
Time series for initial phase after accident available		■									■	■	■
Hosting Observatory Sites										■	■	■	■
Probabilistic methods including Bayesian statistics	■		■	■		■	■	■					
Development of mathematical models	■		■	■		■	■						
Freshwater radioecology	■	■	■	■	■		■	■	■	■	■	■	■
Marine radioecology	■	■	■	■				■	■				
Terrestrial radioecology	■	■	■	■	■		■	■	■	■	■	■	■
Environmental radiation protection	■	■	■	■	■		■		■	■	■	■	■
Modeling	■		■	■			■	■			■		
Risk assessment	■	■	■	■	■		■		■	■	■	■	
Radiobiology	■	■	■	■			■	■	■		■		■
Dosimetry	■	■	■	■			■	■	■	■	■	■	
Ecotoxicology	■		■	■	■			■	■				
Ecology	■			■	■			■	■		■	■	■
Communication/dissemination of knowledge	■	■	■	■	■			■	■				
IPR	■	■			■								
Experience in project management and coordination	■	■	■	■	■	■	■	■	■	■	■		■
Training and education	■			■	■	■		■					■

The Observatory Sites will provide a key initial integrating mechanism by offering a common platform for the research which is of relevance to the MELODI and NERIS communities. During the STAR project, two sites have been selected: a NORM site in Poland and the Chernobyl Exclusion Zone. The Silesian Centre for Environmental Radioactivity (GIG-SCRS), the Ukrainian Institute of Agricultural Radioecology (UIAR) and the Chornobyl International Radioecological Laboratory (IRL), which are all included as consortium partners, will facilitate access to these sites, associated databases and most importantly institutional experience and expertise. Field studies are also planned in the Fukushima affected areas, in collaboration with Fukushima University who will be heading the future Center for Environmental Research that has the mission to study the consequences of, and remediation for, the Fukushima accident. COMET, therefore, has the essential links with countries in which nuclear accidents have occurred, as specified in the call.

The COMET partners have a well-established international reputation for scientific excellence. The scientific reputation is reflected by the coordination of large international research projects/programmes and the involvement in application of radioecological knowledge at both national and international level, delivering key knowledge with policy relevance. The scientific excellence and ability to deliver policy related outputs will enable COMET to impact

on policy at national, European and international levels, and attract long-term collaborators. The consortium is also strongly established in international organisations in which its members play active roles: e.g. members of ICRP committees and working groups; UNSCEAR working groups; task leader or participant in IAEA EMRAS working groups/MODARIA; board members of IUR. As a example, three of the COMET partners (NRPA, IRSN, SCK•CEN) have personnel seconded to UNSCEAR for the evaluation of the Fukushima data for assessing the impact on man and environment of the Fukushima accident; NRPA had staff seconded to UN FAO in the months following the Fukushima accident.

The national facilities, expertise and on-going research of COMET partners are combined in the Joint Programme of Activities to capitalise on the relative complementary strengths listed above, enabling a cost-effective and significant advancement in the chosen research themes. The programme of activities will also allow the consortium partners to gain experience of working together in a more integrated manner and further access each other's expertise, which will greatly aid the subsequent long term integration of the partners and ultimately enhance competences in radioecology and the broader Radiation Protection arena in Europe.

Key contributions of partners to COMET

The competence in each partner organisation, as listed in Table B2.3-1, means that there is a clear potential to further integrate expertise over the network by focusing research activities within particular partners with specific strengths in certain areas and share knowledge for maximum added value.

A summary of expertise of the partners focussing on those relevant to COMET is shown in Table B2.3-2 together with an overview of how they will use this expertise to the benefit of the project..

Table B2.3-2: Key areas of expertise from each partner for COMET and justification of inclusion

Partner	**Areas of expertise most relevant for, and justifying, partners role in COMET**	**Main contribution to COMET**
SCK·CEN	Management of large multinational project, quantification of environmental transfer, dose effect studies, human and environmental risk assessment, remediation, emergency management, DSS, MCA, ethics/public perception	Management, integration/implementation,dose effect, environmental transfer modeling
STUK	Regulator, management of large multinational project, human exposure pathways, human risk assessment, environmental monitoring, emergency management	Integration, management, linking of radioecology with emergency
NRPA	Regulator, project management, environmental risk assessment, dosimetry, modeling, DSS, emergency management	Better linking of radioecology with (post) emergency, Environmental transfer modeling
IRSN	Management of large multinational project, Environmental risk assessment (ERA), Dose-effect studiesAdvanced environmental modeling, (bio)geochemistry, ecotoxicology	Dose-effect, Environmental transfer modeling, integration
NERC	Environmental informatics, Environmental risk assessment, quantification of environmental transfer (especially to animals), co-ordination of multinational projects, database management, ecotoxicology	Dissemination, environmental transfer, ecotoxicology
CIEMAT	Dosimetry, environmental risk assessment, modeling of existing situations	Dosimetry, modeling, dissemination
SU	Systems ecology, radiobiology, training and education	Dose effect, Environmental transfer processes, Aquatic ecosystems
BfS	Regulator, process-oriented modeling, quantification of environmental transfer, human exposure pathways	Process-oriented modeling, Observatory sites
UMB	Training and education, ecotoxicology, dose-effect studies,	Training and education, dose-

	multi-contaminants, ethics/public perception	effect studies
GIG-SCRS	NORM monitoring, occupational risk assessment, human and environmental impact assesment	Observatory, environmental transfers, Training, integration
Chornobyl Centre	Radioecology of wildlife, radioecology of the Chernobyl zone's ecosystems, urban radioecology; biodiversity, conservation	Observatory, radioecology of animals, radioecology of Chernobyl zone's ecosystems, training, integration
UIAR NUBiP	Environmental transfers including to farm animals and fish, fuel particles, efficiency of countermeasures.	Observatory, environmental transfer, dose effect, Training, integration
Fukushima University	The long-term effects on the natural environment of radioactive substances, environmental assessments	Fields studies, dose effect, environmental transfer, integration

Sub-contracting

In WP1, subcontracting budgets to obtain financial audit certificates have been included for SCK•CEN and NERC-CEH; according to regulations of the model grant agreement such certificate is required for those organisations for which the EC contribution exceeds 375 000 €

In WP2, subcontracting is used for the organisation of expert workshops (rental of meeting premises and related services) by STUK.Due to local rules STUK has budgeted 10000 € for WP2 workshop arrangements.

There is no subcontracting currently planned for WP's 3 and 4. However, some minor services, such as rental of meeting rooms and catering not yet identified, might be subcontracted during the course of the project depending upon the local arrangements of specific partners.

B.2.3.1. Other countries:

Two organisations from Norway are partners in the COMET projects. Their funds come from the Norwegian Research Council and their own organisations. NRPA, who is leading WP3, is the national regulator for all activities involving the use, transport, storage and release of radioactive substances in Norway. The organisation has a well established research group with expertise in dosimetry, radioecology, radiobiology, effect studies and epidemiology. UMB, The Norwegian University of Life Sciences, is the task leader of all training and education related tasks in COMET (WP2 and WP5). UMB is a leading research and education establishment in biotechnology, food and environmental sciences, with national responsibility for radiochemistry/environmental radioactivity.

Two organisations from Ukraine are key to achieving the COMET goals and are eligible for funding as ICPC country. Together with the University of Fukushima (Japan), these partners have an important role to play in the data gathering for better environmental transfer predictions in emergency and post-emergency situations (WP3) and for environmental effects assessment in the impacted areas (WP4). Fukushima University will have an essential role in achieving the execution of the field experiments and related cross-boundary and innovative research. Given their fundamental role in the project, we ask their contributions to the realisation of the COMET goals are financed according to the rules applying to the EC country partners in the project.

Travel costs of experts and member of the Steering Committee are covered by the COMET budgetary request. Some experts may be from non-EU countries. All invited external experts will be reimbursed for travel and subsistance according to the EC flat rates for daily allowances (C(2009)1942).

B.2.3.2. Additional partners

The scientific challenges related to the human and environmental risk assessments from radiological contaminants are substantial and require a multidisciplinary approach and new competencies inside and outside the radiation research community. Additionally, some of these challenges are shared with the low dose and the nuclear emergency scientific communities. COMET chooses to aboard some of these challenges by attracting new partners to the project using

Flexible funds. 600 k€ have been reserved for flexible funds under a Competitive Call. The aim if this Competitive Call under COMET is to fund research activities to achieve key research needs identified based on the SRAs from ALLIANCE, NERIS and MELODI. A primary motivation of this Competitive Call is to engage the wider scientific communities to jointly address scientific challenges which have been identified as important by both the radioecology community and low-dose or (post) emergency communities (in the three respective SRA).

Preparing for a Competitive Call in collaboration with OPERRA

The consortium has reserved a relatively large flexibility budget (0.627 M€) mainly for a competitive RTD call (0.6 M€). COMET was asked to have the COMET Competitive call organised jointly with OPERRA. COMET decided to have its Competitive call organised jointly with the first OPERRA Competitive Call for Low-Dose RTD call, which OPERRA scheduled to organise the latest December 2013. This is earlier than than the STAR-SRA was to be finalised (STAR scheduled to present the final STAR/ALLIANCE SRA in January 2014). COMET has therefore asked STAR to advance the finalisation of a next version of the SRA for mid-September 2013, which was accepted.

Based on the criteria developed by WP2 for priority setting of research areas, priority research topics for this Call will be identified under WP3 and WP4 through consideration of the SRAs from the ALLIANCE, NERIS and MELODI. In close collaboration with OPERRA and together with key representatives from respectively the (post) emergency platform (NERIS) and low-dose platform (MELODI) and the COMET Steering Committee, COMET will prepare an ALLIANCE RTD first-phase roadmap for priority RTD in radioecology during an October 2013 workshop. Through the OPERRA-coordinator, the ALLIANCE RTD roadmap will be presented to the Independent Commission of Experts (see Annex 3) by mid-November 2013 in order for this Commission to prepare the call topics for COMET based on this ALLIANCE first-phase RTD roadmap. .

COMET organises this Competitive Call, partially to attract new expertise to the consortium and at the same time, guarantee the integration of new beneficiaries to the existing consortium. The proposals will be able to be prepared jointly by one or more external organization. Organisations that are already COMET members can participate in a proposal but the maximum EC contribution requested (by existing COMET partners) may not exceed 20% of the total EC contribution requested by the proposal as a whole. New organisations in the call should reserve a proportion of the call budget for integration purposes with COMET.

OPERRA will launch the Competitive Call in December 2013 and establish through HERCA a second panel of experts for reviewing and scoring the proposals (Annex 3) .

The procedure for publication of call will be conducted jointly with OPERRA but COMET will also advertise the call on the STAR, COMET and ALLIANCE internet sites, the IUR internet sites and through the national contact points set up by Member States and Associated countries. Information will also be distributed through the mailing lists of members of ALLIANCE, MELODI, NERIS, CINCH, EURADOS and other relevant platforms/projects..

Proposal submission and receipt process and evaluation process is fully organised under OPERRA.

Proposal selection The COMET MB and SC will make a decision on the award of the grants by using the recommendations of the expert panel on the best ranked proposals meeting different aims of the Call. The MB and SC are not bound by the recommendations of the Expert Panel but in case their decision diverges from the Expert Panel ranking, it will have to be well justified. A report on the project selection will be sent to the EC by the MB through the COMET co-ordinator. Unsuccessful applicants will be provided with feedback on request. The Competitive Call will be launched in December 2013, and we anticipate that in May 2014 proposers will be notified of the outcome and we hope that new research execution can start August 2014 (month 2014) the very latest.

Call closure: Accession of new beneficiaries

As mentioned, a summary report on the project selection will be sent to the EC by the MB through the COMET co-ordinator. Where there is subsequently a need to add new contractors as beneficiaries, the procedures described in the GA Annex II, Article II.36 will be followed. The Commission may object to the accession of any new beneficiary within 45 days of the receipt of the notification (as defined in GA Annex II, Article II.36 and II.37).

B.2.4. Resources to be committed

The COMET consortium has five work packages. WP1 is for project management and coordination (MGT), WP2 on pan-European networking and JPI (COORD); the RTD WP3 and WP4 consider (post) emergency management and low-dose research linking to NERIS and MELODI, respectively; WP5 is devoted to Knowledge Exchange (OTHER).

The total requested EC contribution is 3,411,000 €, of which 2,783,755 € is already allocated to the different WPs and beneficiaries, with associated total cost of 4,657,754 €. Of this 2.78 M€, 19 % is allocated to management (WP1), 27 % to coordination (WP2), 37 % to RTD (WP3/4) and 17 % to knowledge exchange (Table B2.4-3). Included in these funds are those required for: (1) organizing management meetings under WP1 including funds for inviting experts (reimbursement via EC flate rate system) these funds are allocated to the organising partner; and (2) organising workshops which are organised by WPs 2 and 5. Again workshop funds are allocated to the organising partner and a budget for invited experts has been allocated. Where possible the specific WG meetings will be associated with the management meetings (Annual meetings) and workshops to limit spending on travel.

Since all beneficiaries are involved in management tasks (member of the Management Board and for WP leaders additionally membership of the Executive Committee), the co-ordinator did allocate associated personnel and travel costs to all the COMET partners within the budget of WP1.

Considerable funds are allocated to field work in the Chernobyl and Fukushima affected areas: about 30 man months and 100 k€ are allocated to this activity. This is essential to conduct the RTD described within the Initial Research Activities and to best exchange knowledge with/learn from those coutries which have suffered major nuclear accident.

A substantial fraction of the budget is allocated as flexible funds (627 k€, 18 %). 600 k€ of these flexible funds will be used for organising a Competitive Call (in collaboration with OPERRA) (two call topics) and attracting new partners to COMET. The exact partitioning will depend on the needs for RTD identified under WP3/4 and the specifics of the Call and its associated topics. The remainder ~27 k€ of the flexlible funds will be allocated for ad hoc purposes as required and justified (~20 kEUR of this budget will in priority be used to adapt the budget of Chornobyl Centre once they are validated as a non-profit research institution). Some of it may be used to facilitate the development of joint work plans between "old" and "new" partners as necessary for the efficient implementation of RTD and other activities and allowing for optimal integration. Flexible funds may be dedicated to not yet specified purposes (e.g. extra expert invitation, extended workshops). Allocation of ad hoc flex funds will only occur following the agreed upon management decision process. Flexible funds are allocated under the WP1 budget of the co-ordinator.

Table B2.4-1: Distribution of EC funds requested by COMET partner and WP

Participant N°	Short name	WP1	WP2	WP3	WP4	WP5	TOTAL
1	SCK•CEN w/o flex fund	€ 346.924	€ 124.455	€ 43.947	€ 124.048	€ 31.798	€ 671.172
2	STUK	€ 26.637	€ 165.160	€ 48.149	€ 0	€ 21.424	€ 261.370
3	NRPA	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
4	IRSN	€ 32.979	€ 74.514	€ 60.413	€ 126.064	€ 9.353	€ 303.323
5	NERC-CEH	€ 33.869	€ 67.195	€ 57.383	€ 74.203	€ 174.004	€ 406.655
6	CIEMAT	€ 8.753	€ 47.447	€ 32.565	€ 0	€ 50.169	€ 138.934
7	SU	€ 36.218	€ 51.327	€ 45.007	€ 95.071	€ 31.838	€ 259.460
8	BfS	€ 11.266	€ 32.023	€ 27.655	€ 10.178	€ 11.426	€ 92.548
9	UMB	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
10	GIG-SCRS	€ 8.316	€ 69.442	€ 52.856	€ 0	€ 38.865	€ 169.479
11	Chornobyl Center	€ 5.153	€ 28.783	€ 10.115	€ 28.793	€ 36.225	€ 109.069
12	UIAR	€ 7.600	€ 29.639	€ 33.720	€ 24.768	€ 18.800	€ 114.527
13	Fukushima University	€ 12.000	€ 50.718	€ 60.450	€ 72.900	€ 61.150	€ 257.218
1	Flex fund	€ 627.244					
	TOTAL w/o flex fund	€ 529.715	€ 740.702	€ 472.260	€ 556.025	€ 485.052	€ 2.783.755
	TOTAL EC CONTRIBUTION INCLUDING FLEX FUND						€ 3.410.999

Two COMET partners (UMB, NRPA) are from Norway and bring added benefits and economies to the project by contributing without EC funds. They will be funded by the Norwegian Research Council. The same rationalization process was applied by the Norwegian partners in establishing their budget and their budget had to be justified to the project coordinator, as for all COMET partners. Their budget is presented in Table B2.4-2.

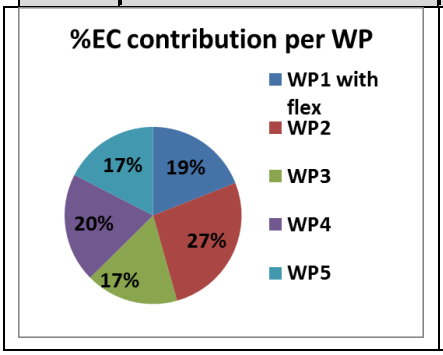
Table B2.4-2: Total budget of Norwegian partners, not requesting EC contribution

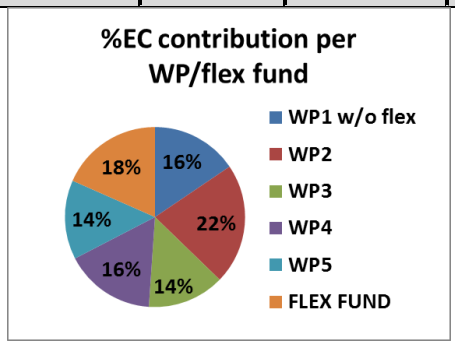
Participant	Short name	WP1	WP2	WP3	WP4	WP5	TOTAL
3	NRPA	€ 23.900	€ 39.800	€ 150.900	€ 41.150	€ 28.900	€ 284.650
9	UMB	€ 35.520	€ 144.640	€ 193.280	€ 267.840	€ 194.080	€ 835.360

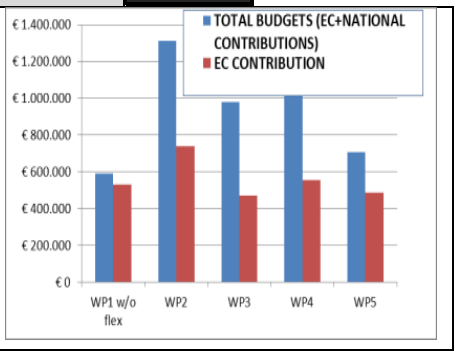
Table B2.4-3. shows the allocation of funds over the different cost categories per WP. At the bottom of that table the national contributions to the project are presented. Excluding the amount allocated for flexible funds, 40 % (~1.8 M€ of which 1.1 M€ from the Norwegian partners) of the budget comes from national funding. Additionally, the work under WP4 as presented in the IRA could not be executed with the manmonths as allocated in the WP tables. Therefore IRSN and SCK•CEN have planned that PhD students will participate in these activities, for which only 12 mm are allocated to the COMET project and the remaining time (24 mm in case of IRSN, 36 in case of SCK•CEN) and bench fees will be covered by their own funds. UMB also envisages a PhD for their research work under WP4.

Table B2.4-3: Distribution of requested funds by COMET WP, allocation of funds over cost types, partner contribution and requested EC contribution and combined total

WP no	COMET TOTAL BUDGET	MGT	COORD	RTD	OTHER	TOTALS
WP1	Personnel cost (in €)	€ 254.873				
	Person Month (in MM)	*30,0*				
	Subcontracting (in €)	€ 3.000				
	Other direct costs (in €)	€ 125.927				
	FLEX fund (in €)	€ 627.244				
	TOTAL direct cost (w/o flex)	€ 379.050				
	REAL Indirect costs	€ 205.335				
	Total budget (w/o flex)	€ 589.135				
	Requested EC contribution w/o flex fund	€ 529.715				
WP2	Personnel cost (in €)		€ 728.299			
	Person Month (in MM)		*105,5*			
	Subcontracting (in €)		€ 10.000			
	Other direct costs (in €)		€ 74.000			
	TOTAL direct cost		€ 812.299			
	REAL Indirect costs		€ 498.131			
	7% indirect cost		€ 56.161			
	Total budget		€ 1.310.431			
	Requested EC contribution		€ 740.702			
WP3	Personnel cost (in €)			€ 554.392		
	Person Month (in MM)			*81,5*		
	Subcontracting (in €)			€ 0		
	Other direct costs (in €)			€ 71.400		
	TOTAL direct cost			€ 625.792		
	REAL Indirect costs			€ 354.812		
	Total budget			€ 980.604		
	Requested EC contribution			€ 472.260		
WP4	Personnel cost (in €)			€ 525.587		
	Person Month (in MM)			*97,5*		
	Subcontracting (in €)			€ 0		
	Other direct costs (in €)			€ 176.300		
	TOTAL direct cost			€ 701.887		
	REAL Indirect costs			€ 367.665		
	Total budget			€ 1.069.552		
	Requested EC contribution			€ 556.025		
WP5	Personnel cost (in €)				€ 295.487	
	Person Month (in MM)				*46,0*	
	Subcontracting (in €)				€ 0	
	Other direct costs (in €)				€ 164.925	
	TOTAL direct cost				€ 460.412	
	REAL Indirect costs				€ 247.620	
	Total budget				€ 708.032	
	Requested EC contribution				€ 485.052	
TOTALS	*Person month total*	*30,0*	*105,5*	*179,0*	*46,0*	*360,5*
	Requested EC contr excl Flex Fund	€ 529.715	€ 740.702	€ 1.028.285	€ 485.052	€ 2.783.755
	EC contribution Flex Fund	€ 627.244				€ 627.244
	Total EC Contribution					€ 3.410.999
	National contributions	€ 59.420	€ 569.728	€ 1.021.870	*€ 222.980*	*€ 1.873.999*







B.3. Impact

B.3.1. Expected impacts listed in the work programme

Overall strategic impact

COMET will, in collaboration with the ALLIANCE, establish a pan-European Centre of Excellence for Radioecology, with a programme of activities supported by the radioecological community. Strong ties will be established with European stakeholders (including regulators, industry and allied sciences) and the wider international radiological sciences and ecotoxicology communities. This trans-national structure will be capable of ensuring appropriate governance of research in the field of radioecology in pursuit of a long-term shared vision; uniting the research objectives and related programmes of various research organisations, national programmes and funding bodies within an agreed Strategic Research Agenda.

Through COMET the ALLIANCE will be positioned as a strong component of the *Horizon 2020* Radiation Protection Federating Association. Although COMET is not a Preparatory Phase project itself it will promote better integration of national and international research efforts, by assisting the ALLIANCE to define joint programming instruments with other Radiation Protection platforms.

Our scientific strategy is to structure the radioecological research in the most effective way, through the further development of the SRA created by the FP7 STAR project and development of mechanisms of joint programming and implementation (JPI). The research activities under WP3 and WP4 will strengthen the collaboration between the radioecology and (post)-emergency and low-dose research communities. The development of future common research lines and a Joint Programme of Activities and Implementation Plan between NERIS/MELODI and ALLIANCE will increase efficiency, leading to the optimized use of research funds and infrastructure, and a more holistic approach to research. The innovative multidisciplinary, cross-boundary research will have both important practical (improved response to emergency and post-emergency situations, contribute to more robust screening values for environmental protection and evaluation of which animal models are suitable models for man and can we achieve improved understanding of effects on man through the use of alternative animal models) and scientific impacts (front-line research on the role of epigenetics in species fitness and transgenerational effects developed under laboratory and field conditions (Chernobyl and Fukushima affected areas)).

Specific WP related impact

WP2

- Strengthen the pan-European network in radioecology built upon the foundations laid by the 7FP STAR NoE and the European Radioecological Alliance (ALLIANCE) to proceed towards a single federating structure in the field of radiation protection and thus, prepare for the *Horizon 2020* programme.
- Increase the value of relevant national and international funding by joint planning, implementation and evaluation of the research programmes in radioecology, and achieving long-term sustainability.
- Identification of key topics/areas and specific scientific questions, and updating of the Radioecology SRA in close collaboration with stakeholders to ensure that the research recommendations and potential impact remain relevant to the scientific and general community, and correspond to genuine and achievable research priorities.
- Targeted open research calls will by launched (through OPERRA for COMET) focussing on the strategic research priorities, in addition to achieving the scientific aims of the calls this will attract new partners and key know-how, and facilitate a process of enlarging the ALLIANCE.
- Increase linkage with third countries especially those which have experienced major nuclear accidents (Japan, Ukraine)
- Increase participation of new member states in EURATOM FP projects, thereby evolving a more broad and effective implementation of the European Research Area in the field of radiation protection and exploiting the full potential of institutes, universities and other organisations in these countries as regards their infrastructure, human resources and overall competences.

WP3

- Improved predictive model capabilities for better protection of humans and the environment especially for situations with dynamic variation in radionuclide distributions, e.g. post-emergency. For the first year after an accident improved models will better predict the doses received via both external and internal exposure. This will provide a more robust basis for guiding adequate actions on evacuation, relocation and countermeasures. For the later phase

after an accident, improved models will allow us to better determine the duration of any contamination problem and optimize remediation measures to be applied.

- The research activities under WP3 will strengthen the collaboration between the radioecology and the (post)-emergency research community. The development of future common research lines and a Joint Programme of Activities and Implementation Plan between NERIS and ALLIANCE, will increase efficiency, leading to the optimized use of research funds and an improved and holistic approach to related research.

WP4

- Improved understanding of primary mechanisms at the cellular and sub-cellular level in organisms exposed to low radiation doses, for example the role of epigenetic processes in phenotypic and transgenerational effects or adaptation strategy; highly relevant for assessing population fitness and health risk for offspring and future generations;
- Synergistic networking between ALLIANCE and MELODI: model animals used in ecotoxicology/radioecology exhibit shorter life-cycles than those traditionally used in toxicology/radiobiology, allowing the relevancy of long term and transgenerational issues to be assessed more rapidly. Epigenetic biomarkers remain to be developed for a number of cell types in radiobiology and advances made under COMET for "new" biological models will be of value to other environmental sciences also;
- Establish a bridge with the non-EURATOM research community where epigenetic processes are considered as a highly relevant and innovative field when dealing with environmental stressors;
- Reduced uncertainties and provide guidance on how to deal with low dose effects in wildlife protection regulation.

WP5

Through an effective communication strategy, this WP will contribute towards integration and capacity building by maintaining a high level and quality of dissemination and international profile for radioecology through the website, workshops and sponsored courses. The anticipated impacts of the WP are:

- Provide a platform for integration of national and international radioecological research and the user community and ensure that knowledge gained is retained and made available into the future
- Contribute to an improved focusing and exploitation of scientific research
- Maintain expertise and transfer of high-level competence in radioecology via targeted training courses responding to user needs

COMETs contributions to realizing the expected impacts of the overall work programme (C(2012)4610)

Expected impacts listed in work programme	**How will COMET contribute to realize impact?**
II.2.3. Better integration of national and international research efforts in radiation protection and the low-dose risk, leading to significant optimisation of the protection afforded to the workforce, the public and the environment.	WP2.4 will assure co-ordination with national programmes. Amongst others, a long-term plan towards integration of the national radioecology programmes to create a framework for future research activities will be created. Additionally, activities proposed within WP3 and WP4 are only made possible by substantial allocation of some organisations own research funds (e.g. by funding a PhD).
II.2.4. Optimised development and use of existing and future nuclear safety research infrastructures in Europe in all activities of the programme and facilitated access for researchers to these infrastructures throughout Europe.	WP2.3 will establish a state-of-the art of large-infrastructures for radioecological research within Europe and beyond, identify missing key-infrastructure and indicate potential host institutes, develop conditions for access, optimal use and research prioritisation at the facilities. Additionally WP3 and WP4, will share infrastructure for efficient research execution and the Observatory Sites will be common ground for field research
II.2.5. Continuous improvement of nuclear safety culture through effective coordination and support at Community level of training schemes recognised as international scientific references; transfer of	WP2.5 will co-ordinate with training and educational platforms, encourage creation of standardized certification system for postgraduate qualifications throughout the EU and encourage collaboration and increased utilisation of joint resources within

higher-level competences for young as well as experienced research workers, increasing the attractiveness of nuclear careers in public and private research organisations across the EU; strengthened links with other Community policies and training networks outside the EU.	training and education providers. WP5.3 will contribute to maintaining and enhancing competence in radioecology e.g. by time efficient mechanism of delivering training, interaction with international organisations (e.g. IRPA) that deliver courses, and exploring implementing the ECVET system.
II.2.6. To help support strategic and pan-European objectives of the programme (European Research Area, future actions), in particular related to improved information to the public and increased participation of Member States who could benefit from increased participation in Euratom FP projects, thereby enabling a more broad and effective implementation of the European Research Area in the field of nuclear fission, and exploiting the full potential of institutes, universities and other organisations in these countries as regards their infrastructure, human resources and overall competences.	WP5 through the development of an open access website (5.1) and the organisation of workshops on general interest subjects (5.2) will contribute to improved information of the public and participation of stakeholders. WP2 will establish structures and mechanisms for optimized use of infrastructure, databases, and competences. Working with the ALLIANCE we will enable a more broad and effective implementation of the European Research Area in the field of nuclear fission increasing the potential as regards infrastructure, human resources and overall competences. The project involves a Polish beneficiary and via the Open Calls additional partners will be attracted.
II.2.7 Activity: Cooperation with Third Countries: With Ukraine cooperation is being pursued under the umbrella of existing Euratom bilateral cooperation agreements. Furthermore, specific cooperation with Japan in the wake of the recent nuclear accident could be envisaged.	From the start, COMET will benefit from cooperating with Japan and Ukraine as third countries and we see their participation in the project as essential to enable us to learn from major nuclear accidents. These partners will be fully imbedded in the project (participation in all WPs) and are key for the data collection for improved radioecological modelling for (post) emergency situations and field studies in Chernobyl and Fukushima affected areas.

B.3.2. Spreading excellence, exploiting results, disseminating knowledge, and management of intellectual property

The dissemination of knowledge, exploitation of results and spreading of excellence between the radioecology and the user communities are fundamental to the achievement of the objectives of COMET. As such we have dedicated a work package to knowledge exchange (WP5). A key objective of COMET, to be delivered through WP2, is to evolve a pan-European radioecology research initiative to enhance the integration of the European radioecological community in collaboration with the European Radioecology Alliance and appropriate platforms and projects. Both this overall aim and the more specific objectives of WP2 through to WP5 will require effective engagement with a wide range of relevant stakeholders. A proactive Communication Plan will be developed that targets the user community (deliverable D5.2). A regular flow of information will be planned so that COMET is established as a trusted provider of news and information for the user community. Our initiatives will aim at a two-way communication, not simply providing information. We will establish a list of spokespersons able to deal with particular aspects of the project such that we can respond most effectively and in a timely manner to enquiries. Communications resources existing within the consortium will be exploited where appropriate (e.g. existing corporate news feeds to ensure dissemination to a much broader audience).

Good exchange of knowledge between COMET and platforms in other areas of radiation protection will be aided by the inclusion of senior representatives of a number of European radiation protection platforms in our Steering Committee.

The increased participation of Ukrainian and Japanese collaborators is in itself a mechanism to spread excellence and knowledge and more fully exploit the results (and previous efforts) of European funded radioecology. The open call, by attracting additional partners to COMET and the ALLIANCE, will further this.

Web site and social media

It is now essential for producers of information to provide it on-line in ways appropriate to spcific target audiences. COMET will follow best practice approaches to communication and dissemination as defined in EC (2012) and ensure

that good design principles are applied so that communication is effective. A key output of WP5 will be an externally oriented website which will provide open access to all of the outputs of COMET (including deliverables, data and workshop outcomes); social media (e.g. COMET Twitter account) will be used in conjunction with the website as appropriate to best ensure take-up by our target audiences.

A strategic goal of WP5 is to develop the capability to provide open access to as much of the relevant, high quality, compiled data, knowledge and training resources as possible. This will be built on the foundation of the considerable resources and expertise of COMET partners and the STAR Radioecology Exchange (which will be maintained by COMET after the STAR project finishes in summer 2015). In conjunction with the web site, the use of technologies such as SMS alerts, e-zines, forums, podcasts, news feeds, clips, webcasts, weblogs will be evaluated to select suitable communication pathways for different target groups. The future sustainability of the Radioecology Exchange will be ensured through interaction with the ALLIANCE.

Scientific Dissemination Strategy

The dissemination strategy will be included within the Communication Plan for use and dissemination of knowledge generated during the project.

The dissemination strategy will include:

(i) developing a strong collaboration with NERIS, MELODI and other relevant European platforms, projects and networks through joint meetings, exchange of documentation, attendance at each other's relevant workshops and specific consultation on relevant issues

(ii) topical workshops in WP5. For these workshops the consortium will pay particular attention to using established best practice. Presentations will be prepared beforehand and peer reviewed prior to the meeting to ensure that they are clear, simple and to the point, that the key messages which need making are obvious and that the technical content is understandable, avoiding jargon. The speakers will be selected based on a proven record to give good, clear talks and an ability to discuss constructively. Workshop material will be complemented by background and training materials on the website. Workshop attendees will be drawn from appropriate user communities and allied areas of science (with some funding included to enable participation of key invited participants from outside of the COMET consortium).

(iii) targeting the many national and international organisations particularly those with participation from the user community such as IRPA and the OECD-NEA.

(iv) consultation and dissemination workshops in WPs 2 – 4. These will seek opinion on the evolution of the a pan-European network in radioecology (WP2), identify common needs from the SRAs of different areas of radiation protection to form the basis of the open calls, and ensure that the outputs of the open calls (and other research activities in COMET) are effectively disseminated such that there is uptake by the user community.

Capacity building

To keep attracting new recruits to the field, COMET will maintain the PhD Research School initiated by the STAR Network of Excellence once the STAR project concludes in the summer of 2015. The Observatory Sites will be used for practical training on field sampling and monitoring. These training sessions will be open to professionals and students. Additionally WP5 will support the retention and enhancement of knowledge through training activities focussed on professionals. Close collaboration with the user community, relevant radiation protection platforms/projects with training elements and training focussed projects (e.g. ENEN) will ensure that the training activities are focussed to requirements and not duplicating other efforts. COMET will endeavour to help ensure that there are training and education mechanisms for radioecology in the future which are linked with those of other radiation protection platforms (WP2). Furthermore, COMET partners will seek to use the research activities of the project as a basis for developing collaborative PhD and MSc projects.

Management of intellectual property

All consortium partners, including those in the original consortium and extending to any new partners incorporated as the project progresses, will share the knowledge and intellectual property rights generated within the project.

B.4 Ethics issues

During the implementation of the COMET project, fundamental ethical principles will be respected and the partners have been informed of their responsibilities related to this. Participants of the COMET project will conform to current legislation and regulations in the countries where the research will be carried out. Where requested by national regulation or rules, participants will seek the approval of the relevant ethics committees prior the start of the RTD activities that raise ethical issues.

The first year of the research implemented in the project will be used for structuring the research efforts according to the roadmap as well as preparation of pilot studies to conduct molecular epigenetic studies on organisms (plants, earthworms, zebrafish and frogs), which will be exposed to radiation as well as controls. This planning stage will include thorough consultation on ethical issues and preparation of ethical guidelines.

The Ethical issues checklist has been circulated among the COMET partners and all partners have provided the required information. There are potentially sensitive ethical questions related to studies on vertebrate organisms. Some of the RTD activities will use vertebrates (fish and frog samples, such as tissues or fish cell lines). The COMET partners carrying out research projects will seek the approval of the relevant national or local ethics committees prior to the start of the RTD activities.

In accordance with the Amsterdam protocol on animal protection and welfare, animal experiments will be replaced with alternatives wherever possible (e.g. use of cell cultures and artificial tissue systems for mechanistic studies). Suffering and distress of animals will be avoided or kept to a minimum.

No suffering is expected to be related to the radiation exposures per se, as the studies are related to the effects of low and protracted doses.

We confirm that the proposed research in the COMET project does not involve activity dealing with: 1) research on human embryos/foetus; 2) research on humans; 3) privacy (processing of genetic information or personal data).

Relevant ethical guidance will be made available to the project participants via the COMET website. The guidance available at COMET website will include relevant EU legislation, International conventions and declarations (such as Helsinki Declaration), Opinions of the European Group on Ethics, and Protection of Animals.

	*Research involving activities marked with an asterisk * in the left column in the table below will be referred automatically to Ethics Review)*		**WP4**
	Research on Human Embryo/Foetus	YES	Page
	Does the proposed research involve human Embryos?		
	Does the proposed research involve human Foetal Tissues/ Cells?		
	Does the proposed research involve human Embryonic Stem Cells (hESCs)?		
	Does the proposed research on human Embryonic Stem Cells involve cells in culture?		
	Does the proposed research on Human Embryonic Stem Cells involve the derivation of cells from Embryos?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	X	
	Research on Humans	YES	Page
	Does the proposed research involve children?		
	Does the proposed research involve patients?		
	Does the proposed research involve persons not able to give consent?		
	Does the proposed research involve adult healthy volunteers?		
	Does the proposed research involve Human genetic material?		
	Does the proposed research involve Human biological samples?		
	Does the proposed research involve Human data collection?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	x	
	Privacy	YES	Page
	Does the proposed research involve processing of genetic information or personal data (e.g. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?		
	Does the proposed research involve tracking the location or observation of people?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	x	
	Research on animals	YES	Page
	Does the proposed research involve research on animals?	x	
	Are those animals transgenic small laboratory animals?		
	Are those animals transgenic farm animals?		
	Are those animals non-human primates?		
	Are those animals cloned farm animals?		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		
	Research involving ICP countries	YES	Page
	Is the proposed research (or parts of it) going to take place in one or more of the ICP Countries?	x	
	Is any material used in the research (e.g. personal data, animal and/or human tissue samples, genetic material, live animals, etc):		
	a) Collected in any of the ICP countries?	x	
	b) Exported to any other country (including ICPC and EU Member States)?	x	
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL		
	Dual use	YES	Page
	Research having direct military use		
	Research having the potential for terrorist abuse		
	I CONFIRM THAT NONE OF THE ABOVE ISSUES APPLY TO MY PROPOSAL	x	

B.5 Gender aspects

All organisations in the consortium have equal opportunity policies and institutional mechanisms to ensure fair treatment of women in their workplaces. The COMET partners are committed to the implementation of these equal opportunity policies.

However, COMET by chance is confronted with a gender imbalance: all WP leaders are women. Over the whole consortium women are well-represented and are slightly outnumbering men.

- The consortium has 13 participants with in total 64 key staff members, 33 female and 31 male.
- The COMET project has 20 subtasks of which 17 are led by women.

The members have been selected on the basis of the expertise needed. For anticipated future assignments (Competitive Call), PhDs, master students, selection will be gender neutral.

ANNEX 1: Key Steps

Keystep number	Month	Description
		Work package 1
KS1.1.	M1 or M3	Kick-off Meeting + establishment of EC and MB If no real kick-off M1, web-meeting in M1 and kick-off M3
KS1.2.	M1	Consortium Agreement (1)
KS1.3.	M1	Standard operation procedures for data management on the project workspace based on SCK•CEN's best practice
KS1.4.	M4	Establishment of COMET/ALLIANCE Steering/scientific committee
KS1.5	M6	Internal rules of the SC
KS1.6.	M12	First meeting of the COMET MB and SC
KS1.7	M13	New Performance indicators
KS 1.8	M15	Start integrating new partners
KS 1.9	M24	Second meeting of the COMET MB and SC
KS1.10	M36	Third meeting of the COMET MB and SC
KS1.11	M48	Final meeting of the COMET MB and SC
		Work package 2
KS2.1	M5	Workshop together with NERIS and MELODI platforms for identification of key topics/areas for the research activities to be funded via the Competitive Call and development of first-phase RTD roadmap
KS2.2	M12	Selection of the projects to be implemented
KS2.3	M24	Decide on submission of proposal to Erasmus Mundus
KS2.4	M24	Updating STAR catalogues and databases with the information obtained from the new COMET and ALLIANCE partners
		Work package 3
KS3.1.	M5	Agree on Initial Research Activities
KS3.2	M6-30	Execution Initial Research Activities
KS3.3	M12	New projects selected from the Competitive Call
KS3.4	M15-48	Execution of selected research activities
KS3.5	M30-48	Validation of research results
KS3.6	M48	Final Workshop to share feedback on the joint programming mechanisms implemented as demonstration by both COMET-WP3 and WP4. Preparation of Horizon 2020 by adjusting the mechanism proposed by COMET
		Work package 4
KS4.1.	M3	Agree on detailed IRA plans for low dose epigenetic effects and fitness consequences in laboratory and field
KS4.2	M12	Selection of field sites in CEZ and start site characterization process
KS4.3	M12	New projects selected from the Competitive Call
KS4.4	M15	End of new partner(s) integration process and start execution of selected research activities in low dose effects
KS4.5	M24	Selection of field sites in Fukushima affected area and start site characterization process
KS4.6	M25	Start Epigenetic field experiments in CEZ
KS4.7	M32	Start Epigenetic field experiments in Fukushima affected area

KS4.8	M48	Final Workshop to share feedback on the joint programming mechanisms implemented as demonstration by both COMET-WP3 and WP4. Preparation of horizon 2020 by adjusting the mechanism proposed by COMET
		Work package 5
KS5.1	M11	Field studies course Ukraine
KS5.2	M12	Workshop 1
KS5.3	M21	Workshop 2
KS5.4	M31	Field studies course Poland
KS5.5	M36	Workshop 3
KS5.6	M43	Workshop 4

ANNEX 2: List of meetings/workshops/field work

COMET		Work package	Purpose	Who involved	Location/type of meeting
Month	1	WP1	Videoconference or Kick-off	All partners or at least Coordinator and WP leaders	Brussels/meeting
Month	2				
Month	3		Kick-off (if not held in M1)		Brussels/meeting
Month	4				
Month	5	WP2, 3, 4	Criteria for prioritizing research and development of first-phase RTD roadmap for ALLIANCE: basis for COMET Competitive Call topic description	SC + all partners + NERIS&MELODI/OPERRA representatives	Finland/workshop
Month	6				
Month	7				
Month	8				
Month	9				
Month	10				
Month	11	WP5	Ukrainian field studies course	UMB, Chornobyl Center, UIAR, SU, NERC-CEH, SCK•CEN + open to others	Ukraine/field course
Month	12	WP4	Initiate Field Work Chernobyl: site selection and characterisation	Chernobyl Centre, UIAR, IRSN, SU, CEH, SCK•CEN,	Chernobyl
Month	12	WP5	1st 'Key science question' workshop	NERC-CEH, NRPA, Chornobyl Center,UIAR, + open to all other partners	Ukraine/workshop
Month	12	WP1 WP2-5 WP2,3,4	MB and SC meeting Annual meeting Selection of highly scored projects by external review committee	MB, SC Partners MB+SC	France/meeting
Month	14				
Month	15				
Month	16				
Month	17				
Month	18				
Month	19				
Month	20				
Month	21	WP5	2nd 'Key science question' workshop	NERC-CEH, NRPA, + open to all other partners	UK/workshop
Month	22				
Month	23				
Month	24	WP1 WP2-5	MB and SC meeting Annual meeting	MB, SC Partners	Sweden /meeting
Month	24	WP4	Site selection and characterization in Fukushima affected area	Fukushima University IRSN, SU, CEH, SCK•CEN,	Japan/Fukushima affected area
Month	25	WP4	Epigentic studies in CEZ Site selection and characterization in Fukushima affected area (M24)	Chernobyl Centre, UIAR, IRSN, SU, CEH, SCK•CEN,	Chernobyl
Month	26				
Month	27				

Month	28				
Month	29				
Month	30				
Month	31	WP5	Polish field studies course	UMB, GIG-SCRS, SU, NERC-CEH, SCK•CEN + open to others	Poland/field course
Month	32	WP4	Field work (epigentic studies) Fukushima	Fukushima University, IRSN, SU, CEH, SCK•CEN,	Japan/Fukushima affected area
Month	33				
Month	34				
Month	35				
Month	36	WP5	3rd 'Key science question' workshop	NERC-CEH, UMB, NRPA + open to all other partners	Norway/workshop
Month	36	WP1 WP2-5	MB and SC meeting Annual meeting	MB, SC Partners	Norway/meeting
Month	37				
Month	38				
Month	39				
Month	40				
Month	42				
Month	43				
Month	44	WP5	Final 'Key science question' workshop	NERC-CEH, NRPA, Fukushima University + open to all other partners	Japan/workshop
Month	45				
Month	46				
Month	47				
Month	48	WP2	Final workshop: Workshop Alliance-NERIS-MELODI-OPERRA to integrate the new knowledge gained during the project to give recommendations for future research lines of the Horizon 2020 programme	All partners + ALLIANCE, NERIS, MELODI, OPERRA open?	Belgium/workshop
Month	48	WP1	MB and SC meeting	MB, SC	Belgium/meeting

Field trips

Jointly organised

ANNEX 3: Organisation of COMET call under OPERRA

Based on information received from JR Jordain, Co-ordinator of OPERRA on March 7, 2013. Text in Red and Underlined is added specifically for COMET

Proposal to improve the decision process for the management of RTD calls to be performed in 2013 and 2014, in response to the negotiation mandate of OPERRA

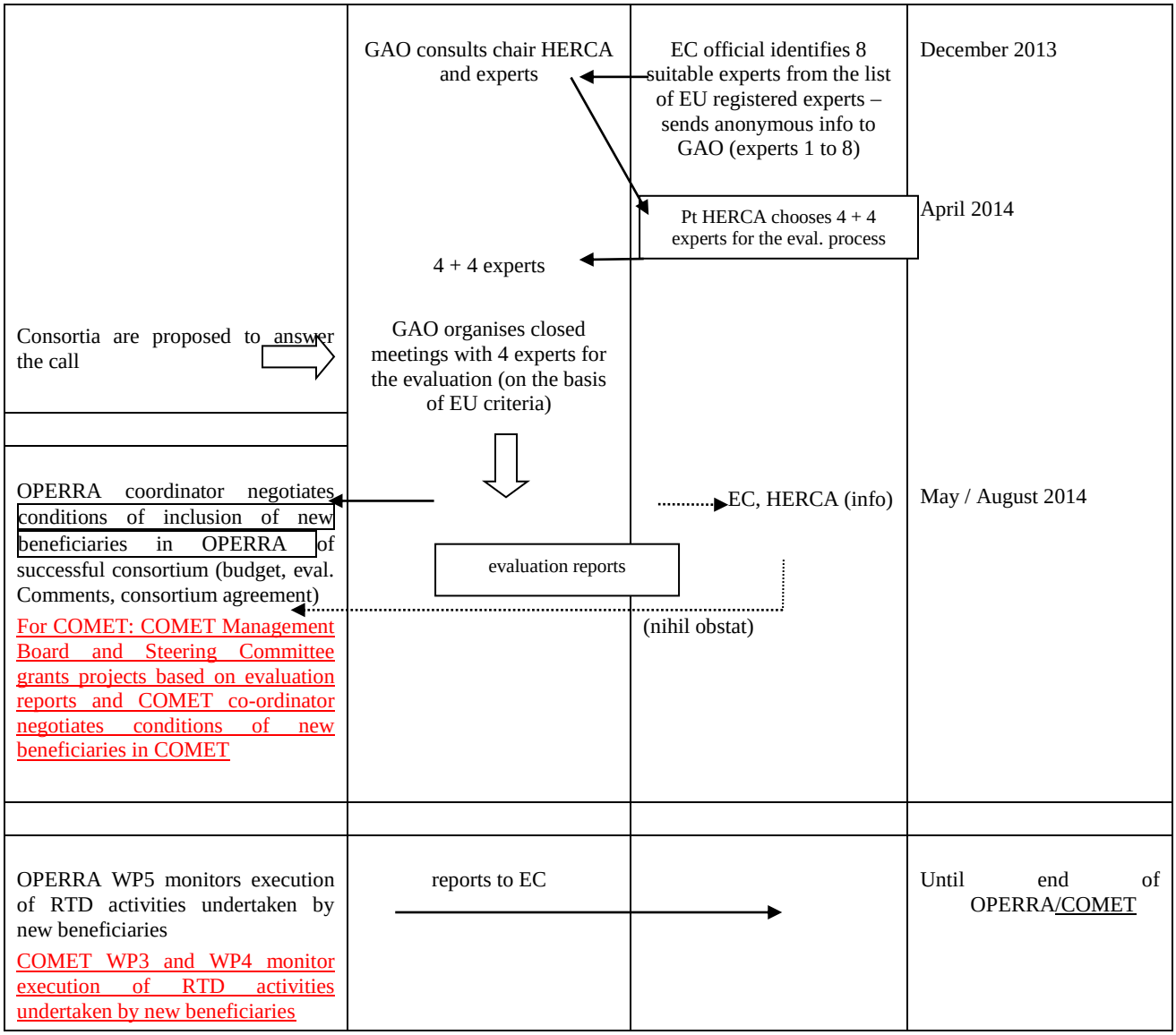
The evaluation summary report (ESR) of OPERRA pointed to the need to better address the issue of guaranteeing the independence of the process leading to extend EU funding to new or existing OPERRA consortium members through the two open calls which OPERRA proposed to run in its successfully evaluated proposal.

The following proposals could be applicable, with the neccassry changes having been made, to COMET calls. The annexed chart shows the "workflow" which would result from such proposals.

1. It is proposed to complement the MELODI SRA with a "RTD roadmap" listing research priorities. This roadmap would evolve each year, reflecting SRA developments, the contribution potential from laboratories across Europe (large and small, in the radiological "core competencies" and in other useful disciplines beyond, as well as achieved results. A proposal will be presented at the next MELODI Open workshop in September 2013. (For COMET the ALLIANCE SRA will be discussed at the October 2013 meeting and a first-phase RTD roadmap for the ALLIANCE will be prepared).
2. The call specification could then be drafted in an independent and confidential manner by a small group convened by a "Go-between Administrative Operator" (GAO) chosen by OPERRA as a subcontractor for operations requiring clear separation and confidentiality. This group would be chaired by the President of HERCA, and consist for the first call of one representative of the EC, and one independent scientific advisor. (In the future Platform operations, this group could be extended to further stakeholders, still maintaining confidentiality, in particular when the progressive integration process would lead national funding schemes to intend to participate to such open calls.) The deliverable from this unique meeting would be the RTD call fiche and work programme, which would be kept confidential by the GAO and by members of the group until publication by the GAO in the scientific journals identified by OPERRA in compliance with EC rules for such calls already applied in DoReMi.
3. The evaluation of the responses to the call would be done by experts selected for appropriate skills and independence, from the database of experts currently operated by the EC. The list of 4 experts, with a reserve list of 4 other experts could be selected by the President of HERCA on the basis of a subset of experts from the EC database, proposed by EC. The GAO would ensure that the evaluation process is conducted anonymously, with respect to OPERRA/COMET and the project partners, including MELODI/ALLIANCE.
4. The evaluation reports would be transmitted by the GAO to the OPERRA/COMET coordinator, who then would perform the necessary actions to include new beneficiaries in the consortium (for COMET the MB and SC will grant the porjects based on the evaluation reports) or allocate additional funding to existing members, inform the EC of the results of such activities and prepare an amendment request to the OPERRA/COMET grant agreement to include new members in the consortium and update annex 1 to the grant agreement.

OPERRA RTD calls

OPERRA **COMET**	service contract invoices **GAO** **« Gobetween »** **Administrator Operator**	**External decision process**	**Timing**
• MELODI/COMET&ALLIANCE adopts - SRA - Roadmap of priorities (developed through a consensus building process, supported by an external advisory entity (EAE) – for COMET: SC+MB)			Workshop Brussels October 2013 For COMET: workshop Helsinki? October 2013
• OPERRA coordinator sends these doc, together with ALLIANCE first phase RTD roadmap	GAO convenes a closed and confidential "RTD call preparation meeting", by inviting • Pt HERCA, Chair of the meeting • EC official • EAE representative • COMET SC representative		November 2013
	call document	Chair of "call preparation meeting" notifies RTD call document to GAO, with a copy to EC	November 2013
OPERRA/COMET coordinators provide lists of journals for publication of the calls	GAO organises call publication		
publicity on the call by MELODI (website…), COMET/ALLIANCE	published call		December 2013 (deadline for response to call: end March 2014)


GAO consults chair HERCA and experts
EC official identifies 8 suitable experts from the list of EU registered experts – sends anonymous info to GAO (experts 1 to 8)
December 2013
Pt HERCA chooses 4 + 4 experts for the eval. process
April 2014
4 + 4 experts
Consortia are proposed to answer the call
GAO organises closed meetings with 4 experts for the evaluation (on the basis of EU criteria)
OPERRA coordinator negotiates conditions of inclusion of new beneficiaries in OPERRA of successful consortium (budget, eval. Comments, consortium agreement)
EC, HERCA (info)
May / August 2014
evaluation reports
(nihil obstat)
For COMET: COMET Management Board and Steering Committee grants projects based on evaluation reports and COMET co-ordinator negotiates conditions of new beneficiaries in COMET
OPERRA WP5 monitors execution of RTD activities undertaken by new beneficiaries
reports to EC
Until end of OPERRA/COMET
COMET WP3 and WP4 monitor execution of RTD activities undertaken by new beneficiaries

ANNEX 4: References to section B

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