

European Core Technologies for future connectivity systems and components

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D1.1 Project Management Plan and Tools

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List of Abbreviations

Abbreviation	Denotation
WP	Work package
PMP	Project Management Plan
PMT	Project Management Tables
GA	Grant Agreement
CA	Consortium Agreement
DoA	Description of Action
SNS	Smart Network Services
KDT	Key Digital Technologies
EG	Expert Group

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1 Role and relevance of the deliverable within the project

The Project Management Plan (PMP) sets out how an efficient project implementation as well as high-quality project results are being ensured within COREnect. According to this plan, work of all work packages is being coordinated and consolidated throughout the project duration. It describes how all necessary steps will be planned and synchronized to achieve the goals of the project during the different phases thus safeguarding project contingency.

Where needed, this PMP refers to the relevant legal and underlying documents such as the Grant Agreement (GA) with its annexes including the Description of the Action (DoA) and the Consortium Agreement (CA). The PMP is accompanied by a dynamic PM tool – the Project Management Tables (PMT) – which contain PMP information and is constantly updated throughout the project.

2 Project Management Tools

As described in the relevant sections below, COREnect project has set up a number of tools that will be used throughout the project to coordinate and manage the research activities. These tools are meant for internal use only and all partners have been granted access.

In addition, the Project Management Plan as vital, but static source of information has been accompanied by a dynamic xls file, the Project Management Tables containing the following information:

- Consortium contacts & responsibilities
- Reporting schedule
- Meeting schedule
- Gantt Chart
- Work Plan
- Deliverables & Milestones
- Risk Table
- Dissemination activities
- Publications
- Budget & Person month effort

The Project Management Tables are accessible via COREnect SharePoint and constantly being updated. With this key instrument, all project occurrences are recorded and easily accessible for the Consortium.

3 Consortium Members & External Experts

The COREnect Consortium consists of heterogenous partners (industry, SMEs, academia) – so called beneficiaries. A list of all active partner contacts is part of the constantly updated Project Management Tables published on Sharepoint.

In addition, invited experts (internal and external) contribute to COREnect project. Internal experts are distinguished by their affiliation with one of the Beneficiaries. Thus, Beneficiaries and internal experts are bound to the project by Grant and Consortium Agreement. External experts work on a voluntary basis for the project, i.e. without funding from the project. Experts are organized in three expert groups (EG) from top academia and industry of SNS and KDT communities as well as other related communities, with around 20-30 experts in each and 70%-80% internal experts from partners inside the consortium and 20%-30% external experts from outside the consortium. For inclusiveness and wide acceptance of the roadmap, COREnect recruits external experts from other communities associated with SNS and KDT communities as shown in Figure 1. A list of all expert contacts and their

affiliation to one of the Expert Groups is part of the constantly updated Project Management Tables published on Sharepoint.

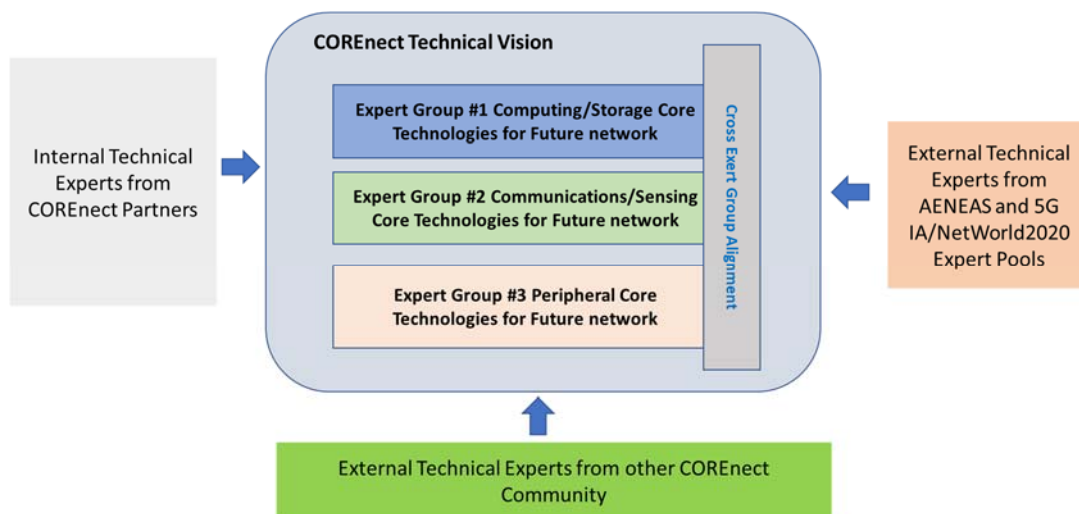


Figure 1: Conceptual sketch of the COREnect Expert Groups

4 Project Management Structure

COREnect has a simple and appropriate management structure according to the project size and consortium constellation. Defined tasks and responsibilities achieve an efficient and effective control of the project on three levels:

- At **strategic level** where the consortium together with the coordinator will decide the overall strategic orientation of the project, agree on plans, monitor milestones and approve results.
- At **operational level** where the work package leaders will steer the project activities and ensure the quality of the deliverables of the project.
- At **day-to-day operational level** where the project team will conduct the daily affairs.

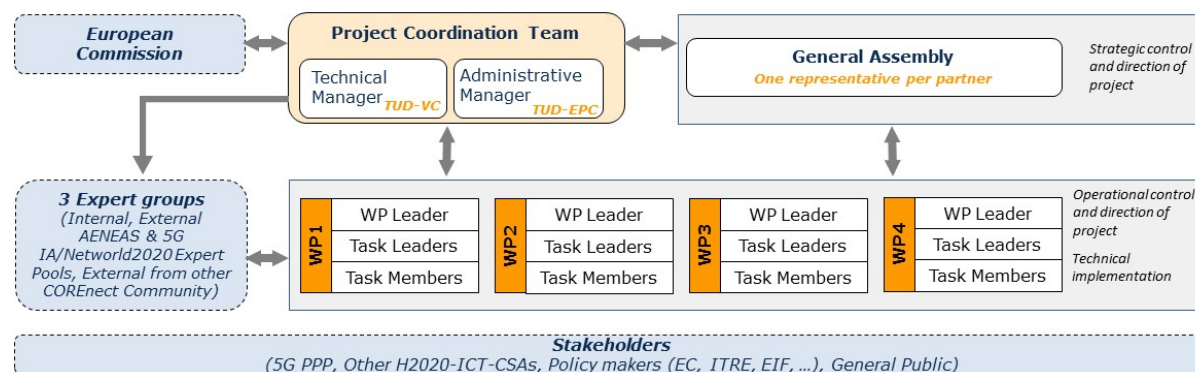


Figure 2: COREnect project management structure

In the following, the roles of the different bodies are outlined (cf. Figure 2):

The project is governed by the **General Assembly (GA)** as the highest decision-making Consortium Body and by the Coordinator, who manages the administration and implementation of the project.

The GA monitors the project progress (particularly the achievement of milestones and quality of the deliverables). The GA decides on general contents of the project work, changes to the Annex I ‘Description of the Action’, finances, and the evolution of the consortium (e.g. entry or withdrawal of partners). Each consortium partner is represented at all GA meetings as a GA Member. The GA is chaired by the project coordinator and will meet at the beginning of the project during a kick-off meeting and then every six months during the project unless decided otherwise.

The **Project Coordination Team (PCT)** consisting of **Project Coordinator, Technical and Administrative Manager** is the party acting as the intermediary for efficient and correct communication between the parties and the EC and will, in addition to its responsibilities as a party,

- handle all communications with the consortium and with the EC;
- coordinate the needed negotiations (e.g. the consortium agreement (CA) before the project start);
- monitor the compliance of consortium partners regarding their contractual obligations;
- ensure the day-to-day management on the level of the entire project;
- observe and guide the interactions between the WPs;
- control the finances, administer the EC financial contribution and coordinate the reporting;
- prepare all GA project meetings as well as distribute deliverables, minutes, etc.

The **Work Package Leaders (WPLs)** are responsible for the project execution at an operational level. They coordinate the cooperation and information flows between the work packages and monitor the effective and efficient implementation of the project. The work at Task level is organized in the same way as at the WP level under the coordination of the respective task leader together with the responsible deliverable editors. The WP Leaders report to the General Assembly.

Expert Groups will support the objectives of the COREnect on the following five main elements:

- Provide feedbacks on the continuously evolving COREnect strategy and technical vision;
- provide feedbacks on the identified R&I and investment requirements identified in COREnect;
- analyse and contribute to the detailed industry roadmap on developing core hardware technologies for connectivity systems;
- SRA Coordination of SNS and KDT communities;
- help with linkages between SNS and KDT communities and contribute to COREnect outreach.

For each expert group, a **Chair and a Vice-Chair** will be appointed from the COREnect consortium with the following responsibilities when the project kicks off:

- Coordinate COREnect partners for establishing selection criteria as well as carrying out the selection of internal and external technical experts; the list of experts may be revised during the project lifetime if missing competences or/and new topic areas are identified;
- promote gender balance in the selection of technical experts;
- organise the work of the expert group via conference calls, dedicated expert group meetings, side meetings, dedicated workshop(s);
- meet the deliverable deadlines as defined in the project;
- collaborate with other expert groups for cross-topic activities.

Table 1: COREnect Management Bodies, responsible persons and contacts (derived from PMT, 09/2020)

Management body	Responsible person	E-Mail
Project Coordinator (PC)	Gerhard Fettweis (TUD)	Gerhard.Fettweis@tu-dresden.de
Technical Manager (TM)	Yaning Zou (TUD)	yaning.zou@ifn.et.tu-dresden.de
Administrative Manager (AM)	Katharina Amsel (TUD)	Katharina.amsel@tu-dresden.de
General Assembly	one representative per partner	--
WP1 Leader (WPL1)	Yaning Zou (TUD)	yaning.zou@ifn.et.tu-dresden.de
WP2 Leader (WPL2)	Didier BELOT (CEA)	Didier.BELOT@cea.fr
WP3 Leader (WPL3)	Jochen KOSZESCHA (IFAG)	Jochen.Koszescha@infineon.com
WP4 Leader (WPL4)	Jacques MAGEN (AUS)	jacques@australo.org
Chair Expert Group 1	Gerhard Fettweis (TUD)	Gerhard.Fettweis@tu-dresden.de
Chair Expert Group2	Piet WAMBACQ (IMEC)	piet.wambacq@imec.be
Vice-Chair Expert Group2	Frederic GIANESELLO	frederic.gianesello@st.com
Vice-Chair Expert Group2	Didier BELOT	Didier.BELOT@cea.fr
Chair Expert Group3	Patric PYPE	patrick.pype@nxp.com
Vice-Chair Expert Group3	Jochen KOSZESCHA (IFAG)	Jochen.Koszescha@infineon.com

5 Decision processes

This section will be completed as soon as the Consortium Agreement has been signed by all partners.

6 Communication & Information Management

Efficient communication among the project partners and teams is a key issue in all collaborative projects. This is why both the communication strategy and the management structure are designed to allow for efficient information exchange with equally efficient and speedy subsequent decision-making processes. Using these tools any significant issues including potential problems will be raised quickly to the attention of the relevant decision-making body and resolved.

6.1 Electronic communication & information exchange

Day-to-day discussions and exchange of information are done by use of common online communication tools, among them are audio- and web conferencing, e-Mail, shared folders and others. The following communication and information exchange tools have been set up for COREnect:

- project-internal mailing list for general project organisation, management and general technical discussions: COREnect@ifn.et.tu-dresden.de
- COREnect SharePoint: <https://imecinternational.sharepoint.com/sites/COREnect/>
- COREnect website: <https://www.corenect.eu/>
- Conference calls via GoToMeeting (provided by Coordinator), WP or experts related meetings will be organized via Webex and other tools that are convenient for the inviting partner

6.2 Document Management

Documentation stands for the set of files related to the work carried out under the COREnect work plan by the partners of the project or experts. Collaborative document editing is possible via COREnect Sharepoint that provides an online document editor for online, simultaneous editing of text etc. as well as via desktop client.

To ensure a coherent layout, templates are provided whenever reasonable, e.g. for:

- Powerpoint presentation
- Agenda
- Periodic Reports
- Deliverables
- Cost statement

6.3 Preparation & Organisation of Meeting

The stringent timetable and networking character of COREnect demands concrete mechanisms for carrying out a proper coordination among the partners, and to fulfil the objectives. COREnect will hold specific meetings with different goals, both by meeting at a common location and via conference calls. Co-location with other meetings or events that the partners plan to attend will always be considered as the best option to optimize resources.

Table 2: List of planned COREnect consortium meetings & workshops (derived from PMT, 09/2020)

Month	Date	Purpose of the meeting	Venue	Participants
3	02.09.2020	Strategy meeting	online	Consortium + EC
3	07.09.2020	Kick-off Meeting / General Assembly Meeting	online	Consortium
3	10./11.09.2020	Internal Workshop on European Strategy and Vision	online	Consortium + EC
4	01.10.2020	Expert Group Kick-off meeting	online	Consortium + EC + around 50 experts
5	26. or 27.11.2020	1st Expert Group Meeting	online	Consortium + around 50 experts
5	26.11.2020	COREnect Workshop (planned in conjunction with EFECs)	online	Consortium + public
6	Dec 2020	General Assembly Meeting	TBD	Consortium
12	June 2021	2nd Expert Group Meeting (planned in conjunction with EuCNC)	TBD	Consortium + around 50 experts
12	June 2021	COREnect Workshop (planned in conjunction with EuCNC)	TBD	Consortium + public
12	June 2021	General Assembly Meeting	TBD	Consortium
17	Nov 2021	3rd Expert Group meeting (planned in conjunction with EFECs)	TBD	Consortium + around 50 experts
17	Nov 2021	COREnect Workshop (planned in conjunction with EFECs)	TBD	Consortium + public
18	Dec 2021	General Assembly Meeting	TBD	Consortium
24	June 2022	COREnect Workshop (planned in conjunction with EFECs)	TBD	Consortium + public
24	June 2022	General Assembly Meeting	TBD	Consortium

COREnect will establish the following set of interactions:

Jour fixe meetings: will be organized by the PCT in collaboration with the involved partners. The purpose of these calls is to discuss and solve urgent organizational as well as WP-overlapping issues. The PCT prepares the agenda and also provides minutes after the end of the meeting.

General Assembly meetings: COREnect is planning to General Assembly meetings (if possible face-to-face) every 6 months. The purpose of these meetings is to evaluate the current status of the project in terms of general organizational and WP-based questions. The PCT prepares the agenda of each meeting at least 14 days before the event. The PCT also provide minutes and Action Points within 14 days after the end of the meeting.

WP meetings: will be organized by WPLs at least once a month to facilitate work progress and for discussions about technical and organizational items. WPLs will prepare the agenda and also provide minutes after the end of the meeting.

Expert Groups Workshops: in total, three meetings of the Expert Groups will be held in conjunction with major events in KDT and SNS communities. The scope of these meetings are defined as follows:

- 1) a) Kick off and plan roadmapping work,
b) give feedbacks on the initial definition of the strategy and COREnect technical vision, and
c) may give feedbacks on the initial definition of the required R&I and investment.
- 2) a) Discuss the initial definition of the industry roadmap,
b) review the definition of strategy and important technical domains, and
c) review the definition of the required R&I and investment.
- 3) a) Finalise the first version of the industry roadmap,
b) give feedbacks on the final strategy and important technical domains, and
c) give feedbacks on the final definition of the required R&I and investment.

7 Project Progress Monitoring

COREnect is aiming at an appropriate fulfilment of project goals. The scheduling of milestones (cf. Gantt Chart annexed) and deliverables allows for monitoring the project progress, which will be implemented by means of internal and external reporting. The goal is to ensure the detection of errors and deviations as early as possible in the project's life cycle and to provide measures for how to handle such issues. This will enable the consortium to systematically apply corrective actions or contingency plans, if necessary.

7.1 Internal Reporting

On a regular basis, WP Leaders as well as Expert Group Chairs and Vice-Chairs present the progress for the past period and identifying the planned work for the next period, while considering any deviations from the plan and proposing corrective measures. Due to the time sensitivity of COREnect project, these reports expected to coincide with meetings of the General Assembly and may thus be orally presented. Considering the temporal proximity of Periodic Reports to the European Commission, no additional internal financial reports are foreseen. However, the Coordinator may request interim financial figures whenever suitable to monitor actual costs and spent effort, but also detect and prevent possible financial errors.

7.2 External Reporting (European Commission)

The Coordinator must submit to the European Commission the technical and financial reports. COREnect is divided into two reporting periods (cf. Table 3). The coordinator must submit a periodic report within 60 days following the end of each reporting period. The report includes - besides the “Periodic Financial Report” - a “Periodic Technical Report” with the following items related to scientific progress:

- an explanation of the work carried out by the beneficiaries;
- an overview of the progress towards the objectives of the action, including milestones and deliverables. This report must include explanations justifying the differences between work expected to be carried out in accordance with Annex 1 of the Grant Agreement and that actually carried out. The report must also detail the exploitation and dissemination of the results and an updated ‘plan for the exploitation and dissemination of the results’;
- a summary for publication by the European Commission;
- the answers to the ‘questionnaire’, covering issues related to the action implementation and the economic and societal impact, notably in the context of the Horizon 2020 key performance indicators and the Horizon 2020 monitoring requirements.

Table 3: COREnect Periodic Reports (derived from PMT, 09/2020)

Type of Reporting	Months covered	Period covered	Deadline	Status
EU Report 1 (technical & financial)	1 - 12	07/20 - 06/21	30.08.2021	
EU Report 2 (technical & financial)	13 - 24	07/21 - 06/22	30.08.2022	

Additional content may be reported continuously, but should be updated for Periodic Reports at the latest and will be included in the latter:

- Deliverables
- Milestones
- Critical risks & mitigation measures
- Publications
- Dissemination & communication activities
- Patents & innovations
- Gender of staff involved in the project

All continuous reporting items are integrated in the Project Management Tables. All deliverables and reports will be made available after internal review and quality assurance to all partners via COREnect website (D1.1 being confidential exclusively via COREnect Sharepoint).

8 Risk Management and Quality Assurance

COREnect is an ambitious collaborative project with a cross-domain consortium and the most prominent industry, academia and associations involved. Problems may occur in the implementation of the project plan. To allow the Consortium to quickly react and immediately perform corrective activities, a set of potential project-related risks has been identified (cf. Table 4). As project risks by nature are susceptible to change, they are reviewed continuously at the GA meetings. It is the role of the project management

(WP1) to maintain an up-to-date risk table, modifying risk levels as appropriate. As part of the Project Management Tables, the risk table is maintained up-to-date, modifying risk levels and mitigation measures as appropriate.

The COREnect project is aiming at a high level of quality of its deliverables and other documents (e.g. policy briefs, publications, reports) to fulfil the goals and milestones of the project, e.g. by partner peer-review and feedback by the expert groups. In addition to that, each researcher has responsibility for the quality of his/her own work. The technical and formal quality of project results will be assessed by means of a formal review procedure to ensure a continuously high quality. TUD as Coordinator and main quality guarantor will act as standard reviewer and involve appropriate partner reviewers wherever appropriate.

Table 4: COREnect Critical Risks & Management (derived from PMT, 09/2020)

Risk N°	Description of risk	WP N°	Proposed risk-mitigation measures
1	Lack of engagement from SNS and KDT com	3, 4	The consortium is well-connected with even 2 related industry associations on board. In case of a lack of enagment, COREnect partners will personally intervene with experts of the community to identify the related issues and take appropriate measures.
2	Insufficient number of voluntary technical experts	3	Technical partners of COREnect have committed to providing technical experts for each Expert Group. The SRAs of both KDT and SNS communities are defined by voluntary technical experts. 5G IA and AENEAS have sufficiently large pools of technical experts to address this issue. Risk-mitigation measures: start to compose the list 3 months before the project kicks off with 20% back-up candidates. Should any technical expert be unable to join or continue with the expert group work, a new member will immediately replace her/him.
3	Path to European sovereignty not implementable	1, 2, 3, 4	European sovereignty can be interpreted in different ways by different stakeholders. One of the project objectives is to find a common view on the sovereignty objective with realistic conditions and opportunities in mind. By prioritising the core technologies based on their impact, market potential and criticalness, COREnect will present a realistic vision and roadmap with reduced risk for the 5G & beyond industry.
4	Global roadmap and standardisation activities impact the European strategy	1, 2, 3, 4	Although COREnect focusses on the European strategic autonomy objectives, the project will strongly consider that the telecom and the nanoelectronics industry operate within a global market. Therefore, the consortium will actively monitor, through its numerous global connections and memberships, global evolutions and leverage the agility of COREnect to maximise the value of the project results.
5	General management risks, withdrawal of partner, or key staff	1, 2, 3, 4	The consortium has been composed carefully with multiple organisations and experts that are all highly committed to the project objectives. All competencies in the consortium can be reallocated to other partners if needed. All organisations have multiple alternative experts in their staff that can deliver on the objectives in case key staff leaves the project.
6	Conflicts within the Consortium	1, 2, 3, 4	Unilateral decisions will be avoided as much as possible to get a majority on all decisions taken. Rules in the consortium agreement would be applied to eliminate the conflict while still ensuring project viability.
7	Lack of communication or consensus within the consortium	1, 2, 3, 4	Within the proposal management, procedures have been defined for enabling effective decision-making. The project coordinator and the members of the Project Steering Committee have the necessary skills to resolve such conflicts by adequate negotiation. Additionally, the project allows for close contacts between partners (meetings, videoconferences etc.) – thus avoiding unexpected conflicts and allowing for permanent mediation.
8	A deliverable is delayed	1, 2, 3, 4	The project management will continuously monitor the progress of work in accordance with defined work plans. If needed, redistribution of resources and manpower or alternative approaches will be considered to reach deadlines

9 Cost/Budget Management

Yearly financial reports are prepared by each partner as part of the EC Periodic Reporting. In addition, the Coordinator provides a detailed template, which may be used by partners wishing more in-depth controlling of expenditures. Requested information include actual expenditures in the cost categories

personnel costs, travel expenditure, equipment and other direct costs. In addition, the actual effort in terms of person months per partner and WP is recorded.

Financial Reports allow the Administrative Manager to monitor actual costs and spent effort, but also detect and prevent possible financial errors. Furthermore, over- or underspending by a partner or in a WP will be identified and scrutinized. Budget and PM spending will be recorded in the Project Management Tables (cf. Tables 5 and 6) and presented in graphical form.

Table 5: COREnect Planned versus spent effort per partner and WP (derived from PMT, 09/2020)

Period # months	WP1			WP2			WP3			WP4			TOTAL		
	Plan GA	Spent		Plan GA	Spent		Plan GA	Spent		Plan GA	Spent		Plan GA	Spent	
	M1-24 24	M1-12	M13-24	M1-24 24	M1-12	M13-24	M1-24 24	M1-12	M13-24	M1-24 24	M1-12	M13-24	M1-24 24	M1-12	M13-24
TUD + BI	4,00			2,40			4,00			1,00			11,40		
TUD	4,00			0,00			4,00			1,00			9,00		
BI	0,00			2,40			0,00			0,00			2,40		
SG IA	0,00			1,75			2,00			1,20			4,95		
AENEAS	0,00			1,20			0,20			0,90			2,30		
BOSCH	0,00			1,50			2,95			0,50			4,95		
CEA	0,00			3,50			3,50			2,00			9,00		
EAB	0,00			2,50			2,00			0,50			5,00		
IFAG	0,00			0,75			3,00			0,50			4,25		
IIIV	0,00			2,50			2,50			0,50			5,50		
AUS	0,00			0,50			0,50			12,00			13,00		
IMEC	0,00			3,00			4,00			1,00			8,00		
NXP	0,00			3,50			3,00			0,50			7,00		
ST	0,00			1,00			2,00			0,50			3,50		
TOTAL	4,00	0,00	0,00	24,10	0,00	0,00	29,65	0,00	0,00	21,10	0,00	0,00	78,85	0,00	0,00

Table 6: COREnect Planned versus spent budget per partner (exemplary, derived from PMT, 09/2020)

PARTICIPANTS	TYPE of EXPENDITURE (as defined by participants)	PLANNED GA	SPENT M 01-12 (1st EU Report)	SPENT M13-24 (2nd EU Report)	REMAINING
1 TUD+BI Funding Rate: 100,00%	Person months	11,40 PM			11,40 PM
	Personnel costs	67.260,00 €			67.260,00 €
	Subcontracting	- €			- €
	Other direct Costs	37.000,00 €			37.000,00 €
	thereof travel costs	37.000,00 €			37.000,00 €
	thereof equipment	- €			- €
	thereof other goods & services	- €			- €
	Indirect Costs Total (25%)	26.065,00 €			26.065,00 €
	Total Costs	130.325,00 €			130.325,00 €
	of which EU Grant amount:	130.325,00 €			130.325,00 €
2 SGIA Funding Rate: 100,00%	Person months	4,95 PM			4,95 PM
	Personnel costs	47.025,00 €			47.025,00 €
	Subcontracting	- €			- €
	Other direct Costs	4.000,00 €			4.000,00 €
	thereof travel costs	4.000,00 €			4.000,00 €
	thereof equipment	- €			- €
	thereof other goods & services	- €			- €
	Indirect Costs Total (25%)	12.756,25 €			12.756,25 €
	Total Costs	63.781,25 €			63.781,25 €
	of which EU Grant amount:	63.781,25 €			63.781,25 €

10 Conclusion

The COREnect Project Management Plan has been set up to ensure the achievement of project goals with regards to time, money and quality. It has introduced all project partners to management tools, processes, and relevant documents thus stipulating a common base to for project implementation. The fundamental project and knowledge management tools have been set up. They are described in the present document and have already proven their practicability in the initial phase of the project.

Annex A: COREnect Gantt Chart

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
	2020						2021												2022					
	Year 1												Year 2											
	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
WP 1 Project Management	D1.1																							
T1.1: Project Coordination																								
T1.2: Administrative, financial and legal mgmt																								
WP 2 Strategy, vision and requirements	D2.1D2.2																							
T2.1: Strategy and vision																								
T2.2: R&I and Investment requirements																								
WP 3 Roadmap and recommendations	D3.1D3.2+D3.3D3.4D3.5D3.6D3.7																							
T3.1: European core technologies roadmap																								
T3.2: Recommendations and guidelines																								
WP 4 Community building and outreach	D4.1D4.2D4.3																							
T4.1: Engagement and community building																								
T4.2: Outreach, dissemination and exploitation																								
Milestones	MS1					MS2						MS3						MS4						MS5
Public events (WS = workshop, FE = final event)					WS1							WS2						WS3						WS4