Ten Projects
Horizon 2020 for Cultural Heritage
Pre-Kick Off Meeting

EUROPEAN FAÇADES
Project

Second draft, March, 2015

A.I.C. – Associazione Investire in Cultura

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B - TECHNICAL ANNEX

COVER PAGE

Title of Proposal: Tethered UAV for Buildings façades inspection

Acronym: EUROPEAN FAÇADES

List of Participants:

Participant No *	Participant organisation name	Country
1	X	X
2	Y	Y
3	Z	Z
4	W	W
5	K	K
6	K	K
7	K	K
8	K	K
9	K	K
10	S	S
11	L	L
12	A	A
13	O	O.

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European Façades

Tethered UAV for Buildings façades inspection

1 – Excellence

1.1 – Objectives

This study proposal is aimed at the study and development of a system based on tethered MAV (Micro Aerial Vehicles) for the automatic inspection and monitoring of building facades and large structures. The monitoring of building and structures, in general, is an important aspect of architectural heritage conservation and study. The proposed system can be a valuable tool for the two following purposes:

- Planning of restoration intervention on buildings and structures of cultural interest

- Mapping and creation of a database of buildings of historic interest

The availability of a fast, effective an systematic way to map buildings facades is an important tool for both the study and the planning of restoration intervention on architectural heritage. A rich database of the current state of the architectural heritage is fundamental for the classification of buildings, which is currently unavailable in many countries. This is particularly relevant, for example, for the buildings with external walls covered by fresco paintings, as found in many historical Italian cities.

1.2 – Relation to the Work programme

The work programme topic to which Resilient Europe relates is Robotics 24 because the proposal fulfils the Call requirements, ie.:

a) Call Specific Challenge:
b) Call Scope:
c) Call Expected impact:
d) Call Types of action:
Research and innovation actions.

Code 1 (to be written once all Work packages are ready)

1.3 – Concept and approach

Code 2 (to be written once all Work packages are ready)
(Describe the overall project starting from the activities of WP2, WP3, and WP4: their approach, methodology, etc. and any national or international research linked to this project).

1.4 Ambition

Code 3 (to be written once all Work packages are ready)

(Describe for the overall Project, i.e. for the activities reported in WP2, WP3, and WP4:

1 - the state-of-the-art

2 – the progress beyond the state-of-the-art

3 – the literature concerning the previous points)

2 – Impact

2.1 –Expected impacts

Code 4 (to be written once all Work packages are ready)

(Describe how a lasting impact of the Project will be ensured by the following strategic Project choices):

……..

(In particular, describe the following Project outcomes that will become available in a practical use):

……..

2.2 –Measures to maximize impact

Code 5 (to be written once all Work packages are ready)

a) Dissemination and exploitation of results

Preparation of a draft plan for dissemination of project results

All Partners will prepare items for publication (scientific papers, conference abstracts, website updates, etc.). Full details about how to publish Project results are outlined into the Consortium agreement.

b) Communication activities

All partners will describe, according to their opinion:

- Market impacts of the project

- Market size and potential

- Steps towards commercialization

- Necessity of a European approach

3 – IMPLEMENTATION

3.1 Work plan - work packages, deliverables and milestones

Code 6 (to be written once all Work packages are ready)

(Describe the overall Work Plan based on the activities of the five Work packages.)
Timing of the Work plan (Gantt chart)
Inter-relation of the components (Pert chart)

The following five Work Packages: WP1, WP2, WP3, WP4 and WP5 represent the structure of this Work plan

Table 3.1a: Work package WP1 description

Work package number 1		**Start Date or Starting Event**				
Work package title	**Coordination**					
Participant number	X	Y	Z	W		
Short name of participant	X	Y	Z	W		
Person/months per participant:	X	Y	Z	W		

Objectives

This WP guarantees that:

- an effective coordinating structure is created
- the research project is carried out according to the time schedule and budget established,
- meetings are organized to enable collaboration and management of consortium partners,
- the project progress of the WPs is managed and monitored against contractual deliverables,
- the WPs objectives are achieved efficiently,
- a system is created to provide a continuous evaluation feedback and a constant project monitoring.
- the project is managed according to the contract between the EUROPEAN FAÇADES consortium partners and the EC, maintaining a continuous link with the EC, and the overall legal, contractual, ethical, financial and administrative management activities are performed ensuring accurate and timely distribution of funds, reporting on activities, etc.).

Description of work

WP 1 is the Coordination Work Package, which will last for the whole duration of the project.

1 - Coordinator

The responsibility of the project coordination will be taken by …… who will supply the Project

Coordinator. The project coordinator is responsible for all deliverables.

The coordinator's main activities concern the monitoring and management of the agreed deliverables and milestones in the contract between the consortium and the EC, and the smooth running of the project as a whole. The coordinator will maintain continuous relationships with the General Assembly including the Work Package leaders and will report to the EU. For the day-to-day project management, the Project Officer (PO) supports the coordinator. She/he will focus on the daily management, coordination and administrative and financial aspects of the project.

Coordinator activities:

a) Kick Off meeting.

Upon signature of the contract with the European Commission, the project coordinator will organize an initial kick-off meeting for all personnel involved in the project. This kick-off meeting will enable the participants to obtain a better perspective of their role in the EUROPEAN FAÇADES project. Prior to concluding the contract with the EC, a Consortium Agreement will be signed between the project partners

b) Process Management tasks.

The Project Coordinator will conduct the overall project management, as specified in the contract between the consortium and the EC, i.e.:

- Organize the project meetings, workshops, and receive reports;
- Oversee the drawing up and timely signing of the Consortium Agreement;
- Ensure that all parties will sign the contract with the EC on time;
- Initiate, prepare and preside over regular project progress meetings and the dissemination of information to all partners pertaining to these meetings;
- Act as liaison to the European Commission on behalf of the group in all verbal and written communication;
- Inform the Commission properly about the situation and progress of the work;
- Inform the Commission in advance of the date and subject of the meetings;
- Coordinate the overall financial, administrative and contractual activities of the project, including monitoring and maintaining the overall adherence to the financial budgets;
- Report the overall budgetary situation of the project to the EC, based on the cost declarations from the individual partners;
- Coordinate the dissemination of knowledge and deliverables.

3 - Operational project management

The consortium agreement and contract conditions with the EC will be monitored by the General Assembly to ensure compliance by all participating parties.

For each work package, a WP leader has been appointed to take primary technical control of and responsibility for the proper management and execution of the tasks related to the particular WP. He/she

establishes (in co- ordination with the Project Coordinator) the detailed schedule of his/her WP. He/she is also responsible for the quality of, and the correct and timely submission of deliverables relating to his/her WP. Each WP leader is also appointed to chair the meetings among the partners participating to his/her WP and will communicate frequently both formally and informally with the workers in the WP.

4- Monitoring:

a) Internal reporting

In order to monitor and guide the consortium, each individual partner will regularly (after the first four months and thereafter at four-monthly intervals) submit a progress report to the respective Work Package leaders. On the basis of these reports, the WP leaders will monitor progress and take any necessary action to ensure the work package remains on schedule.

Each WP leader is required to provide the PC regularly (after four months and thereafter at four monthly intervals) with a progress report concerning his/her WP and containing sufficient technical information to enable the PC to be assured that work is progressing according to plan.

The status of the project will be updated by the PC in a Project Dashboard that will highlight all key progress indicators of the project and areas at risk.

b) External reporting

The combined WP reports (task of the PC) will be discussed and evaluated during meetings of the General Assembly and will constitute the interim reports and form the basis for the annual and final reports that will be submitted to the European Commission by the PC.

Based on the EU model format the coordinator will ensure that all partners provide a consistent flow of information containing key points on the financial progress in the form of a financial report and associated financial plan, as well as an activity report and updated implementation plan.

c**) Internal communication**

A communication plan will be agreed upon by the General Assembly at the kick-off meeting and will define means and methodology of communication among the project partners.

5- Financial / administrative management

The Project Officer of …… will ensure that all budgetary actions are performed according to the rules and regulations of the EC and the consortium agreement. This includes amongst others establishing a good operating practice for financial management adapted to the financial system of each participating party, to ensure that the received funds are correctly distributed, accounted for, cost statements are received.

Deliverables

– ***Consortium Agreement.*** A Consortium Agreement will be concluded among the project partners.
– ***Kick-Off meeting minutes.***
– ***Meeting/workshop minutes.***
– ***General Assembly meeting minutes.***
– ***Internal website with public areas for communication and data sharing***
– ***Partners progress report.*** Each individual partner will regularly submit a progress report to the respective Work Package leaders in order to monitor progress and to ensure the work package remains on schedule.
– ***Work Package progress report.*** Each WP leader is required to provide the PC regularly with a WP progress report concerning his/her WP to enable the PC to be assured that work is progressing according to plan.
– ***Interim reports.*** The PC will combine the WP progress reports and will constitute the interim reports.
– ***Progress reports to the EC.*** Annually the PC will submit progress reports to the EC.
– ***Final report (technical, financial, deliverables).*** The PC will submit the final report to EC.

Table 3.1a: Work package WP2 description

Work package number 2		**Start Date or Starting Event**					
Work package title	**Planing of restoration interventions**						
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

Planning of restoration intervention on buildings and structures of cultural interest

Description of work

Deliverables

Table 3.1a: Work package WP3 description

Work package number 3		Start Date or Starting Event					
Work package title	Monitoring of building facades						
Participant number	X	Y	Z	W			
Short name of participant	NILU	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

(Grontoft)

- To assess the savings in costs for conservation-restoration of building façades due to atmospheric chemical weathering, that are likely to be obtained in Europe by meeting EU air quality directives.
- To assess the reduction in air pollution that would be needed to meet suggested target levels for atmospheric chemical weathering of façades in Europe.
- To assess the savings in costs for conservation-restoration of façades due to atmospheric chemical weathering that could be obtained by reduction in air pollution.
- To assess the likely change in costs for conservation-restoration of building façades in Europe due to atmospheric chemical weathering in a future situation with climate change.
- To assess the importance of atmospheric chemical weathering of façades relative to other, physical,

biological and anthropogenic causes for implementation of façade renovation.

- To apply results from historical and present registration, mapping and monitoring of the state of conservation of facades for assessment of lifetimes and costs for conservation-restoration of façades, including prediction of changes in lifetime and costs due to environmental changes such as reduction in air pollution or climate change.

(Grontoft)

(Caridys Panayotis)

A historic building is a fragile resource that requires the finest care. Maintenance and rehabilitation of walls and facades call for a thorough understanding of the forces that cause deterioration, knowledge of the properties of building materials, up-to-date inspection tools and methods, and a solid command of renovation and repair techniques. In this reference it is important that experts on the field provide state-of-the-art information and methodologies for the inspection, maintenance, and restoration of historic buildings facades of virtually every period, style, and material.

(Caridys Panayotis)

Description of work

(Grontoft)

NILU have through previous projects (e.g. EU projects MultiAssess and CultStrat, the ECE-ICP materials project and Norwegian projects) and experimental field studies, carried out over many years, taken part in the development of models and dose response-functions for façade weathering. The models can be used to calculate the atmospheric chemical weathering rates of building façades and monument surfaces, due to air pollution and climate/climate change, and the related costs for, and lifetimes between, conservation-restoration intervention (Watt et al., 2008).

The EU 2008 Air Quality Directive gives maximum acceptable air pollution levels in Europe for the protection of health. Reduction of air pollution to meet such directives will also reduce the weathering rate, and thus the cost for conservation-restoration of building façades and monument surfaces, by increasing the time intervals between needed interventions. Specific target levels for the atmospheric weathering on rates of façade materials have been suggested.

NILU will use available air pollution data from open sources such as the European Environmental Agency (AirBase, 2015) and the ECE-ICP materials project (ICP, 2015), and climate change model data available from the international Panel for Climate Change, IPCC, and other open sources, to estimate present and possible future rates of, and costs due to, atmospheric chemical weathering of building façades and monument surfaces. The cost savings that can be obtained by reducing the air pollutants to meet EU Air Quality Directives and suggested target levels, and the changes in weathering rates and cost due to expected climate change, will be calculated in terms relative to the present and compared to total costs for conservation-restoration interventions on façades.

The assessment of the costs due to air pollution and climate change will consider the importance of atmospheric chemical weathering of façades relative to other, physical, biological and anthropogenic causes for implementation of façade renovation actions, by their relative expected influences on decisions to implement restoration interventions. The assessment will be based on evaluation by / questionnaires to experts on building renovation (architects building engineers, scientists, conservators) and by more detailed analysis of specific cases of renovation of building- and, or monument-façades.

The information on the relative importance of different determining factors for the timing of façade renovation action will be combined with results from historical and present registration, mapping and monitoring of the state of conservation of facades to model the future likely lifetimes and costs for conservation-restoration of the façades for different air pollution and climate scenarios.

The development and testing of the MAV (Micro Aerial Vehicle) system for automatic inspection and monitoring of building facades and large structures in the project, with the aim to improve planning of

restoration interventions and mapping, and to create a database of buildings of cultural interest, will give important input to this work.
The assessments of cost savings on renovation of building façades that could be obtained by reducing air pollution and meeting health directives and suggested target levels for the weathering of façades, and by mitigation climate change, are important additions to environmental cost-benefit analysis including evaluation of risk and costs for health and ecology. Such information about monetary benefits of actions to improve the state of the environment will be supplied as important input to policy makers and planners with the potential to contribute to better decision making for increased wealth and welfare.
References:
AirBase 2015. The European air quality database. http://www.eea.europa.eu/data-and-maps/data/airbase-the-european-air-quality-database-8 (Accessed Feb. 2015)
ICP 2015. http://www.corr-institute.se/ICP-Materials/. (Accessed Jan. 2015)
Watt, J. Tidblad J, Kucera V and Hamilton R. (ed). 2008. The Effect of Air Pollution on Cultural Heritage, Springer, USA.
(Grontoft)

(Caridys Panayotis)
First there will be a general research on the facade materials in specially chosen buildings and the ways in which structural and decorative elements are vulnerable to an array of environmental forces. After a detailed investigation of tools and techniques for inspection, we will explore planning issues for the restoration or replacement of facade components.
During our many years' experience on pre and post earthquake inspection and evaluation of buildings, we have already inspected-screened more than 10.000 building structures (houses, hospitals, schools, hotels, theatres) and we possess all the relevant data. In most of them we have carried out ambient vibration measurements defining natural frequencies and modal shapes, soil-structure interaction, and discontinuities of the load bearing system to seismic damage. A great number of the above mentioned structure are traditional-monumental.
By using these data we will be able to establish the minimum requirements for conducting periodic inspections of building facades to identify unsafe conditions that could cause harm to persons and property.
Due to age, lack of maintenance, design or construction errors, or a combination of these factors, building facades deteriorate. Based on our applied methodology about the performance of building facades through investigation and research, governing authorities, owners, and qualified professionals will become more aware of potential unsafe conditions on building facades that if unaddressed, can jeopardize public safety and surrounding properties.
(Caridys Panayotis)

Deliverables

(Grontoft)
Del 1: Assessment of costs and savings in costs for conservation-restoration of building façades caused by atmospheric chemical weathering due air pollutants and their reduction to meet air quality directives and target levels, including the effect of climate change. Including "Model 1" development and presentation.

Del 2: Modelling of the future likely lifetimes and costs for conservation-restoration of façades for different air pollution and climate scenarios, including assessment of the importance of atmospheric chemical weathering relative to other reasons for the implementation and timing of conservation-restoration action for building façades. Including "Model 2" development and presentation.

(Grontoft)

(Caridys Panayotis)

Main deliverables will be:

1) An extensive 10.000 building database with information on the vibration and deterioration to be used an information pool to elaborate new façade inspection and restoration methods.

(Caridys Panayotis)

Table 3.1a: Work package WP4 description

Work package number 4		**Start Date or Starting Event**					
Work package title	**Monitoring of building façades**						
Participant number	X	Y	Z	W			
Short name of participant	X	Y	Z	W			
Person/months per participant:	X	Y	Z	W			

Objectives

Monitoring of building façades

Description of work

Deliverables

Code 7 (All Partners received empty templates for Work packages WP2, WP3, and WP4; please, any Partner should return these templates to *each2014@gmail.com* ***compiled as a first draft).***

Table 3.1a: Work package WP5 description

Work package number five		**Start Date**					
Work package title	**Project results diffusion**						
Participants number							
Short name							
Pearson/months per Participant:							

Objectives

Objectives if this Work package are

1 - Dissemination and exploitation of results

Definition of a work plan for dissemination and exploitation of the project results; implementation of a social platform

2- Communication activities

Organization of events concerning the partners of the Consortium; preparation of a website; organization of mid term workshops and final conference open to EU Commission experts

Description of work

This Work package aim is to improve the dissemination of information about the project results and deliverables: it is a core measure of the project's success. According to this preliminary consideration, different promotion and dissemination actions are foreseen and addressed to both experts in the field and any other Stakeholders.

1 - Dissemination of project results through scientific journals and through participation in Congresses, conferences and workshops

All project results will be shared and disseminated among the project Partners. In order to ensure high visibility of the project within the scientific community, publication in high impact factor scientific journals will be encouraged, as will be presentation at relevant workshops and conferences. Each research institution in this proposal will contribute to this dissemination as participants in WP 5.

2 - Organization of a workshop and a conference

In particular, within six months from the starting of the project a workshop will be held open to specific stakeholders.

3 - Demonstration event. In close collaboration with the WP2, WP3 and WP4 teams a demonstration event will be arranged in order to show how the newly developed techniques work.

This will exhibit the validity and usefulness of the new tools to a competent audience, able to comment and discuss the results obtained.

4 - EUROPEAN FAÇADES Website. Promotion of the demonstration event will be made through this website.

Other activities:

1 – Organization of the partners consortium meeting before and throughout the project activity according to the Coordinator suggestions (for 24 months); application of tools and methodologies of risk management to the governance of single parts of the project according to the suggestions of the project coordinator.

2 - Dissemination and exploitation of results deliverables, elaboration of a website concerning the activities of the project; maintenance and adjournments of the website during and after the project preparation; organization of events.

3– Project internal communication of documents and deliverables among the project partners

Deliverables

- ***Workshop and conference in and related information & dissemination material***
- ***Papers in scientific journals***
- ***Launch of fully functional Knowledge Base***
- ***Demonstration even***

- Commercial service development

-Business Plan for exploitation of products and services

Next Table 31b shows the list of work packages:

Code 8 (to be written once Work packages are ready)

TABLE 3.1b – List of Work packages

Work Package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End Month
One						
Two						
Three						
Four						
Five						
				Total months		

Next Table 3.1c shows the list of Deliverables for each Work package:

Code 9 (to be written once Work packages are ready)

TABLE 3.1c – List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date
		One				
		Two				
		Three				
		Four				
		Five				

3.2–Management structure and procedures

In order to efficiently manage the project, a specific WP dedicated to coordination and management has been foreseen in the project work plan, to ensure that suitable priority and attention will be given to project management. Within this WP 1 all the aspects related to administrative and quality management of the project will be included. The responsibility of the project coordination will be taken by XXX that will supply the Project Coordinator (PC) and a Project Officer (PO).

The project partners are fully committed and agree to work together with the utmost cooperation for the timely fulfilment of their responsibilities. Previous experiences and participations in European framework programs have led to the decision to keep this management structure as simple as possible. The **overall organizational structure** proposed for the EUROPEAN FAÇADES project is presented in Figure 1. It is aimed at ensuring the fulfilment of the project objectives, by allowing clear and continuous communication among the project partners.

a) Project Coordinator

The overall management of the project will be the responsibility of XXX as coordinating partner. Key to this is the role of the Project Coordinator, which will be carried out by …….

The **Project Coordinator** (PC) will be responsible for the **overall coordination** of the **technical and scientific activities, and all other aspects of the project** including **management of potential conflicts** and compromise negotiation in the unlikely event of conflict and will also be the primary contact person for the European Commission. Hence he/she will be responsible for all communication with - and reporting to - the EC.

The **Project Officer** (PO) will be responsible for day-to-day **legal and contractual management** of the project and **administrative and financial activities.** The PO will report to the PC.

In particular, according to the Consortium Agreement, the Coordinator shall be responsible for:

- Monitoring compliance by the Parties with their obligations
- Keeping the address list of Members and other contact persons updated and available
- Collecting, reviewing and submitting information on the progress of the project and reports and other deliverables (including financial statements and related certification) to the Funding Authority
- Preparing the meetings, proposing decisions and preparing the agenda of General Assembly meetings, chairing the meetings, preparing the minutes of the meetings and monitoring the implementation of decisions taken at meetings
- Transmitting promptly documents and information connected with the project
- Administering the financial contribution of the Funding Authority and fulfilling the financial tasks
- Providing, upon request, the Parties with official copies or originals of documents which are in the sole possession of the Coordinator when such copies or originals are necessary for the Parties to present claims.

The following Table 3.2a gives a list of milestones.

Code 10 (to be written once Work packages are ready)

TABLE 3.2a – List of milestones

Milestone number	Milestone name	Related work package(s)	Estimated date	Mean of verification

The following Table 3.2b gives the critical risks identified and the possible mitigating actions.

Code 11 (to be written once Work packages are ready)

TABLE 3.2b – Critical risks for implementation

Description of risk	Work package(s) involved	Proposed risk-mitigation measures

b) The General Assembly

The General Assembly is the decision making body of the Consortium.
The General Assembly shall consist of one representative of each Party (hereinafter referred to as "Member").
Each Member shall be duly authorised to deliberate, negotiate and decide on all matters listed in the Consortium Agreement.
The Coordinator shall chair all meetings of the General Assembly, unless decided otherwise by the General Assembly.
The Parties agree to abide by all decisions of the General Assembly.
This does not prevent the Parties from submitting a dispute for resolution in accordance with the provisions of settlement of disputes.
Operational procedures for the General Assembly representation in meetings
Any Member:

- should be present or represented at any meeting;
- may appoint a substitute or a proxy to attend and vote at any meeting;
- shall participate in a cooperative manner in the meetings.

c) The Work Package leaders

All technical and scientific issues of the project, in particular relating to the interdependence between and coherence of the different WPs - will be managed and consolidated by **the Work Package leaders** who will **report to the PC directly**. To achieve the R&D objectives of the project, the experimental, scientific and technical work has been organized into 3 R&D WPs (WP2,WP3, and WP4).
For each of them, a WP leader will be appointed to take primary technical control of and responsibility for the proper management and execution of the tasks related to the particular WP. In particular, he/she establishes (in coordination with the PC) the detailed schedule of his/her WP and the work in progress. Each WP leader is also responsible for identification of risks and for proposing solutions to the PC in respect of his/her WP. Taking into account that any of these R&D WPs will be the responsibility of three/four partners, WP leaders will be rotated among partners any four months.
Each WP leader is required to provide the PC at four monthly intervals with a progress report concerning his/her WP and containing sufficient technical information to enable the PC to be assured that work is progressing according to plan.

d) Means for governance and control

The means for governance and control (quality assurance, consortium agreement and communication plan) will be tailored to the scale of the EUROPEAN FAÇADES project. A correctly empowered governance and control for the overall project management will be guaranteed by following means:
The Consortium Agreement: All the EUROPEAN FAÇADES rules will be included and described in detail in the **Consortium Agreement**.
This document will define:

- the responsibilities, mutual obligations and roles of the partners;
- the division of the budget;
- the strategy for the exploitation of results;
- the rules for the settlement of disputes

The Consortium Agreement will be signed within the first month of the project and will define in a very clear and detailed way: roles of each partner, formal rules of participation, voting mechanisms, criteria for evaluation of activities realized by each partner, rules for budget re-allocation, etc.
The Quality Plan: A **quality plan** will be agreed by the General Assembly at the Kick-off meeting, and will ensure that appropriate quality assurance is undertaken. It will include:

- persons responsible for quality assurance, quality standards, methodologies and procedures;
- procedures for identification, distribution, collection, filing, maintenance and disposal of quality records resources, schedule and responsibilities for conducting the quality assurance activities

Quality control will represent a key issue in the overall management of the project, since it plays a critical role in keeping the action aligned towards its final objectives.

d) Project Meetings

An initial „launch/kick-off meeting will be organized at the start of the EUROPEAN FAÇADES project for all the personnel involved in the project. The purpose of the kick-off meeting is to:

- Present to all involved an overview of the project;
- Enable each participant to obtain a better perspective of his/her role in the EUROPEAN FAÇADES project and set this in context with the roles and skills of other project members;
- Define the main outline of the Consortium Agreement;
- Establish procedures for Quality Assurance and formalize policies for publication, intellectual property rights and any arbitration procedures.

3.3 –Consortium as a whole

Partners of the Consortium will be all the partners working on the five Work packages. Each partner will designate a member to participate to the meetings of the Consortium.
All the rules reported in the EU suggested Consortium Agreement must be followed.
The Consortium partners belong to very different scientific disciplines, from IT engineers to archaeologists, from robotics and mechanical experts and they have to complement one another in order to create a Robotic System suitable for this project.
Analogously, the presence inside the Consortium of Enterprises is fundamental for building and experimenting the products of project.
The EUROPEAN FAÇADES project is proposed by a consortium of xx **partners** from **X EU Member States** and comprises all the appropriate key players to ensure the availability of resources, capacities, technologies, capabilities, technical and operational knowledge required for the timely achievement of the goal of the project.
The consortium will bring together European efforts and methodological/technological developments and has therefore a high potential for developing and validation of innovative non-destructive diagnosis techniques to assess and monitor the state of preservation of the European heritage.
The partners to the EUROPEAN FAÇADES project have the following areas of interest and activity, Table 3.3.

Code 12 Any Partner should send these data by mail to each2014@gmail.com; please only one sentence!)

Table 3.3 Areas of interest/activity for EUROPEAN FAÇADES project partners

Partner	Area of interest / activity
NILU-Norwegian Institute for Air Research	Assessment of weathering and conservation-restoration costs for facades due to air pollution and climate change

3.4 – Resources to be committed

Code 13 (Section 3.4 to be written only after all other points and sections are ready)

According to costs as stated in the budget table in Part A of the Proposal, the following Table 3.4.1 shows the costs distribution.

Table 3.4.1 Total Costs

	WP 1	WP 2	WP 3	WP 4	WP 5	Total
Personnel costs						
Other costs						
Total direct costs						
Indirect costs						
Subcontracting						
Total costs						
Requested subsidy	2					

In order to achieve the objectives of EUROPEAN FAÇADES, a duration of 24 months has been foreseen for the project. The overall project cost is € xx.xxx.xxx and **the overall EU contribution requested is € xxxx.xxx**, both reasonable and necessary considering the number of partners, the ambitious objectives and the duration of the project.

In the following, more details are provided about the costs in the main cost categories of the project.

3.4.1 - Personnel Costs

Personnel costs represent a significant part of the project budget, in total **€ xxxx.xxx**. For each work package, the personnel costs have been calculated considering the appropriate man-power (see Table 3.4 a – Summary of staff effort) needed to complete the proposed activities.

TABLE 3.4a – Summary of staff effort

	WPn	WPn+1	WPn+2	Total Pearson/ Months per Participant
Participant Number/Short Name				
Participant Number/Short Name				
Participant Number/Short Name				
Total Person/Months				

The weighted average monthly rate costs of the personnel that will be working in the work package are provided in Table 3.4.2

Table 3.4.2 – Weighted average monthly personnel costs in € per partner and work package

Partner	W	W	W	W	W

Next Table 3.4b shows "other direct costs" for participants where those costs exceed 15% of the personnel costs.

TABLE 3.4b – "Other direct cost" items

Participant Number/Short Name	Cost (€)	Justification
Travel		
Equipment		
Other goods and services		
Total		

3.4.2 - Travel costs (other direct costs)

The total travel costs are **€ xxxx** and refer to meeting, working session and other issues related to the coordination of participants' contributions, as well as to the attendance of conferences and events for dissemination purposes. In more detail, the following travels have been foreseen, so far, for calculating the travel costs:

Project meetings: technical and management meetings where all participants will be present, and where technical issues as well as management issues will be discussed. 6 project meetings are foreseen for the project duration (one meeting each 6 months of project).

Technical meetings: meetings needed among two or more partners collaborating on the same tasks. The twice yearly Project meetings will form a significant venue for inter WP discussions, and will make

provision for specific subsets of WP managers to meet outside the main workshop on request, e.g. for inter- and intra-WP decision-making purposes.

***Dissemination meetings*:** participation to international conferences/workshops to present the EUROPEAN FAÇADES results, and for attendance to the EUROPEAN FAÇADES workshop. Each participant involved in WP5, will receive travel costs.

3.4.3 - Consumables (other direct costs)

The total costs for consumables amount to **€ xxxxx**.

The consumables with EUROPEAN FAÇADES are mostly related to preparation, analysis, characterisation, validation, process optimisation, pre-prototype development and tests and are summarized in table 3.4.3

Table 3.4.3.a – Consumables per work package

	Consumables description

A total of **€ xxx** has been included for the purchase of durable equipment by the project partners. The equipment costs were calculated on depreciation basis, considering the duration of usage of the equipment within the project. The table 3.4.3.b provides an overview of the planned equipment purchases

Table 3.4.3.b – Equipment purchase per participant

rtner short name	Valu	Eligi	Description	WP

3.4.4 - Other costs (other direct costs)

The other remaining costs amount to **€ xxxx**. These are listed in Table 3.4.4

Table 3.4.4 – Other direct costs per Work package

	Other costs

4 – Members of the Consortium

Code 14 (All Partners, starting from now, should write at least about three pages plus the relevant publications lists, concerning both the Organizations they belong to and the persons who will carry out the proposed activities)

4.1 – Participants

- A description of the legal entity and its main tasks, with an explanation of how its profile matches the tasks in the proposal;
- a curriculum vitae or description of the profile of the persons, including their gender, who will be primarily responsible for carrying out the proposed research and/or innovation activities;
- a list of up to 5 relevant publications, and/or products, services (including widely-used datasets or software), or other achievements relevant to the call content;
- a list of up to 5 relevant previous projects or activities, connected to the subject of this proposal;
- a description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work;
- any other supporting documents specified in the work programme for this call.

(Grontoft)

Partner no. 1: NILU-Norwegian Institute for Air Research (NO)

Legal entity and its main tasks:
NILU is an internationally well-known research institute in the field of air quality and environmental pollution. NILU performs ~ 250 projects each year for governments, industries and national and international organisations. NILU has about 200 employees of which 61 are PhDs, and has accredited laboratories for chemical analyses and monitoring instruments. NILU's annual turnover is ~220 mill NOK. About 11 % of the budget is basic grant from the Norwegian Research Council to NILU as a national research institution for air pollution. NILU has participated in more than 110 EU-projects, including one Network of Excellence (NoE) and some Integrated Projects (IP). Many of these projects have included SMEs. Nine of the projects have been in the field of preservation of cultural heritage.

NILU will do analysis and estimation of weathering rates and conservation-restoration cost for European façades depending on air pollution levels and climate change. NILU will calculate the cost savings that can be obtained by reducing air pollution in relation to EU directives and suggested target levels. The relative importance of atmospheric

chemical weathering for the timing of renovation intervention on façades cost as compared to other physical, biological and anthropogenic factors will be assessed.

Key persons

Dr. Terje Grøntoft, (male) 52 years old, has a PhD in Chemistry from the University of Oslo (2004) and is Senior Researcher at the Norwegian Institute for Air Research since 2001. He has been scientific coordinator and active in the general coordination for several EU projects lead by NILU. His professional experience in the field of the project is: Assessment of air pollution, climate and climate change exposure, degradation risk and cost of conservation-restoration for build structures, materials and cultural heritage. Measurement and modelling of corrosion/degradation of materials and cultural heritage. Design of environmental monitoring in field test campaigns. Measurement and modelling of indoor and outdoor air quality (IAQ). Experience with scientific work in EU projects.

Relevant publications, products, services

- **Grøntoft, T.** (2011) "Climate change impact on building surfaces and façades", International Journal of Climate Change Strategies and Management, Vol. 3 Iss: 4, pp.374 – 385.
- **Grøntoft, T.** (2011) How will climate change affect the corrosion of material surfaces including building façades in Norway? In: Kelman, I. (Ed.) Municipalities Addressing Climate Change: A Case Study of Norway. Nova Publishers. New York.
- Johan Tidblad, Vladimir Kucera, Martin Ferm, Katerina Kreislova, Stefan Brüggerhoff, Stefan Doytchinov, Augusto Screpanti, **Terje Grøntoft**, Tim Yates, Daniel de la Fuente, Ott Roots, Tiziana Lombardo, Stefan Simon, Markus Faller, Lech Kwiatkowski, Joanna Kobus, Costas Varotsos, Chris Tzanis, Linda Krage, Manfred Schreiner, Michael Melcher, Ivan Grancharov, and Nadya Karmanova. "Effects of Air Pollution on Materials and Cultural Heritage: ICP Materials Celebrates 25 Years of Research," International Journal of Corrosion, vol. 2012, Article ID 496321, 16 pages, 2012. doi:10.1155/2012/496321
- Sabbioni, C., Brimblecombe, P. and Cassar, M . (eds.) "The Atlas of Climate Change Impact on European Cultural Heritage: Scientific Analysis and Management Strategies" Anthem Environmental Studies." Anthem Press. 15. Nov 2010: Full list of authors: C. Sabbioni, A. Bonazza, P. Messina, M. Cassar, P. Biddulph, N. Blades, P. Brimblecombe, C.M. Grossi, J. Tidblad, R. Kozlowski, L. Bratasz, J. Slawomir, M. Drdacky, J. Blaha, I. Herle, J. Lesak, D. Masin, S. Pospisil, Z. Slizkova, C. Saiz-Jimenez, J.M. Gonzalez Grau, **T. Grontoft**, G. Svenningsen, I. Wainwright, C. Hawkings, A. Gomez Bolea, X. Arino Vila.
- Ron Hamilton, Helen Crabbe,**Terje Grøntoft**, and Stephan Fitz. Chapter 2. Monitoring, Modelling and Mapping, and Tim Yates, Milos Drdácký and Terje Grøntoft. Chapter 8 Risk Assessment and Management Strategies at Local Level in Watt, J. Tidblad J, Kucera V and Hamilton R. (ed). 2008. The Effect of Air Pollution on Cultural Heritage, Springer, USA.

Relevant previous projects or activities

EU project TeACH, "Technologies and tools to prioritize Assessment and diagnosis of air pollution impact on immovable and movable Cultural Heritage," (Grant Agreement no. 212458) (2008-2011) http://www.teach-project.eu/.

EU project CULT-STRAT, "Assessment of Air Pollution Effects on Cultural Heritage – Management Strategies", (SSPI-CT-2004-501609) (2004-2007) http://www.corr-institute.se/cultstrat/

***EU project MULTI-ASSESS*,** "Model for multi-pollutant impact and assessment of threshold levels for cultural heritage" (EVK4-CT-2001-00044) (2002-2005) http://www.corr-institute.se/MULTI-ASSESS/

Norwegial Research Council project: "Adaptation to extreme weather in Norwegian municipalities" (2006-2011) http://www.klimakommune.no/

EU project MEMORI, "Measurement, Effect Assessment and Mitigation of Pollutant Impact on Movable Cultural Assets. Innovative Research for Market Transfer." (Grant Agreement no. 265132) (2009-2012) http://www.memori-project.eu/.

Infrastructure and major items of technical equipment, relevant to the proposed work

- NILU is an air pollution, climate and materials corrosion data centre with high competence in model development for data analysis and application
- NILU has an accredited laboratory, which supplies air pollution samplers and monitoring equipment.

- NILU has an advanced accredited chemistry laboratory for air and environmental pollution analysis.
- NILU has a corrosion laboratory with different test chambers for controlled environment exposures of material samples.
- NILU has an efficient administration department used to administration of participation in EU projects.

(Grontoft)

4.2 – Third parties involved in the Project

No third parties involved in this project

5 – Ethics and Security

5.1 – Ethics

There is no ethics issue in the ethical issue table in the Administrative Proposal Form of EUROPEAN FAÇADES, Part A.

5.2 – Security

The activities or results of this project do not raise security issues.