Horizon 2020

Call: H2020-SC5-2016-2017
(Greening the Economy)

SECOND STAGE

Topic: SC5-01-2016-2017

Type of action: IA
(Innovation action)

Proposal number: 730355-2

Proposal acronym: CLARITY

Deadline Id: H2020-SC5-2016-TwoStage

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How to fill in the forms

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the previous steps in the submission wizard.

Proposal ID **730355-2** *Acronym* **CLARITY**

1 - General information

Topic SC5-01-2016-2017

Call Identifier H2020-SC5-2016-2017

Type of Action IA

Deadline Id H2020-SC5-2016-TwoStage

Acronym CLARITY

Proposal title* Integrated Climate Adaptation Service Tools for Improving Resilience Measure Efficiency

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months *36*

Fixed keyword 1 *Geo-information and spatial data analysis* Add

Fixed keyword 2 *Marketing innovation* Add Remove

Fixed keyword 3 *Earth Observation / Services and applications* Add Remove

Fixed keyword 4 *Climatology and climate change* Add Remove

Fixed keyword 5 *Market development* Add Remove

Free keywords *Climate Services Information System (CSIS), Large Infrastructure, Urban areas, Cloud services*

Proposal ID **730355-2** *Acronym* **CLARITY**

Abstract

Urban areas and traffic infrastructure linking such areas are highly vulnerable to climate change. Smart use of existing climate intelligence can increase urban resilience and generate added value for businesses and society at large.

Based on the results of FP7 climate change, future internet and crisis preparedness projects (SUDPLAN, ENVIROFI, CRISMA) with an average TRL of 4-5 and following an agile and user-centred design process, end-users, purveyors and providers of climate intelligence will co-create an integrated Climate Services Information System (CSIS) to integrate resilience into urban infrastructure.

As a result, CLARITY will provide an operational eco-system of cloud based climate services to calculate and present the expected effects of CC-induced and -amplified hazards at the level of risk, vulnerability and impact functions. CLARITY will offer what-If decision support functions to investigate the effects of adaptation measures and risk reduction options in the specific project context, and allow the comparison of alternative strategies.

Four demonstration cases will showcase CLARITY climate services in different climatic, regional, infrastructure and hazard contexts in Italy, Sweden, Austria and Spain; focusing on the planning and implementation of urban infrastructure development projects.

CLARITY will provide the practical means to include the effects of CC hazards and possible adaptation and risk management strategies into planning and implementation of such projects, focusing on increasing CC resilience. Decision makers involved in these projects will be empowered to perform climate proof and adaptive planning of adaptation and risk reduction options.

Remaining characters 292

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under the 7th Framework Programme, Horizon 2020 or any other EU programme(s)? ○ Yes ◉ No

Proposal ID **730355-2** *Acronym* **CLARITY**

Declarations

1) The coordinator declares to have the explicit consent of all applicants on their participation and on the content of this proposal.	☒
2) The information contained in this proposal is correct and complete.	☒
3) This proposal complies with ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct).	☒

4) The coordinator confirms:

- to have carried out the self-check of the financial capacity of the organisation on http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html or to be covered by a financial viability check in an EU project for the last closed financial year. Where the result was "weak" or "insufficient", the coordinator confirms being aware of the measures that may be imposed in accordance with the H2020 Grants Manual (Chapter on Financial capacity check); or	◉
- is exempt from the financial capacity check being a public body including international organisations, higher or secondary education establishment or a legal entity, whose viability is guaranteed by a Member State or associated country, as defined in the H2020 Grants Manual (Chapter on Financial capacity check); or	○
- as sole participant in the proposal is exempt from the financial capacity check.	○

5) The coordinator hereby declares that each applicant has confirmed:

- they are fully eligible in accordance with the criteria set out in the specific call for proposals; and	☒
- they have the financial and operational capacity to carry out the proposed action.	☒

The coordinator is only responsible for the correctness of the information relating to his/her own organisation. Each applicant remains responsible for the correctness of the information related to him/her and declared above. Where the proposal to be retained for EU funding, the coordinator and each beneficiary applicant will be required to present a formal declaration in this respect.

According to Article 131 of the Financial Regulation of 25 October 2012 on the financial rules applicable to the general budget of the Union (Official Journal L 298 of 26.10.2012, p. 1) and Article 145 of its Rules of Application (Official Journal L 362, 31.12.2012, p.1) applicants found guilty of misrepresentation may be subject to administrative and financial penalties under certain conditions.

Personal data protection
The assessment of your grant application will involve the collection and processing of personal data (such as your name, address and CV), which will be performed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Unless indicated otherwise, your replies to the questions in this form and any personal data requested are required to assess your grant application in accordance with the specifications of the call for proposals and will be processed solely for that purpose. Details concerning the purposes and means of the processing of your personal data as well as information on how to exercise your rights are available in the privacy statement. Applicants may lodge a complaint about the processing of their personal data with the European Data Protection Supervisor at any time.

Your personal data may be registered in the Early Detection and Exclusion system of the European Commission (EDES), the new system established by the Commission to reinforce the protection of the Union's financial interests and to ensure sound financial management, in accordance with the provisions of articles 105a and 108 of the revised EU Financial Regulation (FR) (Regulation (EU, EURATOM) 2015/1929 of the European Parliament and of the Council of 28 October 2015 amending Regulation (EU, EURATOM) No 966/2012) and articles 143 - 144 of the corresponding Rules of Application (RAP) (COMMISSION DELEGATED REGULATION (EU) 2015/2462 of 30 October 2015 amending Delegated Regulation (EU) No 1268/2012) for more information see the Privacy statement for the EDES Database).

Proposal ID **730355-2** *Acronym* **CLARITY**

List of participants

#	Participant Legal Name	Country
1	ATOS SPAIN SA	Spain
2	cismet GmbH	Germany
3	SVERIGES METEOROLOGISKA OCH HYDROLOGISKA INSTITUT	Sweden
4	FARISA ASESORES Y CONSULTORES S.L	Spain
5	ZENTRALANSTALT FUR METEOROLOGIE UNDGEODYNAMIK	Austria
6	UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II.	Italy
7	STOCKHOLMS STAD	Sweden
8	AIT Austrian Institute of Technology GmbH	Austria
9	EUREKA COMUNICAZIONE TELEMATICA SRL	Italy
10	Comune di Napoli	Italy
11	AGENCIA ESTATAL DE METEOROLOGIA	Spain
12	WSP SVERIGE AB	Sweden
13	ACCIONA INFRAESTRUCTURAS S.A.	Spain
14	Smart Cities Consulting GmbH	Austria
15	County Administrative Board of Jönköping	Sweden
16	CENTRO DE ESTUDIOS Y EXPERIMENTACION DE OBRAS PUBLICAS - CEDEX	Spain
17	Landeshauptstadt Linz	Austria

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ATOS**

2 - Administrative data of participating organisations

PIC	***Legal name***
999993856	*ATOS SPAIN SA*

Short name: ATOS

Address of the organisation

Street CALLE DE ALBARRACIN 25

Town MADRID

Postcode 28037

Country Spain

Webpage www.atos.net

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no
Non-profit ..... no
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2016 - no
SME self-assessment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 72 - Scientific research and development

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ATOS**

Department(s) carrying out the proposed work

Department 1

Department name: Atos Research and Innovation ☐ not applicable

☒ Same as organisation address

Street: CALLE DE ALBARRACIN 25

Town: MADRID

Postcode: 28037

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ATOS**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name: **Miguel Ángel** Last name: **ESBRÍ PALOMARES**

E-Mail: **miguel.esbri@atos.net**

Position in org.: Research Line Responsible for Geospatial Applications

Department: Atos Research and Innovation ☐ Same as organisation

☒ Same as organisation address

Street: CALLE DE ALBARRACIN 25

Town: MADRID Post code: 28037

Country: Spain

Website:

Phone 1: +34691091744 Phone 2: +34912148086 Fax: +34917543252

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Jose	Lorenzo	jose.lorenzo@atos.net	
Jorge	Lopez	jorge.lopez@atos.net	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CIS**

PIC	***Legal name***
996560250	*cismet GmbH*

Short name: CIS

Address of the organisation

Street ALTENKESSELER STRASSE 17

Town SAARBRUCKEN

Postcode 66115

Country Germany

Webpage www.cismet.de

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no
Non-profit ..... no
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... no
Legal person ..... yes

Enterprise Data

SME self-declared status..... unknown
SME self-assessment ..... unknown
SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE Code: 72 - Scientific research and development

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CIS**

Department(s) carrying out the proposed work

Department 1

Department name: R&D ☐ not applicable

☒ Same as organisation address

Street: ALTENKESSELER STRASSE 17

Town: SAARBRUCKEN

Postcode: 66115

Country: Germany

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CIS**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name **Sascha** Last name **Schlobinski**

E-Mail **sascha.schlobinski@cismet.de**

Position in org.: CEO

Department: R&D ☐ Same as organisation

☒ Same as organisation address

Street: ALTENKESSELER STRASSE 17

Town: SAARBRUCKEN Post code: 66115

Country: Germany

Website: www.cismet.de

Phone 1: +4968196590121 Phone 2: +4970024763833 Fax: -

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Sabine	Trier	sabine.trier@cismet.de	+4968196590120

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **SMHI**

PIC	***Legal name***
999507983	*SVERIGES METEOROLOGISKA OCH HYDROLOGISKA INSTITUT*

Short name: SMHI

Address of the organisation

Street Folkborgsvaegen 1

Town NORRKOEPING

Postcode 601 76

Country Sweden

Webpage www.smhi.se

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: L - Real estate activities

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **SMHI**

Department(s) carrying out the proposed work

Department 1

Department name: Air Quality Research Department ☐ not applicable

☒ Same as organisation address

Street: Folkborgsvaegen 1

Town: NORRKOEPING

Postcode: 601 76

Country: Sweden

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **SMHI**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Lars** Last name: **Gidhagen**

E-Mail: **lars.gidhagen@smhi.se**

Position in org.: Head of Air Quality

Department: Air Quality Research Department ☐ Same as organisation

☒ Same as organisation address

Street: Folkborgsvaegen 1

Town: NORRKOEPING Post code: 601 76

Country: Sweden

Website: www.smhi.se

Phone 1: +46114958531 Phone 2: +46114958000 Fax: +46114958001

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Madeleine	Benderyd	madeleine.benderyd@smhi.se	+46114958640
Monica	Wallgren	monica.wallgren@smhi.se	+46114958104

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **METEOGRID**

PIC	***Legal name***
986501835	*FARISA ASESORES Y CONSULTORES S.L*

Short name: METEOGRID

Address of the organisation

Street CALLE ALMANSA 88 7 C

Town MADRID

Postcode 28040

Country Spain

Webpage http://www.meteogrid.com

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE Code: 74 - Other professional, scientific and technical activities

Department(s) carrying out the proposed work

No department involved

Department name ☒ not applicable

☐ Same as organisation address

Street *Please enter street name and number.*

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **METEOGRID**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name **David** Last name **Caballero**

E-Mail **david@meteogrid.com**

Position in org.: Head of Forest Fire Department

Department: FARISA ASESORES Y CONSULTORES S.L ☒ Same as organisation

☒ Same as organisation address

Street: CALLE ALMANSA 88 7 C

Town: MADRID Post code: 28040

Country: Spain

Website: www.meteogrid.com

Phone 1: +34915210111 Phone 2: +34 627014317 Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Luis	Torres Michelena	luis@meteogrid.com	+34915210111

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ZAMG**

PIC	***Legal name***
972690490	*ZENTRALANSTALT FUR METEOROLOGIE UNDGEODYNAMIK*

Short name: ZAMG

Address of the organisation

Street HOHE WARTE 38

Town WIEN

Postcode 1190

Country Austria

Webpage

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... yes
Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown
SME self-assessment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: - - Not applicable

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ZAMG**

Department(s) carrying out the proposed work

Department 1

Department name: DMM ☐ not applicable

☒ Same as organisation address

Street: HOHE WARTE 38

Town: WIEN

Postcode: 1190

Country: Austria

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ZAMG**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Maja** Last name: **Zuvela-Aloise**

E-Mail: **maja.zuvela-aloise@zamg.ac.at**

Position in org.: Scientist

Department: DMM/VHMOD ☐ Same as organisation

☒ Same as organisation address

Street: HOHE WARTE 38

Town: WIEN Post code: 1190

Country: Austria

Website: www.zamg.ac.at

Phone 1: +43 1 36026 2399 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **LUPT-PLINVS**

PIC	***Legal name***
999976590	*UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II.*

Short name: LUPT-PLINVS

Address of the organisation

Street Corso Umberto I 40

Town NAPOLI

Postcode 80138

Country Italy

Webpage www.unina.it

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... yes

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 853 - Higher education

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **LUPT-PLINVS**

Department(s) carrying out the proposed work

Department 1

Department name: Centro Interdipartimentale di Ricerca LUPT- PLINIVS ☐ not applicable

☐ Same as organisation address

Street: Via Toledo 402

Town: Napoli

Postcode: 80134

Country: Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **LUPT-PLINVS**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Giulio** Last name: **Zuccaro**

E-Mail: **zuccaro@unina.it**

Position in org.: Scientific Responsible

Department: Centro Interdipartimentale LUPT/ PLINIVS [ ] Same as organisation

[ ] Same as organisation address

Street: via Toledo 402

Town: Napoli Post code: 80134

Country: Italy

Website: www. plinivs.it

Phone 1: +390812531023 Phone 2: +390812538935 Fax: +390815513495

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Daniela	De Gregorio	daniela.degregorio@unina.it	+390812538935

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **StockCity**

PIC	***Legal name***
996559183	*STOCKHOLMS STAD*

Short name: StockCity

Address of the organisation

Street Fleminggatan 4

Town Stockholm

Postcode 104 20

Country Sweden

Webpage www.stockholm.se

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: L - Real estate activities

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **StockCity**

Department(s) carrying out the proposed work

Department 1

Department name: SLB Stockholm Air Qaulity and Noise Analysis ☐ not applicable

☒ Same as organisation address

Street: Fleminggatan 4

Town: Stockholm

Postcode: 104 20

Country: Sweden

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **StockCity**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Christer** Last name: **Johansson**

E-Mail: **christer.johansson@aces.su.se**

Position in org.: Environmental officer

Department: SLB Stockholm Air Qaulity and Noise Analysis ☐ Same as organisation

☒ Same as organisation address

Street: Fleminggatan 4

Town: Stockholm Post code: 104 20

Country: Sweden

Website: http://www.slb.nu

Phone 1: +46 761228931 Phone 2: +46 850828931 Fax: *+xxx xxxxxxxxx*

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **AIT**

PIC	***Legal name***
999584128	*AIT Austrian Institute of Technology GmbH*

Short name: AIT

Address of the organisation

Street Donau-City-Strasse 1

Town WIEN

Postcode 1220

Country Austria

Webpage http://www.ait.ac.at/

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Legal person ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 721 - Research and experimental development on natural sciences and engineering

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **AIT**

Department(s) carrying out the proposed work

Department 1

Department name: Safety & Security ☐ not applicable

☒ Same as organisation address

Street: Donau-City-Strasse 1

Town: WIEN

Postcode: 1220

Country: Austria

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **AIT**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Denis** Last name: **Havlik**

E-Mail: **denis@havlik.org**

Position in org.: Scientist / Project Manager

Department: Safety & Security ☐ Same as organisation

☒ Same as organisation address

Street: Donau-City-Strasse 1

Town: WIEN Post code: 1220

Country: Austria

Website: www.ait.ac.at

Phone 1: +436648157865 Phone 2: *+xxx xxxxxxxxx* Fax: +43505502813

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **EUREKA**

PIC	***Legal name***
939134504	*EUREKA COMUNICAZIONE TELEMATICA SRL*

Short name: EUREKA

Address of the organisation

Street VICO NOCE 8

Town BENEVENTO

Postcode 82100

Country Italy

Webpage www.eureka.it

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE Code: S - Other service activities

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **EUREKA**

Department(s) carrying out the proposed work

Department 1

Department name: Financial Modelling ☐ not applicable

☒ Same as organisation address

Street: VICO NOCE 8

Town: BENEVENTO

Postcode: 82100

Country: Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **EUREKA**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Davide** Last name: **Del Cogliano**

E-Mail: **ddc@eureka.it**

Position in org.: Chief Executive Officer

Department: Financial Modelling ☐ Same as organisation

☒ Same as organisation address

Street: VICO NOCE 8

Town: BENEVENTO Post code: 82100

Country: Italy

Website: www.eureka.it

Phone 1: +390688805280 Phone 2: +393358419925 Fax: +390688805283

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **Comune di Napoli**

PIC	***Legal name***
949799848	*Comune di Napoli*

Short name: Comune di Napoli

Address of the organisation

Street PIAZZA DEL MUNICIPIO PALAZZO SAN GIAC

Town NAPOLI

Postcode 80133

Country Italy

Webpage www.comune.napoli.it

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: 841 - Administration of the State and the economic and social policy of the community

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **Comune di Napoli**

Department(s) carrying out the proposed work

Department 1

Department name: Central Directorate for Environment, Land and Sea Protection ☐ not applicable

☐ Same as organisation address

Street: via Speranzella 80

Town: Napoli

Postcode: 80132

Country: Italy

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **Comune di Napoli**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **GIUSEPPE** Last name: **PULLI**

E-Mail: **giuseppe.pulli@comune.napoli.it**

Position in org.: Director

Department: Central Directorate for Environment, Land and Sea Protection ☐ Same as organisation

☐ Same as organisation address

Street: via Speranzella,80

Town: Napoli Post code: 80132

Country: Italy

Website: www.comune.napoli.it

Phone 1: +39 081 7958911 Phone 2: +xxx xxxxxxxxx Fax: +39 0817958913

Other contact persons

First Name	*Last Name*	*E-mail*	*Phone*
Paola	Cardone	paola.cardone@comune.napoli.it	+390817954126

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **AEMET**

PIC	***Legal name***
996472271	*AGENCIA ESTATAL DE METEOROLOGIA*

Short name: AEMET

Address of the organisation

Street CALLE LEONARDO PRIETO CASTRO 8

Town Madrid

Postcode 28040

Country Spain

Webpage www.aemet.es

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: L - Real estate activities

Department(s) carrying out the proposed work

Department 1

Department name: Developments and Applications ☐ not applicable

☒ Same as organisation address

Street: CALLE LEONARDO PRIETO CASTRO 8

Town: Madrid

Postcode: 28040

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **AEMET**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name: **José Antonio** Last name: **García-Moya Zapata**

E-Mail: **jgarciamoyaz@aemet.es**

Position in org.: Head of the Innovation Group

Department: Developments and Applications ☐ Same as organisation

☒ Same as organisation address

Street: CALLE LEONARDO PRIETO CASTRO 8

Town: Madrid Post code: 28040

Country: Spain

Website:

Phone 1: +34915819647 Phone 2: +xxx xxxxxxxxx Fax: +34915819767

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
María Yolanda	Luna Rico	mlunar@aemet.es	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **WSP**

PIC	***Legal name***
998050170	*WSP SVERIGE AB*

Short name: WSP

Address of the organisation

Street ARENAVAGEN 7

Town STOCKHOLM

Postcode 121 88

Country Sweden

Webpage http://www.wspgroup.se/en/WSP-Sweden/

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: -

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **WSP**

Department(s) carrying out the proposed work

Department 1

Department name: Civils ☐ not applicable

☒ Same as organisation address

Street: ARENAVAGEN 7

Town: STOCKHOLM

Postcode: 121 88

Country: Sweden

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **WSP**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Anna** Last name: **Åkesson**

E-Mail: **anna.akesson@wspgroup.se**

Position in org.: Engineer

Department: WSP SVERIGE AB ☒ Same as organisation

☐ Same as organisation address

Street: Södra Grytsgatan 7

Town: Norrköping Post code: 60186

Country: Sweden

Website: http://www.wsp-pb.com/

Phone 1: +46-10-722 64 64 Phone 2: +46-72-210 36 73 Fax: +46 (0)10-722 64 76

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ACCIONA**

PIC	***Legal name***
999812854	*ACCIONA INFRAESTRUCTURAS S.A.*

Short name: ACCIONA

Address of the organisation

Street AVENIDA DE EUROPA 18 PARQUE EMPRESA

Town ALCOBENDAS

Postcode 28108

Country Spain

Webpage acciona-infraestructuras.es

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2013 - no

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: F - Construction

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ACCIONA**

Department(s) carrying out the proposed work

Department 1

Department name: Technology & Innovation Division ☐ not applicable

☐ Same as organisation address

Street: Valportillo Street II, 8

Town: Alcobendas

Postcode: 28108

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **ACCIONA**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name: **José Luis** Last name: **Burón Martínez**

E-Mail: **joseluis.buron.martinez@acciona.com**

Position in org.: Head of ICT Research Group

Department: Technology & Innovation Division ☐ Same as organisation

☐ Same as organisation address

Street: Valportillo Street II, 8

Town: Alcobendas Post code: 28108

Country: Spain

Website: http://www.acciona-infrastructure.com/innovation.aspx

Phone 1: +34917912020 Phone 2: +34917912062 Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Manuel	Palomino García	manuel.palomino.garcia@acciona.com	+34917912020
Christian	Baraja Cuadrado	christian.baraja.cuadrado.ext@acciona.com	+34917912020
Javier	Bonilla Díaz	franciscojavier.bonilla.diaz@acciona.com	+34917912020

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **SCC**

PIC	***Legal name***
940854217	*Smart Cities Consulting GmbH*

Short name: SCC

Address of the organisation

Street Anton Krieger-Gasse 143

Town Wien/Vienna

Postcode 1230

Country Austria

Webpage www.smartcitiesconsulting.eu

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no
Non-profit ..... no
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... no
Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2014 - yes
SME self-assessment ..... 2014 - yes
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE Code: 7020 - Management consultancy activities

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **SCC**

Department(s) carrying out the proposed work

No department involved

Department name ☒ not applicable

☐ Same as organisation address

Street *Please enter street name and number.*

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **SCC**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mrs | Sex: ○ Male ◉ Female

First name: **Andrea** | Last name: **Geyer-Scholz**

E-Mail: **andrea.geyer@cyberspace.io**

Position in org.: Managing Director

Department: Smart Cities Consulting GmbH ☒ Same as organisation

☒ Same as organisation address

Street: Anton Krieger-Gasse 143

Town: Wien/Vienna | Post code: 1230

Country: Austria

Website: www.smartcitiesconsulting.eu

Phone 1: +43 676 872971621 | Phone 2: *+xxx xxxxxxxxx* | Fax: *+xxx xxxxxxxxx*

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CABJON**

PIC	***Legal name***
917778984	*County Administrative Board of Jönköping*

Short name: CABJON

Address of the organisation

Street Hamngatan 4

Town JÖNKÖPING

Postcode 551 86

Country Sweden

Webpage www.lansstyrelsen.se/jonkoping

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes
Non-profit ..... yes
International organisation ..... no
International organisation of European interest ..... no
Secondary or Higher education establishment ..... no
Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown
SME self-assessment ..... unknown
SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: -

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CABJON**

Department(s) carrying out the proposed work

Department 1

Department name: Nature ☐ not applicable

☒ Same as organisation address

Street: Hamngatan 4

Town: JÖNKÖPING

Postcode: 551 86

Country: Sweden

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CABJON**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Måns** Last name: **Lindell**

E-Mail: **mans.lindell@lansstyrelsen.se**

Position in org.: Expert in Limnology

Department: Nature Department ☐ Same as organisation

☒ Same as organisation address

Street: Hamngatan 4

Town: JÖNKÖPING Post code: 551 86

Country: Sweden

Website: www.lansstyrelsen.se/jonkoping

Phone 1: +46 10 22 36 408 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Karin	Stridh	karin.stridh@lansstyrelsen.se	+46102236000
Per	Hallerstig	per.hallerstig@lansstyrelsen.se	+46102236000

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CEDEX**

PIC	***Legal name***
999455312	*CENTRO DE ESTUDIOS Y EXPERIMENTACION DE OBRAS PUBLICAS - CEDEX*

Short name: CEDEX

Address of the organisation

Street C/ Alfonso XII 3-5

Town MADRID

Postcode 28014

Country Spain

Webpage www.cedex.es

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... yes

Non-profit ..... yes

International organisation ..... unknown

International organisation of European interest ..... unknown

Secondary or Higher education establishment ..... unknown

Research organisation ..... yes

Legal person ..... yes

Enterprise Data

SME self-declared status ..... unknown

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

NACE Code: -

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CEDEX**

Department(s) carrying out the proposed work

Department 1

Department name: Transport Research Center ☐ not applicable

☐ Same as organisation address

Street: Autovía de Colmenar Viejo km 18.2

Town: Madrid

Postcode: 28760

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **CEDEX**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Ms

Sex: ○ Male ◉ Female

First name: **Laura**

Last name: **Parra Ruiz**

E-Mail: **laura.parra@cedex.es**

Position in org.: Research coordinator

Department: Transport Research

☐ Same as organisation

☐ Same as organisation address

Street: Autovía de Colmenar Viejo km 18,2

Town: Madrid

Post code: 28760

Country: Spain

Website: www.cedex.es

Phone 1: +34913357783

Phone 2: *+xxx xxxxxxxxx*

Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Marcos	Perelli Botello	marcos.perelli@cedex.es	+34913357821

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **City of Linz**

PIC	***Legal name***
941627404	*Landeshauptstadt Linz*

Short name: City of Linz

Address of the organisation

Street Hauptstraße 1-5

Town Linz

Postcode 4010

Country Austria

Webpage www.linz.at

Legal Status of your organisation

Research and Innovation legal statuses

Public body ..... no

Non-profit ..... no

International organisation ..... no

International organisation of European interest ..... no

Secondary or Higher education establishment ..... no

Research organisation ..... no

Legal person ..... yes

Enterprise Data

SME self-declared status ..... 2014 - yes

SME self-assessment ..... unknown

SME validation sme ..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

NACE Code: -

Department(s) carrying out the proposed work

Department 1

Department name	Dept. for Planning, Technology and Envrionment	☐ not applicable
	☒ Same as organisation address	
Street	Hauptstraße 1-5	
Town	Linz	
Postcode	4010	
Country	Austria	

Dependencies with other proposal participants

Character of dependence	***Participant***	

Proposal ID **730355-2** *Acronym* **CLARITY** *Short name* **City of Linz**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr. Sex: (•) Male ( ) Female

First name: **Wilfried** Last name: **Hager**

E-Mail: **wilfried.hager@mag.linz.at**

Position in org.: Head of Working group

Department: Envionmental Management ☐ Same as organisation

☒ Same as organisation address

Street: Hauptstraße 1-5

Town: Linz Post code: 4010

Country: Austria

Website: www.linz.at

Phone 1: 0043 732 7070-3970 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Proposal ID **730355-2** *Acronym* **CLARITY**

3 - Budget for the proposal

No	Participant	Country	(A) Direct personnel costs/€	(B) Other direct costs/€	(C) Direct costs of sub-contracting/€	(D) Direct costs of providing financial support to third parties/€	(E) Costs of inkind contributions not used on the beneficiary's premises/€	(F) Indirect Costs / € (=0.25(A+B-E))	(G) Special unit costs covering direct & indirect costs / €	(H) Total estimated eligible costs / € (=A+B+C+D +F+G) BENEFICIARY	(I) Reimburse-ment rate (%) BENEFICIARY	(J) Max.EU Contribution / € (=H*I) BENEFICIARY	(K) Costs of third parties linked to participant THIRD PARTIES	(L) Max.EU Contribution / € THIRD PARTIES	(M) Total Costs for BENEFICIARY & THIRD PARTIES (=H+K)	(N) Max.EU Contribution / € BENEFICIARY & THIRD PARTIES (=J+L)	(O) Requested EU Contribution / € BENEFICIARY & THIRD PARTIES
1	Atos	ES	675000	36000	0	0	0	177750,00	0	888750,00	70	622125,00	0	0	888750,00	622125,00	622125,00
2	Cis	DE	513258	25000	0	0	0	134564,50	0	672822,50	70	470975,75	0	0	672822,50	470975,75	470975,75
3	Smhi	SE	312550	36000	0	0	0	87137,50	0	435687,50	100	435687,50	0	0	435687,50	435687,50	435687,50
4	Meteogrid	ES	319200	22000	0	0	0	85300,00	0	426500,00	70	298550,00	0	0	426500,00	298550,00	298550,00
5	Zamg	AT	288000	28000	0	0	0	79000,00	0	395000,00	100	395000,00	0	0	395000,00	395000,00	395000,00
6	Lupt-plinvs	IT	323300	36000	0	0	0	89825,00	0	449125,00	100	449125,00	0	0	449125,00	449125,00	449125,00
7	Stockcity	SE	92300	10000	0	0	0	25575,00	0	127875,00	100	127875,00	0	0	127875,00	127875,00	127875,00
8	Ait	AT	393158	102000	50000	0	0	123789,50	0	668947,50	100	668947,50	0	0	668947,50	668947,50	668947,50
9	Eureka	IT	207000	15000	0	0	0	55500,00	0	277500,00	70	194250,00	0	0	277500,00	194250,00	194250,00
10	Comune Di Napoli	IT	89300	11000	0	0	0	25075,00	0	125375,00	100	125375,00	0	0	125375,00	125375,00	125375,00
11	Aemet	ES	176000	27000	0	0	0	50750,00	0	253750,00	100	253750,00	0	0	253750,00	253750,00	253750,00
12	Wsp	SE	92300	10000	0	0	0	25575,00	0	127875,00	100	127875,00	0	0	127875,00	127875,00	127875,00
13	Acciona	ES	229500	7500	0	0	0	59250,00	0	296250,00	70	207375,00	0	0	296250,00	207375,00	207375,00
14	Scc	AT	292572	25100	0	0	0	79418,00	0	397090,00	70	277963,00	0	0	397090,00	277963,00	277963,00
15	Cabjon	SE	92300	10000	0	0	0	25575,00	0	127875,00	100	127875,00	0	0	127875,00	127875,00	127875,00
16	Cedex	ES	112500	15300	0	0	0	31950,00	0	159750,00	100	159750,00	0	0	159750,00	159750,00	159750,00
17	City Of Linz	AT	40000	6000	0	0	0	11500,00	0	57500,00	100	57500,00	0	0	57500,00	57500,00	57500,00
	Total		4248238	421900	50000	0	0	1167534,50	0	5887672,50		4999998,75	0,00	0,00	5887672,50	4999998,75	4999998,75

Proposal ID **730355-2** *Acronym* **CLARITY**

4 - Ethics issues table

1. HUMAN EMBRYOS/FOETUSES		Page
Does your research involve Human Embryonic Stem Cells (hESCs)?	○ Yes ◉ No	
Does your research involve the use of human embryos?	○ Yes ◉ No	
Does your research involve the use of human foetal tissues / cells?	○ Yes ◉ No	
2. HUMANS		**Page**
Does your research involve human participants?	○ Yes ◉ No	
Does your research involve physical interventions on the study participants?	○ Yes ◉ No	
3. HUMAN CELLS / TISSUES		**Page**
Does your research involve human cells or tissues (other than from Human Embryos/ Foetuses, i.e. section 1)?	○ Yes ◉ No	
4. PERSONAL DATA		**Page**
Does your research involve personal data collection and/or processing?	○ Yes ◉ No	
Does your research involve further processing of previously collected personal data (secondary use)?	○ Yes ◉ No	
5. ANIMALS		**Page**
Does your research involve animals?	○ Yes ◉ No	
6. THIRD COUNTRIES		**Page**
In case non-EU countries are involved, do the research related activities undertaken in these countries raise potential ethics issues?	○ Yes ◉ No	
Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	○ Yes ◉ No	
Do you plan to import any material - including personal data - from non-EU countries into the EU?	○ Yes ◉ No	
Do you plan to export any material - including personal data - from the EU to non-EU countries?	○ Yes ◉ No	
In case your research involves low and/or lower middle income countries, are any benefits-sharing actions planned?	○ Yes ◉ No	
Could the situation in the country put the individuals taking part in the research at risk?	○ Yes ◉ No	

Proposal ID **730355-2** *Acronym* **CLARITY**

7. ENVIRONMENT & HEALTH and SAFETY		Page
Does your research involve the use of elements that may cause harm to the environment, to animals or plants?	○ Yes ◉ No	
Does your research deal with endangered fauna and/or flora and/or protected areas?	○ Yes ◉ No	
Does your research involve the use of elements that may cause harm to humans, including research staff?	○ Yes ◉ No	
8. DUAL USE		**Page**
Does your research involve dual-use items in the sense of Regulation 428/2009, or other items for which an authorisation is required?	○ Yes ◉ No	
9. EXCLUSIVE FOCUS ON CIVIL APPLICATIONS		**Page**
Could your research raise concerns regarding the exclusive focus on civil applications?	○ Yes ◉ No	
10. MISUSE		**Page**
Does your research have the potential for misuse of research results?	○ Yes ◉ No	
11. OTHER ETHICS ISSUES		**Page**
Are there any other ethics issues that should be taken into consideration? Please specify	○ Yes ◉ No	

I confirm that I have taken into account all ethics issues described above and that, if any ethics issues apply, I will complete the ethics self-assessment and attach the required documents. ☒

How to Complete your Ethics Self-Assessment

Proposal ID **730355-2** *Acronym* **CLARITY**

5 - Call specific questions

Declarations on stage-2 changes

The full stage-2 proposal must be consistent with the short outline proposal submitted to the stage-1- in particular with respect to the proposal characteristics addressing the concepts of excellence and impact.

Are there substantial differences compared to the stage-1 proposal?	○ Yes	◉ No

Data management activities

A new focus within Horizon 2020 is data management, for example through the use of Data Management Plan (DMP).

DMPs detail what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

The use of a DMP is required for projects participating in the Open Research Data Pilot in the form of a deliverable in the first 6 months of the project (possible updates during the project).

Other projects are invited to submit a DMP if relevant for their planned research.

Are data management activities relevant for your proposed project?	◉ Yes	○ No
A Data Management Plan will be delivered (Please note: a Data Management Plan (DMP) is required for projects participating in the Open Research Data Pilot in Horizon 2020, in the form of a deliverable in the first 6 months of the project. All other projects may deliver a DMP on a voluntary basis, if relevant for their research).	☒	
Data Management is part of a Work Package.	☒	
Data Management will be integrated in another way.	☐	

Please indicate how data management will be addressed in your project:

Please indicate how data management will be addressed in your project.

Open Research Data Pilot in Horizon 2020

Proposal ID **730355-2** *Acronym* **CLARITY**

If selected, all applicants will participate in the Pilot on Open Research Data in Horizon 2020 , which aims to improve and maximise access to and re-use of research data generated by actions.

Participants in the Pilot will be invited to formulate a Data Management Plan (DMP). DMPs detail what data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

Participating in the Pilot is flexible in the sense that it does not mean that all research data needs to be open. Rather, projects can define certain datasets to remain closed via a Data Management Plan (DMP).

Applicants also have the possibility to opt out of this Pilot. In this case, applicants must indicate a reason for this choice (see options below).

Please note that participation in this Pilot does not constitute part of the evaluation process. Proposals will not be penalised for opting out.

We wish to opt out of the Pilot on Open Research Data in Horizon 2020.	○ Yes	◉ No

Integrated Climate Adaptation Service Tools for Improving Resilience Measure Efficiency

SC5-01-2016-2017

Exploiting the added value of climate services

a) Demonstration of climate services

List of participants:

No.	Participant organisation name	Country	ORG.	Stakeholder Type
1	**Atos Spain S.A. (ATOS)**	ES	IND	Tech. Provider
2	cismet GmbH (CIS)	DE	SME	Tech. Provider
3	SVERIGES METEOROLOGISKA OCH HYDROLOGISKA INSTITUT (SMHI)	SE	GOV	Supplier/ Purveyor
4	FARISA ASESORES Y CONSULTORES S.A. (METEOGRID)	ES	SME	Purveyor
5	Zentralanstalt für Meteorologie und Geodynamik (ZAMG)	AT	GOV	Supplier
6	Universita' Degli Studi Di Napoli Federico II - PLINIVS Centre (PLINIVS -LUPT)	IT	UNI	Purveyor
7	STOCKHOLMS STAD (StockCity)	SE	GOV	End-User
8	AIT Austrian Institute of Technology GmbH (AIT)	AT	RTO	Tech. Provider/ Purveyor
9	Eureka Comunicazione Telematica srl (EUREKA)	IT	SME	Tech. Provider
10	Municipality of Naples (NAPOLI)	IT	GOV	End-User
11	Agencia Estatal de Meteorología (AEMET)	ES	GOV	Supplier
12	WSP Sverige AB (WSP)	SE	IND	Purveyor
13	ACCIONA Infraestructuras S.A. (ACCIONA)	ES	IND	End-User
14	Smart Cities Consulting GmbH (SCC)	AT	SME	Purveyor
15	County Administrative Board of Jönköping (CABJON)	SE	GOV	End-User
16	Centro de Estudios y Experimentación de Obras Públicas (CEDEX)	ES	GOV	End-User
17	City of Linz (LINZ)	AT	GOV	End-User

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1. Excellence

"Climate change is underway and cannot be stopped completely. Action to mitigate greenhouse gas emissions is essential to avoid the worst effects over the longer-term. However, some changes are already built into the climate system, with inevitable consequences. CLARITY will use the IPCC recommendations to address relevant natural hazards and use the IPCC findings regarding adaptation and mitigation actions as "Disaster Risk Management and Adaptation to Climate Change Share Many Concepts, Goals, and Processes … Both fields share a common interest in understanding and reducing the Risk created by the interactions of human with physical and biological systems. Both seek appropriate allocations of risk reduction, risk transfer, and disaster management efforts, for instance balancing pre-impact risk management or adaptation with post-impact response and recovery. Decisions in both fields may be organized according to the risk governance framework." (SREX[1]). Consequently, disaster risk management and climate change adaptation planning have much in common and should be considered together.

Unless the vulnerabilities and risks are managed appropriately, climate change will increasingly affect project performance and the investments made in these projects" [EU-GL][2].

Urban infrastructure is a long-term investment due to the lifetime of the individual assets such as roads, bridges and railways. The effects of climate change are highly relevant and the smart use of existing climate intelligence for increasing urban resilience has a high potential to generate benefit for businesses and society. Urban areas and traffic infrastructure linking such areas are highly vulnerable to climate change: (1) built up areas can create unique microclimates in terms of temperatures, wind and humidity (e.g. urban heat island effect, urban canyons, urban drainage); (2) urban areas are characterized by high density of built up areas, infrastructure and population; (3) city dwellers are particularly susceptible to vulnerabilities in infrastructure (e.g. drainage, sewers, transportation or energy systems); and (4) well-functioning traffic infrastructure is essential for the economy as well as for the well-being of the citizens.

1.1 Objectives

Overarching objective of CLARITY is to **demonstrate the benefit of climate services for climate proofing of vulnerable large-scale investments** such as urban infrastructure. The six underlying measurable objectives are:

O1 Develop an integrated Climate Services Information System (CSIS) for resilience assessment and climate-proofing of the large scale infrastructure projects – The CLARITY CSIS will support the infrastructure planners and managers, in the task of climate-proofing large scale infrastructure projects. CSIS will be designed as an eco-system of cloud-based climate services and provide support for: Identification of project climate sensitivity (extensible to new project types); evaluation of the exposure to climate hazards under future climate conditions (anywhere in EU); assessment of vulnerability to observed and future climate (extensible to new project types); risk assessment in an all-hazard approach context; identification and appraisal of the adaptation options; development of adaptation action plans (sec. 1.3.1, WP1/T1.3).

O2 Maximize the re-use and tailoring of existing data, technologies and services – CSIS will integrate and customize core climate services such as Copernicus Climate Change Services (C3S), in order to provide the basis data on current climate and land cover (e.g. ECA&D, E-OBS, Copernicus Land Monitoring Services), downscaling services (e.g. SUDPLAN, EURO-CORDEX), seasonal (ECMW IFS, NCEP CFS) and long term (IPCC) climate predictions (sec. 1.3.2). It will enrich the climate projections with domain specific information such as population density, population structure, building substance and land use, in order to answer the needs of the end-users that are involved in CLARITY demonstrators and other stakeholders (see O3). The basic data set will be available for the whole EU (e.g. based on INSPIRE data), and the users will have a possibility to improve the service by providing additional or more accurate data for their region/location. CLARITY inherits from projects in the areas of Climate change and Urban planning, disaster preparedness as well as Future Internet technology. The re-use of existing data, technologies, services and concepts in CLARITY CSIS is explained in section 1.3.2 and the actual work needed to integrate this background in CLARITY will be performed within the scope of WP2/T2.2 (data re-use) WP3 "Science Support" (model re-use) and WP4 "Technology support" (technology reuse).

[1] ipcc-wg2.gov/SREX

[2] European Commission, 2011. Non-paper Guidelines for Project Managers: Making vulnerable investments climate resilient. Final report of service contract no. 071303/2011/610951/SER/CLIMA.C3 ("Guidelines for project managers: 'climate proofing' of vulnerable investments"). Acclimatise, UK, and COWI A/S, DK.

O3 Co-design and Co-develop with suppliers, purveyors and end-users - Climate service development will be facilitated by a bottom up approach with integral stakeholder and end user involvement (user-centred design). CLARITY climate services will be co-developed by city planners, consultants and providers of the climate intelligence and end-users from urban and regional planning as well as infrastructure providers. In an AGILE and iterative process, the CLARITY development team shall identify and close concrete gaps between policy and its implementation, address societal acceptance, as well as the operational and exploitation requirements (sec. 1.3.3, WP1/T1.2, T1.3).

O4 Demonstrate and validate the added value, flexibility and adjustability of the CLARITY Services to national and/or regional differences - CLARITY will implement four representative demonstration cases to *validate concepts, methods and software and to measure the added value of CLARITY for the users within and outside consortium.* The demonstration cases will focus on climate-proofing of large scale investments with appropriate geographical, climatic, and investment type representation. The demonstrations will lean on existing climate-proofing efforts in the four locations (see 1.3.4, WP2) and enlarge the knowledge base. With the help of the CLARITY community (see O5), we will also assess and maximize the result transferability to other sites and assure that the services are flexible enough to address new adaptation measures and risk reduction options under differing conditions (sec. 1.3.4, sec. 1.4, O3, O5, WP2/T2.3, T2.4).

O5 Create a CLARITY community - To be able to scale up the results of the project we will create and manage a CLARITY community encompassing the different stakeholder categories (see O3). The community will grow throughout the project to prepare the uptake and become a core of future sustainability. Communication will aim at creating awareness and interest for CLARITY results and activities and interest to join the CLARITY Community; dissemination activities will aim at recruiting members into the CLARITY Community and engaging with members to obtain feedback (sec. 2.2.1, WP6/T6.3, T6.4).

O6 Make fit for Exploitation - CLARITY aims to assure that the project results are turned into an operational and sustainable Climate Services deep-seated in the existing CC adaption data and tools landscape. This will be achieved by: (1) the development and advertising of an inclusive business plan that allows the third party developers and service providers to benefit from use of the CLARITY Services; (2) provision of the documentation and feature videos for potential users and integrators; (3) technical compatibility of CLARITY with established data and service infrastructures such as existing CC adaptation platforms and research infrastructures; and (4) development of a mature software based climate service that will reach the pre-operative phase by the end of the second project year, that supports the exploitation strategy and addresses the operational and organisational needs of the target users. (sec. 2.2.2, T1.4, WP5, WP6)

1.2 Relation to the work programme

In the following we address the scope section “SC5-01-2016: a)” of the SC5-01 call and explain how we are addressing the individual requirements.

To measure the added value of climate services for end-users, they must be 'user-centric'. Climate services need to be co-designed and co-developed through close collaboration of suppliers/purveyors and users” (O3, O5, sec. 1.3.3, sec. 1.3.4, WP1/T1.2, T1.3) → CLARITY brings together European weather service providers that are key suppliers of climate intelligence, purveyors including environmental consultancy companies, centres of competence and private climate services with end users such as in urban and infrastructure planning that have a concrete need for climate services in the context of planning, designing building and operation of vulnerable large scale infrastructures. The end user partners directly involved in CLARITY as well as the members of the CLARITY community will be considered customers whose concrete requirements will determine the offer created. For this the project will pursue an AGILE development approach very successfully followed e.g. in the Switch-On project (FP7-603587, 2013-2017, www.water-switch-on.eu), coordinated by SMHI already during the project presented as a success story by the commission[3], where the concrete user need is considered the “centre of gravity” and users are continuously involved in the co-creation of the result.

User-driven demonstration of climate services in sectors or business **networks in which their deployment can already take place at the current state of knowledge, or with limited incremental efforts (O1, O2, sec. 1.3.2, WP2/T2.3)** → CLARITY will focus on the area of climate proofing urban large scale infrastructure where the basic market has been created through legal requirements. A comprehensive and mature EU-Guideline on how to

[3] Investing in European success. A Decade of Success in Earth Observation Research and Innovation - Directorate-General for Research and Innovation Directorate I – Climate Action and Resource Efficiency Unit I.4 – Climate Action and Earth Observations

address the topic is available since 2011 and a comprehensive set of tools and services to apply the guideline are desperately needed. CC and domain data required is largely available. CLARITY will be based on the results of FP7 climate change, future internet and crisis preparedness projects (SUDPLAN, ENVIROFI, CRISMA) with an average TRL of 4-5. This allows us to start the project with an early deployment of prototypic climate services and mature the climate services from there. The additional development effort will go into the fulfilment of real end user requirements and the operationalization of the software.

Need to prove the maturity and sustainability of the concept, while also addressing the replicability and marketability of the proposed services **(O4, O6, T1.4, T2.4, T5.4)** → Combining mature concepts of climate adaptation planning, decision support for disaster preparedness paired with cutting edge technologies will allow the assessment of effects of different adaption and risk reduction measures on urban infrastructure. The major objective is to enable the creation of climate-proof urban environments that are both sustainable and pleasant to live in. Improving knowledge about the performance of potential adaptation measures at the site, CLARITY will reduce risk of mal-adaptation, and contribute to more effective adaption strategies. As a result, vulnerable large scale investments will be better protected from the effects of CC. *Clarity aims to enable project managers and other stakeholders of large-scale implementation projects to properly assess, dimension, and incorporate innovative adaptation and long term risk reduction options into their implementation projects and incorporate the findings in future planning (adaptive management).*

Respond to a formulated need for climate services by end-users that are served by climate service suppliers or business intermediaries; … the activity needs to be co-designed and co-developed with these end-users ***(O3, O4, O5, sec. 1.3.1, sec. 1.3.4, WP1/T1.2, T1.3)*** → The needs for CC resilience planning are well established (see 1.3.1). Main end-user concern is to make the task of the climate-proofing the large scale investments manageable within the bounds of the overall project plan and to reduce the risk of mal-adaption. In order to address these concerns, the CLARITY demonstration development teams will consist of providers, purveyors and end-users. Together with core technology providers, these teams will be integral part of the demonstrator development and owners of the results.

Demonstration of climate services in relation to issues where climate-related intelligence can support tangible decision-making processes in the public or private domain ***(O4, WP2/T2.3)*** → Supporting (resilience-)design decisions in the context of (urban) large scale investments such as transport infrastructure. Urban planners, construction engineers, environmental consultants and project managers in construction companies involved in the design, building and operation of these infrastructures are the target end-users of the CLARITY climate service. They will be supported in their work by CLARITY CSIS on several levels (see O1). The outcome of infrastructure projects supported by CLARITY climate services are climate-proof assets where CC resilience has to be taken into account by design. The use and usability of CLARITY will be demonstrated through four demonstration cases (see O4).

The added value of the climate service provided has to be measurable and should be validated by the end-users collaborating in the demonstration projects ***(O4, WP2/T2.4)*** → The use of CLARITY climate services will contribute to climate resilience by design approach in large scale infrastructures and reduce the risk of mal-adaption. Without climate services such as provided by CLARITY individual, time intensive and costly and non-transferable CC impact studies have to be performed. CLARITY will speed up the process and increase the quality of the results. Metrics regarding both aspects will be used in the validation process of the four demonstration cases.

Communicate the added value of the services to other relevant end-user communities that must be specified ***(O3, O5, WP6/T6.3)*** → The addressed communities include: Climate Service Providers such as public and private meteorological offices; infrastructure design and environmental consulting companies; urban administrations and other public and private bodies dealing with large scale infrastructure investments vulnerable to the effects of climate change such as Infrastructure operators.

The typical end-users are urban planners, construction engineers, environmental consultants and project managers in construction companies involved in the design, building and operation of these infrastructures. The new knowledge created with the help of CLARITY climate services can also be used to inform or consult the public about specific resilience design decision that might affect the public life (e.g. retention capacity necessitates relocation of homes).

Adequately address the barriers which currently hamper the full deployment of climate services in the given area and solutions to tackle these ***(O1, O2, O6, T1.2, T5.1)*** → The project foresees two to types of requirement elicitation activities. T1.2 will focus on end-user requirements (functionality) where T5.1 will focus on requirements for the successful deployment and exploitation of CLARITY climate services. Main barriers include: (1) the fragmentation of tools and information; and (2) exceedingly high level of knowledge that is required to use the currently available tools and services. CLARITY climate services will considerably lower these barriers by providing an end-to-end solution to address the climate sensitivity and adaptation problem. The CLARITY offer will be based on the sound conceptual basis that is provided by the prominent EU-guideline.

The… action … may be part of a larger development (e.g. infrastructure, wind farm) that is funded by additional or follow-up resources, be it private or public ***(O4 ,sec. 1.3.4.x)*** → The four demonstration cases connect to the design, planning and operation of real infrastructure projects in their respective locations (e.g. Stockholm road bypass tunnel, Spanish railways) addressing hazards that are induced or amplified by climate change, such as flooding or heat impacts. Through the Community Building Process, CLARITY aims to connect urban infrastructure projects that are supported by European Structural and Investment Funds[4] such as ERDF CF, ETC, ESF, EAFRD and EMFF.

1.3 Concept and approach

CLARITY will provide a cost-effective mean to assess the expected performance of adaptation and risk reduction options by providing operational indicator based resilience assessment services. This will effectively enable project managers to integrate cc-resilience into large-scale investment projects. In order to answer to a concrete need and maximize the societal benefits, CLARITY will primarily concentrate on the issue climate-proofing the urban areas and transport networks. It will support planning measures to increase resilience aiming to climate-proof the infrastructure as well as those aiming to lower the impact of climate change on population.

Starting from the baseline described in 1.3.2, CLARITY aims to become THE operational climate resilience planning and assessment service for large-scale implementation projects that will be demonstrated within the project scope in T2.3 and beyond the project scope in T5.4 (see also sec. 2.2.2). It will allow the users to assess the impact of alternative planning measures for long-term climate-change risk reduction.

Analysis of the "beyond the state of the art" elements of the CLARITY proposal is presented hereafter.

1.3.1 CLARITY climate service concept and key functionality

In line with the recommendations of the EC working document on "Adopting infrastructure to climate change"[5], CLARITY will make use of the "Non-paper Guidelines for Project Managers: Making vulnerable investments climate resilient" [EU-GL] as the baseline specifications of clarity climate services. In this way, CLARITY will be closely aligned with the existing best practice recommendations and therefore compliant with related ongoing developments. Functions of the five modules that are defined in this document are illustrated in the Figure 1. CLARITY will feature: downscaling of climate change projections to regional/local scale that is applicable for any part of the EU; mapping of this new knowledge to concrete large scale infrastructure projects; meaningful impact, vulnerability and adaptation potential indicators and criteria; projection of the vulnerability, risks and (usability of) adaptation options that have been established for specific project in the past to similar projects and areas with similar climate; and user-defined similarity metrics for project and climate similarity. Resulting CLARITY climate services will allow the end-users to explore alternative resilience scenarios with respect to: (1) variable local context; (2) selection of relevant climate intelligence (based on representative CC Scenarios); (3) varying hazard intensities; (4) flexible exposure scenarios; (5) possible variations and alternative selection of options. Apart from the decision-support functions, the climate service will also support integration of the data and simulation model results, as well as management of simulated risk and adaptation scenario information.

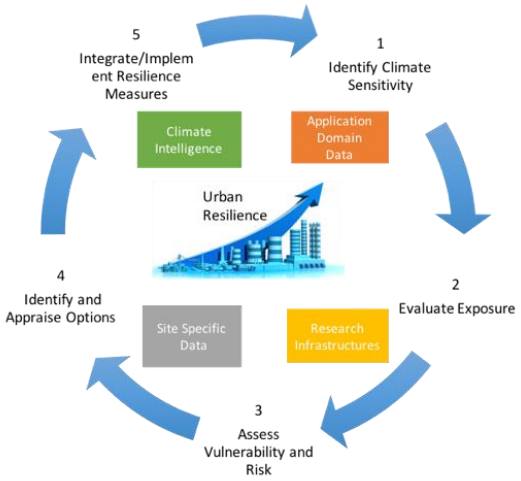


Figure 1: Modules for climate resilient investments

[4] ec.europa.eu/regional_policy/en/information/legislation/regulations
[5] European Commission, 2013. Adapting infrastructure to climate change. SWD (2013) 137 final

1.3.2 Extending the CLARITY baseline

To develop the CLARITY climate services from scratch would be prohibitively expensive due to the volume of required data, the complexity of the Graphical User Interface (GUI) and the technical task of integrating the modules shown in the Figure 1 into an overall work flow. Fortunately, the baseline implementations of the required elements are already available for all the key functions. This includes: services for access to CC information, in particular the basis data on current climate and land cover (e.g. ECA&D[6], E-OBS[7], Copernicus Land Monitoring Services[8]), downscaling services (e.g. SUDPLAN[9], EURO-CORDEX[10], C3S Copernicus Climate Change Services[11]), seasonal (ECMW IFS[12], NCEP CFS[13]) and long term (IPCC[14]) predictions; modules for risk and impact assessment; as well as the modules for decision support functions like multi-criteria analysis, cost-benefit analysis and highly-interactive spatial visualization.

A considerable part of the project effort will therefore be directed towards the integration of climate service enablers into user demand driven climate services. Large part of the CC information is available on European scale online, often free of charge. This information will be integrated into the CLARITY climate services, together with other open governmental data that is relevant for the project (e.g. INSPIRE data). In order to meet the user-needs, further climate indicators and downscaling products will be provided within the CLARITY, which will be available for the end-users in demonstration cases and for external licensed users. This includes offering a web-based functionality for delivering user customizable indicators, which will combine and add value to the available climate data, while fitting and answering to user needs and specifications. In addition, potential customers will be able to order more advanced tailored data packages, such as additional indicators or more advanced tailoring functionalities to a pre specified cost. We also foresee the possibility of offering on-demand consultancy work, for example by extending the set of indicators with data from a new topic of interest (e.g., health related) or to setup the services for a new location or time frame (see also sec. 2.2.2). The base functionality of CLARITY is inherited from following projects:

CLARITY builds on the architecture and technology of **ENVIROFI** (The Environmental Observation Web and its Service Applications within the Future Internet, FP7-284898, 2011-2013, www.envirofi.eu) project. ENVIROFI has demonstrated how to efficiently use the FI-Ware generic enablers from the “Cloud Hosting”, “Data/Context Management” and Applications/Services and “Data Delivery” FI-Ware chapters in environmental applications (“Future Internet technologies for environmental applications”, doi:10.1016/j.envsoft.2015.12.015). ENVIROFI architecture aims at making the integration of all required tools and services as smooth and affordable as possible, using state-of-the-art tools and service infrastructure from environmental and Future Internet domains.

The **SUDPLAN** project (Sustainable Urban Development Planner for Climate Change Adaptation, FP7-247708, 2010-2012, sudplan.eu) provides a methodology to integrate CC effects into long term urban planning. In order to infuse CC signals into local conditions, decision makers provide local data. This improves the downscaling of climatic and environmental variables, based on the output of a regional climate model (RCM), resulting in improved projections of environmental conditions in the appropriate scale for the local planning process. Downscaling is performed by a set of climate projection services (models) that deliver data describing air quality, rainfall intensity, frequency and duration and hydrological conditions like soil moisture, and surface water resources. The planning process is supported by the SUDPLAN Scenario Management System that links all relevant back-end components together, thus providing end users with a highly interactive scenario execution environment, including 2D and 3D visualisation.

The **CRISMA** project (Modelling crisis management for improved action and preparedness, FP7-284552, 2012-2015, www.crismaproject.eu) provides sound concepts for modelling hazard and impact scenarios as a baseline for the simulation of the effects of alternative planning and response measures. CRISMA provides a seamless concept that connects impact modelling and simulation, including mitigation/adaptation options and state of the art decision support methods that allow prioritisation of intervention actions. CRISMA delivers solutions for time

[6] http://eca.knmi.nl/
[7] http://www.ecad.eu/download/ensembles/ensembles.php
[8] http://land.copernicus.eu/
[9] http://sudplan.eu/
[10] http://www.euro-cordex.net/
[11] https://climate.copernicus.eu/
[12] http://www.ecmwf.int/en/research/modelling-and-prediction/atmospheric-dynamicsnecp
[13] http://cfs.ncep.noaa.gov/
[14] http://www.ipcc.ch/

dependent vulnerability, cascade events and effects, economic impact (including cost benefit analysis) and decision support (including indicators and criteria). CRISMA provides advanced tools for crisis scenario simulation and information management designed to facilitate decision-making and allows decision makers to correlate and compare simulation results and to estimate the effects of alternative adaptation and response activities. Both CRISMA and SUDPLAN have a strong focus on human factors, aiming to make the use of the decision support tool in a complex decision environment as easy and effective as possible.

The TaToo project (Tagging Tools based on a Semantic Discovery Framework, FP7-247893, 2010-01-01) provides a backbone for CLARITY scenario transferability (see T4.4), in form of the "climate twins" idea and software.

The recent **Copernicus Climate Change Services (C3S)** has a vision to be an authoritative source of climate information for Europe and various ongoing projects aim at streamlining the C3S services for a more effective use of climate data in long-term planning. The **SWICCA**[15] (2015-2018) project serves as a proof-of-concept for a Sectorial Information Service (SIS) on water management, providing data and guidance for climate impact assessments in the water sector and ensuring that the available information is useful for water management at local and regional scales across Europe. The project aims at bridging the gap between institutes that provide climate-impact data on one side, and water managers and policy makers on the other. The C3S proof-of-concept project **Urban SIS**[16] (2015-2017) aims to deliver climate and impact indicators, with a focus on the infrastructure and health sectors, at fine resolution over selected European urban areas. This information will be delivered in a format useful for urban planners, engineers, consultants and scientists, as input to local models or dimensional calculations addressing urban hazards driven by intense rainfall, heat waves and air pollution. CLARITY will incorporate these new services, add new value to the data, and show how information about the past, current and future states of the climate can be used to increase the resilience of the European infrastructure.

CLIPC (FP7-607418, 2013-2016, www.clipc.eu) provides a consolidated understanding of user requirements and climate impact indicators based on a thoroughly user consultation and engagement.

The **EURO-CORDEX** project (WCRP, 2009-, www.euro-cordex.net) is the European branch of the international CORDEX initiative, which is a program sponsored by the World Climate Research Program (WRCP) to organize an internationally coordinated framework to produce improved regional climate change projections as input for climate change impact and adaptation studies. The EURO-CORDEX simulations consider the RCPs scenarios used within the framework of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). The model data provided by EURO-CORDEX project will be used in CLARITY for analysis of the long-term regional climate projections on the European scale and as input for further downscaling of future climate scenarios on the local scale.

The **UHI** project (INTERREG CE, 2011-2014, eu-uhi.eu) provides database for state-of-the-art development and application of mitigation and adaptation strategies and measures for counteracting the UHI phenomenon in the Central European cities. The methodology for downscaling of urban climate scenarios will follow the approach applied in the IVF project **Urban climate in Central European cities and global climate change**[17] (2014-2015, www.klimat.geo.uj.edu.pl/urbanclimate/about.html). The Austrian national projects: **SISSI-I+II**[18] (BMWFW, 2010-2011), **FOCUS-I**[19] (ACRP/KLIEN, 2011-2013), **UFT-ADI**[20] (ACRP/KLIEN, 2011-2013), **KELVIN**[21] (FFG Cities of Future, 2014-2015) provide database for climate change scenarios for urban regions in Austria and simulations of efficiency of adaptation measures including effects of green roofs and albedo changes on the urban climate.

Integrated Forecast System (**IFS**[22]) provided by the European Centre for Medium-Range Weather Forecast and Climate Forecast System (**CFS**[23]) model developed by the National Centres for Environmental Prediction (NCEP) will be used as base for the seasonal forecast for the prediction horizons from 30 days to 12 months. The NOAA CFS is a fully coupled model representing the interaction between the Earth's atmosphere, oceans, land and sea-ice. The ECMWF uses the last version of the IFS (model cycle 36r4) and the atmosphere model uncertainties are

[15] http://swicca.climate.copernicus.eu/
[16] http://urbansis.climate.copernicus.eu/
[17] http://www.klimat.geo.uj.edu.pl/urbanclimate/about.html
[18] http://www.bmwfw.gv.at/
[19] https://www.klimafonds.gv.at/assets/Uploads/Projektberichte/ACRP-2009/03032015FOCUSZuvela-AloiseEBACRP2B060373.pdf
[20] https://www.klimafonds.gv.at/assets/Uploads/Projektberichte/ACRP-2010/20150716UFT-ADIACRP3EB.pdf
[21] https://nachhaltigwirtschaften.at/de/sdz/projekte/kelvin-reduktion-staedtischer-waermeinseln-durch-verbesserung-der-abstrahleigenschaften-von-gebaeuden-und-quartieren.php
[22] ECMWF, www.ecmwf.int/en/forecasts/documentation-and-support/evolution-ifs/cycles/technical-description-seasonal
[23] http://cfs.ncep.noaa.gov/

simulated using the 3-time level stochastically perturbed parameterized tendency (SPPT) scheme and the stochastic back-scatter scheme (SPBS) operational in the Ensemble Prediction System (EPS). For multiannual forecasting, also called 'decadal' or 'near-term' climate forecasting, climate models range from a year to a decade ahead (usually 5 years). These predictions take in account both natural variability and climate change, and they are expected to be similar in nearby regions over the same forecast period (www.metoffice.gov.uk/research/climate/seasonal-to-decadal/long-range/decadal-fc). Since reliability of these products is still very limited, CLARITY will integrate specific probabilistic predictions for use in sectors of engineering and road management that will be evaluated emphasizing the associated uncertainty.

The **RESCCUE** project (RESilience to cope with Climate Change in Urban arEas, H2020-700174, 2016-2020) uses a multi-sectorial approach focusing on water to estimate the probability of strong climate anomalies and/or weather extreme events using the CFS ensemble of 25 members. In addition, simulations from the downscaled decadal models will be analysed and an ensemble of its projections will be performed in order to measure the probability of climatic anomalies. In this project, Climate Research Foundation (FIC) participates with the collaboration of Meteogrid and the methodological approach will be used and adapted in the CLARITY project.

The **EUPORIAS** (European Provision Of Regional Impacts Assessments on Seasonal and Decadal Timescales, FP7-308291, 2012-2017, www.euporias.eu) is a four-year collaborative project made up of 24 partners from across Europe bringing together a wide set of expertise from academia, the private sector and the national met services to develop a few fully working prototypes of climate services addressing the need of specific users. The time horizon of climate services is set between a month and a year ahead with the aim of extending it towards the more challenging decadal scale. The methodological approach used in the project will be considered for CLARITY.

The **SPECS** project (Seasonal-to-decadal climate Prediction for the improvement of European Climate Services, FP7-308378, 2012-2017, www.specs-fp7.eu) undertakes research and dissemination activities to deliver a new generation of European climate forecast systems, with improved forecast quality and efficient regionalization tools to produce reliable, local climate information over land at seasonal-to-decadal time scales, and provide an enhanced communication protocol and services to satisfy the climate information needs of a wide range of public and private stakeholders. The project results and the methodology will be considered in the CLARITY project.

The European Climate Adaptation Platform (**CLIMATE-ADAPT, climate-adapt.eea.europa.eu**) is an initiative of the European Commission to support the access and share of data and information in adapting to climate change. The partnership between the European Commission (DG CLIMA, DG Joint Research Centre and other DGs) and the European Environment Agency provides support on expected climate change in Europe, current and future vulnerability of regions and sectors, EU, national and transnational adaptation strategies and actions and adaptation case studies and potential adaptation options and tools that support adaptation planning. The information included in the CLIMATE-ADAPT database will be used in CLARITY for reference regarding the state-of-the-art adaptation in Europe (observations and scenarios, vulnerabilities and risks, adaptation measures, national adaptation strategies, research projects), existing support tools and case studies.

SIGyM[24] is a geographical information system (GIS) platform which combines geo-information, other modelling tools and non-spatial information which are specific for each domain of application. The platform developed by METEOGRID for Spanish Environment Ministry, has some unique characteristics which are the result of analysing and implementing end-user experience and needs and which are required for the development of a meteorological & climate decision support system. The system is accessible through Internet, with a high inter-operability with other legacy systems and data sources, making use of OGC standards (WMS, WFS). It is a powerful tool integrated in a GIS platform, which allow users to define their own warning parameters, setting up the area (e.g., high-speed stretch from Madrid to Toledo), variables and warning thresholds (e.g., yellow warning if the probability of maximum wind gust perpendicular to the path over 100 km/h, exceeds 20%), and the warning mode. It is a very useful and innovative system, which have already been operational for Spanish railway managers.

[24] http://www.meteogrid.com/productos/sigym/

1.3.3 End user involvement and validation approach

Together with providers and purveyors the end-user partners will be involved in all core activities, engaging them in a user-centred design process. Early in the project they will assess the fundamental concepts and development plans based on functional experiments and interactive prototypes. During the project, the end-user partners will assess the progress continuously and provide feedback and recommendations to the development teams. The feedback will be collected using such techniques as interviews, focus groups, and a dedicated web questionnaire to facilitate the processing of the feedback.

1.3.4 Demonstration cases

CLARITY will implement four demonstration cases (DC) showcasing CLARITY climate services in different climatic, regional, infrastructure and hazard contexts in Italy, Sweden, Austria and Spain.

1.3.4.1 DC1 - Adaptation Scenarios for Metropolitan Resilience Planning (Naples, IT)

The Metropolitan City of Naples is located in the Campania region. It includes 92 municipalities. The metropolitan area is characterized by a territorial extension of 1,171km^2, a population of about 3 million and a high population density of about 2.7k pop./km^2. The effect of climate change on precipitation and temperature variables increases the vulnerability of the territory to hydrogeological events, floods, droughts and heat waves. Recent studies at EU level have shown that heat wave events will become more frequent and intense, with health effects accentuated in Mediterranean areas (Åström et al., 2013[25]). This is confirmed by local studies for the Metropolitan area of Napoli, where UHI phenomena aggravate the potential impact of heat waves. The risks connected to increasing summer temperatures have health consequences especially for vulnerable population groups. Current precipitation patterns already cause frequent flash (pluvial) floods and landslides risks in many areas. Different hazard scenarios are related to the variation in precipitation, showing a general reduction in terms of seasonal average (thus resulting in drought risks), but a significant increase in the frequency and intensity of extreme events, aggravated by local factors related to soil sealing and reduced presence of green cover in urban areas. Studies conducted in the Campania Region context (Olivares et al., 2014[26]) integrating climate and hydro simulation, show a significant increase in the occurrence of landslide phenomena: the ratio between the number of events estimated in the period 2071-2010 (RCP 8.5) and that observed in the period 1981-2010 is about double (7 vs 3). In recent years, significant advancements in the field of climate modelling have been achieved at National level, producing reliable climate change scenarios based on the downscaling of GCMs from IPCC emissions scenarios, which have been considered by the Italian Ministry of Environment in the development of the National Strategy for Climate Change Adaptation (MATTM, 2014[27]). Nevertheless, the larger part of this is still scarcely taken into account in territorial planning and urban development actions at regional and local level. This results in a lack of local stakeholder awareness about the need of embedding effective adaptation and mitigation measures into urban planning and building/public space design activities.

Demonstration Case Planning Goals

CLARITY will demonstrate the translation of climate information into actionable results in terms of adaptive design and resilience-based planning, having as main output the implementation of the Adaptation Plan of the Metropolitan City of Naples. The planning support will focus on the reduction of impacts from heat waves, pluvial floods and landslides in the short, medium and long period, linking climate data, vulnerability assessment and potential adaptation/mitigation options across multiple scales of intervention (from urban planning, to neighbourhood scale regeneration and building/open spaces retrofitting), aiming at reducing aggravating factors due to urban and territorial conditions (e.g. obsolescence of building stock and transport networks, urban canyons, lack of green cover, lack of maintenance of river basins and channel, etc.), able to strongly amplify the effect of temperature and precipitation extremes.

[25] Heat-related respiratory hospital admissions in Europe in a changing climate: a health impact assessment, BMJ Open, 3:e001842, 7

[26] Olivares, L., Damiano, E., Mercogliano, P. et al. (2014). A simulation chain for early prediction of rainfall-induced landslides. *Landslides*. Volume 11, Issue 5, pp 765–777.

[27] MATTM - Ministero dell'Ambiente dalla Tutela del Territorio e del Mare (2014), *Strategia Nazionale di Adattamento ai Cambiamenti Climatici*.

Demonstration Scenario

The main objective of Naples demonstration case is to support public administration at Metropolitan and Municipal level in developing the local adaptation plan based on EU Directives and the National Strategy for Climate Change Adaptation.

The implementation of the Adaptation Plan will be based on the exploitation of advanced climate services provided by the CLARITY platform, which will include:

- the creation of a GIS environment for the visualization of climate change impact scenarios and vulnerability levels of selected elements at risk;
- the definition of short- to long-term adaptation options for urban environment (buildings, open spaces and infrastructure) to reduce the impact of relevant climate-related hazards in the area;
- the implementation of a set of performance indicators to assess the potential multi-sectoral benefits of adaptation options;
- the cost-benefit assessment of alternative adaptation scenarios for the Metropolitan City and the Municipality of Napoli;
- the implementation of guidelines for public and private investments in urban regeneration and for the updating of local building codes in a climate-oriented perspective.

Main hazards

Heat waves, pluvial floods, landslides

Main elements at risk

People, residential buildings, critical infrastructures, transport networks, economy.

Sensitivity (key CC signals)

Incremental air temperature increase, Extreme temperature increase, Incremental rainfall change, Extreme rainfall change, Humidity, Solar radiation, Storms, Ground instability/ landslides, Urban heat island

Exposure (to key hazards)

- Residential buildings and open spaces in urban and suburban areas [heat waves]
- Vulnerable population groups in urban and suburban areas (low income, elderly, chronically ill and children) [heat waves]
- Transport networks, critical infrastructure and productive activities [pluvial floods]
- Residential buildings and critical infrastructures in landslide prone areas [landslides]

Vulnerability (to key hazards)

- vulnerability of population to extreme temperature and humidity conditions aggravated by UHI;
- vulnerability of residential buildings and open spaces to extreme rainfall;
- vulnerability of population, residential buildings and critical infrastructures to landslides aggravated by increasing and/or extreme rainfall

Impacts

- Health diseases, injuries and deaths.
- Damage to buildings, open spaces, transport networks and critical infrastructures.
- Economic damage (rehabilitation and reconstruction costs, losses in local GDP from business interruption, tourism reduction, impact on agriculture, etc.).

Main adaptation and risk reduction options

Improved summer performance of building envelope and technical systems; Albedo control, green cover and draining surfaces in urban open spaces; Structural improvement of buildings and CIs in landslide prone areas integration of “blue” and “green” infrastructures in public spaces and transport networks.

Demonstration Objectives

- Demonstrate the use of a GIS-based decision-support tool that will allow to assess the need for adaptive design solutions for buildings, open spaces and critical infrastructures.
- Link available EU and National funding mechanisms for urban regeneration of metropolitan areas (e.g. ESIF/ERDF, OP, H2020) to climate adaptation needs.
- Foster the appraisal of adaptive design solutions based on multi-criteria and cost-benefit assessments (including social aspects).

- Implement one or more pilot design solutions of urban/building/infrastructure adaptation as case study examples in the local Adaptation Plan, developed by exploiting the CLARITY climate services.

Demonstration Case Team Members and their Role:

- LUPT/PLINIVS represents the main scientific team member responsible for the of Naples demonstrator, as hazard/impact and vulnerability models supplier. Through the support of Department of Architecture, LUPT/PLINIVS will be in charge of developing a catalogue of local adaptation measures in relation to the main vulnerability conditions identified, and the GIS environment for the exploitation of CLARITY climate services in the implementation of the Local Adaptation Plan for the Metropolitan City of Napoli.
- Municipality of Naples, as Capital of the Metropolitan City of Napoli has a primary role in the implementation of the use case. Municipality of Naples will be involved in the development of the Local Adaptation Plan and in the definition of alternative adaptation options for the hazards/elements at risk identified that will be tested in terms of impact reduction and cost-effectiveness.

Other Stakeholders

- Regional Civil Protection, as emergency management body and suppliers of hydro-pluviometric data monitoring at ground level of hydrographic basins (through the warning system for regional hydrological and hydraulic risk in Campania Region, with about 220 weather stations);
- Campania Region River Basin Authority, in charge of producing Regional risk maps for hydrogeological hazards and co-planner with Metropolitan City of Napoli of hydrogeological disaster risk reduction measures at metropolitan level;
- CMCC – Euro-Mediterranean Centre for Climate Change, as main supplier of climate data and RCMs;
- Local satellite/aerial remote sensing service/data providers.

Benefit for the Site and relation to existing projects

Currently, in the framework of urban planning and building/public space design, both Regional and Metropolitan levels lack rules or recommendations aimed at implementing effective adaptation measures able to reduce the effects climate-related hazards. Thus, an effective and comprehensive sustainable strategy for resilience-based planning and adaptive design at large scale is missing. Many challenging conditions are connected to the reduction of heat island effect in urban areas and the protection of transport networks and critical infrastructures from pluvial floods and landslides, whereas the ongoing urban development processes, if not adequately integrated with climate adaptation and disaster risk mitigation solutions, may worsen the already critical environmental conditions in the area. In this sense, the assessment of alternative technological options and design/planning scenarios at building, urban and territorial scale, supported by multi-criteria and cost-benefit analyses, represents a key aspect to address public administration policies and regulate private initiatives in the abovementioned areas.

The Napoli demonstration will directly contribute to the many ongoing urban development and disaster risk reduction initiatives, such as: Redevelopment of Napoli Est urban area, public (206M€) and private (2,000M€) initiative; Redevelopment of Bagnoli brownfield, public investment (272M€); Campania Region hydrogeological risk mitigation and adaptation from ERDF 2014-2020 (140M€); Urban regeneration and climate adaptation from ESIF/ERDF-OP “METRO” 2014-2020 (100-150) M€.

The multi-criteria and cost-benefit assessment of effectiveness of alternative mitigation and adaptation options provided through CLARITY will contribute to the prioritisation of planned investments and ensure the effectiveness of planning and design solutions. The Napoli demonstration will take advantage from existing hazard/impact and vulnerability models developed within EU and national projects such as EU-FP7-226479 SAFELAND (landslide hazard/impact and vulnerability models in Campania Region); ITA-OP R&C 2007-2013 Metropolis (heat waves and pluvial flood vulnerability models for population, buildings and open spaces in the Municipality of Napoli). Network of data suppliers and service providers of the Metropolis project will be involved as active stakeholders in the implementation of CLARITY platform for the Metropolitan City of Napoli.

1.3.4.2 DC2 - Fostering adaptation of large scale infrastructure in Sweden to local climate change effects


The Swedish demonstration case involves the climate-proofing of large-scale investments on both the urban and the regional scale. The urban case is represented by Stockholm, the capital of Sweden with an urban population of nearly 1 million inhabitants and 1.8 million inhabitants living within the Greater Stockholm. The city is growing fast and new housing is needed. The increasing share of the Swedish population living in dense urban environments will become exceptionally vulnerable to environmental and climate hazards, calling for innovative planning solutions for the city that converge housing and mobility needs with well-being and health. Intensive impervious sealing of surfaces and human densification are important drivers of the urban microclimate and how it will respond to climate change in the future. At the same time, Stockholm city is located at the border between the large lake Mälaren and the Baltic Sea, thus highly sensitive to future changes in river runoff as well as lake and sea levels. The underground subway, as well as the different existing and planned road traffic tunnels, are also highly vulnerable to extreme precipitation events. Expected climate change effects include higher rainfall intensities, with 25% rise in extreme rain events by the end of the century (Olsson and Foster, 2014[28]). As a result, the Stockholm area will experience a rise in both flash floods and "pluvial flooding" that may last for weeks or even months and cover large areas. This strains the sewer networks and built environment and poses a risk for the population.

The regional scale perspective is given by the County of Jönköping, which is situated in the middle of Southern Scandinavia and includes large areas of the south Swedish highlands, as well as large parts of the second largest fresh water reservoir in Sweden, the Lake Vättern. The municipality of Jönköping with its residential city is situated at the very southern border of the lake. Due to lake tilting (geological influence) in combination with high water levels the lake may reach hazardous levels for the city. Modelled minimum levels for new construction has been set but older parts of the city need further risk decreasing acts. The configuration of the city entails large closed areas when heavy precipitation occurs. Climate effects in aquatic ecosystems of the region has been suggested to include shift in lake mixing and heating, nutrient balance that result in change of nutrient transports to the sea, shifts in biological diversity etc. Indicators that contribute to explanation of environmental data in general, and specifically under the influence of climate change, are needed.

Climate change will shape the risks to human health associated with extreme events such as droughts, floods, heat waves, as also water and air pollution, or even the combination of varied climate-related hazards. Distinct sectors – e.g., agriculture, drinking water supply, health care, urban and transport planning, industry, and insurance – will ask for different indicators with *a priori* unknown specificities, needs, or complexity. Such a requirement calls for an optimization of the use and tailoring of existing climate data and services, in a way that enable them to match the end-user needs, namely in what concerns the specificities of the sector, project or site. The essence behind CLARITY user-customisable indicators is to intervene in each stage of the climate-proofing analysis and planning process, by facilitating the assessment of vulnerability and risks on one hand, and the performance evaluation of adaptation options on the other. CLARITY includes demonstrations of user-specific impact indicators calculated from existing climate services. For this purpose, we will take full advantage from the coordination by SMHI of two Copernicus Climate Change Services (C3S) projects, SWICCA (on water management) and Urban SIS (on urban climate and air quality). The demonstration will be focused on two sites in Sweden (the County of Jönköping and Stockholm city), where the use of indicators (in the scope of flooding, heat waves, and air/water pollution) in the process of building-up resilience on multi-million-euro development projects will be tested. Moreover, through our network in the C3S projects we can get further input and feedback from users in other parts of Europe, covering additional application areas, such as industrial planning, risk management and drought management.

By delivering fit-to-purpose and customisable indicators, launched under a friendly and intuitive CSIS environment, CLARITY will assure that user requirements and preferences are in line with the best available climate data and services.

[28] Short-term precipitation extremes in regional climate simulations for Sweden Jonas Olsson, Kean Foster Published June 2014, 45 (3) 479-489; DOI: 10.2166/nh.2013.206

Demonstration Scenario

This use case will focus on on-going large scale development projects in Sweden, which represent massive investments and will have great impacts over the urban and rural landscape, as well as on the life of dwellers.

Key objectives of the Demo Case

This demo aims at assessing climate-induced risks to the success of selected large scale infrastructure projects in Sweden, and identifying and appraising effective adaptation measures to build climate resilience. By delivering user-tailored indicators that will run over existing climate services, we aim at assessing the usefulness, usability and performance of CLARITY climate services for generating user-customisable impact indicators focusing on selected large scale projects in Sweden.

Main elements at risk

- the construction of 140,000 new homes by 2030 (a 32% increase on the number of homes currently available), including the 'Stockholm Royal Seaport', currently one of Europe´s largest urban development areas.
- the new road tunnel bypass (Förbifart Stockholm), which will become one of the world's longest road tunnels.
- the new infrastructure to handle the connection of Lake Mälaren to the Baltic Sea (Slussen project).
- current infrastructure potentially at risk under climate change: buildings and other critical infrastructure affected by flooding in the County of Jönköping.
- understanding climate impacts in ongoing work for environmental protection in the County of Jönköping

Sensitivity (to key CC signals)

Precipitation, air temperature, wind, solar radiation, and humidity.

Exposure (to key hazards): Large infrastructures, such as transport networks, sewage systems, residential areas and other sites prone to flooding. Urban population, especially elderly and certain susceptible groups, often characterised by chronic medical conditions. Densely populated areas, especially those with low level of greenness and/or high traffic intensity.

Vulnerability (SxE): Flooding of urbanized areas due to limited capacity of sewer networks, causing damages on infrastructure and transport systems, and contamination of drinking and bathing water.

Health effects caused by heat waves and the combination of high temperature and air pollution over densely populated areas.

Risks (effects): Damages on infrastructure and transport systems, and contamination of drinking and bathing water due to flooding of populated areas.

Excess mortality, morbidity (visits to health care centres, hospital entrances, days away from work, preterm birth etc.) and discomfort among the inhabitants due to the exposure to heat waves, air pollution, and polluted drinking and bathing water.

Main adaptation and risk reduction options: Improved drainage capacity of sewer systems, changing land use characteristics for better retention of surface runoff, avoiding sensitive infrastructure at critical locations.

Range from larger scale strategies such as the Swedish Operational Heatwave Early Warning System or the traffic congestion tax in Stockholm, to local planning interventions, such as urban greening or re-design of projected built-up areas or traffic networks

CLARITY Team Members and their Roles: SMHI is responsible for the climate and air quality information delivered through CLARITY and to be used in Stockholm and the County of Jönköping. SMHI, with expertise in air quality and urban heat modelling, together with consultants from WSP, experts in urban flooding and the consequences of intense precipitation, are acting as purveyors, facilitating an efficient use of the enhanced climate services for planners, project leaders and other end-users represented by the two CLARITY partners Stockholm city and the County of Jönköping.

Other Stakeholders: The climate-proofing of large infrastructure projects in Stockholm and the County of Jönköping will attract and interest a number of public authorities, e.g. the Swedish National Road Administration, the Swedish Civil Contingencies Agency and the Public Health Agency of Sweden. Although not official partners, they are heavily involved in risk reductions and adaptation to climate change in Swedish cities and counties. Through our network in the C3S SWICCA and Urban SIS projects we can get further input and feedback from end users in other parts of Europe, covering additional application areas such as industrial planning, risk management and drought management.

Related projects: The C3S proof-of-concept project SWICCA (2015-2017), coordinated by SMHI, provides the following climate impact indicators in different spatial units (catchment, 0.5 deg grid, and 0.1 deg grid): water (water runoff; soil water content; snow water equivalent; aridity; river flow; flow duration curve; flood recurrence; water temperature; nitrogen concentrations and loads; phosphorous concentrations and loads); precipitation (precipitation; dry spell; precipitation intensity duration; precipitation intensity max); and air (temperature; freezing degree days; cloud cover; relative humidity).

The C3S proof-of-concept project Urban SIS (2015-2017), coordinated by SMHI, provides climate data over the Stockholm region for present and future time windows of 5-10 years. The following Essential Climate Variables (ECVs) will be delivered with a spatial resolution of 1x1 km^2 and a temporal resolution of 1 hour: air temperature and relative humidity; wind; precipitation; snowfall and snow cover; boundary layer height; concentration of O_3, NO_2, PM10 and PM2.5; global radiation; direct and diffuse shortwave radiation; local and surface runoff; evapotranspiration; river discharge and soil moisture. From these, a series of more user-friendly impact indicators related to the infrastructure and health sectors will be provided, namely the following: Intensity-Duration-Frequency (IDF) curves, storm movements over the city and the areal affected, daily minimum and maximum temperature. SMHI has coordinated the FP7 project SUDPLAN, a project that developed tools of interest for the CLARITY impact indicator tool. Of special interest is the module for statistical downscaling of intensive rainfall, either as time series or as IDF curves. The downscaling is based on the general Delta Change method, where the end user provides a historical data set of measured precipitation.

Stormwater modelling in Stockholm City (2014-2015), a study of WSP made for Stockholm city, presenting stormwater simulations of the 100-year rain in Stockholm in a future climate including flood mapping.

Two municipalities within the County of Jönköping are taking part and CABJON supports the municipalities in the EU-project U Score. The U Score project is part of the Making Resilient Cities program (UNISDR), a worldwide campaign initiated by the United Nations International Strategy for Disaster Reduction (UNISDR), with the aim to provide tools to measure resilience of cities in order to improve areas of future necessity. Five cities in three EU-countries tested the tool, and suggested improvements to the UN. The Swedish collaboration was coordinated by: Swedish Civil Contingencies Agency[29]. EU project GrowSmarter is co-ordinated by Stockholm city and brings together cities and industry to integrate and demonstrate '12 smart city solutions' in energy, infrastructure and transport, to provide other cities with valuable insights on how they work in practice and opportunities for replication. The project addresses the rapidly urbanising world and aim at making cities smarter, to respond to citizen needs and reducing the environmental footprint. The idea is to create a ready market for these smart solutions to support growth and the transition to a smart, sustainable Europe.

Benefit for the Site and relation to existing projects: The CLARITY climate service will both serve planners with decision-support as well as give operational staff at stake-holder organizations a possibility to train and develop routines that permit a better preparedness for droughts, extreme precipitation, flooding, heat, air and water pollution events.

[29] www.msb.se/makingcitiesresilient

1.3.4.3 DC3 - Linz experiment (AT): urban heat waves, urban heat islands, extreme precipitation

Linz (population 200k) is the capital of the province Upper Austria and the centre of the second-largest metropolitan area in Austria, with a total of 772k inhabitants. The city is situated in the Danube valley and to some extent affected by continental climate with hot summers and cold winters. One climate related concern in the Linz region are heath waves and heath islands. They are a consequence of combination of the climate warming, continuous growth of residential areas, densification of the city centre, loss of vegetation and sealed surfaces[30]. The average number of heat days (HD: Tmax≥30°C) in the period 1981-2010 (15.2 HD p.a.) has been almost doubled compared to the period 1961-1990. The climate projections indicate further rise in the summer temperatures and more frequent heat waves with longer duration in the future, which can have severe impact on the public health[31]. A further climate-change related concern in the Linz area relates to increased frequency and intensity of extreme precipitation events. Severe flooding events were observed in the summers 2002 and 2013[32]. In the future an increase of frequency and magnitude is expected, which let expect more severe local flood exposure[33].

Directive 2014/52/EU of the European Parliament and the Council of 16 April 2014 requires "to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change". In Austria, this directive needs to be implemented before May 2017, as extension of the Austrian Umweltverträglichkeitsprüfungsgesetz 2000[34]. Efforts to (better) integrate the climate adaptation into the standard city planning process aiming for more climate resilient urban fabric conditions are under way. E.g., Vienna has recently published an urban heat island strategy plan[35] that asks for implementation. The administration units in the Austrian cities are thus obliged to extend the existing organisational rules and instruments for Environmental Impact Assessment by incorporating climate adaptation measures in future urban development planning.

The Austrian demo case will demonstrate cost-efficient climate-resilient planning for the urban space and infrastructure in two operational scenarios concentrating on resilience to heat exposure and flooding effects in Linz. The demonstrator will use the urban climate simulations and microclimate simulation and assessing the local measure application against increase in urban heat island effect. Due to the common urban structures and large-scale climate change impacts, the result of the Austrian demo case is relevant for a number of cities in Central Europe and can serve as a base for development of operating procedures and climate services in other regional centres.

Demonstration Scenarios

This demo case will demonstrate urban climate adaptation by applying the spatial planning instruments related to climate adaptation in Linz in Austria, where we will consider risks and adaptation measures related to heat exposure as well as those related to extreme precipitation.

Key objectives of the Demo Case

Key objective of the Austrian Demo Case is to examine the climate related effects and the use of tools and measures for risk assessment, evaluation of climate-change adaptation strategies and integration of adaptation measures for sustainable urban development. The CLARITY solution will: (1) support information exchange and collaborative decision making; (2) provide overview information on key features relevant for climate-resilience of the city or region; (3) assess sensitivity to climate change and the most appropriate adaptation measures at the an urban and district planning level, and (4) Document the recommendations made.

Main elements at risk: City residents, especially vulnerable persons (children, elderly, ill); city infrastructure, buildings, streets and transport networks, energy grids, waste water networks, sewage plants, open spaces.

[30] Hagen, K. et. al (2014) Smart Environment for Smart Cities: Assessing Urban Fabric Types and Microclimate Responses for Improved Urban Living Conditions. realCORP 2014. Proceedings. 573-581.

[31] Anders I. et. Al (2014): Climate Change in Central and Eastern Europe, in: Rannow S. and Neubert M. (Editoren). Managing Protected Areas in Central and Eastern Europe Under Climate Change. Springer-Verlag. Advances in Global Change Research No 58, ISBN: 978-94-007-7059-4, 17-30

[32] ZAMG (2013): Annual report, https://www.zamg.ac.at/cms/de/dokumente/topmenu/jahresberichte/jahresbericht_2013.pdf

[33] P. Kutschera, J. Olsson, L. Gidhagen (2013) RainPortal - A web portal providing climate change related precipitation data using SUDPLAN services, in: Environmental Software Systems. Fostering Information Sharing; IFIP Advances in Information and Communication Technology, Volume 413

[34] https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10010767

[35] https://www.wien.gv.at/umweltschutz/raum/uhi-strategieplan.html

Sensitivity: In this demonstration scenario, we are primarily interested at the level of sensitivity of the main elements at risk to (at least) the CC signals we are most interested in. That is, we need to establish a
Database that will relate the sensitivity of specific element at risk such as "elderly citizen" or "individual residential building of type X" to high or low temperatures, and to various forms of precipitation.
Exposure (key hazards): Consequently, we are mainly looking at exposure of the elements at risk to extreme temperatures and precipitation. For this, we need fine-grained maps providing the intensity, frequency and duration information for extreme weather events (e.g. heat waves, extreme rainfalls). This information needs to be provided for both the current and predicted climate and the models must take into account the local climate effects, e.g. to correctly predict the urban heat islands.
Vulnerability: CLARITY solution must simplify the task of figuring out the extent to which an element at risk of a specific type is vulnerable to the key CC signals if situated (or built) at a given location, as well as the task of comparing the vulnerability at different locations. For example, a residential building of type X may be very sensitive to inundation but its vulnerability will be negligible if the exposure is low, e.g. because the building is at a location that will never be inundated.
Risks: Heat waves diminish the well-being of the city population, and lower the productivity (lack of sleep, heat fatigue). Areas suffering from the urban heat islands are less attractive to both residents and businesses (loss of value). Extreme heat waves can also drastically increase morbidity and mortality, render the elements at risk temporarily unusable and even permanently damage them. Extreme participation events can likewise endanger the population, temporarily disable or permanently damage the element at risk.
Main adaptation and risk reduction options: Adaptation and risk reduction options can either aim at lowering the sensitivity of the elements at risk, or at lowering their exposure.

For heath waves, main adaptation and risk reduction options include: (1) active cooling of residences, urban transport infrastructure and work places; (2) use of heath-adapted architecture; (3) increasing the shadow coverage and evaporation, e.g. through urban greening (including green roofs and facades) measures; (4) use of lighter more reflecting colours for roads, pavements and facades; as well as (5) by assuring uninhibited air circulation from the surrounding green and forested country side towards the urban heat island locations.

Main adaptation and risk reduction options for extreme precipitation events include: (1) re-dimensioning of the sewers; (2) unsealing of the surfaces and building of retention basins to retain more water; (3) reinforcing of dikes; (4) and relocation of the elements at risk to higher locations.

CLARITY Team Members and their Roles:
Purveyors: Smart City Consulting
Suppliers: ZAMG - climate modelling, adaptation scenarios; AIT-SBC (Energy Department) – geo-data processing, integration, impact assessment and planning decision support.
End users: City of Linz – Division Planning Technique and Environment (Environmental management)
Technology providers: AIT-DSS (DSS department):
Data providers: City of Linz: Land use and density, building footprints, open space distribution, technical infrastructure properties;

Benefit for the Site and relation to existing projects:
CLARITY will help the Linz planning authorities, urban environmental protection and climate adaptation departments to implement the climate adaptation strategies by providing a decision support framework aiming at improved planning and documentation of the climate-change adaptation measures.
This will be achieved by developing the organisational workflow and a set of software tools that supports ex ante assessment of sensitivities, exposures, vulnerabilities, risks and effects of available adaptation and risk reduction options through scenario modelling, simulation of adaptation alternatives as well as comparison and ranking of different adaptation options (including the "status quo" option) according to user-defined multi-criteria ranking functions.

1.3.4.4 DC4 - Spanish Transport Infrastructure

In Spain the national road network includes: (1) 2,535 km of toll motorways, (2) 8,830 km of free motorways and (3) 14,465 km of conventional one-way roads. Around 10% of the total network is composed of toll-highways which are managed by companies. Besides a 3.6% of the roads are concessions to companies for the conditioning, maintenance and operation. This proposed CLARITY demo case is addressing the adaptation of a subset of the Spanish network of highways and railways to future impacts due to climate change. The selected subset of roads, which are those of national ownership, comprises 26,038 km, representing 15.7% of the Spanish network. On the other hand, the selected subset of railways includes 3,143 km of the high-speed train network (AVE). For these, several major investments for infrastructure are expected in the coming years. According to the document prepared by Spanish managers and users entitled 'Needs to adapt to climate change of the Spanish transport infrastructures backbone network', climate change will entail negative impacts in railways and highways in all phases of infrastructures' lifecycle (planning, design, construction, maintenance and exploitation).

In parallel, several climatic projections and scenarios have been developed for our region. More specifically, the Spanish Meteorological Agency (AEMet, Ministry of Environment) has developed a collection of climate change regionalized scenarios called PNACC (Plan Nacional de Adaptación al Cambio Climático). These include three emission scenarios (SRES-A2, SRES-A1B and SRES-B1) for temporal horizons of 2050 and 2100 and show the following relevant facts:

- The average air temperature will increase about 2ºC in summer and 1.2ºC in winter.
- The maximum and minimum temperatures will show more extreme values and the variation will be higher than for average temperature.
- The number of frost days will be reduced.
- The daily thermal oscillation will be broader.
- It is expected than around the next mid-century the number of heat waves will double.
- The relative humidity will generally diminish by a 5%.
- Total cloudiness will be reduced for all regions, with the exception of those in the Northeast of Spain.
- Annual accumulated precipitation will decrease in all regions: about 5% in the North and in the East, and around 10% in the South and in the West.
- The number of intense rainfall events will increase, most likely entailing floods.
- The number and length of drought episodes will increase, particularly in summer.

These general facts, amongst others, need to be considered for the impact estimation on the mentioned transport infrastructures. Besides, more detailed studies need to be tailored to the extension of some relevant roads, in particular the second section of an important transport axis (A2) connecting Madrid and Barcelona cities, for which ACCIONA is operator. This four-lane highway section is 73 km long, running from Guadalajara city (PK-62) to Alcolea del Pinar (PK-135), sitting in the province of Guadalajara. This section has been selected as a good example of the network conditions in central Spain which eventually can be extrapolated to others. The chosen region has a typical Continental-Mediterranean climate with long, dry and very hot summers, and equally long and severe winters. Springs and autumns are short and mild. The road conditions ensuring safety and profitability are highly sensitive to the evolution of the maximum and minimum temperatures as well as their daily oscillation. In this sense the main impacts considered due to climate change are those related to maximum temperatures in summer (expected increase of about 5ºC by the end of the century) and minimum temperatures in winter (expected decrease of around 3ºC). As for the high-speed railroad network, the operation ensuring safety and profitability essentially accounts for extreme weather episodes, in particular strong cross-winds, extreme high temperatures and severe snowfall events, all of these may entail the service restriction or even its failure. In the planning and design phase it is required to identify in advance the expected areas in Spain exposed to such conditions to adapt or re-design routes which are or will be within acceptable operation limits. Besides, in the exploitation phase, it is required to know beforehand such expected seasonal episodes in order to adapt, modify or even restrict the operation to ensure safety and profitability. At the moment no climate services are in place to fulfil such requirements.

This CLARITY demonstration case has been selected and designed to be scalable and transferable to other EU countries with similar needs. In essence, CLARITY climatic services will provide data access and indicators to assess climate-proofing in all phases of the mentioned infrastructures' lifecycle, namely:

(1) Planning and design of new infrastructure, routing,
(2) elaboration of construction regulations and recommendations,
(3) selection of construction materials and methods,
(4) infrastructure building phase planning,
(5) long and mid-term maintenance scheduling, and
(6) infrastructure exploitation.

As deduced, two timeframes are considered, a long-term (planning, design) and a short-midterm (exploitation and maintenance). Although the concept 'short-term' is normally used in the weather domain, in CLARITY project relates to 'climate short-term' timeframe, more specifically seasonal and yearly. Long-term is typically relating to decadal or longer time periods (i.e. 30 years).

Risk assessment in the long term: planning and design

Transport infrastructures (railway and road networks) are typically designed to provide operation for over 100 years or more. In this sense it is clear that planning and design of new infrastructures, or the re-design and adaptation of existing ones, must rely solidly on sound projections of climate and on estimations of associated potential risks and impacts to ensure safe and profitable use of them. This consideration points first at the identification and characterisation of vulnerabilities, the quantification and mapping of climatic driving factors, by means of indicators, for several likely climate scenarios and the description of risk functions (probability of expected unwanted consequences) affecting safety, sustainability and profitability of the infrastructure operation. The assessment of the planning of new or alternate routes, the use of new construction materials and methods, the design of a general maintenance policy or the definition of new regulations and technical rules will all make use of such identified potential risks through the long-term (decadal, 30-years etc.) CLARITY climatic services. In this demonstration case, as well as in others in CLARITY project, the proposed climate services provide and integrate seamlessly an important part in the impacts assessment, that of the climate-driven impacts. This assessment also includes other aspects such as environmental, socio-economic or technical which will be provided by other platforms through an inter-operable data and models interchange environment. In such way, CLARITY is part of a compound modelling of future climate-driven impacts in the ground transport network.

As mentioned above, a significant part of the road network is managed by companies which eventually may benefit of CLARITY long-term climatic services. Indeed, given that concessions are typically in force for 30-40 years, the use of long-term climatic indicators and risk estimations will help companies to accurately estimate the required resources and budget for the adaptation tasks in the process of tendering for new concession bids. This will lead to a higher competitiveness and efficiency and contribute to the infrastructure exploitation sustainability.

Risk assessment in the short term: exploitation and maintenance

CLARITY will provide access to climate variables and indicators tailored for the assessment in the climatic short (seasonal) and mid (yearly) terms. Although not extensively considered in the climatic domain, seasonal projections (two to four months) are frequently demanded by infrastructure operators. These services will help to the activation of seasonal campaigns and preventive works (due to frost, winds, heat waves, dramatic thermal oscillation, extreme temperatures, heavy precipitation etc.) including the scheduling of maintenance activities, selection of materials, equipment and methods in order to keep safety standards and ensure profitability and sustainability beforehand. This is particularly useful for companies holding concessions for roads maintenance and exploitation which will fine-tune and adapt strategic decisions in advance.

The Spanish ground transport network is a strategic economic component of paramount importance in the development of different sectors and activities like industry, commerce and human mobility. According to the Spanish Ministry of Public Works and Transport, the ground transport network represents around the 5% of gross value added (estimated in more than 28,000 M Euro) and employs around the 6% of the active population (more than 900,000 workers). The short-term climatic services will also provide information for risk assessment in the infrastructure building and implementation phase, to help a better, more effective and safer scheduling and performance of construction tasks. As seen, CLARITY short and mid-term climate services have a broad collection of end-users in this demonstration case who already have stated their interest in such services. Consequently, the information provided in the short-term and long-term climate services are consistent and coherent spatially and temporally. In this sense the customers making use of both will produce coherent adaptation planning and tasks scheduling.

In this particular demonstration case the short and mid-term climate services will provide seasonal and yearly forecast and mapping of variables and indicators of the driving factors regarding impacts, more specifically centred in the study area of the Guadalajara A2 highway section, as mentioned.

Demonstration Scenario

The objective of this demonstration case is to improve the resilience of existing transport infrastructure, through the development of climate-proofing infrastructure and facilitate the planning and management of maintenance tasks on the Spanish ground transport networks thanks to the development of indicators that contribute to their operation safety, profitability and sustainability in both the short and long term. The results of this demonstration case will help managers, whether they are public administration or licensed companies, to the efficient and cost-effective planning of resources and budget for the design and implementation of climate-driven impacts adaptation measures in the Spanish railway and highway networks.

Demonstration tasks

- To characterise vulnerability of Spanish ground transport network to the future climate-driven hazards.
- To identify the climate variables behind impacts in the Spanish ground transport network.
- To generate new or use existing future climate scenarios in the demonstration case geographical extent (Spain, Guadalajara region etc.)
- To design and generate a set of indicators quantifying climate-driven impacts in the Spanish ground transport network.
- To identify and design adaptation measures in the long term according to the obtained climate variables in decadal projections (up to 30 years) and climate studies (up to 100 years). This includes routing, construction materials and methods and maintenance framework design.
- To identify and design adaptation measures in the short term using monthly projections (up to 60 days) and seasonal forecast (two months to one year).
- To identify and quantify the associated socio-economic cost of each adaptation measure applying multi-criteria analysis. This task will produce, on one hand, a comparison between adaptation costs and consequences of the expected impact and, on the other hand, the associated costs (including damages and other impacts) in the case of applying or not applying adaptation measures in each moment.
- To identify and recommend the most appropriate level of adaptation according to the existing available resources and provide assessment of the percentage of impact reduction achieved.
- To integrate the demonstration case climate change scenarios, Spanish ground network vulnerability and climate-driven impacts in the common CLARITY GIS-based platform, aimed at the visualisation, risk assessment and decision making process in the adoption of adaptation measures in a quantifiable way.
- To provide assessment for resources and budget accurate appraisal in the planning and scheduling of adaptation activities in the study case, whether they are construction of new infrastructures or maintenance programs of existing ones. This will help as well to the better resources planning and use in the preparation of concession bids.

Key objectives of the Demo Case

- Demonstrate CLARITY GIS-based decision support and climate services for the assessment of adaptation measures for the Spanish ground transport networks facing short-term and long-term climate impacts.
- Demonstrate new methodologies and climate services for the investment assessment for adaptation measures according to the expected climate impact reduction in infrastructures.
- Demonstrate new methodologies and climate services to improve safety, profitability and sustainability of ground transport networks management in all phases of their lifecycle.
- Elaborate and apply a guide of recommendations for the regulations update on design and management of Spanish ground transport infrastructures according to foreseen climate impacts scenarios.
- Design and elaborate a user guide for the application of CLARITY climate services aimed at the Spanish administration of ground transport networks for their use and development of their competences (regulations, planning, design, exploitation, safety, maintenance etc.)
- Design and elaborate a user guide aimed at licensed companies operating in Spain for the application of CLARITY climate services for the improvement of safety and profitability in the exploitation and maintenance of ground transport networks and for the improvement of the efficiency of resources and budget planning in future bids. This will lead in an overall improvement of their business.

Main elements at risk

Spanish ground transport networks (railways and highways) and their associated main structural elements (i.e. bridges, tunnels etc.)

Sensitivity (key CC signals)

- Rain, temperature (extreme and mean values in summer and winter), ice and snow.
- Changes in extremes and daily data percentiles of the different temporal horizons (monthly, seasonal, yearly and decadal forecasts; climate studies over 30 years or more) of several significant variables such as temperature, precipitation (rain and snow), cloudiness, radiation and wind.

Exposure (key hazards)

Reduction in operation safety in all infrastructures lifecycle phases (construction, exploitation, maintenance) due to extreme weather conditions altering their physical properties or exposing vehicles to direct risks. This may entail in the reduction or even failure of service of such infrastructures. Management and operation includes a set of safety rules under which the infrastructure may operate. Restrictions may lead to the restriction of use or even closing the service in the most severe cases.

The considered weather factors are strong cross-winds, heavy rain and snowfall episodes, hail, extreme temperatures (both, very high in summer and very low in winter), thermal oscillation, frost and visibility reduction due to fog. Most of these driving factors are related to extreme weather.

Derived natural hazards, such as floods, flash floods, landslides, forest fires, may also affect the operation, safety and effectiveness of ground network infrastructures.

Vulnerability

Given that the ground transportation network in Spain is not generally adapted to the forthcoming impacts due to climate change, the vulnerability is centred in the general, progressive loss of safety due to alteration of physical properties, reduction or failure of systems efficiency and response capacity. Besides future climate impacts will lead into less profitable exploitation of networks and, consequently, in less sustainable models. Design and construction phases are also affected by potential impacts of climate change, particularly due to extreme weather events that may eventually reduce safety and cost-effectiveness. These are directly related to a non-adapted regulation and technical recommendations in the design, implementation and exploitation phases taking into account climate impacts.

Risks

Three general risks are considered, namely loss of safety, loss of profitability and loss of sustainability. These are observed both in the short and the long term during infrastructure lifecycle. Particular impacts in infrastructures, among others, are:

- Damage increase in embankments due to runoff generated by extreme precipitations.
- Damage increase in the road pavement due to higher temperatures increase. This fact will produce more ruts and cracks by binder premature oxidation.
- Failure of components not prepared for climate change impacts. This fact will affect specifically to ground structures drainage systems.
- Damage increase in the catenaries by surges produced by electrical storms and objects fall transported by strong winds.
- Damages in the superstructure due to extreme meteorological events, particularly storms and strong winds.
- Dilatation in critical components of speed train rails such as catena-ries, screens and plantations.
- Safety reduction and health worsening of workers due to extreme temperatures.
- Construction phase delays due to adverse events.
- Landslides and rock fall in embankments due to heavy rainfalls.
- Safety reduction of vehicular circulation, for example due to strong winds.
- Increase of foundations erosion and bridges collapse due to floods

Main adaptation and risk reduction options

- Adaptation of methodology for planning new infrastructure to future climate.
- Adaptation of regulations and recommendations for designing a new infrastructure adapted to future climate.
- Make recommendations for the use of construction material and methods adapted to future climate.
- Adaptation of methodology for maintenance planning and scheduling according to future climate.

- Adaptation of planning and scheduling of construction activities to future climate.
- Adaptation of rules and policies for a safe, profitable and sustainable exploitation in a future climate.

CLARITY Team Members and their Roles:

MeteoGRID is a Spanish SME providing meteorological and climate services aimed at the transport, energy, agriculture and natural hazards. MeteoGRID has developed and implemented a GIS-based platform (SIGYM) which seamlessly integrates geographical and weather data and models for the temporal and spatial analysis of variables and indicators. The role of MeteoGRID in this demonstration case is:

- Climate services provider
- Adaptation of existing and new climate data to the case requirements
- Provide daily, seasonal, decadal and future forecasts of climate variables
- Calculate associated indicators for climate impact assessment
- Integrate forecasts in the geographical platform

CEDEX is a centre for the research and experimentation of public works. It is part of The Ministry of Public Works and Transport. The centre has different laboratories aimed at research and experimentation on infrastructures construction methods, materials and technologies (materials and structures laboratory, geotechnical laboratory and railway interoperability laboratory). CEDEX facilities include a transport research centre particularly tailored for the ground infrastructures subject of this demonstration case. Since 1953, CEDEX has participated in a wealth of research and innovation projects on highways and railways.

The main role of the CEDEX in CLARITY and in this demonstration case is to provide technical and scientific support on the identification of potential impacts in infrastructures and adaptation measures, materials and procedures according to the vast experience and capacity accumulated.

The main role of Acciona Infraestructuras is as end user of the CLARITY climate services framework. Acciona will be in charge of testing climate services in this demonstration case, focusing on the planning and scheduling of maintenance activities for critical ground transport infrastructures such as highways, as explained above. Acciona will contribute to the demonstration scenario with the integration of the required legacy systems that currently operate in the network. In particular, Acciona will give access to three weather stations providing meteorological information of different points along the selected highway section. Therefore, the use case will integrate the existing data coming from the sensors already deployed in the pilot into the CLARITY platform. Besides, in case that any another parameter is required, Acciona will provide the expertise and capabilities to identify and deploy adequate sensor solutions to monitor the indicators suggested.

Cismet will provide an integrated, inter-operable and interactive framework to access CLARITY climate services and data for the geographical extension of the proposed demonstration areas.

Benefit for the Site and relation to existing projects:

The participation of Acciona in CLARTIY aims at the improvement of the competitiveness in the road infrastructures management business unit, by developing new methods and enabling more advanced capabilities for maintenance activities in highways, which will be supported by the technological outcomes of the project. This will, at the same time, improve the visibility of Acciona as a reference company with the necessary know-how to include advanced maintenance planning as part of the technological offer in public tenders, and will increase the chances of Acciona of winning contracts for the construction and management of new highways.

The Spanish Railway Network (RENFE) is making use of meteorological services since 2011 to ensure safety and efficiency of their operations by evaluating weather conditions based in forecasts provided twice per day. Thanks to CLARITY outcome, climate services in the long and short term providing indicators will be integrated and will improve RENFE's capacity for strategic planning and decision making for climate change adaptation, particularly for extreme weather episodes. This will improve as well the efficiency of maintenance planning and scheduling, increasing the forecast horizon to seasonal, yearly, decadal and long-term timeframes. CLARITY outcome will help RENFE to quickly and efficiently find alternative routes or transport solutions in case that the network is partially or generally affected; provide resources and planning of train frequency; improve preparedness for expected adverse conditions, such as snow cleaning, salt deployment, train sheltering, food supplies for travellers, adaptation of heating and cooling systems etc.

1.3.6 Trans-disciplinary aspects of CLARITY climate services

Disaster risk management and climate change adaptation planning have much in common and should be considered together. To achieve this project follows a holistic and all-hazards, multi-risk and multi-stakeholder approach which enables practitioners to perform the best possible adaptation planning. The approach needs to be applicable for all relevant spatial and organisational (local, regional, national, pan-European) scopes and scales and applicable for all types of (combined) hazards, elements at risk and their vulnerabilities as well as open for all types of response actions that need to be covered in corresponding scenarios. The issue addressed relates to a larger number of disciplines involved including environmental sciences, response forces of different types, public agencies in charge of civil protection and back office experts dealing with systems to support activities in adaptation planning and crisis preparedness. The project brings together representatives of all types of stakeholders (suppliers, purveyors, technology providers, practitioners) from very different domains, involved to address this issue and has the priority to deliver something that practitioners can really use in adaptation planning.

1.4 Ambition

CLARITY aims to provide an end-to-end solution that enables decision makers to climate-proof urban infrastructure and provide highly-interactive decision support for end users, which is easy to use despite the complexity of the analysis being performed.

1.4.1 Bridging the gap between high quality research results with high innovation potential and practitioners in need of operational solutions

It is the ambition of CLARITY to demonstrate working prototype research results and transform into operational climate services that are demonstrated in a realistic environment. The challenges include the capturing the needs of multi-disciplinary practitioner teams in a way that the results can be transformed in innovation (commercial products and services) for these business requirements need be taken into account from day one. To overcome the “valley of death” between research and practitioners need a combined effort of researchers, technology providers and practitioners is required.

1.4.2 Transferable climate service for adaptation performance planning

CLARITY will cover the full support of the targeted workflow from access to basic Climate Intelligence to concrete Decision support and will constitute a sound basis for option assessments that can be realistically used in practice. It will *improve the state of the art by seamlessly combining established methods in the application of CC Research results, risk and impact assessment, and decision support*. The main part of the work here will be to link all elements required in a CC adaptation assessment scenario (see 1.3.1) dealing with aspects such as spatial and temporal scale, variable mapping and aggregation. Furthermore, CLARITY climate services will be flexible and transferable enough to cover arbitrary temporal and spatial resolutions in the context of various CC impact scenarios that are relevant for the respective end user. CLARITY *downscaling services will provide the downscaled climate-change data for any part of the Europe on demand*. User-defined *similarity metrics will allow re-use of existing results from similar projects and similar locations in own projects*. The “climate twins” concept[36] will be used to identify and map regions whose current climate conditions show high similarity with the expected future climate in a target region. This will allow users to learn from local well-established adaptation strategies and provide analogue ones in the target region.

1.4.3 Beyond generic climate adaptation guidelines

Guidelines on how to approach climate change adaptation in several forms are available. Prominent examples are e.g. the Urban Adaptation Support Tool and Mayors Adapt (provided through the European Climate Adaptation Platform Climate-ADAPT - climate-adapt.eea.europa.eu). These tools explain the required steps for climate change adaptation and give the necessary background to understand the problem and find appropriate solutions but fail to **provide a practitioner with concrete and solid evidence** of the expected performance of resilience measures at the project location including indicators that are meaningful for their individual problems. Project-specific decision support is addressed by the [EU-GL] document. CLARITY will demonstrate concrete climate

[36] Ungar, J., Peters-Anders, J., Loibl, W. (2011): Climate Twins – An Attempt to Quantify Climatological Similarities, in Environmental Software Systems. Frameworks of eEnvironment, Springer Berlin Heidelberg, https://doi.org/10.1007/978-3-642-22285-6_46

services in line with the aforementioned generic background material and thus will be an enabler towards the operationalization and full deployment of climate services within reasonable time and budget constraints.

1.4.4 Impact indicator calculation for customizing climate services output

Ongoing efforts aim to make climate data available as climate services. In these services data is translated to impact indicators that more simply quantify a certain risk or negative impact, allowing adaptation, risk mitigation and in general a more sustainable long-term planning. Current development in this direction is made by EU through e.g. EEA and large programs like CLIPC and the COPERNICUS Climate Change Services. Experience from these projects show that impact indicators can either be created by a pure statistical analysis of climate data, or can require additional data to be fused with climate variables. In the latter case, indicators must be tailored to a specific use and cannot be precomputed at the climate service. CLARITY will develop and demonstrate an impact indicator calculation on top of existing climate services offering a highly relevant advancement of the state of the art.

1.4.5 "What-if" in the climate resilience planning process

CLARITY will enable decision makers to assess the consequences of specific risk reduction options by trying out and comparing different options in a simulation. CLARITY will address this by following the decision support methodology that has been established by the CRISMA project (see 1.3.3). Key aspect here is to considerably simplify the comparison of scenarios, allow the end-users to "play" with scenario parameters and different performance indicators and decision criteria (e.g. cost, influence on inhabitants ´behaviour, sustainability of materials etc.), compare and rank the results.

CLARITY users will be able to objectively rank the adaptation scenarios according to explicitly stated decision objectives of the different stakeholders, taking into account key performance indicators including indicators related to uncertainties. This will allow the groups of stakeholders to understand everyone's concerns and agree on a compromise scenario.

Although this approach is straightforward and easily understood by the end users[37], it has never been made available as part of an operational climate service as is the ambition of the CLARITY project.

[37] Our experiences from CRISMA show that this methodology is easily understood by the users and very efficient as a support for decision making in inhomogeneous groups of stakeholders with different goals and objectives (see https://youtu.be/VBvr8d40lk8?t=6m44s).

2. IMPACT

Integration of climate resilience into planning of the urban and traffic infrastructure is vital for the long-term sustainability of the critical infrastructure as well as to for the well-being of the citizens. For some EU policy areas, climate "proofing" has already been taken up as a parameter in obligatory cost-benefit analyses during the project development phase, and a number of activities are under way to effectively extend this obligation to other types of critical infrastructure projects *(European Commission, 2013. Adapting infrastructure to climate change).* CLARITY will contribute to 3 out of 4 priority areas of the initial Global Framework for Climate Services (GFCS) (#2) disaster risk reduction, (#3) health, and (#4) water in the context of urban infrastructure. CLARITY will provide components pertaining to (#3) Climate Services Information System (CSIS), (#4) User Interface Platform (UIP) and aims at the "*Incorporation of climate information management in business consulting services and Private business development*" (*A European research and innovation Roadmap for Climate Services, European Commission, Directorate-General for Research and Innovation –European national climate services centres: various models and products p11)*.

2.1 Expected impacts

2.1.1 Expected impacts mentioned in the work programme

Facilitating rapid deployment and market uptake of climate services by demonstrating their added value (O4, 1.3.4 T1.3) → Based on the combination of climate intelligence, general information relevant for infrastructure projects and project specifics, CLARITY will demonstrate that climate services can be used to as a tool to incorporate resilience in the design, planning and operation of resilient infrastructure that is highly important for urban life. CLARITY will simplify the process of climate-proofing infrastructure projects to the point where resilience concepts can be incorporated as a straight forward engineering task rather than a costly and non-transferable scientific exercise.

Providing added-value for the decision-making process addressed by the project, in terms of effectiveness, value creation, optimised opportunities and minimised risks **(O4 T.2.4, T4.5)** → CLARITY will provide the target users with indicators on the climate sensitivity, exposure, risk and potential adaptation option of their projects in an all-hazard approach context. MuIti-Criteria and Cost-Benefit analysis functionality will help decision makers to weigh the options in terms of cost, effect and potential side effects. This will support the users in taking informed decisions about measures and minimize the risk of inflated project costs and mal-adaptation.

Increasing the provision of climate services with added value to the end-users;(O3, O4, T1.2 T1.3, T2.3) → Taking real end-users needs as the driver for climate service development is essential to create a real added value. By delivering fit-to-purpose and customisable indicators, launched under a user friendly and intuitive CSIS environment, CLARITY will assure that user requirements and preferences are in line with the best available climate data and services.

Fostering market uptake of climate services (O5, O6, WP5, WP6) → CLARITY climate services based on concrete user needs will be designed for the emerging market of "resilience by design" of (urban) infrastructure in direct support of a EC Guideline (EU-GL) that is likely to be taken up as the de-facto standard for planing climate-proof infrastructure in Europe. Dedicated community building and marketing activities will further push the market uptake of CLARITY and climate services in general. CLARITY dissemination, community building and marketing activities in WP6 are designed to foster the uptake of CLARITY climate services and closely aligned with the exploitation and business planning activities in WP5.

Offering concrete solutions to overcome barriers hampering deployment of climate services in the specific area of application (O1-O3, WP1/T1. 3, WP/T2.3) → CLARITY will deliver concrete climate services that will enable project managers to realistically take climate change into account. For this, a well-structured and openly available integrated approach is needed that overcomes the technological and conceptual barriers. A conceptual approach is provided with the EU-GL. Clarity climate services will serve as the tools to apply the guideline in practice in a replicable manner and relieve the end-user from the use of fragmented and incompatible tools.

2.1.2 Other expected impacts

2.1.2.1 Contribution to improved resilience to Climate Change

The planning of climate change adaptation and resilience measures should be performed together with disaster preparedness planning. CLARITY climate services will provide the means to include climate aspects in hazard scenarios. This will link both areas and thus automatically will enable climate change sensitive preparedness planning. This will substantially contribute to improved resilience of large scale heavy investment assets contribution to a more resilient society.

2.1.2.2 Job Creation, strengthening the competitiveness and growth

Realising its innovation capacity, CLARITY aims to introduce climate-proofing at non-prohibitive effort and cost while maximising the reuse of the knowledge from previous projects. This will make the task of climate-proofing the urban and traffic infrastructure projects far more affordable than today - resilience concepts for urban infrastructure projects can be incorporated as a straight forward engineering task and no longer remain a costly and non-transferable scientific exercise. Backed by the corresponding policies, this will result in climate-proofing on a broad scale. Positive effects will include: less mal-adaptation, more resilient society, securing of existing innovative businesses and the creation of new ones. New value chains will be established providing business opportunities also for SME in multiple sectors from planning and engineering services to auditing and finance industry. In particular, the purveyor type businesses involved in the project expect to significantly enlarge their capacity for serving the customers and generate new business opportunities.

"Assessing the Implications of Climate Change Adaptation on Employment in the EU (Ref. Ares(2014)2491874 - 28/07/2014)" document indicates that more than 400k jobs will be lost by 2050 in EU due to climate change. In a reference scenario, where 0,5% of the GDP (annually or cumulative until 2050) is invested in counter-measures, this loss is overcompensated by creation of the 500k new jobs. By lowering the costs of planning and risk of mal-adaption, CLARIFY will help to serve jobs at risk and further increase the job generation towards the expectations of the "ambitious" scenario, where over million new jobs are created and a large part of the 400k lost jobs will be saved by 2050.

2.1.2.3 Social Innovation, other environmental and social impacts

Aiming at the enhanced implementation in the medium-term of the EU Adaptation Strategy and of national and local efforts towards climate-proofing of key European economic sectors and services, CLARITY addresses the need of society to minimize the negative effects of the climate change through adequate adaptation actions. Our approach is primarily targeting the value of property but it also takes into account the citizens' health and wellbeing by making the connection between the infrastructure monetary value and its perceived value for the citizens. CLARITY will help the infrastructure owners and public administration in choosing the best strategy for rendering the urban infrastructure CC-resilient. In addition to these stakeholders, the general population, especially the more vulnerable groups such as elderly and poor citizens, will benefit from improved urban infrastructure. By helping to make the infrastructure climate-proof, CLARITY will contribute towards more resilient and more sustainable society. This will result in fewer expenses related to fixing the climate-change related damage as well as in improved quality of life & health of the citizens. CLARITY offers opportunities to enhance public accountability and transparency, since it supports a highly systematic decision making process in the planning as well as in the implementation and execution phases of the infrastructure projects. It has the potential to contribute to improved governance by raising the level of transparency and accountability in CC adaptation measures decision making process.

2.1.2.4 Contribution to Disaster Risk Reduction

CLARITY takes into account i.e. the recommendations established by the Sendai Framework[38] of actions (2015-2030) mainly on preparation actions. CLARITY climate services will be developed having in mind the overall SENDAI GOAL: "Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase

[38] http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

preparedness for response and recovery, and thus strengthen resilience". CLARITY will contribute to the 4 SENDAI Priorities:

1. Understanding disaster risk→ by making realistic and complex scenarios available and understandable to all types of stakeholders
2. Strengthening disaster risk governance to manage disaster risk →by fostering collaboration between all stakeholders involved in disaster risk management and preparation.
3. Investing in disaster risk reduction for resilience allowing the assessment of different options of potential mitigation and resilience measures
4. Enhancing disaster preparedness for effective response, and to «Build Back Better» in recovery, rehabilitation and reconstruction → by providing and demonstration the use of enhanced tools for creation, analysis and sharing of complex multi-hazard, multi-stakeholder scenarios. Thus enabling stakeholders to better assess potential situations and their side effect.

2.2 Measures to maximise impact

The overall philosophy of CLARITY is **making best use of existing experiences and know-how and sharing and open access to all results of the project**. This includes concepts, solutions and the software developed as well as dissemination and communication results. CLARITY addresses broad and heterogeneous target groups; the classification in categories is a guideline for all participants to browse their respective networks for access to different groups and to contribute to the spread by providing contacts, visit and host events in their region and act as "ambassadors" for CLARITY as a whole and in their specific field of expertise. The consortium provides geographical coverage of the most of Europe taking into account the respective neighbouring countries:

Location of Partners	**Reach** *(by Geography, language, culture and established economic relations)*
SPAIN	Iberian Peninsula and Islands in Mediterranean and Atlantic Sea, South/Western part of France, South America
AUSTRIA and GERMANY	Central and Eastern European Countries, Danube Region, Benelux, Eastern part of France
SWEDEN	Northern European Countries, Denmark, Baltic Countries
ITALY	Italian Peninsula and Islands in the Mediterranean Sea, South-East European Countries

CLARITY - Categories of direct Target Sectors and Stakeholder					
Sector			**local**	**regional / national**	**EU / Global**
Scientific Sector	***Meteorology and Climate***	Universities, Research Institutes, Applied Sciences, research networks like EUREKA; cooperative research projects on national and international level			
	Spatial Sciences (Geography, Urban Planning, Spatial Planning)				
	Geo- and Environmental Sciences				
	Construction above and below surface including Architecture and Materials				
	Agriculture				
	ICT				
	Social Sciences related to Public Administrations and Security				

Public Services, Government	***Public Administrations***	Urban and spatial planning; land use regulations, operational planning and statistics (migration, demographic development), economic development	Cities and communities; first responders	Regional and federal bodies; ministries for environmental, economic affairs; internal affairs (disaster, security), health	EU DGs (Climate Action, Energy, Environment, CIVIL Protection, Internal Market, Maritime Affairs, Mobility and Transport, Communications Networks, Regional and urban policy, Neighbourhood), EU agencies, foreign administrations
	Legislative Bodies	including law enforcement	Regional Parliaments	National Parliaments	EU Parliament, EU Council; foreign legislative bodies; International Organisations - UN
	Infrastructure Providers Transport (public and private)	Erecting and maintaining of railways, roads, waterways, airports, harbours acting on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks			
	Infrastructure Providers (public and private)	Erecting and maintaining infrastructure for energy, water, waste management acting on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks			
Industrial Sectors	***Real Estate incl. Facility Management***	Professional developers and organizers of real estate projects for residential, commercial (e.g. shopping malls), industrial, public (e.g. stations, hospitals, schools) or mixed usage	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks		
	Construction (above and below surface)	Erection of buildings and infrastructure for account of a third party	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks		
	Plant Engineering	Build-up of industrial production equipment, utilities (excluding the building hull) including resources and disposal concepts	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks		
	Insurances	Compensation of economic damage after liability cases and disasters, risk assessment for possible damages; investment of assets, therefore role of investors as well	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks		
	Investment and Asset Management	Investment in financial, tangible and intangible (e.g. IPR) assets for profit; risk assessment of assets	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks		
	Finance	Financing of projects of various kind (real estate, infrastructure, innovation, private, public) by banks, other private organizations and individuals (e.g. crowdlending or loans for enterprises); risk assessment referring economic risks.	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks		

	Infrastructure Operators	Public and private bodies that operate businesses on third parties´ infrastructure on own behalf or for account of another (e.g. railway operation or run a cable car that is owned by a tourism association)	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks	
	Planners and Consultants	Experts that consult public and private provider and operators on erection, operation and usage of infrastructure and land use and assess preconditions and effects	Different actors on single level (e.g. only regional) or more levels with own affiliates or in cooperative networks	
Civil Society	***Inhabitants***		local interest	
	Citizen Scientists	organized in specific fields of research by scientific organizations (see above) mainly gathering field-data or preservation work	local interest	involvement on more levels e.g. research field related associations
	Local supplier	supply of local inhabitants, neighbourhoods with goods and services of daily need	local interest	
	Schools (teachers, students)	Projects in education on various topics and involving multiple subjects	local interest, connecting with other local stakeholder project related	involvement on more levels e.g. via subject related associations
	Environmental NGOs		mainly organized on international level with local/regional chapters	
	Private property owners	Residential and (small) trade real estate	local interest	involvement on national level via associations

Table 1 - Categories of direct target sectors and stakeholders

2.2.1 Communication, Dissemination and Community Building

The objective of CLARITY Communication activities is to brand, promote and convey the message of CLARITY to target audiences. We will reach out to parties dealing with the issue of Innovation for climate change adaptation, risk reduction and resilience through news updates, conferences and active distribution of the good practices identified during the project. The main target groups of CLARITY will include: (sub-) regional and local authorities, such as municipalities and local development agencies environmental agencies; environmental clusters; environmental consultancies; companies with specific CC resilience offers; infrastructure providers and operators in the partner regions. Also the general public will be a target group in order to inform them and point out the EU contribution to this initiative.

The general strategy of dissemination aims (1) at the awareness and acceptance of the scientific and technological soundness of the CLARITY climate services, and (2) at the institutions that will take into account CLARITY for setting up their individual CC risk and adaptation strategy and implementation plans. A detailed plan of the dissemination and communication activities will be the baseline for coordination and streamlining of all dissemination activities of the project partners with the goal of generating synergies and ensuring efficient dissemination on regional, national and international levels.

Key to the success of CLARITY is the close collaboration with practitioners. The cooperation will work in two directions. First, there is a lot of existing know-how that CLARITY will integrate. Second, the results of the project will be shared through a series of interactive (training) workshops. The community building activities, led by SCC, will start from the consortium contacts to existing groups and associations such as eu-smartcities.eu, www.iclei.org, www.eurocities.eu, and www.popsu.archi.fr.

One instrument for low-threshold involvement of practitioners and prospective follower communities will be an online climate services platform (working title "myClimateService.eu", see T5.4). Prospective end-users can

fathom the benefits for their specific project and test the tools on their own, get in contact with the growing community and register for workshop attendance and consulting services. The business model will be sort of freemium/pay per use based and elaborated on in the CLARITY business plan (T5.2). CLARITY will utilize this platform for testing the usability of the tools and learns which additional services have to be provided. Due to the "self-service-approach" of the platform it encourages end-users to experiment with it and makes professional and sophisticated climate services affordable for smaller cities and communities and self-evidently economically applicable for smaller urban projects. Furthermore, it will be used for acquisition and marketing.

The partnership is very well networked so it can reach out to the complete community including all relevant stakeholders. Training and capacity building activities will be supported and organised as part of the project. This includes collaboration under topic DRS-9-2014|2015 CSA PLACARD[39] and RIAs RESIN[40] and EU-CIRCLE[41]. Scientific dissemination will be conducted as support activity underlining the scientific soundness of the CLARITY service. This will be achieved through conference papers and workshops, popular periodicals, and scientific journals using open access publication channels where possible. Dissemination towards practitioners and general public will be facilitated by aforementioned dedicated talks and workshops with high end-user participation, traditional media like newspapers, TV, as well as social media that allows the consortium to continuously advertise and showcase the project results. A series of events - the CLARITY Stakeholder Engagement Tour (conferences, forums, conventions) in the respective regions - will be attended every year. Every year the consortium will target one major urban planning/Smart Cities event such as the Smart City Expo World Congress in Barcelona. These major conferences with international reputation will provide the "annual CLARITY anchor event" with a thoroughly orchestrated concept (T6.3).

Professional videos will be produced for each demonstration site and a concept video for the entire CLARITY project. In order to guarantee an appropriate topic related environment it is planned to establish and operate a YouTube channel on climate change and encourage various communities to contribute (T6.2).

The following table highlights the most important dissemination activities that will be carried out by the project (for space reasons, **the complete tables can be found in section 4-5 – Annex I – CLARITY Dissemination activities, which includes the traditional and social media activities and the list of professional networks identified**).

Type of activities	Title (of event, journal, newspaper, TV channel, etc.)	Target audience
Integrated Modelling and Monitoring for Decision Making in urban and transport infrastructure planning	International Symposium on Environmental Software Systems, Croatia, 2017 (Worldwide Conference)	Software for the Environment, Scientific Community EDSS, EIS,
GIS specialized journals – GIS-based applications for addressing climate change, environmental and natural hazards issues	• Computers & Geosciences[42] • Computers, Environment and Urban Systems[43] • International Journal of Digital Earth[44] • Transactions in GIS[45]	Software for the Environment, Natural hazards, Climate Change Scientific Community
Creation of CLARITY project blog/website	Raise scientific awareness and help the public to better understand the interrelation of the different research fields involved.	Society. This activity intends to communicate people the relevance of this and others similar sites in their region
Creation of CLARITY LinkedIn dedicated group	Linkedin Group: CLARITY	Specialists on Urban planning and infrastructure management and conservation, climate change, environmental and natural hazard issues
Presentation	Climate Knowledge Brokers Workshop 2017,201x,201x; http://en.openei.org, wiki/Climate_Knowledge_Brokers_Group	Worldwide Climate change knowledge broker network (> 40 institutes, companies, organization worldwide)

[39] www.cmcc.it/projects/placard-platform-for-climate-adaptation-and-risk-reduction
[40] http://cordis.europa.eu/project/rcn/196890_en.html
[41] http://www.eu-circle.eu
[42] http://www.journals.elsevier.com/computers-andgeosciences
[43] http://www.journals.elsevier.com/computers-environment-and-urban-systems
[44] http://www.tandfonline.com/toc/tjde20/current
[45] http://eu.wiley.com/WileyCDA/WileyTitle/productCd-TGIS.html

Name of network / community	Relevance for CLARITY, in terms of communication, dissemination, exploitation	Types of individuals / professions organised in this network
IFIP WG 5.11 – Computers and Environment http://ifipwg511.org	Relevant for Dissemination activities. See member list http://ifipwg511.org/index.php?page=memberlist.php) Demonstrates the outreach in the environmental domain worldwide.	Scientific Community
OGC	Relevant for Dissemination and Standardization (standardized service/ interface development in the area of sensor observations (etc. used in Sensor Monitoring Networks). Relevant OGC Working Groups: **Sensor Web Enablement DWG** (Sensor Web DWG); **Emergency & Disaster Management DWG** (EDM DWG); **Earth Systems Science DWG** (ESS WG)	Standardisation / Scientific Organisation
IAUC (International Association for Urban Climate) http://www.urban-climate.org/	Support during the project execution, dissemination of results	scientific, scholarly and technical experts in urban climate and micro-scale processes

2.2.2 Exploitation and Business Perspective

CLARITY's value proposition is to make climate-proofing of infrastructure easier and faster at a fraction of the cost of individual climate sensitivity, vulnerability, impact and adaptation strategy studies. At present complete studies on urban level require a multi-disciplinary exercise resulting in a paper study that is taken into account in an overall (static) implementation plan. Typical cost of such studies is in excess of hundred thousands of Euro per project. EU-GL specifications suggests to lower this cost through "stairways planning", where the initial assessment is almost entirely automated, but the final planning may include expert workshops and manual runs of the specific models. This initial assessment capability will be supported by a CLARITY climate service that provides the functionality of the first three EU-GL modules, as explained in T1.3.

We foresee several main lines of commercial services related to this CLARITY marketplace: (1) low- or even zero-price/high volume automated pre-assessment; (2) customization and extensions of the data and services; and (3) consulting and project-specific modelling of the key adaptation options for the projects where this is still necessary.

We have identified four target markets: (1) Organisations that deal with planning and risk assessment; (2) organisations that act as consultants; and (3) Organisations that act as service providers, (4) organisation that operate (urban) infrastructure. More concretely we identify entities that can be members of one or more target groups: Cities (Planning), Insurance Companies (Risk Assessment), Consulting Companies (Consultancy), Environmental Information Agencies (Service/Data Providers), National Meteorological Services (Service/Data Providers), and Private Meteorological Services (Service/Data Providers). The approach to these markets will be pragmatic and pro-active. Participation on high impact events will be used to build a mindshare and establish CLARITY as one of the cornerstones in a general Climate Change adaptation strategy "in support of major implementation projects at local, regional or national levels". The concrete business opportunities will be primarily discussed with a number of "key accounts" – companies and public bodies that express high interest in our work.

Complementing the joint vision of the consortium to leverage the scientific and innovation outputs of the project, each partner is committed to promote the results in multiple domains using individual networks, depending on the partner's profile: research, business, social, policy making, standardization, education, environment, etc. Partners will turn their foreground knowledge into "Value Propositions" or "Unique Selling Propositions" as summarized in the following table that reflects the exploitation and dissemination objectives of the partners.

Participant	Value Propositions / Unique selling propositions	Targeted users/customers
ATOS	CLARITY will help ATOS to develop solutions which involve key emerging trends and technologies addressing the environmental, risk assessment and public market	Public Administration and Civil Protection bodies are an opportunity to seek collaboration models in public services in which public administration provide infrastructural supply. New market opportunities are also expected in the insurance and tourism sectors.
CIS	Offering Open Source Scenario and Decision Support Tools as a basis for consulting activities	Urban and transport infrastructure sectors (regional, national)
SMHI	Offer user-oriented and user-tailored web-based climate services targeted at large-scale investments on urban to regional scales. Trigger new possibilities for on-demand consultancy work.	Public authorities or agencies and private companies in the sectors of e.g. road administration, civil protection, urban/regional planning, and public health.
METEOGRID	Enlarge the meteorological services already on operation towards climate services focused to transport and urban infrastructure management	(1) Administration and public bodies in the domain of management of transport infrastructure, (2) civil engineering companies, (2) private companies related to infrastructure management, (3) economic feasibility and profitability consultant and (4) infrastructure licensee companies.
ZAMG	Provide services related to regional and urban climate modelling and scientific expertise on climate change on local scale.	Public authorities (national, regional and municipal) in the sector of urban/regional planning, public health, energy, environment and construction.
PLINIVS	To better integrate its two specific fields of expertise: impact assessment, and the development of adaptation strategies. PLINIVS may also improve its risk assessment model and extend it to the effects of climate change with the aim to obtain a platform for the performance assessment of climate change adaptation measures	To get the opportunity to develop together with local authorities a working method for the planning and resilience/adaptation evaluations for the areas affected by Climate Change effects taking advantage from a common computerised tool that will allow to export the experience to other Administrative Public Institutions, real target of the project exploitation such as: Civil Protections, Regions, Union of Municipalities, single Municipalities, Lifelines Providers, Infrastructure Managers.
AIT	Support the municipalities and infrastructure providers in Austria and surrounding countries in use and customization of the CLARITY products.	National and regional government authorities; infrastructure providers
EUREKA	Offering consulting, regarding economic and societal impact analysis using CLARITY climate services	Government Agencies specialized in Catastrophes prevention/mitigation, Civil Protection, Regions and Municipalities, insurances Companies
AEMET	Offering forecasting, early warnings, monitoring, research (strong focus on climate change, severe weather events forecasting, numerical weather prediction) and international co-operation. Services for prediction of severe weather events over Spain, air pollution and temperature data. Furthermore, AEMET is able to perform the global and regional climate scenario simulations	National, regional and municipal authorities (planners) as well as the sectors of energy, environment and construction.
WSP	Outcomes will include new modelling experience using the developed indicators, as well as the PR value of showing our expertise in hydrologic/hydraulic modelling which may bring us new clients within the near future.	The increasing number of Swedish towns, cities, municipalities and regions that are performing climate adaption plans and strategies.
SCC	CLARITY will help to develop insights on Climate Change effects, thus increase offerings for consulting, development of collaborative innovation projects and services and dissemination of their results; franchise and branding.	(1) Smaller municipalities and their economic communities on a regional level (2) Replication in international scale as consulting service for local purveyors (private and public) (3) Dissemination opportunities in Canada
StockCity, NAPOLI, ACCIONA, CABJON, CEDEX, LINZ	Value Propositions: Operational use of CLARITY climate services for impact assessment in urban/regional planning and large infrastructure projects Targeted users/customers: The individual organisations, public and private, involved in the respective planning, implementation and managing activities	

Table 2: **Partners' value propositions**

2.2.4 IPR management, data management and open access to services, software and data

IPR will be governed by the Consortium Agreement (CA) that will be signed by all partners before the project. The CA will address background and foreground knowledge, ownership, protected third party components of the products, and protection, use and dissemination of results and access rights. The overall philosophy is sharing and open access to all results of the project. Within the project consortium the following principles will be implemented. (1) Confidentiality; (2) Each Contractor is and remains the sole owner of its IPR over its pre-existing know-how. However, the pre-existing know-how needed for carrying out own work under the project shall be granted on a royalty-free basis. (3) The ownership of project knowledge will belong to the partner(s) generating it. (4) Partners shall proactively disseminate if it does not adversely affect its protection or use and subject to legitimate interests.

The consortium will use the Open Source software and Open Documentation as a way to achieve larger mindshare, and achieve a sustainable result beyond the project end. The consortium commits to publish all newly developed climate service foreground under an appropriate open software licence that maximizes the business opportunities of the project partners while still benefiting from the open source community. Where possible, the same licence will also be chosen for new versions of the already existing open source software that is further developed in the project. Furthermore, all documentation produced in the project will be published under appropriate open documentation licence.

The project also foresees a specific task to manage the research data generated and collected during the project. The assessment of climate change adaptation measures will require the processing and storage of a large variety of data sets, including data on population, infrastructure, land use, general environmental and meteorological variables and climate change projections based on relevant IPCC scenarios. As the project will generate data sets related to the whole chain of climate change impact and adaptation assessment such as downscaled climate projections, hazard, impact and risk maps, vulnerability functions, indicator and criteria sets, these results are valuable data assets by themselves. For the use of the consortium and relevant stakeholders the non-sensitive data produced in the context of the project will be made publicly available and registered at relevant catalogues such as the Climate Change Data Catalogue of the World Bank.

3. Implementation

3.1 Work plan - Work packages, deliverables and milestones

3.1.1 Brief presentation of the overall structure of the work plan

CLARITY will be carried out over 36 months split into three periods of 12 months each. Milestones highlighting relevant results at the end of each period are defined at the project level (sec. 3.2.3 Project Milestones).

As shown in the Figure 2, the CLARITY climate services and workflows are designed and co-created with pilot stakeholders in WP1 (Co-creation), using the background elements that have been adopted for use in CLARITY in two support work packages: WP3 (Scientific support) and WP4 (Technical support).

Demonstration and validation of the results is conducted in WP2, thus providing the input for two "Impact" work packages: WP5 "Exploitation and Business" and WP6 "Dissemination and community building".

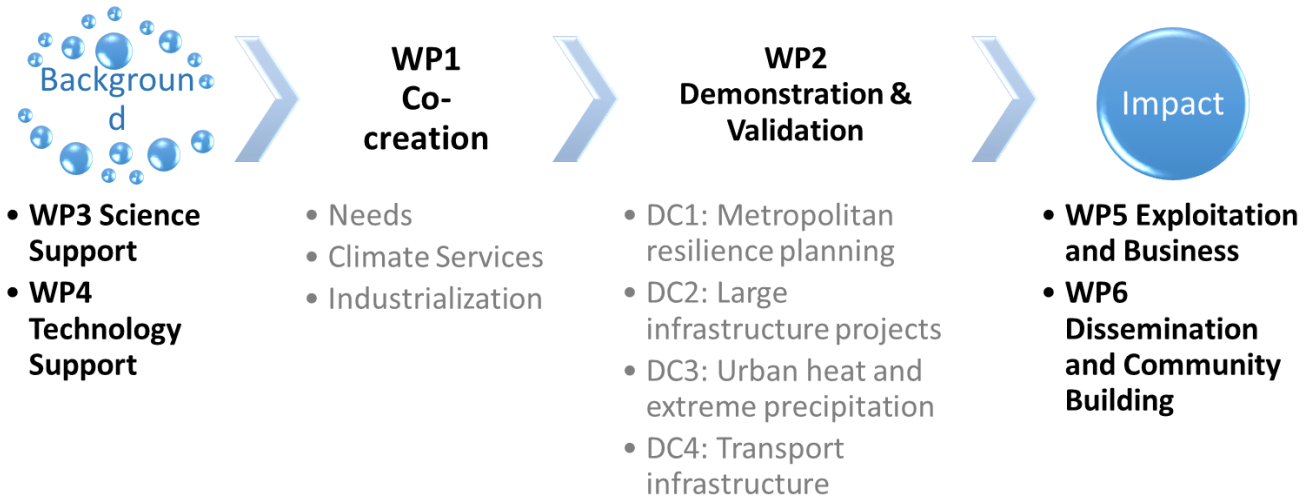


Figure 2: **CLARITY PERT Chart**

The feedback loop indicates that the feedback received from external stakeholders is fed back into WP1 and influences the final design and functionality of CLARITY climate services.

3.1.2 Timing of the different work packages and their components (Gantt chart or similar)

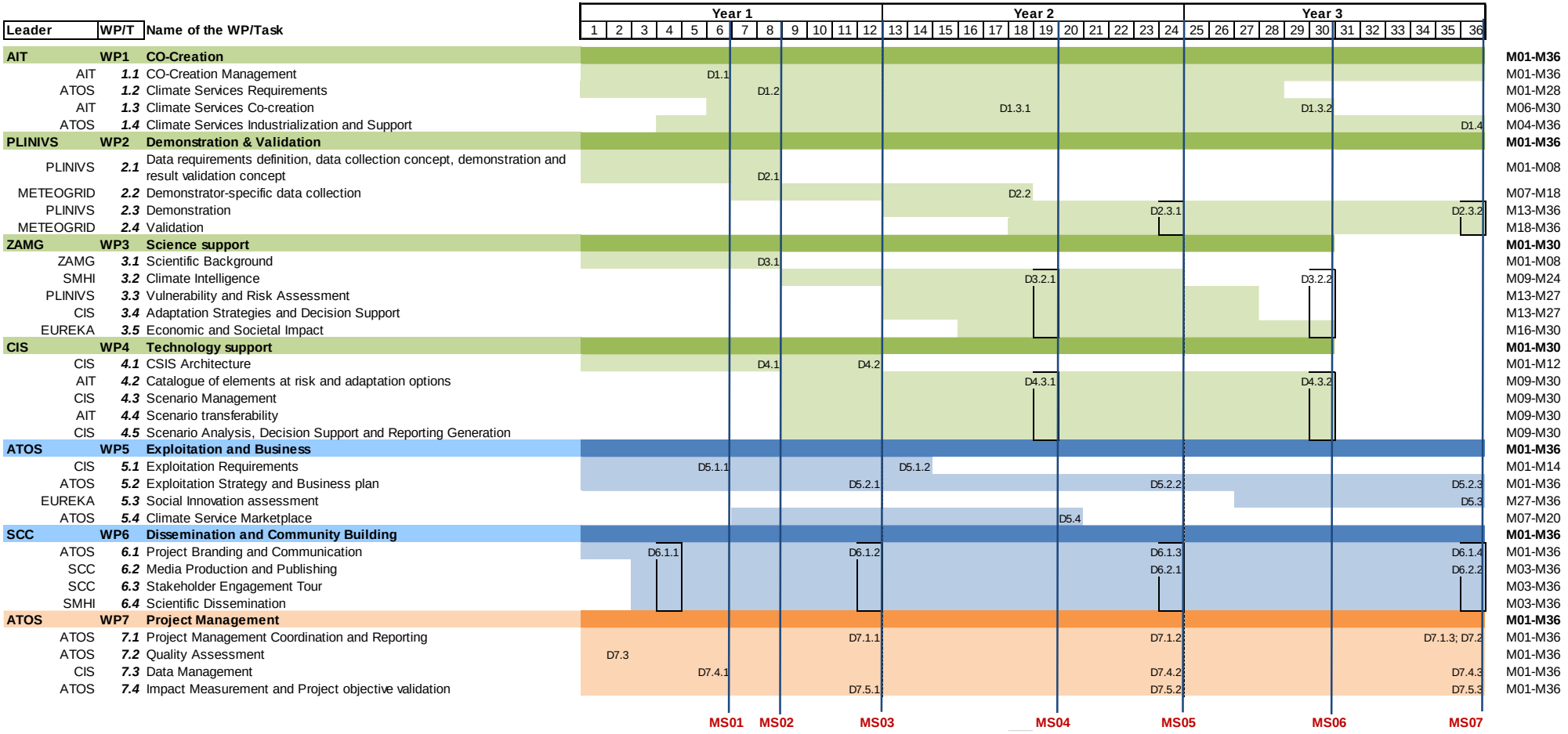


Figure 3: GANTT Chart (with Milestones and Deliverables)

3.1.3 Description of each work package

	WP #	1						Start date or starting event:			M01 (End: M36)						
	WP title	Co-Creation															
Participant	Number	1	2	3	4	5	6	7	**8**	9	10	11	12	13	14	15	16	17
	Short name	ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS-LUPT	StockCity	**AIT**	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABJON	CEDEX	LINZ
	PMs	31	16	13	10	13	5	4	**20**	2	2	5	4	5	1	4	3	4

Objectives

The objective of WP1 is to involve practitioners, suppliers, purveyors and technology providers, scientists and potential end users (customers) in the climate service co-creation and deliver the CLARITY CSIS software and workflows in support of the climate-resilience planning. In line with the recommendations of the EC working document on "Adopting infrastructure to climate change", CLARITY will make use of the "Non-paper Guidelines for Project Managers: Making vulnerable investments climate resilient" [EU-GL] as the baseline specifications of clarity climate services. In this way, CLARITY will be closely aligned with the existing best practice recommendations and therefore compliant with related ongoing developments.

WP1 will start with the EU-GL specifications, WP3 models and WP4 services that are inherited from the background projects (see section 1.3.2). In an AGILE process, these inputs will be integrated into CLARITY CSIS that is ready to be configured for specific use, fed with local data and used in WP2 demonstrators. This will be achieved through following tasks:

Description of work

T1.1 CO-Creation Management (M01-M36; Lead: AIT; Participants: ATOS, CIS, ZAMG, PLINIVS, SCC)

This task will be led by the WP1 leader/technical manager and include all members of the Technical Committee as task participants. They will coordinate the development efforts in all work packages, oversee the co-creation process and coordinate the AGILE development within WP1 and across the work packages. In cooperation with the Project Manager, the WP leaders will organise the cross-wp agile teams in support of the WP2 demonstration cases, coordinate the high-level CLARITY implementation strategies/plans, set/agree on goals, milestones, oversee the technical project progress and decide on schedule of the project activities for a window of 3-6 months in advance. At the project start this task will initiate and set up the agile co-creation process, making sure that the inputs from other work packages as well as the stakeholders' needs as expressed in T1.2 are incorporated into CLARITY CSIS. When issues or new opportunities are discovered during the project, the T1.1 team will analyse the issue at hand and define the mitigation measures (as actions for the involved partners or as proposals to GA, depending on the severity).

T1.2 Climate Service Requirements (M06-M28; Lead: ATOS; Participants: CIS, SMHI, METEOGRID, ZAMG, PLINIVS, STOCKCITY, AIT, EUREKA, NAPOLI, AEMET, WSP, ACCIONA, CABJON, CEDEX, LINZ) Output: D1.1 and D1.2

At the project start this task will organise the initial workshops with all project participants to consolidate the project background and ideas together with all team members and collect initial user feedback that will be further refined in T1.2. The first workshop will be organised as a plenary meeting right after the project kick-off and feature the presentation of the Non-paper Guidelines for Project Managers: Making vulnerable investments climate resilient" [EU-GL], early demonstrations of the scientific concepts (WP3) and technologies (WP4) that were inherited from previous projects (see also section 1.3.2) as well as the discussion on the ways to adapt these project inputs to the real needs of the CLARITY end-users. At the follow up workshops, the needs for Climate services (CS) and possible solutions will be discussed with the case study city administration bodies by means of user stories, carried out as a joint task of climate modellers/impact analysts, ICT service developers, urban and infrastructure planners and environmental department officers from the case study cities. In order to minimize the travel expenses and maximize the number of involved stakeholders, at least one workshops will be set up in each CLARITY use case area and the participation invitations sent to interested stakeholders beyond those involved in the project. This initial intensive co-creation phase will result in the first user stories and test cases. This task will formulate the first consolidated set of CLARITY user stories based on EU-GL specifications and initial stakeholders' feedback from T1.1 workshops in M08 and maintain the database of updated user stories and test cases throughout the project.

T1.3 Climate Services Co-creation (M06-M30; Lead: AIT; Participants: ATOS, CIS, SMHI, METEOGRID, ZAMG,

PLINIVS, STOCKCITY, AIT, AEMET, WSP, CABJON, LINZ) Output: D1.3.x

The task will integrate the WP3 and WP4 output and implement the CLARITY CSIS for use in WP2 demonstrators and in line with the user stories (requirements) from T1.2. Resulting CLARITY climate services will follow the "staircase" principle that is central to EU-GL to quickly and cost-efficiently determine how the project is sensitive to climate change in the first place and what types of adaptation options (if any) need to be considered before investing in fully fledged studies. CLARITY CSIS will feature support for: (1) assessing the sensitivity of elements at risk (humans, buildings, infrastructure, etc.) in relation to a range of climate variables and secondary effects / climate-related hazards." (T3.2); (2) assessing the exposure of the project(s) and assets to climate hazards in the location(s) where the project will/could be implemented" (T3.2) ; (3) assessing the vulnerability of the project(s) to current and expected climate conditions at the project site (T3.3); (4) mapping of this new knowledge to concrete project(s) as well as incorporating the concrete calculations and expert opinions in order to estimate the concrete CC-related risks for the project at hand (T3.4); (5) assessing the costs and impacts of different adaptation options for the concrete projects / elements at risk (T3.5); as well as (6)documenting the findings as input for adaptive planning (T4.4). This will allow the end-users to explore alternative resilience scenarios (T4.3, T4.4, T4.5) with respect to: (1) variable local context; (2) selection of relevant climate intelligence (based on representative CC Scenarios); (3) varying hazard intensities; (3) flexible exposure scenarios; (4) possible variations and alternative selection of options.

Apart from the decision-support functions, the climate service will also support integration of the data and simulation model results (T4.1), as well as management of simulated risk and adaptation scenario information (T4.3).

While primarily catering to the needs of the CLARITY demonstrators, T1.3 will also provide a technical basis for the CLARITY marketplace in T5.4, in form of the automated "initial assessment" functionality that combines the EU-wide climate downscaling models (T3.2) with the catalogue of elements at risk and adaptation options (T4.2), "scenario transferability" module (T4.4) and the decision support elements of the CLARITY CSIS (T4.5). **T1.4 Climate Services Industrialization and Support (M04-M36; Lead: ATOS; Participants: CIS, METEOGRID, AIT) Output: D1.4**

At the project start, this task will provide necessary repositories for hosting of the CLARITY software code, data and services as well as a set of tools to support the development of industrial-quality code[46].

Based on the concrete needs and lessons learned in research and industrialization projects of the CLARITY partners and on the requirements of the CLARITY Quality Plan and Project Handbook (D7.3), this task will provide support in form of the consistent development toolset including e.g. Git for source code management, Maven for build automation, Jenkins for continuous integration and release management, Open Stack based cloud hosting, Vagrant for VM configuration, Docker for containerization, etc. Later in the project, this task will provide support for hosting of development tools and CLARITY services as well as for the issue and bug tracking. In the last six months of the project, this will be the only active development task in order to assure that no new features are implemented and that the remaining development efforts are spent on issue and bug fixing.

Deliverables

D1.1 Initial workshops and the CLARITY development environment (AIT, R, CO, M06)

A report summarizing the lessons learned in initial CLARITY workshops (T1.1). This deliverable will also contain a report on establishment of the CLARITY development environment (T1.4), as annex to the main document.

D1.2 Database of initial CLARITY CSIS user stories and test cases (ATOS, OTH, PU, M08)

Online database with first consolidated version of the CLARITY CSIS user stories and test cases, based on EU-GL and the feedback from initial workshops. This database will be maintained throughout the project as a part of the ongoing T1.2 work.

D1.3.x CLARITY CSIS v1, v2 (AIT, OTH, PU, M18, M30)

CLARITY Climate Services Information System, packaged and ready to be used in WP2.

D1.4 Final industrialization and support report (ATOS, R, PU, M36)

Report on the achievements of the T1.4 work in the last six months of the project. This report will include the summary of the bug and issue reports that addressed in the final project months and of the known bugs and issues that are left open at the project end.

[46] The task at hand is illustrated e.g. in https://xebialabs.com/periodic-table-of-devops-tools

	WP #	2								Start date or starting event:					M01 (End: M36)			
	WP title	Demonstration & Validation																
Participant	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Short name	ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS-LUPT	StockCity	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABJON	CEDEX	LINZ
	PMs	11	11	13	32	12	19	6	7	13	14	15	6	30	0	6	8	2

Objectives

The collection and management of scenario data is essential to the project. The objective of WP2 is to support the successful implementation of CLARITY demonstration cases, including the preliminary data collection and compilation activities and the final validation of the proposed tools with respect to end-users' requirements. To this aim WP2 will:

- provide a harmonised methodology for data collection across the different demonstration cases, linking end-user's requirements from WP1 with modelling and software needs in WP3 and WP4,
- monitor the effective implementation of CLARITY demo cases,
- deliver local data (sensitivity, exposure, vulnerability to CLARITY models (WP3) and tools (WP3),
- collect climate scenarios and tailor them to the specific needs of the demonstration cases,
- Validate the tools implemented in WP4, including unit and integration testing,
- And demonstrate the fulfilment of requirements and the application potential of the tools, providing feedback to WP1 and WP4

Description of work

T2.1 Data requirements definition, data collection concept, demonstration and result validation concept (M01-M08; Lead: PLINIVS; Participants: ATOS, CIS, SMHI, ZAMG, STOCKCITY, AIT, EUREKA, NAPOLI, WSP, CABJON) Output: D2.1

The task will define data requirements to provide the climate services and preparatory work. It will provide a harmonized approach for data collection (climate signals, urban land use and environment data, inventory of elements at risk, sensitivity, exposure, etc.) across the different demo cases to support the transferability, scalability and replicability of CLARITY climate services in different EU contexts. This approach will be part of the guidelines on how to set-up CLARITY climate services. The proposed methodology will be adapted from previous EU and national project, such as CRISMA, SUDPLAN and Metropolis[47] and will be oriented towards the integrated management of multi-scale information in a GIS environment. It will define spatial units of analysis (model grid spacing, street blocks, etc.) with territorial level data (census data, land use, regional & urban climate model results, microclimate modelling results). The required input of models (WP3) and tools (WP4) will be systematically identified for the individual demo cases, with reference to the specific climate hazards and elements at risk. The result will allow to effectively carry out the data collection in T2.2. In addition, this task will also define and document the demonstration and validation plans and methodology, based on the demonstration and validation methodology of the CRISMA project.

T2.2 Demonstrator-specific data collection (M07-M18; Lead: METEOGRID; Participants: ATOS, CIS, SMHI, ZAMG, PLINIVS, STOCKCITY, AIT, EUREKA, NAPOLI, AEMET, WSP, ACCIONA, CABJON, CEDEX, LINZ) Output: D2.2

Based on the outcomes of WP1 in terms of requirements and T2.1, this task will support the data collection activities in the different demonstration cases. A survey of all relevant data sources for the demonstrations will be performed at the beginning of the project. Datasets related to sensitivity, exposure and vulnerability parameters will be provided for the models (WP3) and tools (WP4). A catalogue of CLARITY data and metadata will be maintained by the consortium and continuously updated throughout the project in case new data will become available. The datasets will be collected and made available to the pilots. As a part of this task, the catalogue of elements at risk and adaptation options will be populated with the data from the demonstration sites and with the data from the climate-adapt.eea.europa.eu/sat and other case study portals mentioned on that web page. This will allow to validate the scenario transferability functionality (T4.4) later on and provide the initial data set for the CLARITY marketplace in T5.4. Where feasible datasets will be made accessible through the GEOSS platform following the GEOSS Data Sharing Principles. The compliance of collected data with the end-users' requirements (WP1), models'

[47] All projects that are mentioned in the task descriptions are introduced in section 1.3.2 and 1.3.4 of the document.

(WP3) and tools' (WP4) needs will be assessed through workshop sessions with key stakeholders, data suppliers and potential end-users' representative of the 4 CLARITY demonstrators (at least 2 per demonstration case). Complementing T2.3, dedicated workshops will provide stakeholders with the opportunity to evaluate/test/know/identify the current state of models and data in CLARITY climate services. During the workshops relevant pre-existing (legacy) tools, models and data will be identified required for the actual implementation of the demo-cases, and highlighting key limitations and integration requirements.

T2.3 Demonstration (M13-M36; Lead: PLINIVS-LUPT; Participants: ATOS, CIS, SMHI, METEOGRID, ZAMG, STOCKCITY, AIT, EUREKA, NAPOLI, AEMET, WSP, ACCIONA, CABJON, CEDEX, LINZ) Output: D2.3.x

Based on the lessons learned in baseline demonstrations (T1.2), as well as on the methodology and planning that was identified in T2.1, T2.3 aims at the efficient management and conduction of the demonstration activities in the case study areas. Planning, set-up and execution of the demonstrators will involve all relevant stakeholders, providing two iterations for each demonstrator. The first iteration will focus on the compliance of the proposed solution to the requirements, identified in WP1, demonstrating and collecting feedback to WP3 and WP4 where improvements or adaptation are requested. The second iteration will focus on the full demonstration of CLARITY climate services, allowing to showcase the functionalities, operational environment and workflows of the proposed solutions.

Workshops with EU-level and local end-users and stakeholders will be carried out in each CLARITY demonstrator area, assessing the compatibility of the CLARITY climate services with current procedures, practice and needs in each location; and identifying priorities of application of CLARITY solution for each location, while also drawing insights that could be applicable in the broader European context. A specific focus will be given to the identification of additional or follow-up resources mobilised to implement the demonstrators, such as the European Structural and Investment Funds (ESIF), in particular under the European Regional Development Fund (ERDF). A final joint event showcasing the results from the 4 CLARITY demonstrators will be organised, illustrating the wide transferability of the implemented tools across different contexts in EU.

T2.4 Validation (M18-M36; Lead: METEOGRID; Participants: ATOS, CIS, SMHI, ZAMG, PLINIVS, STOCKCITY, AIT, EUREKA, NAPOLI, AEMET, WSP, ACCIONA, CABJON) Output: D2.3.x

This task dedicated to the validation of CLARITY framework and tools, in terms of compliance with requirements and functionalities identified, and the potential uptake (impact) of CLARITY in providing an improved capacity for exploiting climate services in the EU (in particular in the context of the European research and innovation Roadmap for Climate Services). Validation will also assess efficiency of the CLARITY CSIS design, appraisal and implementation of climate adaptation strategies, with a specific reference to the EU GL - Non-paper Guidelines for Project Managers: Making vulnerable investments climate resilient and the EU Strategy on adaptation to climate change.

Business exploitation potential will be identified, highlighting the benefit derived from the integration of CLARITY within planning and management procedures in terms of cost savings, process improvement and efficiency increase, leading to value creation, optimised opportunities and minimised risks.

The validation will be performed through collaborative sessions involving end-users and stakeholders, both within CLARITY consortium and external. Structured interviews and questionnaires will allow the benchmarking of satisfaction levels in terms e.g. of functionality, reliability, usability, efficiency, maintainability and security.

Deliverables

D2.1 Demonstration and validation methodology (PLINIVS-LUPT, R, PU, M08)

This deliverable will provide a methodology and plan for: (1) the collection of required data (climate signals, urban environment, inventory of elements at risk, sensitivity, exposure, etc.) in T2.2; (2) conduct the demonstrations in T2.3 and (3) validate the results in T2.4.

D2.2 Catalogue of local data sources and sample datasets (METEOGRID, R, PU, M18)

This deliverable will provide a catalogue of local data sources for each of the demo applications, describing how local data is integrated in CLARITY Climate Services, to ensure transferability of the proposed methodology for data collection and tools customization.

D2.3.x CLARITY Demonstrators Implementation and Validation Report v1, v2. (PLINIVS-LUPT, R, PU, M24, M36)

This deliverable will provide a report on the outcomes of the first and second round of CLARITY demonstrators' implementation, providing feedback to WP1, WP3 and WP4. It will also report the outcomes of the evaluation and validation process, including feedback from potential end-users external to the consortium.

	WP #	3					Start date or starting event:								M01 (End: M30)			
	WP title	Science Support																
Participant	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Short name	ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS-LUPT	StockCity	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABJON	CEDEX	LINZ
	PMs	0	5	14	14	22	20	0	7	13	0	6	0	9,5	0	0	8	0

Objectives

Based on the methodological concept and end-user driven requirements defined in WP1, WP3 will integrate all the existing (background) data, models and algorithms that are necessary for realization of the CLARITY demonstration scenarios into the CLARITY climate services. WP3 will provide all "scientific background" elements of the adaptation scenario chain required for implementation of the [EU-GL]. WP3 spans the arc from climate forcing over local conditions to CC hazards and impacts, including adaptation measures, decision criteria and socio-economic impact. The overall objective can be broken down to:

- **Scientific Background:** provide the scientific base (literature overview, model simulations and data) tailored to project needs as a service for WP1 along the logic of EU-GL;
- **Climate Intelligence**: provide climate data for reference scenarios driven by end-user needs; provide downscaled climate signals based on IPCC scenarios and implement models and algorithms that use available local data and models for improving the projections of environmental variables by further downscaling and bias correction; connect environmental variables to meteorological signals by providing hazard models incl. input and output variables driven by CC signals;
- **Vulnerability and Risk Assessment**: provide indicators for vulnerability and risk assessment based on hazard models output; analyse sensitivity and exposure by providing inventory data for quality and quantity of elements at risk, such as people, infrastructure, including distributions in time and space; define vulnerability functions for the different identified elements at risk;
- **Response Strategies and Decision Support**: provide models and algorithms to evaluate the response of strategies implemented for adaptation and/or mitigation measure to be combined with impact modelling and assessment; develop aggregation algorithms producing indicators driving decision support models and algorithms based on WP1 concepts;
- **Economic and Societal Impact:** develop adaptation scenarios illustrating the economic and societal consequences of the implementation of different adaptation measures compared to reference scenarios;

Description of work

T3.1 Scientific Background (M01-M08; Lead: ZAMG; Participants: SMHI, PLINIVS, AEMET, ACCIONA) Output: D3.1

At the initial phase of the project T3.1 will contribute to the inception activity and in this context will outline the best possible picture of reference scenarios to support WP1 and WP2 work. This activity will include initial compatibility studies (e.g. CC signals as input to concrete hazard models), define interoperable data formats and exchange interfaces and verify that the approach complies with EU GL.

T3.2 Climate Intelligence (M09-M24; Lead: SMHI; Participants: METEOGRID, ZAMG, PLINIVS, AIT, AEMET, ACCIONA) Output: D3.2.X

T3.2 will provide climate and environmental data for reference and adaptation scenarios of the CLARITY use case studies. Reference scenarios are the basis for adaptation measure comparability built on existing ("historic") data sets (local context). These scenarios are projected into future climate conditions with the full chain of elements required to perform an impact assessment (from climate forcing over local conditions to CC hazards and impacts). The comparison between present and projected hazard impact will indicate the effect of CC. Downscaled climate and environmental projections for IPCC scenarios selected in WP1 will be used for impact assessments in the pilot use cases. Downscaling of temperature, rainfall and air pollution, hydrological conditions will constitute an extension of services implemented in FP7-24778 SUDPLAN and include the use of microclimate models for heat load assessment in urban areas (ACRP-KLIEN FOCUS-I, ACRP-KLIEN UFT-ADI, ACRP-KLIEN COIN, BMWFW SISSI_I+II, IVF)[48] Urban climate in Central European cities and global climate change) and e.g. probabilistic seasonal and near-term climate predictions based on the available operational products (ECMWF IFS, NCEP CFS). Task 3.2 will apply and

[48] See references and explanations are in T1.3.2. Same for other tasks.

customise models and algorithms to downscale and bias correct the regional-scale environmental variables to a spatial and temporal scale useful for adaptation measure assessment under future extreme environmental conditions. Examples of this work are the integration of available local data and models with respect to heat waves and air pollution episodes in cities, or with respect to intense rainfall with risk for urban flooding and droughts. Task 3.2 will determine the local environmental response to current CC forcing, future forcing without adaptation and with adaptation for measures, formulated by T3.4, that change the forcing through feedback to the climate and environmental signals. The output from Task 3.2 serves as input (and is tailored) to the hazard, exposure and impact modelling in T3.3.

T3.3 Vulnerability and Risk Assessment (M13-M27; Lead: PLINIVS-LUPT; Participants: ZAMG, AIT, EUREKA, ACCIONA; CEDEX) Output: D3.2.X

T3.3 will provide the models and algorithms to handle the consistent chain from the given climate driven environmental signal to the local hazard intensity, specific exposure quality and quantity and the simulated impact including damages on infrastructure and services, as well as on population health with subsequent economic losses. The work will be based on the concepts and models that were developed in previous European and national projects, such as FP7-284552 CRISMA, FP7- 226479 SAFELAND, OP R&C 2007-2013 Metropolis, extended and streamlined towards CC signals and their impacts. Based on the outcomes of Tasks 3.1 and 3.2, the main steps of this Task are the following (according to Modules 1-4 of EU GL). (1) To identify the climate sensitivity (High, Medium and No) of pilot cases in relation to a range of climate variables and secondary effects/ climate-related hazards. (2) For zones exposed with high or medium sensitivity, to evaluate the spatial data (GIS) of climate variables and related hazards, taking also into account the future evolution of phenomena. (3) To assess the vulnerability of each element at risk (people, buildings, infrastructures, economy, etc.) under effect of each hazard analysed. (4) To assess risk (at high or detailed level) consequent on hazard induced by CC on elements exposed.

Based on the outcomes of T3.2, input-output parameters for hazard modelling will be calculated, identifying the impact/risk quantification for physical and non-physical assets, considering magnitude and evolution of CC, statistical analyses, averaging period and joint probability events. Inventory data for quality and quantity of elements at risk, including their distribution in time and space, will be detailed. For each hazard and element at risk considered vulnerability curves will be implemented and integrated into corresponding hazard/impact models. To this end, input-output parameters for impact modelling will be calculated, thus leading to the definition of “measured” (through calculations and modelling) reference scenarios, reflecting the outcomes of WP1. The task solves the problem of local context information integration, both of today’s situation and assumed future developments in the timeframe of the adaptation measures. This will be realised for the environmental conditions simulated in T3.2. T3.3 and T3.4 thus together provide the models, algorithms and data to be integrated in the WP2.

T3.4 Adaptation Strategies and Decision Support (M13-M27; Lead: CIS; Participants: METEOGRID, ZAMG, PLINIVS, AIT, EUREKA, ACCIONA, CEDEX) Output: D3.2.X

Task 3.4 will provide models and algorithms to integrate adaptation measure effects in the impact modelling which will allow the assessment of alternative adaptation measures compared to reference scenarios. For this, we select short lists of adaptation measures (Module 5, EU GL) to respond to the climate vulnerabilities and risks that have been identified in T3.3. The adaptation measures must be environmentally, socially, technically, and legally feasible. In this perspective. The parameters modified by the implementation of adaptation measures will affect the input data of the model for impact Assessment, described in Task 3.3, leading to modified (“adapted”) impact scenarios. For different types of measures, such as city planning, construction and social behaviour. The expected changes to parameters in the models and algorithms for the scenarios are qualified (e.g. which characterisation of hazards, exposures or impacts are changing in which direction and how intense, how adaptation measures affect vulnerability curves for different hazards and elements at risk). This will be detailed specifically for the climate and environmental data of T3.2. For selected and elaborated adaptation measures in the demonstration cases, the effects are quantified to enable simulations of alternative scenarios.

T3.5 Economic and Societal Impact (M16-M30; Lead: EUREKA; Participants: ZAMG, PLINIVS-LUPT, AIT, ACCIONA) Output: D3.2.X

Task 3.5 will appraise adaptation options selected in T3.4 (Module 6, EU GL), with the scope to select efficient and ‘optimal’ options (i.e. those maximising net benefits), considering also the robustness in the context of the uncertainties associated with future CC. Decision-relevant indicators will be extracted from the simulated scenarios, allowing the comparison of results of alternative decisions. Parameters and algorithms for multi-criteria and cost-benefit analyses will be implemented to assess the direct and indirect multi-sectoral effects of CC adaptation measures. The work includes the provision of models and algorithms implementing a decision support approach based on the ranking of alternative scenarios, i.e. compared to a reference scenario, such as multi-criteria-analysis.

Models and algorithms that handle (calculate and visualise) uncertainties in comparing alternative planning measures and scenarios will be elaborated and integrated in the overall decision support logic. Through the use of T3.5 results an 'Integrated adaptation action PLAN into the project development cycle' (Module 7, EU GL) can be created. Giving scientifically sound background that helps to define: clear roles and responsibilities; actions needing institutional and community cooperation with plan and timing of consultation and communication; statement on how the project will manage climate risks and vulnerabilities; monitoring and systematic appraisal, review continued relevance and effectiveness of the adaptation decisions, identifying adjustments. In addition, this task will also provide the models and algorithms for transforming the available monitoring data into indicators and criteria that are directly useful for adaptive management

Deliverables

D3.1 Science support plan and concept (ZAMG, R, PU, M08)

This deliverable will provide an overview of the scientific concept behind CLARITY CSIS, and WP3 work plan (per task)[49], taking into account the input from the D1.1.

D3.2.x Science support report (ZAMG, R, PU, M20, M30)

This deliverable is a short report that will accompany the WP3 software and report on the work performed in WP3 since the project start (per task).

It will also provide an updated plan for the WP3 work until the project end (per task), taking into account the users feedback from the first version of the demonstrators (D2.3) each tasks contributes one chapter.

MERGE: This deliverable will accompany the final release of the WP3 software elements/models and report on the work performed in WP3 since release of the D3.3.

	WP #	4					Start date or starting event:								M01 (End: M30)			
	WP title	Technology Support																
Participant	Number	1	**2**	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Short name	ATOS	**CIS**	SMHI	METEOGRID	ZAMG	PLINIVS-LUPT	StockCity	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABJON	CEDEX	LINZ
	PMs	19	**17**	0	15	0	7	0	12	2	0	5	0	0	0	0	0	0

Objectives

Based on the methodological concept and end-user driven requirements defined in WP1, WP4 will provide the technological backbone of the CLARITY CSIS by tailoring the technological background to project needs. For this, WP4 will integrate and adapt all required and existing (background) tools and services that are necessary for realization of the CLARITY reference scenarios and implementation of the [EU-GL] into the CLARITY climate services. WP4 spans the arc from IT architecture and IT infrastructure, over software for data and scenario management, to visualization and ranking of potential adaptation options. The overall objectives can be broken down to tasks as follows:

Description of work

T4.1 CLARITY CSIS architecture (M01-M12; Lead: CIS; Participants: ATOS, METEOGRID, PLINIVS) Output: D4.2

Adopt the best architectural practices, data and model integration tools from the "Future Internet Public Private Partnership" programme and FP7 projects ENVIROFI, SUDPLAN and CRISMA, thus giving the solid ICT foundation to the CLARITY climate services and the anchor for all other developments in the project. This task will also adapt and integrate the existing software for data, indicators and model result/scenario integration (from ENVIROFI, from CRISMA, standard OGC software) into the CLARITY climate services.

T4.2 Catalogue of elements at risk and adaptation options (M09-M30; Lead: AIT; Participants: CIS, PLINIVS) Output: D4.3.x

Adapt the existing catalogue software background such as the AIT EMIKAT (Environmental Catalogue) to serve as a repository of elements at risks and adaptation options. This catalogue will allow users to link the sensitivities of elements at risk to key hazards, indicate the applicability, impact, implementation price and time needed for

[49] D3.1, D3.2.x, D4.1 and D4.3.x all contain inputs from all WP3/WP4 tasks, e.g. as separate sections,

implementation of different adaptation options for different element at risk/hazard combinations.

T4.3 Scenario Management (M09-M30; Lead: CIS; Participants: ATOS, METEOGRID, PLINIVS, AEMET) Output: D4.3.x

Adapt the climate scenario management system software prototype from SUDPLAN for use in CLARITY. This software will allow end-users to easily produce and manage new scenarios by editing the parameters of the pre-defined core scenarios as defined in WP1.

T4.4 Scenario transferability (M09-M30; Lead: AIT; Participants: ATOS, METEOGRID, PLINIVS) Output: D4.3.x

Within this task we will adapt the "climate twins" concept and related software from the TaToo project: To allow "real world insights" about future climate impact and appropriate adaptation, one can search for "twin" regions, where the current climate appears similar to an expected future climate of a point of interest (POI). We call such region pairs with similar climate conditions (at different times) "Climate Twins". From these current climate Twin regions we can learn "hands on" how future climate impacts may be experienced in the POI and how to adapt to the changing climate conditions, expected in the future. The TaToo "Climate Twins" prototype has been realized as a search tool with a web-based graphical user interface (GUI) that allows the users to explore climate change effects based on maps of current and future climate. Similarity refers to temperature regimes or precipitation regimes compared by the monthly average signal pattern. In CLARITY, the Climate Twins similarity concept will be extended to include other multi-criteria metrics, e.g. the similarity of the projects and measures. .

T4.5 Scenario Analysis, Decision Support and Report Generation (M09-M30; Lead: CIS; Participants: ATOS, METEOGRID, PLINIVS, EUREKA) Output: D4.3.x

The software provided by this task will support the analysis and comparison of scenario candidates (options) regarding performance indicators that can be defined by the end user. Indicator based decision support functionalities[50] will be provided using concepts and software of the CRISMA FP7 Project (see sections 1.3.x). The climate services will incorporate concepts for collaborative decision making offering a large variability regarding specific decision strategies. The software will address the issue of assessing the results and helping the users to find a compromise solution that satisfies the multiple and often opposed requirements of the key stakeholders. For this, criteria sets are aggregated by a multi-criteria ranking functions that allow the users to easily compare and rank different scenarios and corresponding adaptation plans according to different criteria and their relative weight and level of importance. The tools will help to make explicit what end-users are implicitly/intuitively aware of regarding the important performance indicators and decision criteria and collaboratively decide/agree on preparedness strategies that take the individual stakeholders points of view into account.

Deliverables

D4.1 Technology support plan (CIS, R, PU, M08)

This deliverable will provide a plan or the WP4 work (per task), taking into account the input from the D1.1.

D4.2 CLARITY CSIS architecture (CIS, R, PU, M12)

This deliverable will describe the CLARITY CSIS architecture. It will be updated later in the project if needed.

D4.3.x Technology support report (CIS, R, PU, M20, M30)

This deliverable will accompany the WP4 software and report on the work performed in WP4 since the project start. It will also provide an updated plan for the WP4 work (per task) until the project end, taking into account the users feedback from the first version of the demonstrators (D2.3)

[50] S. Schlobinski, et. al.: Decision making and strategic planning for disaster preparedness with a multi-criteria-analysis decision support system. IFIP Advances in Information and Communication Technology 01/2015; 448:178-186

	WP #	5					Start date or starting event:								M04 (End: M36)			
	WP title	Exploitation and Business																
Participant	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Short name	ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS-LUPT	StockCity	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABION	CEDEX	LINZ
	PMs	25	12	1	7	6	4	1	3	11	1	4	1	3	7	1	1	1

Objectives

This WP focuses on the efficient and effective dissemination and exploitation of the project results. The concrete objectives of this WP are:

- To analyse the market and assess the competitive market environment,
- To develop (and refine) a strategy and the business model for CLARITY ensuring the commercial exploitation of valuable project's results on a global scale, in the specific market as assessed in the previous analysis,
- To identify relevant market- and customer segments and to assess relevant conditions in the respective segments
- To define the value proposition for the customer and consequently to work out the main customer relationship and distribution channels appropriate for the relevant customer segments
- To collect exploitation and business requirements including legal framework to bring the CLARITY innovation in line with the project exploitation strategy.
- To steer and guide project partners to correctly and consistently exploit project outcomes in line with the project strategy
- To analyse and describe the possible socio-economic impact of CLARITY results.
- To prepare a viable IPR plan allowing an effective and widespread exploitation of project results.
- Perform Activities to prepare Commercial Exploitation
- In order to accelerate market uptake and international spread a marketplace for climate service suppliers, purveyors and the demand side will be launched to attract and support local CARITY "ambassadors" - myClimateService.eu

Description of work

T5.1 Exploitation Requirements (M01-M14, Lead: CIS; Participants: ATOS, METEOGRID, ZAMG, EUREKA, AEMET, ACCIONA) Output: D5.1.x

The activity will collect and define requirements on CLARITY climate services and related innovation as marketable results rather than demonstrators that can be derived from End User requirements only. The exploitation requirements will potentially influence the CSIS Architecture, Technology selection and distribution aspects as well as licensing schemes of the CLARITY Innovation to provide a sound technological basis for collaborative exploitation of the project results.

T5.2 Exploitation Strategy and Business plan (M01-M36, Lead: ATOS: Participants: ALL) Output: D5.2.x

CLARITY exploitation strategy will define the guidelines for exploitation of the CLARITY results, such as: (1) market analysis: analyse the external conditions for CLARITY results, and provide insight to market needs and trends, and define the market context, (2) exploitable results: common methods to identify and characterise exploitable result relevant for the market, (3) potential user groups: identify potential groups of end-users in relation to exploitable results, (4) suppliers: rules for characterising partners potentially in charge of exploitation initiatives and respective trainings and key partners, (5) enabling means and tools for exploitation actions: selection of means and tools that support exploitation, including common definitions for documentation and other materials needed to perform exploitation actions, (6)rules to be followed in order to safeguard IPR and avoid conflicts. In addition, T5.2 will provide an exploitation plan with business model definition covering a market analysis, a comprehensive SWOT analysis, a sale and marketing strategy as well as a financial plan. There may be alternative exploitation strategies and business models, since it is expected that some outcomes cannot be commercialised following traditional business methods and will also depend on the type of results and the technology readiness level. Such strategies include e.g. standardisation activities. The results of the socioeconomic impact analysis (T5.3) as well as legal and regulatory feasibility aspects will be taken into account. All activities will be in line with the CLARITY innovation management cycle described in section 3.2.5.

T5.3 Social Innovation assessment (M27-M36, Lead: EUREKA; participants: CIS, ZAMG, PLINIVS) Output: D5.3

This task will address the assessment of the potential direct and indirect socio-economic impacts of CLARITY climate services. In a first stage, the areas of impact on the different stakeholders will be identified. In addition to economic, financial, and technological impacts, the potential social and societal impacts (i.e. impacts on employment and working routines, knowledge creation and sharing and social capital) will be taken into account. The impacts on project partners' business, practitioners planning capabilities and the benefit for the wider public will be estimated.

In a second stage, quantitative and qualitative data from before/after CLARITY will be taken into account. This data along with the WP2.4 validation results will be used to describe and to assess the business potential of CLARITY climate services. Finally, the assessment results will be presented through appropriate qualitative and/or quantitative result indicators.

T5.4 Climate Service Marketplace (M07-M20; Lead: ATOS; Participants: CIS, METEOGRID, ZAMG, AIT, AEMET, SCC) Output: D5.4

This task will provide a web based platform to support exploitation activities of the project, based on the software and data provided by T1.3 and T2.2 respectively. T5.4 contributes both to objectives O5 Create a CLARITY Community and O6 Make Fit for Exploitation. Through established networks of the national met-offices ZAMG, SMHI and AEMET in the consortium T5.4 will connect to prominent national and EU-level climate change adaptation platforms such as CLIMATE Adapt[51] and European Innovation Partnership (EIP) Smart Cities and Communities[52] adding value regarding market place functionality where planners and operators of large scale investments can gain access to relevant scenarios, specific services and required expertise. In addition, it will serve as a means for project advertisement and communication closely related to WP6.

After the setup of the marketplace, a regular (editor) team will take over operation. Besides issues in communicating the outcomes of the project and insights of the different demonstration cases, the marketplace will contribute to requirements, testing and support the business cases for CLARITY exploitation.

Deliverables

D5.1.x Exploitation Requirements and Innovation Design (CIS, R, PU, M06, M14)

The document will present the CLARITY climate service innovation design including the exploitation requirements. In three iterations the document will report on the progress of the respective tasks and corresponding results.

D5.2.x Exploitation and business plan (ATOS, R, CO, M12, M24, M36)

The deliverable will describe the overall exploitation strategy for CLARITY and dimensions for exploitation initiatives characterisation and qualification and will outline the procedures followed to prepare project specific business models and to analyse the exploitation potential of the proposed results.

D5.3 Social-Innovation Assessment (EUREKA, R, PU, M36)

This deliverable will describe the assessment of the current and potential socio-economic impact of CLARITY project.

D5.4 MyClimateService.eu Marketplace (ATOS, OTH, PU, M20)

Initial release of the web based marketplace for offers from climate service suppliers, purveyors. The marketplace will be connected to prominent climate adaptation platforms. The deployed and populated software will be accompanied by an online documentation.

[51] http://climate-adapt.eea.europa.eu/

[52] eu-smartcities.eu

	WP #	6					Start date or starting event:							M01 (End: M36)			
	WP title	Dissemination and Community Building															
Participant	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	**14**	15	16	17
	Short name	ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS-LUPT	StockCity	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	**SCC**	CABJON	CEDEX	LINZ
	PMs	12	4,5	5	6	6	5	2	3	4	2	4	2	3,5	**34**	2	2,5	1

Objectives

WP6 aims to provide measures to achieve the expected project impact through and effective project communication and dissemination of its results towards target audiences. This includes the following main objectives:

1. **Create awareness** of the CLARITY climate services, case studies, demonstrators and tools among the relevant stakeholders in the climate and urban infrastructure planning and management sector, industries and civil society through effective dissemination of the project results to the relevant target audience.
2. **Underline the excellence** of the CLARITY results, through scientific publications and verification of the underlying models and assumptions by the relevant scientific community, as a way to provide additional argumentation for use of the climate services by relevant stakeholders.
3. **Build up and foster the CLARITY Community** with regional "chapters" involving local target sectors and stakeholders that are interested in specific CLARITY scenario(s), either as potential CLARITY end-users or as providers of the climate adaptation solutions that need to be taken into account in the planning process.
4. **Support exploitation measures** in WP5. In particular, the task T6.3 closely relates to Task 5.4 - Climate Service Market Place.

This will be achieved through five tasks and two types of activities:

- Tasks T6.1, T6.2 and T6.3 focus on project branding and wide, interdisciplinary communication- and awareness measures and interconnection with other projects and initiatives.
- Tasks T6.3 and T6.4 focus on sharing insights with expert audiences and the preparation of dedicated workshops to ignite additional implementation projects for third parties that are similar to CLARITY demonstrators.

Description of work

T6.1 Project Branding and Communication (M01-M36; Lead: ATOS; Participants: CIS, METEOGRID, ZAMG, ACCIONA, CEDEX). Output: D6.1.x

This task will comprise: (1) Definition of the CLARITY communication and dissemination plan at the beginning of the project; (2) set-up and maintenance of a public website (e.g., www.clarity-project.eu) which will serve as a means to reach target audiences and the interested public taking into account the integration of social media (e.g., Twitter, Facebook, LinkedIn, YouTube) as appropriate. This website will host all CLARITY public deliverables and also contain an RSS-enabled “newsroom” to advertise project related events and to describe its progress; (3) assure that the project corporate identity incl. logo and graphics is used consistently on all communication materials. Graphic designs will be also produced for dissemination materials (flyers, newsletters, etc.) and; (4) support concertation with other EU projects and networks according to a communication and dissemination plan where a selection will be made in order to allow for maximum outreach.

T6.2 Media Production and Publishing (M03-M36; Lead: SCC; Participants: SMHI, STOCKCITY, AIT, EUREKA, AEMET, WSP, SCC, CABJON). Output reported in: D6.1.x

This task will prepare printed and electronic publications on CLARITY results complementing T6.1. This will include a project flyer, newsletters, and press releases and press conferences (including background briefings and visits for selected journalists and experts) at appropriate occasions, as well as the professional marketing videos for each demonstrator and for the entire CLARITY project as a venture (what we aim for are short and informative videos in a style similar to https://www.youtube.com/user/Kurzgesagt). The project will disseminate through a webzine run by SCC with a wide scope of "smart cities and citizens" related content with links to several social media channels.

In order to further enhance the visibility of the CLARITY project and support the community building measures in T6.5, SCC will make a "call for contribution" for third-party videos that are related to climate change in several categories. Submitted videos will be reviewed by an editorial jury to ensure that contributions are both relevant and of high quality. Moreover, the project will publish an editorial article (from short clips to feature stories

including interviews) once every week.

T6.3 Stakeholder Engagement Tour (M03-M36; Lead: SCC; Participants: ALL). Output reported in: D6.1.x and D6.2.x

Every year the consortium will target (at least) one major urban planning and development event, such as the Moscow Urban Forum, or the Smart City Expo World Congress in Barcelona (delegates from more than 500 cities). These major events will provide the "annual anchor event" for which a detailed concept consisting of presentation, workshops and meetings will be designed. At the annual anchor events stakeholder workshops will be hosted (1-2 workshops per event depending on topics and attendees´ background). This concept will be the blueprint for the following annual events and for participation of specific CLARITY partners at individual (e.g. local) events. This will allow the CLARITY partners to be "local CLARITY ambassadors" for their region and field of expertise. Specific events will be selected regarding the impact e.g. presence of the perspective multipliers or customers and thematic focus (e.g. Transport, Energy, Urban Climate) of the event. Three events per CLARITY demonstration region will be held (approx. 18 events throughout the whole project).

T6.4 Scientific Dissemination (M03-M36; Lead: SMHI; Participants: ATOS, CIS, ZAMG, PLINIVS, SMHI, AIT, AEMET, ACCIONA, CEDEX). Output reported in: D6.1.x and D6.2.x

In order to achieve a high impact towards the target audiences within the scientific research domain, the partners will perform the following dissemination activities: (1) Publication and presentation of technical and scientific papers based on the project's research results at conferences and workshops (either external or specifically organized by the project) towards user and science communities complementing each other (e.g., Climate Change Communities, Disaster and Risk Management Communities, Urban and Critical Infrastructure Planners and Managers, students, researchers, professionals, etc.); (2) Organization of scientific workshops[53] and talks regarding CLARITY results targeting the communities mentioned in (1); and (3) Interaction with CLARITY Advisory Board experts.

In cooperation with the T6.3, this task will publish the D6.2.x "CLARITY guideline" as a practical step by step guide to help stakeholders responsible for the management of urban and transport infrastructure to incorporate Climate Change and natural hazard adaptation in their preservation strategies.

Deliverables

D6.1.x Communication and dissemination plan and report (ATOS, R, PU, M04, M12, M24, M36)

This document provides a guideline for all communication and dissemination activities carried out in the project including the concept for the stakeholder engagement tour performed in T6.3. Moreover, it will report on the results produced in the context of WP6 including produced media, papers etc. Conclusions about and impact of the carried out dissemination activities will be reported in the final iteration. This deliverable will also contain the summary report on networking and community building activities performed during the project.

D6.2.x CLARITY Guideline (AIT, R, PU, M24, M36)

Practical step by step guide to help stakeholders responsible for the planning and management of Urban Infrastructure to incorporate Climate Change and natural hazard adaptation in their preservation strategies.

[53] A draft list of potential activities has been collected in section 2.3.1.2 Dissemination, in "Dedicated workshops and talks" table

	WP #	7					Start date or starting event:								M01 (End: M36)			
	WP title	Project Management																
Participant	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Short name	ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS-LUPT	StockCity	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABION	CEDEX	LINZ
	PMs	37	4	1	0	1	1	0	1	0	0	1	0	0	1	0	0	0

Objectives

The main objective of this work package is to ensure the achievement of the project objectives and meet the contractual commitments through administrative coordination, and including timely and efficient organisational and financial management, as well as providing the measures that will help to achieve the expected project impacts. The coordination of the project work comprises four main activities: (1) Decision making and conflict resolution; (2) Administrative and financial management; (3) Quality assurance; and (4) Data management.

Administration and Finance comprises all the activities to be carried out by the Coordinator and includes periodic reporting; document production and archiving; establishing and maintaining financial records; coordination and consolidation of annual cost claims, follow-up of EC payments, distribution of partner shares and monitoring of payments according to the agreed procedures; executing and controlling global expenses; collecting audit certificates and bank guarantees as required; assistance to individual project partners on specific administrative issues. **Decision making and conflict resolution** include the organisation of meetings of the coordination and decision making body for project progress review, decision making and conflict resolution, modifications of contracts (consortium agreement, budgets etc.), revisions of the project strategy and partnership if and as required. **Quality Assurance:** includes the review of deliverables and other results, tracking of the "lessons learned" reported in a Quality Plan.

Besides, as part of the project **participation in the H2020 Pilot on Open Research Data**, this work package will design and implement a Data Management Plan with regard to all the datasets, models and knowledge that will be used as essential part or generated by the project.

Description of work

T7.1 Project Management Coordination and Reporting (M01-M36; Lead: ATOS). Output: D7.1.x and D7.2

Centralising the steering of the project as well as handling administrative and contractual tasks both with the consortium partners and the European Commission. The coordinator has responsibility for contacting the Project Officer, formulating propositions for possible modifications of the work plan, supervising contacts with all external organisations, delivering all types of reports and deliverables., monitoring the progress of work according to the project time schedule, resource usage, budget allocation and project cash flow, managing conflicts following the foreseen procedures and co-operating with the technical and quality management. Compilation and editing of management reports or coordinating online forms is also part of this task. The coordinator will prepare a periodic report for each reporting period comprising a summary of the progress of work towards the objectives in the context of the project plan. This report will include explanations regarding potential deviations from the work plan, the use of the resources and a Financial Statement from each partner, together with an aggregated summary financial report consolidating the claimed Community contribution of all the partners.

T7.2 Quality Assessment (M01-M36; Lead: ATOS). Output: D7.3

The CLARITY Quality Plan and Project Handbook will be designed to facilitate co-operation in the project by defining rules and standards for the day-to-day work. The intention is that all project partners have the same point of reference and a common understanding of methods and procedures with particular emphasis on the contractual obligations towards the European Commission. These guidelines aim to reduce project overhead, facilitate project management for all partners and thus assure timely and high quality performance. A major section concerns the Quality Control procedures for producing Deliverables where document standards and templates are introduced. Finally, quality control procedures for project management in general are presented in support of all management roles in the project including procedures for project risk monitoring and management and contingency planning.

T7.3 Data Management (M01-M36; Lead: CIS). Output: D7.4.x

The project will support access to and re-use of research data generated by CLARITY, and will deliver a Data Management Plan (DMP). The purpose of the DMP is to provide an analysis of the main elements of the data management policy that will be used with regard to all the datasets that will be generated by the project. The DMP

will reflect the status of the data that will be produced: Identifier and description for each data set, reference to existing suitable standards, description of how data will be shared and description of the procedures that will be put in place for long-term preservation.

T7.4 Impact Measurement and Project objective validation (M01-M36; Lead: ATOS; Participants: CIS, SMHI, PLINIVS, AIT) Output: D7.5.x

The main outcome of this task will be to produce a "semaphore" follow-up table tool (so called KPI dashboard) containing Key Performance Indicators (KPIs) that will be used to measure and communicate the project's impacts based on the initial Project objectives. These KPIs will relate to the expected impacts defined in Section 2.1 as well as the objectives related to coverage of the user requirements in WP1, stakeholders' satisfaction (periodically estimated through online pool) and technical readiness of the CLARITY climate services (e.g., statistics on test coverages, open/closed feature requests and issues - from Task 1.4).

Deliverables

D7.1.x Project Periodic Report (ATOS, R, CO*, M12, M24, M36)

The Project has foreseen 4 reporting periods of 12 months each, ensuring relevant results at the end of each period. Although restricted, each Periodic Report will include a publishable summary of the progress of work. In addition to the annual periodic reports, interim reports will be produced every 6 months for the correct management of the project.

D7.2 Final Report (ATOS, R, PU, M36)

In addition to the periodic report for the last period of the project, a final report will be provided including a final publishable summary report comprising a description of the main S&T results, potential impact and main dissemination activities.

D7.3 Quality Plan and Project Handbook (ATOS, R, CO, M02)

D7.3 will define and specify the appropriate mechanisms and processes that will be established in order to maintain a certain quality level throughout the whole project structure and outcomes. An initial version will be provided at a very early stage and then internally updated.

D7.4.x Data Management Plan (CIS, R, PU, M06, M24, M36)

The purpose of the DMP is to provide an analysis of the main elements of the data management policy that will be used with regard to all the datasets that will be generated by the project. The DMP will reflect the status of the data that will be produced: Identifier and description for each data set, reference to existing suitable standards, description of how data will be shared and description of the procedures that will be put in place for long-term preservation.

The DMP is not a fixed document, but evolves during the lifespan of the project. The first version of the DMP is expected to be delivered within the first 6 months of the project and will comply with the template provided by the Commission[54]. More elaborated versions will be delivered at later stages of the project, by the mid-term and final review to fine-tune it to the data generated and the uses identified by the consortium, since not all data or potential uses are clear from the start.

D7.5.x KPI dashboard (ATOS, OTH, CO, M12, M24, M36)

KPI dashboard will be used to measure the project's impacts based on the Project objectives and validate the level of achievement wrt. to the project objectives. The indicators will be updated continuously throughout the project (e.g. whenever a deliverable is issued). QA action to assure the adherence of the data to reality will be performed by the coordinator, with help of the Technical Committee.

[54] Guidelines on Data Management in Horizon 2020; http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf

3.1.4 List of work packages

Work package No.	Work Package Title	Lead Participant No.	Lead Participant Short name	Total person months per WP	Start Month[55]	End Month
WP1	Co-Creation	8	AIT	142	M01	M36
WP2	Demonstration & Validation	6	PLINIVS-LUPT	205	M01	M36
WP3	Science Support	5	ZAMG	118,5	M01	M30
WP4	Technology Support	2	CIS	77	M01	M30
WP5	Exploitation and Business	1	ATOS	89	M01	M36
WP6	Dissemination and Community Building	14	SCC	98,5	M01	M36
WP7	Project Management	1	ATOS	47	M01	M36
			(total)	**777**		

Table 3: Work package list

3.1.5 List of deliverables

Deliverable No[56]	Deliverable name	WP No.	Short name lead participant	Type[57]	Dissemination level[58]	Delivery date (proj. month)[59]
D1.1	Initial workshops and the CLARITY development environment	1	AIT	R	CO	M06
D1.2	Database of initial CLARITY CSIS user stories and test cases	1	ATOS	OTH	PU	M08
D1.3.x (x=1,2)	CLARITY CSIS	1	AIT	OTH	PU	M18, M30
D1.4 (x=1,2,3)	Final industrialization and support report	1	ATOS	R	PU	M36
D2.1	Demonstration and validation methodology	2	PLINVS	R	PU	M08
D2.2	Catalogue of local data sources and sample datasets	2	METEOGRID	R	PU	M18
D2.3.x (x=1,2)	CLARITY Demonstrators Implementation and Validation Report	2	PLINIVS	R	PU	M24, M36
D3.1	Science support plan and concept	3	ZAMG	R	PU	M08
D3.2.x (x=1,2)	Science support report	3	ZAMG	R	PU	M20, M30
D4.1	Technology support plan	4	CIS	R	PU	M08
D4.2	CLARITY CSIS Architecture	4	CIS	R	PU	M12
D4.2.x (x=1,2)	Technology support report	4	CIS	R	PU	M20, M30
D5.1.x (x=1,2)	Exploitation Requirements and Innovation Design	5	CIS	R	PU	M06, M14
D5.2.x (x=1,2,3)	Exploitation and business plan	5	ATOS	R	CO	M12, M24, M36

[55] Measured in months from the project start date (month 1)

[56] Deliverable numbers in order of delivery dates using the numbering convention:
<WP number>.<number of deliverable within that WP>

[57] Nature of the deliverable using one of the following codes:
R: Document, report (excluding the periodic and final reports)
DEM: Demonstrator, pilot, prototype, plan designs
DEC: Websites, patents filing, press & media actions, videos, etc.
OTHER: Software, technical diagram, etc.

[58] It is expected that most of the deliverables will be publicly available. Dissemination level using one of the following codes:
PU = Public, fully open, e.g. web
CO = Confidential, restricted under conditions set out in Model Grant Agreement
CI = Classified, information as referred to in Commission Decision 2001/844/EC

[59] Measured in months from the project start date (month 1)

D5.3	Social Innovation assessment	5	EUREKA	R	PU	M36
D5.4	MyClimateService.eu Marketplace	5	ATOS	OTH	PU	M20
D6.1.x (x=1,2,3,4)	Communication and dissemination plan and report	6	SCC	R	PU	M04, M12, M24, M36
D6.2 (x=1,2)	CLARITY Guideline	6	AIT	R	PU	M24, M36
D7.1.x (x=1,2,3)	Project Periodic Report	7	ATOS	R	CO	M12, M24, M36
D7.2	Final Report	7	ATOS	R	PU	M36
D7.3	Quality Plan and Project Handbook	7	ATOS	R	CO	M02
D7.4.x (x=1,2)	Data Management Plan	7	CIS	R	PU	M06, M24,M36
D7.5.x (x=1,2,3)	KPI dashboard	7	ATOS	OTH	PU	M12, M24, M36

Table 4: Deliverables list

	Deliverable Name	Leader	Nat	Diss	Year 1												Year 2												Year 3											
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
D1.1	Initial workshops and the CLARITY development environment	**AIT**	R	CO						■																														
D1.2	Database of initial CLARITY CSIS user stories and test cases	**ATOS**	OTH	PU								■																												
D1.3.x	CLARITY CSIS	**AIT**	OTH	PU																		■												■						
D1.4	Final industrialization and support report	**ATOS**	R	PU																																				■
D2.1	Demonstration and validation methodology	**PLINIVS**	R	PU								■																												
D2.2	Catalogue of local data sources and sample datasets	**METEOGRID**	R	PU																		■																		
D2.3.x	CLARITY Demonstrators Implementation and Validation Report	**PLINIVS**	R	PU																							■													■
D3.1	Science support plan and concept	**ZAMG**	R	PU								■																												
D3.2.x	Science support report	**ZAMG**	R	PU																				■										■						
D4.1	Technology support plan	**CIS**	R	PU								■																												
D4.2	CLARITY CSIS Architecture	**CIS**	R	PU												■																								
D4.3.x	Technology support report	**CIS**	R	PU																				■										■						
D5.1.x	Exploitation Requirements and Innovation Design	**CIS**	R	PU						■								■																						
D5.2.x	Exploitation and business plan	**ATOS**	R	CO												■												■												■
D5.3	Social Innovation assessment	**EUREKA**	R	PU																																				■
D5.4	MyClimateService.eu Marketplace	**ATOS**	OTH	PU																				■																
D6.1.x	Communication and dissemination plan and report	**SCC**	R	PU				■								■												■												■
D6.2.x	CLARITY Guideline	**AIT**	R	PU																								■												■
D7.1.x	Project Periodic Report	**ATOS**	R	CO												■												■												■
D7.2	Final Report	**ATOS**	R	PU																								■												■
D7.3	Quality Plan and Project Handbook	**ATOS**	R	CO		■																																		
D7.4.x	Data Management Plan	**CIS**	R	PU						■																		■												■
D7.5.x	KPI dashboard	**ATOS**	OTH	CO												■												■												■

R = Report; DEM = Demonstrator, Prototype; DEC = Website, videos; OTHER = Software

Dissemination Level:

PU Public, fully open, e.g. web

CO Confidential, restricted under conditions set out in Model Grant Agreement

CI Classified, information as referred to in Commission Decision 2001/844/EC

Table 5: Planning of Deliverables

3.2 Management structure and procedures

In this section the governing bodies of the CLARITY project are described, as well as the main roles of the various organisations within the project's management structure. We present the consortium plans for managing financial matters, risks, quality and certain legal aspects. Management of the intellectual property rights (IPR) was described in section 2 (Project Impact).

3.2.1 CLARITY governance structure

The Management structure proposed for CLARITY aims at facilitating the co-operation between partners while maintaining a strict control of progressive achievements of the project objectives. It distinguishes between decision-making structures and organisation of daily operations. This aspect, as well as the management bodies and their composition, are described below in further detail.

General structure

The organisational structure of the consortium shall comprise the following consortium Bodies (cf. Figure below):

- **General Assembly** (GA) as decision-making body of the consortium.
- The **Technical Committee** and the **Technical Manager**, as the supervisory body for the execution of the Project.
- The **Coordinator** is the legal entity acting as the intermediary between the Parties and the European Commission. The Coordinator shall, in addition to its responsibilities as a Party, perform the tasks assigned to it as described in the Grant Agreement.
- The **WP leaders**: co-ordination of tasks and activities towards the WP objectives and ensuring a smooth running and co-ordination with other Work Packages.
- An external **Advisory Board**, composed by external user representatives and scientific experts.

The **General Assembly** is the decision-making body of the consortium. It shall consist of the Coordinator and one representative of each Party. Each General Assembly Member shall be deemed to be duly authorised to deliberate, negotiate and decide on all matters listed below. The Coordinator shall chair all meetings of the General Assembly. The Parties agree to abide by all decisions of the General Assembly, whereby every reasonable effort shall be made to reach a consensus. The General Assembly shall be free to act on its own initiative to formulate proposals and take decisions in accordance with the procedures set out herein.

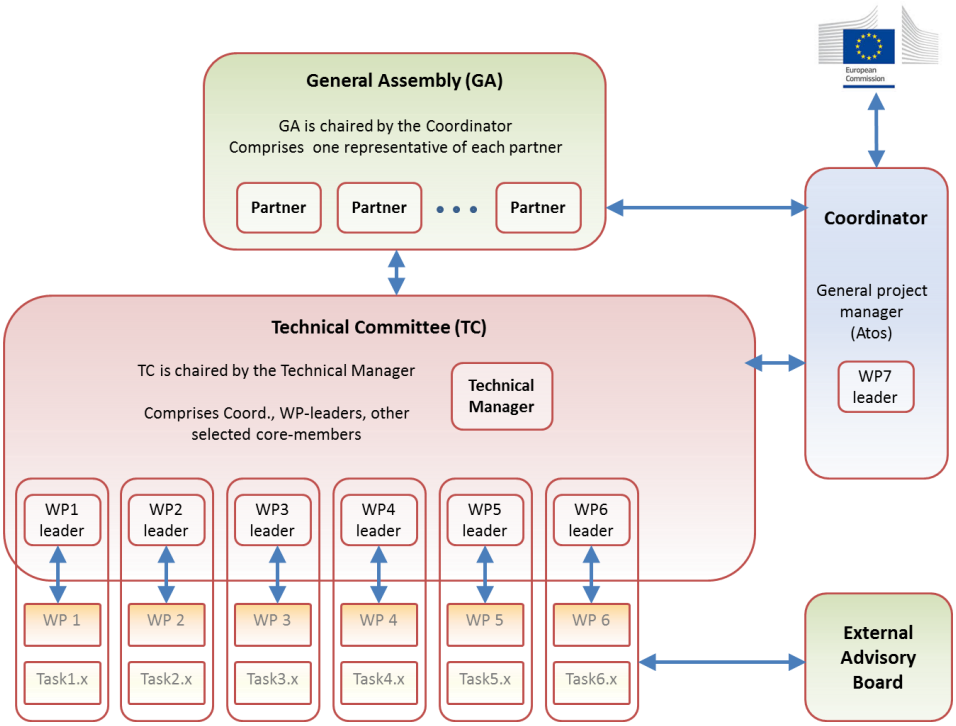


Figure 4: CLARITY governance structure

The following decisions shall be taken by the General Assembly:
Content, finances and intellectual property rights

- Proposals for changes to the DoW (Description of Work) to be agreed by the European Commission
- Changes to the consortium Plan (including the consortium Budget). The consortium Plan means the DoW and the related agreed consortium Budget, including the payment schedule
- Withdrawals from the Background included by partners
- Additions to Background excluded and to Listed Affiliated Entities

Evolution of the consortium

- Entry of a new Party to the consortium and approval of the settlement on the modalities and conditions of the accession of such a new Party
- Withdrawal of a Party from the consortium and the approval of the settlement on the modalities and conditions of the withdrawal
- Declaration of a Party to be a Defaulting Party
- Corrective measures to be required of a Defaulting Party
- Termination of a Defaulting Party's participation in the consortium
- Suspension of all or part of the Project
- Termination of the Project and/or the Consortium Agreement

The **Technical Committee**, chaired by the Technical Manager (AIT) and consisting of the WP leaders (ATOS, CIS, AIT, ZAMG, SCC and PLINIVS-LUPT) plus selected core members (SMHI and AEMET), shall be in charge of the technical guidance of the Project and shall report to the General Assembly about the potential problems, risks and proposed solutions dealing with technical aspects. The Executive Board shall be responsible for:

- Planning the roadmap and establish the project strategies dealing with the technical developments
- Assuring the technical planning and the coherence of the results
- Discussing the results (reports, deliverables, prototypes, etc.) of all technical work packages
- Forwarding the results for discussion to the General Assembly

The **Technical Manager** shall assist the Coordinator and WP leaders, and report to the former. This person is responsible for the technical development of the Project. This includes the management of dependencies between various tasks, coordination of technical work, review and approval of technical reports and deliverables, and resolution of problems of a technical rather than an administrative nature. The Technical Manager' duties shall include:

- Monitoring the general technological community in those research areas tackled by the Project to determine the state-of-the-art and industry evolution
- Keeping abreast of industry technological trends
- Monitoring of the progress of scientific research and technological developments carried out in the Project
- Work plan deviation identification and "troubleshooting" of technical and organisational contingencies
- Coordination of scientific meetings and the preparation of consequent reports
- Liaison between the Project and related projects, networks of excellence, standardisation bodies and in general with adjacent research communities
- Support the decision making mechanism, proposing changes regarding scientific and technological implementation or adjusting the work plan ensuring the overall success of the project

The partner AIT has appointed *Ms. Andrea Nowak* as the person representing the Technical Manager.

The **Coordinator** is the legal entity acting as the intermediary between the partners and the European Commission. The Coordinator shall also be in charge of the monitoring of the execution of the Project, non-core coordination tasks and the quality assessment. The Coordinator shall, in addition to its responsibilities as a partner, perform the following core coordination tasks:

(a) Administer the Community financial contribution regarding its allocation between the partners and activities, in accordance with the EC-GA and the decisions taken by the General Assembly. The Coordinator shall ensure that all the appropriate payments are made to the other partners without unjustified delay
(b) Keep the records and financial accounts making it possible to determine at any time what portion of the Community financial contribution has been paid to each partner for the purposes of the Project

(c) Inform the EC of the distribution of the Community financial contribution and the date of transfers to the partners, when required by the EC-GA or by the Commission
(d) Review the reports to verify consistency with the Project tasks before transmitting them to the Commission
(e) Monitor the compliance by the partners with their obligations under the EC-GA and the Consortium Agreement (CA)
(f) Prepare the meetings, proposing decisions and preparing the agenda of the General Assembly meetings, chairing the meetings, preparing the minutes of the meetings and monitoring the implementation of decisions taken at the meetings
(g) Install and monitor in-house quality procedures according to suitable standards, measuring the evolution of the project according to the quality indicators and metrics. The Coordinator shall elaborate the CLARITY Quality Plan and Project Handbook designed to facilitate co-operation in the project
(h) Keeping the address list of partners and other contact persons updated and available
(i) Elaboration of Periodic Progress Reports
(j) Representation (as in PR: Public Relations) of the consortium before Third Parties

Mr. Miguel Ángel Esbrí has been appointed by ATOS as CLARITY Project coordinator.

Each Work Package is led by one partner. The partner designates one person belonging to the organisation that shall act as a WP leader. Activities for **WP leader** consist of:

- Co-ordination of tasks and activities towards the WP objectives
- Ensuring a smooth running and co-ordination with other Work Packages
- Monitoring of the tasks progress with respect to task goals, milestones, and adequacy of results
- Reporting to the Management structure of any possible deviations identified due to scheduling, unsuitability or risks affecting the quality of project results and/or objectives
- Designation and co-ordination of task leaders

Work Package 1 leader **AIT** (Ms. Andrea Nowak*)*
Work Package 2 leader **PLINIVS- LUPT** (Ms. *Daniela De Gregorio*)
Work Package 3 leader **ZAMG** (Ms. *Maja Zuvela-Aloise)*
Work Package 4 leader **CIS** (Mr. *Pascal Dihé)*
Work Package 5 leader **ATOS** (Mr. *Jorge López)*
Work Package 6 leader **SCC** (Ms. *Andrea Geyer-Scholz)*
Work Package 7 leader **ATOS** (Mr. *Miguel Angel Esbrí)*

The **Advisory Board** is composed of external user representatives, scientific and industry experts and plays an essential role for the final validation and potential extension of CLARITY requirements and validation. A number of relevant stakeholders closely related to the case studies proposed in the project, supported by recognised experts, have already supported the development of the proposal and agreed to participate in this Advisory Board. A detailed description of the members of this Board, and the institutions that they represent, is provided in section 4.3 of the Proposal.

In order to accommodate the costs associated to the Advisory Board activities, such as travel arrangements and allowances, the CLARITY consortium has reserved in the Technical Manager (AIT) budget a total amount as specified in the section “Resources to be committed” under *Other goods and Services*.

3.2.2 Operational Procedures

CLARITY partners shall cooperate in order to achieve the common goal: the consortium is aware that the synergy developed within the consortium shall provide an outcome of a greater value than the addition of each individual result.

The Project Coordinator shall ensure that the consortium and key role players have the necessary tools and procedures to effectively communicate avoiding potential risks of lack of communication and/or over management. In order to ensure fluent communication between the partners without incurring a high travelling expense due to excessive number of meetings, the coordinator shall cost effectively schedule meetings, which would allow the participants communicating face to face only when necessary; providing an alternative and maintaining the communication during the whole project lifetime.

A Quality Assurance Plan and Project Handbook (Deliverable D7.3) will be designed to facilitate co-operation in the project by defining rules and standards for the day-to-day work. The intention is that all project partners have the same point of reference and a common understanding of methods and procedures, with particular emphasis on the contractual obligations towards the European Commission.

All project internal arrangements shall take the form of a written **Consortium Agreement (CA)** which shall govern the following:

- the internal organisation of the consortium including the decision making procedures;
- rules on dissemination and use, and access rights;
- the distribution of the financial contribution of the Union;
- the settlement of internal disputes, including cases of abuse of power;
- liability, indemnification and confidentiality arrangements between the beneficiaries.

In addition, the Consortium Agreement will include specific sections on the governance structure for the project and the preparation and organisation of meetings (convening, preparation of agenda, voting rules, meeting minutes).

The next paragraphs provide the basis of a proposal for these operational procedures.

Representation in meetings

Any member of a consortium body:

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

Preparation and organisation of meetings

The chairperson shall convene ordinary meetings of the consortium body and shall also convene extraordinary meetings at any time upon written request of any member. Final rules shall be confirmed through a Consortium Agreement to be signed at the project start.

The chairperson of a consortium body shall give notice in writing of a meeting to each member of that consortium body, with a proposal for agenda, as soon as possible and within a minimum number of days preceding the meeting, to be fixed.

During a meeting of the respective consortium body the members present or represented can unanimously agree to add a new item to the original agenda. Any decision may also be taken without a meeting if the chairperson circulates to all members a written document which is then signed by the defined majority of members. Meetings of the respective consortium body may also be held by teleconference or other telecommunication means. Decisions shall only be binding once the relevant part of the minutes has been accepted.

Voting rules and quorum

The respective consortium body shall not deliberate and decide validly unless a suggested two-thirds (2/3) of its members are present or represented (quorum). Each member of a consortium Body present or represented in the meeting shall have one vote, except the General Assembly, which members shall have a number of votes equalling the percentage of its Project Cost Share in the total cost of the Project. Defaulting partners may not vote. Decisions shall be taken by a majority of two-thirds (2/3) of the votes. The Consortium Agreement should also define the rules for any veto rights.

Minutes of meetings

The chairperson shall produce written minutes of each meeting which shall be the formal record of all decisions taken. He shall send draft minutes to all members within the timeframe to be specified in the CA. The chairperson shall send the accepted minutes to all the members of the project body, and to the Coordinator, who shall safeguard them. If requested the Coordinator shall provide authenticated duplicates to the partner. The minutes shall be made available to all Parties.

3.2.3 Project Milestones

The consortium shall provide reports and other deliverables to the EC, where the work carried out and/or the conclusions achieved shall be shown. However, the main purpose of the deliverables is their use by the consortium. The project shall operate within certain administrative procedures, which shall be defined at a very early stage covering management reporting, document standards, collaborative specification and development, review, configuration, change control and quality assurance. A common format shall have to be agreed upon for the preparation of all documentation and the deliverables.

The activity reports, project publications and other deliverables shall be submitted for review to the Management structure. The Coordinator compiles and produces the final version of the reports taking into account corrections made by Board Members.

A number of project key milestones have been defined for the all project duration and they are listed in the table below in chronological order (and also graphically showed in the Project GANTT in Figure 8).

Milestone No.[60]	Milestone name	Related work package(s)	Estim. Date	Means of verification[61]
MS01	Initial workshops with end-users and exploitation requirements understanding	1, 5,6 ,7	M06	D1.1, D5.1.1, D6.1.1, D7.3, D7.4.1
MS02	Climate Service requirements and plans for data collection; demonstration and validation; and science and technology support	1, 2, 3, 4	M08	D1.2, D2.1, D3.1, D4.1,
MS03	CSIS Architecture, stakeholders engagement and initial assessment of project objectives	4, 5, 6, 7	M12	D4.2, D5.2.1, D6.1.2, D7.1.1, D7.5.1
MS04	First version of Co-Created CLARITY Services	1, 2, 3, 4, 5	M19	D1.3.1, D2.2, D3.2.1, D4.3.1, D5.1.2,
MS05	First demonstration and evaluation of CLARITY Services	2, 5, 6, 7	M24	D2.3.1, D5.2.2, D5.4, D6.1.3, D6.2.1, D7.1.2, D7.4.2, D7.5.2
MS06	Second version of Co-Created CLARITY Services	1, 3, 4	M30	D1.3.2, D3.2.2, D4.3.2,
MS07	CLARITY Services final validation, packaging and documentation	ALL	M36	Final Report

Table 6: List of Milestones (ordered chronologically)

[60] Measured in months from the project start date (month 1)

[61] Shows how to confirm that the milestone has been attained

3.2.4 Innovation management

ATOS will bring to the CLARITY project its knowledge and experience with Innovation management and will develop and maintain a framework for systematic innovation management in line with the European Technical Specification[62] (TS) for Innovation Management. Such innovation management approach includes activities that are required for generating innovations and is applicable to all public and private organisations regardless of sector, type or size. As the guiding principles of the TS establish, the project innovation management strategy follows a PDCA structure (Plan-Do-Check-Act). This facilitates its potential integration with other standardised business management systems existing in partner organisations. The key activities foreseen in this project cover:

- **Understanding the context of the project**: This activity focuses on scanning and analysing information about the external environment related to the project to identify present and future challenges. The exploration includes market and PEST analyses, as well as identifying the needs of interested parties, involving them in consultation activities at all stages of the project development. This activity also covers the understanding of each partner's exploitation expectations and innovation strategies.
- **Leadership for innovation and strategy**: The management board will develop a common vision of what the project is expected to achieve. It will also define the type of innovation sought for (e.g. with regards to product, service, process, organization…) and the level of novelty (e.g. incremental, radical or disruptive…). Responsibilities and authorities for the relevant roles will be assigned and communicated. This activity is also meant to foster a culture that supports innovation, such as communication and sharing, openness and collaboration, and failure tolerance. Reporting procedures to the project coordinator will be established.
- **Planning for innovation success**: Planning is based on the outputs of external and internal analyses carried out in the 'understanding of the context ', as well as the policies established in the strategy. This activity will determine the risks and opportunities in a way to ensure that the innovation achieves anticipated results and that undesired effects are prevented or reduced.
- **Innovation support**: Appropriate mechanisms to register and protect IP should be suggested and applied. Collaboration with external stakeholders, technology watch and competitive intelligence activities will also be considered.
- **Innovation management process**: This activity focuses on establishing check points (phase-gate / go-no go) to assess the progress of the project towards the development of exploitable results. It focuses on protection of the results, in accordance with the guidelines established in the previous activity 'Innovation Support'. Partners will make plans to ensure the availability of funding and organizational resources for market introduction of the project results and establish the mechanisms (production, supply chain, customer service, etc.) to find out their degree of acceptance in the market.
- **Assessment of the performance and improvement of the innovation approach**: This activity is dedicated to the monitoring, measuring, analysis and assessment of KPIs established for the previous activities, such as growth rate of profit, economic income, operating margin, market share, RoI, scientific impact, intangible assets generated (IP), impact on environmental or social sustainability. It will result in a set of lessons learnt that will be reverted to the EC and to the partners involved.

These activities will be coordinated in the context of WP7 supported by the exploitation activities of WP5.

Atos Spain Innovation management strategy

ATOS innovation management strategy is aligned with both the European Technical Specifications and the Spanish norm for innovation management[63], which reflects most aspects covered by the European standard. In particular, to ensure the exploitation of successful RDI results and a timely detection of internal and external opportunities, our group applies a filtering of obtained intangible assets, not only according to their Technical Maturity Level, but also taking into account criteria such as code availability and evolution capacity, replicability, technical added value, business added value, IPR, market readiness and expectations, alignment with Atos key strategies (e.g. Customer Transformation Challenges) , etc. Those criteria, as well as a defined process to present RDI results, enables the Atos research and innovation board to select the appropriate exploitation strategy for each asset according to its assessed position along the path to market. The ARI innovation board is an internal decision making group composed by a mix of technical and business oriented profiles, which meets on a bi-yearly basis.

[62] UNE-CEN/TS 16555-1:2013

[63] UNE 166002:2014

Figure 5: Asset positioning along the path to market

The following diagram shows how established objectives for each step of the path to market guide the activities to be carried out internally and externally to exploit RDI project results according to their particular status.

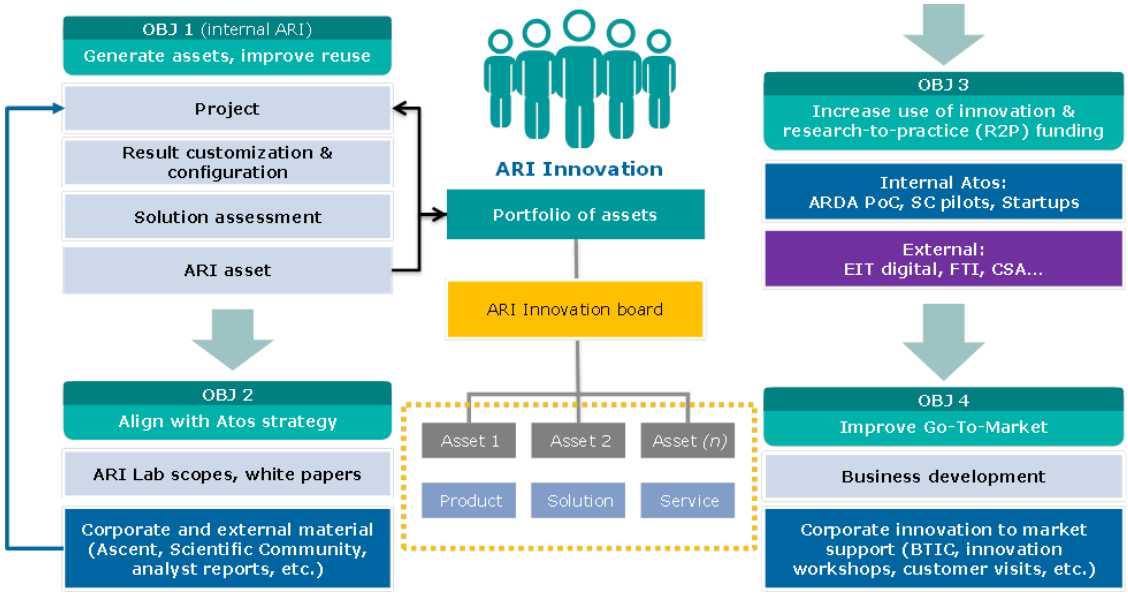


Figure 6: Atos Innovation Management Strategy

3.2.5 Risk analysis and mitigation measures

Project risk analysis and mitigation is based on the risk management process and cross-partner risk awareness:

A. **Risk Planning** is concerned with identifying risk management procedures and responsibilities. Risk Management Planning occurs as part of the proposal and negotiation phase.
B. **Risk Identification** is about uncovering risks before they turn into problems. Like risk planning, risk identification is an iterative process. The first phase of risk identification takes place during the proposal phase; this will be updated when the project starts, and be continued throughout the project.
C. **Risk Analysis** is the most detailed phase of the entire risk management process. It involves evaluating the risk attributes, and prioritizing the risks. Evaluating the attributes of a risk involves establishing values for probability (the likelihood the risk will occur) and the impact (in terms of significance for the project).
D. **Risk Response** is the process of deciding what should be done with a risk, if anything at all. Risk Response answers two key questions: (1) who owns the risk (responsibility) and (2) what can / should be done (scope and actions).
E. **Risk Monitoring** is the process of keeping track of the risks and evaluating the effectiveness of the response actions. Monitoring may also provide a basis for developing additional response actions and identifying new risks and will be done continuously.

The Coordinator is responsible for the risk analysis and mitigation process and establishes the risk management procedures at the project Kick-Off.

Each WP leader is requested to set up the “risk management plan” for its work package and update it on a regular basis. The risk management plan comprises: (1) Risk identification, (2) Risk analysis, (3) Risk response, and (4) Risk monitoring. The risk management process is documented in the “Risk Register”, which is circulated among the Consortium and analysed by the Technical Committee in the first instance and then by the General Assembly.

Initial Risk Register

At the time of proposal writing, we can already identify and assess the following risks as listed in the following Table.

Description of risk[64]		Related WP(s)	Probability[65] /Impact	Proposed risk-mitigation measures
1. Scientific and Technical Risks				
1.1	Incompatibility of ambition and real end-user requirements	WP1,2	Medium/ High	CLARITY involves end-user in all core activities and stages of the project. The objective is to streamline the scientific work towards results and tools that are practical and thus will be welcomed by the target users. Continuous user involvement and the AGILE approach will minimize the risk of failure
1.2	Improper definition and coordination of the demonstrations	WP1,2,3,4	Low/ High	Project has defined the position of a Technical Manager and a Technical Committee to coordinate the technical aspects of the project development process ensuring the coordination of technical exchanges between Work Packages (especially WP1, WP2, WP3 and WP4) and assuring coherence of all technical developments
1.3	Lack of transferability of results (concepts, developments)	WP1,2,3,4	Medium/ High	Transferability of results to other locations and topics is given special attention in the project. The specific case studies demonstrated in CLARITY will document the local data that are required to repeat one of the cases in another location within Europe. There will also be fall-back methods for locations where less local data are available
1.4	Risk that the availability of data needed to implement the business cases is delayed or it is of insufficient quality	WP3	Medium/ High	The quality control system set-up in the management procedures will constantly monitor the evolution of the availability of data. In case of delays, the CLARITY Consortium will be timely alerted and remedial plans will be defined and executed
1.5	Inherent large uncertainties reduce usefulness of the results to unacceptable levels	WP1,2,3,4	Low/ Medium	Obviously it is impossible to precisely predict the future. However, an overall concept on how to deal with uncertainties and their propagation in the context of CC adaptation measure assessment will be part of the standardised method and in this alone will be a significant advancement of what decision makers have available today. The project results will support decision makers by comparison of different adaptation options. As large parts of different options are the same - uncertainties are mainly restricted to differences due to different measures. Nevertheless the topic is challenging especially in the context of giving recommendations regarding the dimensioning of specific adaptation measures and thus will be given due consideration in the complete work monitored by leading partners
1.6a	Uncertainty in the climate signal preventing robust results	WP1,2,3	Low/ High	To minimise this risk selected climate projections will be carefully analysed by comparison with a large ensemble of projections, in order to assess their probability of exceedance in various aspects. New projections produced during the project period will be studied for an updated picture
1.6b	Uncertainty in the impact models preventing robust results	WP1,2,3	Low/ High	To minimise this risk the impacts models' uncertainty will be carefully assessed by sensitivity analyses, both for today's climate and for estimating the additional uncertainty when forced with future projections
1.6c	Uncertainty in the adaptation assessment preventing robust results	WP1,2,3	Low/ High	To minimise this risk adaptation options will be carefully designed and conceptualised in order to facilitate uncertainty estimation. This includes assessing secondary feedback effects when measures interact with the existing environment, as well as the risks for unexpected societal development
1.7	Technical results of low quality / relevance to users	WP1,2,4,5	Low/High	Internal procedures will ensure the quality of the technical outcomes. Results will be re-evaluated throughout the project in order to ensure their validity with respect to users and market needs

[64] A **critical risk** is a plausible event or issue that could have a high adverse impact on the ability of the project to achieve its objectives

[65] **Level of likelihood** to occur: **Low/medium/high** (same categories for **Impact**)

The likelihood is the estimated probability that the risk will materialise even after taking account of the mitigating measures put in place

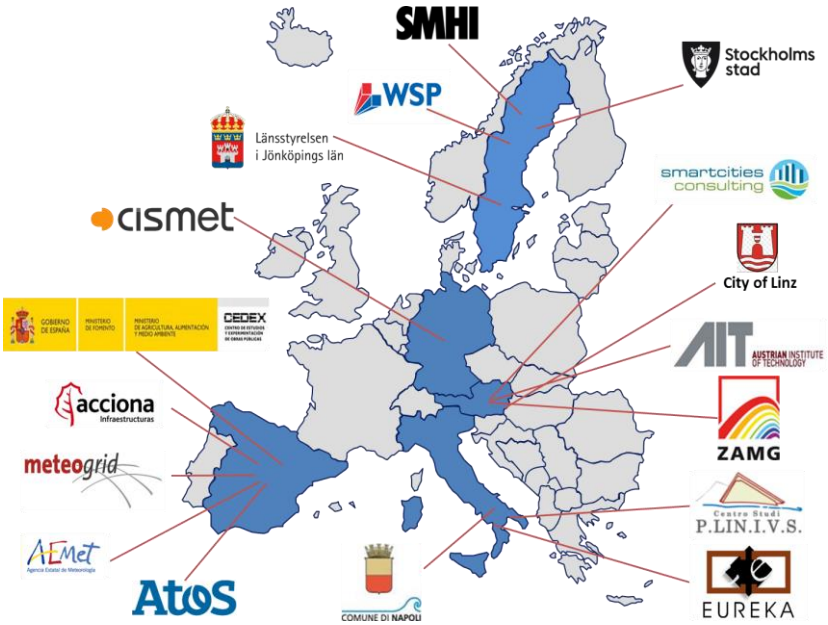
	and market			
1.8	Time necessary for technical activities is underestimated	WP1,2,3,4	Low/Medium	AGILE methodology will allow to have project checkpoints to monitor and detect problems early and take corrective actions
2. Business and Dissemination				
2.1	Dissemination of the project results is not sufficient to create impact	WP5,6	Low/ Medium	The consortium is strongly determined to create sustaining impact, and the partners have substantial experience in the international R&D business; dedicated tasks for dissemination, and exploitation will plan and execute this goal and prevent this risk
2.2	Failure to properly disseminate the results of the project among the decision making stakeholders	WP5,6	Low/ High	Explicit compilation of required expertise that needs to be provided by partners, providing excellent positions to approach relevant European actors while others have a wide technical and others RTD dissemination background. Additionally dedicated workshops will provide direct contact opportunities for adequate communication of the project's outputs, while a dedicated video and social network participation will target the web channels
2.3	Lack of interest by public bodies or policy makers	WP1,5,6	Low/ Medium	Partners will approach relevant European actors, and similar/ complementary projects and invite them to join the CLARITY community and participate in the marketplace from the project start. Public bodies or policy makers will also be approached by project workshops and participation in conferences devoted to Climate Change.
3. Management and Financial Risks				
3.1	Coordination and/or management of CLARITY fails	WP7	Low/ High	The project coordinators as well as most of the consortium members have exhaustive experience in managing and running EU research projects, and the professional project management will plan and pro-actively avoid deviations and failures
3.2	Key person leaves consortium	All	Low/ High	If the partner cannot provide a replacement, a re-allocation of responsibilities between partners will be implemented
3.3	Lack of communication or consensus within consortium	All	Low/ Medium	Within the proposal, management procedures have been defined for enabling effective decision making. The project coordinator and the members of the General Assembly have the necessary skills to resolve such conflicts by adequate negotiation. Additionally, it is planned to keep close contact within the consortium by regular telephone conferences and virtual meetings, also facilitated by regular TelCos in support of the WP specific work
3.4	Partner overspending resources and/or allocated budget	All	Low/ High	The project management will monitor the partner spending through WP reports and through partners' progress reporting. If necessary a reallocation of resource of partners will be initiated
3.5	Disputes between partners	All	Low/ Medium	The beneficiaries agree to use reasonable endeavours to try to amicably settle any dispute arising among them in relation to the implementation of the project and for such purpose, to bring the dispute at the appropriate management body level. Failing to reach an amicable settlement, the dispute arising out of or in connection with the project including the grant agreement, shall be finally handled according to the dispute resolution provision set forth in the Consortium Agreement
3.6	Bankruptcy of a partner and financial risks	All	Low/ Medium	Although consortium consists of well and for many years established organisations, it is envisaged to minimise the risk of not being able to reclaim funds from a bankrupt partner for work not yet accomplished in the project, by continuously monitoring the project progress, also to be reported in the periodic reports. Moreover, to further minimise the financial risks, pre-financing and interim payments are limited and each partner will contribute to a guarantee fund and the partners will agree payment tranches in relation to successful deliverables realisation to be agreed in the Consortium Agreement
3.7	Missing accomplishment of partners' obligations	All	Low/ High	The consortium is composed of a well-balanced team providing all the required competencies to accomplish the planned activities. To assure the realisation of the envisaged results, each task is assigned to a specific partner overtaking the responsibility for coordinating and monitoring. In case of a failure resource will be reassigned or additional added

3.8	Not suitable quality of deliverables	All	Low/ High	Definition of a reviewing process for all deliverables, including the formal appointment of reviewers (partners) for each deliverable. For specific cases, reinforce partners participating in the deliverable

Table 7: Critical risks for implementation

3.3 Consortium as a whole

Consortium overview and complementarity



CLARITY team is a well-balanced consortium in relation to the objectives of the project. The consortium includes the **necessary and sufficient number of partners** covering all the required **multidisciplinary expertise** to successfully carry out the required RTD tasks as well as to assure a manageable project structure. As a result, the project consists of 17 partners, who span five countries in alphabetic order: Austria (4), Germany (1), Italy (3), Spain (5) and Sweden (4). Complementarity between the participants detailing their role and contribution are described in this section, while their previous experience relevant to CLARITY and the benefits of the project for each organisation is justified in section 4.

Consortium composition leading criteria

The CLARITY project has followed a purposeful, multidisciplinary approach in establishing the consortium in order to conform to the following criteria:

- Adequate level of manageability
- Balanced consortium between industry, academia and SMEs
- Know-how transfer from key "background" projects (sec. 1.3.2)
- Inclusion of industrial stakeholders
- Trans-national approach
- Gender Equality

Adequate level of manageability

The first criterion is satisfied:

- By choosing a Coordinator with comprehensive experience in managing large industrial research projects and by defining a suitable management strategy, as described in section 3.2 Management structure and procedures.
- By bringing together partners that know each other and have already collaborated in the past.

Balanced consortium

The consortium comprises institutions from 5 different countries spread around Europe and has the right balance of skills and industrial scope, essential to this project; its composition has been designed to enable the smooth handling of the four dimensions throughout the project:

- European weather service providers (SMHI, ZAMG, AEMET) that are key **suppliers of climate intelligence**, bringing to the project climate modelling and simulation intelligence, expertise on numerical weather models as well as climate downscaling techniques from IPCC climate global simulations.
- **Purveyors,** including environmental consultancy companies (SCC, WSP), centres of competence (AIT, SMHI, PLINIVS –LUPT) and private climate services (METEOGRID); and .

- Industrial partners and SME's - such as ATOS, CIS, AIT and EUREKA - acting as **technology providers** and providing experience in large-scale systems integration, development and operation of (environmental, climatic and natural hazards) information and decision support systems including the underlying service infrastructure and related GIS, visualisation navigation and management clients and proven track record in providing consultancy to public authorities. They can transfer the research results into production and sustain the technological infrastructure of the CLARITY Climate Services
- Climate service development will be facilitated by a bottom up approach with integral **end user** involvement (StockCity, NAPOLI, ACCIONA, CABJON, CEDEX and City of LINZ). They have a concrete need for climate services in the context of planning, designing building and operation of vulnerable large scale infrastructures. The end user partners directly involved in CLARITY as well as the members of the CLARITY community are considered potential customers whose concrete needs will be addressed by the project.

Consortium composition overview

The following table provides an overview of CLARITY partners and their main expertise:

#	Participant organisation name	ORG.	Stakeholder Type	Key expertise/ Competences	Main Role in the project
1	**ATOS**	IND	Tech. Provider	Coordination. Integration of in-situ & EO observations from environmental sensors, web services for accessing and processing geospatial information, expertise on OGC standards (WMS, WFS, WPS, WCS, SWE). Development of web client applications.	ATOS will act as CLARITY Coordinator. It will also will also lead the tasks on the climate services requirements collection and industrialization, exploitation and Communication, for which ATOS has a long experience and proven track record in running and past EU projects.
2	CIS	SME	Tech. Provider	Strong background in human centred design and implementation of decision support systems and geospatial application design and development.	CIS will lead WP4, being main responsible for the detailed specifications of the CLARITY CSIS Architecture. It will contribute to all WPs with aspects of simulation integration, asset management and decision support. and will lead data management activities.
3	SMHI	GOV	Supplier and Purveyor	Expert agency under the Ministry of the Environment and Energy. Offers high quality products and services to professional clients and carries out R&D in the fields of meteorology, climate, hydrology and oceanography with a strong international cooperation. SMHI is the National Focal Point for IPCC and coordinates two Copernicus Climate Change Services (C3S).	Climate intelligence provider, being responsible for delivering climate data for reference and adaptation scenarios and user-tailored indicators. SMHI will coordinate tasks T3.2 (on the delivery of climate and environmental data for reference and adaptation scenarios) and T6.4 (on scientific dissemination).
4	METEO GRID	SME	Purveyor	Offering high quality services and products in the field of applied meteorology and climatology, weather forecasting and risk management. Expertise in adapted GIS information systems to weather and risk management, OGC standards, and open source tools development.	METEOGRID will lead the task 2.2 and will coordinate the Spanish demo case. It will be also involved in the industrialization of the service from the initial design of the service until the commercialization channels.
5	ZAMG	GOV	Supplier	ZAMG's is Austria's national meteorological and geophysical service and a subordinate agency to the Federal Ministry of Science, Research and Economy (BMWFW). It offers services and consulting to federal organisations as well as private media companies, insurances, power authorities, the building industry and to road weather services.	ZAMG will lead the WP3 on Science Support and will be responsible for delivering climate data, particularly urban climate simulations for demonstration cases of the City of Linz and Naples. It will provide expertise on climate change and climate impacts in WP1 and WP2 and will contribute in scientific dissemination.
6	PLINIVS –LUPT	UNI	Purveyor	PLINIVS is involved in European and national researches concerning risk assessment under effect of natural hazards (earthquakes, volcanic eruptions and hydrogelogical events) in the framework of emergency planning and development of mitigation strategies	PLINIVS will lead the WP on requirements and collaborative scenarios implementation, and main responsible for the implementation of the Metropolitan City of Naples demonstration, coordinating the efforts

					for all Italian end-users in CLARITY
7	StockCity	GOV	End-User	SLB-analys, a unit at the Environment and Health Administration (EHA) of the city of Stockholm, supports several local municipal authorities with air quality control and assessments, offers commercial services (air quality measurements, modelling, consultations) and is also involved in several scientific research projects.	StockCity is an end-user/consultant, with the tasks to identify needs, provide data, and show the added-value of the climate services provided. SLB's close contacts with planners and stakeholder organisations provide the necessary platform for exploiting the CLARITY climate services. StockCity will participate in WP1, WP2 and WP6.
8	AIT	RTO	Tech. Provider, Purveyor	Coordination of national and international Projects related to environmental monitoring in the field of air, water, soil and climate change.	AIT will contribute with 2 teams to the project: The DSS-Team concentrates on co-creation, provides the CLARITY technical manager and leads the WP1. In addition, it significantly contributes to WP4, through provision of the "catalogue of elements at risk and adaptation options" (T4.2) and co-development of the scenario transferability functionality (T4.4). The AIT –ENERGY Team – the Sustainable Buildings and Cities Unit (SBC) concentrates on use case definition related to planning aspects in WP1, on the Austrian demonstrator in WP3, on the urban heat island detection and microclimate modelling in WP3 and on applying the Climate Twins tool from the TaToo project to CLARITY in T4.4.
9	EUREKA	SME	Tech. Provider	Simulation models for economic impact evaluation of natural disasters and business planning	EUREKA will be main responsible for the economic and financial analysis and for the financial modelling in CLARITY
10	NAPOLI	GOV	End-user	City of Naples is committed with the Central Campania River Basin Authority to jointly develop local adaptation plans for the Metropolitan City of Naples Area, addressing hydrogeological and climate-related hazards risk reduction strategies	Pilot case of CLARITY in Naples will be used as a test application to implement the Civil Protection plans for the municipalities in the Metropolitan City of Naples
11	AEMET	GOV	Supplier	AEMET's competences include all activities generally carried out by national meteorological service. In particular climate issues, climate change scenarios, numerical weather prediction models, forecasting severe weather events and a wide network of observations including 15 meteorological radars (covering Spain), around one thousands of automatic observation stations and one supercomputer where most of the models run operationally several times a day.	AEMET will be responsible for regional simulations over the Spanish demonstration sites. It will provide expertise on numerical weather prediction models, climate models and climate downscaling techniques from IPCC climate global simulations.
12	WSP	IND	Purveyor	WSP Sweden has about 50 consultants (primarily engineers) working with hydraulic and hydrologic modelling of surface waters, and additional resources within the subject area, as well as neighbouring competences (GIS, groundwater modelling, etc.) can be found within the company nationally as well as worldwide.	WSP's task as a purveyor will be to test and demonstrate the usefulness of CLARITY in the Swedish user cases, i.e., how modelling can be performed based on the indicators derived from the downscaling of the climate models. WSP will participate in the co-creation process (WP1), the Swedish demo case (WP2) and dissemination (WP6).
13	ACCIONA	IND	End-User	Within Construction business line, ACCIONA Mantenimiento de Infraestructuras subsidiary company specializes in providing integral maintenance services for road, water and environmental infrastructures. It is a leader for infrastructure maintenance and conservation solutions, improving and protecting the environment for the benefit of those that use or	The main role of Acciona Infraestructuras in the project will be as end user of the CLARITY framework, presenting an application test case focused on the planning of maintenance activities for critical transport infrastructures based on climate information services.

				are affected by these infrastructures. This specialist business unit is also capable of offering the best solutions for special structures in the most complex projects, covering every area of civil engineering and building construction, thanks to its proven commitment to innovation, its extensive experience and a great team of professionals.	
14	SCC	SME	Purveyor	SCC develops collaborative innovation projects and supports business development of SME. Publisher of Webzine emphasizing innovation in cities and communities.	SCC will lead WP6 - Dissemination and Community Building and support partners with individual dissemination tasks like local/regional events.
15	CABJON	GOV	End-User	As a County Administrative Board in Sweden it stands as an important link between people and municipalities on the one hand, and the government and central authorities on the other. CABJON coordinates the regional effort to adapt the society to a changing climate.	CABJON will guide the members to develop relevant indicators, tools and models useful for all County Boards. Offers have the capacity and network to both obtain national needs, as well as distribute results in an efficient way throughout the country. Is involved in WP1, WP2 and WP6.
16	CEDEX	GOV	End-User	CEDEX competences include research activities related to all the main fields in civil engineering (roads, geotechnics, structures and materials, harbours and coasts, techniques applied to civil engineering and environment, and hydraulics of continental waters).	The main role of CEDEX in the project will be the assessment of road infrastructures in view of the medium and long term climate scenarios provide by the CLARITY climate services.
17	LINZ	GOV	End-User	City of Linz is responsible for planning and implementation of the regional efforts to adapt the society to a changing climate.	City of Linz will enrich the CLARITY consortium as a stakeholder experienced in flooding adaptation related to territorial planning. In this perspective, it will contribute to develop of decision-making tools and will allow the administration to investigate the effects of adaptation measures in the local context.

Table 8: Participants expertise and involvement

Competence and experience of the Coordinator

The project will be managed by ATOS, which is an ideal partner for managing this project given that:

- It has vast experience in the management of large scale projects, at national and international level in previous Framework Programmes (IP, STREP, CSA, old eTEN, eContent, ICT PSP...). In particular, ATOS has experience in the management of environmental and security related projects. Atos Spain SA is 2nd in the ranking of top 10 industry organisations in FP7 signed grant agreements in terms of counts of participations for the period 2007-2012[66].
- ATOS has the organizational capacity and appropriate human resources to manage CLARITY project.
- ATOS has invested on project management methodologies (e.g., PMI, Prince2) and quality control schemes (e.g., ISO 9001:2000), which reinforce its ability to successfully manage projects similar to CLARITY.
- ATOS will involve experts in the management and integration of international projects, as well as experts in the dissemination activities in Public Administration.

[66] Sixth EC FP7 Monitoring Report, 7 August 2013: http://ec.europa.eu/research/evaluations/index_en.cfm?pg=fp7-monitoring

Gender Equality

CLARITY is aware of the EU strategy regarding „Gender Equality in Research and Innovation“[67]

1. Fostering gender balance in research teams, in order to close the gaps in the participation of women.
2. Ensuring gender balance in decision-making, in order to reach the target of 40% of the under-represented sex in panels and groups and of 50% in advisory groups.
3. Integrating the gender dimension in research and innovation (R&I) content, helps improve the scientific quality and societal relevance of the produced knowledge, technology and/or innovation.

In particular CLARITY is addressing objectives 1 and 2 and has undertaken effort to set-up the R&I team in a gender-balanced way. Where the Technical Manager and **4 out of 7 WP-Leaders are women**. The **advisory board consists of 2 female and 2 male** experts. The overall **CLARITY Team** consists of 65 people where **41 are men and 24 women**. The ratio falls only 3% short of the recommended target (40%). The project is aware of this issue and has the objective to increase the number of female researchers involved during the project lifetime.

[67] https://ec.europa.eu/programmes/horizon2020/en/h2020-section/promoting-gender-equality-research-and-innovation

3.4 Resources to be committed

This section includes different figures describing the resources allocated to the different CLARITY tasks per partner, the estimated budget and requested EC contribution and a detailed project budget table.

#	Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total Person/Months per Participant
1	ATOS	31,0	11,0	0,0	19,0	25,0	12,0	37,0	**135,0**
2	CIS	16,0	11,0	5,0	17,0	12,0	4,5	4,0	**69,5**
3	SMHI	13,0	13,0	14,0	0,0	1,0	5,0	1,0	**47,0**
4	METEOGRID	10,0	32,0	14,0	15,0	7,0	6,0	0,0	**84,0**
5	ZAMG	13,0	12,0	22,0	0,0	6,0	6,0	1,0	**60,0**
6	PLINIVS	5,0	19,0	20,0	7,0	4,0	5,0	1,0	**61,0**
7	STOCKCITY	4,0	6,0	0,0	0,0	1,0	2,0	0,0	**13,0**
8	AIT	20,0	7,0	7,0	12,0	3,0	3,0	1,0	**53,0**
9	EUREKA	2,0	13,0	13,0	2,0	11,0	4,0	0,0	**45,0**
10	NAPOLI	2,0	14,0	0,0	0,0	1,0	2,0	0,0	**19,0**
11	AEMET	5,0	15,0	6,0	5,0	4,0	4,0	1,0	**40,0**
12	WSP	4,0	6,0	0,0	0,0	1,0	2,0	0,0	**13,0**
13	ACCIONA	5,0	30,0	9,5	0,0	3,0	3,5	0,0	**51,0**
14	SCC	1,0	0,0	0,0	0,0	7,0	34,0	1,0	**43,0**
15	CABJON	4,0	6,0	0,0	0,0	1,0	2,0	0,0	**13,0**
16	CEDEX	3,0	8,0	8,0	0,0	1,0	2,5	0,0	**22,5**
17	LINZ	4,0	2,0	0,0	0,0	1,0	1,0	0,0	**8,0**
	Total	**142,0**	**205,0**	**118,5**	**77,0**	**89,0**	**98,5**	**47,0**	**777,0**

Table 9: Summary of staff effort

General view of efforts and costs

The total estimated costs for CLARITY project are about 5.887.672 Euro and EC requested contribution is about 4.999.998 Euro.

In terms of costs, most of the budget is devoted to personnel (**72,15%**) and overheads (**19,83%**), for a total of around **91,98%** in personnel direct and indirect costs. Around **4,87%** of the costs are related to travel and about **2,29%** to other costs (including equipment and consumables). Costs foreseen for subcontracting represent **0,85%**.

Under the subcontracting category, AIT has allocated 50.000 Euro for the concept "Professional marketing video recording and editing for producing 5 videos about CLARITY project (one for each of the four pilot demonstrators plus the entire CLARITY project as a venture)".

The total efforts foreseen for the fulfilment of the project objectives are **777 person/months**, which are distributed in the following categories:

- CO-Creation (WP1): **142,0 p/m; 18,3%**;
- Demonstration & Validation(WP2): **205,0 p/m; 26,4%**;
- Science support (WP3): **118,5 p/m; 15,3%**;
- Technology support (WP4): **77,0 p/m; 9,9%**;
- Exploitation and Business (WP5): **89,0 p/m; 11,5%**;
- Dissemination and Community Building (WP6): **98,5; 12,7%**
- Project management and data management activities (WP7): **47,0 p/m; 6,0%.**

A more detailed distribution of the costs and efforts among the different main project activities is provided in the next tables.

			ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS	STOCKCITY	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABJON	CEDEX	LINZ
person/month rate (Eur)			5.000	7.385	6.650	3.800	4.800	5.300	7.100	7.418	4.600	4.700	4.400	7.100	4.500	6.804	7.100	5.000	5.000
Personnel Costs			675.000	513.258	312.550	319.200	288.000	323.300	92.300	393.158	207.000	89.300	176.000	92.300	229.500	292.572	92.300	112.500	40.000
Travel			26.000	22.000	24.000	18.000	24.000	24.000	10.000	30.000	15.000	8.000	18.000	10.000	7.500	19.100	10.000	15.300	6.000
Equipment			5.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other goods and services			5.000	3.000	12.000	4.000	4.000	12.000	0	72.000	0	3.000	9.000	0	0	6.000	0	0	0
Sub-total Other Direct Costs			36.000	25.000	36.000	22.000	28.000	36.000	10.000	102.000	15.000	11.000	27.000	10.000	7.500	25.100	10.000	15.300	6.000
"Other" exceeds 15% personnel costs?										Yes			Yes						
Sub-contracting			0	0	0	0	0	0	0	50.000	0	0	0	0	0	0	0	0	0
Indirect Costs (25%)			177.750	134.564	87.138	85.300	79.000	89.825	25.575	123.789	55.500	25.075	50.750	25.575	59.250	79.418	25.575	31.950	11.500
Total Costs		**5.887.672**	888.750	672.822	435.688	426.500	395.000	449.125	127.875	668.947	277.500	125.375	253.750	127.875	296.250	397.090	127.875	159.750	57.500
Reimbursement rate (RIA = 100%)			70%	70%	100%	70%	100%	100%	100%	100%	70%	100%	100%	100%	70%	70%	100%	100%	100%
Requested EC contribution		**4.999.998**	622.125	470.975	435.688	298.550	395.000	449.125	127.875	668.947	194.250	125.375	253.750	127.875	207.375	277.963	127.875	159.750	57.500

Table 10: General view of project costs

				Efforts per Task																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Leader	WP/T	Name of the WP/Task	Start-End	Total	ATOS	CIS	SMHI	METEOGRID	ZAMG	PLINIVS	STOCKCITY	AIT	EUREKA	NAPOLI	AEMET	WSP	ACCIONA	SCC	CABJON	CEDEX	LINZ
AIT	**WP1**	**CO-Creation**	**M01-M36**	**142,0**	**31,0**	**16,0**	**13,0**	**10,0**	**13,0**	**5,0**	**4,0**	**20,0**	**2,0**	**2,0**	**5,0**	**4,0**	**5,0**	**1,0**	**4,0**	**3,0**	**4,0**
AIT	T1.1	CO-Creation Management	M01-M36	14,0	1,0	2,0	1,0		1,0	1,0		**6,0**			1,0			1,0			
ATOS	T1.2	Climate Services Requirements	M01-M28	44,5	**6,0**	1,5	3,0	2,0	6,0	2,0	2,0	3,0	2,0	2,0	1,0	2,0	5,0		2,0	3,0	2,0
AIT	T1.3	Climate Services Co-creation	M06-M30	59,0	9,0	10,0	9,0	3,0	6,0	2,0	2,0	**9,0**			3,0	2,0			2,0		2,0
ATOS	T1.4	Climate Services Industrialization and Support	M04-M36	24,5	**15,0**	2,5		5,0				2,0									
PLINIVS	**WP2**	**Demonstration & Validation**	**M01-M36**	**205,0**	**11,0**	**11,0**	**13,0**	**32,0**	**12,0**	**19,0**	**6,0**	**7,0**	**13,0**	**14,0**	**15,0**	**6,0**	**30,0**	**0,0**	**6,0**	**8,0**	**2,0**
PLINIVS	T2.1	Data requirements definition, data collection concept, demonstration and result validation concept	M01-M08	17,5	1,0	1,0	1,0		4,0	**4,0**	1,0	0,5	2,0	1,0		1,0			1,0		
METEOGRID	T2.2	Demonstrator-specific data collection	M07-M18	59,0	2,0	2,0	2,0	**12,0**	4,0	6,0	2,0	2,0	4,0	6,0	4,0	2,0	6,0		2,0	2,0	1,0
PLINIVS	T2.3	Demonstration	M13-M36	75,0	7,0	7,0	5,0	10,0	2,0	**6,0**	1,0	4,0	3,0	4,0	5,0	1,0	12,0		1,0	6,0	1,0
METEOGRID	T2.4	Validation	M18-M36	53,5	1,0	1,0	5,0	**10,0**	2,0	3,0	2,0	0,5	4,0	3,0	6,0	2,0	12,0		2,0		
ZAMG	**WP3**	**Science support**	**M01-M30**	**118,5**	**0,0**	**5,0**	**14,0**	**14,0**	**22,0**	**20,0**	**0,0**	**7,0**	**13,0**	**0,0**	**6,0**	**0,0**	**9,5**	**0,0**	**0,0**	**8,0**	**0,0**
ZAMG	T3.1	Scientific Background	M01-M08	14,5			2,0		**9,0**	2,0					1,0		0,5				
SMHI	T3.2	Climate Intelligence	M09-M24	32,5			**12,0**	6,0	4,0	1,0		4,0			5,0		0,5				
PLINIVS	T3.3	Vulnerability and Risk Assessment	M13-M27	22,5					3,0	**8,0**		0,5	4,0				3,0			4,0	
CIS	T3.4	Adaptation Strategies and Decision Support	M13-M27	35,5		**5,0**		8,0	3,0	6,0		1,5	3,0				5,0			4,0	
EUREKA	T3.5	Economic and Societal Impact	M16-M30	13,5					3,0	3,0		1,0	**6,0**				0,5				
CIS	**WP4**	**Technology support**	**M01-M30**	**77,0**	**19,0**	**17,0**	**0,0**	**15,0**	**0,0**	**7,0**	**0,0**	**12,0**	**2,0**	**0,0**	**5,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**
CIS	T4.1	CSIS Architecture	M01-M12	7,0	2,0	**2,0**		2,0		1,0											
AIT	T4.2	Catalogue of elements at risk and adaptation options	M09-M30	10,0		2,0				2,0		**6,0**									
CIS	T4.3	Scenario Management	M09-M30	23,0	6,0	**5,0**		6,0		1,0					5,0						
AIT	T4.4	Scenario Transferability	M09-M30	17,0	5,0			4,0		2,0		**6,0**									
CIS	T4.5	Scenario Analysis, Decision Support and Report Generation	M09-M30	20,0	6,0	**8,0**		3,0		1,0			2,0								
ATOS	**WP5**	**Exploitation and Business**	**M01-M36**	**89,0**	**25,0**	**12,0**	**1,0**	**7,0**	**6,0**	**4,0**	**1,0**	**3,0**	**11,0**	**1,0**	**4,0**	**1,0**	**3,0**	**7,0**	**1,0**	**1,0**	**1,0**
CIS	T5.1	Exploitation Requirements	M01-M14	14,0	3,0	**4,0**		1,0	2,0				2,0		1,0		1,0				
ATOS	T5.2	Exploitation Strategy and Business plan	M01-M36	36,0	**10,0**	2,0	1,0	2,0	1,0	2,0	1,0	1,0	4,0	1,0	1,0	1,0	2,0	4,0	1,0	1,0	1,0
EUREKA	T5.3	Social Innovation assessment	M27-M36	10,0		2,0			1,0	2,0			**5,0**								
ATOS	T5.4	Climate Service Marketplace	M07-M20	29,0	**12,0**	4,0		4,0	2,0			2,0			2,0			3,0			
SCC	**WP6**	**Dissemination and Community Building**	**M01-M36**	**98,5**	**12,0**	**4,5**	**5,0**	**6,0**	**6,0**	**5,0**	**2,0**	**3,0**	**4,0**	**2,0**	**4,0**	**2,0**	**3,5**	**34,0**	**2,0**	**2,5**	**1,0**
ATOS	T6.1	Project Branding and Communication	M01-M36	13,0	**9,0**	1,0		1,0	1,0								0,5			0,5	
SCC	T6.2	Media Production and Publishing	M03-M36	24,0			1,0				1,0	1,0	2,0		1,0	1,0		**16,0**	1,0		
SCC	T6.3	Stakeholder Engagement Tour	M03-M36	46,0	2,0	2,5	1,0	5,0	2,0	3,0	1,0	1,0	2,0	2,0	1,0	1,0	2,0	**18,0**	1,0	0,5	1,0
SMHI	T6.4	Scientific Dissemination	M03-M36	15,5	1,0	1,0	**3,0**		3,0	2,0		1,0			2,0		1,0			1,5	
ATOS	**WP7**	**Project Management**	**M01-M36**	**47,0**	**37,0**	**4,0**	**1,0**	**0,0**	**1,0**	**1,0**	**0,0**	**1,0**	**0,0**	**0,0**	**1,0**	**0,0**	**0,0**	**1,0**	**0,0**	**0,0**	**0,0**
ATOS	T7.1	Project Management Coordination and Reporting	M01-M36	30,0	**30,0**																
ATOS	T7.2	Quality Assessment	M01-M36	3,0	**3,0**																
CIS	T7.3	Data Management	M01-M36	3,0		**3,0**															
ATOS	T7.4	Impact Measurement and Project objective validation	M01-M36	11,0	**4,0**	1,0	1,0		1,0	1,0		1,0			1,0			1,0			
				777,0	**135,0**	**69,5**	**47,0**	**84,0**	**60,0**	**61,0**	**13,0**	**53,0**	**45,0**	**19,0**	**40,0**	**13,0**	**51,0**	**43,0**	**13,0**	**22,5**	**8,0**

Table 11: Efforts distribution per Task and Partner

3.4.1 'Other direct cost' items (travel, equipment, other goods and services, large research infrastructure)

In addition to the costs indicated in section 3 of the proposal administrative forms, and the effort shown above, all other major costs are now described and analysed in more detail.

Travel category amounts approx. to 4,87% of the total project costs. Average travel budget by partner is around 17 K Eur, and varies depending on the location of the partner and its role in the project. The travel budget has been estimated under the following assumptions:

- Each partner is expected to be represented at least by two persons for WP-leaders, and one person for others, in each physical meeting on average. They will be given the freedom of deciding on the number of persons attending and the number of meetings attended as long as the allocated budget is not exceeded
- Work Package/consortium meetings are expected to be scheduled at least quarterly
- At least one representative of each partner is expected to attend EC review meetings (this will depend on Commission requirements)

In order to accommodate the costs associated to the Advisory Board activities, such as travel arrangements and allowances, the CLARITY consortium has reserved in the Technical Manager (AIT) budget the amount of The 59.500 Euro.

In addition, as part of the stakeholder engagement activities, the project plans to organize a series of CLARITY pilot workshop and demonstration events with different stakeholders and end-users. To that end, a total sum of 36.000 euro has been reserved (18 workshops will be organized with an average cost of 2.000 euro per workshop). This amount has been equally divided and allocated under the budget of the following pilot representatives: SMHI, PLINIVS, AIT and AEMET (9.000 euro each).

Finally, as shown in the general view of project costs (Table 10), most of the participant's amount devoted to other costs ('travel', 'equipment', and 'goods and services') do not exceed 15% of their personnel costs. For the exceptions, the individual justification is provided.

#8 / AIT	Cost (€)	Justification
Travel	30.000 Eur	
Other goods and services	72.000 Eur	• 3.500 Euro for audit certificate • 9.000 Euro for organizing workshops related to the Austrian pilot (approx. 2000 Euro per wokshop) • 59.500 Euro reserve for costs associated to the Advisory Board activities (calculations were made according to the following estimations: 7 persons 5 trips (approx. 2 per year) 2 days per trip 800 Euro cost per trip (plane + 1-night hotel) 450 Euro Remuneration for experts (daily fee) ➔ Travel costs: 28.000 Euro ➔ Personnel costs: 31.500 Euro Total: 59.500 Euro
Total	102.000 Eur	

Table 12: 'Other direct cost' items. Participant #8 AIT

#11 / AEMET	Cost (€)	Justification
Travel	18.000 Eur	
Other goods and services	9.000 Eur	9.000 Euro for organizing workshops related to the Spanish pilot (approx. 2000 Euro per wokshop)
Total	27.000 Eur	

Table 13: 'Other direct cost' items. Participant #11 AEMET

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4. MEMBERS OF THE CONSORTIUM

4.1. Participants (applicants)

P1. Atos Spain S.A (ATOS) - Spain

Partner Full Name	Atos Spain S.A	Logo	
Short Name	ATOS	Country	Spain
Status	Industry	Website	http://www.atos.net and http://www.atosresearch.eu

Atos SE (Societas Europaea) is a leader in digital services with pro forma annual revenue of circa € 12 billion and circa 100,000 employees in 72 countries. Serving a global client base, the Group provides Consulting & Systems Integration services, Managed Services & BPO, Cloud operations, Big Data & Cyber-security solutions, as well as transactional services through Worldline, the European leader in the payments and transactional services industry. With its deep technology expertise and industry knowledge, the Group works with clients across different business sectors: Defence, Financial Services, Health, Manufacturing, Media, Utilities, Public sector, Retail, Telecommunications, and Transportation.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is listed on the Euronext Paris market. Atos operates under the brands Atos, Atos Consulting, Atos Worldgrid, Bull, Canopy, Unify and Worldline. For more information, visit: atos.net.

Atos Research & Innovation (ARI) is the R&D hub for emerging technologies and a key reference for the whole Atos group. With more than 28 years of experience in running Research, Development and Innovation (RDI) projects, we have become a well-known player in the EU context. Our multidisciplinary and multicultural team has the skills to cover all the activities needed to run projects successfully, from scientific leadership to partnership coordination, from development of emerging technologies to the exploitation of project outcomes, with a strong focus on dissemination, innovation adoption and commercialization.

Atos is a founding member of the European Technology Platform NESSI (Networked European Software and Services Initiative). Our company is a major partner in Future Internet-related initiatives being member of the FI PPP Steering Board and Industrial Advisory Board. Since 2014, Atos is a founding member of the Big Data Value Association (BDVA), assuming the roles of Vice-presidency and Deputy Secretary-general. We are also member of the 5G PPP Steering Board. Additionally, Atos is a member of NetWorld2020, NEM, Nanomedicine, ERTICO, ARTEMIS, CELTIC, NIS, EOS, PESI, LSEC, ETSI, OW2, OASIS, Cloud Security Alliance, Eurocities, etc. Finally, Atos is a core member of the KIC for EIT Health Innolife and an official member of the KIC EIT ICT Labs associated node Madrid. At national level, Atos is currently holding the Presidency and Secretary of PLANETIC for ICT, as well as the Vice-presidency of es.Internet for Future Internet technologies, and is member of several others, such as Logistop for Integral Logistics or the Spanish Railways Technology Platform.

Within ARI, the **Environment sector** covers research and innovation for environment, and focuses its activity on the design and implementation of information architectures, oriented towards the seamless geospatial data distribution and execution of distributed geospatial processes to improve the Natural Risk Management.

The team has developed (since 1999) large number of consultancy and research projects dealing with the use of the current geographical information standards and linked in many cases with the European Policy Initiatives in this field (e.g. INSPIRE). ATOS also provides technical and thematic knowledge in the Environmental domain:

- Integration of in-situ & EO observations from environmental sensors.
- SOA for accessing and processing geospatial information.
- Expertise on OGC standards (WMS, WFS, WPS, WCS, SWE…).
- Implementation of geographical independent decision support and alerting systems for the prevention of disasters.

Expertise and relevant Projects

More relevant references:

- **DRIVER**, EU FP7 (SEC), 2014-2018 (http://driver-project.eu). The DRIVER (Driving Innovation in Crisis Management for European Resilience) project implements the Crisis Management System-of-Systems Demonstration Programme funded under the 7th Framework Programme by the European Commission. Coordinated by ATOS, DRIVER was launched in May 2014 and gathers the expertise of 37 organisations from 13 EU Member States and two associated countries, and receiving a budget of roughly 45 M Euros, is currently the largest crisis management project in Europe.
- **ICARUS**, EU FP7 (SEC), 2012-2016 (www.fp7-icarus.eu). Research project (with a global budget of 17.5M€) which aims to develop robotic tools which can assist "human" crisis intervention teams, and heterogeneous robot collaboration between unmanned search and rescue devices, where the main role of Atos is related to the collation and merging of data from different sources, taking into account their varying reliability, and integration of data with GIS information.
- **ENVIROFI**, EU FP7 (ICT, FI-PPP), 2011-2013 (www.envirofi.eu). The Environmental Observation Web and its Service Applications. ATOS was the Coordinator of the ENVIROFI project, the Usage Area projects on Environment of the Phase 1 of the Future Internet PPP (FI-PPP), as part of its large experience in the field of coordination of international complex projects.
- **EO2HEAVEN**, EU FP6 (ENV), 2010-2013 (www.eo2heaven.org). Earth Observation and Environmental modelling, where ATOS acted as Research coordinator. This collaboration resulted in the design and development of a GIS based upon an open and standards-based Spatial Information Infrastructure (SII) envisaged as a helpful tool for research of human exposure and early detection of infections.
- **DEWS**, EU FP6 (ICT), 2007-2010 (www.dews-online.org). Coordinated by ATOS, the DEWS project was created in order to design and implement an early warning system for the whole Indian Ocean and the adjacent countries based on open standards. DEWS developed an innovative platform and services for the disaster management cycle between GITEWS hazard detection and warning/alarm. DEWS software included models for tsunami wave spreading, assessment of vulnerabilities/consequences of natural disasters and systems for monitoring and crisis management, including information and decision support.
- **ORCHESTRA**, EU FP6 (ICT), 2004-2008 (www.eu-orchestra.org). Open architecture and infrastructure for risk management, research contribution to INSPIRE. Coordinated by ATOS.

Role in the project

ATOS is the CLARITY Project Coordinator and will act as main interface to the European Commission. ATOS will also play an important role in the technical and business related activities, leading the tasks on the on the climate services requirements collection and industrialization, exploitation and Communication, for which ATOS has a long experience and proven track record in running and past EU projects.

Key personnel

Miguel Ángel Esbrí (male) is the Research Line Expert for geospatial technologies within Atos Research & Innovation (ARI) department. He holds a Master Degree in Computer Sciences Engineering from the Jaume I University in Castellón, Spain since 2002. He is specialised in Geo-Spatial technology and more particularly in interoperable systems based on Open Geospatial Service standards. He joined the Atos Spain, in September 2006 as a Consultant. Since then, he has been involved in the technical development, management and coordination of EU funded projects (mainly focused on environmental issues and natural and man-made hazards), like ORCHESTRA, DEWS, EO2HEAVEN, ENVIROFI, ICARUS and DRIVER. He is currently the Project Coordinator of the FOODIE Project (Farm-Oriented Open Data in Europe, http://www.foodie-project.eu).

José Lorenzo (male) is the Head of the Manufacturing, Retail and Environment Market in Atos Research & Innovation (ARI) and former E&U Market Manager also in ARI. He has a Telecommunication Engineer Degree (Master of Science) and specialty of TELEMATICA (Data Transmission) by the Faculty of Technology in the University of Vigo (Spain). He joined the ATOS former, Sema Group sae, in April 2001 as a Consultant. Since then, he has been involved in the technical development, management and coordination of EU funded projects, like ORCHESTRA or DEWS. Latest projects being coordinated by him are EO2HEAVEN (as Research Coordinator) (http://eo2heaven.org), OpenNode or ENVIROFI (phase 1 project of the FI-PPP) (http://envirofi.eu), and currently EO4wildlife (http://eo4wildlife.eu).

Mario Núñez Jiménez (male) has a Degree in Computer Sciences Engineering from the Polytechnic University in Madrid, Spain. He is specialised in J2EE server side developments, databases, XML technology and Web Services. He is working at ARI in projects for the European Commission. Two of his latest relevant involvements have been the ORCHESTRA project (developing Web Services and dealing with XML from server side and also doing integration with Web GIS Client) and DEWS (developing plugins for a standalone application based on Udig and Eclipse RCP dealing with Geographical information and Postgre database).

Jorge López (male) got his degree in Economic sciences at the University of the Basque Country and holds a Master Degree in Information Technologies (Basque Country Technology Centre, 2000) and a Master Degree in GIS management (Unigis Girona, 2012). He joined ATOS in 2000 as a product engineer. During the last 9 years he has been working in EU R&D projects, assisting in administrative and management tasks, being responsible for exploitation research in projects such as PENG, ALIS, DEWS, EO2HEAVEN, ENVIROFI and providing consultancy in the field of environmental applications.

Eva Vega Sánchez (female) holds a degree in Economics (2000) by the University of Las Palmas de Gran Canaria (Spain). She has been working for Atos since 2009. Nowadays, she works as a business consultant in the Manufacturing and Retail Sector in Atos Research and Innovation. She was leading the exploitation tasks of FITMAN (FI-PPP phase 2 project applied to manufacturing), EASY-IMP project (development of a design collaboration platform for smart clothing) and the ARTEMIS project ASTUTE (Pro-active decision support for data-intensive environments) and she is collaborating in the impact assessment tasks of the Co-Cities project (Cooperative Cities extend and validate mobility services). Her background also includes the participation in several Public Sector National consultancy projects (SIRHUS Project- Integral System of Human Resources, Meta4-Integral System of Human Resources and Health Institutions Staff Payroll). She has previous experience as a Market Analyst for a FMCG Multinational and as an external Foreign Trade Consultant for the Chamber of Commerce of Santa Cruz de Tenerife.

Relevant publications:

- *Future Internet technologies for environmental applications*. C. Granell, D. Havlik, J. Lorenzo et al. Article in Environmental Modelling and Software 78:1-15, April 2016. This paper investigates the usability of Future Internet technologies (aka "Generic Enablers of the Future Internet") in the context of environmental applications
- *The Future Internet Enablement of the Environment Information Space*. T. Usländer, A. J. Berre, C. Granell, D. Havlik, J. Lorenzo, Z. Sabeur, S. Modafferi. This paper motivates the enablement of the Future Internet to become a highly functional service platform supporting the design and the operation of software applications in the Environmental Information Space. http://dx.doi.org/10.1007/978-3-642-41151-9_11
- *From Sensor to Observation Web with Environmental Enablers in the Future Internet*. D. Havlik, S. Schade, Z. Sabeur, P. Mazzetti, K. Watson, A. Berre, J. Mon, 2011. Sensors, 11, 3874-3907
- *Towards a Multi-Style Service-Oriented Architecture for Earth Observations*. S. Schade, P. Mazzetti, Z. Sabeur, D. Havlik, T. Usländer, A. Berre, J. Lorenzo. EGU General Assembly 2011 Conference Paper
- *Interlinking National Tsunami Early Warning Systems towards ocean-wide-system-of-systems networks.* Lendholt, M.; Esbri, M. A.; Hammitzsch, M. In: Proceedings Ed.: Rothkrantz, J.; Ristvej, J.; Franco, Z. 9th International Conference on Information Systems for Crisis Response and Management - ISCRAM (Vancouver, Canada, 2012) 2012. 1-10 p.
- *User interface prototype for geospatial early warning systems - a tsunami showcase.* Hammitzsch, M., Lendholt, M., and Esbrí, M. Á. Nat. Hazards Earth Syst. Sci., 12, 555-573, doi:10.5194/nhess-12-555-2012, 2012
- *A hazard-independent approach for the standardised multi-channel dissemination of warning messages.* Esbrí, M. A., Hammitzsch, M., and Lendholt, M. European Geosciences Union (EGU) General Assembly 2012, Vienna, Austria, 22–27

Relevant significant infrastructure and/or any major items of technical equipment

Atos Research and Innovation is organized in eleven Sectors within Atos' established markets (i.e. Public Sector & Health & Transport, Finance, Media & IT, Energy & Utilities, and Manufacturing & Retail) and five Technological Labs. The structure fosters the alignment of emerging technology research and development with the market / customer needs. The ultimate goal is to be at the forefront of both R&D in Information and Communications

Technologies (ICT) and the enabling of efficient technology and innovation transfer from R&D projects to the real world.

ARI is present in various locations: Asturias, Barcelona, Bilbao, Madrid, Santa Cruz de Tenerife, Santander, Santiago de Compostela, Valladolid in Spain; Ankara and Istanbul in Turkey; and Bratislava in Slovakia.

Thanks to the extensive trajectory in developing and managing R&D projects, the research group of Atos may provide a wide set of tools and methods that may benefit the project from a managerial and technical point of view:

- A professional Project Management Office (PMO) supports project managers in the financial reporting and auditing processes that take place during the project.
- A graphical design team supports the project team in elaboration of branding material (posters, brochures, templates) and in the creation and maintenance of project web sites.
- A system administrators' team supports the project technical team in acquisition, configuration and installation of required hardware equipment, IT services or software licenses.
- The marketing department of the company broadcasts the communications, news or press releases produced by the project towards diverse national and international press and online sites.
- A set of collaborative tools are at the disposal of project team for communication (online meeting tool, mailing lists manager), for management (budget/payments monitoring spreadsheets, project plan and quality control methods) or for development (software repositories, SVN).
- Our worldwide portfolio of offerings and customers is available for disseminating the project results on one hand, but also for exploring potential users and business partners to adopt and exploit the project solution.
- And finally, several Atos locations are well placed and communicated to host projects meetings or reviews, providing all the required infrastructure and services for an efficient meeting performing.

P2. cismet GmbH (CIS) - Germany

Partner Full Name	cismet GmbH	Logo	
Short Name	CIS	Country	Germany
Status	SME	Website	www.cismet.de

cismet GmbH is an open source software company specialised in providing user-tailored, highly integrated and interactive solutions for distributed geo-spatial applications. Cismet personnel can be considered experts in the field of Environmental Decision Support Systems and Geospatial Application Design and Development. With a strong research profile, the company aims at transforming the latest ICT research results into solutions which are usable by real world end users. Company personnel have been involved in European research projects since 1997 - in the ICT, security and environment programs of the EU. The company has an extensive network of more than 100 R&D and application partners. This research provides customers access to cutting-edge technology. Research has a focus on information infrastructures (including integration of computational models) and highly interactive graphical user interfaces, including 3D visualisation.

Expertise and relevant Projects

Cismet publishes frequently in scientific communities dealing with decision support in environmental software systems and model integration (MODSIM, EnviroInfo, iEMSs, ISESS, …). An excerpt of relevant publications:

- P. Dihé, R Denzer, M. Polese, A. Heikkilä, D. Havlik, J. Sautter, Th. Hell, S. Schlobinski, G. Zuccaro, An architecture for integrated crisis management simulation (Modsim 2013)
- Ralf Denzer , Sascha Schlobinski, Lars Gidhagen , Thorsten Hell, How to build integrated climate change enabled EDSS (ISESS 2013)
- S. Schlobinski, L. Gidhagen, Jonas Olsson, Steven Frysinger, R. Denzer, P. Kutschera, Integration of Climate Change Effects in Local Models and Urban Planning Processes (IEMSS 2012)
- Sander, S., Schlobinski, S., Hoppe, H, Integrating climate change in the urban planning process - a case study. Environmental Software Systems. Frameworks of eEnvironment - 9th IFIP WG 5.11 International Symposium, ISESS 2011, Brno, Czech Republic, June 27-29, 2011.
- R. Denzer, S. Schlobinski, T. Hell , R. Güttler and L. Gidhagen, Towards Automation of Model Execution from a Decision Support Environment (Modsim 2011)
- Denzer, R., Schlobinski S., Gidhagen L. (2011). A Decision Support System for Urban Climate Change Adaptation, In: Proceedings of the 44th Hawaii International Conference on System Sciences (HICSS-44), CDROM, IEEE Computer Society
- Schlobinski, S. Denzer, R., Hell, T., Güttler, R., 2011 (2011). Vision and Requirements of Scenario-Driven Environmental Decision Support Systems Supporting Automation for End Users. In: Environmental Software Systems Vol. 9, Frameworks of eEnvironment, IFIP AICT 359, Springer, 51-63

The most relevant international research projects with cismet personnel involved include:

- **SWITCH-ON**, EU FP7 (ENV), since 2013. Scientific information management platform for hydrological research based on open government data
- **CRISMA**, EU FP7 (SEC), 2012, since 2012. Integrated crisis management simulation management system for training of crisis management and response personnel
- **SUDPLAN**, EU FP7 (ICT), 2010-2013. Planning and decision support system for urban climate change adaptation including severe weather events
- **TATOO**, EU FP7 (ICT), 2010-2013. Semantic tagging infrastructure for environmental information resources on the world wide web
- **SANY**, EU FP6 (ICT), 2006-2010. Sensor service architecture, research contribution to Open Geospatial Consortium's sensor web enablement
- **ORCHESTRA**, EU FP6 (ICT), 2004-2008. Open architecture and infrastructure for risk management, research contribution to INSPIRE

Role in the project

CIS will lead WP4, being main responsible for the detailed specifications of the CLARITY CSIS Architecture and scenario management, scenario analysis and decision support software. As an SME cismet will contribute to all activities related to the successful commercial exploitation. It will contribute to all WPs with aspects of simulation integration, asset management and decision support. and will lead data management activities.

Key personnel

Sascha Schlobinski is one of cismet's CEOs, responsible for R&D. He holds a degree in Applied Computer Science and a Master of Computer Science from the International Max Planck Research School at the Saarland State University. He is working in the area of Enviromatics since 1998 with focus on design and implementation of distributed architectures and more recently on concepts for Geospatial EDSS. He has been working in EU funded projects since FP5 …

Pascal Dihé works a Senior Researcher and Developer and is responsible for many research activities in the company. He holds a degree in Applied Computer Science from the University of Applied Sciences Saarbrücken. He is working in the area of Enviromatics since 2000 with focus on design and implementation of distributed architectures, currently as one of the main architects of the CRISMA project.

Prof. Dr. Ralf Denzer is a professor of computer science in Saarbrücken, a partner in cismet, director of EIG, and director of Environmental Informatics Institute (EII), a non-profit organisation. He is specialised in distributed infrastructures and decision support systems, and has influenced European ICT research in the field of ICT for Environment heavily during the past 10 years. He has been long-time chairman of IFIP WG5.11 (Working Group Computers and Environment), is the founder of the ISESS conference, member of the editorial board of Environmental Modelling & Software, has edited and co-authored 18 books and proceedings, and has authored and co-authored 114 publications up to date.

Prof. Dr. Steven P. Frysinger (male) has been actively and principally engaged in human factors engineering and research since 1980. His graduate education includes an MS in Applied Psychology with a concentration in Human Factors, and his Ph.D. research focused on the user interaction elements of environmental decision support systems. In the 1990s Dr. Frysinger turned his expertise more directly toward environmental management and protection, leading a team conducting research and development of highly integrated decision support system architectures based on user-cantered design principles, and he continues this work to the present day. He helped to establish the basis for applying core human factors principles to environmental informatics in general, and environmental decision support systems in particular. The application domains of his work have included ground water contamination, natural resource management and protection, natural and anthropogenic crisis management, and climate change adaptation. As a long-time volunteer in law enforcement and public safety he has also applied his expertise to incident management contexts.

P3. Sveriges Meteorologiska och Hydrologiska Institut (SMHI) - Sweden

Partner Full Name	Swedish Meteorological and Hydrological Institute	Logo	SMHI
Short Name	SMHI	Country	Sweden
Status	government agency	Website	www.smhi.se

SMHI is a government agency under the Swedish Ministry of Environment offering products to support decision-making in the environmental sector. SMHI is responsible for national meteorological, hydrological and oceanographic forecasting and the production of climate change projections. The main fields of research include weather and climate modelling, data assimilation, hydrology, oceanography and air quality. Climate research is a cross departmental activity, with all six research sections contributing to the development of climate projections, impact assessments and communication with stakeholders, regional authorities and major utilities.

SMHI is the Swedish focal point for IPCC and has been commissioned by the government to lead the national knowledge centre for adaptation to climate change, which also operates the Swedish Portal for Climate Change Adaptation (www.klimatanpassning.se).

Expertise and relevant projects

The SMHI research department, with a staff of 100 persons of which the majority has a PhD, is internationally active in climate as well as environmental impact modelling. Relevant projects for CLARITY are:

- Coordinator of Copernicus C3S project **UrbanSIS** (2015-2017) project that will offer a proof-of-concept climate service delivering Essential Climate Variables (ECV) and impact indicators over urban areas related to infrastructure and health.
- Coordinator of Copernicus C3S project **SWICCA** (2015-2018) project that will offer a proof-of-concept climate service for water indicators in climate change adaptation.
- Partner of Copernicus C3S project **CLIM4ENERGY** (2015-2017), a service providing climate change indicators tailored for the energy sector.
- Coordinator of FP7 project **SUDPLAN** (2010-2012) which facilitated downscaling services for rainfall, hydrology and air quality, to be applied in European cities.
- WP leader of FP7 project **CLIPC** (2013-2016) which aims at providing a consolidated understanding of user requirements and climate impact indicators based on a thoroughly user consultation and engagement.

Some recent publications:

- Vautard, R., Gobiet, A., Sobolowski, S., **Kjellström, E**., Stegehuis, A., Watkiss, P., Mendlik, T., Landgren, O., **Nikulin, G.**, Teichmann, C., Jacob, D., 2014. The European climate under a 2 °C global warming. Environ. Res. Lett., 9, 11 pp.
- **Olsson, J., Foster, K.,** 2013. Short-term precipitation extremes in regional climate simulations for Sweden. Hydrology Research, doi: 10.2166/nh.2013.206.
- **Olsson, J., Gidhagen, L.,** Gamerith, V., Gruber, G., Hoppe, H., Kutschera, P., 2012. Downscaling of short-term precipitation from regional climate models for sustainable urban planning. Sustainability, 4, 866-887, doi:10.3390/su4050866.
- **Gidhagen, L., Engardt, M.**, Lövenheim, B., Johansson, C., 2012. Modeling effects of climate change on air quality and population exposure in urban planning scenarios. Advances in Meteorology, Article ID 240894, 12 pp, doi:10.1155/2012/240894.
- Borrego, C., **Amorim, J.H.**, Tchepel, O., Dias, D., Rafael, S., Sá, E., Pimentel, C., Fontes, T., Fernandes, P., Pereira, S.R., Bandeira, J.M., Coelho, M.C., 2016. Urban scale air quality modelling using detailed traffic emissions estimates. Atmospheric Environment 131, 341–351. doi:10.1016/j.atmosenv.2016.02.017.

Role in the project

SMHI will intervene in CLARITY as climate intelligence provider, being responsible for: (1) delivering climate data for reference and adaptation scenarios driven by end-user needs; (2) delivering downscaled climate signals based on IPCC scenarios and implement models and algorithms that use available local data and models for improving the projections of environmental variables by further downscaling and bias correction; and (3) connecting

environmental variables to meteorological signals by providing hazard models incl. input and output variables driven by CC signals. SMHI will develop a tool capable of delivering user-tailored indicators that will run over existing climate services. The performance of this new tool, launched under a friendly and intuitive CSIS environment, will be demonstrated on selected large scale infrastructure projects in Sweden. SMHI will coordinate tasks T3.2 (on the delivery of climate and environmental data for reference and adaptation scenarios) and T6.4 (on scientific dissemination).

Key personnel

Lars Gidhagen (male) is head of the air quality research unit. He has a PhD in atmospheric chemistry and his research is focusing on the urban environment and the health impact of air pollution. Lars Gidhagen is the coordinator of Copernicus C3S project Urban SIS and is part of the steering committee for the Swedish Clean Air and Climate research programme. He was the coordinator of SUDPLAN FP7 project.

Magnuz Engardt (male) is Associate Professor and specialist in regional air quality modelling. Magnuz Engardt has over 20 years of research experience and 50 peer-reviewed papers. He participated in SUDPLAN, IMPACT2C and ECLAIRE FP7 projects.

Jonas Olsson (male) is Associate Professor and his main fields of research are climate change impacts on hydrology and rainfall disaggregation and downscaling. Jonas Olsson has over 50 peer-reviewed papers and was co-editor to the book “Impacts of Climate Change on Rainfall Extremes and Urban Drainage Systems (IWA Publishing, 2012). He was WP leader in the SUDPLAN F7 project.

Lena Strömbäck (female) is Associate Professor and expert in databases and information management. She has over 20 years of experience of research on information management. She has had a large range of scientific commitments including EU-project partner leadership, committee member and key note speeches. She has published some 35 peer reviewed international papers. Lena Strömbäck directed the hydrological part of the SUDPLAN FP7 project and is WP leader in the Copernicus C3S project Urban SIS, responsible for the public data portal.

Jorge H. Amorim (male) is a researcher at SMHI. He has focused his career on the development and evaluation of urban/local scale numerical models capable of describing urban flows and dispersion phenomena, aiming to improve the understanding of air pollution and microclimate patterns and trends in cities under climate change, and related impacts on human health and urban sustainability. He has 27 papers indexed to the Web of Science. He is the WP leader for urban downscalling in Copernicus C3S project Urban SIS.

P4. FARISA ASESORES Y CONSULTORES S.A. (METEOGRID) - Spain

Partner Full Name	FARISA ASESORES Y CONSULTORES S.A.	Logo	
Short Name	METEOGRID	Country	Spain
Status	SME	Website	http://www.meteogrid.com

MeteoGRID (commercial name of FARISA ASESORES Y CONSULTORES S.L.) is a Spanish private company, providing high quality services and products in the fields of applied meteorology, weather forecasting Early Warning Systems (EWS) and risk management since 2004. MeteoGRID range of services cover several domains, such as natural disasters, extreme weather, civil protection emergencies, hydrology, agriculture, energy, transportation and civil engineering among others, for which accurate weather forecast is required and used in added value products, such as EWS. MeteoGRID technical team has been developing and improving Weather Forecasting Systems (WFS) since 1996, with of an interdisciplinary team composed of highly qualified experts in meteorology, natural hazards and computing. MeteoGRID activity is divided into three main groups of projects, namely: a) Consultancy projects and studies. b) Weather forecasting and information systems development projects. C) Research and development projects. MeteoGRID consultancy services include studies on meteorology, hydro-meteorological and natural hazards risk assessment, renewable energy resources assessment and forecast, high-accuracy agriculture weather services, and general-purpose geographical distribution of meteorological and climate variables for other applications. MeteoGRID provides high added value weather services, based on the developed WFS, that produces operational forecasts specially adapted for technical users. Most of the technical activities affected by weather are managed in Spain using these Systems, including natural disasters (a lot of expertise in forests fires), power management (production, distribution, consumption forecasting), hydrology, civil protection emergencies, agriculture, traffic, etc. Finally, MeteoGRIDs team has a large experience in R+D activities, in national and international projects, and its commercial activity is highly based on research results transfer into products and services.

Expertise and relevant projects

- IMDROFLOOD. Improving drought and flood early warning, forecasting and mitigation using real-time hydroclimatic indicators.
- ERA-LEARN 2020. European Commission. Ongoing
- WUIWATCH. Urban Interface Forest Fire Risk Observatory And Interest Group. Directorate-General Humanitarian aid and civil protection. European Commission. Ongoing. https://wuiwatch.org
- SPITFIRE. Spanish-Portuguese meteorological information system for trans-boundary operations in forest fires. Directorate-General Humanitarian aid and civil protection. European Commission. Ongoing. http://firehelp.wixsite.com/spitfire
- SUNSHINE. Smart Urban services for higher energy efficiency. The Information and Communication Technologies Policy Support Programme. European Commission. http://www.sunshineproject.eu/
- SIGYM. Service of weather and geographical information system for Early Warning and risk assessment for forest fires in Spain. https://sigym3.com

Recent publications:

- Robert Monjo, Emma Gaitán, Javier Pórtoles, Jaime Ribalaygua, Luis Torres - Changes in extreme precipitation over Spain using statistical downscaling of CMIP5 projections. Int. J. Climatol. DOI: 10.1002/joc.4380.
- Raul Rodríguez, Xavier Navarro, M. Carmen Casas, Jaime Ribalaygua, Beniamino Russo, Laurent Pouget, Angel Redaño - Influence of climate change on IDF curves for the metropolitan area of Barcelona (Spain). International Journal of Climatology, 34: 643-654. DOI: 10.1002/joc.3712
- J. Ribalaygua, L. Torres, J. Pórtoles, R. Monjo, E. Gaitán, M. R. Pino - Description and validation of a two-step analog/regression downscaling method. Theoretical and Applied Climatology. Volume 114: 1-2, pags. 253-269. DOI: 10.1007/s00704-013-0836-x

- Jaime Ribalaygua, Mª Rosa Pinob, Javier Pórtoles, Esther RoldánbEmma Gaitán, David Chinarro, Luis Torres - Climate change scenarios for temperature and precipitation in Aragón (Spain). Science of The Total Environment. Volume 463-464, pags. 1015-1030. DOI: 10.1016/j.scitotenv.2013.06.089
- C.M. Goodess, C. Anagnostopoulou, A. Bárdossy, C. Frei, C. Harpham, M.R. Haylock, Y. Hundecha, P. Maheras, J. Ribalaygua, J. Schmidli, T. Schmith, K. Tolika, R. Tomozeiu and R.L. Wilby - An intercomparison of statistical downscaling methods for Europe and European regions – assessing their performance with respect to extreme temperature and precipitation events. Climatic Research Unit Research Publication 11 (CRU RP11).

Role in the project

Meteogrid will support the development of the Spanish Demonstration Case in the phase of data collection from stakeholders and end-users, in the integration of models and tools used in the local context with the overall infrastructure of CLARITY climate services.

Key personnel

Luis Torres Michelena (male): He graduated (Master of Science) in Physics and in Theoretical and Applied Meteorology. He has developed his professional career in Telefónica Group where he held the position of Manager of Information Systems at Telefonica S.A., having come to act as Director of Organization and Information Systems for the Italian company Acea-Telefonica Spa. He has extensive experience in management and development of computer control systems as well as management teams and customer relation.

David Caballero Valero (male): Holds a degree in forestry engineering and a PHD from the Universidad Politécnica de Madrid. David is one of the most renowned experts in our country in climate hazard, with almost 28 years of experience. He has participated in numerous projects, European and national, on climate hazard, having performed in some of them the role of general coordinator or responsible researcher.

Jaime Ribalaygua Batalla (male): Jaime Ribalaygua holds a PhD in Forest Engineering, whose PhD dissertation was: “Development of a statisitcal method for generating high-resolution climate scenarios, from low-resolution simulations of General Circulation Models: application to Spain”. Holding a master in Theoretical and Applied Meteorology Master and another one in Evaluation and Correction of Environmental Impacts Master. With an extensive professional background in the meteorology area, both in weather forecasting and in climate research.

P5. ZENTRALANSTALT FUR METEOROLOGIE UNDGEODYNAMIK (ZAMG) - Austria

Partner Full Name	Zentralanstalt für Meteorologie und Geodynamik	Logo	
Short Name	ZAMG	Country	Austria
Status	Government/Public body	Website	www.zamg.ac.at

The ZAMG, founded in 1851, is the Austrian national weather service. ZAMG's responsibilities include all activities generally carried out by national meteorological and geophysical services such as: gathering, treatment and storage of results of meteorological and geophysical examinations; advisory and consulting services including expert opinions; dealing with meteorological and geophysical questions connected to the protection of the environment; information, advice and warning in cases of crises and incidents as well as natural and environmental disasters; climatological and geophysical survey of Austria; practice-oriented research in the complete field of meteorology and geodynamics including related sciences; cooperation with meteorological and geophysical institutions in Austria, other countries and on an international basis; promotion of international co-operation between meteorology and geodynamics and other sciences.

As the lead partner and initiator of large international projects (e.g. INCA-CE, EUMETNET Nowcasting Activity, Meteoalarm), ZAMG has demonstrated high management skills and coordinative competence in the past. There are sufficient administrative capacities and resources at ZAMG to guarantee for adequate project management, including regular assessment and monitoring of the project progress, e.g. via reports.

Expertise and relevant Projects

Research coordination and main research activities in national and international projects:

- **HABIT CHANGE, INTERREG IV B CE**, 2010-2013. Adaptive Management of Climate-induced Changes of Habitat Diversity in Protected Areas.
- **INCA-CE, Central Europe,** 2010-2013. Integrated Nowcasting system for the Central European area.
- **3PCLIM, INTERREG IV**, 2011-2014, Past, Present and Perspective Climate of Tirol, Südtirol-Alto Adige and Veneto.
- **FOCUS-I, ACRP**, 2011-2013. Future Of Climatic Urban heat Stress Impacts - Adaption and mitigation of the climate change impact on urban heat stress based on model runs derived with an urban climate model.

Selected publications relevant for the project:

- Žuvela-Aloise, M., Koch R., Neureiter, A., Böhm, R. and S. Buchholz (2014): Reconstructing urban climate of Vienna based on historical maps dating to the early instrumental period, Urban Climate, doi: 10.1016/j.uclim.2014.04.002
- Anders I., Stagl J., Auer I., Pavlik D. (2014): Climate Change in Central and Eastern Europe book chapter in: Rannow S. and Neubert M. (Editoren). Managing Protected Areas in Central and Eastern Europe Under Climate Change. Springer-Verlag. Advances in Global Change Research No 58, ISBN: 978-94-007-7059-4, 17-30
- Kann, A., G. Pistotnik, and B. Bica (2012): "INCA-CE: a Central European initiative in nowcasting severe weather and its applications", Adv. Sci. Res., 8, 67-75, doi:10.5194/asr-8-67-2012, 2012
- Meirold-Mautner I., Wang Y., Kann A., Bica B., Gruber C., Pistotnik G., Radanovics S. (2010): Integrated Nowcasting System for the Central European Area: INCA-CE, Advances in Intelligent and Soft Computing 81, Data and Mobility, p.107-114, Editors: J. Dh et al. Springer-Verlag Berlin-Heidelberg. DOI: 10.1007/978-3-642-15503-1_10.
- Žuvela-Aloise M., Koch R., Matulla C. and J. Nemec (2013): FOCUS-I Adaption and mitigation of the climate change impact on urban heat stress based on model runs derived with an urban climate model, ACRP project Nr. B060373, pp. 67

- Žuvela-Aloise M., Koch R. und Chimani B. (2013): Hitzegefahr: Städte im Klimawandel (Cities in Climate Change). In: smart city: Wiener Know-How aus Wissenschaft und Forschung. Schmid Verlag, Wien, 2013, ISBN: 978-3-900607-50-0, 234 – 240.

Role in the project

The ZAMG will be responsible for providing use case specific climatological data and climate change signals on local scale. Major contribution to the project will encompass regional and urban climate modelling and evaluation of climate data for current and future climate conditions (WP2) and evaluation of results (WP4) including the lead of the Task 4.2. ZAMG will support project activities with scientific expertise on climate change and climate impacts (WP1) and will contribute to scientific dissemination (WP5).

Key personnel

Dr. Maja Zuvela-Aloise (female) holds a degree in natural sciences from the University of Kiel, Germany. She worked as scientific consultant in ESS GmbH, Austria on integration of the numerical models into web-based DSS for water and air quality management. She has joint the ZAMG in 2010 and is in charge of urban climate modelling applications including coordination of projects related to urban climate, climate change impacts and design of adaptive measures.

Mag. Alexander Kann (male) worked on the FWF research project ALIDALCOM at the Institute of Meteorology and Geophysics, University of Vienna. Since 2002, he is working at the Central Institute for Meteorology and Geodynamics in Vienna (at the Numerical Weather Prediction Department). Since 2009, he is head of the model application section at ZAMG. He was visiting scientist at the Institute for meteorology in Bratislava (Slovakia) in 2008 and 2009. His main research interests during the last two years are nowcasting methods as well as development of nowcasting ensemble system and statistical adaptation.

Dr. Ivonne Anders (female) is a researcher at ZAMG since 2009. Her main focus is on regional climate modelling for Europe but also high mountain regions like the Alps and the Carpathian Mountains. Further research covers the investigation of land atmosphere interaction and wind climate in coastal regions. She was involved in the ENSEMBLES FP6 and the HABIT CHANGE FP7 projects.

P6. UNIVERSITA' DEGLI STUDI DI NAPOLI FEDERICO II - PLINIVS Centre (PLINIVS-LUPT) - Italy

Partner Full Name	PLINIVS Study Centre (Study Centre for Hydrogeological, Volcanic and Seismic Engineering) University of Naples Federico II	Logo	Centro Studi P.LIN.I.V.S.
Short Name	PLINIVS-LUPT	Country	Italy
Status	University/Research Centre	Website	www.plinivs.it

PLINIVS Study Centre (Study Centre for Hydrogeological, Volcanic and Seismic Engineering) is a structure of LUPT Research Interdepartmental Centre, University of Naples Federico II. Since 2006, PLINIVS is a National Competence Centre on Volcanic Risk for the Italian Civil Protection.

PLINIVS activity in the last 30 years included the development several probabilistic simulation models to assess the impacts of natural hazards, taking into account the impact distribution in time and space and the cumulative effects given by possible cascading events, as well as a continuous data collection activity on built environment and population, at national and regional scale, that allowed building up a comprehensive GIS database, that includes population data, classification of different building typologies (detailed at the level of technical elements: structure, wall, roof, opening, etc.), features of transport networks. The database includes vulnerability classes of each element at risk (population, building components, transport network nodes) with respect to seismic, volcanic and hydrogeological risk.

The database is integrated into hazard/impact models, allowing to derive the expected impact of a given seismic, volcanic and flood/landslide event on the territory with a detail of a 500x500m mesh at national level and 250x250m at regional level (including the CLARITY demonstration case area).

The main models and tools developed in the last 25 years can be summarised as follows:

- *Seismic Impact Simulation* – Seismic impact model, developed and refined during 25 years of research and technical services[1], also as Center of Competence of Italian Department for Civil Protection (DPC).

  The model allows a real time estimation of expected impact of earthquakes on the entire Italian territory. During real seismic crises, the intensity and location of the event is the input provided by the INGV and the output are the “impact maps” used by the DPC to manage the early phases of the emergency and coordinate Search&Rescue activities.

- *Volcanic Impact Simulation* – Volcanic impact model (for explosive eruptive events), developed in the last 15 years[2], to quantify the potential losses consequent to a possible eruption of Vesuvius or Campi Flegrei. The model allows the simulation of the cumulative damage on exposed elements following the different hazardous phenomena occurring over time: earthquake (EQ), ash fall (AF), pyroclastic flow (PF), and lahars (LH).

  The dynamic simulation methodology is based on the updating of vulnerability curves following a given time history of the eruption, simulating e.g. the progressive degradation of buildings and infrastructure, the reduced population in the area following evacuation operation. The model includes a specific approach for the treatment of uncertainties.

- *Landslide Impact Simulation* – Developed within SAFELAND Project - Living with landslide risk in Europe (EU FP7, 2009-2012) to assess the behaviour of buildings under dynamic load due to rapid landslide (as debris

[1] - Seismic Risk to Population in Campania - The Preparation of SISMA, a Seismic Impact Simulation Model for Regional Planning". Collaborative Project of the Centre LUPT with The Martin Centre (University of Cambridge),UK 1987.
- TOSQA Project - Earthquake Protection for Historic Town Centres”, EU – DG Environment and Climate,1993-95.
- Update of National Seismic Vulnerability Maps. GNDT-INGV, 1996-1998.
- SAVE. Definition and updating of Seismic Vulnerability of built environment in Italy” funded by GNDT-INGV, 2002 - 2004.

[2] VESUVIUS. Human Casualties and Structural Vulnerability consequent to a possible eruption of Mount Vesuvius, EU FP5, 1998-2000.
EXPLORIS. Explosive eruption risk in densely populated EU volcanic regions and evaluation of the likely effectiveness of possible mitigation measures, EU FP6, 2002-2005.
SPEED. Scenarios of Hazard and Damage at Vesuvius and Campi Flegrei, 2007- 2009.

flow). Vulnerability classes for prominent structural and non-structural elements of the building are defined, and the limit load for each of these is computed by limit state analysis related with experimental tests.

- *Economic impact of natural hazards* – Developed within SPEED Project - Scenarios of Hazard and Damage at Vesuvius and Campi Flegrei (research agreement between PLINIVS-LUPT and Italian Department of Civil Protection, 2007- 2009) to estimate, in probabilistic terms, the direct and the indirect economic impact of a Sub-Plinian I or Strombolian type eruption of Vesuvius. The model has been implemented through a computer based simulation model. Along the expected time history of the eruptive event all the possible "direct costs" and the "factors" (indirect costs) impacting the economic growth in the event area have been identified. Each cost factor is built up through a specific algorithm that is fed by various providers, in order to run a software that will estimate the global amount of economic damage from a volcanic event. An updated version of the model has been recently released (EU-FP7 CRISMA Project) to include the cost-benefit evaluation of mitigation measures on building components (seismic strengthening of structures, strengthening of roofs against ash fall, protection of openings). EU-FP7 SNOWBALL is testing the application of the model in the context of cascading effects.

These experiences place the PLINIVS Study Centre among the most representative research structures in the field of seismic, volcanic and hydrogeological risk modelling and assessment.

In the context of CLARITY, the methodology applied within PLINIVS models (Probabilistic dynamics modelling, Bayesian networks, Event tree analysis, Monte Carlo Method, fuzzy logics and error propagation calculation for uncertainties treatment) to derive realistic impacts on the built environment from hazard modelling (single or multi-risk approach), will be transferred in the context of climate change induced hazards, with a specific focus on extreme heat and precipitation events.

The consolidated approach for the integration of adaptation and mitigation actions within the hazard/impact modelling, their performance and cost-benefit assessment, will constitute an important reference for the implementation of tools able to evaluate the effectiveness of adaptation strategies in the context of CLARITY platform.

The specific topics of local stakeholders' engagement, urban resilience assessment, analysis and evaluation of climate change adaptation measures will be addressed through the involvement of the Department of Architecture (DiARC) of University of Napoli Federico II.

DiARC research activity is primarily aimed at decision support and technical assistance to local government and stakeholders in urban and regional sustainable regeneration processes, environmental assessment of planning and design strategies, as well as in the implementation of technical policies for the building and urban retrofitting, preservation and enhancement of cultural heritage and climate change adaptation. Together with PLINIVS, DiARC has recently developed (METROPOLIS project) a vulnerability model for heat waves population, buildings and open spaces.

Expertise and relevant Projects

PLINIVS is involved in European and national researches concerning risk assessment under effect of natural hazards (earthquakes, volcanic eruptions, hydrogeological and marine events) in the framework of emergency planning and development of adaptation and mitigation strategies.

Main projects related to environmental risks and decision support which have involved the PLINIVS Study Centre are the following:

- **SAFELAND**. Living with landslide risk in Europe, EU FP7, 2009-2012 (as research unit of AMRA Scarl).
- **CRISMA.** Modelling crisis management for improved action and preparedness. EU FP7, 2012-2015 (as research unit of AMRA Scarl)
- **SNOWBALL**. Lower the impact of aggravating factors in crisis situations thanks to adaptative foresight and decision-support tools, EU FP7, 2014-2017.
- **METROPOLIS**. Integrated and sustainable methodologies and technologies for the adaptation and the safety of urban systems, ERDF - OP R&C 2014-2017.

- **REACHING OUT.** Demonstration of EU effective large scale threat and crisis management outside the EU, EU Horizon2020, 2016-2019

Selected publications are:

- Schlobinski, S. Zuccaro, G. Scholl, M. Meiers, D. Denzer, R. Guarino, S. Engelbach, W. Taveter, K. Frysinger S. (2015). Decision making and strategic planning for disaster preparedness with a multi-criteria-analysis decision support system. Environmental Software Systems, Infrastructures, Services and Applications, Vol 448, pp. 178-186. Springer International Publishing, 25.3.2015.
- D'Ambrosio, V. Leone, M.F. (2015) *Climate change risks and environmental design for resilient urban regeneration. Napoli est pilot case*. TECHNE: Journal of Technology for Architecture & Environment, 10.
- Zuccaro G., Leone M.F. (2014). The mitigation of volcanic risk as opportunity for an ecological and resilient city. *TECHNE*, vol. 7, p. 101-107, ISSN: 2239-0243.
- Mavrouli O., Fotopoulou S., Pitilakis K., Zuccaro G., Corominas J., Santo A., Cacace F., De Gregorio D., Di Crescenzo G., Foerster E., Ulrich T. (2014). Vulnerability assessment for reinforced concrete buildings exposed to landslides. Bull Eng Geol Environ. DOI 10.1007/s10064-014-0573-0.
- Zuccaro G., Leone M.F., del Cogliano D., Sgroi A. (2013). Economic impact of explosive volcanic eruptions: a simulation-based assessment model applied to Campania Region volcanoes. *J Volcanol Geoth Res*, Elsevier, vol. 266, ISSN: 0377-0273. DOI: 10.1016/ j.jvolgeores.2013.09.002.

Role in the project

PLINIVS has an important role in the development of concept model at the base of the tool which CLARITY project will have to produce (WP1), and in the coordination of demonstration activities (leading WP2) contributes to elaboration of algorithms related to impact evaluation due to climate change and the definition and evaluation of possible adaptation measures through performance and cost-benefit criteria (WP3 and WP4).

PLINIVS will also support the development of the Napoli Demonstration Case, together with the Municipality of Napoli, either in the phase of data collection from stakeholders and end-users, either in the integration of models and tools used in the local context with the overall infrastructure of CLARITY platform.

Key personnel

Giulio ZUCCARO (male) is associated professor of 'Building Science' and 'Theory of structures' at the University of Naples Federico II. He is scientific director of PLINIVS Study Centre. He is member of Great Risks Committee of Italian Civil Protection. For 30 years, he is engaged in national and international researches in the context of risk assessment under effect of natural hazards.

Mario LOSASSO (male) is full professor of 'Architectural Technology' and Head of the Department of Architecture (DiARC) of University of Naples Federico II. He is President of the Italian Society of Architectural Technology and member of the Scientific and Technical Committee of PLINIVS Study Centre. The main areas of expertise concern: urban, housing and public spaces regeneration; innovative technologies for environmental sustainability, design and construction; adaptive design, technological and energy retrofitting for buildings and public spaces.

Antonio SANTO (male) is Associate Professor of Engineering Geology since 2006. He was Researcher of Engineering Geology at Napoli University from 1991 till 2005. He had a teaching activity at Molise (1996-1998), Salerno (1999-2000) and SUN Universities (2004-2005). Actually, he is Scientific Coordinator of the preparatory course "Hydrogeological Territorial Defenses in Campania Region" for the National Civil Protection. He is Member of Campania Region Competence Centre on "Analysis and Monitoring of the Environmental Risk" since 2002. He has been consultant of many national research agencies and authorities: CNR - GNDCI (1998-1999); C.U.G.R.I. (1999-2000); Regione Campania (2001-2008); AMRA - (2006 – 2008). He has nearly 25 years of research experience on engineering geology and hydrogeological risk assessment.

Mattia LEONE (male) is architect and PhD in Architectural Technology. He is currently contract professor in "Multi-Scale Building Technology" at Politecnico di Milano and Research Fellow at the University of Naples Federico II at PLINIVS-LUPT Study Centre. Since 2013 he is member of the Urban Climate Change Research Network (UCCRN) and since 2015 he is associate at the Center for Urban Disaster Risk and Resilience (CUDRR+R, New York). His main research activities concern sustainable design, energy and technological retrofitting of

buildings and public spaces, building technologies for the mitigation of natural hazards and climate change adaptation.

Daniela DE GREGORIO (female) is structural engineer and PhD in Engineering of Constructions. She is currently a Research fellow at the University of Naples Federico II PLINIVS-LUPT Study Centre on the topic of risk assessment and cascading effects scenarios evaluation. Her main research activities concern the analysis of vulnerability of buildings under effect of natural events.

Sergio GUARINO (male) is mechanical engineer and PhD in Engineering of constructions. He is currently a Postdoctoral fellow at the University of Naples Federico II. His main research activities concern the analysis of uncertainties in the risk assessment and the use of multi- criteria methods aimed decision making.

Stefano NARDONE (male) is IT consultant for software analysis & development and GIS specialist. His main activities concern development of models and tools on GIS probabilistic base for risk analysis concerning single natural hazards or combined effects (multi risk or cascading effects).

Significant infrastructure and technical equipment

Meteorological monitoring station

PLINIVS-LUPT Headquarters are provided with a meteorological monitoring station, installed in June 2012, that continuously stores data on temperature, precipitation and humidity. The results of the monitoring are compared with the other stations in the Municipality of Napoli to identify microclimate variations. Data are accessible to PLINIVS research unit.

Data Sharing and Development

For Data Sharing and Development, PLINIVS Study Center is equipped with a DELL PowerEdge R410 server, linked to the University of Naples Federico II (UNINA) network, and configured to be accessible from Internet. The size of the server is tailored for the research and development needs of the Center, running Xen server virtualization software.

Simulation and geospatial data sharing is arranged using different Virtual Machines (VM) configured for the scope, and containing all the needed system and application software.

Access to shared data is regulated with usual security login to the exposed services, and measures against unauthorized accesses are taken.

VMs are Linux based and comprehend software needed for geospatial data sharing according with OCG standards (WMS/WFS/WPS etc.): PostgreSQL + PostGIS; Apache HTTP Server; Geoserver; Mapserver; Python; Java; PyWPS.

P7. STOCKHOLMS STAD (StockCity) - Sweden

Partner Full Name	STOCKHOLMS STAD	Logo	Stockholms stad
Short Name	StockCity	Country	Sweden
Status	Government	Website	http://international.stockholm.se

Sweden's capital city Stockholm has been working on climate change mitigation and adaption since the 1990s. The city is a real frontrunner, with well implemented climate action plans and pioneering policies to ensure it meets its ambitious environmental targets. The carbon dioxide emissions have been cut by 25% per citizen since 1990. Stockholm was the first city to receive the award European Green Capital by the EU Commission in 2010. By presenting good examples and sharing experiences and ideas with other cities, the goal behind the award is to improve the global environment long term.

The Environment and Health Administration of the city of Stockholm (EHA) has as key priority to ensure that Stockholm remains a sustainable city, while offering an attractive and inspiring living and working environment. The climate action group coordinates implementation and monitors the results of all climate actions undertaken in the city. Their long term aim is to become completely fossil-fuel free by 2040.

Expertise and relevant projects

SLB analys is a unit at the Environment and Health Administration (EHA) of the city of Stockholm (staff of 15 persons) has been the operator responsible for the Eastern Sweden Air Quality Association since it started in the beginning of the 1990s. This association has grown since then and now it consists of 50 municipalities, 4 regional county administrations, energy production companies and two university departments (Department of Environmental Science and Analytical Chemistry at Stockholm University and The Institute of Environmental Medicine at the Karolinska Institute). SLB analys will be responsible for the Stockholm city participation in CLARITY.

- SLB analyst is currently part of the ***Swedish Climate and Clean air research program*** (SCAC, www.scac.se). This program is focused on exposure and health effects, effects on ecosystems, and climate effects from short-lived climate pollutants (SLCP) as well as the synergies and conflicts between air pollution and climate actions.
- ***GrowSmarter*** is co-ordinated by Stockholm city (EHA) and brings together cities and industry to integrate and demonstrate '12 smart city solutions' in energy, infrastructure and transport, to provide other cities with valuable insights on how they work in practice and opportunities for replication. The project aims at making cities smarter in responding to citizen needs and in reducing their environmental footprint. The idea is to create a ready market for these smart solutions to support growth and the transition to a smart, sustainable Europe. Together with 20+ industrial partners smart technologies related to energy, mobility and infrastructure are being rolled out on chosen sites. The idea is to create a business case to initiate market roll out in the Follower Cities and the rest of Europe. Stockholm, Cologne and Barcelona - have each selected a site in their city where the 12 smart solutions will be rolled out over the next five years. Five Follower Cities will closely monitor to learn from their experiences, to identify measures suitable for their specific local context.
- ***ACCEPTED*** (Assessment of changing conditions, environmental policies, time-activities, exposure and disease) is a recently completed project that takes a multi-scale approach to address the interaction between climate and air quality at the urban scale. Global warming may lead to more heat waves, which enhanced by the heat-island effect over cities may result in extremely high pollutant concentrations. The project analysed the synergetic effect of air-pollution and elevated temperature that may be more severe than the one expected from heat or pollution alone. The approach explicitly accounts for climate change, possible adaptation practices adopted by local authorities, urban air-quality, exposure estimates accounting for indoor air-quality and time activity and health impact assessment of vulnerable groups. The results are useful for national and local policy makers to evaluate the efficiency of current policies and highlight the need of future updates. Air pollution control policies are important even at

concentrations below the current limit values, especially for vulnerable groups, including not only elderly but also foetuses and young children. The project involved 11 different partners in four countries in Europe and was funded by the European network ERA-ENVHEALTH. SLB analysis (EHA) contributes with exposure calculations for health impact assessments and evaluation of efficiencies of measures to reduce air pollution impacts.

The City of Stockholm is working on a ***Climate Adaptation Plan***, where research on heat stress and health impacts are important new facts. The Climate Adaptation work is organised as a group where several administrations are included under the direction of the City Executive.

Some recent publications:

- Johansson, C, Burman, L., Forsberg, B. The effects of congestions tax on air quality and health. Atmos. Environ. 2009; 43, 4843-4854.
- Orru, H.; Lövenheim, B.; Johansson, C.; Forsberg, B. 2015. Potential health impacts of changes in air pollution exposure associated with moving traffic into a road tunnel. J Expo Sci Environ Epidemiol, 1-8.
- de Hoogh, K.; Korek, M.; Vienneau, D.; Keuken, M.; Kukkonen, J.; Nieuwenhuijsen, M. J.; Badaloni, C.; Beelen, R.; Bolignano, A.; Cesaroni, G.; Pradas, M.C.; Cyrys, J.; Douros, J.; Eeftens, M.; Forastiere, F.; Forsberg, B.; Fuks, K.; Gehringk, U.; Gryparis, A.; Gulliver, J.; Hansell, A. L.; Hoffmann, B.; Johansson, C.; Jonkers, S.; Kangas, L.; Katsouyanni, K.; Künzli, N.; Lanki, T.; Memmesheimer, M.; Moussiopoulos, N.; Modig, L.; Pershagen, G.; Probst-Hensch, N.; Schindler, C.; Schikowski, T.; Sugiri D.; Teixidó, O.; Tsai, M.-Y.; Yli-Tuomi, T.; Brunekreef, B.; Hoekk, G.; Bellander, T., 2014. Comparing land use regression and dispersion modelling to assess residential exposure to ambient air pollution for epidemiological studies. Environ Int | 73 (382-392). DOI: http://dx.doi.org/10.1016/j.envint.2014.08.01
- Denier van der Gon, H.; Gerlofs-Nijland, M.E.; Gehrig, R., Gustafsson, M.; Janssen, N.; Harrison, R.M.; Hulskotte, J.; Johansson, C.; Jozwicka, M.; Keuken, M.; Krijgsheld, K.; Ntziachristos, L.; Riediker, M.; Cassee, F.R., 2013. The Policy Relevance of Wear Emissions from Road Transport, Now and in the Future - An International Workshop Report and Consensus Statement. J Air Waste Manag Assoc., 63 (136-149). DOI: http://www.tandfonline.com/doi/abs/10.1080/1096224.
- Korek, M. Johansson, C., Svensson, N., Lind, T., Beelen, R., Hoek, G., Pershagen, G., Bellander, T., 2016. Can dispersion modeling of air pollution be improved by land-use regression? An example from Stockholm, Sweden. Journal of Exposure Science and Environmental Epidemiology, online publication 3 August 2016; doi: 10.1038/jes.2016.40.

Role in the project

StockCity will, together with SMHI, demonstrate how climate services and the Clarity tools can strengthen the adaptation aspects of urban planning and reduce the negative health impacts of current and future heat waves and air pollution episodes in Stockholm.

Key personnel

Christer Johansson (male, Professor) has two positions, one as professor at the Atmospheric Science unit of the Department of Environmental Science and Analytical Chemistry (ACES), Stockholm University and one as environmental expert at the Environment and Health Administration (EHA) of the City of Stockholm. He has co-ordinated several national and international research projects focusing on the emissions, atmospheric transport and transformation of aerosols and their impact on urban air quality and health. Part of his work at ACES is to support the Swedish EPA in guiding local environmental authorities in supervising urban air quality. He is supervisor of Master and PhD student and responsible for a Master course on Air Quality outdoors and Indoors. At EHA he leads projects assessing the health consequences of urban planning and strategies for reducing adverse air pollutants in urban areas. He has published more than 200 reports of which 80+ in peer-reviewed journals (h-index 31). From July 2015 he is a member of the European Green Capital expert panel (for air quality).

Christina Wikberger (female, BSc) is an environmental expert at the Environment and Health Administration (EHA) of the City of Stockholm. She is specialised in climate adaptation issues and the importance of ecosystem

services. She works closely with the city's real estate department, exploitation and urban planning offices. She was project manager of the C/O City project assessing ecosystem services.

Boel Lövenheim (female, MSc) is an environmental expert at the Environment and Health Administration (EHA) of the City of Stockholm. She is specialized in air quality monitoring and modelling and she has been responsible for air quality modelling and exposure calculations in several projects, including project related to urban planning and health impact assessment. She has also expertise in GIS (ArcView).

Magnus Sannebro (male, MSc) is an environmental expert at the Environment and Health Administration (EHA) of the City of Stockholm. He is specialised in climate change and climate adaptation, mainly regarding different water related issues such as rising sea level, increased precipitation and flooding. He has also worked with environmental monitoring and issues related to the Water Framework Directive (WFD).

P8. AIT Austrian Institute of Technology GmbH (AIT) - Austria

Partner Full Name	AIT Austrian Institute of Technology GmbH	Logo	
Short Name	AIT	Country	Austria
Status	Research	Website	http://www.ait.ac.at

The AIT Austrian Institute of Technology (http://www.ait.ac.at), Austria's largest non-university research institute, employing a staff of about 1260 persons, takes a leading position in the Austrian innovation system in the areas of Energy, Mobility, Health & Environment, Safety & Security as well as Innovation Systems and has a key role in Europe as the RTO focusing on the key infrastructure topics of the future. AIT is heavily engaged in contract research for government and industry. In this project the departments Safety & Security (DSS) and Energy (Business Unit Sustainable Buildings and Cities) will be engaged. International co-operations and the participation in a large number of research projects of the European Union maintain our international standard and give our customers the advantage of participating in latest research results of the international scientific community. In the recent years, the AIT DSS- moved to cross-domain applications using environmental observations and predictions as a mean to improve the management of the overall systems, and contribute to public safety and security, e.g. by integration of the environmental information in the traffic control, city planning, or e-health applications. The aim of DSS is to reach top leading positions in special segments such as highly flexible, scalable, secure, and robust environmental monitoring systems and to enhance these systems with value adding tools to open a broader market and new business opportunities to our customers.

The Energy Department favors a holistic approach dealing with energy and urban development addressing buildings and cities of tomorrow considering the challenges of the future including climate change, mitigation and adaptation. Using innovative simulation and decision support tools, enables stakeholders and experts to improve smart Cities.

Expertise and relevant Projects

- **ENVIROFI** (FP7-284898). Overall technical coordination and lead of the conceptual enablers prototyping. Contributions to architecture, requirements analysis and enablers identification. Proof of concept of the Mobile Data Acquisition Framework (MDAF) and its configuration and integration in the Biodiversity and Air Quality pilots.
- **CRISMA** (FP7-284552). “Crisis Management Modelling Tool” Coordinated Project. Overall technical coordination, lead of the Architecture development and development of the various functional components of the framework.
- **SUDPLAN** (FP7-247708). “Sustainable Urban Development Planner for Climate Change Adaptation” aims at developing an easy-to-use web-based planning, prediction, decision support and training tool, for the use in an urban context, based on a what-if scenario execution environment, which will help to assure population s health, comfort, safety and life quality as well as sustainability of investments in utilities and infrastructures within a changing climate.
- **TaToo** (FP7- 247893) Tagging Tool based on a Semantic Discovery Framework; Within TaToo the Climate Twins application has been developed finding twin regions which show current climate that is expected as future climate for a Point of Interest. The twin areas may serve as “adaptation templates” The application is a web tool, carried out based on similarity indicators on temperature and precipitation regimes exploring current climate observations and future climate simulation results.
- **UFT-ADI** (ACRP – Austrian Climate Research Program, Call 2009 (2010-2014). (Urban Fabric Types and Micro Climate Response - Assessment and Design Improvement). The UFT-ADI Project models CC adaptation measures specifically for open spaces in urban environments to improve microclimatic conditions at a very local scale.
- **EU-LAKES** (EU structural funds, 2010-2013 - Central Europe Program.) The project EU-LAKES aimed at developing guidelines on how risks (caused by climate change) to the ecological health of lakes, including

the areas around their shorelines, can be identified, assessed and mitigated by environmental policy measures.

Most relevant and recent publications of key personnel involved:

- C. Granell, D. Havlik et. al. (2016) Future Internet technologies for environmental applications, Environmental Modelling & Software, Volume 78, April 2016, Pages 1-15, ISSN 1364-8152, doi: 10.1016/j.envsoft.2015.12.015
- Loibl, W., Stiles, R., Pauleit, S., Hagen, K., Gasienica, B., Tötzer, T., Trimmel, H., Köstl, M. (2014) Improving Open Space Design to Cope Better with Urban Heat Islands Effects. In: GAIA 23/1(2014): 64 – 66 doi: 10.14512/gaia.23.1.17
- Hagen, K., Gasienica-Wawrytko, B., Loibl, W., Pauleit, S., Stiles, R:, Tötzer, T. (2014) Smart Environment for Smart Cities: Assessing Urban Fabric Types and Microclimate Responses for Improved Urban Living Conditions. realCORP 2014. Proceedings. 573-581.
- P. Kutschera, J. Olsson, L. Gidhagen (2013) RainPortal - A web portal providing climate change related precipitation data using SUDPLAN services in: Environmental Software Systems. Fostering Information Sharing; IFIP Advances in Information and Communication Technology, Volume 413
- J. Ungar, J. Peters-Anders, and W. Loibl (2011) ; Climate Twins – An Attempt to Quantify Climatological Similarities; pp. 428-436. IFIP Advances in Information and Communication Technology (IACT) 359, Springer. Heidelberg, doi: 10.1007/978-3-642-22285-6_46
- D. Havlik, Th. Usländer, A.J. Berre, C. Granell, J. Lorenzo, Z. Sabeur, St. Modafferi (2013) The Future Internet Enablement of the Environment Information Space in: Environmental Software Systems. Fostering Information Sharing; IFIP Advances in Information and Communication Technology, Volume 413, 2013,pp 109-120
- Loibl, W., Tötzer, T., Köstl, M., Züger, J., Knoflacher, M. (2011) Modelling Micro-climate Characteristics for Urban Planning and Building Design, pp. 605 -618. IFIP Advances in Information and Communication Technology, (IACT) 359, Springer. Heidelberg, doi: 10.1007/978-3-642-22285-6_65

Role in the project

AIT will contribute with 2 teams to the project:

The **DSS-Team** concentrates on co-creation, provides the CLARITY technical manager and leads the WP1. In addition, it significantly contributes to WP4, through provision of the "catalogue of elements at risk and adaptation options" (T4.2) and co-development of the scenario transferability functionality (T4.4). The AIT – ENERGY Team – the Sustainable Buildings and Cities Unit (SBC) concentrates on use case definition related to planning aspects in WP1, on the Austrian demonstrator in WP3, on the urban heat island detection and microclimate modelling in WP3 and on applying the Climate Twins tool from the TaToo project to CLARITY in T4.4.

Key personnel

Mag. Nowak Andrea (female) holds a degree in computer science from University of Vienna, Austria. She joined the AIT Safety and Security department in 1992, and successfully leads the Business Unit Information Management &eHealth. A. Nowak has been a Deputy Head of AIT Safety & Security department since 2008 and currently acts as a president of Public Safety Communication Europe (PSCE).

Dr. Wolfgang Loibl, MSc (male) holds a PhD in Geography and Regional Science and a MSc in Organization Development. He is Senior Scientist and Thematic Coordinator for the "Smart Cities " research field of AIT's Energy Department, working with AIT >35 years as spatial analyst, modeler and regional planner, being engaged in numerous national and international projects dealing with spatial analysis, urban and regional development, impact assessment and urban dynamics simulation model development. He is also representative of AIT in the CCCA (Climate Change Center Austria) and Coordinating Lead Author of the Socioeconomic Impact Chapter of the Austrian Assessment Report 2014 on Climate Change. He was and is project and WP coordinator for various national and EU projects listed above.

Dr. Mag. Denis Havlik (male) holds a degree in natural sciences from University of Vienna, Austria. He joined the AIT Safety and Security department in 2005, and successfully led (as a coordinator and as a technical manager) several FP6 and FP7 IPs related to environmental informatics and crisis management, including the ENVIROFI and CRISMA projects that EU-CRISP builds upon. Thanks to his background in natural sciences and subsequent

working in ICT (2000-2003 Mandrakesoft), and telecommunication (2004-2005 T-mobile Austria), he is capable of bridging the gaps between technical experts of various provenances in large multi-disciplinary projects.

Dr. Tanja Tötzer (female), holds DI and PhD in Landscape Architecture and Landscape Planning. She is scientist at AIT since 1998. She has broad experience in GIS analysis and in exploring spatial patterns and processes. Her main research projects include landscape dynamics in urban regions as well as urban heat island and microclimate effects including microclimate modelling.

Mag. Jan Peters Anders (male), holds Msc in Geography, is working as Scientist with AIT since 2004. He is concentrating on GIS-application development, on Web based GEO-applications, on GUI design and remote access data retrieval systems, working on agent based modelling and applying 3D environments. Jan Peters Anders is the driving force behind the Climate Twins tool that will be adapted for use in CLARITY in T4.4.

Doris Leopold (female) graduated at a school for tourism and management in 1984. Since 2002 she has been employed at the Austrian Institute of Technology as computer scientist. Mrs. Leopold is a main developer of the AIT EMIKAT tool, that will be adopted as a "catalogue of elements at risk and adaptation options" in T4.2.

DI Peter Kutschera (male) holds a degree in Informatics of Technical University of Vienna (TU Wien). He has expert knowledge in distributed systems architecture and services for environmental monitoring and risk management applications, as well as in visualisation and user interfaces design.

P9. Eureka Comunicazione Telematica srl (EUREKA) - Italy

Partner Full Name	Eureka Comunicazione Telematica srl	Logo	EUREKA
Short Name	EUREKA	Country	Italy
Status	SME	Website	www.eureka.it

Since 1993 Eureka works in the field of management consulting with particular reference to the development of new businesses, concentrating the knowledge and skills of experienced professionals. Eureka consultants offer a complete service that starts from the identification of customer needs and comes to the service design and development.

The Eureka team is composed of senior consultants characterized by an appropriate university and post university education, an in-depth knowledge of the organizational and managerial processes and a long and proven work experience, gained through a lot of projects in favour of small and medium-sized companies, private organizations, management and business schools and public administrations.

Therefore, the integration of professional experience and expertise, specific and complementary, is the main feature of Eureka organizational structure that ensures total flexibility and dynamism.

Eureka services are composed as follows:
Simulation Model for economic impact evaluation of natural disasters
Eureka, based on many experiences over the years in the development of simulation models/forecasts of the economic impact on businesses, local systems, has developed the following competencies:

- Ability to analyze complex phenomena and their transposition into simulation models;
- Ability to perform what-if analysis of economic phenomena;
- Development of models for sensitivity analysis related to the assessment of investment projects;
- Specific territory "reading" skills of, through analysis of the economic-territorial data and indicators;
- Preparation of territorial development plans;
- Management of databases on statistical indicators;
- Experience (the company and/or professionals) in the assessment of impacts caused by natural phenomena (earthquakes, storms, volcanic eruptions, floods, etc.).

Thanks to those capabilities Eureka is able to accomplish the following tasks:

- Identification of the main input parameters and corresponding units;
- Definition of algorithms useful for the simulation of output;
- Identification of the main output variables and their units;
- Design of the model (input variables, algorithms, output, etc.);
- Definition of a set of input variables and output on which to build any sensitivity analysis;
- Construction of the simulation model in Microsoft Excel;
- Test of the model with available and/or estimated data.

Business Planning. This service**,** offered on the basis of a consolidated methodology for the assessment of the economic and financial results, is provided flexibly and customised according to the specific needs connected to the formulation of a business plan: presentation of application for facilitated loans, initiate relationship with banking organisations, feasibility verification of initiative, presentation of the initiative to potential financing subjects, etc.

The activity concerns business already started, analysing the adopted strategies and the quantitative elements in order to identify the necessary modifications and to assess the overall soundness and the economic and financial feasibility, or new business initiatives by supporting the arrangement, from strategic, operational and

organisational viewpoint, of the company activities in the different areas of management (production, marketing, management control, finance, etc.).

Financial modelling. This service is closely related to the business planning. It aims to provide a financial representation of some, or all, aspects of a business, by using specific software. Thanks to the technical expertise and experience gained in many industries, Eureka is able to develop "financial needs" models. These models are characterized by performing calculations based on financial information. The models may also summarize particular events for the end user and provide direction regarding possible actions or alternatives for financial needs coverage.

Cost-Benefit Analysis (CBA). The service aims to provide the methodology and calculation support to Public administrators in order to evaluate the convenience and the opportunity to invest in public infrastructures.

The CBA is also performed by Eureka in order to support quantitative evaluation of mitigation actions finalized to reduce natural or man-made impacts.

Programming and achievement of analysis, promotion and development interventions in specific industries and economic areas. The service aims to provide the business consulting and technical assistance activities in favour of private companies and public administrations: companies audit, business check-up, studies and research, etc.

Design of managerial and support to decision-making systems and subsequent assistance to their implementation. The service aims to provide the business consulting and technical assistance activities in favour of private companies and public administrations: management control systems; workload detection systems; budget formulation, orders control systems, etc.

Expertise and relevant Projects (for Eureka company and/or Eureka personnel)

- **REACHING OUT.** Demonstration of EU effective large scale threat and crisis management outside the EU, EU Horizon2020, 2016-2019.
- **CRISMA** "Modelling crisis management for improved action and preparedness" – Economic Impact modelling and Cost Benefit Analysis for mitigation action assessment - commissioned by AMRA (Centre of Competence in sector Analysis and Monitoring of Environmental Risk (2013-2014).
- **ARES** "Risk Analysis Update for Vesuvio and Campi Flegrei Areas", commissioned by LUPT Research Center - Naples University – Italy (2014).
- **SpeeD - Eruption Event of Vesuvius** within the project for the definition of scenarios and hazard Damage within the activities of the Center of Competence PLINIVS (University of Naples "Federico II) and the Agreement between the Campania Region and the Department of Civil Protection (2009 through 2014).
- **Sea storm on the coastal system of the Campania Region** - commissioned by AMRA (Centre of Competence in sector Analysis and Monitoring of Environmental Risk (2007).
- **SAVE - Earthquake - part of the (Updated tools for Seismic Vulnerability Heritage Estate and of Urban Systems)** sponsored by University of Naples and University of Basilicata and funded by GNDT-INGV (2003 to 2005).

One of Eureka shareholders (Davide Del Cogliano) has wrote, with other authors from Plinius Center, D. Del Cogliano et al, **"Economic impact of explosive volcanic eruptions: A simulation-based assessment model applied to Campania region volcanoes"**, Journal of Volcanology and Geothermal Research, October 2013.

Role in the project

EUREKA will be main responsible in CLARITY for the economic impact evaluation and of the Cost Benefit Analysis.

Key personnel

Davide Del Cogliano (male), Eureka partner and CEO, is graduated in Economics at the University of Naples and earned an MBA in the Service Industry at the Institute Tagliacarne of Rome. After a period at Arthur Andersen, in 1988 he founded the company Eureka. He was Professor of Finance at the Master organized by Tagliacarne Institute of Rome (1987-2008) and at many other post-graduate schools in Italy.

He assumed top management positions in various companies, including Asia (Waste Management Company) of Benevento and Naples, Amtu (Public Transport) of Benevento and Naples Milk Municipal company. He has extensive experience in investment evaluation, financial modelling and business planning. In the last 15 years, he has applied simulation methods to estimate the economic impact of natural disasters and Cost Benefit Analysis to assess mitigation investments. He has published, along with Fabio Mario Polidoro, two books:

- "How to read the Balance Sheet," Maggioli Publishers, 1995
- "The Business Plan of service enterprises", Franco Angeli, 1993

Fabiola Labia (female), Eureka partner, is graduated in Law the University of Modena and earned an MBA in the Service Industry at the Institute Tagliacarne of Rome. After working in human resources management for Hay Management Consulants Company, from 1993 to the present, she has been working as Eureka consultant. She has consolidated experience in business planning and in designing support to decision-making tools, especially in the definition of requirements for model building of complex environments. She is a teacher of Marketing and Business Planning at professional and post-graduate courses. She has published:

- Chapter 6 - "The financial statements" - Chapter 7 "Framework for the reading of the budget" in Del Cogliano-Polidoro " How to read the Balance Sheet" - Maggioli Publishers- 2002 - second edition
- Del Cogliano-Labia "Project Work, The Milk Public Plant of Naples: solutions for the enhancement of the brand", volume achieved in the Master Insprint - Innovation and Development of Intellectual Property - Rome - 2003

Mauro Iorio (male), Eureka partner, is graduated in Master's degree Electronic Engineering at the University of Naples. He has worked 13 years with CSC in the Outsourcing business, 10 years with Cap Gemini in System Integration, and other 3 years in other companies. He has been responsible for P&L, customer satisfaction and for all business aspects of the managed contracts by him, such as account performances, technical, contractual, administrative, and financial. He has managed local and global capabilities of companies, mainly in the Transformation Project, implementing Offshore solutions in the Application area, and providing Application Portfolio Evaluation Report to the customer and rationalizing the infrastructure (Consolidation Program). Within the managed project he has developed strong skills in Cost/Benefit Analysis and Evaluation, Investment evaluation, Data Mining, Data Warehouse and SW Lifecycle. He has acquired a relevant experience in Program and Project Management, as certificated by the former Project Management Professional of PMI.

Anita Ganci (female) Eureka Employee, she works as financial management assistant. She has developed a strong competence in reporting tools for public financed projects. She also works as senior assistant in financial modeling.

P10. Municipality of Naples (Napoli) - Italy

Partner Full Name	City of Naples	Logo	
Short Name	Napoli	Country	Italy
Status	Italian Public Administration	Website	www.comune.napoli.it

The City of Naples (977,264 people, density 8,333 inh./km^2), chief town of Naples Metropolitan City (about 5M people, density 2,172 inh./km^2, organized into 10 administrative areas, named Municipalities), is the local authority that represents its community and takes care of the interests of Neapolitan citizens and promotes development. The administrative bodies of the Municipality are the Mayor, the Borough Council and the Council of Assessors (Giunta). The management of national and EU projects, is carried out by the Department of Cabinet of Mayor, with the *Autonomous Organized Unit for European Programs and Great Projects Coordination*.

According to art. 3 of the Statute of the City of Naples (TITLE I: PURPOSE AND CORE VALUES): "The City of Naples: a) informs its action to the values of freedom, equality, solidarity, b) works to overcome existing discrimination and to determine the actual conditions of equal opportunity, c) and promotes actions aimed at the protection of nature and all living species. The City of Naples consolidates and develops its role in Europe and in Mediterranean area, promotes cooperation and exchanges between people in accordance with the historical traditions of the City, its cultural resources, and its nature as open community. The City undertakes the promotions of initiatives aimed at the solution of the South issue".

The City of Naples is part of the Covenant of Mayors and has been recently involved in the Mayors Adapt initiative, with the commitment of defining a strategy by developing a comprehensive local adaptation plan or integrating adaptation to climate change into relevant existing plans. City of Naples will enrich CLARITY consortium with his experience concerning Climate Change impact and relative territorial planning. In this perspective, it will contribute to develop a decision-making tool based, which, in future, will allow the administration to investigate the effects of adaptation measures in the local context.

Furthermore, the City of Naples is committed with the Central Campania River Basin Authority to jointly develop local adaptation plans for the Metropolitan City of Naples Area, addressing hydrogeological and climate-related hazards risk reduction strategies.

To this aim the, pilot case of CLARITY in East Naples will be used as a test application to implement the Metropolitan City of Naples Adaptation Plan through the Urban Resilience Platform.

Relevant previous projects and activities

- **USEAct Urban Sustainable Environmental Actions** (2013-2015), Coordinator. Funded under URBACT II Program, ERDF 2007-2013, the USEAct project aims to achieve urban development and new or improved settlement opportunities for people and businesses taking up residence in existing locations, without consumption of further land and at the same time developing, through innovative planning and organisational tools, the construction and real estate economies, addressing the enhancement of historic building heritage, reducing energy consumption in buildings, developing sustainable and climate-resilient communities, and cutting back on further infrastructure building/management costs.
- **SEAP** (2012). Based on the Baseline Emissions Inventory (BEI), the plan identifies the actions to be implemented at the Municipality level in the following sectors: buildings heating and cooling, public lightning, transports and mobility, renewable energy sources and co-generation, green procurement, territorial planning and participatory approaches, waste reduction and recycling.
- **Napoli Smart City** (ongoing). Funded under the Public Notice of the Ministry of Education and Research (March 2, 2012) for Smart Cities and Communities and Social Innovation, the project is aimed to develop smart solutions for sustainable mobility, cloud services enhancement, waste treatment and sustainable management of water resource.

- **Reduction of flash flood risk and sewerage retrofitting** (ongoing): Functional adaptation of East Napoli sewage treatment plant (CIPE, ongoing, 89M€); new sewerage in S. Maria del Pianto street with cesspool in Capodichino (ERDF 2007-2013 obj. 1.4, € 3.44M€); new sewerage in G. Gigante street and connection with Immacolata square sewerage system (ERDF 2007-2013 obj. 1.4, € 3.970.409,73).
- **Urban redevelopment of Napoli East port area** (ongoing): Funded under ERDF 2007-2013, obj. 6.2, with 206.9M€, the project aims at the redevelopment of open spaces, green areas and public buildings along the waterfront of East Naples. Currently, tender procedures for the 11 sub-projects have been completed, of which 3 are in the construction phase and 8 in the final design stage.

Relevant publications, products and services (including widely-used datasets or software)

- Comune di Napoli (2015). The USEAct Final Report. http://urbact.eu/files/useact-final-report.
- Comune di Napoli (2014). *Plan for Hydrogeological Risk Prone Areas of the Central Campania River Basin / Piano Stralcio per l'Assetto Idrogeologico dell'Autorità di Bacino Campania Centrale*.
- Comune di Napoli, ANEA - Agenzia Napoletana Energia Ambiente, DETEC - Department of Energetics of University of Naples Federico II (2012). *Piano d'Azione per l'Energia Sostenibile (PAES)*, July 2012.

Role in the project

As an end-user the City of Naples will enrich the project with his experience concerning Climate Change impact and relative territorial planning. In this perspective, it will contribute to develop a decision-making tool based, which, in future, will allow the administration to investigate the effects of adaptation measures in the local context.

Key personnel

Giuseppe Pulli (male) architect, is the Chief of the Central Directorate for Environment, Protection of Land and Sea and the Central Directorate for Infrastructure, Public Works and Mobility in the City of Naples. He deals with environmental issues within urban redevelopment projects for protection and enhancement of historical centres and cultural heritage.

P11. Agencia Estatal de Meteorología (AEMET) - Spain

Partner Full Name	Agencia Estatal de Meteorología	Logo	
Short Name	AEMET	Country	Spain
Status	Government	Website	http://www.aemet.es

The Agencia Estatal de Meteorología, AEMET, is the State Agency under the Spanish Ministry of Environment responsible for the official activities related to meteorology and climatology in Spain, including weather information for general purposes. AEMET retains exclusive responsibility for the main meteorological infrastructure in the whole territory of Spain, international exchange, aviation and maritime services as well as the meteorological support to Defence. The total staff is over 1.400; about 600 out of them have University master degrees.

The direction and most of the general management activities, as well as most of the technical departments, are located at the AEMET headquarters in Madrid. A President distributes the technical activities under three main Directions: Infrastructure & Production (Production Dpt., Infrastructures Dpt., Development and Applications Dpt.), Human Resources and Strategy and Commercial activities.

AEMET is the representative of Spain at four international organizations: WMO, ECMWF, EUMETSAT and GEO, and it is member of several international groups of cooperation: EUMETNET, HIRLAM, etc. It is the operator or leader of international operational programmes such as the Nowcasting SAF (EUMETSAT), the GAW (WMO) atmospheric station at Izaña, (Tenerife, Canary Islands), the WMO Regional BREWER Calibration Centre for Europe (RBCCE) and the Northern Africa – Middle East – Europe node of the Sand and Dust Storms Warning and Assessment System (SDS – WAS) of WMO.

The main research activities at AEMET cover numerical weather prediction, severe weather events, remote sensing, climate (including climate modelling and climate change scenarios) and atmospheric composition. AEMET leads co-operative R+D projects such as MedCOF, a Mediterranean initiative on climate, or the SRNWP EPS programme of EUMETNET and has significant participation in others such as HYMEX and a number of COST actions. It has been involved on many European FP7 projects some of them on going such as MACC-II, MyWave, EUPORIAS or MUSICA.

Expertise and relevant projects

Research in AEMET belongs mainly to the Developments and Applications Department (DDA). More than 50 researchers work in this department and they are split in several groups devoted to NWP, Climate modelling, Wave modelling, Atmospheric Chemical Composition modelling, Applications and Innovation. AEMET staff participate in several international research projects like HIRLAM, MACC II, MyWAVE, EUPORIAS, ECEARTH, METCOFF and so on.

The AEMET is the representative of Spain at intergovernmental meteorological organisations such as the World Meteorological Organisation (WMO), the European Centre for Medium Range Weather Forecasts (ECMWF), EUMETSAT (European meteorological satellites organisation) or the Intergovernmental Panel on Climate Change (IPCC). The AEMET is also the representative in the meteorological groups of OACI, NATO and other intergovernmental organisations.

There is in addition a significant participation of the AEMET in a number of international groups of co-operation between meteorological services, mainly in association with other European countries such as ECOMET, EUMETNET. At the same time, the AEMET is carrying out bi-lateral co-operation on many different fields with the national meteorological services and other institutions of France, Portugal, Morocco, Germany, Latin-American countries etc.

AEMET team has more than 20 years of experience in NWP models and its objective verification against observations. We have also more than 10 years of experience in using Ensemble Prediction Systems for probabilistic forecast of weather parameters and more than 5 years of experience in working with Atmospheric Chemical Composition Models (MACC). Research on aerosols and its effect in the solar radiations parameters in

NWP models. AEMET is running an operational NWP model (Hirlam/Harmonie) from 1992 and a Multimodel Ensemble Prediction System from 2006 (SREPS/gSREPS). We have plans to upgrade our operations to new systems based on the model Harmonie running a 2.5 Km resolution in 2016.

Description of the project/activity	**National or European funding scheme**	**Years**	**Main Subject**
METCOFF (Mediterranean Climate Outlook Forum)	WMO / AEMET	2013-	Generating consensus seasonal forecasts for the Mediterranean region and northern African region as part of WMO's drive to increase the availability of user-friendly climate services.
MOSES (Managing crOp water Saving with Enterprise Services)	H2020: WATER-1a- No 642258	2014-2019	To put in place and demonstrate at the real scale of application an information platform devoted to water procurement and management to facilitate planning of irrigation water resources.
EUPORIAS (European Provision Of Regional Impacts Assessments on Seasonal and Decadal Timescales)	FP7: EU 308291	2012-2017	Developing a few fully working prototypes of climate services addressing the need of specific users.
ECEARTH	European Consortium	2015-2020	EC-Earth generates reliable in-house predictions and projections of global climate change, which are a prerequisite to support the development of national adaptation and mitigation strategies.
PREFLEXMS (Predictable & Flexible Molten Salts Solar Power Plant)	H2020: LCE - 2014-2	2015-2018	Demonstration of renewable electricity and heating/cooling technologies
MACC & MACC-II (Monitoring Atmospheric Composition and Climate)	FP7-SPACE: EU 283576 EU 218793	2009-2011 & 2011-2014	Atmospheric Chemical Composition Modelling. Effects of aerosols in solar radiation parameters
ACTRIS (Aerosols, Clouds, and Trace gases Research Infrastructure Network)	FP7: EU 262533	2011-2015	Effects of aerosols in clouds
POLLINDUST (Composition, sources and multi-decadal evolution of the dust and particulate pollutants observed in the subtropical Saharan Air Layer)	Spanish National R&D Plan	2012-2016	Time evolution of dust in the Sahara desert and its effect on the weather over Spain
HIRLAM (High Resolution Limited Area Model)	Funded by European Meteorological Services	1985-	NWP models and objective verification. EPS for probabilistic weather forecast

HyMeX (HYdrological cycle in the Mediterranean Experiment)	Funded by French, Italian and Spanish Research Institutions	1995-	Water cycle in the Mediterranean and its effect over the climate

Role in the project
AEMET will be responsible for regional simulations over the Spanish demonstration sites. It will provide expertise on numerical weather prediction models, climate models and climate downscaling techniques from IPCC climate global simulations.

Key personnel
Jose A. Garcia-Moya (male): Head of the Innovation Area. He joined AEMET (formerly INM) in 1980. He is BSc in Physics and MSc in Atmospheric Physics and Geophysics. He was AEMET Head of Research in 2010-2011. His areas of expertise include the Predictability and Ensemble Prediction Systems, Numerical Weather Prediction (Convection parametrization schemes) and objective verification of numerical models. He has several publications in peer-review international magazines. He has participated in several international projects like HIRLAM, PYREX, TOUGH, MULTIMETEO, MULTIMETEO XXI, HONEYMOON.

Ernesto Rodriguez-Camino (male): Head of Climate Evaluation and Modelling Division at AEMET, responsible for research on issues related with classical climatology and climate modelling. Seasonal forecasting and generation of downscaled climate change projections over Spain -feeding a wide variety of impact and adaptation studies- are two of the main operational responsibilities of this division. He has long experience in atmospheric modelling and has also participated in many national and international projects in connexion with modelling and currently with climate services (e.g., EUPORIAS, MOSES). He was deputy project leader of the HIRLAM project for the development of an operational limited area model for short-term forecasting. He has recently participated in the shaping of European Met Services' plans for climate services in the frame of the WMO's Global Framework for Climate Services. He is currently co-chair of the WMO RAVI Working Group on Climate and Hydrology. He is also responsible for the coordination of the WMO MedCOF initiative on operational seasonal prediction for the Mediterranean region.

Antonio Rodriguez Martinez (male): Head of the Environmental Developments Service since 2013 until now. He joined AEMET in 1985. He is BSc in Physics and MSc in Physic and Applied Meteorology. He was involved in EUMETSAT Nowcasting SAF project as developer in 2003-2013. His areas of expertise include develop and validate of satellite products as well as a nowcasting tools to forecast the surface solar radiation using satellite and numerical models information. He has several publications in scientific documentation for international and internal projects.

Alfons Callado Pallares (male): AEMET Meteorologist, member of the Predictability Group where he is currently developing the gSREPS Convection-Permitting Ensemble Prediction system. He joined AEMET (formerly INM) in 2000. He is BSc in Physics and MSc in Atmospheric Physics and Geophysics. His areas of expertise include the Predictability and Ensemble Prediction Systems (EPS), specifically dealing with Numerical Weather Prediction models' errors and uncertainties and using stochastic parameterisations, and objective verification of numerical models and EPSs. He has publications in peer-review international magazines. He is a member of the European project HIRLAM (GLAMEPS-HarmonEPS). He was a scientific visitor at ECMWF in 2011.

Maria Rosa Pons Reynes (female): AEMET Meteorologist, member of the Weather Forecast Team in Santander. She joined AEMET (formerly INM) in 2000. She is BSc in Physics and MSc in Atmospheric Physics and Geophysics, as well as in Mathematics and Computer Science. Her areas of expertise include weather analysis and forecast, statistical and downscaling techniques and quality management. She was Head of AEMET's Regional Office in Cantabria in 2008-2012. She has participated in several regional advisory committees related with adverse weather events such as flood control. She has publications in peer-reviewed international magazines and participated in several international projects like PRECIOSO, SEASONAL-2 and ENSEMBLES.

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Relevant infrastructure and equipment

- Observational network

  In addition to the conventional observation at the observatories managed by the staff (synoptic, upper air, aeronautical, specialised etc.) the INM has nearly 250 automated stations. There is a network of 15 meteorological radars with Doppler capacity and a lightning detection network. Climatological observations by collaborators and amateurs are performed in more than 3,700 sites.

  AEMET also operates the Izaña Special Observation Site, which is a reference in Atmospheric Chemical Composition observations. The IARC contributes to the WMO Global Atmosphere Watch (GAW) system with the high altitude Izaña Atmospheric Observatory (IZO) and to the GURME program with the Santa Cruz de Tenerife Observatory (SCO).

- Computer resources

  AEMET has a Data Processing Centre (DPC) to support our operational activities in Numerical Weather Prediction and processing of our observation network (meteorological radars, satellites …). This centre has a continuous monitoring (24/7) and it includes a High Performance Computer (Bull). This supercomputer allows AEMET to upgrade our NWP models for both research and operations.

P12. WSp Sverige AB (WSP) - Sweden

Partner Full Name	WSP Sverige AB	Logo	
Short Name	WSP	Country	Sweden
Status	Industry	Website	http://www.wsp-pb.com/en/WSP-Sweden/

WSP is an international, leading consultant firm for professional services in transport, infrastructure, industrial, environmental and energy projects, with over 30.000 employees and offices in about 40 countries on five continents. WSP is a suitable partner of choice for co-operation in this project because of our extensive experience in stormwater investigations. WSP Sverige has a staff of over 50 persons working with issues related to hydraulic and/or hydraulic modelling. Our knowledge has been demonstrated in numerous stormwater projects conducted in cooperation with municipalities all over Sweden, of which the stormwater project regarding flash flood mapping in a future climate performed for Stockholm municipality is a prime example.

WSP has previously collaborated successfully with SMHI in previous projects and thus a good co-operation and result is anticipated even in this project. Furthermore, WSP has additional expertise available in this field at other offices in Sweden, as well as in our global network of specialists.

Expertise and relevant projects

WSP is partner in the Copernicus C3S Urban SIS project, representing the advanced end-user acting as purveyor and supporting Stockholm authorities to adapt to a future increase in urban flooding. The WSP office in Norrköping, Sweden, with additional expertise support from Stockholm (and possibly also other offices) will contribute to the CLARITY demo case performed in Sweden. Recent projects related to the CLARITY project comprises:

- **Simulation of the 100 year rain for Norrköping Municipality**; Flood risk mapping due to intense rainfall; 2012; Norrköping Water and Waste.
- **Water strategy – Staffanstorp Municipality**; Flood risk mapping due to intense rainfall in order to study risks connected to city planning; 2010-2011; Municipality of Staffanstorp.
- **Simulation of the 100 year rain for Vallentuna Municipality**; Flood risk mapping due to intense rainfall; 2012-2013; Municipality of Vallentuna.
- **Stormwater modelling, Stockholm City**; stormwater simulations of the 100-year rain in Stockholm in a future climate including flood mapping, 2014-2015. Stockholm City.
- **Pluvial flooding investigation for confined areas in Norrköping**; a flood mapping project for Norrköping municipality to identify areas prone to flooding in a future climate, 2012, Municipality of Norrköping.

Role in the project

WSP will, together with SMHI, support Stockholm City (StockCity) and the County Administrative Board of Jönköping (CABJON) in the use of climate services and demonstrating the usefulness of the CLARITY tools to lower the vulnerability and impacts of future urban floodings.

The Swedish demo case aims at assessing climate-induced risks to the success of selected large scale infrastructure projects in Sweden, and identifying and appraising effective adaptation measures to build climate resilience. By delivering user-tailored indicators that will run over existing climate services, we aim at assessing the usefulness, usability and performance of CSIS´s tool for generating user-customisable impact indicators focusing on selected large scale projects in Sweden.

WSPs task as a purveyor will be to test and demonstrate the usefulness of the CLARITY, i.e. how modelling can be performed based on the indicators derived from the downscaling of the climate models. For the Swedish demo case, the fundamental concepts and development plans based on functional experiments and interactive prototypes will be assessed and the results will be validated.

Key personnel

Anna Åkesson (female) has a PhD in hydrology from the Royal Institute of Technology, Stockholm and is presently consultant at the storm-and waste water group at WSP Norrköping. Her foremost competence is in hydrologic and hydraulic modeling in rural and urban systems, with experience from river peakflow modelling, stormwater investigations related to sustainable urban developments, as well as general climate adaptation projects.

Karin Dyrestam (female) is an oceanographer currently employed at the storm-and wastewater group WSP Norrköping. Her main work experience is however in hydrology/hydraulics. She has experience from the hydrological warning service at the SMHI, until she joined WSP in 2014. At WSP, her foremost expertise is in hydraulic modeling in rural and urban systems, with experience from stormwater modelling, flood risk mapping, river modelling as well as general climate adaptation projects.

Peter Hedenquist (male) is the head of the storm- and wastewater group at WSP Norrköping. He has a long and solid background in a wide range of technical areas – from construction experience and business development in the process industry to project management and presently as group leader for the storm- and wastewater group at WSP Norrköping. Peter Hedenquist's experience within the urban water management topic comprises investigations related to flooding, sewage system's capacities as well as many related tasks within sustainable urban development.

Anna Risberg (female) is head of the Bridge & Hydraulic Design department at WSP Stockholm. She has an MSc in Aquatic and Environmental engineering and has worked since 2006 as a consultant within water systems, dam safety, water supply and sewer systems. Anna is a specialist in hydraulic modeling of rivers, waste- and stormwater networks and dam safety especially in earth fill dams. Projects have included construction of model, calibration against measured data and control, and calculations of measures. Mainly tools like MIKE 11, MIKE 21, MIKE URBAN CS and MOUSE have been used. Typical projects have also included flow measurement, connection control and suggested measures for water and wastewater systems.

Sofia Thurin (female) is an engineer at the Bridge & Hydraulic Design department at WSP Stockholm. She has an MSc in Aquatic and Environmental engineering. Her thesis was about hydraulic modeling of a Swedish river using MIKE 11. She has worked since spring 2011. Projects have mainly included construction of hydraulic models (including both river models and models for extreme precipitation events) and calibration against measured data and control. Sofia Thurin is skilled in the use of MIKE 11, MIKE 21, MIKE 3, ArcGIS and CAD 2D.

P13. ACCIONA Infraestructuras S.A. (ACCIONA) - Spain

Partner Full Name	ACCIONA Infraestructuras S.A.	Logo	
Short Name	ACCIONA	Country	Spain
Status	Industry	Website	www.acciona-infraestructuras.com

ACCIONA Infraestructuras is a leading European construction company designing, constructing and managing buildings and civil infrastructures under sustainability principles. It has an international presence in more than 30 countries and its total turnover in 2015 was about 3,336 M€, employing 27,406 people. It is part of ACCIONA Group (turnover in 2015 was 6,544M€ and employed 32,147 people) whose business lines are Energy; Construction, Water & Services and other activities such as Real State, Urban-Environmental Services, Logistic and transport. ACCIONA's business strategy is tightly linked to sustainability and in recognition of the company's efforts and commitments received in 2009 the recognition for Corporate Sustainability of the EU Business Award.

Within Construction business line, ACCIONA Mantenimiento de Infraestructuras subsidiary company specializes in providing integral maintenance services for road, water and environmental infrastructures. It is a leader for infrastructure maintenance and conservation solutions, improving and protecting the environment for the benefit of those that use or are affected by these infrastructures. This specialist business unit is also capable of offering the best solutions for special structures in the most complex projects, covering every area of civil engineering and building construction, thanks to its proven commitment to innovation, its extensive experience and a great team of professionals.

ACCIONA Infraestructuras has its own R&D Technological Centre in Madrid, composed by a multidisciplinary and international team of about 150 highly qualified researchers from a wide range of disciplines and an extent experience in R&D projects both national and international. Main research areas encompass nanotechnology, new construction materials, products and systems, ICTs, energy efficiency and environmental technologies. The Centre includes its own laboratories of nanotechnology and advanced materials, RES and HVAC integration in buildings, ICT, automation, virtual reality and simulation, chemistry analysis as well as workshops for prototyping construction.

http://www.acciona-infrastructure.com/innovation/technology-center.aspx

Expertise and relevant Projects

- **TIMI**, NAT CENIT 2007-2010. The aim of the project was to develop a portfolio of new technologies and methodologies that foster an intelligent, sustainable and efficient intermodal transport network of goods in Europe.
- **CLIMATEFORCULTURE**, EU FP7 (ENV) 2009-2014 (www.climateforculture.eu). The project focused on the connection of completely new high resolution climate change evolution scenarios with whole building simulation models to assess future projections of outdoor climate changes on the indoor environments in historic buildings and its impacts on cultural heritage items in Europe and Egypt.
- **ACCUS**, EU ARTEMIS, 2013-2016 (www.projectaccus.eu). ACCUS aims to provide an integration and coordination platform for urban systems (including a road monitoring subsystem among them) in order to

optimize their combined performance, thus achieving more flexible, more efficient, safer and more robust integrated urban systems and managing their emergent behaviors.

- **ZONESEC**, EU FP7 (SEC), 2014-2017 (www.zonesec.eu). The Global Objective of ZONeSEC is to support the security of citizens by providing a total solution for the protection of Widezone infrastructure taking into consideration issues pertaining to costs, complexity, vulnerability, societal acceptance and ethics. ZONeSEC guarantees technological excellence by leveraging best of breed activity pattern recognition and state models, based on data from advanced low cost sensors, state of the art simulation techniques, robust, resilient, and flexible and cutting edge ICT infrastructure, expert systems and reasoning for decision support and seamless large volume of data and information sharing to multiple channels.

Role in the project

The main role of Acciona Infraestructuras in the project will be as end user of the CLARITY framework, presenting an application test case focused on the planning of maintenance activities for critical transport infrastructures based on climate information services.

In this line, the interest of the company will be to provide its subsidiary ACCIONA Mantenimiento de Infraestructuras, which is specifically dedicated to the operation and maintenance of infrastructure concessions, with means for evaluating the climate conditions of the areas in which the infrastructures are located and therefore being able to estimate more accurately the resources and costs that should be assumed to overcome those tasks both for existing projects and when preparing bids for new potential tenders.

Key personnel

Mr. Christian Baraja (male) obtained his MSc. in Physics major in Solid State Physics from the University Autónoma of Madrid and his Master's degree in Technology and Energy Resources from the University Rey Juan Carlos in Madrid. He joined the ICT team of ACCIONA Infraestructuras in July 2013 and provides a strong background related to general project management of EU R&D co-funded projects (FP7, H2020 and ECSEL) in the area of ICTs applied to Construction, Transport, Energy Efficiency, Security, Smart Cities and Ambient Assisted Living. He has also experience in the management of technical activities such as wireless mesh networks software architecture design and optimization, wireless sensor networks deployment in multiple scenarios, energy sub-metering architecture design, development and deployment as well as multiple data monitoring. He is currently involved in two FP7 projects ZONESEC and Holisteec as well as two Horizon 2020 projects Ecoscale and Tribe.

Ms. Raquel Cortinat (female) with a University degree in Acoustic Engineering in Universidad Politécnica de Valencia and a Master in Architectural and Environmental Acoustics in the Ramon Llul University, she works in the ITC group of ACCIONA's R&D Centre since 6 years. She has professional experience in development of architectural and environmental acoustics projects, covering vibrations, noise & insulation measurements; laboratory work concerned with the acoustic absorption materials and in noise & vibrations control. She is involved in different national and international projects: Common Energy, IN2RAIL, and SESBE. She has wide experience in the implementation of new technologies at construction works and different types of infrastructure.

Ms. Raquel Garcia (female) graduated from Polytechnic University of Madrid in Telecommunication Engineering. She joined ACCIONA Infraestructuras in 2012 as a researcher, specialist in electronic and hardware, and since then, she has been involved in several European R&D Projects related to ICT and embedded systems applied to the construction sector and the building environment. She is currently involved in Artemis project DEWI, "Dependable Embedded Wireless Infrastructure", focused on the development of applications based on wireless sensor networks and in FP7 project NEED4B, "Demonstration of Very Low Energy New Buildings". Her research interests are mainly focused on embedded systems, wireless sensor networks, and ICT applied to the construction sector, smart cities and urban systems.

Mr. Manuel Ruiz (male) is a Mathematics graduate by the University of Valladolid (Spain). He holds "Industrial mathematics and scientific computation" master by Technische Universität Kaiserslautern (Germany). At present, he is part of the Information and Communication Technology Group in the R&D Department of ACCIONA Infraestructuras. His research activity is focused on software engineering and ICT applied in construction.

Relevant infrastructure and equipment

- **MeteoTICs:** is a weather tool that provides geolocalized weather forecasts consisting of multiple environmental parameters, directly obtained from the combination of data from several weather forecast web services, and other parameters calculated from them. The tool contains a web interface for configuration purposes, allowing to manage user accounts, GPS coordinates of the locations where forecasts are needed, user data access and visualization rights, and scheduling of forecasts downloads. Besides, the web interface provides graphical visualization of the forecast to which the user has access. MeteoTICs provides as well a web service for data exchange with other software applications.
- **Traffic Control center building.** The traffic control center located near the town of Torija (Guadalajara) holds the central security equipment, and collects the security and surveillance information coming not only from the surroundings of the building and the building itself (cameras) but also from the other systems (critical infrastructures) along the highway.

P14. Smart Cities Consulting GmbH (SCC) - Austria

Partner Full Name	Smart Cities Consulting GmbH	Logo	
Short Name	SCC	Country	Austria
Status	SME	Website	www.smartcitiesconsulting.eu

Smart Cities Consulting GmbH is a privately held SME based in Vienna, Austria.

We believe that every city and community has to develop their individual strategy of "being smart" and to develop measures for it. Valuable insight and inspiration will be provided by projects conducted by other communities with comparable preconditions acting as "role models" or "best practice" for specific fields of action. We strive to connect communities and their numerous stakeholders and stimulate cooperation. (Especially for small communities with limited resources and knowledge base cooperation is a "means of choice" for achieving results that can be future proof.) An essential ingredient for "smart communities" is local economy and value creation - this is why we start an accelerator program for SME under an own brand (www.axxelerate.eu). We want to help to establish and support local business und innovation hubs and interconnect them as well on international level; our first cooperation partner is the Vancouver based Canadian incubator for wireless economy Wavefront (www.wavefrontac.com)

SCC is dedicated to cooperation itself and organized as a network of autonomous small corporates and individuals (experts in their respective lines of work). The advantage is to be able to offer skilled forces for a variety of tasks and provide partners with business services as well as dissemination and public communication.

Role in the project
SCC will develop and orchestrate dissemination measures of CLARITY together with all partners and assist with their regional dissemination activities. Additionally, SCC will foster connection with other suitable initiatives on international level, address "followers" and attract ambassadors for spreading CLARITY´s results in various stakeholder groups.

Relevant infrastructure and equipment
SCC runs a webzine (www.smartcitiesconsulting.eu) that will be used for publishing editorial CLARITY stories together with the social media channels; skilled editors and professional journalists work for SCC. The webzine will start a new category "Climate Change" to provide a lively editorial environment. CLARITY will provide the opportunity to establish an additional editorial job for CC effects on cities/communities as an interesting position for an emerging science editor. Actually the webzine is in English and German language; articles in additional languages according to the geographical spread of CLARITY will increase the reach and provide the interested public with information concerning CC and effects on regional level.

Key personnel
Andrea Geyer-Scholz (female) is a seasoned business administrator and economist (graduated from Vienna University of Economics and Business) with long lasting experience in the ICT sector as key account manager. Entrepreneur for 20 years providing business and innovation services including project development and business angel activities. Core team member of "Digital City Vienna" initiative initiated by ICT enterprises and supported by the municipality which aims to support Vienna´s smart city strategy (as ICT is an enabling technology for it in many aspects) and to develop and strengthen the ICT habitat Vienna as a European hot spot for enterprises, professionals, start-ups, investors and encourage careers and foster the industrial location.

Sandra Stromberger (female) is a digital strategies expert (graduated from Freie Universität Berlin) and highly experienced in all aspects of online platforms and -affiliation plus movies. She developed digital concepts (mainly focussing on business development) for several enterprises. As a project on own behalf she founded and pursues the initiative "Industry meets Makers" in Austria targeting to connect established industries with the emerging "makers" scene and start-ups (www.industrymeetsmakers.com). Sandra is core team member of "Digital City Vienna" initiative as well.

Delia Modest (female) and **Michel Mehle** (male) co-developed and now write (non-exclusive) for the webzine. They represent the online editors team: young journalists with background in print and TV strongly dedicated to online media formats and prone to explore and experiment with (cross-media) possibilities to provide content that is not common knowledge understandable and with journalistic quality. They will be the backbone of the CLARITY media content team and also deal with other media professionals concerning third media coverage.

P15. County Administrative Board of Jönköping (CABJON) - Sweden

Partner Full Name	County Administrative Board of Jönköping	Logo	Länsstyrelsen i Jönköpings län
Short Name	CABJON	Country	Sweden
Status	Government	Website	www.lansstyrelsen.se/jonkoping

The County Administrative Board of Jönköping (CABJON) is a Governmental Agency that link People and Communities with the Government, Parliament and Central Government. The main responsibility is to coordinate the development of the county in line with goals set in National Politics, including different issues - from rural development to biodiversity. Sweden consists of 21 counties.

CABJON is a rigid organization with the expertise needed for EU-projects (ca 250 employees including experts in e.g. ecology, GIS, law, economic, and communication) and has previously been involved in several EU (-LIFE) projects, presently participating in relevant climate change/adaptation projects e.g. SWICCA as well as e.g. Life to Ad(d)Mire (LIFE08NAT/S/000268) and UC4LIFE (LIFE10 NAT/SE/000046). CABJON is not coordinating any project at the moment. The County Board has experience and was responsible for EU-projects starting almost two decades ago (e.g. Structural Funds 1999-2002). For information, visit: www.lansstyrelsen.se/jonkoping.

Within CABJON, the results of projects adding knowledge to future climate impact is fundamental in planning of infrastructure, permissions for industries and environmental hazardous activities, environmental monitoring and biological diversity. CABJON has also experiences of working with real flooding, draughts and other CC relevant issues the last decade. The organisation has since 2011 been coordinating the regional work with CC and Climate Adaptation on mission by National Government.

More relevant references:

- **SWICCA**, C3S, 2015-18: The aim of SWICCA (Service for Water Indicators in a Climate Change Adaptation) is to provide data and guidance for climate impact assessments in the water sector. By using indicators, climate impact assessments can be done without having to run a full production chain from raw climate model results – instead the indicators can be included in the local workflow with local methods applied, to facilitate decision-making and strategies to meet the future. CABJON participate as end-user. (http://www.swicca.eu)
- **Making Resilient Cities (UNISDR), EU-project U Score :** The program is a worldwide campaign initiated by the United Nations International Strategy for Disaster Reduction (UNISDR). The aim of the EU-project U Score is to provide tools to measure resilience of cities in order to improve areas of future necessity. Two municipalities within the County are taking part and CABJON supports the municipalities. Five cities in three EU-countries tested the tool, and suggested improvements to the UN (Coordinated by: Swedish Civil Contingencies Agency). (http://www.msb.se/makingcitiesresilient)

Role in the project

CABJON will act as CLARITY partner and together with SMHI demonstrate the added value of climate services accessed through the CLARITY tool, contributing to a sustainable planning of infrastructure, industrial permissions and environmental hazardous activities in the county. CABJON represents one of 21 County Boards in Sweden thus giving the project input needs by national authorities.

Key personnel

Karin Stridh (female) is the Head of the Administrative and Economic Department at CABJON. She holds authorisation of signing contracts etc in the name of the organisation since 2008. As Controller of economics she has experience of working with administrative/economic issues within EU-projects and programmes since almost a decade.

Måns Lindell (male) is an expert of Limnology within CABJON. He has a Doctoral Degree in Limnology from the Lund University, Sweden. He is specialised in environmental monitoring of one of the largest lakes within Europe: Lake Vättern, Sweden, where he plans and evaluates the environmental state of the lake. He has continuously

worked with CC-relevant aquatic research projects, followed in-situ measurements with long time series, remote sensing techniques, models of climate change in aquatic ecosystems. The research has especially been carried out in the proposed CC-sensitive cold water Lake Vättern. Måns is following (representing end-user) in the SWICCA – project.

Per Hallerstig (male) is Head of Nature Department within CABJON. He is responsible for the organisations internal work with climate change (shared by several groups). As Head of the Department, he is also in charge for other EU-projects in which CABJON is participating in, mostly within the LIFE-program, e.g. LIFE to Ad(d)Mire (LIFE08NAT/S/000268), LIFE TAIGA (LIFE13 NAT/SE/000065) and UC4LIFE (LIFE10 NAT/SE/000046).

Frida Moberg (female) works with coordinating the regional alignment of CC and Climate Change Adaptation Programme, a mission initiated by the Swedish Government, implemented at CABJON in 2011. She thus coordinates the internal work within the organisation as well as externally, e. g CABJON is coordinating a regional network (Regional Climate Council) consisting of >50 participating organisations, industries and/or authorities. CABJON is responsible for developing regional action programs, regional climate status reports, risk assessments analysis and knowledge based reports. The work also involves contacts with the local scale e.g. industries, municipalities etc.

Anne-Catrin Almér (female) coordinates the regional environmental monitoring program related to CC indicators at CABJON. She is also evaluating the regional environmental objectives where several indicators are related to CC. The regional outcome contributes to the 16 National environmental objectives coordinated by the Swedish Environmental Protection Agency (SEPA). Furthermore, she is coordinating the regional network of urban air pollution. The Urban air pollution network consists of 13 municipalities and several industries. She is also following the SWICCA-project.

P16. Centro de Estudios y Experimentación de Obras Públicas (CEDEX) - Spain

Partner Full Name	Centro de Estudios y Experimentación de Obras Públicas - Ministerio de Agricultura, Alimentación y Medio Ambiente	Logo	
Short Name	CEDEX	Country	Spain
Status	Government	Website	http://www.cedex.es

Centro de Estudios y Experimentación de Obras Públicas (CEDEX), Centre of Studies and Experimentation in Public Works in English, was created in 1957 as an autonomous organisation that at present reports to the Ministry of Public Works and functionally to the Ministries of Public Works, and Agriculture and Environment of Spain, in the sphere of their respective competences.

CEDEX is an institution that provides multidisciplinary support in civil engineering technologies, construction and associated environment, giving assistance to various administrations, public institutions and private companies. Its specialised technical units, Centres and Laboratories, some of which have been active for more than 100 years, provide high-level technical assistance, applied research and technological development in the areas characteristic of the civil engineering sector: harbours and coasts, hydraulics of continental waters, roads, structures and materials, geotechnics, techniques applied to the civil engineering and environment and historic studies of the public works. These units devote about 70% of their resources to high-level technical assistance and the remaining 30% to applied research and development, technological transfer and other actions on technical and scientific information.

Its wide range of activities includes:

- Acquisition, analysis, treatment and application of basic data.
- Scale physical models and numerical simulation.
- Studies and research in its own installations and with prototypes.
- Quality control in public works.
- Support to the planning and implementation of the Departments own basic standards.
- Environmental studies.
- Auscultation of works, elements and systems.
- Scientific and technological information and documentation.
- Organisation of postgraduate courses, seminars and other educational activities.

The specialisation of the human team, the singularity of some of its installations, the variety of civil engineering and environmental matters undertaken and the growing cooperation with similar overseas institutions make CEDEX an avant-garde international organisation able to apply the latest innovations to solve the numerous problems present nowadays in the ambits of its specialisation, specifically where civil engineering needs to be combined with the inherent environmental aspects, with a view to a sustainable development.

Expertise and relevant Projects

- USE-IT (http://www.useitandfoxprojects.eu/). Users, safety, security and energy in transport infrastructure (H2020).
- LIFE MINOx-STREET (http://www.lifeminoxstreet.com/life/inicio/). MonItoring and modelling the NOx removal efficiency of photocatalytic materials. A STRategy for urban air quality ManagEmEnT (LIFE12 ENV/ES/000280).
- LIFE LIFESURE (http://www.lifesure.es). Self-sustaining urban roads: A way to improve environmental performance of urban areas (LIFE12 ENV/ES/000072).
- SOLUTIONS (http://www.urban-mobility-solutions.eu/). Sharing Opportunities for Low Carbon Urban TrasnportatIONS (FP7)
- DIRECT MAT. DIstmantling and RECycling Techniques for road MATerials - Sharing knowledge and practices (FP7).
- LINK. The European forum on intermodal passenger travel (FP6).

Role in the project

The main role of CEDEX in the project will be as end-user of the CLARITY climate services. In this way, CEDEX will contribute in the Spanish demo case, providing specialised technical assistance in the fields of road materials and road maintenance. Also, CEDEX is actively involved in different normative organizations, at European and national level, being able to assess existing standards, identifying gaps or aspects that might need to be reviewed in view of future climate scenarios.

Key personnel

Ms. Laura Parra (female) is a Civil Engineer graduated in the ETSICCP of Santander. She has worked for CEDEX since 2005. She started in the field of earthworks and geotechnics. From 2009 to 2010, she worked in the transport management and planning area as project manager. Since 2010, she works in pavement surface characteristics division, where she is research coordinator. Also she is taking part in research programmes and projects dealing with road materials and environmental impact (wastes and secondary materials and LCA). She is a member in several normalization committees, both at national and international level (CEN TC 227 WG 5, ISO TC43 SC1 WG 33, AEN/CTN41/SC2/GT5 and AEN/CTN198).

Mr Marco Perelli (male) graduated from Polytechnic University of Madrid in Civil Engineering. (specialization: Foundations and Structures). He has worked for CEDEX since 1995. From 1995 to 2016, he has been working in Traffic and Road Safety in many fields as tunnel equipment, tunnel accident and incident studies, road safety barriers and other vehicle restraint systems and road blackspot studies. Currently, he is also working in environmental impact in construction (Life Cycle Assessment-LCA and Life Cycle Costing-LCC) as scientific technical program coordinator. He is also member in several national normalization committees (AEN/CTN135/SC1 and AEN/CTN198).

Relevant infrastructure and equipment

- Full-Scale Accelerated Pavement Test Track: this facility allows the controlled application of wheel loading to pavement structures for the purpose of simulating the effects of long-term in-service loading conditions in a compressed time period.
- Infrastructure Laboratory: specialised in road materials and bituminous mixtures and binders testing.
- CEDEX Rail Box: is a 21-meter-long installation which allows real-scale testing of complete rail sections.

P17. City of Linz (LINZ) - Austria

Partner Full Name	City of Linz	Logo	
Short Name	LINZ	Country	Austria
Status	Government (Austrian City Administration)	Website	http://www.linz.at/

The City of Linz (193.800 people, spatial extension 196.048 km^2, density 990 inh./km^2), capital of the Province of Upper Austria is organized into 9 districts and 36 statistical quarters. Of the approximately 96 km² area 29.27% are grassland, 17.95% forest, 6.39% water, 11.63% are traffic areas and 34.76% are building land. The urban area includes (parts of) 13 other municipalities with together 271,000 inhabitants. Linz is also part of the Linz-Wels-Steyr metropolitan area of Upper Austria, home to around one third of the province's population (460.000 people) and second-largest urban area in Austria. Linz is one of the main economic centres of Austria. The Voestalpine AG is a large steel company (founded during World War II), which is known for the LD- ("Linz-Donawitz") steel production process. The former "Chemie Linz" chemical industry company has been split up into several companies. The harbour is an important transportation hub for the steel industry. Delivering coal, ore and distributing steel and metal products. As Linz is the provincial capital and itself a large city requiring administration, many employees are working in administration and services. About 190,000 people are employed in Linz, which is almost twice the number of working people who live in Linz. Therefore, Linz has to deal with a lot of commuter traffic. During work days around 100,000 employees commute into Linz and about 18,500 out of Linz.

Linz is the one of the important congress destinations in Austria. The city is home to a vibrant music and arts scene. At the south banks you find the Lentos Art Museum and the "Brucknerhaus", the Ars Electronica Museum is located at the north banks, hosting every year the Ars Electronica Festival in early September and the "Linz Fest", taking place annually in May. Since 2004, the Crossing Europe Film Festival is held annually. Linz could - most recently with the 2013 opened new musical theater at Volksgarten, the Bruckner Festival, the Linzer Klangwolke (”Linz soundcloud”) etc. positions itself as an internationally well-known cultural city. Linz is UNESCO city of Media Arts.

Linz is located in the Danube valley 200 km east of Vienna and approx. 100 km west of Salzburg. The Danube is a landmark within the city and supports ventilation of cooler air form the outskirts. The close neighbourhood of the Danube indicates quite some flood risk: in 2002 and 2013 large severe flood events took place, where the Danube banks and the lower historic centre south of the Danube were flooded. The historic centre of Linz is characterised by small, medieval, baroque to renaissance houses including several sacred buildings. Linz shows large plazzas with little to no green and a lot of sealed surface which has effect on heating up the centre as well as lacking leakage possibilities to soil and groundwater, concentrating discharge to the paved surface.

The political bodies of the Municipality are the Mayor, and the City Council. The administration is organized in 12 divisions, one of them responsible for Planning, Technique and Environment, which serves as partner in the project.

Role in the project

City of Linz will enrich the CLARITY consortium as a stakeholder experienced in flooding adaptation related to territorial planning. In this perspective, it will contribute to develop of decision-making tools and will allow the administration to investigate the effects of adaptation measures in the local context.

Key personnel

DI Wilfried Hager, education in Technical Chemistry at Graz Technical University**,** is working for Linz since 1985. Till 2005 he was responsible for air quality monitoring, now he is head of the Environmental Management Department which is part of the Planning, Technology and Environment Division. His duty is now strategic developments for the City of Linz regarding environment and since 2007 in the field of energy,

4.2. Third parties involved in the project (including use of third party resources)

Table 1: P8. AIT Austrian Institute of Technology GmbH (AIT) - Austria

Does the participant plan to subcontract certain tasks (please note that core tasks of the project should not be sub-contracted)	Yes
Professional marketing video recording and editing for producing 5 videos about CLARITY project (one for each of the four pilot demonstrators plus the entire CLARITY project as a venture). The supplier will be selected on the base of the best offer according to the procurement procedures and evaluating and choosing amongst them the most cost-effective offers.	
Does the participant envisage that part of its work is performed by linked third parties[3]	No
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	No

Table 2: P14. ACCIONA Infraestructuras S.A. (ACCIONA) - Spain

Does the participant plan to subcontract certain tasks (please note that core tasks of the project should not be sub-contracted)	No
Does the participant envisage that part of its work is performed by linked third parties (Article 14 of the Model Grant Agreement)	No
Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Agreement)	Yes
ACCIONA Infraestructuras has a collaboration framework agreement with the Fundación Agustín de Betancourt (FAB), setting a stable and permanent cooperation in scientific and technological issues for the support at the implementation and execution of national and international R&D projects at which ACCIONA Infraestructuras participates. In the context of this collaboration agreement, FAB makes available to ACCIONA seconded researchers, on a project-by-project basis, to support the technical and scientific execution of the works to be carried out in ACCIONA's R&D projects, which work in ACCIONA premises under its direct supervision. Fundación Agustín de Betancourt is a cultural Foundation with private and permanent character, Spanish nationality, non-profit and public interest, with legal personality and full legal capacity to act. It was created in 1977 in the Polytechnic University of Madrid (UPM) under the impulse of four engineers interested in promoting research, innovation, technology transfer and collaboration between universities and industry. Since its constitution and in accordance with its statutory objectives, the Foundation has cooperated with the University in fulfilling its foundational objectives: promote and develop fundamental and applied research, technological development and innovation.	

[3] A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action. (Article 14 of the Model Grant Agreement).

4.3. Advisory Board. Composition and short profiles

CLARITY Advisory Board shall play an essential role for the final validation and potential extension of CLARITY requirements. A number of relevant stakeholders, supported by recognised experts, have already supported the development of the proposal and agreed to participate in this board.

A short profile of the members and the institutions that they represent is provided below.

Dr. Deliang Chen (male) is currently Professor in Physical Meteorology and head of Regional Climate Group at University of Gothenburg, Sweden. During 2009 and 2012 he served as Executive Director of the International Council for Science (ICSU) which is a sponsor for all four existing global change research programmes (IGBP, WCRP, IHDP, and DIVERSITAS) and the new global initiative in Earth System Science: Future Earth. Other previous appointments include Science Director of the Beijing Climate Centre. Chen is an elected member of the Royal Swedish Academy of Sciences and has served on numerous international and national committees and boards (e.g. Expert Group for the Major National Global Change Research Program (China) and Board of Stockholm Resilience Centre). He is an internationally renowned regional climate researcher. Recently he was appointed Lead Author of IPCC AR5. He also serves as an editor on several international scientific journals.

Chantal Pacteau (female) is Senior scientist at the Institute of Ecology and Environmental Sciences Paris, Co-Director of the European Hub of the Urban Climate Change Research Network (UCCRN) and Research scientist at the French National Centre for Scientific Research (CNRS). She collaborated with UNESCO and served as Scientific Deputy Director in charge of Africa and Middle East at the CNRS Office of European and International Relations. Deputy Director of the Paris Consortium Climate-Environment-Society (2007-2016), she reinforced interdisciplinarity between climate, life and human and social sciences, and relationships with public institutions. She has been a member of strategic advisory committees of different summits as the International Conference on Biodiversity (UNESCO, 2005) The World Summit on Sustainable Cities Ecocity (Nantes, 2013), Climate Chance, the Climate Actors World Summit (Nantes, 2016).

Ebru Gencer (female) is the Executive Director of the Centre for Urban Disaster Risk Reduction and Resilience (CUDRR+R) and President of the Board of Directors. She is an urban planner specialized in disaster risk reduction, climate change adaptation and sustainable development. She has a Ph.D (Urban Planning) and M.Phil (Urban Planning/Architecture) from Columbia University, New York and MSc (Urban Preservation and Renewal) and Diploma (City and Regional Planning) from Mimar Sinan University in Istanbul.
Currently, she is the Co-Chair of the Urban Planning Advisory Group to the Special Representative of the UN Secretary General for Disaster Risk Reduction and to the UN Office for Disaster Risk Reduction (UNISDR). She also holds a Research Associate position with the Euro-Mediterranean Climate Change Centre (CMCC) based in Venice, Italy and a Board Member of ISOCARP's (International Society of City and Regional Planners) Centre for Urban Excellence.

Thomas Madreiter (male) worked for one year as assistant at the Institute of Public Finance and Infrastructure Policy at the Vienna University of Technology (Prof. Wilfried Schönbäck). From 1995 to 2001 he worked in urban development in Vienna with the focal point management of urban development processes. From 2001 to 2005 he was assistant to the Vice Mayor and Vice-Governor, Executive City Councilor for Finance, Economic Affairs and Vienna Public Utilities of Vienna, Dr. Sepp Rieder. From 2005 to 2013 Thomas Madreiter was Head of the Department for Urban Development and Planning in Vienna. In 2011, he was interim Head of the Department for Energy Planning in Vienna. Since January 2013, Thomas Madreiter is Director of Planning of the City of Vienna. He is in this position by way of example responsible for the strategic coordination of Smart City Wien.

Jose L. Muñoz-Bonet (male), is Executive Director of EIT Climate KIC Spain[4], and member of the Executive Team of Climate KIC Europe. Master Degree in Industrial Engineering, and DAE in Innovation Projects. With more than 25 years of professional experience in environment management, water & energy management, innovation and international cooperation, he has had executive responsibilities in companies such as IBM, Wang Computers, Manufacturers' services, Innove Verda SA, and public bodies such as the regional gov. of Valencia – Spain. He has been European Lead of the Programme "Pioneers into Practice (PiP)" for Climate action (Climate KIC) with more than 1000 climate experts overall Europe., and Regional Innovation Scheme (RIS) Manager of Portugal in Climate KIC. During 8 years was the Chairman of the "National Commission of Environment" of the Spanish ICT sector (SEDISI) and the Spanish representative in the "Environmental Policy Group of EICTA" in Brussels (European Association of Electronics, Information, Communication & Technology).
He was Head of European Territorial Innovation in the Valencian Regional Government of Spain, Director of the Regional Framework Operation "Strategic Partnership for Competitiveness and Sustainable Development. PERSPECTIVE 2007-2013 " (Interreg – European Commission), chair of several strategic working groups within the framework of EU projects, and expert in several reports, opinions and amendments proposed by European institutions and in particular for the Commission of Environment, Climate Change and Energy (ENVE) of the Committee of Regions of Europe, (Water scarcity and droughts, water management, and energy).
He has been member of several committees and working groups, lecturer and expert at international forums, universities, organizations and institutions of the European Union - Committee of European Regions - CoR, the Assembly of European Regions - AER, Commission Mediterranee, and other International forums.

Julio Vaquero (male), is a Civil Engineer working in the Spanish Ministry of Public Works. He is responsible for road technology (auscultation and pavements) within the Technical Department of the Road General Directorate. He collaborates in the development of technical normative and Research and Development studies. At this moment, he is the director of 2 studies carried out by CEDEX: LCA and LCCA in road pavements and Temperature influence in pavement deflexion measures. He actively participates in several committees at national and international level: Road pavement committee at PIARC (Permanent International Association of Road Congresses) and president of the mirror committee ATC at Spanish level; member of CEN TC 227 "Roads" and workgroup CEN TC 227/WG5 "Surface Characteristics" and president of the subcommittee AEN/CTN-41/SC2 "Carreteras" (mirror groups at Spanish level). In the field of consultancy, he has participated on behalf of the Spanish Administration in the "Reference Group" in the HISPEQ project (Hi-speed survey Specifications, Explanation and Quality), from CEDR (Conference of European Directors of Roads).

[4] Climate-KIC is Europe's largest public-private innovation partnership, working together to address the challenge of climate change. Climate KIC drives innovation in climate change through creative partnerships large and small, local and global, between the private, public and academic sectors. All partners bring their industry experience to the community and are connected through a national or regional centre. Climate KIC is an initiative supported by the European Institute of Innovation and Technology (EIT) a body of the European Commission. (www.climatekic-spain.org / www.climate-kic.org)

5. ETHICS AND SECURITY

5.1 Ethics

As indicated in the Ethics issues table in section 4 of the proposal administrative forms, the participants have not identified at this stage any ethical issue that applies to the foreseen CLARITY activities.

5.2 Security

1. CLARITY will not involve activities or results raising security issues

2. CLARITY will not involve 'EU-classified information' as background or results

The execution of this project will not require nor make use of any background EU-classified information. For these reasons, CLARITY is not a security sensitive project.

ANNEXES

I. Initial communication and dissemination plan

Type of activities	Title (of event, journal, newspaper, TV channel, etc.)	Target audience
Scientific dissemination		
Presentation, Poster General Project	• International Symposium on Environmental Software Systems, Croatia, 2017 (Worldwide, bi-annual) • FOSS4G (world's largest conference on geospatial open source software) (Worldwide, annually)	Software for the Environment, Scientific Community EDSS, EIS
Presentation, Poster General Project	• European Geosciences Union General Assembly (EGU) • AGILE Conference (Europe, annually) • INSPIRE Conference (Europe, annually) • International Cartographic Conference (Worldwide, bi-annual). Largest and most important conference on applications of cartographic information	Geo Scientific Community
Presentation, Poster General Project	European Data Forum (http://www.data-forum.eu) (Europe, Conference every year)	Publication and Use of Open data in different domains
Presentation, Poster of CLARITY methodology and climate change risk scenarios for urban and transport infrastructures	• European Meteorological Society (Conference every year); • 3rd ECCA. European Climate Change Adaptation Conference (6-8 June, 2017, Glasgow, UK) • EMS & ECAM (Conference in Europe, annually)	Climate Scientific Community; Researchers, professionals, local and international organizations; Meteorology and Climate Modelling
Peer Reviewed Paper on CLARITY approach to adaptation scenarios	iEMSs 2018, Environmental Modelling and Software for Sustainability in a Context of Global Chance (Conference every 2 years)	Environmental Models & Software, Worldwide
Peer Reviewed Paper Impact Assessment, Decision Support	EnviroInfo 2017 - International Conference on Environmental Informatics for Environmental Protection, Sustainable Development and Risk Management (Europe, annually)	Environmental Software,
Integrated Modelling and Monitoring for Decision Making in urban and transport infrastructure planning	International Symposium on Environmental Software Systems, Croatia, 2017 (Worldwide Conference)	Software for the Environment, Scientific Community EDSS, EIS
Peer-reviewed presentations of pilot case study	Österreichischer Klimatag 2017, 2019	Climate scientists, regional stakeholders
Peer Reviewed Paper on CLARITY approach to climate change adaptation scenarios	9th Congress of the International Environmental Modelling and Software Society "Environmental Modelling and Software for Sustainability in a Context of Global Change", (venue to be determined for 2017)	Researchers, practitioners in modelling, software experts
GIS specialized journals – GIS-based applications for addressing climate change, environmental and natural hazards issues	• Computers & Geosciences[5] • Computers, Environment and Urban Systems[6] • International Journal of Digital Earth[7] • Transactions in GIS[8]	Software for the Environment, Natural hazards, Climate Change Scientific Community
Peer Reviewed Paper on social benefit estimation	European Economic Review	Scientific Community
Traditional media		
Media releases	Press release for all major private and public consumer media	General public

[5] http://www.journals.elsevier.com/computers-andgeosciences
[6] http://www.journals.elsevier.com/computers-environment-and-urban-systems
[7] http://www.tandfonline.com/toc/tjde20/current
[8] http://eu.wiley.com/WileyCDA/WileyTitle/productCd-TGIS.html

throughout the project, newspapers	companies (regional and national newspapers, TV, radio, etc.)	
Public information print media	Folders and information brochures for distribution at dissemination events attended by project partners	Information for the interested public
Dissemination on partners' web sites and social media accounts	Press releases, Short news, Scientific results	Information for the General public and scientific community
TV and Radio programs	Specialized radio/tv programmes, e.g. Euranet Plus (http://euranetplus-inside.eu)	Interested public
Social media		
Creation of CLARITY project blog/website	Raise scientific awareness and help the public to better understand the interrelation of the different research fields involved	Society. This activity intends to communicate people the relevance of this and others similar sites in their region
Twitter, Facebook	Creation of dedicated CLARITY Twitter and Facebook accounts	Mainstream Information
Creation of CLARITY LinkedIn dedicated group	Linkedin Group: CLARITY	Specialists on Urban planning and infrastructure management and conservation, climate change, environmental and natural hazard issues
Dedicated workshops and talks		
Presentation	Climate Knowledge Brokers Workshop 2017, 201x, 201x; http://en.openei.org, wiki/Climate_Knowledge_Brokers_Group	Worldwide Climate change knowledge broker network (> 40 institutes, companies, organization worldwide)
Workshop	Local stakeholder's workshops to develop and implement adaptation strategies (2018, 2019)	Regional community representatives

Table 3: Initial communication and dissemination plan

Name of network / community	Types of individuals / professions organised in this network	Relevance for CLARITY, in terms of communication, dissemination, exploitation
IFIP WG 5.11 – Computers and Environment http://ifipwg511.org	Scientific Community	Relevant for Dissemination activities. See member list http://ifipwg511.org/index.php?page=memberlist.php) Demonstrates the outreach in the environmental domain worldwide.
OGC	Standardisation / Scientific Organisation	Relevant for Dissemination and Standardization (standardized service/ interface development in the area of sensor observations (etc. used in Sensor Monitoring Networks). Relevant OGC Working Groups: **Sensor Web Enablement DWG** (Sensor Web DWG); **Emergency & Disaster Management DWG** (EDM DWG); **Earth Systems Science DWG** (ESS WG)
iEMSs	Scientific Society	Relevant for Dissemination: International Environmental Modelling & Software Society
Climate Change Centre Austria (CCCA) http://www.ccca.ac.at	Scientific Society	Network of 24 Austrian institutions active in climate research. Information exchange network and organizer of reports, seminars, workshops and conferences to inform the public about climate change topics.
HIRLAM (HIgh Resolution Limited Area Model) http://hirlam.org	European meteorological institutes	Support during the project execution, dissemination of results
IAUC (International Association for Urban Climate) http://www.urban-climate.org/	scientific, scholarly and technical experts in urban climate and micro-scale processes	Support during the project execution, dissemination of results
EUMETNET http://www.eumetnet.eu	European National Meteorological Services	Dissemination of results
Web site of PLINIVS Study Centre/ www.plinivs.it	Engineers, Geophysicists, Volcanologists, Hydrogeologists, Territorial planners, Architects, Sociologists, GIS experts.	PLINIVS Study Centre is a Research Structure of Architecture Faculty of University of Naples Federico II, specialized in vulnerability and impact assessment at territorial scale under effect of natural hazards. PLINIVS web site can inform researchers, professionals, local and international organizations, can be future users of CLARITY platform.
Umweltbundesamt	Authority	Relevant for Dissemination and Exploitation: Federal Environmental Agency Austria, Vienna
EEA	Authority	European Environmental Agency, Copenhagen; in particular climate portal CLIMATE-ADAPT http://climate-adapt.eea.europa.eu/
AXA, MAPFRE	Insurance company	Relevant for ATOS' exploitation of CLARITY results concerning environmental, climate change and natural hazard risk analysis and their direct and indirect link with in economic losses in different sectors (e.g., tourism, agriculture, infrastructure, etc.)
Association of Italian Chamber of Commerce abroad (www.assocamerestero.it)	Business community	CLARITY presentation and result dissemination to Italian companies in over 50 countries all over the world
Observatory for research in conservation www.investigacionenconservacion.es	Research community	CLARITY presentation and result dissemination to Spanish researchers
Spanish Technological Platform of the Construction sector http://www.plataformaptec.com/	Business community	Dissemination of results. Acciona is a member of the platform.
Web site of Acciona	Business community	Dissemination of results

http://www.acciona-infraestructuras.com/es/		
Planetic-Spanish Technological Platform for the dissemination of ICTs http://planetic.es/	Business and research community	Dissemination of results
Spanish Technological Platform of the Roads sector http://www.ptcarretera.es	Business and research community	Dissemination of results. Acciona is a member of the platform
FEHRL (http://www.fehrl.org). Forum of European National Highway Research Laboratories	Research community	Dissemination of results
PTEC (http://www.plataformaptec.com). Plataforma Tecnológica Española de la Construcción	Business and research community	Dissemination of results

Table 4: Initial list of networks for CLARITY community building activities

II. Glossary of Terms and Abbreviations

Adaptation Measures can be separated in:	**Hard and source-oriented**: Measures that affect either the environmental conditions of the Hazard (e.g. more vegetation in a city with historic centre that needs to be protected) or an integral part of the Hazard Model (e.g. topography, dimension of sewage system, etc.) **Hard and receptor-oriented**: Measures that reduce the vulnerability of the element at risk (e.g. installing drainage system in the Cultural Heritage asset). No change in environmental Hazard **Soft**: Measures that include behavioural changes, emergency systems and adequate provision of information to managers of vulnerable Cultural Heritage sites and assets
Adaptation Scenario	Impact Scenario, where an adaptation measure has been implemented. Usually an adaptation scenario is based on a reference scenario (adding the implementation of an adaption measure). Adaptation scenarios based on the same Reference Scenario will allow the direct comparison and evaluation of adaptation measures
CA	Consortium Agreement
CC	Climate Change
CC Adaptation Measure Model	Conceptualisation of a Climate Change Adaptation Measure that allows the simulation of the effects of an adaptation measure in the context of an impact scenario
Climate Change Adaptation Measure	Measure to decrease the potential greater effect (Impact) of a Climate Change inducing Hazard on the Element at risk
Climate signal	Projections up to the year 2100 of a set of environmental variables driven by climate models and regionally downscaled over Europe
Cost Benefit Analysis Model	Model to evaluate the economic benefit consequent to the impact reduction due to the implementation of policies of mitigation/adaptation of which is quantified the cost. The Cost-Benefit Analysis depends on several parameters among which one of the most sensible is the period of return of the evaluation
Criterion	Measure (normalized) of the level of Satisfaction of an indicator
CS	Case Study
Downscaling	Reducing the spatial and/or temporal scale of a Climate Signal
DS	Decision Support
Element at Risk	Entity exposed to risk of damage due to the occurrence of a given event (Object of an Impact Study)
Element at Risk Data	The data collected from the inventory of Elements at Risk that can be used as input of an Exposure Model
Exposure (Exposure Data)	Representation of the quantity of the elements at risk exposed to the risk and their spatial and temporal distribution
Exposure Model	Computational Model of how the E@R (Elements belonging to a vulnerability class) are distributed on the territory affected by the Hazard according to the hour of the day, the day of the week and the season
EEA	European Environment Agency
FP7	7th Framework Programme
GCM	General circulation model
GUI	Graphical User Interface
Hazard Model	A model able to evaluate the probability of occurrence of a hazardous event

	(Natural or Anthropic) of given Intensity in a site and within an assigned period of time
HW	Heat Waves
HTML5	Hypertext Markup Language (Version 5)
ICMS	Integrated Crisis Management Simulation System
Impact	The probable spatial/temporal damage distribution according to a predefined scale of damage expected on the element at risk under consideration. The impact can be measured in several ways: physical, economic, social, functionality etc. and it can be evaluated as direct and/or indirect consequence of the event at a given time (snapshot) or projected in the future
Impact Scenario/Study/Assessment	Simulation of the damage expected on the study area for the element at risk of interest
Indicator	Single or aggregated parameters describing in a synthetic form the impact on the elements exposed involved in the study
IPCC	Intergovernmental Panel on Climate Change
IPR	Intellectual Property Rights
MCDA	Multi-criteria Decision Analysis
RCM	Regional climate model
RESTful	Web Services based on Representational State Transfer (REST)
LRI	Large research infrastructure
RCP	Representative concentration pathways
Reference Scenario	Impact Scenario built on existing ("historic") data sets (local context) that is projected into future climate conditions with all expected changes (population, built-up areas etc.). The comparison between present and projected hazard impact will indicate the effect of CC
SME	Small and medium enterprise
SMS	Scenario Management System
TRL	Technology readiness levels
Use Case	Concrete instance of Multiple Adaptation Scenarios for a given Reference Scenario
Vulnerability	The probability of a given element at risk, classified as part of a specific Vulnerability class, to be affected by a level of damage, according a prefixed scale of damages, under a given hazard intensity
Vulnerability Class	Categorization of Elements at Risk grouped according to selected properties (e.g. age, health status, crop resistance to droughts, maximum runoff capacity, etc.) able to identify a given behaviour of the element under the hazardous action
WP	Work package

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