Brussels, 24 October 2016

COST 113/16

DECISION

Subject: **Memorandum of Understanding for the implementation of the COST Action "REthinking Sustainability TOwards a Regenerative Economy" (RESTORE) CA16114**

The COST Member Countries and/or the COST Cooperating State will find attached the Memorandum of Understanding for the COST Action REthinking Sustainability TOwards a Regenerative Economy approved by the Committee of Senior Officials through written procedure on 24 October 2016.

MEMORANDUM OF UNDERSTANDING

For the implementation of a COST Action designated as

COST Action CA16114
RETHINKING SUSTAINABILITY TOWARDS A REGENERATIVE ECONOMY (RESTORE)

The COST Member Countries and/or the COST Cooperating State, accepting the present Memorandum of Understanding (MoU) wish to undertake joint activities of mutual interest and declare their common intention to participate in the COST Action (the Action), referred to above and described in the Technical Annex of this MoU.

The Action will be carried out in accordance with the set of COST Implementation Rules approved by the Committee of Senior Officials (CSO), or any new document amending or replacing them:

a. "Rules for Participation in and Implementation of COST Activities" (COST 132/14);
b. "COST Action Proposal Submission, Evaluation, Selection and Approval" (COST 133/14);
c. "COST Action Management, Monitoring and Final Assessment" (COST 134/14);
d. "COST International Cooperation and Specific Organisations Participation" (COST 135/14).

The main aim and objective of the Action is to The RESTORE COST Action will affect a paradigm shift towards restorative sustainability for new and existing buildings and space design across Europe.. This will be achieved through the specific objectives detailed in the Technical Annex.

The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at EUR 64 million in 2016.

The MoU will enter into force once at least five (5) COST Member Countries and/or COST Cooperating State have accepted it, and the corresponding Management Committee Members have been appointed, as described in the CSO Decision COST 134/14.

The COST Action will start from the date of the first Management Committee meeting and shall be implemented for a period of four (4) years, unless an extension is approved by the CSO following the procedure described in the CSO Decision COST 134/14.

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OVERVIEW

Summary
Sustainable buildings and facilities are critical to a future that is socially just, ecologically restorative, culturally rich and economically viable within the climate change context

Despite over a decade of strategies and programmes, progress on built environment sustainability fails to address these key issues. Consequently the built environment sector no longer has the luxury of being incrementally less bad, but, with urgency, needs to adopt net-positive, restorative sustainability thinking to incrementally do 'more good'.

Within the built environment sustainability agenda a shift is occurring, from a narrow focus on building energy performance, mitigation strategies, and minimisation of environmental impacts to a broader framework that enriches places, people, ecology, culture, and climate at the core of the design task, with particular emphasis on the benefits towards health.

Sustainability in buildings, as understood today, is an inadequate measure for current and future architectural design, for it aims no higher than trying to make buildings 'less bad'. Building on current European Standards restorative sustainability approaches will raise aspirations and deliver restorative outcomes.

The RESTORE Action will affect a paradigm shift towards restorative sustainability for new and existing buildings, promoting forward thinking and multidisciplinary knowledge, leading to solutions that celebrate the richness of design creativity while enhancing users' experience, health and wellbeing inside and outside buildings, in harmony with urban ecosystems, reconnecting users to nature.

The COST proposal will advocate, mentor and influence for a restorative built environment sustainability through work groups, training schools (including learning design competitions) and Short Term Scientific Missions (STSMs).

Areas of Expertise Relevant for the Action	**Keywords**
● Civil engineering: Sustainable engineering, adaptation to long-term environmental changes ● Economics and business: Sustainability ● Environmental engineering: Environmental impact, Life Cycle Assessment	● restorative sustainability ● restorative design processes-methods-tools ● climate change ● health and well-being ● sustainable urban development

Specific Objectives
To achieve the main objective described in this MoU, the following specific objectives shall be accomplished:

Research Coordination
● To increase knowledge, collaboration and timely knowledge transfer among research centres, universities, education entities, companies, NGOs and the built environment related industry sectors.
● The pre-development of new compulsory design approaches, processes and technologies that can build

and improve upon existing best practices.
● The creation and reinforcement of an European network of skilled professionals (architects, engineers, constructors, urban planners, academics, sustainability practitioners, etc.) able to face the complexity of a broader agenda of environmental strategies.
● Fostering continued collaboration beyond the completion the RESTORE action. The network members are change agents.
● The inclusion of Restorative sustainability criteria within education curricula, thus preparing the next generations of building practitioners.
● Stimulate a major academic research focus on Restorative approaches to design; this is founded on multidisciplinary research collaborations.

Capacity Building
● Facilitate sharing of knowledge of potential for restorative sustainability perspectives that include place, energy, water, waste, resources, health, equity, and education.
● Increase and enhance knowledge and strengthen collaboration among research centres, universities, education entities, companies, NGOs and the built environment related industry sectors.
● Advance awareness and implementation of new required practice approaches, methods and technologies that build and improve upon existing best practices.
● The creation and reinforcement of a network of professionals (architects, engineers, constructors, urban planners, etc.) able to tackle emerging environmental challenges.
● To foster continued collaboration beyond the completion of this action.
● The preparation of H2020 applications.

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TECHNICAL ANNEX

1. S&T EXCELLENCE

1.1. Challenge

1.1.1. Description of the Challenge (Main Aim)

The RESTORE COST Action will affect a paradigm shift towards restorative sustainability for new and existing buildings and space design across Europe. Despite over a decade of built environment sustainability strategies and programs, these based on climate change targets of capping global warming to 2deg C, progress has failed to address key sustainability issues in a meaningful way. With the Paris 2015 Agreement intent of targeting global warming at 1.5 ℃, the sector no longer has the luxury of being incrementally less bad: it requires an urgent shift to net-positive, restorative sustainability thinking.

The built environment is a pivotal part of the climate change problem, heavily contributing to an impact of 40% on energy and water, carbon, and waste. It is also a key in climate change solutions, not only reducing but also creating net positive impacts. Research is demonstrating that built environment impact accounts for example 12% water, 39% CO2, 65% waste, 71% energy consumption and the potential improvement of green building is estimated to be energy 24-50%, CO2 emissions 33-39%, water 40% and waste 70%.

Sustainability (1) (See definitions below) in buildings and cities, as it is understood and practiced today, is now being recognised as an inadequate measure for current and future building design, for it aims no higher than to make buildings “less bad”. Alternatively a Restorative approach (2) to the built environment (3) has an enormous and unexplored potential to improve such impact. Although the impacts call for the need of adequate technical actions, there is a broad range of qualitative perspectives that are poorly considered by the built environment and by European regulatory frames.

Thus, within the built environment sustainability agenda, the RESTORE action proposes to expand on a narrow focus on building energy performance, mitigation strategies and limiting of environmental impacts, moving towards a broader framework that regenerates places (4) and enriches people, ecology, culture, and climate at the core of design, construction and operation activities, with a particular emphasis on concepts such as health, biophilia (5), and links to the natural ecosystem.

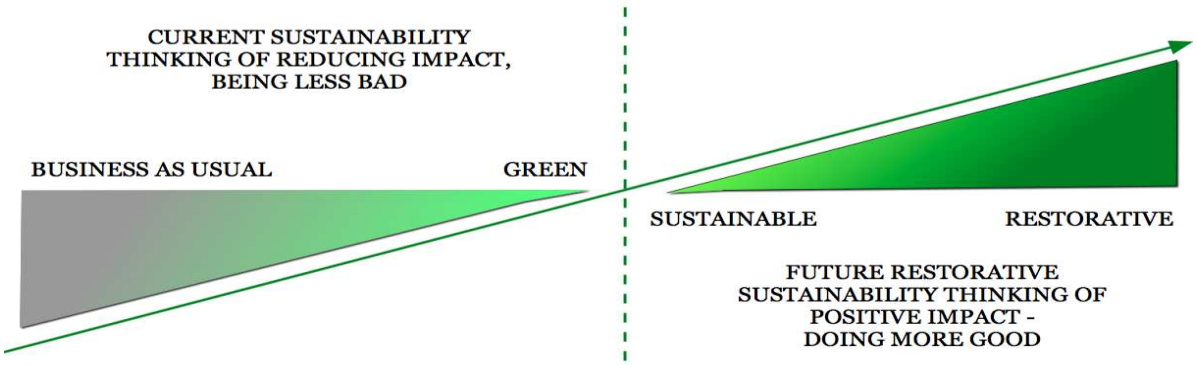
The RESTORE Action will specifically address the complexity of a broader range of quantitative and qualitative thinking throughout its actions, seeking opportunities and innovations that will enable multiscale (‘scale jumping’ – 6) thinking from the human microscale to the building/space mesoscale of city and ecosystem dimensions. A mixed network of researchers, built environment practitioners, green building consultants and agencies will enable the feasibility of this multi-scale thinking approach. The multidisciplinary approach and its scientific, design based, effectiveness is achieved by involving expertise drawn from ecology, economy, sociology, design and planning, construction, human health and wellbeing, design, mechanical engineering, production of materials.

The RESTORE COST action will investigate how a new focus of sustainable built environment can be a driving force for changing the status quo of today's practice beyond legislation and client requirements. Sustainability targets are becoming broader and deeper, forcing designers to embrace forward thinking, access and implement multidisciplinary knowledge, and multiple tools that simulate dynamic and complex future scenarios.

The RESTORE COST action will advocate, mentor and influence restorative built environment sustainability through working groups, training schools (including instructional design competitions) and Short Term Scientific Missions (STSMs).

Key Definitions:

(1) *Sustainability* is defined as seeking to limit damage caused to socio-economic and ecological systems.
(2) *Restorative Sustainability* is defined as restoring the capability of socio-economic and ecological systems to a health state.
(3) *Built Environment* - a collective description for the design, construction and operation of building, infrastructure and related projects.
(4) *Regenerative Sustainability* is defined as regenerating relationships that allow of socio-economic and ecological systems to continuously evolve.
(5) *Biophilic Design* - is defined as design that improves health through connection with nature. (*biophilia* - "our innate relationship with nature")
(6) *Scale Jumping* is defined as the potential for sustainability solutions to be implemented at a scale beyond individual building projects



1.1.2. Relevance and timeliness

The existing EU and Member State 'sustainability standards' are currently driving improvement yet on an incrementally 'less bad' approach that seeks to limit environmental and sustainability damage, Emerging 'restorative standards' based on ecology, equity and health, determine the required vision and then 'back cast' as to what is required within design, construct and operational practice. It is recognised that incremental 'less bad' change is no longer sufficient. Embracing restorative sustainability to address health, energy and climate change issues is needed, and has the associated potential to benefit business and competitiveness for Europe.

To date, European and Member State sustainable targets can be seen as narrow and energy centred. Reducing energy consumption a priority under the Energy Performance of Buildings Directive (EPBD) and the 2020 and 2030 objectives on energy efficiency. While the proposal places energy as one target, it is observed how European directives are the driver of designs and urban planning that neglects the multiple possibilities offered by a Restorative Sustainability

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approach. The RESTORE action will timely progress the transaction from an energy centric approach to a more holistic sustainability approach to also embrace a health and socially just impacts, benefits and relationships with natural ecosystems.

While energy receives a great deal of focus in terms of building sustainability, it today is estimated that at least 10% of health care costs can be attributable to the impact of our built environment, resulting, for example from poor air quality, low levels of comfort, toxicity of building materials and a disconnect from the health benefits of biophilic design.

The influence and impact of the built environment extends beyond the building. Restorative sustainability seeks to address the ecological and social impacts, upstream impacts from e.g. material sourcing, the impact of construction activity and the downstream influence of buildings to enable or restrict users' health and sustainability behaviors.

1.2. Specific Objectives

1.2.1. Research Coordination Objectives

The RESTORE Action addresses the creation, advocacy, dissemination and implementation of research evidence that can inform restorative sustainability practice within the built environment on health, wellbeing, energy, resource use, biophilia and link to ecosystems at multiple scales.

The RESTORE Action aims are:

- To increase knowledge, collaboration and timely knowledge transfer among research centres, universities, education entities, companies, NGOs and the built environment related industry sectors.
- The pre-development of new compulsory design approaches, processes and technologies that can build and improve upon existing best practices.
- The creation and reinforcement of a European network of skilled professionals (architects, engineers, constructors, urban planners, academics, sustainability practitioners, etc.) able to face the complexity of a broader agenda of environmental strategies.
- Fostering continued collaboration beyond the completion the RESTORE action. The network members are change agents.
- The inclusion of Restorative sustainability criteria within education curricula, thus preparing the next generations of building practitioners.
- Stimulate a major academic research focus on Restorative approaches to design; this is founded on multidisciplinary research collaborations.

The RESTORE Action, through its working groups will focus on Restorative Sustainability, progressing from 'business as usual' built environment sustainability, providing a pathway to Regenerative Sustainability.

1.2.2. Capacity-building Objectives

The RESTORE Action capacity building objectives are to:

- Facilitate sharing of knowledge of potential for restorative sustainability perspectives that include place, energy, water, waste, resources, health, equity, and education.
- Increase and enhance knowledge and strengthen collaboration among research centres, universities, education entities, companies, NGOs and the built environment related industry sectors.
- Advance awareness and implementation of new required practice approaches, methods and technologies that build and improve upon existing best practices.

- The creation and reinforcement of a network of professionals (architects, engineers, constructors, urban planners, etc.) able to tackle emerging environmental challenges.
- To foster continued collaboration beyond the completion of this action.
- The preparation of H2020 applications.

1.3. Progress beyond the state-of-the-art and Innovation Potential

1.3.1. Description of the state-of-the-art

The evidence of climate change, and its effects on legislative requirements, and market demands, has moved the sustainability agenda to an important and core position. However, although every of the professionals involved with the build environment sector declare to embrace sustainability as the primary driver of their ethos, restorative sustainability has been achieved at a disappointingly small scale. Efforts can be further encumbered by energy and environmental targets legislated under building codes, which in their negotiation between ambitions and market readiness often default to the latter. Both EU Regulation and Voluntary Certification Systems focus on limiting damage to the environment with scarce attention towards regenerative, restorative design. Today there is an increasing, yet limited, number of Restorative projects in Europe and outside its boundaries. Some of the projects are intended to be demonstrational. (The Bullitt Center, USA; The EAU Enterprise Centre, UK; The UBC CIRS Building, Canada; The Edge, Amsterdam; Geelen Counterflow, Netherlands :Snøhetta's Powerhouse Kjørbo, Oslo).

It will also review lessons learnt from the emerging sustainability standards that are based on ecological, social and equitable restorative and regenerative philosophies and advocacy. Some of these standards adopt a back casting approach that envisions a desired future and then back casts the required actions to achieve. (Examples of these standards include The Natural Step, Living Building Challenge, Well Building Standard, One Planet Living, Planet Mark). State-of-the-art reviews will therefore inform a new set of parameters that describe the higher levels of performance needed in the built environment of the future, and in so doing provide guidance, examples and an active and engaged community of experts and practitioners to deliver new models.

1.3.2. Progress beyond the state-of-the-art

The RESTORE Action will:

- Recognise and disseminate the paradigm shift required to move from the energy-centric sustainability thinking to human and ecosystem-based sustainability.
- Create the bases for academic research within the field of restorative design.
- Enable practitioners to integrate the processes, methods, and tools for the implementation of Regenerative Design.
- Create the foundations of evidence based Regenerative design while negotiating through the constraints and opportunities of standards and regulations.
- Equip educators to influence architecture students at the early stages of their professional career.

The RESTORE network will:

- Promote a wider definition of sustainable design in practice, relating to the development, testing and implementation of restorative sustainable solutions.
- Encourage practitioners to think beyond the boundaries of their professional specialisations, through multidisciplinary collaboration to enable effective communication between all actors involved at all stages of the design, construction, and operation of buildings.

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- Draw in expertise from other scientific domains such as ecology, geography, biology, physiology, and psychology.
- Share knowledge as it develops and evolves.
- Encourage adoption of integrated strategies, processes, methods, and tools of sustainable design.

1.3.3. Innovation in tackling the challenge

The RESTORE network will explore:

- The new challenges facing the built environment. Today, the “reduce, reuse, recycle” and “building green” paradigms, together with the limitation of environmental impacts and the enactment of mitigation strategies, only partially capture the drivers of current and future design challenges.
- The climate change impact on and of the built environment, the creation of rich ecosystems, the prioritization of human health and well-being, user-friendly building operation strategies, and up-cycling of construction products are the next generation of design targets, and represent a radical shift from the energy-driven and carbon-centred notion of sustainability that, for many years, has been the exclusive remit of mechanical engineers and environmental consultants.
- The opportunity to positively regenerate ecosystems through design and building operations. The building industry is being called upon to fully embrace advances in research that support new targets, expanding design scenarios and exploiting traditional and advanced processes, methods and tools to conceive, develop, test and implement innovative solutions that celebrate the richness of design creativity while providing comfort to users in harmony with the enrichment of urban and natural ecosystems.

1.4. Added value of networking

1.4.1. In relation to the Challenge

Across EU, the network envisions an emerging perspective on sustainability within the built environment sector. This perspective departs from current building practice that equates sustainable with “less bad”, and moves towards a philosophy that buildings and cities can be actively positive for the environment. This emerging perspective is, at present, limited to a few pockets of practitioners and researchers’ (some are part of the network), theory and research. By sharing, developing and promoting awareness of a new restorative sustainability perspective through networking and related activities, the RESTORE network will;

- add value and synergy, and enable progress to a sector that is socially just, ecologically restorative and culturally rich;
    - socially just through an improved salutogenic and biophilic health focus to benefit the wellbeing of every individual, and through energy solutions to eliminate resource dependence and fuel poverty;
    - ecologically restorative through an improved relationship between buildings and the environment, with benefits such as increased biodiversity within the places we live and work;
    - culturally rich through facilitating new growth within the deep green build sector, a market estimated to be growing at 22% per annum;
- encourage “Thinking Differently” from established built environment practices and working methods – fostering a responsible collaborative, lean and sustainable building sector;
- investigate the possibility to integrate unexplored opportunities within the built environment (e.g., food production appropriate to the scale and density of buildings);

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- Identify scale jumping for restorative sustainability from the building level to the community and smart cities level (focus of Working Group 5).

1.4.2. In relation to existing efforts at European and/or international level

The RESTORE Action will:

- Address, develop and promote the embryonic restorative sustainability efforts that exist, or are emerging, within the EU, for example within the UK, Italy, Romania and Sweden. The activities taking place at a European level are generally based on a top-down approach: EU regulations and directives, addressing the topics of sustainability, energy efficiency and reduction in resource consumption, R&D projects financed with EU funds, technical harmonization through the European Committee for Standardization (CEN), subsequently implemented at a national level.
- The RESTORE will address a bottom-up approach, working to implement new policies at regional and local level through a radical change in respect of culture and practices. Furthermore, the aim is implement R&D projects addressing the themes of RESTORE's work packages in order to integrate RESTORE's best practice within scientific development.
- In addition, the RESTORE Proposal will address, develop and promote the embryonic and emerging restorative sustainability efforts internationally, for example, those developed and tested in the USA, Canada, Australia, and New Zealand and in early stages within the EU. In these cases, a strong emergent development of rating systems and tools for sustainability has taken place in recent years, addressing the lack of standards regulating or promoting restorative sustainability at a national level. The RESTORE Proposal aims to benefit from global best practices and policies specifically addressing restorative sustainability development in the EU.

2. IMPACT

2.1. Expected Impact

2.1.1. Short-term and long-term scientific, technological, and/or socioeconomic impacts

Increasing awareness and sharing of practices aligned to restorative sustainability is one of the main targets of the proposal. Restorative sustainability is a relatively new endeavour within the built environment, and in light of such an early stage, sustainable networking is essential for shaping the methods and direction of work to be undertaken. The RESTORE Action's Working Groups will bring together people across Europe from different backgrounds with relevant expertise and knowledge to contribute towards shared goal of collaborative outcome reporting.

More specifically the network will support intensive, action learning European workshops (in different European cities) that beta tests restorative sustainability within a design competition environment. The workshops will include public administration and communities, local investors, industry, thought leaders and academics working together with practitioners of the built environment (for example EU early career architects, engineers and consultants under 35 years). The workshop participants will receive ECTS - European Credit Transfer and Accumulation Scheme and CPD, Continuing Professional Development for professionals. Media coverage will contribute to both a local and an international debate.

The Restore Action will provide opportunities for career development within the ever widening built environment sustainability scope. Participants and partner institutions interested in restorative sustainability will be able to engage in the Action activities to develop skills, influence practice and

produce publishable outputs. Output publications, networking and collaborations will further enhance participants' research and practice career development.

The proposal expects to have short and long term impacts in the EU Built Environment sector through influencing practice, research, education, investors and public administrations. It will catalyse new methods and solutions for whole-system, inter-disciplinary, collaborative approaches to design, construction and operation of buildings through networking and outputs, creating competences, and workshops open to a broad audience of stakeholders. In addition, it is foreseen restorative sustainability will be included within the academic research and education foci of the academic Acton partners. The activity and outcomes of the Action will be disseminated in relevant papers, blogs, journals and an edited book.

Long term outcomes of the Action working groups, will, collaboratively further enable adoption of new, European based restorative sustainability programmes. Outputs will catalyse new methods and solutions for whole-system, inter-disciplinary, collaborative approaches to design, construction and operation of buildings. The outputs from the Action working groups, by being significantly based on European leading universities participations, will encourage the inclusion of restorative sustainability criteria within academia research and specifically education curricula will be impacted for the preparation of the next generation of built environment practitioners.

2.2. Measures to Maximise Impact

2.2.1. Plan for involving the most relevant stakeholders

Knowledge and improved understanding on restorative sustainability from the Action will be channelled through a series of workshops.

The output of the action will enhance knowledge and competence and offer a framework for advances in the practice of restorative thinking. The outputs of the COST are not intended to be bound to specific professional, and it is anticipated to have a broad international impact. The action will spread outside of the main stream built environment practitioners, for example engaging in dialogues with other key areas such as sustainable agriculture, ecosystem modelling and smart transport.

The RESTORE network of proposers is a collaborative of leading sustainability practitioners, with a common believe that a restorative sustainability it is necessary to impact the European built environment. The Action proposal includes Restorative Sustainability advocates, influencers, amplifiers and leaders, in association with organisations interested in expanding the scope of sustainability. This Action proposal aims to involve a number of key leading-edge practitioners and researchers across the EU, and connect them with a wider group of stakeholders. These activities include educational design competitions as part of COST Training Schools and Short Term Scientific Missions (STSMs), involving participation from professional organisations and Public bodies (e.g. municipalities).

The RESTORE MC team and partners will constitute a cross-border network on the theme of Restorative Sustainability. The network's membership has been selected to include diversity according to geographical representation, age and gender balance. In addition the network is a mix of practitioners and academics that crosses typical academic networks and professionals association, thus the impact is considered to be transversal and potentially exponential.

This includes participants from less research-intensive countries across Europe, including Albania, Hungary, Latvia, Poland, Romania and Slovenia, representing about one third of the total of the proponents. There is still a significant gap between European countries in the application of EU

directives in this field (e.g. Energy Performance of Buildings Directive, EPBD recast). RESTORE can be an effective platform for exchange of knowledge and good practices to try to bridge this gap.
RESTORE will facilitate a wider international focus and cooperation. Further widening and development of the proposal will follow this same philosophy and values. The network will encompass a range of industrial SME partner participation across EU member states, including built environment NGO's, industry advisors and SME organisations, ensuring a wide input of restorative sustainability knowledge. The RESTORE proposal also includes experienced individuals and, importantly, young practitioners in the built environment sector and in related educational establishments.

The RESTORE Action information database and social media communication channels will enable stakeholders, organisations and individuals with focused expertise to develop relevant outcomes, papers or practice strategies. More specifically, to enable the effective coordination and management of the proposed network, the RESTORE Action will establish a stakeholder's information database, hosted on the Actions website. To enable efficient and effective communication of COST Action development, outcomes, innovative thinking and related content, a social media based communication network will be created.

2.2.2. Dissemination and/or Exploitation Plan

The RESTORE Action will disseminate findings, outputs and deliverables across a number of media and communication platforms, including: State-of-the-art papers, reports, journal articles, conference presentations, and externally funded bids.

The RESTORE proposal is based on a series of deliverables, including a mentoring program, an interactive website, and a book. Specifically, a book will be the base for a future framework that could inform the policy at standards level, inspiring the revision of, for example, EN 15643-Sustainability of construction works.

The RESTORE Action will through its working groups develop and disseminate an "Atlas of Solutions" being a catalogue of solutions that will enable and facilitate the creation of restorative sustainable built environment.

The mentoring programme for young practitioners deploys through educational design workshop as part of COST Training Schools, and related initiatives such as Short Term Scientific Missions (STSMs). An interactive website and a book that Focus on "Strategies, Methods and Tools for Restorative Design in Europe". The website will have interactive contents for the larger public, while the book (which is also an available pdf) covers the theoretical and practical implications of Restorative Design.

Both the interactive website and the book cover topics that correspond to the WGs later introduced:

- The Evolving Agenda of Restorative Design, which introduces to the evolving spectrum of paradigms, design challenges, opportunities, and perspectives for sustainable architecture and urban design. It discusses the knowledge, skills, and competence that should inform and orient the practice shift required by an approach to architecture informed by restorative sustainability.
- Processes, Methods and Tools for Restorative Design. Primarily based on case studies derived from the workshops, it constitutes the core of the action and intends to provide "hands-on" guidance to the practice of restorative design.
- Structure and Work Flows in Professional Design Practice. Grounded in a dense dialogue among the stakeholders involved in RESTORE, it focuses on the application of knowledge of

sustainability in professional practice and on the flows of exchanges between and across disciplines that can facilitate innovation. This also includes consideration of visualisation and communication skills (e.g., for sharing sustainable design proposals values and qualities with other members of the team and clients) in the context of an iterative and integrated design process

- Norms and certification system. This part will discuss an examination of the economic benefits and costs of restorative sustainability and how the EU regulatory system may evolve toward the promotion and the implementation of a restorative agenda.
- Scale Jumping. This part discusses synergies from the micro to the macroscale of design.
- New grant funding and submission of common H2020 projects will be exploited.

2.3. Potential for Innovation versus Risk Level

2.3.1. Potential for scientific, technological and/or socioeconomic innovation breakthroughs

During last two decades, scientific and technological innovation has focused on the preparation of assessment systems and indicators to promote a basic level of sustainability. Objections can be raised concerning different interpretations of sustainability as it is proposed by EU norms and today evaluation methods and assessment systems orient design choices by awarding high or low sustainability (mostly energy based) score. It is evident that this approach has contributed to disseminate a working mode in practice. One of the focus of the COST application is to focus on the new knowledge (theoretical and applied), the skills, and the competence that can support new working models that look beyond the frame of static assessment methods, and that could lead to solutions characterized by a wider range of integrated qualitative and quantitative restorative sustainable performances.

The aim is therefore to stimulate the Development of New Knowledge, Skills and Competence at research and practical level on the bases of multidisciplinary collaborations not commonly possible in standards research projects. The RESTORE Action will bring together European sustainability researchers, experts, and practitioners across a wide spectrum of disciplines to create a unique and collaborative knowledge based community. Through its participants and working groups it will seek to remove barriers that exist in preventing progress from sustainability to restorative sustainability.

3. IMPLEMENTATION

3.1. Description of the Work Plan

3.1.1. Description of Working Groups

WG0. PROJECT COORDINATION AND COMMUNICATION	
The general coordination, administration and communications activities of the project. It includes the Management Committee (MC) members. See attached work plan for the main tasks scheduled.	
Objectives	Project coordination and communication. Development and coordination of Information Database and Communication Channels.
Methods	Coordination, administration and funding, communication and dissemination.
Activities	Project management, project administration and finance, fundraising, project communication, project dissemination.
Milestones	Progress report 1 = month 12; PR 2 = month 24; FA = month 48

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List of major deliverables	Short term: Project management reports (progress reports, etc.), accounting reports (Intermediate Financial Report, etc.), grant application, website, mid-programme conference, collated output and results from restorative sustainability STMS, determination of end of RESTORE Action final report content and report.
	Long term: Curation of the "Atlas of Solutions" (described under 2.2.2), a catalogue of solutions that facilitate the creation of restorative buildings. Development and promotion of final conference, reports and book.
Topics include:	Coordination, Communication, Output Management and Wrapping Up.

WG1. RESTORATIVE SUSTAINABILITY	
The Evolving Agenda of Restorative Design, which introduces the evolving spectrum of paradigms, design challenges, opportunities, and perspectives for sustainable architecture and urban design. It discusses the knowledge, skills, and competence that should inform and orient the practice shift required by an approach to architecture informed by restorative sustainability.	
Objectives	Define the influence of the built environment as a contributing cause / factor and potential solution to address climate change.
Methods	Analysis of the state-of-the-art, increasing awareness, mentoring of practitioners and professionals, dissemination.
Activities	New paradigm definition + gap analysis, short-term scientific missions, training school, events, and papers.
Milestones	M1 = month 6; M2 = month 11
List of major deliverables	Short term: State of the art + new paradigm report, STSM reports, design competition, conference presentations and articles.
	Long term: Produce training materials, Contribute to the "Atlas of Solutions" (described under 2.2.2), a catalogue of solutions that facilitate the creation of restorative buildings, University curricula (Under Grad / Post Grad, Masters).
Topics include:	Ecology (soils, carbon, nature), Place, Bio-Climate, Health, Energy, Water, Equity and Education.

WG2. RESTORATIVE DESIGN PROCESS	
Processes, Methods and Tools for Restorative Design. Primarily based on case studies derived from workshops, it constitutes the core of the action and intends to provide "hands-on" guidance to the practice of restorative design.	
Objectives	Design process analysis, solutions and implementation.
Methods	Analysis of the state-of-the-art, increasing awareness, mentoring of practitioners and professionals, dissemination, Review of existing standards and networks in respect of restorative sustainability approaches and development, Gap analysis, short-term scientific missions, training school, events, papers.
Activities	New paradigm definition + gap analysis, short-term scientific missions, training school, events, and papers.
Milestones	M3 = month 16
List of major deliverables	Short term: State of the art + new paradigm report, STSM reports, design competition, conference presentations, and articles.
	Long term: Produce training materials, Contribute to the "Atlas of Solutions" (described under 2.2.2), a catalogue of solutions that facilitate the creation of restorative buildings, University curricula (Under Grad / Post Grad, Masters).
Topics include:	Biophilic Design, Bio-Climate Design, Cradle to Cradle, Design for Deconstruction, Circular Economy.

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WG3. RESTORATIVE BUILDING AND OPERATIONS	
Impact and innovations for a restorative approach to construction and operations (facilities management).	
Objectives	Regenerative building analysis, solutions and implementation.
Methods	Analysis of the state-of-the-art, Existing and former network efforts, Review of existing standards in respect of restorative sustainability approaches and development.
Activities	New paradigm definition + gap analysis, short-term scientific missions, training school, events, and papers.
Milestones	M4 = month 21, M5 = month 26
List of major deliverables	Short term: State of the art + new paradigm report, STSM reports, design competition, conference presentations, and articles.
	Long term: Produce training materials, Contribute to the "Atlas of Solutions" (described under 2.2.2), a catalogue of solutions that facilitate the creation of restorative buildings. University curricula (Under Grad / Post Grad, Masters).
Topics include:	Lean construction, Zero Waste, Material Conservation, Modern Methods of Construction.

WG4. RETHINKING TECHNOLOGY	
Impact and influence of built environment technologies for a restorative sector.	
Objectives	This working group will explore the potential for further implementation of such interactive systems and technologies in new and existing buildings.
Methods	Analysis of the state-of-the-art, increasing awareness, mentoring of practitioners and professionals, dissemination.
Activities	New paradigm definition + gap analysis, short-term scientific missions, training school, events, papers
Milestones	M6 = month 33, M7 = month 39
List of major deliverables	Short term: State of the art + new paradigm report, short-term scientific missions, training school, events, and papers.
	Long term: Produce training materials, Contribute to the "Atlas of Solutions" (described under 2.2.2), a catalogue of solutions that facilitate the creation of restorative buildings.
Topics include:	Information Management, Digital, Smart (Buildings, Cities), Production (3D), Nanotechnology, Transportation, Communications and Social Media (restorative education and learning).

WG5. SCALE JUMPING	
Thinking beyond the building, identifying scale jumping potentials to neighbourhood and city level sustainability.	
Objectives	This working group will explore scale jumping potentials including analysis, solutions, and implementation.
Methods	Analysis of the state-of-the-art, increasing awareness, mentoring of practitioners and professionals, dissemination.
Activities	New paradigm definition + gap analysis, short-term scientific missions, training school, events, papers
Milestones	M8 = month 43
List of major deliverables	Short term: State of the art + new paradigm report, short-term scientific missions, training school, events, and papers.

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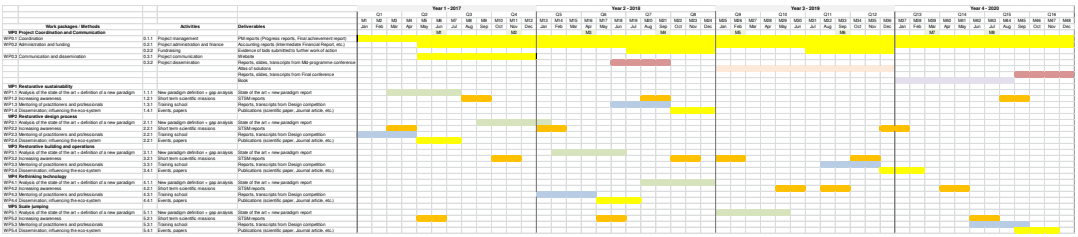
	Long term: Produce training materials, Contribute to the “Atlas of Solutions” (described under 2.2.2), a catalogue of solutions that facilitate the creation of restorative buildings.
Topics include:	Building as Clusters, Buildings as nodes in Nano and Micro Grids (energy, water, transport, communications), Neighbourhoods, Smart and Eco Cities.

As noted all working groups will contribute to the Action’s “Atlas of Solutions” a catalogue of solutions that facilitate the creation of restorative buildings.

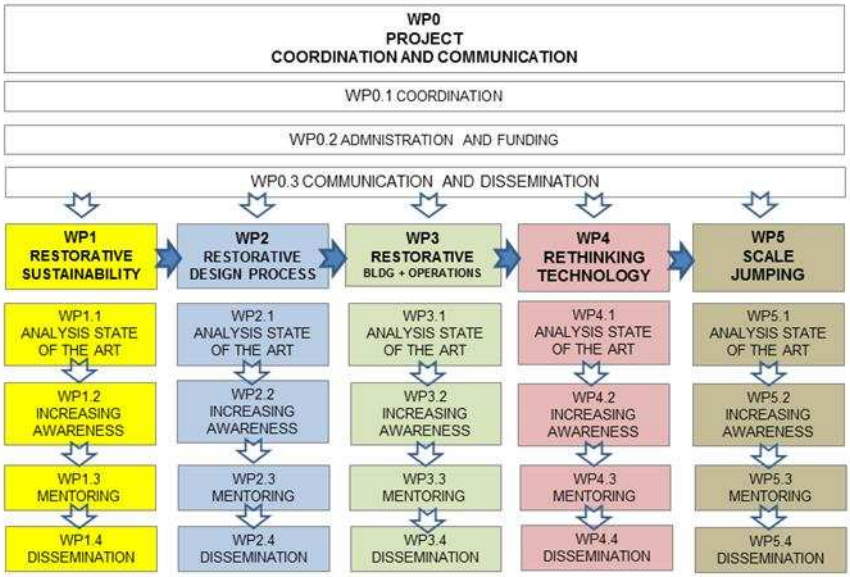
3.1.2. GANTT Diagram

Please refer to following diagram for details.
Each year, a minimum of two face-to-face meetings of the Action WG’s and the MC will take place.
Virtual meetings of all groups will occur a minimum of quarterly.
Specific annual activities will include:

- Year One: Kick off meeting: setting up the Action and website, scoping topic areas, building a web-based reference portfolio of existing work undertaken by Action members.
    - 1 COST Training School. 4 Short Term Scientific Missions (STSMs).
- Year Two: Completion and publication of scoping work/ reviews. Agreement on WG activity for the remainder of the Action. First studies designed and set up. Grant applications submitted.
    - 2 COST Training Schools. 4 STSMs. Mid-Programme Conference.
- Year Three: consolidation, continuation. Results of studies submitted for publication.
    - 1 COST Training Schools. 4 STSMs.
- Year Four: Synthesis of work. Ongoing studies, publications (e.g. a book summarizing the action’s results), grant applications.
    - 1 COST Training Schools. 4 STSMs. Final Action Conference.



3.1.3. PERT Chart (optional)



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3.1.4. Risk and Contingency Plans

Planning for risk and contingency is an ongoing process and will take place at all phases of the Action life cycle, from initial concept to closeout. At closeout, the lessons learned in risk and opportunity management throughout the project will be an important contribution to the success of future projects.

The main risks anticipated include delays in the development of activities (conferences, workshops), insufficient level of quality for the deliverables (papers, books), lack of resources dedicated to the project by a partner (participation in STSMs), change of contact persons and/ or project managers, or the withdrawal of a partner. Milestones are set at minimum twice a year and checked for progress and completion during meetings of the MC (see Gantt diagram summary at par. 3.1.2), in order to periodically monitor the project and promptly implement any corrective action needed.

Risk management will be performed through process steps described in IPMA 3.0 competence baseline framework (or similar internationally recognised), developed by the International Project Management Association. In the following table main activities of the project have been evaluated with regard to the impact (I) on success of their low performance, the probability (P) for it and the magnitude of risk (R=IxP). The RESTORE Management Committee (MC) will focus on the activities with higher risk.

				Risk and probability of low performance		
	Work packages / Methods	**Activities**	**Deliverables**	I	P	R=IxP
WP0	**Project Coordination and Communication**					
WP0.1	Coordination	Project management	PM reports (Progress reports, etc.)	4	2	**8**
WP0.2	Administration and funding	Project administration and finance	Accounting reports (Intermediate Financial Report, etc.)	4	2	**8**
		Fundraising	Grant application	3	4	**12**
WP0.3	Communication and dissemination	Project communication	Website	2	2	**4**
		Project dissemination	Mid-programme conference	3	2	**6**
			Atlas of solutions, final conference and book	4	3	**12**
WPx	**Work package "x"**					
WPx.1	Analysis of the state of the art	Gap analysis	State of the art report	3	3	**9**
WPx.2	Increasing awareness	Short term scientific missions	STSM reports	4	3	**12**
WPx.3	Mentoring of practitioners and professionals	Training school	REGENERATION style design competition	4	3	**12**
WPx.4	Dissemination; influencing the eco-system	Events, papers	Conference presentations, articles	3	3	**9**

RESTORE contingency plan includes:

- Time contingency - scheduling an adequate preparation and execution time for the activities, e.g.: “analysis of the state of the art” activities = 5 months, “increasing awareness” = 2 months/STSM, “mentoring” = 4 months/training event, “dissemination” = 4 months/conference.
- Budget and cash contingency: Over and under spend of funds is an anticipated risk, which will be addressed through close budget management and the timing of events in relationship to COST funding cycles. Effective budget reconciliation, especially within the final stages and months of the budget cycles will be essential and closely managed. There will be external short-term funds available for unexpected demands during the project life cycle.

3.2. Management structures and procedures

Management of the project is specifically included as the first working group and work package of the project. The overall management of the Action will be undertaken by the Management Committee (MC). More immediate management will be undertaken within Working Groups (WG). WGs and work packages (WP) are strictly interrelated, so each WG is to this extent independent in the management and delivery of the final result of their WP while working under the coordination of the main proposer.

The entire project will be managed using the tools of Project Management, according to the IPMA 3.0 competence baseline framework (or similar internationally recognized), developed by the International Project Management Association. Certified under ISO/IEC 17024 project managers

will have key roles in WG0. Project Coordination and Communication. Working group activities will typically be coordinated by expert facilitators. Each year, a minimum of two in-person meetings of the WGs and MC will take place. Virtual meetings of all groups will occur a minimum of quarterly. See work plan at par. 3.1.2.

3.3. Network as a whole

The Network of proposers has been assembled in order to create an optimal balance among experts belonging to universities, research centres, Industry SMEs and NGOs. The main objective is to facilitate the interplay between the academic world and the market in fostering and developing advanced expertise, with the possibility to implement new policies with the help of NGOs typically working in close connection with public bodies and policy makers.

The consortiums will allow for exchange of expertise among north-western and south-eastern EU countries, which experience different climate needs and architectural conditions, as well as different stages of maturity in terms of sustainability awareness. This approach is of crucial importance to ensure a common rate of implementation amongst the project partners.

The number of countries (19) and proposers (33) is considered appropriate to develop activities proposed and to address the challenges related to the themes of the working groups. The core expertise of the Network is a good balance across civil, environmental and engineering, economic and educational disciplines. The average number of years elapsed since PhD graduation is around 8 that will guarantee a robust scientific accuracy of the proposal's outcomes. The gender ratio approximately 60/40 promotes women's inclusiveness, while the ratio between business enterprises and research centres/universities/NGOs is 50/50; this will allow for well-balanced technology transfer, increasing confidence and potential for effective transfer and adoption of the Action's scientific outcomes within the built environment sector.

The Action also includes IPCs and NNCs. IPCs involved will bring great value to the project from a cultural, technological and above all methodological point of view. This will be crucial from a strategy perspective, given that the most advanced and effective sustainability principles will need a robust action plan to be concretely implemented in the market. Subsequently, IPCs could benefit from the analysis of the technological and regulative EU framework.

The involvement of NNCs will help to establish a cultural and technical bridge between countries with more advanced experience in the implementation of EU energy efficiency directives to those experiences challenges. COST member countries will also benefit from the opportunity to initiate new scientific and business relationships outside the EU, building on partnerships established by the MC with organizations in the US, Canada, Australia and New Zealand.