

Cultural heritage, climate change and security

1. Theme and area of the Joint Programming Initiative (JPI)

European and global challenge

This theme on cultural heritage is a key European challenge because:

- Most European citizens live in or around cultural heritage with which they identify closely because of the uniqueness and irreplaceable value of historic buildings, collections and sites for their tangible and intangible values
- Climate change impacts severely on cultural heritage leading to irreversible damage and losses because of its age and fragility which we owe present and future generations to protect and conserve as symbols of their culture and history
- Security risks threaten in catastrophic ways the physical nature of cultural heritage assets as symbols and icons of European cities and towns that are widely reported by the Media thus demonstrating the central role that cultural heritage has in the lives of communities
- The combined effects of climate change and security threaten the existence of the cultural environment of Europe that has developed and shown resilience over millennia
- Before these combined risks to Europe's cultural heritage become irreversible threats, concerted action is needed to protect, strengthen and transform the unique historic environment of Europe

The challenges related to cultural heritage have several complex strands:

1. Challenge 1 probes the relation between cultural heritage (i.e. historic cities and towns, landscape, archaeology, ancient buildings and collections of artefacts) and one of the most serious drivers of future change for communities - *climate change*. Climate change impacts severely on cultural heritage. The ways in which cultural heritage is adapted can mitigate climate change (through modest use of energy, sustainable materials and passive design). This in turn also opens up new avenues for mitigation and adaptation measures across all sectors from construction to transport through re-learning of old traditions and practices.
2. Challenge 2 probes the issues of *protection and security of cultural heritage*. Here the global dimension is very clear: European conservation and security of cultural heritage can only be delivered against an improved understanding of the global context. Climate change is driving the need to consider the whole assemblage and its context in the 21st century so that faced with cultural and environmental challenges, our understanding and the resilience of cultural heritage will be transformed.
3. Challenge 3 probes the relation between the protection of cultural heritage and its cultural uses by society i.e. *the transformational challenge of cultural heritage*. The new relationships between cultural heritage and its meaning, history, value, significance, composition, conservation and use are community related issues that will "drive" cultural heritage more strongly under conditions of environmental change because communities are faced with cultural as well as economic decisions on what to save and what to lose. This includes the protection of Europe's intangible heritage

which expresses its common identity, including the development of solutions to problems of reintegration of “forgotten” heritage (such as social and cultural rehabilitation of abandoned buildings and localities that often symbolise minority cultures).

Among the representatives of many Member States and Associated Countries, and within professional bodies and associations there is intense discussion of these three challenges which are central to the understanding by decision makers of man’s relationship to cultural heritage.

The protection of cultural heritage under climate change conditions will be a major concern for decision makers and researchers in Europe. It will be viewed as a measure of the enduring civilisation of Europe as well as sustained recognition of its worldwide leadership in this research area. In a changing society, the quality of that society is sustained by its appreciation of the endeavours of human creativity such as monuments, historic buildings, urban complexes and cultural landscapes. This appreciation is in turn profoundly influenced by the survival of the physical cultural heritage. But in order for cultural heritage to survive, it needs to be protected, but it will only be protected if the strategies, methodologies and tools needed to protect and secure cultural heritage from natural catastrophes and man-made disasters are developed. These are the gaps that this JPI needs urgently to overcome.

While this theme will reinforce very interesting collaborations in Europe, it will also open opportunities for collaboration with non-European partners, including countries on the southern shores of the Mediterranean Sea, the emerging economies of BRIC (Brazil, Russia, India and China), Byelorussia and Ukraine whose histories are entwined with EU member states in the east, as well as the technologically advanced countries of USA and Japan. In addition this JPI is networked to international organizations including the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), the International Council on Monuments and Sites (ICOMOS), the Council of Europe and Europa Nostra.

This JPI is timely because of:

- the high level of research maturity of the pan-European cultural heritage sector
- the degree of preparation of the sector to deliver the three challenges of this JPI
- the advanced degree of preparation of the team supporting this JPI
- the balanced composition of the Member States and Associated Countries supporting this JPI

Policy relevant focus

- There is a strong and clear position in the EU policy that The Community shall contribute to the flowering of the cultures of the Member States and Associated Countries, while respecting their national and regional diversity and at the same time bringing the common cultural heritage to the fore. Action by the Community shall be aimed at ... supporting and supplementing action in the following areas...- *conservation and safeguarding of cultural heritage of European significance*¹.
- These provisions of the Treaty on European Union were further clarified by the Council Conclusions of June 17, 1994, in which The Council points out that Article 128 of the

¹ Treaty on European Union, article 128, February 7, 1992

Treaty establishing the European Community selected *cultural heritage as a priority field of action for the Community... in both movable and fixed heritage.*

- The Council also considered that the various aspects of the cultural heritage should be combined in one global action, highlighting the importance of: i) *taking into account the cultural dimension of other Community policies and programmes; ii) increasing the awareness of all those concerned, especially at local level; iii) mobility for professionals, the exchange of experience and information; iv) European networks and establishments devoted to conservation, training, and research in the field of cultural heritage and cooperation with third countries and the international organizations concerned.*
- The Council of Ministers postulated on May 1999 a wise management of the natural and cultural heritage and stated : i) *the richness of Europe's cultural heritage and landscapes is an expression of its identity and is of world-wide importance; ii) to reverse any process of abandonment and decline and to hand this heritage on to future generations in the best possible conditions requires a creative approach involving the definition of integrated strategies for the preservation and restoration for landscapes and heritage and raising public awareness; iii) Cultural heritage is an economic factor becoming increasingly important for regional development and cultural places of interest are also an essential precondition for the development of tourism.*(European Spatial Development Perspective, May 10, 1999)²
- The EC Conference on “*Sustaining Europe’s Cultural Heritage: from research to policy*” held in London, in September 2004, highlighted as one of the most important issues the need to reinforce the contribution of *cultural heritage research*, aiming to include cultural heritage protection in EU directives and to promote favourable educational, training and knowledge transfer programmes (London Declaration³).
- On November 2007, the Culture Ministers of the EU Member States endorsed the European Agenda for Culture on the basis of the Communication presented by the Commission in May 2007. The Council resolution includes five specific priority areas of action for the 2008-2010 Period, one of which is: *Promote access to culture, especially by promoting cultural heritage, cultural tourism, multilingualism, digitisation, synergies with education (in particular arts education) and greater mobility of collections.*
- UNESCO identified future research needs and legal questions with regard to *suitable responses to climate change*, linkages to other UN and international bodies, including the IPCC (UNESCO, 2008⁴)
- Council of Europe identified both *gaps in the research area than in policy on vulnerability of climate change to cultural heritage*. Cultural heritage (i.e. historic cities and towns, landscape, archaeology, ancient buildings and collections of artefacts) is exposed to and one of the most serious drivers of future change for communities - *climate change*. Climate change impacts severely on cultural heritage. Change in the water cycle, both precipitation patterns and relative humidity, will enhance several damaging processes including salt crystallization, biodegradation, surface loss Europe.⁵

²European Spatial Development Perspective (ESDP), Potsdam, May 1999

http://ec.europa.eu/regional_policy/sources/docoffic/official/reports

³ London Declaration, <https://www.ucl.ac.uk/sustainableheritage/conference-proceedings>

⁴ UNESCO Policy document on the impacts of climate change on World Heritage Properties; *World Heritage Centre*, CLT-2008/WS/6, Paris, 32 p.. <http://whc.unesco.org/en/climatechange/>

⁵ Council of Europe, Vulnerability of cultural heritage to climate change, Report AP/CAT (2008) 44 <http://www.coe.int/t/dg4/majorhazards/ressources/Apcat2008>

- The European Parliament Temporary Committee on Climate Change for the first public hearing on "Climate impact of different levels of warming" included "Global climate change impact on our cultural heritage"⁶
- *IPCC have not included Cultural heritage* in its latest reports.⁷
- Landscape is clearly referred to in the European Treaty demonstrating the importance of public interest in the cultural, ecological, environmental and social fields, and constituting a resource favourable to economic activity and contributing to job creation through the protection, management and planning of cultural heritage. Landscape contributes to the formation of local cultures and that it is *the framework of European natural and cultural heritage, contributing to human well-being and consolidating European identity*.⁸
- *The increased threats of natural disasters and extreme weather phenomena* caused by climate change, such as increased flooding, storm surges, droughts and forest fires, have received special attention within the recent G8 held in l'Aquila, Italy⁹
- A study on the *protection of cultural heritage from natural disasters* for the EU Parliament Policy Department revealed numerous shortcomings in protecting and safeguarding European heritage; it identified the need for further jointly planned research and further extends idea of the "Barnier report"¹⁰.
- Studies on the *loss of cultural heritage* from fires were developed within the COST 17 Activity "Fire loss to historic buildings"¹¹.
- *The new directive on the assessment and management of flood risks does not include cultural heritage protection*¹².
- Some European Codes, for example Eurocode 8, namely its Part 3 requiring repair and strengthening of existing buildings against seismic loads, or codes on improved *energy efficiency cannot be applied to historic buildings without appropriate and coordinated research*¹³.
- The Commission launched an EU green paper on Energy Efficiency, especially in buildings in 2005 and the Energy Efficiency Action Plan from 2006. Both intimated that in Europe 40% of energy use is consumed in buildings, more than by industry or transport. This JPI aims also at assessing the *potential of energy saving in historic buildings*.
- *Over 80% of European buildings are over 50 years old; they need to be adapted sustainably* (i) to a climate undergoing change, and (ii) for uses that are more sophisticated for present and future living than was acceptable in the past. It is vital to recognize the lessons that historic buildings can provide to new construction, because historic buildings were designed to work with the climate, rather than resist it. Appropriately engineered solutions are required to adapt historic buildings to the problems they encounter with a changing climate, including more frequent moisture

⁶ CLIMM Background documents public hearing 10 September 2007:

http://www.europarl.europa.eu/meetdocs/2004_2009/organes/clim

⁷ IPCC Fourth Assessment Report (2007)

⁸ European Landscape Convention (preamble) - European Treaty Series – Doc. No. 176

⁹ Responsible leadership for a sustainable future, Document G8, L'Aquila, 2009

¹⁰ EP, European Parliament 2007b. Protecting the Cultural Heritage from Natural Disasters, Brussels, by M. Drdacky et. al. (<http://www.europarl.europa.eu/activities/committees>)

¹¹ <http://www.heritagefire.net>

¹² Directive on the assessment and management of flood risks – proposal COM (2006) 15 Final of 18.01.2006

¹³ www.eurocode-resources.com/eurocde-8-en-a14.html

penetration, through higher ground water and increased rainfall, or longer dry periods leading to subsidence. To give one example, there are 25 million structures in the UK, 6% of which are historic buildings. 55% of all construction in the UK is connected to refurbishment, repair, maintenance and improvement of existing buildings and within 30 years, 92% of all constructions ever to be built in the UK will have been built.¹⁴

- Past research shows that more than one-fifth of the present energy consumption and up to *30-45 MT of CO₂/Y could be saved by 2010* by applying more ambitious standards to new and when refurbishing buildings which represents a considerable contribution to meeting the Kyoto targets. The aim of *improved energy efficiency* has been set out in earlier existing legal instruments. Among the main Community legislation for the sector are the Boiler Directive (92/42/EEC), the Construction Products Directive (89/106/EEC) and the buildings provisions in the SAVE Directive (93/76/EEC). The *Directive on the energy performance of buildings* in force since January 2003 builds on those measures with the aim to provide for an ambitious step-ahead to increase the energy performance of public, commercial and private buildings in all Member States.
- The "Agenda for a sustainable and competitive European tourism" approved by the European Commission in October 2007 outlines the future steps for promoting the sustainability of European tourism and further contributes to the implementation of the renewed Lisbon Strategy for Growth and Jobs and of the renewed Sustainable Development Strategy. It builds on the recommendations of the Tourism Sustainability Group, which were issued in February 2007. Action for more sustainable European tourism includes *conserving and giving value to cultural heritage*¹⁵.
- Tourism is particularly important when it comes to offering job opportunities to young people, who represent twice as much of the labour force in tourism as in the rest of the economy. *Employment growth in the tourism sector has been significantly higher than in the rest of the economy in recent years*, making the sector a significant contributor to the Lisbon objective to create more and better jobs.
- *The impacts or other effects on historic cities related to mass tourism* have been discussed at numerous international conferences or workshops organised by the Organization of World Heritage Cities (Evora 1997), by the European Commission (EC Conferences in Bologna 1989, Strasbourg 2000, Krakow 2002, Prague 2006), by the Council of Europe (Riga 1999) and by relevant ICOMOS scientific committees. Also EC Project were funded at regard IMPACT, PICTURE, AMECP, MIMIC, LiDo, VIDRIO, AERP (Assessment of Environmental Risk Related to unsound use of Technologies and Mass Tourism) These studies showed problems related to tourism as a source of potential or real risk on the one hand or benefits to cultural heritage on the other. There is a lack of reliable data concerning impact and risk generated by large numbers of visitors and which are clearly linked to tourism.
- *Cultural heritage are targets of mindless vandalism and extremist actions*. The former is represented namely by the graffiti movement as well as by the "souvenirism" (i.e. the desire to transport a particle or even a part of a monument home) In recent years a very specific phenomenon has intensified: extremist vandalism, with irreversible damage or erase of inscription and part of sculptures and paintings.¹⁶

¹⁴ UKCIP- Costing the Impact of Climate Change in the UK: a Heritage Case Study, 2004

¹⁵ Action for More Sustainable European Tourism, Report of the Tourism Sustainability Group, February 2007

¹⁶ M. Dradcky and T. Drdacky Impact of tourism on Historic materials, structures and the environment: a critical review. In Heritage, Weathering and Conservation (Ed. R. Fort, M. Alvarez de Buergo, M. Gomez-Heras and C. Varquez-Calvo) Taylor and Francis Group, London, 2006 (ISBN 0 415 41272 2)

- *The preservation of cultural heritage links materials and their physical condition (tangible) to their cultural significance and meaning (intangible), to help improve quality of life by delivering an ecologically friendly way of life using local traditions and traditional craft skills as the basis for development. It harmonises cultural variety, European identity and sustainable development.*
- *The Salzburg Global Seminar on *Connecting to the World's Collections: Making the Case for the Conservation and Preservation of our Cultural Heritage*, with representatives of 32 nations around the world, produced a declaration acknowledging that “although we have made tremendous gains in the cultural heritage sector in education, facilities, new technologies, and partnerships, *our global cultural heritage is threatened by continuing deterioration and loss resulting from a shortage of trained conservation practitioners, natural and man-made emergencies and environmental risks, including climate change,*” and recommending “governments,..... to work together to strengthen the *investment in research, networking, educational opportunities, and the exchange of knowledge and resources globally*”.¹⁷*

2. Proposing GPC members

The JPI will mobilize the best research teams and infrastructures and their international partners active in the area of protection of cultural heritage not only in Europe but worldwide.

The Countries which have expressed their agreement in participating to this JPI are as follows:

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¹⁷ Salzburg Declaration on the Conservation and Preservation of Cultural Heritage, 31 October 2009, Salzburg, Austria

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3. Objectives

The objective of this JPI reveals the strong relationships that link cultural heritage, conservation, technological innovation and economic development which are at the basis of this JPI. It will explore the three strong challenges through the application of research to the protection of cultural heritage through a multidisciplinary approach involving science, engineering, technology, conservation and culture. It will also address the challenges and opportunities presented by an increasingly globalised, environmental and security-conscious society and to develop appropriate responses.

- Building on knowledge of mitigation from other sectors, to develop novel adaptation strategies, plans, diagnostic tools in order to evaluate the real risk to the sustainability of cultural heritage.
- Develop new measures for the assessment of carrying capacity of cultural heritage in dynamic and evolving conditions and situations using present knowledge of the resilience of cultural heritage projected to 2099.
- Address the significant scientific challenge of developing new management systems to ensure that cultural heritage remains accessible to European citizens and world tourism under changing climate and security conditions.
- Evaluate the uncertainties produced by climatic drivers and security threats for cultural heritage.
- Develop a management framework that reflects the complexity faced by heritage

managers across Europe in prioritising the most serious threats to European society in the 21st century, climate change and loss of security.

- Develop a systems approach that builds on interdisciplinary scientific effort, with the central focus on measurement and modelling of complex climate – security - human behaviour.
- Map earth observations using experimental and modelling infrastructures to enable downscaling of data for use at a regional and local level.
- Transform European citizens as agents of changeable to cope with cultural materials change in the 21st century.
- Export and diffuse knowledge, innovation and an interdisciplinary methodological approach from Europe to the rest of the world.

4. Research questions being addressed

Joint programming is essential to deliver a breakthrough in Europe research by developing solutions on the 3 interlinked challenges for European civilization: 1) defining carrying capacity and resilience in the face of the combined risks of climate change and security; and 2) designing highly innovative hybrid solutions based on cultural-technological inputs for the protection of cultural heritage and 3) developing climatic-security-behaviour risk models to support policy development.

These challenges will be developed through the following Research Areas and Sub-Areas:

1. Sustainable Management of Cultural Heritage

1.1 Defining carrying capacity and resilience for the protection of heritage assets

Building on pan European and international initiatives in the field of protection of cultural heritage, namely the World Monuments Watch (World Monuments Fund), World Heritage at Risk (UNESCO), Council of Europe, Blue Shield, an integrated research framework on climate change and security risks with distributed governance and data base will be established. Data base information on the risks from climate change and human threats (extremisms, war) to cultural heritage across this initiative will be shared. through an inquiry about specific threats and their causal mechanisms, with emphasis on new supports for cultural activities (such as electronic devices). This will serve to monitor the synergistic impact on cultural heritage in order to identify current levels of resilience and to review if necessary, the carrying capacity of cultural heritage in terms of use by European citizens and tourism into Europe. These organizations will pull their observations, monitoring and modelling data in order to provide the basis for the development of a coherent framework for risk assessment and management.

1.2 Synthesizing data and modelling

A European network of research centres for data-modelling-scenario coordination will be established. A network of cultural heritage sites in Europe that have been monitored extensively through collaborative projects funded by the EU Framework Programmes for Research since 1984 will be created. Data from key monumental sites in Europe will be supported by baseline heritage climatology data created by the EC 6FP Programme Noah's Ark Project. These research networks will focus specifically on the development of new

management protocols based to understand the resilience of cultural heritage in the face of novel threats.

1.3 Development of condition indicators

Indicators will be developed to measure changes in appearance and structural integrity of cultural heritage, both deterioration and improvements in conditions. These will include:

- Assessment of the use of tools to diagnose the status of cultural materials, assemblages and systems
- Establish and test predictive models compared to field data
- Validate standard protocols for risk assessment and emergency preparedness under field conditions

2. Natural and Man-Made Impacts on Cultural Heritage

2.1. A network for the protection of cultural heritage from natural and man-made hazards

Loss of World (including European) cultural heritage is increasing due to natural as well as man made hazards (in addition to climate change and security violation acts). Studies on protection of cultural heritage from natural disasters revealed severe deficiencies in coordinated European prevention, emergency action as well as post disaster activities and works. Recent earthquakes discovered incorrect measures which were adopted in the past (for example reinforced concrete strengthening of masonry). Multiple risks are an issue which requires to be developed through dedicated models. Application of new Directives (flood) and Standards (Eurocode 8 on antiseismic safety of buildings) require European coordination and cooperation namely in the field of historic architecture.

2.2 Regional earth observation for improved impact assessment of sites

The use of satellite systems, non-intrusive and remote monitoring instrumentation is very well developed in other sectors. There is an urgent need for the development of technologies and systems based on satellite and spatial infrastructures dedicated to improved assessment of cultural heritage sites and the environmental monitoring of archaeological sites (both on the short term “preventive archaeology” than in the long term) and cultural landscapes, including coastal change.

2.3 Localised early warning(EWS), alarm and rapid response systems for the protection of cultural heritage

Early Warning Systems (EWS) are necessary to minimise risks of global and local hazards by taking decisions in the proper time. The objectives of EWSs are to be better prepared to face the risk of long term or sudden disasters by avoiding and reducing damage and loss to cultural heritage, saving human lives, protecting economic development and maintaining quality of life. The development of these systems will take into account the distinction between early warning, alarm and rapid response systems. EWSs are normally located at some distance from a vulnerable site depending on the nature of the threat and the time required to take action in response to the threat. Alarm system stations are located in the buildings or sites, where the alarm signal is needed. Continuous communication between a central station and the alarm station are also needed. For a rapid response system, a large number of stations distributed uniformly over an urban area are needed. Rapid response systems are mainly applicable to larger urban areas, where catastrophe management is an important public task. All three aspects will be developed for the protection of cultural heritage.

3. Cultural Heritage Treatment, Repair, Maintenance and Re-Use for the 21st Century

3.1 Advanced diagnostic tools

Long term experiments that develop the Canadian Conservation Institute's 10 Agents of Deterioration will be clustered under two headings: climate risks and human risks. These experiments will form the basis for the development of advanced diagnostic tools and technologies to protect cultural heritage from the synergistic effects of climate-human risks. From this, highly innovative hybrid solutions based on cultural-technological inputs for the protection of cultural heritage. This sub research area also includes threats, alteration mechanisms and conservation of modern materials used in cultural information storage (CDs, DVDs, etc);.

3.2 Applications of nanotechnology

European cultural materials and assemblies are on average several hundred years old. Fragility and vulnerability increases with age and the rate of change will accelerate depending on external pressures. The EC Noah's Ark Project demonstrated for the first time in a conclusive way the likely future impact of a range on parameters on cultural materials, Joint Programming will enable the cross disciplinary application of advanced technologies, moderated by an assessment of the cultural acceptability of such measures, in order to improve the resilience of cultural materials by respecting regional features, (for example wooden architecture). Nanotechnology is expected to improve moisture resistance of a wide range of cultural materials.

3.3 Intelligent multi-sensor systems for remote control of cultural heritage

Building on recent developments in wireless mesh sensors technology, a wireless non hierarchical scalable and self organising sensor network will be applied to cultural heritage site at risks to improve the management of sites before, during and after a crisis. By integrating a range of chemical, physical, biological sensors into a single early warning intelligent system will be integrated that will alert managers to circumstances that would lead to damage. The aim is to develop remote, reliable and durable gathering of data, which will be self powdered for a period of up to 10 year.

4. Social, Cultural, Political and Economic Value of Cultural Heritage

4.1 Development of climatic-security-behaviour risk models to support policy development.

Cultural heritage has yet to be recognised as a major societal issue in climate change discourses. Yet climate change is emerging as one of the key driver of loss of cultural heritage in the 21st century. Communities that for centuries have lived around cultural heritage must adapt to a changing physical environment in which the appearance and conditions of the historic fabric around them experiences irreversible change. Planning policy development at a European and international level will be informed by the output of complex scenarios from these models. The level of uncertainty is low in terms of the influence that these models will have on planning, because for the first time policy makers and their advisers will be able to use realistic representations of the combined impact of climate and security risks on movable and immovable cultural heritage. In addition comparative studies on preservation and restoration policies across Europe will allow to adapt the model out put to the different national and regional reality.

The development of climatic-security-behaviour risk models will enable cultural heritage to be located at the centre of the human system as a symbol of European creativity and

enterprise over millennia in Europe. Complex risk models will integrate data on climate, security and behavioural change in order to inform key policy development.

4.2. Tourism flows

Tourism flows across Europe have been sustained by the attraction to visitors of the sense of history and artistic endeavour in Europe's cultural heritage. Tourism in turn has produced for many communities a source of livelihood that has enabled a traditional way of life to survive. The impact of climate change on the one hand, and security threats on the other have been studied, though never in combination. European competitiveness for tourism income will not withstand the double impact of climate change-induced events and security incidents. Tourism policies will be improved by access to scenarios derived from these models. The development of "intelligent" tourism will be favoured, allowing to surmount the gap between the highly educated travellers and tourism, based on consumerism values.

4.3. Implementing the principles of sustainable development to cultural heritage

Sustainable development is high on the policy agenda across Europe. Cultural heritage across Europe is valued by citizens for the sense of belonging and identity that it represents to them. Cultural heritage is identified with sustainable development for its prudent use of resources. Lessons will be learnt from the past on the implementation of economic, energy-efficient, user-friendly systems that stabilise indoor environments while reducing climate-induced damage of objects and collections. Yet the risks imposed by the combination of climate and security threats will jeopardise not only cultural heritage, but also the wider ambition for sustainable development. Therefore sustainable development policy, including energy, mobility and urban management, will be informed by the outputs from the climatic-security-behaviour risk models. Due to the close links between behavioural change and sustainable development, these policies and their underpinning research will be used in the mode of a 'virtuous circle' in the development of these complex climate security and behaviour models. Preservation of rural heritage includes the support for local communities and allows them to develop their activity, connected with manufacture of products. The creation of favourable conditions will be developed for preservation of intangible heritage as handcrafts, folklore, culturally important behaviour pattern.

4.4 Cultural inclusivity

Cultural inclusivity in heritage terms recognises the focal point of European historic centres as places of cultural interaction and commercial activity. In order to avoid the abandonment of historic centres and in order to maintain the diversity and age distribution of communities it is necessary to ensure that the history of relevant heritage items (e.g. their transformation from their origins) are understood so that historic buildings are conserved, restored and adapted to improve access and comfort of all citizens from young families to older residents. Research is needed to develop renewable energy systems that minimise structural and visual intrusion in historic buildings while improving occupant comfort and energy efficiency

5. Training and Mobility

The Cultural Heritage JPI will aim to improve advanced training of researchers. Another aim is to stimulate the mobility of researchers across the partners' research institutions and laboratories, and to provide opportunities for placements within local authorities and regions

in order to exchange knowledge and experience with communities. These activities will transfer the knowledge and technological excellence among the partner countries and contribute to European cohesion policy. Specific instruments will be created to support these activities in which the EU already has a long track record. A novel aspect of training and mobility will be its strong international dimension which will ensure that the leadership of Europe in this area of research is secured.

6. Dissemination of Results out of Europe

The importance to Europe of disseminating the results of this JPI internationally is evidenced by the fact that one of the six research areas will be devoted to disseminating the scientific and technological results derived from this JPI as a coordinated action in order to maximise impact. Dissemination will therefore be integrated into the overall strategy and budget of the JPI. The aim is to propagate research results at different levels and to different degrees according to the audiences whether researchers, practitioners or the public. The common information platform, the Net-Heritage Observatory, developed as part of the EU ERA-Net Net-Heritage project, will be enlarged for this purpose. This instrument has great potential to engage the participation of other countries in this JPI and to export European added value to emerging countries thus encouraging economic activities.

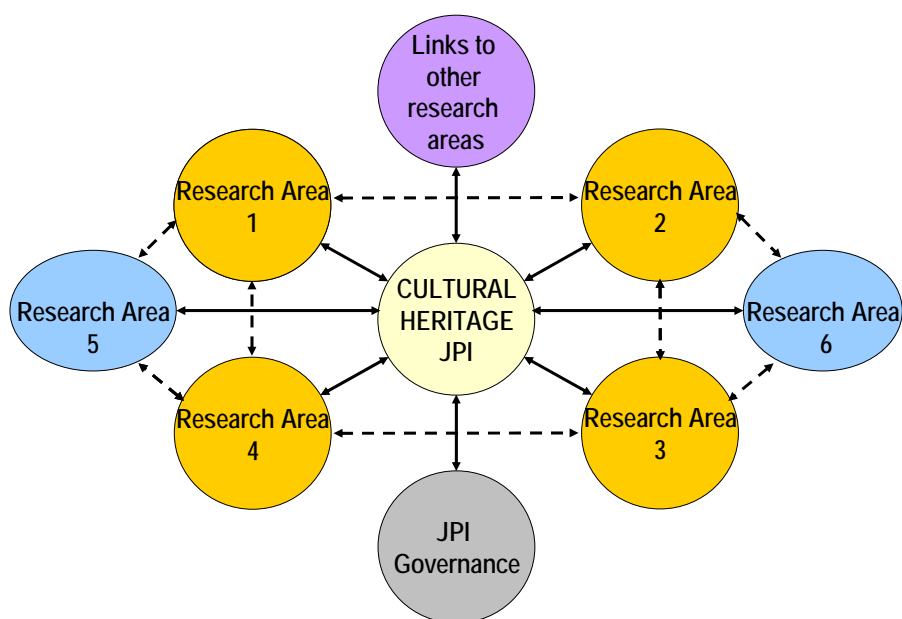
JPI Interaction

This Cultural Heritage JPI will build on its strong interdisciplinary qualities by interacting with six important research areas likely to influence the protection of cultural heritage:

- Environmental research and development
- Energy
- Transport
- Information and communications technology
- Materials
- Social, Economic and Humanistic disciplines

This JPI will also exchange research developments with other JPIs.

The six interlinked research areas are represented in the following scientific and technological structure:



5. Added-value, benefits and impact

5.1 Benefits and impact of the JPI for European citizens and European competitiveness

Europe is highly competitive compared to the rest of the world in the area of research for the protection of cultural heritage. This area of research is complex and requires years of effort to produce a demonstrable effect. Europe's expertise is based on the combined research effort at a European level of highly skilled physicists, chemists, biologists, geologist, engineers, architects, art historians and conservators. Research for the protection of cultural heritage is most advanced in Europe; if it is delocalised now, it will not be rebuilt as other regions will seize the advantage offered to them.

This JPI theme will drive European competitiveness in this research area even more strongly at an international level; it will demonstrate conclusively its contribution to the economic, environmental, social and cultural sustainability of Europe. It proposes that architecture, landscape and space are the material manifestations of European identity that must be understood, maintained and (re)integrated into our changing society. This is a challenge not only because of climate change, but also because of other critical changes that are taking place, from European and global migration and changing demographics to the integration of advanced technologies into everyday lives. For these reasons, change in European identity which is manifested by changes in the physical fabric of society is the Grand Challenge of this JPI theme because it marks the changing role of Europe in a globalised world.

Economic impact: Economic globalization demands competitiveness on every front. Cultural heritage is no exception. Tourism is a dynamic and growing industry vital to the economic strength of Europe. Tourism is an activity that can have a truly major impact on sustainable development for transitional economies in Europe. In part, this is to do with its sheer size. Europe is the number one tourist destination in the world and has an impressive

density and diversity of historic attractions. Consequently, tourism plays an important role in the development of the vast majority of European regions. Infrastructure created for tourism purposes contributes to local development, and jobs are created or maintained even in areas undergoing industrial or post-industrial change including regeneration. Historic rehabilitation creates a 13% higher return on investments than new construction and 16.5% more jobs. It also produces over 1200 times less waste. The cultural heritage sector also has a multiplier effect creating about 26.7 jobs for every direct one, compared to the auto industry where the factor is 6.3¹⁸. In 2004, foreign tourists spent more than 860 million nights in European accommodation. In addition between 6-10% of daily spending takes place at cultural heritage sites; the majority flows to communities and businesses around sites. The EU tourism industry generates more than 4% of the EU GDP, with about 2 million enterprises employing around 4% of the total labour force (approximately 8 million jobs). When related sectors are taken into account, tourism indirectly generates about 11% of the European Union's GDP and provides about 12% of the labour force (24 million jobs). Yet only 10-15% of jobs are directly on sites or are related to sites. This spread is usually considered the best for a balanced development of society.

The impact of the proposed JPI is very high, since it contributes through research, harmonisation and applicability of the best existing methodologies to a sustainable cultural heritage and thus allows the development of a sustainable European tourism industry. *Only if cultural heritage is included in the value chain of our society, can it be secured for future generations.*

Environmental impact: The backbone of European research for the protection of cultural heritage has been in the environmental field and it is here that this JPI can deliver the greatest and most sustained impact. The competence and scientific knowledge on the protection of cultural heritage are only found in Europe, which is not the case for other research fields. If Europe does not defend, support and export its know-how to the rest of the world these competences will be extinguished. Cultural heritage in its quantity and variety in Europe is helping to reduce Europe's environmental footprint by extending the useful life of non-renewable resources such as building and fit-out materials thus reducing waste and greenhouse gas emissions that lead to climate change. The adaptive potential of Europe is relatively high because of well-developed political, institutional and technological support systems. The benefits of re-use as embodied by cultural heritage are numerous: re-use of cultural heritage locks in more carbon and embodied energy; it protects design and engineering value (90% of value is often in the design) and craft skills. Historic buildings were designed with original low impact on the environment and they continue to have a low impact by using surplus materials for the re-manufacture of buildings, fixtures, fittings etc. Technological options already exist for adaptation but their suitability for the historic environment has yet to be tested and developed thus creating a new market for European products and services. *It is accepted that early stage avoidance of environmental impact is often difficult for organisations to justify economically and politically, however as cultural heritage can demonstrate, research is needed to investigate to what extent it is possible.*

Social impact The cultural heritage of the European Union is the memory of its society, and is thus essential to a shared European identity. It is the basis for the progressive integration of the 27 Member States that will enable them to form part of a strong European Union based on a common history and cultural roots. *Because cultural heritage protection is a highly complex task, it can only be successfully undertaken by uniting forces and using the synergies that will*

¹⁸T.M. Nypan, Cultural Heritage monument and historic buildings as value generators in a post-industrial economy. In European legislation and cultural heritage, 2004.

be established through this JPI instrument.

Cultural impact The success of society will not be measured only by its ability to foster economic globalization, but also by its ability to mitigate cultural globalization. In both cases, cultural heritage will play a central role. Both economic and cultural globalisation means change and change can be disruptive: politically, economically socially and psychologically.¹⁹ *Adaptive reuse of the heritage resources can provide a sense of stability and a sense of continuity for people and societies, which help counteract the feeling of disquiet felt as a result of economic globalization.*

The impact of this JPI in terms of raising the awareness and visibility of the cultural heritage sector will be both on the level of Member States/Associated Countries. and on the European level. *The overall aim of this JPI is to include the protection of the European cultural heritage in the sustainability strategy of the European Union, including the impact of climate change and energy issues on cultural heritage.*

5.2 Value added to overall current research financed from national and Community public funds

This research area has been born and have prospered within the European context, created by the RTD Framework Programmes starting with the 1st Framework Programme on research (first funded project : “Effects of air pollution on historic buildings and monuments: scientific basis for conservation” 1984-1986). The new area of scientific research applied to cultural heritage immediately started to gather research centres throughout Europe.

In the period 1986-2002, European projects were funded within FP RTD Environment Programmes.

Up to now, the 5th Framework Programme for Research within the key action “City of Tomorrow and Cultural Heritage”, has provided the highest budget of funding of around 40 MEuro (10 M€ per year for EU 15). The work programme covered topics ranging from movable to immovable cultural heritage to establish the scientific basis for protection, conservation and fostering of Cultural Heritage.

Within the 6th Framework Programme, funding was decreased to 10 MEuro (2.5 M€per year for EU 25) within the programme “Research in Support of Policy”. Although this serious reduction in funding was evident, the Cultural Heritage EU programme continued over the last 5 years to receive by far the highest number of project proposals compared to other topics of the programme and resulted in a very strong competition for project approval (1 project out of 9 proposals funded).

Within 7FP this area of research is funded within the sub-activity 6.3.2 “*Protection, conservation and enhancement of cultural heritage, including human habitat*” of Theme 6 Environment (including climate change) with a funding of 8 M€per year for EU 27.

The table below summarizes the projects funded in 5, 6 and 7 FP within the Thematic Area Environment:

<i>EU FP</i>	<i>Instrument</i>	<i>Project</i>
5FP		

¹⁹ D.D. Rypkema. Cultural Heritage and sustainable economic and social development. In European legislation and cultural heritage, 2004.

	Cost Shared Research (CSR)	APPEAR (CC: Belgium), BACPOLES (CC: Italy), BIOBRUSH (CC: United Kingdom), BIODAM (CC: Germany), BIOREINFORCE (CC: Italy), CAMEL (CC: France), CATS (CC: Italy), COLLAPSE (CC: Sweden), COMPASS (CC: Netherland), DIAS (CC: Greece), FRIENDLY HEATING (CC: Italy), IDAP (CC: Denmark), IMPACT (CC: United Kingdom), InkCor (CC: Slovenia), ISHTAR (CC: Italy), LASERACT (CC: Greece), LiDo (CC: Germany), MASTER (CC: Norway), MIMIC (CC: United Kingdom), MODHT (CC: United Kingdom), MULTI-ASSESS (CC: Sweden), ONSITEFORMASONRY (CC: Germany), PAPYLUM (CC: Slovenia), ROCEM (CC: Poland), RUFUS (CC: United Kingdom), SUIT (CC: Belgium), VIDRIO (CC: Italy)
	Cooperative Research Project (CRP)	HISTOCLEAN (CC: Germany), ITER (CC: Germany), LICONS (CC: United Kingdom), PaReLa (CC: Slovenia)
	Accompanying Measure (AM)	CHEPRISS (CC: United Kingdom), CURE (CC: Poland), DEMOTEC (CC: Norway), TECOM (CC: Greece), PANEURO (CC: Poland), SUSTAINABLE HERITAGE (CC: United Kingdom)
	Concerted Action (CA)	COALITION (CC: Spain)
	Thematic Network (TN)	FIRE-TECH (CC: Belgium), MIP (CC: Netherland)
6FP		
	Specific Targeted Research Project (STREP)	AUTHENTICO (CC: Italy), CHEF (CC: Germany), COINS (CC: Italy), CONSTGLASS (CC: Germany), CULT-STRAT (CC: Sweden), DESALINATION (CC: Italy), FING-ART-PRINT (CC: Netherland), MULTI-ENCODE (CC: Greece), NOAH'S ARK (CC: Italy), PAPERTREAT (CC: Slovenia), PICTURE (CC: Belgium), PROPAIN (CC: Norway), SALTCONTROL (CC: Belgium), SENSORGAN (CC: Sweden), SurveNIR (CC: Slovenia)
	Specific Targeted Innovation Project (STIP)	CONSIST (CC: Germany), GRAFFITAGE (CC: Spain)
	Concerted Action (CA)	ARCHAEOMAP (CC: Italy)
	Specific Support Action (SSA)	ARCHAIA (CC: Italy), CHRAF (CC: Spain), SAUVEUR (CC: Czech Republic), SPRECOMAH (CC: Belgium), SUSTAINING HERITAGE (CC: United Kingdom)
7FP		
	Integrated Project (IP)	CLIMATE FOR CULTURE (CC: Germany)
	Collaborative Project	MUSECORR (CC: France), POPART (CC: France), ROCARE (CC: Austria), SMOOHS (CC: Germany), TEACH (CC: Italy)
	Coordinated Supported Action	CHRESP (CC: Slovenia), CHIC (CC: Slovenia), ERANET (CC: Italy), WRECKPROTECT (CC: Sweden)

	(CSA)	
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(*) CC = Coordinator's country

Within the Thematic Area Social Sciences and Humanities (SSH) some projects have been funded in 5, 6 and 7 FP as reported in the following table.

<i>EU FP</i>	<i>SubTheme / Research Area/Activity</i>	<i>Project</i>
5FP	Dynamics of knowledge, generation and use	The role of language in mobilisation processes of ethnic and immigrant minorities (LANGMOB)
6FP	Improving the generation, distribution and use of knowledge and its impact on economic and social development	Pour un espace des sciences sociales européen (ESSE)
	New forms of citizenship and cultural identities	Exploring the Scope for a Shared European Pluralistic Ethos. A comparative investigation of religious and secular ethically-derived requests for exemption from the law in an enlarging Europe (EuroEthos)
	Actions to promote the ERA in SSH	MUtual SOurces on Modern MEDiterranean Architecture: towards an open and shared system (Musomed)
	ERA NET Project	Humanities in the European Research Area (HERA)
7FP	The citizen in the European Union	Identity and conflict. Cultural heritage and the reconstruction of identities after conflict (CRIC)
	Socio-economic and scientific indicators	European educational research quality indicators (EERQI)

Within the thematic area Europe's Information Society (INSO) the major issue addressed on cultural heritage is the digitisation by creating electronic versions of the materials in Europe's libraries, archives and museums, making them available online, for work, study or leisure (e.g. digital libraries with related issues such as copyrights, accessibility).

In the themes Nanosciences, nanotechnologies, materials and new production technologies (NMP) and Energy, cultural heritage is included in large-scale projects not focused on cultural heritage, which is "hidden" making not possible to identify them.

The national programmes and organizations on which this JPI is based are as follows:

Austria

Research on the protection of cultural heritage is funded within the following Project: Förderungen des BMUKK für Museen (http://www.bmukk.gv.at/kultur/museen_foerd.xml), Österreichische Initiative für digitales Kulturerbe / The Austrian Digital Heritage Initiative, (<http://www.kulturerbe-digital.de/>) and for Museum - Forschung an Museen (<http://www.formuse.at/>), NIKE - Netzwerkinitiative Kulturelles Erbe (to be started within next year).

In addition various regional funds, initiatives and activities are currently active, partially in conjunction with European funding like LEADER+

The organisations involved in research applied to the protection of cultural heritage are as follows: Salzburg Research (<http://www.salzburgresearch.at/>), AIT – Austrian Institute of Technology (<http://www.arcs.ac.at/>), uma information technology GmbH. (www.uma.at/kulturerbe/), KKA – KulturKontakt Austria (<http://www.kulturkontakt.or.at/>).

On average the funding dedicated to this area of research are approximately €300 – 500 k per year.

Bulgaria

The national research and innovation policies of the Bulgarian government are focused mainly on: defining strategic priority research areas which will ensure the sustainable economic development of the country; improving the existing common framework for research and development activities; optimization of the structure and profile of the research potential; encouraging the investments in R&D including on behalf of the business; new effective funding mechanisms of scientific research and innovations in accordance with the needs of the economy, the industry and the export potential of the industrial sectors; developing intermediary structures facilitating the links between “suppliers” and “demanders” of knowledge and innovations.

An important number of national research institutions are working in the field of cultural heritage research.

The National Science Fund (NSF) at the Ministry of Education and Science is the main research-funding organization that supports both fundamental and applied research. Through its specialized schemes, the NSF strongly supports the development of research activities in the field of cultural heritage. More specifically, since 2006 the NSF supports cultural heritage research via the following portfolio of instruments: i) Targeted research programme for preservation, restoration and socialization of cultural sites of national significance, where 16 projects were supported at the amount of 1,5 MEuro. ii) Development of national research infrastructure, where in the period 2006-2009 about 10 projects in the area of cultural heritage infrastructure were supported amounting and approx. 2 MEuro. iii) Thematic research project competition where one of the priorities is preservation of cultural heritage; iv) Co-funding of European research programmes, where matching funds are provided for successful research teams in Framework programme 7th and COST programme.

Other instrument that supports cultural heritage is the Operational programme “Regional development” under the structural Funds: Measure 2.1: Protection of environment, nature and historical and cultural heritage. Measure 2.2: Capacity building for sustainable use of natural resources, cultural and historical heritage.

Czech Republic

Czech Republic has a significant history of participation in the joint EU research projects in the field of cultural heritage (partners in 7 projects of the FP5 and 7 in the FP6, 4 in the FP7).

Czech Grant Agency supports yearly in average about 6-7 projects of research into cultural heritage themes. The Ministry of Culture of the Czech Republic has been preparing a new programme specifically focused on the *National and Cultural Identity Research (NAKI)* which should call for projects in May 2010. The programme contains several thematic priorities corresponding to the JPI themes, namely the impact of climate and its changes on historic objects, the impact of functional changes of historic objects and the problems of security and safety related to historic environment, including natural disaster issues. The overall budget for the NAKI programme is planned in the amount of 16 MEUR/year. The Czech CP is Chairman of the Committee of the Minister of Culture for Research which have prepared the NAKI Programme and will control it.

France

Research on the very notion of cultural heritage: i) The lab LAHIC (CNRS/EHESS/MCC) is very active in that field (sociology and anthropology of archeology), but the other labs of EHESS contribute too, specially w.r.t. the “patrimonialisation” processes alluded to above. ii) Inquiry about “immaterial” heritage is also intensively pursued in this lab. iii) The programme *Cultural Heritage in Eastern Mediterranean* (Maison de l'Orient et de la Méditerranée, Lyon) is another important contributor to this inquiry, with special attention devoted to the Middle-East (the MOM is also active in the archeology sub-thema below). iv) The CNRS/Toulouse Le Mirail lab FRAMESPA contributes, with special emphasis on local and Hispanic data. v) A significant part of the CNRS/Lille I lab CLERSE deals with the sociological aspects of heritage policies.

Aspects of the HERITAGE programme dealing with archaeology: i) The lab ARSCAN (*Archeologie et Sciences de l'Antiquité*) (CNRS/Paris I/Paris X) and, more generally, the *Maison René Ginouvès* (Nanterre) are very actively involved in the field. ii) In Bordeaux, the lab IRAMAT (CNRS/Université de Bordeaux) deploys many, iii) research activities on material aspects of conservation and restoration.

Legal aspects of heritage conservation: The main French team works in the lab CECOJI (CNRS/Université de Poitiers), with special emphasis on comparative aspects of European legislation.

Methodology and activities of conservation and restoration: ii) The preservation of movable and immovable cultural heritage is a major mission of the French Ministry of Culture and Communication (MCC). Management of heritage is performed by several heritage departments of the ministry (archaeology and listed monuments, museums, libraries, music etc.) together with the regional directorates (DRAC). All research programmes of the MCC are coordinated by the Department for Development and International Affairs/ Mission for Research and Technology (DDAI/MRT), with funding belonging to an inter-ministerial budget monitored by the Ministry of Research. In this framework, the amount of money specially dedicated to Cultural research in 2007 is 35 M€ (23 M€ for human resources ; 12 M€ for investment and functioning). The French Ministry of Culture allocates 20 % of this budget to support research in Sciences for the conservation of cultural heritage. Research programmes are conducted by research laboratories and restoration centres managed by the Ministry of Culture, and by joint structures created with major research institutions, such as the National Centre for Scientific Research (CNRS), the French Atomic Energy Commission (CEA), universities and engineers schools. The following ones are specially worth to be quoted, for they work in the heart of the JPI Cultural Heritage thematic: i) Center for Research and Restoration of the French Museums (C2RMF, Institute of Chemistry CNRS/Musée du Louvre) is an international reference; it is involved in the European Programme *Charisma* (Cultural Heritage Advanced Research Infrastructures”). ii)

Laboratory for Research on Historical Monuments (LRMH) in Champs sur Marne. iii) Center for Research on Conservation of Collections (CRCC) in Paris. iv) Interregional Center for Conservation and restoration (CICRP), in Marseille. v) Arc'Antic, mainly dedicated to conservation of metallic underwater archaeological artefacts in Nantes. vi) Arc'Nucleart, mainly focused on water-logged wood, excavation and conservation process on wooden ships, in Grenoble.

3D-reconstitution of lost architectures: i) Research by the lab MAP (Models and Simulations for Architecture), CNRS/MCC, Marseille. ii) Platforms *Archeovision* and *Archeogrid*, monitored by the lab AUSONIUS (CNRS/Université de Bordeaux).

Digitalization of heritage collections: i) Programme *MUSOMED* ("Mutual Sources on Modern Mediterranean Architecture) developed by the *Invisu* Unit (CNRS/INHA) in Paris. ii) Digitalization of mediaeval manuscripts at large scale, as done by the IRHT (CNRS, Paris et Orléans) and of later manuscripts by the CESR (CNRS/Université de Tours).

Generalities on the French modus operandi in the scope of the JPI Cultural Heritage: A framework agreement between the Ministry of Culture and the CNRS reinforces the relationship between both institutions and their research laboratories: 32 joint research units and 25 specific programs were funded 1.100.00 € in 2006. This agreement also aims at developing national and international networks, such as *ChimArt* dedicated to sciences for archaeometry and heritage conservation. In 2003, the French Ministry of Culture launched a national programme dedicated to research on heritage materials and their conservation with an annual call and an annual budget of 300 k€ This programme aims at reinforcing research in the field of conservation, which often requires interdisciplinary links between basic sciences, and at giving a better legibility to those actions. The programme promotes a new synergy between different actors working in this field (researchers, conservators, curators, architects, etc.) and helps technological transfers and innovation activities. Since the beginning of this programme, 24 projects have been selected after a scientific evaluation by a steering committee. At the end of 2007, a conference held in Paris in order to disseminate the results achieved during the four first years of the programme and before starting a new four year stage. Since 2004, MCC also supports the works of standardisation undertaken in the field of Conservation of cultural heritage both at national level (through French standardisation agency AFNOR) and at European level in the CEN/TC346. At the European level, French laboratories are involved in Research programmes funded by the European Research FP's. Among them, it is important to mention C2RMF's participation (with its accelerator AGLAE) in the Eu-ARTECH Transnational Access programmes, among a consortium of thirteen internationally distinguished European infrastructures operating in the field of artwork conservation.

Iceland

The *Architectural Heritage Fund*, whose role is to provide grants for maintenance and renovation of listed buildings and structures, and of other buildings deemed by the Architectural Heritage Board to be of historical/cultural value had a budget of just over 255 million ISK in 2008. The Archaeological fund which provides grants for archaeological research has a budget of 25 million ISK, but the Althingi, or Parliament in Iceland has also provided direct grants to archaeological research this amount varies from year to year.

Rannís, the Icelandic Centre for Research reports to the Ministry of Education, Science and Culture with the purpose of providing professional assistance in the preparation and implementation of science and technology policy in Iceland. One of its main functions is the operation of the financial support system for research and technological development. Rannís serves the Icelandic science community across all areas of science and the humanities. Rannís operates on an annual budget of about 130 million ÍSK, of which about half comes from the

direct budget and the rest from service fees and contracts. The grants funds operated by Rannís have following annual budge of around 1000 million ISK is divided by the Research Fund, the Fund for Research Equipment, the Technology Development Fund, the Graduate Research Fund and the Fund for Non-fiction Writers.

Italy

The *Ministry of Education, University and Research (MIUR)*, is organised into 12 General Directorates, including, in particular, the General Directorate for Internationalization of Research and the Directorate General for the Coordination and the development of research. The MIUR is also acting as a controller of a number of major scientific national organizations, including the *National Research Council (CNR)*, one of the most important entities, nationally focused to the heritage preservation. The CNR, is organised into 11 Thematic Departments, one of which is the *Department of Cultural Heritage*. This Department gathers together all CNR institutes working on cultural heritage with research teams focusing on various aspects of science and technology applied to the protection of tangible and intangible cultural heritage, including basic and applied research.

MIUR has various funding instruments for research projects which are under its care. These instruments are funded through one main Fund named FIRST (Fund for Investments in Scientific and Technological Research) which includes 4 main sections: FAR (Fund for the Support of Research); FIRB (Fund for Investments in Applied Research); PRIN (Research Programmes of relevant National Interest); FAS (Fund for underdeveloped Areas). All those financial instruments are frequently employed to research and technologies for cultural heritage.

Also in the *National Research Programme (PNR)* currently in preparation, MIUR includes, as one of its main axis, the research applied to the field of Cultural Heritage, developed also in cooperation with the Italian *Ministry of Cultural Heritage and Activities (MiBAC)*. That specific topic will be also included in the Strategy for the Internationalization of the Research of Italy (SIRit), to be also prepared from MIUR before the end of the year.

The *Ministry for Cultural Heritage and Activities (MiBAC)* pursues the institutional mission of preservation and enhancement of cultural heritage, including landscape. The core of MiBAC in the field of research applied to the protection of cultural heritage is represented by the activities carried out by its three research institutes: *the Central Institute for Restoration (Istituto Superiore per la Conservazione e il Restauro, ISCR)*; *the Opificio delle Pietre Dure (OPD)*; *the Istituto Centrale per il restauro e la conservazione del patrimonio archivistico e librario (ICPAL)*.

The *Ministry of Economic Development, MISE*, has within its organisation a General Directorate for Production Development and Competition, which includes the Office for Technological Innovation, Research and Development. MISE is also acting as a controller of the *Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)* that together with the CNR is one of the most relevant research realities in Italy that works in the field of applied technologies to heritage conservation.

National funds dedicated to Cultural heritage research: In terms of funding for research projects on cultural heritage at national and EU level, the Italian System shows a considerable value and has shown a positive trend in recent years. MiBAC invested about 30ML euro in 2007, shared among research programs and research activities within institutional activities in the field of knowledge, preservation, restoration and enhancement of cultural heritage. MIUR has allocated in the period 2005-2007, 15 MEuro/year with a prevision of the same amount for next year.

Following the example of other EU countries like UK, also the Italian Ministry of Economy and Finances (MEF) is supporting since 1997 the conservation of cultural heritage troughs the

income of the national lotteries. The value of this funding, distributed on a regional basis, is about 500ML € for the period 2006/2009. In the structural funds for the period 2000/2006 the Italian Government have focused on research for cultural heritage the amount of 5ML € for the realization of a technological district for cultural heritage, based in the Calabria Region, and the same amount is established for the period 2007/2013.

The CNR Department of Cultural Heritage has an yearly budget of research project funding of 2,5 ML Euro.

ENEA has allocated on projects and technologies for Cultural Heritage more than 5 ML euro from 2006 to 2009.

Lithuania

Lithuanian research policy is conducted by the Ministry of Education and Science (MES), which is also the biggest government source of research funds. The Research Council of Lithuania contributes to the formation of science policy and finances national research programmes. The Research Council closely cooperates with the Ministry of Culture and Department of Cultural Heritage of the Ministry. Cultural Heritage Centre, founded by *Department of Cultural Heritage*, aims to create full register of the tangible cultural heritage of Lithuania, contributing to the field of research. Main research activities are concentrated in state institutes and universities, e.g. Institute for Culture, Philosophy and Art (tangible and intangible heritage), Institute of Literature and Folklore (intangible heritage) etc. Department of Cultural Heritage also includes association “Lietuvos Paminklai”, which performs cultural heritage management work. Concerning research activities in the field of tangible cultural heritage, the Ministry of Culture also closely cooperates with the Ministry of Environment and Ministry of Economics in aiming to ensure preservation of both tangible and intangible cultural heritage and developing sustainable tourism.

The participation of Lithuania in European programmes of European heritage days (joint programme of Council of Europe and EU), Route of historic gardens in Europe and Jewish cultural heritage route (Council of Europe) required complementary research and encouraged wider collaboration with neighbour states – Latvia, Poland, Byelorussia, Ukraine – on the level of research institutions and non governmental organisations (Societies of Art Historians etc.). The participation of Lithuania in the monitoring activities for cultural heritage of Baltic sea states strengthens professional links with Germany and Scandinavian countries. Thus the development of research in the field of cultural heritage in Lithuania is defined both by local realities and European challenges.

Poland

Two governmental bodies are responsible for funding research supporting the preservation of cultural heritage. The Ministry of Culture and National Heritage is the main governmental body responsible for cultural politics in Poland. One of the major responsibilities of the Ministry is the care for the preservation and conservation of national heritage. Among others the Ministry is financing the Academies of Fine Arts and the most important national museums, which carry out broad research tasks in the field of heritage science. The Ministry also finances the National Centre of Investigation and Documentation of Cultural Heritage and the Centre for the Protection of Public Collections in Warsaw. On the other hand, the Ministry of Science and Higher Education is the major central governmental source of funds for research in general. It covers around 60% of funds for R&D spent in Poland every year. Cultural heritage research is financed through core funding for statutory R&D activities of various research organisations and through individual research projects, applied for within open, peer reviewed competitions held bi-annually.

In 2008, the government established the National Programme of Scientific Research and Development, as a principal tool of the state policy in the area of research and innovation. The programme identified priority areas, research objectives and programmes for the coming 5 – 10 years. The National Programme comprises research programmes in the cultural heritage sector in priority area 1 “Society in conditions of a secure, accelerated and sustainable socio-economic development” and priority area 3 “Energy and infrastructure”.

Romania

On 23 May 2009, the Romanian Government approved the second National Plan for Research, Development and Innovation (PN II). The National Authority for Scientific Research is the Governmental organization charged with the implementation of PN II. The specific programme “Partnerships in priority fields” has *1 research direction with 3 themes devoted to cultural heritage*, as follows: i) Development of preservation techniques for patrimony. ii) Integration of preservation and restoration techniques with assuring of community viability. iii) Cultural patrimony.

PN II has a budget of approximately 4.5 billion EUR) for the period 2007-2013. The first call for proposals was launched on 1 June 2007 and for these themes several project proposals will be submitted. The total budget is split on specific programmes, research direction and themes may compete between themselves.

The Ministry of Culture, Religious Affairs and National Heritage has also a specific annual programme to preserve national cultural heritage but is not devoted to research. It finances only restorations and preservation works of monuments specified in the National List of Monuments.

Slovenia

Slovenian research policy is on the national level conducted by the Ministry of Higher Education, Science and Technology (MHEST), which is also the major governmental source of funds for research. The Ministry formed the Slovenian National Research and Development Programme, through the expert support of the Science and Technology Council of the Republic of Slovenia.

The National Research and Development Programme is implemented by the Slovenian Research Agency, which was established by the Government of the Republic of Slovenia. The Agency performs professional, development and executive tasks relating to the National Research and Development Programme at every level, as well as other work to promote research and development activities. Main policy instruments of the agency are: research programmes, basic and applied research projects, targeted research programmes, young researches, research infrastructure.

On the field of tangible cultural heritage agency closely cooperates with the Ministry of Higher Education, Science and Technology and the Ministry of Culture. In the field of cultural heritage it involves also the Directorate for Cultural Heritage, Information-Documentary Centre for Heritage (register of cultural heritage) and Institute for the protection of cultural heritage of Slovenia.

Current main topics are: informatisation of cultural heritage, new law on protection of cultural heritage, establishment of a unified register of cultural heritage, new approaches in the field of written cultural heritage, volatile organic matters in cultural heritage collections, mobile archeological heritage etc.

In regards to FP7 programme, MHEST is a partner in HERA (Humanities in ERA) ERA-NET initiative and actively contributing to the common pot with a goal to financially support also

research projects from the field of cultural heritage.

Concerning research activities in the field of tangible cultural heritage, the *Ministry of Culture* closely cooperates also with the *Ministry of the Environment and Spatial Planning* and the *Ministry of the Economy*. Main topics: i) spatial impacts of cultural heritage and sustainable preservation of cultural landscape, ii) tourism and cultural heritage, iii) mobile cultural heritage: archaeological and archeometrical research.

For the field of Cultural Heritage Slovenia is allocating app. 14,5 mio EUR per year. This includes financial support of national research programmes and projects, support for junior research programme, support for infrastructure programmes and support for publishing.

Spain

The main body responsible for scientific research funding in Spain is the Ministry of Science and Innovation (MICINN), although there are also some programmes financed by other Ministries, Autonomous Regions and other organisms.

National Research Programmes are defined and organised in four-year National Plans, in which mechanisms and priorities are defined. Studies in the conservation of cultural heritage received for the first time institutional support with the establishment of the first National Plan (1988-1991), which included a research programme on Cultural Heritage. Nevertheless, it disappeared as a specific programme during subsequent National Plans, although has been included among research priorities in other National Programmes. In consequence, research in cultural heritage is spread over different programmes, including Sciences and Humanities. This situation is very similar in Regional Programmes.

On the other hand the interest of the Spanish scientific community in Cultural Heritage Research is clear not only due to the number and the quality of the projects presented to the National Programmes, but also to the participation in European Programmes, or in initiatives such as the Thematic Network on Cultural Heritage of the CSIC (Scientific Research Council) or Net-Heritage.

For this reason, and regarding the multidisciplinary nature of research in Conservation, a Sub-Programme of Research in Conservation within the *Non-directed Basic Research Programme* of the *National Plan of R+D+I*, managed and financed through the General Subdirectorate for Research Programmes, will be a unique opportunity to fill this gap in research, and find an adequate approach to this field.

In National Plan 2004-2008, projects related with conservation of cultural heritage were funded with 4,7 million € over a total budget 1.372 million €. In National Plan 2008-2011, total budget for research projects managed by the General Subdirectorate for Research Projects has been 420 million € in 2008 and 430 million € in 2009. The amount received by research projects related with conservation of cultural heritage has been about 1,2 million € in 2008 and about 1,7 million, in 2009.

Turkey

TUBITAK is the leading agency for the management, funding and conduct of research in Turkey. It was established in 1963 with a mission to advance science and technology, to conduct research and to support Turkish researchers. TUBITAK funds research projects carried out in universities and other public and private organisations, conduct research on strategic areas, develops support programs for public and private sectors, publishes scientific journals, popular science magazines and books, organises science and society activities and supports undergraduate and graduate students through scholarships.

It is a governmental body which operates under the fold of the Prime Ministry with adequate administrative and financial autonomy. The Council's decision-making body is the Science

Board, composed of the President and 12 members. The President, as the person of the Science Board, implements its decisions and is the head of the entire administration.

The main tasks of TUBITAK are to determine Turkey's science and technology policies and to support, encourage and coordinate scientific research. It establishes and operates special institutes to conduct research and development activities geared to the targets of the economic development plans and to the priorities set by the Science Board. It funds research projects carried out in universities and other public and private organisations, conduct research on strategic areas, develops support programs for public and private sectors, publishes scientific journals, popular science magazines and books, organises science and society activities and supports undergraduate and graduate students through scholarships.

TUBITAK is also the national coordinating body of the EU Framework Programmes (FP); by its department "EU Framework Programmes National Coordination Office" (TUBITAK NCO). TUBITAK organises info-days, conferences and brokerage events to raise the awareness about EU FPs. Covering all the FP7 areas, Turkish NCPs are working full-time in this office. TUBITAK also supports Turkish researchers in the development phase of the projects. There are several support programmes for FP7 such as; travel support, coordinator award, university – industry partnership promotion award, consortium agreement support and pre-proposal check support.

TUBITAK NCO has been involved in FP6 as a coordinator in 2 SSA projects, and partner in 25 SSA projects. TUBITAK NCO has participated to 18 ERA-NET projects in FP7 and continues participating to the relevant projects, in all priorities.

TUBITAK also has international Relations with ESF, EUREKA, COST, BSEC, ECO, European Commission, EU Framework Programmes, NATO (SfP & CCMS), OECD, United Nations, UNDP, UNESCO.

A task force composed of five people is dealing with the Joint Programming Initiatives in NCO.

United Kingdom

Responsibility for culture in England resides with the Department (Ministry) of Culture, Media and Sport (DCMS). Culture is a devolved responsibility in Scotland, Wales and Northern Ireland. DCMS sponsors a wide range of Non- Departmental Public Bodies (NDPBs). The largest is English Heritage, which is responsible for the conservation of the historic environment, including the historic maritime environment, archaeology and landscapes in England. It has a budget for all research (including conservation science) of some £9.8 million per annum, and has published a Research Strategy. DCMS also sponsors the National Museums and Galleries. Most of the NMGs invest a proportion of their core funding in conservation and research, and in many cases they have world-class reputations in their fields. Recently, in response to recommendations by a House of Lords Science and Technology Select Committee Inquiry on "Science and Heritage", the Arts and Humanities Research Council has become the lead research council for heritage science and has announced the launch of a Science and Heritage Programme to fund research and other activities in this area. Due to the devolved nature of governance for heritage science research in the UK, the whole sector (both moveable and immovable heritage) is working together to devise a national research strategy for science and heritage.

The devolved nature of governance has also meant that there have been few large-scale targeted funding programmes in this area. On the publication of its 2006 research policy, English Heritage has identified two priority research areas: "Studying and assessing the risks to historic assets" (€ 2.5m per annum) and "Discovering, studying and defining historic assets" (€/m per annum). Similarly, the Arts and Humanities Research Council has a large

budget for the support for research training through its postgraduate awards (~ 45m per annum), but only a small portion of the research funded is directly relevant to heritage research. However, it does support a postgraduate programme, Collaborative Doctoral Awards (approx € 1M per annum), which supports partnerships between universities and other sectors, predominantly the heritage sector . It also provides postdoctoral project funding across its remit which includes Archeology (€ 1.6M spend per annum) and museums' practice, librarianship and information science (~€700K spend per annum) – again largely through responsive mode. In targeted mode, the AHRC Landscape and Environment programme (which looks at the relationship between culture and environment) funds research in the region of € 1.6M per annum, while seed-funding for projects is provided through its Museums and Galleries Research Programme projects (€700K spend per annum).

In addition, the national organizations and programmes of interested potential Countries in this JPI are :

Greece

The Hellenic Ministry of Culture is the main governmental instrument for the protection of cultural heritage in Greece. It is in charge of the organization, supervision and funding of excavations, restorations, conservation, works of infrastructure, educative programs, publications and exhibitions. The Directorate of Prehistoric and Classical Antiquities is the service of the Hellenic Ministry of Culture and which constitutes the main coordinator of the task of the Heritage Net proposal.

The Hellenic Ministry of Culture (www.yppo.gr) comprises the following research services:

1) Under the General Directorate of Antiquities and Cultural Heritage are 1.1. The Directorate of Prehistoric & Classical Antiquities, 1.2. The Department of Applied Research within the Directorate of Conservation of Ancient & Modern Monuments, 1.3. The Department of Physical and Chemical Research within the National Archaeological Museum, 1.4. The Center for Stone.

2. Under the General Directorate of Restoration, Museums and Technical Works: The Directorate of Restoration of Ancient Monuments

Furthermore, in the main as well as in some regional museums there are conservation laboratories that conduct applied research using available diagnostic equipment.

The research interests of the Ministry are: i) Development of Non Destructive, Mobile, Diagnostic equipment, ii) Scientific documentation, iii) Active Conservation, iv) Preventative Conservation (natural hazard risk map etc), v) Development of Standards in procedures and materials, vi) Monitoring of the Environment and of changes in cultural heritage

The Hellenic Ministry of Culture is actively participating in the ERA NET Project on the protection of tangible cultural heritage – NET HERITAGE

The Netherlands

In the Netherlands expertise in the field of the JPI is existing in the first place in the Cultural Heritage Agency (RCE) and the Netherlands Institute for Cultural Heritage (ICN). The Cultural Heritage Agency is the national knowledge institute for archaeology, monuments and cultural landscape. The Agency aims at the protection and development of the national heritage in these fields. The Netherlands Institute for Cultural Heritage (ICN) is the national knowledge institute for management and preservation of moveable cultural heritage. The ICN has four main tasks: consulting on management and preservation of collections, performing research, managing the ICN collection and disseminating and sharing knowledge. The

research program of ICN concern value and evaluation, risk management, museometry, object in context and accessibility. Then the National Archives and the National Library (KB) have programs in the field of conservation. The KB functions as expertise centre in the field of conservation by coordinating the national *Metamorfoze* project for the preservation of library collections. The Netherlands Institute for Heritage serves as an information centre for and about the heritage sector. Its activities are concentrated in three programme lines: Heritage and cultural participation, Heritage in cultural landscapes & urban environment and Heritage from an international perspective. Within the universities research into cultural heritage is conducted in several institutes. In the Free University at the Research Institute for the Heritage and History of the Cultural Landscape and Urban Environment (CLUE) scientists with various disciplinary backgrounds are working on interdisciplinary, often international projects concerning the changing role of heritage in our environment, the historical dimension of spatial issues and the historical development of city and countryside. At the Delft University of Technology in the institute RMIT multidisciplinary research is being conducted in the field of transformations of the built environment. For conservation science the University of Amsterdam can be mentioned. In the *Ateliergebouw*, the University of Amsterdam's training programme for preservation and conservation, the conservation studios of the Rijksmuseum (RMA) and ICN's conservation science department are housed together. The cooperation between the three institutions will make it possible to develop into a centre of expertise for preservation and conservation. Museums in the Netherlands and abroad will profit from the knowledge developed through this cooperation. At the Netherlands Organisation for Scientific Research NWO a multidisciplinary Science for Arts programme is currently in development, aiming at interdisciplinary research in conservation and restoration. At the research organisation TNO an important theme is the quality of the living environment. Climate change has both direct effects on the living environment (influence on air quality and health), and indirect effects (rising sea levels, increase in the variety of precipitation, soil subsidence, urgency of new spatial planning).

This JPI will create *a new umbrella* for cultural heritage research :

- Through the implementation of the planned objectives and research areas, the construction of a *fully operational European Research Area* on cultural heritage preservation will be created and enlarged based on a multidisciplinary scientific approach, which gather physicists, chemists, biologists, geologist, engineering with architects, art historians conservators, including humanistic sciences.
- This JP initiative is a unique opportunity that will ensure European nations *maximize and coordinate their combined critical mass* to contribute to European competitiveness, and it will support Europe in solving global problems in the global context.
- This JPI initiative will *strengthen Europe's leadership* in developing science-based conservation, and it will assure to Europe a unique role in the world for a long lasting period. Without this JPI this area of research will extinguish as there is no other part in the world where these competences are developed..
- The impact of this JPI is expected to be felt in the *international sphere* and the role that Europe has to play in the world is to export heritage values for the sustainable development, economic, environmental, social and cultural of the world in the future tens years.

No single nation may be able to develop this area of research solely within its own

borderlines and to have this role in the world. This JPI is essential for the future development of this research area and to export the concepts which are at the basis of this JPI in the world.

This JPI is not a **duplication** of other initiatives:

- Cultural heritage in 7FP does not have its own “house”, it is part within the themes Environment (Sub-activity 6.3) and Socio-economic Sciences and the Humanities, and only very marginally in NMP, Energy and ICT. That means that within FP7 it is impossible a multidisciplinary and multisector approach as it is proposed in this JPI
- FP is *not* enough for *long-lasting, large-base research* endeavour in this area of research.
- National and regional programmes are affected by *site specificities*

Thanks to this JPI European, national and regional programmes will be organised in an open coordination scheme as foreseen by the ERA concept.

5.3 Need to choose the JP approach, rather than any other existing European mechanism

The research applied to the protection of cultural heritage needs to be funded by public research, while other sectors of research can count on large private findings.

This JPI will contribute to preserving the European cultural heritage, promote new forms of public engagement with this heritage, strengthen Europe’s leadership in developing science-based conservation, improve competitiveness and enhance job creation in the broadly defined heritage sector.

This JPI will have a strong impact on both the European level and national level also on the harmonisation and acceptability of technologies and methodologies applicable to the tangible cultural heritage, while it will also follow the subsidiarity principle, allowing each member state the most suitable methodology for restoration and conservation according to the very specific demands of the cultural assets in their original environments.

JPI is the most appropriate instrument for this area of research because:

- The existing national programmes do not allow collaboration among Members States and in the rare case where this is possible it is limited to travel cost funding.
- The existing ERA NETs are not sufficient, and in the existing ERA NET Project on the protection of tangible cultural heritage no calls are planned.
- ERA-NETs are short in time. The relevance of this subject requires a broader approach. The JPI will allow the establishment of solid foundations to the implementation of specific research applied to protection of cultural heritage in National Research Programmes for the future, as it has been identified as a gap and a priority in most European countries.
- This area of research need to be supported by public funding, which is not the case for other themes.
- This area of research can count only very limitedly by private funding through the new instrument developed following the ERA concept such as ETP and JTI, which is not the case for other themes.
- This JPI is mature, and to wait for the next year it will not let the proposal to be

improved.

5.4 Overcoming legal and practical barriers for transnational cooperation in the specific thematic area

This JPI will have a very visible impact in overcoming legal barriers among EU Member States and Associated Countries.

Because of the principle of subsidiarity there are no common directives or common policies on cultural heritage at European level. In this context the role played by research, which does not recognise borders and nor does it adhere to the principle of subsidiarity, is massive and unique. In the past 25 years research applied to the protection of cultural heritage has created a common knowledge-based framework in which scientists, stakeholders, cultural heritage managers and conservators have collaborated to find common solutions to common problems. The role played by research in this specific sector is not common to other research areas. With this JPI, research will be able to reinforce this unique and fundamental role and create a pan European cultural heritage research sector from this fragmented field.

This JPI will encourage and support a closer relationship among national RTD programmes from Europe, fostering cooperation and leading to joint and reciprocal activities, considering that 80% of research in Europe is financed at the national and regional level; .

This JPI will overcome institutional barriers to ensure that research activities have a transnational vision in the sectors relevant to the preservation of cultural heritage, enhancing the dissemination of research results and news in the field of protection of tangible cultural heritage.

A further significant synergy will arise from the fact that the JPI will interact with other research programmes on the level of the Member States, e.g. with environment, agricultural, transport, innovation, energy Research Programmes. It is important to demonstrate to other research programmes that there is a mutual benefit if cultural heritage aspects are considered.

6. Preliminary suggestions concerning the governance and implementation of JPI

6.1. Participating Countries

14 European Member States and Associated Countries have participate in the preparation of this JPI proposal: Austria, Bulgaria, Czech Republic, Cyprus, France, Iceland, Italy, Lithuania, Poland, Romania, Slovenia, Spain, Turkey and United Kingdom.

9 of them, i.e. Bulgaria, France, Iceland, Italy, Poland, Romania, Slovenia, Spain and United Kingdom, are already actively working within the NET-HERITAGE project, i.e. the ERA NET Project on “European network on Research Programme applied to the Protection of Tangible Cultural Heritage”.

The balanced composition of the Member States and Associated Countries supporting this Joint Programming Initiative is proved by the participation of big and small countries, as well as new associated countries.

In addition the geographic distribution of participating Countries assure the consideration of the different problems affecting the protection of cultural heritage due to different environmental, social, cultural and economic conditions, including countries from the Mediterranean Basin to the Polar Area, as well as different typologies of tangible assets characterising the European cultural heritage.

6.2 Human, scientific and technical resources made available by participants

Europe already has the competences as well as infrastructures as starting element: JPI offers the possibility to coordinate these capacities in relation of the assigned objectives.

Since 1984, the European Union has funded research applied to the protection, conservation and valorisation of Cultural Heritage, which allowed the creation of a network of human, scientific and technological resources.

EC projects covered topics ranging from movable to immovable, tangible and intangible cultural heritage to establish the scientific basis for protection, conservation and fostering of Cultural Heritage.

The *ERA NET project NET HERITAGE on “European network on Research Programme applied to the Protection of Tangible Cultural Heritage”* is currently involving 14 European Member States: Italy (coordinator), Belgium, Bulgaria, France, Germany, Greece, Iceland, Latvia, Malta, Poland, Romania, Slovenia, Spain and United Kingdom. The 15 research programme managers currently involved have decided to take up the challenge of networking new research activities at national levels in the multidisciplinary field of Science and Technology applied to the Protection of Tangible Cultural Heritage. The Partnership including: 9 Ministries, 5 RTD Agencies and 1 RTD Foundation. has already created national networks of experts on the protection of cultural heritage, including national research organisation (e.g. CNR, ENEA, CNRS, CSIC, Fraunhofer), universities and stakeholders.

ERNEST “Europe Research Network on Sustainable Tourism” is an ERA NET Project gathering a large group of regions and organisations which are undertaking steps to strengthen the contribution of sustainable practices to competitiveness within the frame that the *conservation of Europe’s heritage will contribute to its attractiveness*. This ERA NET includes 10 European Member and States and Associated Country: Regione Toscana (Italy) as coordinator, Cité de la Culture et du Tourisme Durable (France), Basquetour (Spain), Prefecture of Ilia (Greece), South-East Romania Development Agency (Romania), Govern de Illes Balears (Spain), Regional Development Agency of North Hungary (Hungary), South West Tourism (United Kingdom), Danish Forest and Nature Agency, Nord Zealand (Denmark), Generalitat de Catalunya (Spain), Conseil Régional d’Aquitaine (France), Regione Emilia Romagna (Italy)

HERA “Humanities in the European Research Area” is the ERA NET Project aiming at strengthening the European voice in the Humanities, which will be concluded by December 2009. The main objective of HERA was to ensure that the European Research Area can fully benefit from key contributions consequent on humanities research. The HERA Joint Research Programmes just starting will decide in December after evaluation the research proposals to be funded.

The *European Construction Technology Platform (ECTP)* which galvanize the construction sector by including 125 member organisations (i.e. 25 large companies, 34 research centres, 27 universities, and 13 SMEs and 26 associations) has created among the 7 area on which it is structured the Focus Area Cultural Heritage (FACH). A Strategic Research Agenda (SRA) including activities regarding cultural heritage research has been developed in strict connection with stakeholders and several National Platforms have been activated in different

European member states and . and associated countries.

Connections with the most relevant international organizations active in the field of cultural heritage protection includes: the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), the International Council on Monuments and Sites (ICOMOS), the Council of Europe and Europa Nostra.. These connections will assure to this JPI the required global perspective which is the prerequisite to fulfill the envisaged objectives.

6.3 Available infrastructure and new infrastructure required to carry out the proposed JPI

This JPI will offer the opportunity to European Member States and Associated Countries. to improve the network of large infrastructure (i.e. lasers, neutrons, synchrotron, climatic wind tunnel, shaking table etc.) for the specific application to cultural heritage protection. It will facilitate optimization and effectiveness of use of other specific infrastructure – monitoring stations and networks, IT networks, digital libraries and databases, mobile laboratories, specific experimental facilities, powerful analytical laboratories available in individual partner countries.

The European infrastructure “Cultural Heritage Advanced Research Infrastructures: Synergy for a Multidisciplinary Approach to Conservation/ Restoration (CHARISMA)” is an I3 Project funded within FP7 Capacities Programme, including 3 activities of networking, 3 of access and 3 of joint research, started in October 2009 with a duration of 4 years. CHARISMA includes archives (ARCHLAB) and mobile instrumentations (MOLAB).

Two platforms of large scale facilities in France (Accelerator AGLAE in C2RMF and Synchrotron SOLEIL) and one in Hungary (FIXLAB) are dedicated to the advanced study of

6.4 Indicative overall budget and indicative contributions from the different participants

This JPI could be of 50 millions (euro)/year for 10 years, for a total of 500 millions (euro), but this amount can be increased depending of the number of partners of the JPI. Project cores will be financially supported from the JP with contributions from existing national research projects in the form of in kind costs and/or research results, opening specific laboratories for experimental work or long term stays.

Drawing together the average yearly budget elaborated by the participating Members States and Associated Countries reported in section 5.4, the indicative funding on cultural heritage research will be as follows:

<i>Country</i>	<i>Funding on cultural heritage research (MEuro / year)</i>
Austria	0,5
Bulgaria	0,25
Czech Republic	16
France	7
Iceland	5,6
Italy	40
Slovenia	14,5

Spain	1,7
UK	23,8

With the Countries participating in this JPI which are not included in the table a discussion for the definition of the funding related to this area of research is on going.

This table demonstrates that the intended budget of this JPI of 500 MEuro is reasonable and achievable considering that the Member States have made individual commitment of a substantial size.

6.5 Duration of the research activities

The programme has to be sustained for at least 10 years.

Europe risks being unprepared for cultural heritage research, if it does not foster a new generation of researchers capable of tackling this area of research.

The duration of this JPI must allow for appropriate initiatives concerning human capital selection, formation and transfer knowledge to stakeholders, as well as dissemination out of Europe.

6.6 Preliminary governance structure

Government Board (GB) – Composed by the top management representative of each Member State, the GB will be responsible for the political and strategic orientation of this Joint Programming Initiative. Meets once per year, chaired by the Coordinator.

Executive Committee (EC) – Composed by the scientific and technical representative of each Member State, managing the Joint Programming Initiative and coordinating the implementation of the activities planned within this JPI. The Executive Committee shall also include major experts from any country involved in this JPI selected on a peer-review basis. The Executive Committee will be chaired by the coordinator and it will meet twice per year.

The *Coordinator* will be responsible for coordinating the activities among GB, EC and SB to implement a mutually accepted and realistic vision. The Coordinator will lead a JPI Management Office where a project manager and administration will be based for the necessary support for the day-to-day management.

The *Advisory Board (AD)* will include representative of UNESCO, Council of Europe, World Monuments Fund, ECTP, Blue Shield. It will advise the GB on the strategic issues, on the efficiency and effectiveness of the JPI initiative and contribute to integrate this JPI into the global context.

6.7 Openness to additional participant countries at a later stage

Taking into account the principle of open access as referred to in paragraph 7 of the Council conclusions concerning Joint Programming of Research in Europe in response to major societal challenges, additional participants both Member States and Associated Countries will be allowed to join at a later stage this JPI.

6.8 Preliminary indications for success/performance indicators

The indicators that are at the basis of this JPI are in line with the evaluation systems of the Member States/Associated Countries and the EC: 1) Producing research that is of highest level and responsive to international needs; 2) Providing resources that are useful to decision-makers and the European citizens; 3) Promoting an environment of collegiality, integrity, and excellence.

The activities of the JPI which are described in section 4 are addressed to manage research, development and knowledge transfer in the field of protection of cultural heritage.

These objectives will be conducted for the benefit of the involved countries and implemented within the following values:

Excellence - The JPI Cultural Heritage will pursue excellent and innovative research and innovation, which could be based and developed only in Europe. Only the best researchers and operators identified through a defined peer review process will be involved for ensuring the highest standards of quality.

Participative - The JPI will involve all different stakeholders: public and private organizations that have proven capacity for research and innovation.

Collaborative - The JPI “Cultural Heritage” will enable mutually supportive collaborations between and among multidisciplinary researchers, cultural heritage managers and policy decision makers. The involvement of regional, national, and international actors in the protection of cultural heritage will develop research collaborations and effective partnerships.

Integrated and Focused - The JPI will support research and innovation combining the wide spectrum of professionalises which work in the field of cultural heritage. The JPI will allow the enhance of knowledge, their application and dissemination worldwide. It will create a synergistic environment and instruments which integrates disciplines dispersed by now if not ignoring each others.

Policy Development - The JPI will contribute to include cultural heritage in those policy sector which by now neglect it (including climate change)

Summary of Key Performance Indicators

- Number of researchers and related professionals involved in the JPI projects
- Number of research, management and development collaborations.
- Access and use of new knowledge by cultural heritage managers and citizens.
- Number of technologies developed or adapted for specific use.
- Number of research publications and their impact in the field.

