

CLIMATE FOR CULTURE

AT A GLANCE

Title: Damage risk assessment, economic impact and mitigation strategies for sustainable preservation of cultural heritage in the times of climate change

Instrument: Integrated Collaborative Project

Total Cost: 6 566 893 €

EC Contribution: 4 964 866 €

Duration: 60 months

Start Date: 01-11-2009

Consortium: 27 partners from 14 countries

Project Coordinator: Johanna Leissner, Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. (Germany)

Project Web Site: www.climateforculture.eu

Key Words: Climate change impacts, cultural heritage, sustainability, preventive conservation, microclimate, high resolution climate models, damage assessment, IPCC report, UNESCO World Heritage sites



THE CHALLENGE

Climate Change is one of the most critical global challenges of our time. This factor, coupled with the increasing demand our society makes on energy and resources, has forced sustainable development to the top of the **European** political agenda. Scientific research shows that the preservation of the cultural heritage of Europe is particularly vulnerable to all three of these factors. As a non-renewable resource of intrinsic importance to the European identity, we need to develop more effective and efficient sustainable adaptation and mitigation strategies in order to preserve these invaluable cultural assets for the long-term future. More reliable assessments will lead to better prediction models, which in turn will enable preventive measures to be taken, thus reducing energy and the use of resources.

PROJECT OBJECTIVES

For this purpose and for the first time ever, the CLIMATE FOR CULTURE project will connect completely new high resolution Climate Change evolution scenarios with whole building simulation models to identify the most urgent risks for specific regions. The innovation lies in the elaboration of a more systematically and reliable damage/risk assessment which will be deduced by correlating the projected future climate data (with the spatial resolution of up to 10x10 km grid size) with whole building simulation models and new damage assessment functions. In situ measurements and investigations at cultural heritage sites throughout Europe will allow a much more precise and integrated assessment of the real damage impact of climate change on cultural heritage at regional scale. Sustainable (energy and resource efficient) and appropriate mitigation/adaptation strategies, also from previous EU projects, are further developed and applied on the basis of these findings simultaneously. All these results will be incorporated into the assessment of the economic costs and impacts.



METHODOLOGY

Precious collections in historic buildings from various European regions as well as UNESCO World Heritage Sites will be included as representative case studies for *in situ* investigations of existing problems and for the projection of future challenging issues using whole building simulation and different *in situ* monitoring technologies.

In order to ensure an effective and efficient use of resources, this project will build, wherever possible, on the results of already concluded EU research projects. New mitigation strategies will be developed with a special focus on energy and resource efficiency, applicable to a wide variety of immovable and movable cultural assets under changing environmental conditions and in different climatic zones.

The CLIMATE FOR CULTURE project will thus be able to estimate more systematically the damage potential of climate change on European cultural heritage under different climate change scenarios at regional scale.

EXPECTED RESULTS

To raise the awareness of the decision makers what it costs to take actions and what it costs, if actions are not taken to protect cultural heritage, the economic impact and physical risks to European cultural heritage will be identified.

To ensure that the results from this project are brought to the attention of policy- and decision-makers, a "Political Dissemination Board" will be established, consisting of members of the European Parliament, national ministries and other representatives.

The final achievement of the project will be an economic impact report on cultural heritage in the times of climate change akin to the 2006 STERN report. Such a report would be a truly European contribution to future IPCC Reports and suitable for integrating cultural heritage into the EU Sustainable Development Strategy.

PROJECT PARTNERS	
Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. (Germany)	Eindhoven University of Technology, Unit Building Physics and Systems (Netherlands)
Czech Technical University in Prague, Prague, Faculty of Mechanical Eng. (Czech Republic)	University of Ljubljana, Faculty of Civil and Geodetic Engineering, Chair for Research in Materials and Structures (Slovenia)
Consiglio Nazionale Delle Ricerche - Istituto di Scienze dell'atmosfera e del Clima (Italy)	Gradbeni Institut ZRMK, Centre for Indoor Environment, Building Physics and Energy (Slovenia)
University of Zagreb, Faculty of Civil Engineering (Croatia)	Gotland University / Baltic Sea Region Network on Indoor Climate in Churches (Sweden)
Institute of Electronic Structure and Laser/ Foundation for Research and Technology, Holography Lab - Laser Applications Division (Greece)	Andreas Weiß, freelance conservator-restorer / Baltic Sea Region Network on Indoor Climate of Churches, SME (Germany)
Max Planck Institute for Meteorology (Germany)	RSD - Engineering Consulting & Software Development, SME (Poland)
Technische Universität München, Studiengang für Restaurierung, Kunsttechnologie und Konservierungswissenschaft (Germany)	Krah & Grote Measurement Solutions, SME (Germany)
TB Käferhaus GmbH, Consulting engineers for the preservation of cultural heritage, SME (Austria)	Haftcourt Ltd., SME (Sweden)
ACCIONA, S.A. (Spain)	Bayerische Verwaltung der staatlichen Schlösser, Gärten und Seen (Germany)
Bayerische Staatsgemäldesammlungen – Doerner Institut (Germany)	National Trust for England, Wales and Northern Ireland (United Kingdom)
Kybertec Ltd., SME (Czech Republic)	Glasgow Caledonian University (United Kingdom)
CULTNAT - Center for Documentation of Cultural & Natural Heritage (Egypt)	Jonathan Ashley-Smith, Consultant for Conservation Risk Assessment, SME (United Kingdom)
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