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# The Climate Crisis and Its Impact on Our Cultural Heritage – ‘Strengthening Cultural Heritage Resilience for Climate Change’: A Survey in Europe by the EU OMC Expert Group

**Abstract:** The Earth's climate is becoming hotter and more extreme. Scientists are no longer talking about climate change but about climate crisis and it is high time to act. The next World Climate Conference COP28 will take place in Dubai and important climate policy decisions are pending: defining specific solutions that must be scaled up this decade to limit warming to 1.5 degrees; building resilience and mobilising finance at scale; looking where the world stands on climate action and support; identifying the gaps; and working together to agree solution pathways to 2030 and beyond. These issues also affect our cultural heritage – we know it is threatened by the climate crisis and that irreplaceable losses are already occurring. What can we do to protect cultural assets? What dangers exist for the written cultural heritage in libraries and archives? How do we deal with losses? We urgently need to address these issues. That is why the Council of the European Union has mandated the EU Commission to set up an expert group of Member States based on the Open Method of Coordination (OMC). Bearing in mind the Paris Agreement (2015) and the UN Sustainable Development Goal 13 on climate change, the state of play of cultural assets in relation to climate change in the respective countries has been identified and good practices as well as innovative measures for historical environments have been collected. Delegates from 25 EU Member States and three associated countries started working in January 2021 and they published their results and recommendations in September 2022. The survey undertaken by the delegates of the OMC expert group shows that little information from the area of libraries and archives is available, which demonstrates an urgent need to deal more intensively with the effects of climate change and to develop appropriate measures.

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# 1 Climate Change Becomes Climate Crisis – Background

Exactly 20 years ago, in 2003, the EU Commission was the first research funding institution in the world to publish a call for scientific research into the effects of climate change on cultural heritage. At the time this seemed to be a purely academic research question far removed from reality. Since then, climate change has progressed faster than climate models had predicted and, meanwhile, its impact on cultural heritage can no longer be overlooked.

The continent of Europe is particularly affected by the rise in temperature, as shown in the report published on 23 April 2023 by the Copernicus Climate Change Service (ESOTC) which describes the most important climate events of 2022 in Europe and around the world. These data-based findings show continuously rising temperatures and an increasing number of extreme events in 2022 and in a long-term context. Here is an extract from a brief summary of the report:

In recent decades, Europe has warmed faster than any other continent, with temperatures rising twice as fast as the global average. In summer, much of the continent experienced exceptional heatwaves, and maximum temperatures in Europe reached around 10°C higher than typical maximum temperatures in summer. Large parts of Europe suffered extreme and prolonged heatwaves, and southern Europe experienced the highest number of days with very high heat stress levels since records began. Low amounts of rainfall and high temperatures led to widespread drought. Carbon emissions from summer forest fires were the highest in 15 years, and in some countries, the highest emissions in 20 years were recorded. A record loss of glacier ice was recorded in the European Alps.

Climate change has arrived in Europe and has long since become a climate crisis. Climate change is affecting everything and each one of us, including our cultural heritage, causing enormous damage and loss at an unprecedented speed and on an unprecedented scale. At the same time, the traditional knowledge stored in our cultural heritage offers inspiration for green, sustainable solutions to the climate crisis.

## 2 Cultural Heritage in European Policies: The Political Mandate for the OMC Expert Group of EU Member States ‘Strengthening Cultural Heritage Resilience for Climate Change’

Cultural heritage plays a key role in making our societies fit for the future. This applies more especially to the written cultural heritage in which the achievements of our civilisation are documented and made available to future generations. The loss of written records would render our knowledge-based society disoriented as they form the basis for innovation and offer suggestions for how we might meet the challenges of climate change. In addition, the written records in libraries, archives and museums are authentic sources, which cannot be valued highly enough in the age of fake news and ChatGPT. The EU and its Member States have recognised the importance of cultural heritage and therefore committed themselves as early as 2009 to the protection of cultural heritage in Article 3 of the Treaty of Lisbon while, in 2019, the EU adopted the European Green Deal with the aim of becoming the first climate-neutral continent by 2050 and meeting the major challenges of climate change. By doing so the EU is taking on a leading role at global level. Inspired by and building on the Green Deal and the Council of the European Union’s Work Plan for Culture 2019–2022, the establishment of an Open Method of Coordination (OMC) expert group of EU Member States was envisaged for the first time; it will address climate change and cultural heritage in order to assess the current situation in the Member States, the available knowledge as well as the deficits and obstacles that need to be removed. This is the only way to strengthen resilience to climate change. With the establishment of the OMC expert group, the EU and Member States emphasise the urgent need for an in-depth debate on climate change and cultural heritage to ensure that the discussion and planning of measures to tackle climate change are initiated both at EU and national level.

To date, neither the EU Member States nor the EU have adequate laws, policies, strategies and action plans to mitigate the consequences of climate change for cultural heritage.

In response, in October 2020, the EU Commission implemented the mandate of the Cultural Affairs Committee of the Council of the European Union to set up an EU OMC expert group. Twenty-five EU Member States and three associated countries agreed to participate in the expert group, which began its work in January 2021.

The participating countries are Austria, Belgium, Croatia, Cyprus, the Czech Republic, Estonia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slova-

nia, Slovenia, Sweden, Spain, as well as Norway, Iceland and Switzerland as associated countries. Owing to its federal structure, Germany has sent two delegates: representing the federal states is Christina Krafczyk, President of the Lower Saxony State Office for the Preservation of Monuments, while the federal government is represented by the present author, Scientific Representative of the Fraunhofer-Gesellschaft and the Alliance for Research on Cultural Heritage, who was elected Chairperson by the delegates at the first meeting.

## **2.1 Objectives and Scope of the Mandate**

The objectives and scope of work of the OMC expert group are set out in the mandate of the Council of the European Union of 12 October 2020; the OMC expert group shall investigate current and emerging threats and impacts of climate change on cultural heritage, including cultural landscapes. It shall explore appropriate adaptation and mitigation measures, identify potential risks and focus on building the resilience of cultural assets in the face of a changing environment while avoiding maladaptation. The group is also tasked with examining the contribution that cultural heritage with its inherent traditional knowledge, such as traditional craft techniques, resource-saving and climate-adapted construction methods or low-energy ventilation systems, can make to mitigate and combat climate change in line with the objectives of the Green Deal.

## **2.2 Current Situation and Results from the Member States**

To begin with, the expert group decided that both tangible and intangible cultural heritage should be considered. The situation in the countries was ascertained by means of a multi-page questionnaire: in about half of the countries, policies such as the National Adaptation Plan for Climate Change or the National Recovery Plan (e. g. in Scandinavia, Italy, Greece and Cyprus) already exist that take both cultural heritage and climate change into account. However, nine countries still lack such policies, with Germany being one of them. One problem mentioned by most delegates was the different responsibilities of the ministries which often barely communicate or co-operate with one another; this leads to a significant weakening of the cultural heritage sector both at EU and national level.

But what threats does climate change pose to cultural heritage? That was one of the main questions put to the delegates of the EU expert group. Unsurprisingly, the effects of extreme climatic events were named as the main hazard, for example heavy precipitation, heat waves or prolonged periods of drought, the effects of

which have been increasingly observed in recent years, particularly due to the devastating floods in the Ahr valley but also in historic gardens and cultural landscapes. For many EU Member States rising sea levels in particular present an ever-increasing threat as many cultural heritage sites are located along coastlines, while indirect threats such as socio-economic effects or demographic change are identified as further dangers. In addition to extreme events, gradual, slow climate change is also damaging cultural heritage, which involves the acceleration of corrosion processes on many historical materials such as glass, metal and stone or iron gall ink due to higher temperatures and the general change in climate as a whole – rainfall, direct sunlight, wind speed and direction, differences between day and night, frost and thaw cycles, absolute humidity, to name just a few climatic parameters.

Another question dealt with the type of cultural heritage that is being adversely affected by progressive climate change. Here the delegates listed buildings and monuments firstly and cultural landscapes secondly, where the effects can sometimes even be seen with the naked eye. The effects of climate change on movable cultural assets such as works of art or printed books and manuscripts in museums, archives and libraries were mentioned less often, as very little research has been carried out in this area to date.

## 2.3 Collecting Examples of ‘Good Practice’

An important task of the mandate is the collection of examples of *good practice*. These examples are intended to show innovative and sustainable solutions based on methods and measures that are already in use today to contribute to a CO<sub>2</sub> reduction on the one hand and to promote adaptation to climate change on the other. This is because the most important project of the European Commission, the Green Deal and the initiative of the current Commission President Ursula von der Leyen, the New European Bauhaus, includes the areas of construction as well as the existing building stock at European level. A key point of discussion within the work of the OMC expert group was the examination of the CO<sub>2</sub> life cycle of historically significant and listed buildings; to this end, it is necessary to assess the existing building stock and its preservation within the framework of a holistic approach. The aim of all regulations should take into account that the preservation of existing buildings that have the potential to be renovated and improved – and here in particular historical monuments – is already an advantage in terms of climate policy, which is illustrated by the example of grey energy. In Europe, too, buildings consume by far the most energy and contribute to around one third of CO<sub>2</sub> emissions. Even with new, energy-saving buildings half of the impact on the environment is already reached before they are even operational.

For this reason, greater focus needs to be put on grey energy in existing buildings, especially in listed buildings. For a comprehensive assessment the future climatic situation, i. e. climate change, must also be taken into account in the operation of buildings (heating, cooling, humidification and dehumidification, shading) and in their maintenance. Listed buildings occupy a leading position in terms of ecological and climate-friendly construction; a very high percentage of these buildings have used a wide range of climate-friendly building materials, both in their initial construction and in their ongoing restoration. Most often, locally-produced materials were used that did not require long-distance transport, as is otherwise often the case today. Due to these two factors, architectural monuments have a positive ecological balance, for example through the use of wood from local forests with its high CO<sub>2</sub> capture capacity.

However, the OMC expert group has found that there is a lack of fundamental quantitative as well as further qualitative data on precisely this key topic, which prevents entry into a results-orientated political discussion on energy efficiency in existing buildings. Together with the importance of architectural monuments and historically important buildings in urban and rural areas as core elements of European identity, the preservation and respect for their special characteristics remains of the utmost importance in the context of the Green Deal.

## **2.4 Research – The Indispensable Driver to Strengthen Cultural Heritage Against Climate Change**

Research and innovation are fundamental prerequisites for developing strategies and measures to protect cultural heritage from climate change, which is demonstrated by the 83 examples of ‘good practice’ that the EU OMC expert group has collected as part of its mandate. Most of the examples come from EU research, as the EU Commission has increasingly funded research projects in this area in recent years and continues to do so. Nevertheless, there are still major gaps in our knowledge regarding how, and to what extent, climate change is affecting our movable heritage, which is primarily displayed and stored indoors. Research efforts at national level are particularly lacking here, especially in Germany, where there has been no national research programme since 1997. It must be examined, for example, what cooling and energy requirements archives and libraries will have in view of the increasingly frequent and faster occurrence of heatwaves, what threats the arrival of new types of insects will pose and what skills employees at cultural heritage institutions will need in order to develop sustainable solutions to the complex issues involved.

In addition to these specialist aspects, it is also important to regain the international competitiveness of German conservation and cultural heritage research and

secure the next generation of researchers. The setting up of a new national, multi-disciplinary research programme for the preservation of cultural heritage in times of climate change will strengthen urgently-needed co-operation and concentrate the excellence available in the institutions.

The lack, or scarcity, of German research was also evident in the difficulty of finding examples of ‘good practice’. Germany was only able to contribute three examples to the OMC expert group: climate-neutral Dyck Castle and Park, the energy-optimised Margarethenhöhe district in Essen and the EU Climate for Culture project. These and other examples of ‘good practice’ are described in more detail in the appendix to the EU OMC report (Figure 1).<sup>34</sup>

Furthermore, research is urgently needed to gauge the economic and financial impact. We still do not know what costs will be incurred by our society and what budgets will have to be made available to make our cultural heritage climate-resilient. In its report the OMC expert group emphasises the unique role that research has played and will continue to play in promoting cultural heritage in the context of discussions, actions and research development on climate change.

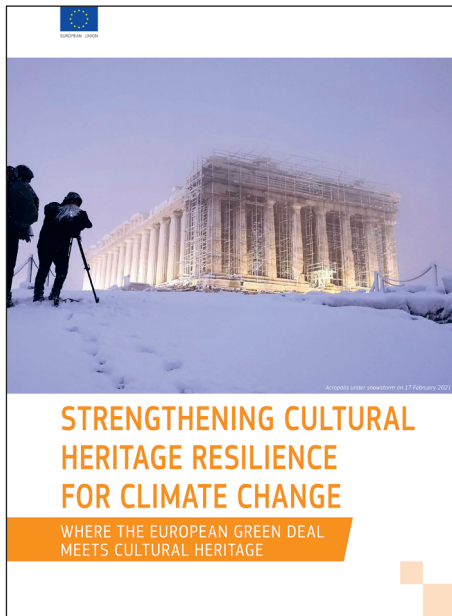
### 3 The Results of the EU OMC Expert Group May Be Summarised as Follows:

- Extreme climate events and gradual climate change are having an unprecedented impact on all types of tangible and intangible cultural heritage around the world.
- Large gaps still exist in the understanding and knowledge of the effects of climate change, particularly with regard to intangible as well as movable cultural heritage.
- There is a lack of relevant and reliable data, particularly with regard to the life cycle of buildings and the costs of structural adaptation and climate technology retrofitting.
- Cultural heritage institutions need incentives and financial support (e. g. tax relief, special write-offs) to adapt to climate change.

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<sup>34</sup> EU OMC report 2022; EU OMC report, good practice 2022. The report of the OMC expert group in German, English and French (<<https://doi.org/10.2766/44688>>) and the collection of 83 examples of ‘good practice’ (<<https://doi.org/10.2766/31292>>) can be downloaded free of charge from the website of the Publications Office of the European Union.

- It is difficult to collect climate-relevant information on cultural heritage in Europe; there is no overarching centralised data and knowledge platform.
- There is a lack of awareness of the urgency of adaptation at all levels.
- Adaptation and resilience plans must be developed immediately.
- Europe needs a forum for mutual exchange. There is a need for a joint monitoring agency.
- There is an urgent need to invest in skills through training and further education opportunities, especially in the (traditional) crafts sector.
- Co-operation and exchange between cultural heritage experts, climate scientists and decision-makers must be intensified.
- Cultural heritage is not integrated in important mainstream policies at EU and national levels, e. g. cultural heritage is missing from many national adaptation plans.



**Fig. 1:** Cover page of the report of the EU OMC expert group 'Strengthening cultural heritage resilience for climate change'. Image: European Union, 2022

## 4 Conclusion and Outlook

Climate change is endangering our European cultural heritage. The 83 examples of 'good practice' already show some solutions for how cultural heritage can be adapted to climate change and contribute to reducing greenhouse gases but, never-



theless, we are only at the beginning of developing suitable adaptation measures. Increased co-operation at all levels is required, as well as intensive engagement with the issue. EU research programmes are already providing good contributions to this, but the Member States in particular are called upon to set up and promote more interdisciplinary and multidisciplinary research projects. The cost of preserving the memory of our civilisation for future generations is presently still unknown, and additional economic studies are therefore needed at both EU and national level to look at adaptation measures. However, our cultural heritage is not only a victim but also part of the solution. It is a rich resource for how our ancestors dealt with climate change and the sustainable solutions they developed, which we should remind ourselves of today. By overcoming these challenges, Europe will take on a leading role in the sustainable preservation of cultural memory.

## References

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