



A Researcher Guide to Writing a Climate Justice Oriented Data Management Plan



- Addressing the environmental impacts of research
- Managing data sustainably
- Preparing for future funding frameworks
- Developing and sharing best practice



A Researcher Guide to Writing a Climate Justice-Oriented Data Management Plan

Digital Humanities Climate Coalition

Information, Measurement and Practice (IMP) Action Group

April 2022

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Most funding applications to **UK Research and Innovation** (UKRI) require the submission of a **Data Management Plan** (DMP). A DMP outlines a project's approach to managing data through a response to a series of prompts on data creation, storage, sharing, and ethics, which are provided in the application guidance. This guidance also points researchers to resources they might find useful in preparing a DMP and encourages applicants to demonstrate knowledge of institutional policies and procedures.

The UK has declared a climate emergency, as have universities and research organisations across the sector. Use of Information Communications Technology (ICT) is widely recognised as a major source of carbon emissions. However, neither the DMP application guidance nor its associated assessment criteria currently refer to the climate crisis or environmental emergency.

Nevertheless at our recent event funders signalled to us that they are open to reimagining the DMP for climate justice, and in Appendix 1 we highlight areas of intervention and propose model wording. Consensus for change may, however, take time to emerge. Funders have also indicated an openness to researchers proactively interpreting existing DMP guidance for climate justice. Reading **DMP guidance** (e.g. in the AHRC Funding Guide) from a **climate justice perspective** makes it clear that its prompts are worded with sufficient openness that they enable researchers to respond in ways which align with sectoral and national climate commitments.

For example, the prompt that asks whether there are 'any legal and ethical considerations of collecting the data' (p. 56) raises the possibility of discussing the ethics of over-producing data that need energy and resources to be stored. Similarly, answers to the question 'How long will [the data] be stored for and why?' (p. 56) might reasonably balance long-term preservation of research outputs with the imperative to reduce the proliferation of data on public facing services that are unused for long periods. Finally, the requirement that the applicant and their institution have 'considered all the risks, and storage will be in line with the institution's data management policy' prompts reflection on long-term data storage, the adaptations to climate change required to ensure long-term storage, and the entanglement of institutional data management policies with environmental strategies.

Of course we recognise that not all researchers will have the knowledge and expertise to develop these lines of thinking and to make informed decisions. We are also mindful that researchers may wish to "play it safe" and not risk a bid by including climate justice-oriented practice that may be new to them. However, the scientific advice is clear that there is an imperative to act immediately. To further facilitate rapid action, the Digital Humanities Climate Coalition are working on a toolkit to support the decarbonisation of arts and humanities research, available from late 2022.



In the meantime, we highlight five areas for immediate consideration when writing a DMP:

- 1. Energy proportionality.** In the Royal Society's report [Digital Technology and the Planet](#) (2020), a key principle of the chapter on Green Computing is 'energy proportionality'. For a researcher writing a climate justice-oriented DMP, the imperative here is not to produce numbers that show their anticipated energy use per month by some measure. Rather it is to demonstrate that the research design seeks to ensure that the resources used (e.g. hardware purchases, compute time, data storage) will be proportional to the results produced (e.g. outputs, anticipated findings, impacts). [Minimal Computing](#) approaches may be useful.
- 2. Resource proliferation.** A key finding of The Shift Project's report [Lean ICT: Towards Digital Sobriety](#) (2019) is that increasing the lifetime of professional laptops from 3 to 5 years could reduce greenhouse gas emissions by up to 37%. Equally, recent and important long form studies like Kate Crawford's [Atlas of AI](#) (2021) have underscored the ecological impacts of device proliferation. For a researcher writing a climate justice-oriented DMP, the imperative here is to justify the environmental costs of new device purchases, to demonstrate alignment with institutional policies on device recycling (e.g. does your institution follow or go beyond [Waste from Electrical and Electronic Equipment \(WEEE\)](#) regulations in their approach), and to consider and explain the benefits of using refurbished devices if appropriate. For example, if external hard drives purchased for a previous project and pooled by your research group are serviceable and within warranty, they may be perfectly usable for a future project that seeks to take a climate justice-oriented approach to data management, and can be described as such in your DMP.
- 3. Computationally intensive research.** Computer time requires energy use. Lannelongue, Greanley, and Inouye give us tools to calculate this in their 2020 paper '[Green Algorithms: Quantifying the Carbon Footprint of Computation](#)'. In turn their '[Green Algorithms](#)' service gives us an interactive way to understand this energy use relative to driving a car, taking a flight, or planting trees, a way – in short – of describing energy proportionality. For a researcher writing a climate justice-oriented DMP, the imperative here is to describe the decisions taken about the purchase of storage and storage services that relate to and overlap with computationally intensive research activities. For example, that the energy source mix for cloud providers have been investigated, or that data will be structured and stored in ways that reduce compute time and the need for brute force approaches.
- 4. Where measurement is challenging, err on the side of caution.** Good quantitative data on environmental impacts can be hard to come by. Building capacity in this area is important. However, especially as we transition, don't be shy to make choices that appear more sustainable to you, even if their positive contribution is not quantified.
- 5. Identifying relevant standards, frameworks, and guidelines.** There are by now many resources that support climate justice across many different aspects of project management. These range from guidelines to minimise the carbon footprint of events, to standards for stakeholder mapping and engagement, to database tools for estimating the carbon intensity of procurement decisions. There are also institution-level standards with project-level relevance (e.g. the [Science Based Targets initiative](#), often referred to as SBTi). These all involve some form of data collection and management, and as such, the DMP is an appropriate place to include them.



We hope this short guide will enable researchers to be bold in interpreting the DMP guidance, rather than seeing climate justice-oriented actions as another box to tick, another hurdle to jump. Climate justice-oriented data management practices can be threaded through the research programmes of all researchers applying for UKRI funding. There is nothing stopping us apart from developing our knowledge so we can define the appropriate actions to take. We hope that the work of the [Digital Humanities Climate Coalition](#), and the opportunities for conversation and co-production we have over the coming months, will build sectoral capacity for that change.

Suggested DMP Citation

Researchers who have referred to this guidance in developing a DMP may optionally include wording such as, “This DMP is aligned with Digital Humanities Climate Coalition’s 2022 recommendations on data management and climate justice.”

Suggested Full Citation

DHCC Measurement and Practice Action Group (Anne Alexander, Sarah Ames, James Baker, James Cummings, Racelar Ho, Leif Isaksen, Barbara McGillivray, Anna Vignoles, Jo Lindsay Walton, Jane Winters). ‘A Researcher Guide to Writing a Climate Justice-Oriented Data Management Plan’. Digital Humanities Climate Coalition Information. April 2022. DOI: 10.5281/zenodo.6451499

Cover Image

Urban Beekeeping, Washington DC. USDA / [ClimateVisuals.org](#). Licensed under Creative Commons.



Appendix 1

Climate Justice-Oriented UKRI Data Management Guidance

How might UKRI revise requirements and guidance in the future? Here we offer recommendations and suggestions to contribute to the discussion.

Climate Justice-Oriented AHRC Data Management Guidance

Digital Humanities Climate Coalition

Information, Measurement and Practice (IMP) Action Group

April 2022

Based on AHRC-230821-ResearchFundingGuideV5.5-2021.pdf (ukri.org/publications/ahrc-research-funding-guide) accessed April 2021

SECTION 4: APPLICATION GUIDANCE

Data Management Plan

The Data Management Plan should outline the project's approach to managing data. It is mandatory to include for all Research, Development and Engagement Fellowship scheme, Research Grants and Follow on Funding applications but is not required for Research Networking. Applicants should address the below points:

One way of reading this is that a climate justice-oriented approach is already a legitimate approach.

1. Briefly introduce the types of data the research will create. Why did you decide to use these data types?

Funders can help researchers by stating that data types that are efficient in terms of storage capacity are also efficient in terms of both financial cost and energy/resource/processing costs.

2. Give details on the proposed methodologies that will be used to create the data. Advise how the project team selected will be suitable for the data/digital aspects of the work, including details of how the institution's data support teams may need to support the project

3. How will the data be stored in the short term?

Funders can help researchers by encouraging the use of existing devices so as to avoid device proliferation

a. What backup will you have in the in-project period to ensure no data is lost?

4. How the data will be stored in the long term

Funders can help researchers by stating that it is usually inappropriate to preserve all project outputs. In turn, funders can encourage applicants to make time in their projects to carefully select data for preservation, knowing that preserving data without purpose is not energy proportionate.

a. Where have you decided to store it, why is this appropriate?

b. How long will it be stored for and why?

c. Costs of storage – why are these appropriate? Costs related to long term storage will be permitted providing these are fully justified and relate to the project Full justification must be provided in Justification of Resources (JoR)

Project 'costs' are both financial and ecological. We encourage funders to support researchers in justifying the appropriateness of their planned activities against both costs.

5. How the data will be shared and the value it will have to others

a. How the data will enhance the area and how it could be used in the future?

b. Releasing the data – advise when you will be releasing and justify if not releasing in line with AHRC guidelines of a minimum of three years. If the data will have value to different audiences, how these groups will be informed?

c. Will the data need to be updated? Include future plans for updating if this is the case.

d. Will the data be open or will you charge for it? Justify if charging to access the data

e. Financial requirements of sharing – include full justification in the JoR

6. Ethical and Legal considerations

a. Any legal and ethical considerations of collecting the data

b. Legal and ethical considerations around releasing and storing the data – anonymity of any participants, following promises made to participants

DHCC REWRITE
c. Costs of storage – why are these appropriate? Costs related to long term storage will be permitted providing these are fully justified and relate to the project. Full justification must be provided in the Justification of Resources (JoR). Note that applicants are encouraged to acknowledge ecological as well as financial costs, and that the appropriateness of activities should be justified against both costs.

You may wish to consult external sources of knowledge in order to provide a more fulsome data management plan. Below are some useful links to assist with creation of the plan and these can provide some guidance and pointers in conjunction with your institution's own knowledge. You do not need to specifically reference these sources in the Data Management Plan unless you feel it is appropriate to do so.

Funders can encourage the use of energy proportionate backup, such as dormant local storage or cloud suppliers whose energy sources are subject to regular audit.

DHCC REWRITE

What backup will you have in the in-project period to ensure no data is lost? Note that applicants are encouraged to consider the ecological costs and ethical considerations of retaining excess data, and the how these risks are mitigated by good data management practices.

From a legal/ethical perspective, it is already established practice to encourage researchers to avoid excessive data collection, especially from from living project participants.

Funders can help researchers by noting that this established practice aligns with climate justice, in that from an energy/resource costs standpoint it is ethically dubious to collect data without clearly justifying the need for that data.

Background

(1) In line with the Paris Agreement and Glasgow Climate Pact, UK universities have adopted Net Zero targets ranging from 2025 to 2050, with UKRI adopting a 2040 target. Pathways to Net Zero, i.e. how soon and how steeply the sector can "bend the curve" of carbon emissions, are also crucial to sustain the possibility to limit global warming to 1.5 degrees.

(2) Digital research practices and infrastructures are associated with significant carbon costs. The Digital Humanities Climate Coalition therefore formed in 2021 with the aim of advising all stakeholders and supporting rapid climate alignment within the UK HE sector.

Challenge

For our sector to meet its climate alignment goals, ambitious abatement and mitigation will need to be pursued in 2022 and each year thereafter. Encouragingly, consultation across UK digital humanities groups has demonstrated that Net Zero and other sustainability issues are high priority. It has also revealed that researchers want more information and tools to support sustainable digital research. There are specific risks challenges around timescales, given the complexity of some of the issues, and the risk that bids currently under development will lock in inappropriate activities for the crucial 2022-2025 timeframe. The challenge is therefore to support a stepped approach, one that can deliver appropriate mitigation as soon as possible, while in the medium-term building capacity, sharing best practice, and transforming incentives to support Net Zero-aligned digital research.

Climate Justice-Oriented AHRC Data Management Guidance

Digital Humanities Climate Coalition

Information, Measurement and Practice (IMP) Action Group
April 2022

Based on AHRC-230821-ResearchFundingGuideV5.5-2021.pdf (ukri.org/publications/ahrc-research-funding-guide) accessed April 2021

SECTION 4: APPLICATION GUIDANCE

If you are using any of the advice contained in external information you should explain this in your data management plan in order to ensure that reviewers are aware as to why you have written the plan in this way.

Data storage and sharing, including future planning for the data:

[Digital Preservation Coalition Knowledge Base](#)

[Digital Curation Centre](#)

[Digital technology and the planet: Harnessing computing to achieve net zero \(Royal Society, 2020\)](#)

Costs of preserving the data

[4C \(Collaboration to clarify the costs of Curation\)](#)

The data management plan will be assessed by reviewers from our Academic College. The data management plan can be up to a maximum of two pages long and can include diagrams, but these must be within the 2-page limits.

By submitting the application, you are confirming your institution has considered and will meet the following points listed below. **Unless** the proposal is inherently digital in its methodology and naturally requires the information in these points to be specified and detailed in order to furnish the application you **do not need** to go into any further detail explaining these points.

By submitting you are confirming that:

- The proposal has been written in line with your institution's data management policy
- You have consulted with the institution's data support (e.g. library services, IT department)
- The institution is able to store the data appropriately during the lifecycle of the grant, the relevant people have been consulted and this has been considered and agreed
- The institution has considered all the risks, and storage will be in line with the institution's data management policy (provide a link to the policy if applicable)
- The institution will ensure the format/quality of the data (how will you make it as easy as possible to access the data?)
- You have consulted the relevant people in your organisation and you are aware of any IP considerations
- You have considered any data protection requirements
- You have considered the legal considerations of collecting and releasing the data and have consulted with appropriate support

DHCC REWRITE

The proposal has been written in line with your institution's data management policy and (where appropriate) environmental strategy.

We believe that funders have a crucial role in changing data management practice at research institutions. Because if long term data storage is 10 years or more, then 'all the risks' must include [a] the risk to data management that is created by climate change (therefore requiring anticipation of adaptation) and [b] the risk of accelerating climate change through the creation of data that needs managing (therefore requiring justification of both data creation and the resources needed to store that data).

Just Transitions

The DHCC IMP Action Group affirms that changes made to DMP guidance and assessment that are necessitated by the climate crisis must be just and not create perverse incentives or inequitable impacts.

That is, a researcher wishing to work with a small community group should not be excluded from doing so by virtue of that community group being unable to provide an environmental audit. Equally, the chances of an early-career scholar gaining funding should not be reduced by them having not built the networks needed to meet ambitious climate targets. Whilst we're long past the point where managing climatic impacts could be seen as a 'nice to have' piece of work bolted onto the side of business-as-usual, at the same time, we need to be sensitive to the diverse levels of capacity and build climate justice-oriented guidance that is collectively nourishing, fascinating, and energising.

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SECTION 5: ASSESSMENT CRITERIA AND PEER REVIEW

- The extent to which the proposed Fellowship would fit within relevant institutional/departmental research, career development and knowledge exchange strategies, as appropriate.

Proposed Development Activities (for Research, Development and Engagement Fellowship scheme only)

- The appropriateness of the proposed development activities which will enhance the applicant's profile within their field, commensurate with the applicant's career stage. The extent to which the proposed activities are proactive and innovative.
- The extent to which the institution has already demonstrated support for the development of the proposed fellow and has outlined a clear programme of appropriate support both during the fellowship and beyond.

For Early Career Researcher Route only:

- The relevance of the research project and leadership development activities to your career development.

Management of the project

- whether the lines of responsibility and accountability are clearly articulated.
- whether a realistic timetable, incorporating milestones, is presented which will achieve the project's aims and objectives within the proposed timescale
- the extent to which you have understood the amount of work to be involved, allocated sufficient time and resources to achieving each aspect.

Data Management

- does the information in the DMP seem appropriate for the research project being proposed? Would you expect to see anything different in your view?
- will the DMP enable the project's data creation, outputs and storage needs in your opinion?
- are there any other areas that need more attention?
- overall – does the plan for data seem feasible, sensible, appropriate and valid?

Funders can help researchers by stating that 'appropriate' can and should include consideration of whether the planned energy and resource costs stemming from the creation of the data are proportional (see Royal Society (2020), pp. 80-82, for commentary on 'energy proportionality')

Recommendations

- (1) As an immediate interim action, UKRI can give support and guidance to researchers to interpret existing Digital Management Plan (DMP) requirements in ways which align with sectoral and national commitments. The DHCC have highlighted areas of intervention and propose model wording, and welcome opportunities for conversation and co-production.
- (2) The DMP section be replaced as soon as feasible with a new document that incentivises climate justice-oriented practice and aligns with sectoral and national commitments.
- (3) Research projects now underway (or soon to commence) would benefit from UKRI guidance on adapting activities and outcomes, including reallocating budget sustainably, in line with rapidly evolving practice.