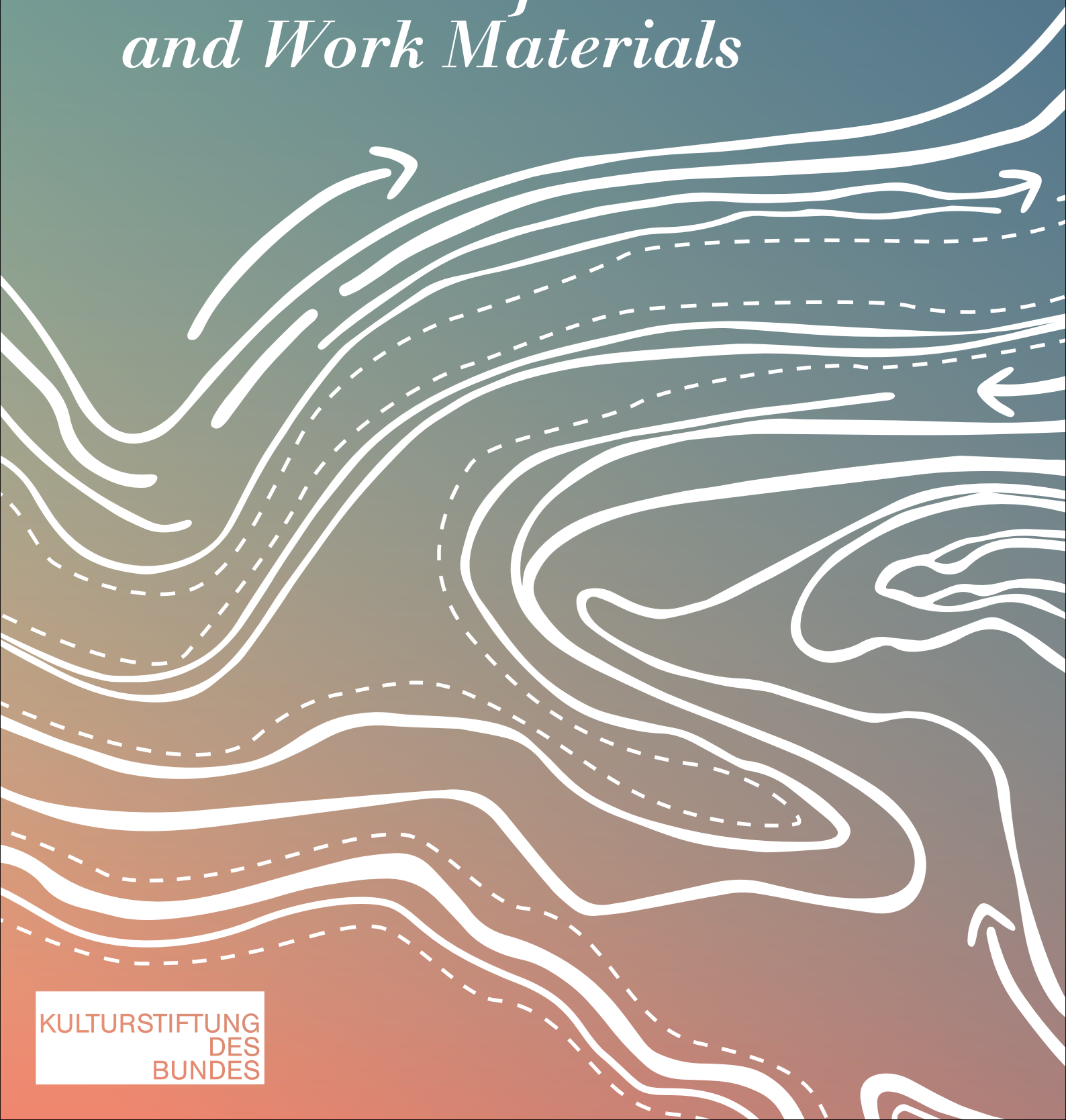
Carbon Footprinting in Cultural Institutions

Documentation of the Pilot Project and Work Materials



KULTURSTIFTUNG DES BUNDES

Contents

Preface: You are the world!

Seldom has a number held such political and social import as 1.5: the temperature increase to which global warming must be limited to avert catastrophic climate change. In 2015, around 200 countries signed the Paris Climate Agreement in order to prevent worsening droughts, famine, and the dangerous loss of the world's ecosystems.

Clearly the fight to avoid climate collapse is one of global scope. Where does the world begin? With our law makers? In private households? We must all work together to make a difference – as consumers, citizens and in working life. The Paris Agreement acknowledges this fact, i. e. legal regulations can only be effective if civil society, industry and politics proceed together down the same path.

Joining forces against climate change! This was the guiding principle of the project "Über Lebenskunst" which the German Federal Cultural Foundation and the Berlin House of World Cultures (HKW) jointly developed and carried out in 2010 and 2011. Based on the intersection of art and ecology, the project became the springboard for organisational learning. The Federal Cultural Foundation has since completed a process of environmental certification in accordance with EMAS which assesses all organisational activities with respect to their environmental impact and seeks to steadily improve them. We have developed a "sustainability compass" for cultural institutions and artists, which is available online (German only). It provides answers to very practical questions, such as how to use public funding, implement projects and transform organisations in the cultural sector in an environmentally friendly manner.

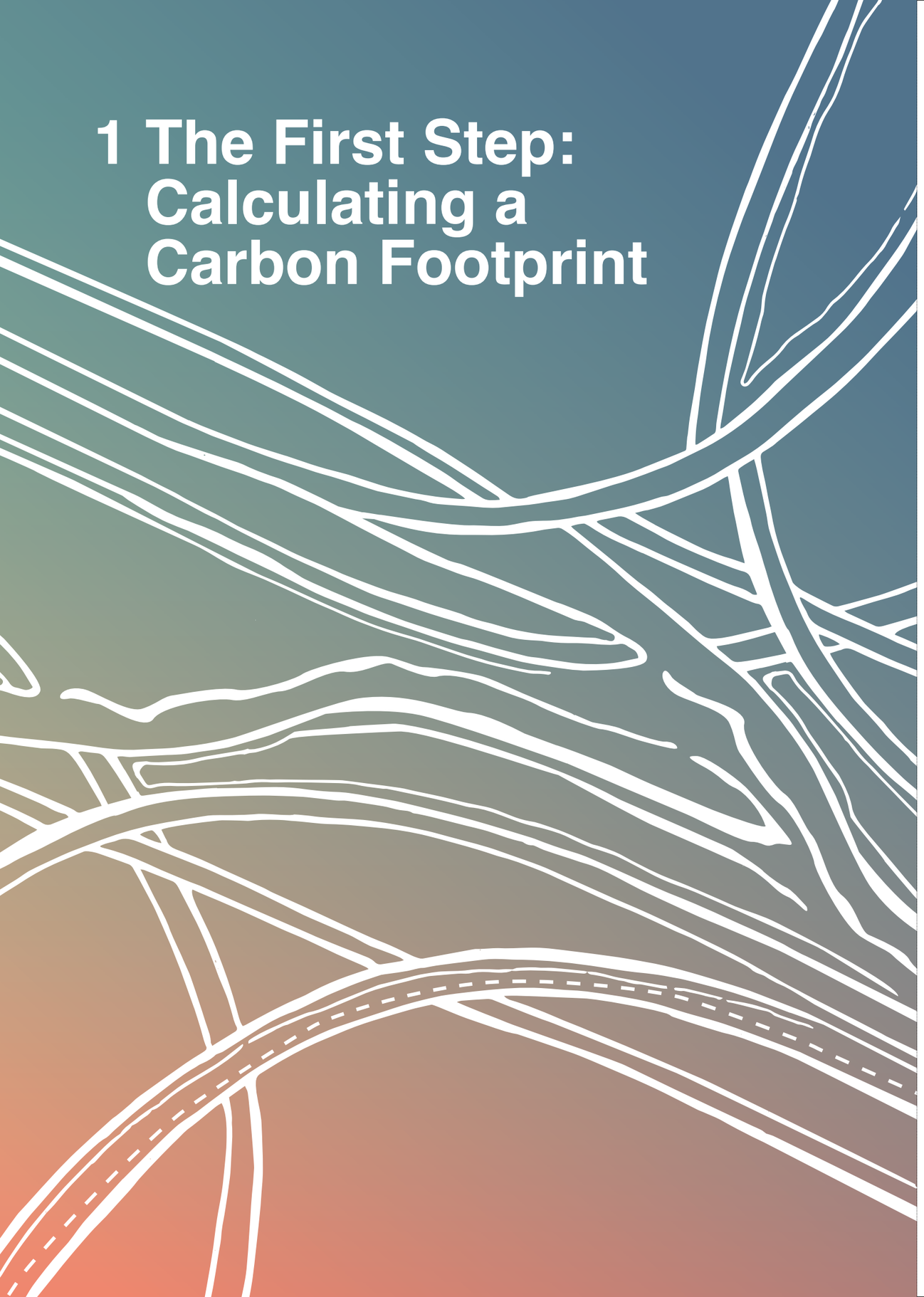
From there, we have gone further – with our sights set on Paris. For example, how high exactly are the CO_2 emissions of a theatre, a museum, an exhibition project, or a cultural foundation? How are they heated? Where does the electricity come from? How do participants travel? The first step to reducing our carbon footprint is learning where we stand at present. If we calculate a value in the current year, we can work to improve it in the following year. This is a learning curve that requires the attention and resources of entire cultural organisations and project teams. It applies to the entire cultural field – from theatres to libraries, concert halls to museums. And this is exactly the starting point of our pilot project "Carbon Footprinting in Cultural Institutions". What measures have others taken? How do we test and evaluate carbon footprints across artistic genres? And as we work to become carbon neutral, what must cultural organisations do and what innovative guiding policies can their funding providers implement so that environmental goals become a natural and universally accepted component of cultural practice?

Will Germany's art and cultural sector play a measurable role in achieving the 1.5-degree target of Paris? Probably only to a limited extent. The global wheels of emissions reduction are not driven by the cultural sector. But climate policy goals can only be achieved at home if all of society participates in the transformation process. We in the cultural sector are also called upon to visibly promote and advance this process!

Our sincere thanks go to all the institutions who have thrown their full support behind this pilot project. This brochure presents how two significant goals were achieved: calculating carbon footprints and guiding organisations onto a path of decarbonisation. Experience has shown us that carbon footprinting is no easy task, but it is instructive, sharpens environmental awareness and provides impulses for concrete measures. We hope that all the participating partners will continue pursuing these processes successfully – and above all, that numerous institutions will follow them with great interest and adopt similar policies themselves.

Hortensia Völckers and Kirsten Haß
Executive board of the German Federal Cultural Foundation

1 The First Step: Calculating a Carbon Footprint



Light into Darkness:
Measuring Environmental Sustainability in the Cultural Sector

by Dr Annett Baumast

Ecological footprint, carbon footprint, greenhouse gas balance, eco-balance etc. Numerous terms and concepts are used to describe (environmental) sustainability – also in the cultural sector.[1] Often they are mixed up or (incorrectly) used as synonyms. The following defines and explains what the different terms really mean.

Ecological footprint

The concept of the ecological footprint has been around for more than a quarter century.[2] Originally coined in the early 1990s by Mathis Wackernagel and William Rees, the term expresses the extent our lifestyle impacts natural resources as calculated in surface area. Measured in global hectares (gha), one's individual ecological footprint corresponds to the so-called biologically productive surface area required to support one's personal lifestyle in the long term.

Currently, the ecological footprint which would not overstrain the world's natural resources or biocapacity is 1.7 gha per person per year. This means that if we all had an ecological footprint at this level, our lifestyles would exist in equilibrium with the resources the Earth could provide over the course of one year and regenerate within the same period. However, according to calculations by the *Global Footprint Network*, we exceeded this limit already in 1970. Since then, the Earth's biocapacity has steadily decreased, while our ecological footprint has significantly risen per person and year since the beginning of the 2000s. Today's global ecological footprint now averages at 2.8 gha per person/year. In other words, we would need the biologically productive surface area of 1.6 planet Earths to sustain our present lifestyle and consumption.

Obviously, we have no extra planet handy, which is why *Earth Overshoot Day* has become an increasingly important marker in connection with the ecological footprint. Earth Overshoot Day is the day on which we have used up all the natural resources which should have lasted us until the end of the year. In 2000, we reached this marker on 22 September, and by 2010 the date arrived on 7 August. Since then, the trend has continued with Earth Overshoot Day coming earlier and earlier each year until 2019 (29 July). Thanks to the Covid-19 pandemic, the pressure on the planet's resources took a temporarily hiatus in 2020 when Earth Overshoot Day arrived on 22 August.

What does this have to do with artistic and cultural organisations? Not only can we calculate the ecological footprint of each person, but also of organisations and individual productions.

On the website of the Global Footprint Network, users can determine their personal ecological footprint by entering various data related to their personal lifestyle. The result is expressed in global hectares with percentages assigned to each evaluated area (food, accommodation, mobility, goods and services). Another important parameter is calculated: one's carbon footprint.

Carbon footprint

The ecological footprint and carbon footprint are often (erroneously) thought to be synonymous. However, the carbon footprint is actually just one parameter of the ecological footprint. It tells us how much CO_2 is emitted on account of our consumption, along with other greenhouse gases (GHG) like methane, calculated as CO_2 equivalents (CO_2e). The footprint calculator mentioned above expresses one's carbon footprint as a percentage and in tonnes. It can also be calculated on its own, for example, using the calculator provided by the German Environment Agency (UBA). Two tonnes per person per year would be a climate-friendly value, but the average German produces almost 12 tonnes of CO_2 per year.[3]

Carbon footprints can also be calculated for organisations, events or projects. The project Ice Watch by Ólafur Elíasson calculated such a carbon footprint in detail – a task that involved transporting blocks of ice from Greenland to Paris and London following an initial installation in Copenhagen.[4] The entire project in London, for example, generated a carbon footprint of 55 tonnes. This value is equivalent to the carbon footprint 52 people would have produced had they travelled from London to Greenland to observe the melting glaciers first-hand. By comparison, the installation enabled thousands of visitors to experience the same thing in London. The project's carbon footprint was calculated in cooperation with the English non-profit organisation Julie's Bicycle which offers cultural organisations and projects a CO_2 calculator as part of its Creative Green Tools.

Environmental balance, eco-balance, climate balance – Who is balancing what?

The German Environment Agency (UBA) defines the internationally standardised and established norms DIN EN ISO 14041 and DIN EN ISO 10444 as follows: "The eco-balance is a method for documenting and assessing environmentally relevant processes. Originally developed to evaluate products, it is also used today for assessing processes, services and behaviours."[5]

The terms "eco-balance" and "environmental balance" are used synonymously[6] – and the term "life cycle analysis" (LCA) is frequently mentioned as well. Eco-balances refer to all environmental impacts, for example, the acidification of soil and bodies of water, the depletion of stratospheric ozone, and the effects on human health. Eco-balances take all inputs and outputs of an organisation, product, event etc. into account, calculate the corresponding amounts, and assess them in terms of their environmental impact.

The terms "climate balance" and "greenhouse gas balance" are also used synonymously, both of which express the impact on the greenhouse effect. In this respect, they represent the carbon footprint of the evaluated object. The standards put forth in the Greenhouse Gas (GHG) Protocol, jointly developed and coordinated by the *World Resources Institute* (WRI) and the *World Business Council for Sustainable Development* (WBCSD), are almost universally used as the basis for determining GHG balances. An important basis for calculating this value is the attribution of GHG emissions to three distinct areas, the so-called "Scopes" *(see p. 10 for more details).*

The carbon footprint – or GHG balance – is a central component of the pilot project funded by the German Federal Cultural Foundation.

Conclusion: Develop targeted measures based on measurements

In the last few decades, a variety of methods and indicators have been developed to measure the environmental impact of our actions – also in the areas of art and culture. Regardless of whether we adopt a one-dimensional measurement, such as the carbon footprint, or the far more comprehensive model of an ecological footprint or eco-balance, it is important to recognise that measurements offer us the opportunity to decide which areas we should focus on based on sound data. In so doing, we can put our money, time and resources to better use in areas where our actions will have the greatest positive impact on the environment and thereby reduce our footprint.

Dr Annett Baumast is an economist and sustainability expert. Her agency carries out projects on sustainability in cultural organisations. She has collaborated with various cultural institutions in Germany and Switzerland, e.g. the Staatstheater Karlsruhe, the Opernhaus Zürich and the Theater Winterthur. Since October 2019 she has been employed as research associate at the Institute for Cultural and Media Management at the Hamburg University of Music and Theatre. https://kultur-nachhaltig.de

This piece is based on an article which appeared in magazine no 158 (German only) published by the Kultur Management Network.

1 For theoretical and practical examples of concepts and indicators for measuring sustainability, also see: Annett Baumast, Jens Pape, Simon Weihofen, Steffen Wellge (eds.): Betriebliche Nachhaltigkeitsleistung messen und steuern. Stuttgart: UTB, 2019 (German only).

2 For more, also see: https://www.footprintnetwork.org.

3 The UBA calculator can be found at https://uba.co2-rechner.de/en_GB/. For more on CO_2 emissions and consumption, see e.g.: https://utopia.de/ratgeber/co2-fussabdruck-die-fakten-zum-co2-footprint/ (German only).

4 To view the report on the CO_2 footprint of the London project, visit: http://olafureliasson.net.s3.amazonaws.com/subpages/icewatchlondon/press/Ice_Watch_London_Carbon_Footprint.pdf.

5 https://www.umweltbundesamt.de/themen/wirtschaft-konsum/produkte/oekobilanz.

6 Also see, e.g.: https://wirtschaftslexikon.gabler.de/definition/oekobilanz-44115 (German only).

Carbon Footprinting as a Basis for Successful Climate Management.
An Introduction

by Ellen Leibing and Maximilian Blaim

Successful climate management is rooted in extensive data collection, the analysis of which can help organisations develop emission prevention or reduction measures. Relevant data is collected and evaluated as a carbon footprint or GHG balance within predefined limits. The resulting footprint reflects the climate impact of various activities in the form of CO_2 equivalents.

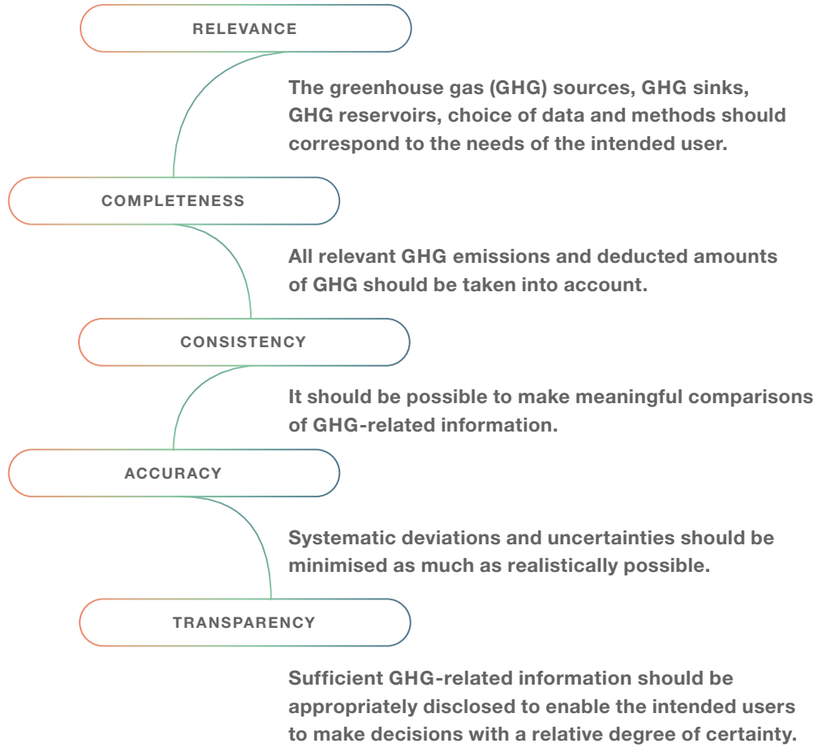
Calculating a carbon footprint

Carbon footprints can be calculated at different levels. The most common carbon footprints are calculated at the corporate level (corporate carbon footprint) and the product level (product carbon footprint). However, carbon footprints can also be calculated at the municipal level or even more specifically, e. g. for individual events or projects. Depending on the level in question, we can customise the balance limits and consider the extent to which certain activities should be taken into account. For example, when carbon footprinting a certain product, the analysis considers the entire life cycle from the extraction of the raw materials to production, use (or consumption) to the disposal of the product.

Numerous private and public organisations have since adopted the internationally established Greenhouse Gas (GHG) Protocol which defines generally accepted categories of GHG emissions. The GHG Protocol is also well-suited for administrative bodies.[1] The GRI standard of the Global Reporting Initiative, which represents the global best practice for public reporting on various areas of sustainability, also refers to the GHG Protocol with respect to emissions.[2] Other rules and standards for carbon footprinting are provided by the DIN ISO series 14060 and the PAS standards.

For the pilot project of the German Federal Cultural Foundation, carbon footprints were calculated in accordance with the GHG Protocol requirements. These emphasise transparency, relevance, completeness, consistency and accuracy when reporting on the GHG balance (see ill. 1).[3]

Ill. 1
Qualitative requirements in accordance with the GHG Protocol



In line with the GHG Protocol, emissions are divided into three “Scopes” (see ill. 2). The seven most significant greenhouse gases as specified in the Kyoto Protocol are measured and calculated. These are carbon dioxide (the reference gas), methane, nitrous oxide, partially halogenated chlorofluorohydrocarbons, perfluorocarbons and sulphur hexafluoride.[4]

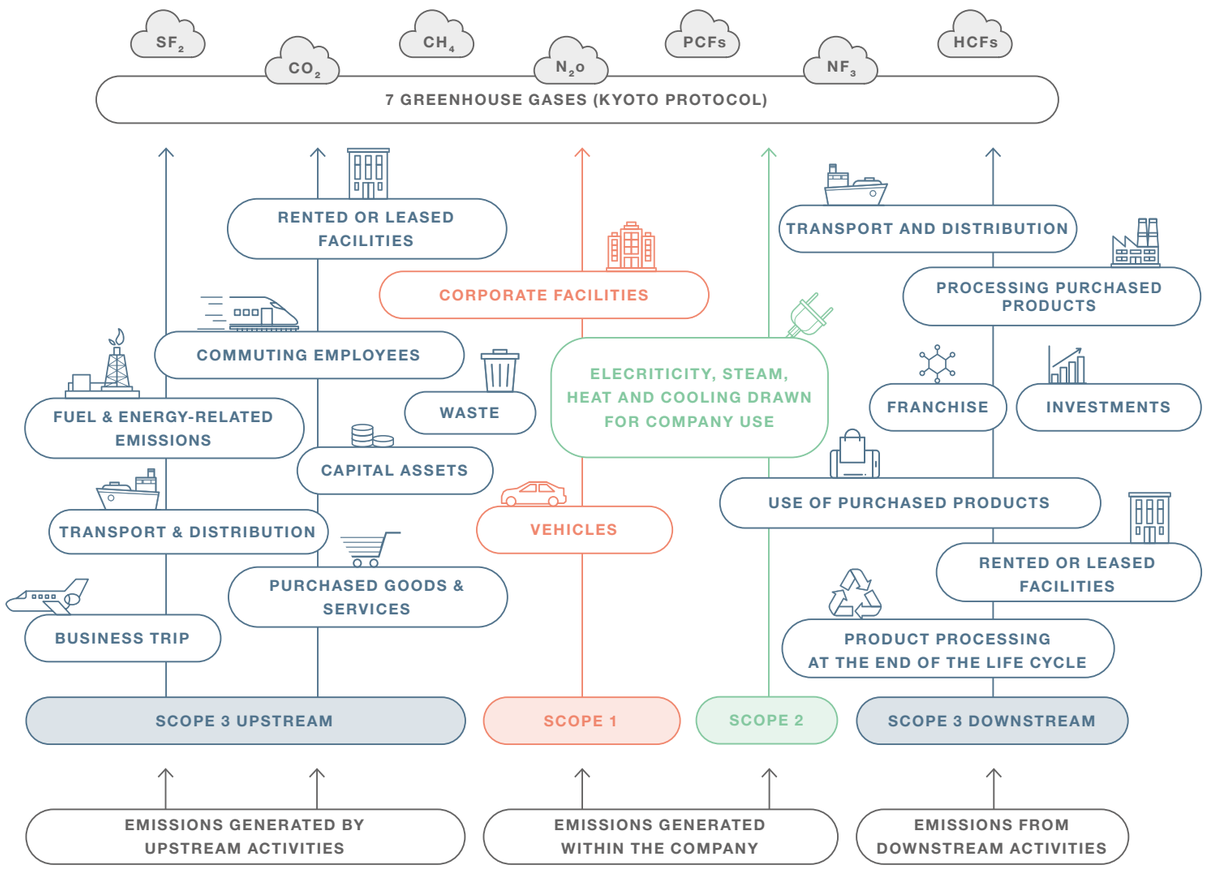
Scope 1 consists of GHG emissions which result directly from fuel-burning processes at on-site stationary and mobile facilities. These include heating plants and automobiles, as well as emissions from physical or chemical processes, e. g. leaks and diffusions of refrigerants from cooling systems.

Scope 2 consists of indirect GHG emissions caused by energy drawn from the electrical power grid. This mainly covers the production and transport of electricity and district heating-related emissions.

Scope 3 consists of all other indirect GHG emissions caused by upstream and downstream activities. In many non-producing facilities, Scope 3 emissions represent the greatest percentage of the total emissions. In this case, the climate effects are largely the result of business trips, the emissions produced by commuting employees, and those resulting from the transport and delivery of goods and services. Depending on the activities and specific characteristics of the balanced areas, indirect emissions can also be included in the calculation.

Biogenic emissions generated from burning of biogenic energy carriers, such as woodchips, can be calculated differently, i. e. as emission-free, plant-based materials which are part of the natural carbon cycle.

III. 2
What balances are calculated? – 3 Scopes based on the GHG Protocol



Steps for calculating a carbon footprint

By adhering to a structured method for calculating a carbon footprint, one can avoid overlooking important working steps (see ill. 3).

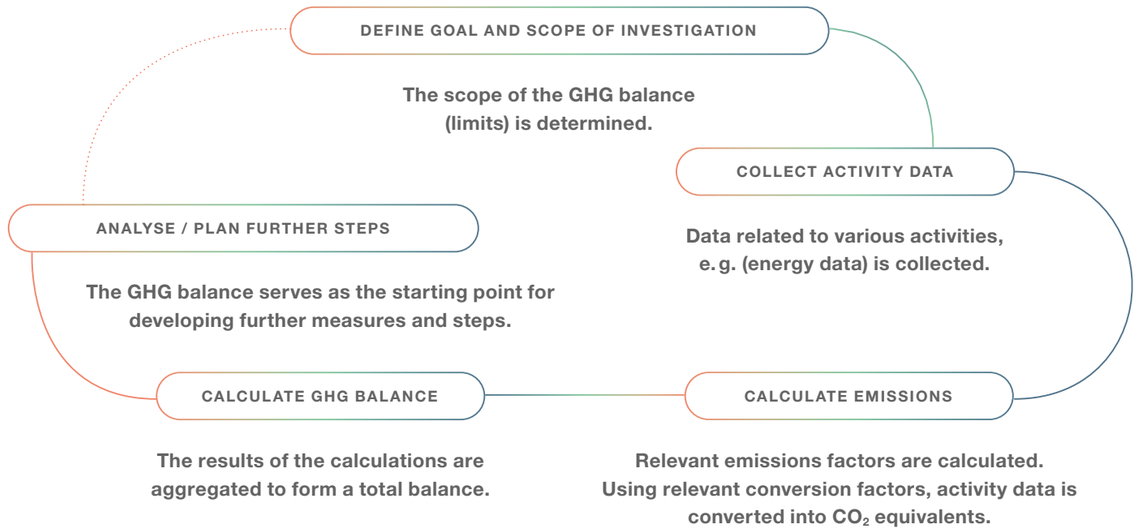
Setting limits for future data collection is the first step to calculating a carbon footprint. In this case, there are several approaches one can take. The *operative control approach* considers all GHG emissions which lie within an institution’s scope of responsibility, and which the institution can directly influence.

With the *financial control approach*, one can calculate GHG emissions caused by activities which are financed by the respective institution.

Alternatively, there is the *equity share approach*, which calculates the proportion of emissions generated by an institution with respect to a specific activity or facility. Even if it is responsible for less than 50 % of the total share, it can still exert a significant influence on administrative and supervisory bodies. In practice, however, most companies use the operative control approach, supplemented, if applicable, by the financial and equity share approaches for other areas.[5]

The next step entails setting a concrete balance limit for the respective organisation. This requires one to identify all GHG emission sources within the prescribed organisational limits which account for an essential share of the total balance or hold significant potential for improving the balance. The organisation itself is responsible for providing the exact criteria for determining which emissions sources are material and should be included in the materiality analysis. The organisation calculates the emissions caused by the activities based on the criteria of “operative control”, from which it can

III. 3
Steps of calculating a carbon footprint



determine its ability to influence the activities, "data accessibility" and the "quantitative significance" of the emissions sources.

While it is obligatory to calculate the balance of Scope 1 and Scope 2 emissions using the established standards, Scope 3 emissions do not have to be completely quantified. Downstream and upstream emissions sources, which the organisation has not (yet) been able to quantify, can be included in the balance as a qualitative parameter. The long-term goal should be an emissions sources report which is as comprehensive and quantitative as possible.[6]

Collection of activity data

The next step is to collect the relevant activity data, i. e. data regarding all activities conducted by the organisation which cause GHG emissions. The focus should preferably be on primary data, such as meter readings, fuel tank levels and concrete measures. Secondary data can also be used, for example, averaged or fixed values or statistical extrapolations. A typical problem for Scope 3 emissions calculations is a lack of solid data. Generally, transparency is of primary importance when making potential assumptions and citing data sources (see the sample template for data collection on p. 57).

Calculation of emissions

To calculate the amount of greenhouse gases, the collected activity data is converted into CO_2 equivalents using emissions factors based on their corresponding climate impact. Emissions factors can be found in various databases, for example, GEMIS[7] or DEFRA[8], which can be used at no cost, as well as fee-based databases, such as ecoinvent[9].

Presentation and analysis of the greenhouse gas balance and possible further steps

The results of the calculation are aggregated into a total balance and can optionally be represented in the form of illustrative graphics. Based on the carbon footprint, organisations can identify relevant fields of action to effectively avoid or reduce greenhouse gases (GHG). Using this knowledge, concrete measures can be developed to lessen the emissions of various activities. For more on this, see the sample template for planning measures on p. 58.

In this respect, the carbon footprint is an important component of an iterative process with the goal of steadily reducing emissions to the point of climate neutrality (see ill. 4). With a sound basis of data, it is possible to develop a sensible climate strategy which sets concrete climate targets and calls for measures based on the principle of "avoid before reducing before compensating". And by conducting ongoing performance controlling and carefully adapting the targets measures, organisations can achieve an effective level of climate protection.

Ellen Leibing heads the Stuttgart branch of Arqum GmbH. Maximilian Blaim works for Arqum GmbH as a project director at the company's Munich branch. Together with their colleagues, they provided expertise and operatively implemented the pilot project of the Federal Cultural Foundation. For over 20 years, Arqum GmbH has been guiding companies and organisations along the path to a sustainable future, in particular in the area of climate management.

III. 4
From carbon footprinting to climate management

1 German Evironment Agency (UBA): Der Weg zur Treibhausgasneutralen Verwaltung. Etappen und Hilfestellungen, 2001, see: https://www.umweltbundesamt.de/sites/default/files/medien/5750/publikationen/2021_fb_weg_zur_treibhausgasneutralen_verwaltung_bf.pdf.

2 For more on the GRI Standard 305 Emissions, see: https://www.globalreporting.org/standards/download-the-standards/.

3 GHG Protocol: A Corporate Accounting and Reporting Standard, Washington D. C. 2004; also see ISO 14064-1: Specification with instructions on qualitatively determining and reporting on greenhouse gas emissions and deducting greenhouse gas emissions at the organisational level (ISO 14064-1:2018); German version, Feb. 2019.

4 Kyoto Protocol | German Environment Agency (UBA): https://www.umweltbundesamt.de/themen/klima-energie/internationale-eu-klimapolitik/kyoto-protokoll#zweite-verpflichtungsperiode-und-zentrale-anderungen.

5 German Environment Agency (UBA): Der Weg zur treibhausgasneutralen Verwaltung. Etappen und Hilfestellungen, 2021.

6 Klimamanagement in Unternehmen: Entwicklung eines Bausteins auf Grundlage des Umweltmanagementsystems EMAS (umweltbundesamt.de), 2020.

7 GEMIS download – IINAS – DE: http://iinas.org/gemis-download-121.html.

8 Greenhouse gas reporting: conversion factors 2020 – GOV.UK: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020.

9 ecoinvent: https://www.ecoinvent.org/.

2 Carbon Footprinting in Cultural Institutions

Carbon Footprinting in Cultural Institutions

The Pilot Project

CO_2 emissions are one of the chief causes of climate change and reducing them is one of the most urgent challenges of the 21st century. The climate protection goals of the Paris Agreement can only be achieved if they are acknowledged as a task that concerns all of society. This applies to art and culture which play a crucial role in creatively shaping the transformation process and making it comprehensible and tangible through artistic examination. As artists and cultural institutions reflect on their own ecological production conditions, they have voiced a need for additional funding, bureaucratic structures, and practical knowledge for carrying out concrete measures. The climate impact of art in Germany is still a blind spot that can only be remedied by focusing on an increasing number of participants.

Climate coaching for knowledge transfer

“Carbon Footprinting in Cultural Institutions” was a pilot project initiated by the German Federal Cultural Foundation. It supported 19 cultural organisations with calculating their carbon footprints in a “convoy process”. The goal was to test a model process for carbon footprinting in the cultural sector which would provide cultural institutions with a tool for achieving climate neutrality. To ensure greater transparency of their own CO_2 emissions, the participating institutions received assistance with their calculations over the course of four months. They were given tailored climate coaching to promote in-house knowledge transfer on improving their climate-impacting activities. Ultimately, the aim was to work together with the institutions to jointly address the question of how environmental sustainability could be incorporated into the funding system of the German Federal Cultural Foundation on a larger scale.

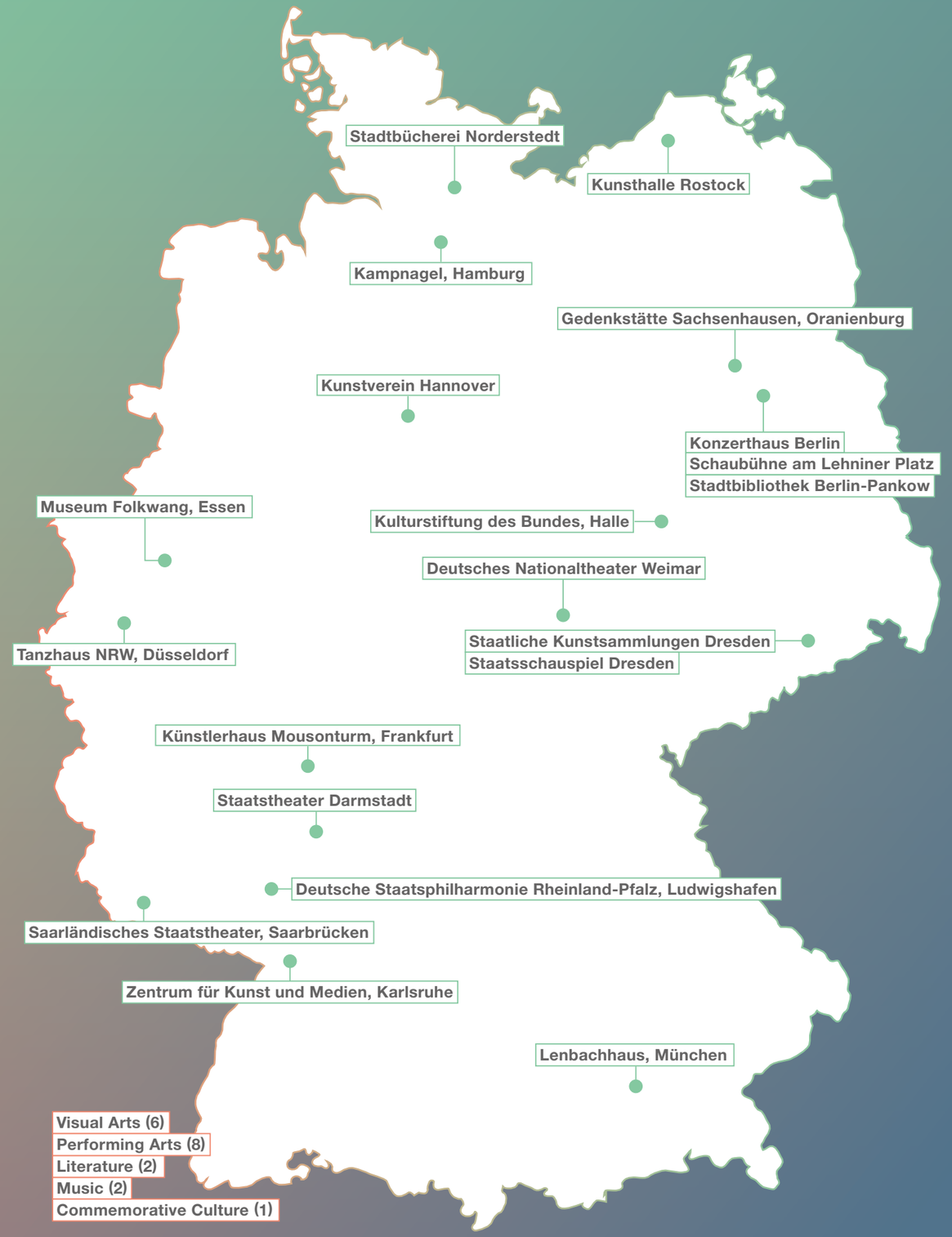
Tools for action

Carbon footprinting is an important tool for conducting CO_2 status analyses: How large is the carbon footprint of an organisation? How are emissions distributed among its fields of activity? In what areas can the carbon footprint be significantly improved? Knowing their carbon footprint, cultural institutions can respond to demands for sustainable and environmentally friendly operations and improve their credibility by demonstrating the will to change their practices. Avoiding or reducing CO_2 emissions not only makes for good cultural and climate policy; it also makes sense from an economic point of view. For example, the environmentally friendly, CO_2-reduced procurement variants in 10 out of 15 typical product groups have lower life-cycle costs than conventional procurement variants (see the study by the Öko-Institut (German only).

19 cultural institutions in the pilot group

The pilot project was carried out in the form of a “convoy process”. This effective approach allows various organisations to work collaboratively with experts, share and benefit from their experience, and learn from one another. The pilot group comprised a broad spectrum of artistic fields – visual arts, performing arts, literature, music, commemorative culture – and represented institutions of varying sizes, local conditions and prior experience.

Carbon Footprinting in Cultural Institutions
The Participants



The Pilot Project Data – A Comparative View

by Ellen Leibing and Maximilian Blaim

Defining and achieving the target

The goal of the pilot project was to calculate an initial carbon footprint based on the *Corporate Standard* of the *GHG Protocol* (calculation of the direct and indirect emissions in *Scope 1* and *Scope 2*) and to calculate the upstream and downstream emissions sources in *Scope 3* (for more on the different "Scopes", see the overview on p. 10). These were considered material for all institutions and were defined in advance for all the project partners.
The other emissions sources from Scope 3 specifically consist of the categories *Mobility* with the subcategories *Business trips* and *Staff commutes*, as well as the categories *Water* and *Waste*.

There were many other emissions sources which could have been considered on an optional and voluntary basis. These included additional emissions in the category *Mobility* with the subcategories *Upstream transport logistics*, *Visitor travel* and *Service provider mobility*, as well as the category *Procurement* with the subcategories *Paper*, *Gastronomy* and *Other* (also see the sample template for data collection on p. 57).

All 19 participating cultural institutions met the criteria of the *Corporate Standard of the GHG Protocol* and calculated at least their *Scope 1 and Scope 2* emissions.

Overall carbon footprinting results

If we tally the results of the footprints of all 19 pilot institutions, we arrive at a total CO_2 equivalent of 20,389 tonnes (t). This amount can be attributed in three parts with 21 % in *Scope 1*, 45 % in *Scope 2* and 33 % in *Scope 3* (see ill. 1). Accounting for all Scopes 1–3, each institution calculated an average CO_2 equivalent of 1,073 t.

In *Scope 1*, the institutions' largest emissions category was *Heating / Fossil fuels* (89 %). Other relevant categories included *Refrigerant losses* (11 %) and *Vehicle fleet* (2 %). The 19 pilot institutions calculated an average of 290 t of CO_2 equivalent in *Scope 1* emissions.

In *Scope 2*, the institutions' most significant emissions categories were *Electricity consumption – externally procured* (64 %) and *District heating – externally procured* (36 %). The average CO_2 equivalent in *Scope 2* emissions for all 19 pilot institutions was calculated at 488 t.
With regard to Scope 3, we differentiated between "obligatory" and "optional" emissions categories.

For the obligatory emissions categories in Scope 3, *Business trips* (64 %) and *Staff commutes* (24 %) comprised the largest share. The category *Waste* (10 %) was also relevant. The average "obligatory" Scope 3 emissions among the 19 pilot institutions amounted to 204 t of CO_2 equivalent.

If we consider the optional emissions categories in the overall view of Scope 3, we find that *Visitor travel* (28 %), *Service provider mobility* (6 %) and *Upstream transport logistics – air travel* (3 %) accounted for a significant share. In the overall view of Scope 3, the pilot institutions produced an average of 356 t of CO_2 equivalent. It is important to note, however, the "optional" emissions categories vary greatly in terms of frequency (see ill. 2).

Interpretation of results / Comparability

The project results can be interpreted in different ways depending on the detail of the emissions balance. In our opinion, it is essential to examine and compare the results based on the requirements of the respective *Scopes 1–3*.

Scope 1 / Scope 2

Generally speaking, all 19 pilot institutions differ with regard to their individual prerequisites. The technical site-specific infrastructure formed the basis for their emissions from *Scopes 1 and 2*. In this case, we can use emissions-specific results for a common reference size (e. g. usable space in m^2) as the basis for evaluating and comparing the pilot institutions.

The results vary between 22 and 118 kg of CO_2 equivalent per square metre (m^2) of used floor space. Consequently, the average emissions value for each institution per square metre of used floor space is 60 kg of CO_2 equivalent.

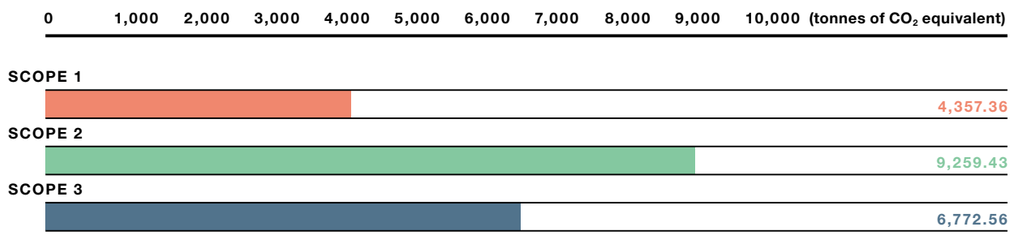
One should bear in mind that the energetic efficiency of an individual institution is not necessarily directly related to the resulting emissions balance. By taking advantage of climate-neutral energy sources (e. g. so-called green energy), institutions with higher energy consumption can significantly improve their emissions balance compared to other institutions.

Scope 3 – Obligatory categories

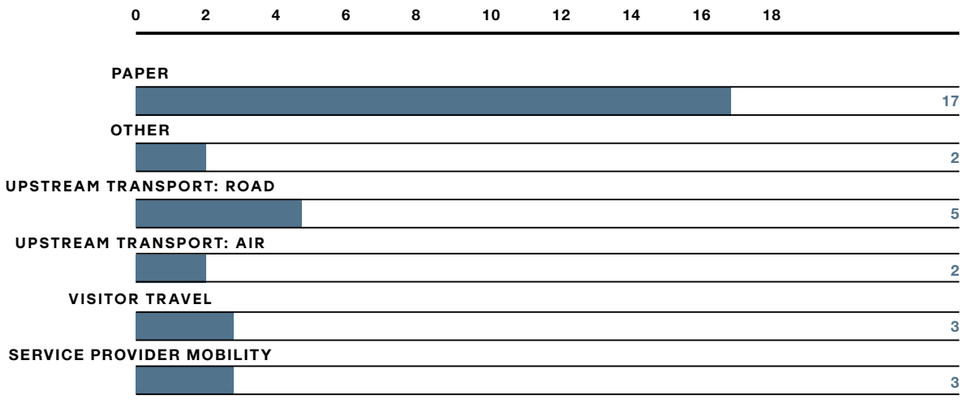
The standard obligatory categories enable us to establish basic comparability between the pilot institutions in *Scope 3 of the GHG Protocol*. However, we should note that when assessing business trips and staff commutes, the lack of availability or quality of data may have skewed the results. For example, the data regarding staff commutes generally had to be collected in the form of questionnaires or estimates. Nonetheless, it is possible to draw comparison even in these areas thanks to the standardised calculation methods.

The overall assessment of the obligatory categories in *Scope 3* also presents us with plausible results. Some 87 % of all emissions can be attributed to *Business trips* and the *Staff commutes*, and by extension, to the area of mobility. And just 13 % are attributable to the categories of *Water* and *Waste*.

Ill. 1
Overall relationship between Scopes 1, 2 and 3



Ill. 2
Number of institutions which reported the optional Scope 3 emissions



Scope 3 – Optional categories

The optional categories in Scope 3 were calculated by the pilot institutions on a voluntary basis. Consequently, it is not possible to qualitatively compare the institutions in these categories. For example, 17 institutions provided data on the *Procurement of paper*, while only two reported on *Upstream transport logistics – Air*. None of the institutions provided information on *Upstream transport logistics – Railway or Water*. This could be due to the fact that these categories either played no essential role or the data they had was insufficient for basing their calculations.

Conclusion

After calculating the initial carbon footprint of the participating cultural institutions, we can derive individual key findings for the respective institutions. They reveal the relevant primary emitters in each institution and suggest paths for potential courses of action. Steadily continuing and improving their efforts to lower their carbon footprints represents a central component to achieving a more climate-friendly future. Moreover, this first calculation of their footprint can serve as a springboard for further activities in sustainability management.

As we mentioned earlier, one should be cautious when making comparisons between the institutions as stark discrepancies exist in the original data. Nonetheless, one can conclude that facility management and mobility – particularly *Visitor travel*, *Business trips* and *Upstream transport logistics* – comprise an essential share of the carbon footprint and thus represent effective “adjustment screws” for improving the footprint going forward.

The authors also wrote the introductory text on calculating carbon footprints on page 8.

Frequently Asked Questions

The participating cultural institutions often asked similar questions during the pilot project. The following list of FAQs was compiled and regularly updated by the accompanying agency.

SCOPE 1 | SCOPE 2 | SCOPE 3

Energy – Refrigerants

What does “loss of refrigerants” mean?

Refrigerant losses occur when cooling agents evaporate or escape, e. g. due to leaks in cooling systems. These GHG emissions are counted toward one’s carbon footprint under Scope 1. If refrigerants are exchanged as part of maintenance work, the replaced amount is not considered in the calculation.

Where can I find information about the type and amount of refrigerant?

Information about the type of refrigerant (e. g. R 134a) is usually specified on the type plate affixed to the cooling system. Information about the replaced amounts should be indicated in the servicing history.

Energy – Electricity

Where do I find emissions factors for electricity?

The emissions factors for electricity are printed on your electricity invoice.

For example, the data is usually provided on the last page in the annual invoice. Otherwise, one can use the carbon footprint of the electricity mix of one’s country of residence.

What should I take into account if the emergency power supply (uninterruptable power supply, UPS) runs on batteries?

The batteries of UPS systems are normally charged via the power grid. Therefore, your organisation’s electricity consumption would most likely include the energy consumed by the UPS.

Should home office electricity consumption be included in the calculation?

In principle, company-related emissions produced in home office can be included in the calculation (under Scope 3), but for the pilot project, we have decided to exclude them. Electricity consumed for IT infrastructure, lighting etc. would normally be of interest.

Energy – Digital emissions

How can I calculate high data usage (e.g. resulting from video conferences)?

To calculate emissions from digital processes, one would normally have to examine the following emissions sources: computing centres operated by cloud service providers (e.g. Microsoft Teams, Webex, Zoom), data transfer of the network providers (e.g. glass fibre, copper wires, broadband), and the users' digital terminals (e.g. computers, routers). The emissions values can vary greatly depending on the respective sources.

Generic factors can be used for such emissions, such as those provided in the study by the German Environment Agency (UVB) (German only).

Mobility – Vehicles

How are hybrid vehicles assessed

Hybrid vehicles are normally powered by conventional fuels (normally petrol) and electricity. Petrol consumption is considered under Scope 1. The best way to calculate this value is to determine the number of consumed litres of fuel. However, the number of driven kilometres can also be used alternatively. The electricity charges should best be specified under Scope 2. If these cannot be quantitatively calculated, we recommended adding a brief explanation to this effect in Scope 2.

How are individual vehicle classes assessed, e.g. three-wheeled vehicles and machines?

If the individual vehicles consume any kind of fuel, they should be divided into groups based on the type of fuel and calculated in Scope 1. If no suitable data exists, we recommend adding a comment, noting the additional fuel consumption of the individual vehicles.

Mobility – Commuter emissions

Should staff commutes be calculated per day?

If your staff commutes are based on statistical data, then the number of driven kilometres per day is extrapolated to a yearly amount. If your data is based on a survey, it makes sense to collect this information on a weekly basis and extrapolate the value to a yearly amount.

Mobility – Service provider mobility

What does "service provider mobility" mean?

This refers to emissions resulting from travel by external service providers and artists.

Mobility – Upstream transport logistics

What is "upstream transport logistics"?

This refers to the delivery of goods to one's location by a transport company. In the museum sector, for example, such goods can include exhibition objects.

How can upstream transport logistics be calculated?

There are several logistical options and calculation methods which one can use. Number 1: individually commissioned one-off transports, in which single or multiple "owned" artworks are shipped by a commissioned transport company. The emissions are then calculated in terms of distance travelled in km. Number 2: individually commissioned combined transport, in which artworks of several institutions are shipped together by the commissioned transport company. (1) One can calculate the distance travelled in km, including the estimated load space of one's own artwork. (2). One can calculate the distance travelled, multiplied by the estimated weight of one's own artworks (tonne-kilometres). In this case, one should apply the corresponding conversion factors and studies, e.g. study by the ÖKO-Institut (German only).

Procurement

How extensively should the area of procurement be presented?

The calculation here should generally focus on existing and measured emissions sources. In a more detailed examination of one's emissions sources in the area of procurement, it is important to draw clear balance limits. As a rule, one should review each project to determine whether any emissions factors apply.

Procurement – Leasing

How should the emissions of leased goods be calculated?

GHG emissions produced in the manufacturing of leased products or goods need not be considered at the moment, though their electricity and fuel consumption should (Scope 1 and 2).

Procurement – Food and beverages

Where do I find the emissions factors for food and beverages?

The emissions factors for food and beverages are quite complicated. On https://www.klimatarier.com/de/index (German only) you can find the emissions data on various foods which you could use (if applicable) in your calculation.

Double accounting

Aren't certain emissions from our institution also the emissions of other participants?

According to the rules of the *GHG Protocol*, one should generally calculate the emissions attributed to Scopes 1, 2 and 3. The result should be a comprehensive overview of the climate impact influenced/caused by one's own activities. Granted, there is usually some overlap in Scope 3, since Scope 1 and 2 emissions of an Organisation A can always be the Scope 3 emissions of an Organisation B. Therefore, we recommend calculating all emissions, even at the risk of having them counted twice. In some circumstances, organisations may agree to collect and share their data in a cooperative spirit.

How are matters of compensation handled?

As a first step, it is necessary to come up with a calculation that depicts the emissions. If portions of the carbon footprint have already been compensated by third parties or service providers, this fact can be noted accordingly. Ideally, one should include information about the resulting emissions and any possible payments of compensation already made.

Recommended Actions and Future Measures

SCOPE 1 | SCOPE 2 | SCOPE 3

Based on their carbon footprints, the participating institutions were able to develop proposals, measures and ideas for future steps. The following selection of recommendations were collected and presented at the concluding workshop of the pilot project.

Networks and knowledge transfer (internal/ external)

- → Form a working group of staff from various areas of the institution to regularly discuss topics related to climate protection
- → Appoint a climate protection officer
- → Train and actively integrate staff into the process through regular communication, e. g. by holding month-long theme-based events, workshops with staff (on electricity, heating, public transport, waste, etc.)
- → Establish a network to foster exchange between other institutions, initiate round-table discussions (for the region or artistic field)
- → Join existing networks (e. g. Netzwerk Grüne Bibliotheken / Green Libraries Network)

Projects

- → Draw up plans for exhibition projects based on CO_2 criteria
- → Re-evaluate the CO_2 budget for productions
- → Donate some of the proceeds to local climate protection projects
- → Fundraising – secure funding for large and small environmental projects
- → Library of Things – support sustainable lifestyle
- → Beehive / bee meadow / insect hotel

Heating / Cooling

- → Assess use of renewable energy sources (e. g. woodchips, pellets, solar thermal energy, geothermal energy, biomass etc.)
- → Assess use of climate-friendly district heating
- → Reduce heating and cooling needs by changing behaviour, sensitising staff to efficient heating and ventilation
- → Energy-saving renovation of buildings: replace single-pane windows with insulating glass, refit exterior facades with insulation cladding
- → Install intelligent control systems which lower thermostats overnight and at the weekends for offices/administrative rooms
- → Check the distance between desks and radiators
- → Add shading to glass facades
- → Install heat pumps
- → Check for high losses of refrigerants in the air conditioning system, substitute with climate-friendlier refrigerants
- → Assess possible use of absorption cooling unit

Vehicle fleet

- → Replace diesel vehicles with electric vehicles
- → Introduce a CO_2 upper limit for company cars

Electricity

- → Assess possible switch to green electricity
- → Replace conventional lightbulbs with LEDs
- → Avoid using standby function: install on/off switches for office equipment, use electricity timers
- → Use ammeters to measure indoor electricity use and identify power guzzlers
- → Install motion detectors in corridors, storerooms, lavatories etc.
- → Install a photovoltaic system
- → Switch to a climate-neutral server
- → Regularly delete unneeded emails and data (high data volume = storage space on server = energy consumption)

Business trips

- → Establish internal criteria for more environmentally friendly travel
- → Establish approval process for air travel
- → Make mobile work possible for longer train trips
- → Arrange business trips with fewer people, look into partially remote solutions
- → CO_2 compensation for flights
- → Book accommodation in green hotels

Service provider mobility / Invited guests, artists etc.

→ Establish travel guidelines for guests and speakers
→ Plan and facilitate longer visits
→ Promote cooperation between institutions to combine multiple events
→ Collaborate with environmentally conscious artists
→ Avoid air travel, support “slow travel”

Transport logistics

→ Better communication and coordination with other organisations and partners with regard to art logistics
→ Use rail freight transport whenever possible
→ Record transport data
→ Assess packaging practices for artworks

Visitor travel

→ Conduct visitor surveys to learn where improvements can be made
→ Install e-auto charging stations in parking lot
→ Include public transport ticket in the price of admission to events

Staff commute

→ Provide bicycle users with roofed bike stands
→ Encourage car-pooling
→ Consider purchasing job bikes, financing public transport tickets for staff

Waste

→ Separate trash more consistently and label containers clearly
→ Provide extra containers for old cell phones, smartphones, CDs etc.
→ Compost organic waste on site

Water

→ Install water-saving faucet heads
→ Install filling station for drinking water (without cups)
→ Review rainwater usage

Procurement / Purchasing / Workshops

→ Introduce environmental guidelines for procurement / purchasing
→ When purchasing musical instruments, pay attention to the origin of raw materials and carbon footprint
→ Purchase environmentally friendly office materials
→ Use environmentally friendly paints and building materials for exhibition staging
→ Examine workshop products: exhibition staging, theatre sets – what is necessary, what can be reused, what can be thrown away?
→ Review coffee machines – fair trade, environmentally friendly cups

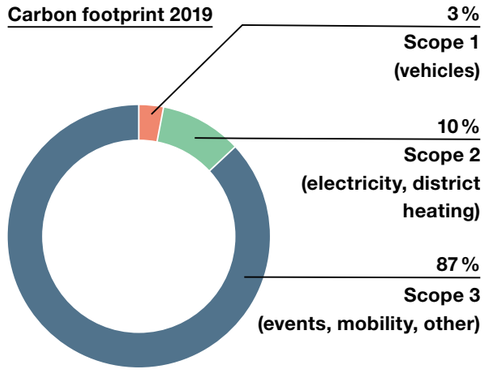
Paper

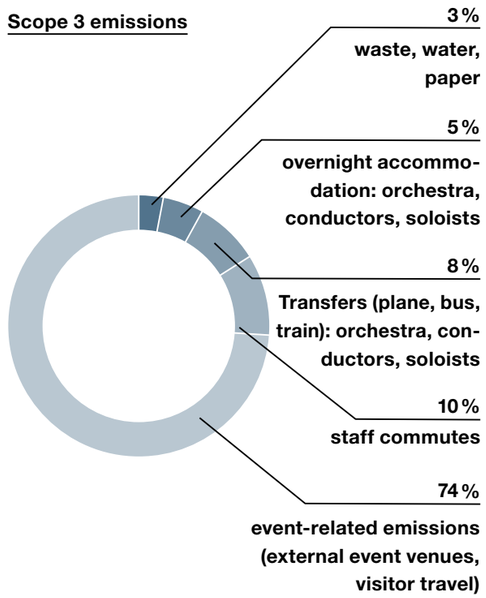
→ Critically assess the use of printed materials and reduce if possible (e. g. concertinas, project flyers, season programmes, exhibition catalogues)
→ Commission environmentally friendly printing companies if possible
→ Switch to recycled paper products (tissues and toilet paper, copy paper, external print products)
→ Set double-sided printing as default
→ Electronic filing – paperless office
→ Review external communication (e. g. invitations) and tickets to determine whether exclusively digital delivery is possible
→ Review advertising materials with respect to CO_2 impact

3 Progress Reports and Examples from the Participating Cultural Institutions

Deutsche Staatsphilharmonie Rheinland-Pfalz

The Deutsche Staatsphilharmonie Rheinland-Pfalz in Ludwigshafen (Rhine) is the largest and most prominent orchestra in the state of Rhineland-Palatinate. As a touring orchestra with no fixed venue, it meets the orchestral needs of audiences throughout the state. With 110 full-time members, the Staatsphilharmonie is a regional and international ambassador and cultural representative of the state of Rhineland-Palatinate. Its stylistic spectrum ranges from large orchestral works and music theatre productions to film music projects.





Carbon footprinting

The carbon footprinting of our state-owned rehearsal venues in Ludwigshafen (Scope 2) mainly focused on which method would most accurately and plausibly calculate and represent the complex GHG-relevant processes resulting from the orchestra's extensive concert and touring activities (over 70 symphonic concerts per year) at numerous external performance venues. Based on the experience we gained from our subscription concerts which we regularly hold at our established venues in Ludwigshafen and Mannheim, and using a recognised GHG calculator, we were able to calculate an average carbon footprint for various concert formats and apply these to our own calculation (Scope 3).

Findings and subsequent steps

Although it requires effort, it is possible to assess emissions which lie beyond one's scope of influence (guest performances). This enables us to draw attention to factors which can be directly influenced or to reveal the extent of potential emissions savings. We were surprised by the ratio of Scope 3 emissions (approx. 85 % in three years) to the total emissions of our institution. In our case, the challenge will be to consider what kind of compensatory measures we can take in the future. In commencing the overall process, we succeeded in raising awareness of environmental protection and sustainability among our staff. Consequently, we will be looking into introducing a suitable management system. In future we intend to make carbon footprinting a permanent fixture of our annual reports.

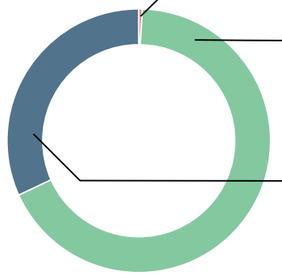
Project participants: Beat Fehlmann (general theatre director), Clemens Keller (administrative director)

Our advice: "The most crucial aspect lies in the assessment of existing figures and data. Accounting statements, travel expense invoices from soloists / conductors, and lists of the orchestra's transportation and transfer activities should all be collected in advance and assessed accordingly." — Clemens Keller (administrative director)

Kampnagel

Kampnagel is an international cultural production venue in Hamburg. In addition to contemporary performing arts, it hosts concerts, conferences and a wide variety of thematically diverse festivals. The former crane factory was first used as a performance venue in the 1980s. Over the past 40 years, it has gradually introduced more or less provisional measures which are tailored to the changing needs of a cultural institution. In the coming years, the building itself will be entirely renovated and modernised for the first time. In 2008, a 1,350-m² photovoltaic system was installed on the roof of the former factory building.

Carbon footprint 2019

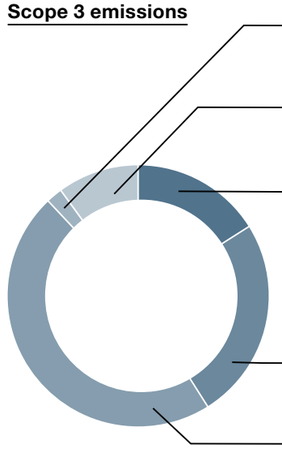


1 %
Scope 1
(vehicles)

67 %
Scope 2
(electricity, district heating)

32 %
Scope 3
(business trips, staff commutes, procurement, waste, water)

Scope 3 emissions



2 %
water

10 %
waste

16 %
staff commutes

25 %
business trips

47 %
procurement / paper

Carbon footprinting

The current carbon footprinting project is one of many sustainability projects which Kampnagel has carried out in recent years – not only at the operational level (e. g. participation in the Ökoprofit programme), but also as part of the artistic programme and in international networks like Imagine 2020 and the current Art Climate Transition (ACT). After collecting the extensive data for the project, we were able to arrive at concrete emission values for the first time. With over 900 events and some 180,000 visitors each season, we knew from the start that the first footprinting phase would have to focus on individual aspects, and so we decided to primarily assess the data on staff mobility, electricity/water consumption, wastewater and procurement in 2019. Travel by international artists plays a significant role in our emissions balance. As international artistic productions comprise our core business, travelling is an essential component in that. Therefore, we decided to put this complex area aside for the time being and examine it in detail in the next phase.

Findings and subsequent steps

The results of our carbon footprint calculations raised awareness within our institution of the need to take action on climate protection. Several departments are now working together to develop a comprehensive Kampnagel-wide sustainability strategy which takes the current findings into account. This will serve as an important basis for the upcoming general renovation of Kampnagel, which will hopefully serve as a model worth emulating by other institutions. Kampnagel is a member of an extensive network of national and international organisations committed to advancing climate-friendly policies in the cultural sector.

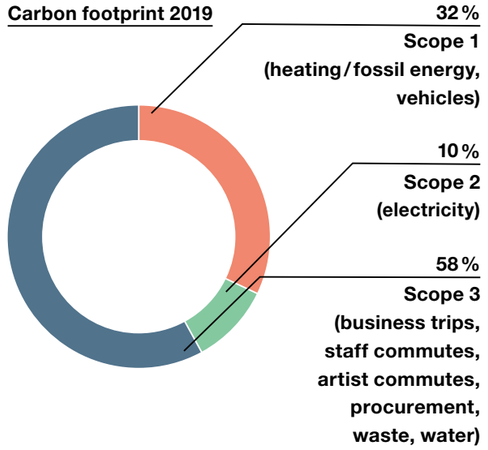
Project team: Amelie Deuflhard (general theatre director), Katrin Ruppel (administrative director), Jendrik Punke (professional trainee) and Uta Lambertz (dramaturge)

"For the first time, we calculated CO_2 values for various areas of operation which made them measurable and comparable – both within Kampnagel and with respect to other institutions. Now we have a category, with which we can objectively assess the development and success of the measures we introduce." — Katrin Ruppel (administrative director)

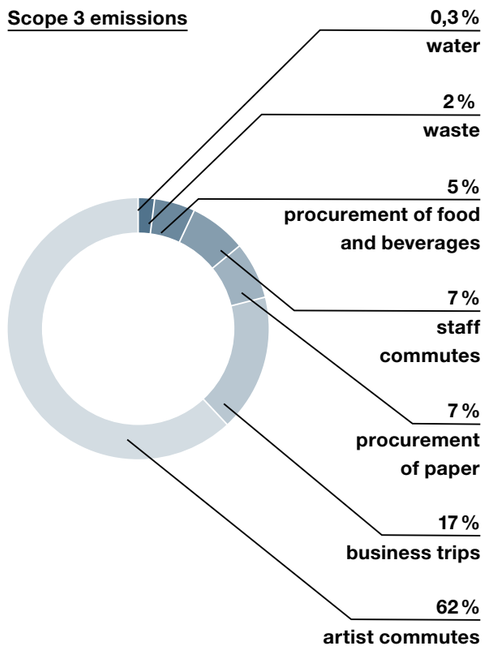
Künstlerhaus Mousonturm

The Künstlerhaus Mousonturm in Frankfurt (Main) opened in 1988 as Germany's first independent production venue. It has since become one of the most important international cultural production sites in the country. We present current works by independent artists and collectives in the areas of contemporary dance, theatre, performance art, music, film and visual art. The ongoing exchange with artists in German-speaking, European and non-European countries remains a central focus of our activities.

Carbon footprint 2019



Scope 3 emissions



Carbon footprinting

Scope 1 and 2 emissions applies to our offices and main performance venues. For Scope 3, we collected data on the mobility of invited artists, the daily commute of staff, business trips, paper consumption, waste, fresh water and gastronomy. As an institution that presents international artistic positions and provides a stage for perspectives of the Global South, we evaluate emissions resulting from artists' travel differently than other data. For the sake of climate equality, we do not want to question the value of cooperation and thus further discriminate against people from countries which contribute less to climate change but are impacted more severely by its effects. Our concept of culture acknowledges the necessity of transnational encounter and exchange; the fight against global warming can only succeed through global cooperation – and that includes theatres.

Findings and subsequent steps

Improving the energy efficiency of the building and its technical systems (especially heating) is very important. We plan to communicate this point more forcefully to our landlord in the future.

We also wish to network better so that we can share knowledge, improve structures and increase visibility both within the alliance of international production companies and at the local level. We want to sensitise our staff to this issue through workshops and encourage everyone to think about resource intensity in all processes of our organisation. This includes planning more efficient trips and performance tours for staff and artists. We will also explore the possibilities, reasoning, feasibility and fundability of compensation payments. The prioritisation of digital communication and marketing formats to replace printed materials is already in development.

With the aid of a visitor survey, we wish to collect information on visitor mobility so that we can include this data in our future calculations. Furthermore, we have to establish an internal system which makes it easier to collect our emissions data in ongoing operations.

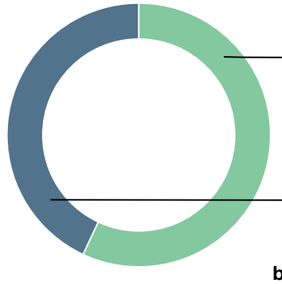
Core team: Katja Liebetruth (administration), Walter Lottré (head of technical systems), Miriam Loy (press and public relations), Katharina Scheuermann (press and public relations), Anne Kleiner (production manager), Matthias Pees (general theatre director and managing director)

Our advice: "Ventilate right = Open windows, lower heating!"

Kunstverein Hannover

As one of the largest and oldest art associations in Germany, the Kunstverein Hannover is renowned for its international programme. The 6½ full-time staff positions are supported by a diverse team of freelancers and volunteers. Thanks to their support, the Kunstverein Hannover is able to supplement its five to six exhibitions each year with an extensive educational programme. Situated inside the Künstlerhaus, the premises of the Kunstverein Hannover comprise 700 m² of exhibition space along with offices, workshops and storage rooms totalling approx. 200 m² of floor space.

Carbon footprint 2019

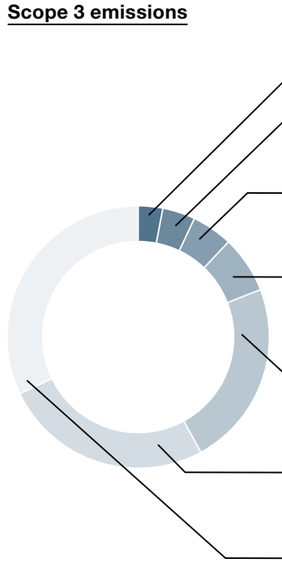


0 %
Scope 1
(no relevant data)

57 %
Scope 2
(electricity, district heating)

43 %
Scope 3
(staff commutes, business trips, waste, water, procurement)

Scope 3 emissions



3 %
business trips

4 %
waste paper

5 %
water

7 %
procurement of paper

23 %
staff commutes

26 %
plastics

32 %
residual waste

Carbon footprinting

All the space used at the Kunstverein was included and analysed in the calculation of our carbon footprint. One of the biggest problems with collecting the data was that our building administrators did not have detailed energy consumption data at their disposal and couldn't obtain a comprehensive overview due to timing and pandemic-related circumstances.

However, our team had more success in calculating commutes and travel distances, as well as resource consumption. Because our building is listed as a historical landmark, renovations are only permitted to a limited degree. Nonetheless, we were able to make some important progress in this regard as well. We were not able to comprehensively calculate carbon footprints for all art shipments in detail yet, but we plan to collect this data in the future.

Findings and subsequent steps

The largest percentage of total emissions comprise the heating and lighting of our premises. The Kunstverein Hannover has already ensured that business trips and commutes are conducted in a climate-friendly manner. Artworks are preferentially transported by ship instead of airplane, and if possible, produced on site. The amount and material requirements of printed products, office furnishings and the environmentally sustainable use of resources are aspects that we intend to examine more intensively in the future. To monitor the development of our carbon footprint, we plan to develop a system which allows us to collect and compare the relevant data in the long term.

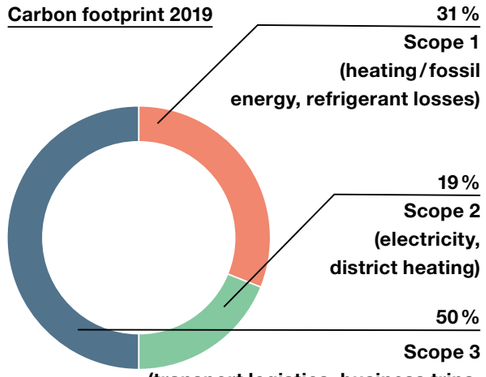
Based on our collected data, we arranged an initial meeting with the city of Hannover; the authorities demonstrated willingness to work together with us to make our day-to-day processes in the building and even larger-scale measures more environmentally friendly.

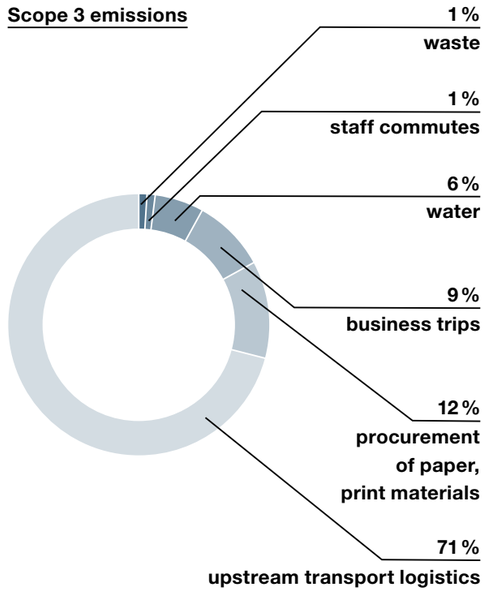
Project team: Marina Neufang (head of finances and shipments), Harry Doerck (technical director), Kathleen Rahn (general director)

"We are all capable of acting consciously and prudently to operate in a more climate-neutral manner in the future. Thanks to the pilot project, we kickstarted a discussion about these issues with the city of Hannover, which is both our institutional sponsor and our landlord – a strategy that we strongly recommend." — Kathleen Rahn (director of the Kunstverein Hannover)

Lenbachhaus München

The Lenbachhaus München is an internationally distinguished museum with works by the *Blauer Reiter*, 19th century works by Munich artists, as well as Jugendstil, New Objectivity and international contemporary art. It has a total operating budget of approximately 15 million euros at its disposal, welcomes some 250,000 visitors each year, holds around 2,500 educational events and organises six to eight rotating exhibitions each year alongside presentations of its standing collection with the support of around 40 staff members.





Carbon footprinting

In addition to our diverse collection presentations in 2019, we also organised four major exhibitions with international loans which then later went on tour to other museums in Europe, Brazil and the United States. Against this backdrop and aware of the overall international orientation of our museum, we quickly realised that the topic of "transport logistics" would represent an important element in the calculation. Retroactively collecting data based on invoices from transport and logistics companies from 2019 was the most time-consuming and complex part in the calculation of our transport logistics, business trips, staff commutes, procurement, waste, water) GHG balance. The revelation that the resulting GHG emissions did in fact comprise the lion's share of GHG emissions of the Lenbachhaus justified the time and effort we put into the calculation.

Findings and subsequent steps

We at the Lenbachhaus will now discuss among ourselves and with the responsible authorities in the state capital of Munich about measures that can be implemented to reduce GHG emissions and what amount can be at least partially compensated. As a museum that conducts a vibrant exchange of international loans and fosters global exhibition partnerships, we must critically examine how much greenhouse gas we are willing to produce for what we want to do, or have to do. Which works should go on tour? How much budgetary leeway do we have to modernise our air conditioning systems? With regard to a possible compensation payment, we would like to support a regional compensation project dedicated, for example, to preserving or restoring the cultural sector in and around the region of Munich.

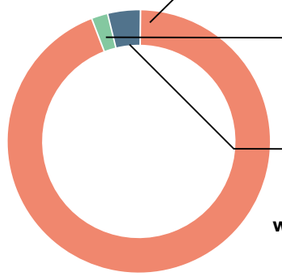
Project team: Hans-Peter Schuster, managing director (responsible); Thomas Staska, accounting; Andreas Hofstett, facility operations

Our advice: "Based on our experience, defining a meaningful balance limit is extremely important. It should be clear from the start which assessable factors can be directly influenced by the institution with a reasonable degree of effort and are likely to have an impact on the carbon footprint." — Hans-Peter Schuster (managing director)

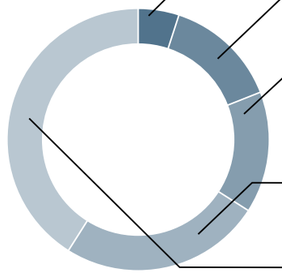
Museum Folkwang

The Museum Folkwang in Essen is home to a prominent collection of paintings, sculptures, media art, graphic works, photography, posters and world art. It stages up to 25 exhibitions and projects each year and offers visitors free admission to its collections. A new museum building, designed by David Chipperfield Architects, opened in 2010. It consists of two exhibition halls, collection areas, a reading room, bookshop, rooms for events and a restaurant. The museum offers 24,000 m² of usable floor space and an exhibition area totalling some 6,200 m². The municipally funded institution employs about 50 staff members. The municipal subsidiary GVE is responsible for facility management.

Carbon footprint 2019



Scope 3 emissions



Carbon footprinting

Our assessments focused on facility management and selected museum operational processes (see diagram). The CO_2 emissions from gastronomy and visitor travel were temporarily excluded from the pilot project. The calculation is based on data from 2019 and reveals a high percentage of fossil-based fuels (natural gas). In 2020, a significant percentage of our cooling requirements were covered by green energy instead of natural gas, using energy-saving technology and climate-friendly refrigerants. We have been gradually integrating energy-saving LED technology into our lighting systems since 2019. These CO_2 savings will likely have a positive effect on our carbon footprint in the coming years. The museum has drawn exclusively green energy since 2010 and uses reusable wall systems for its exhibitions. Four charging stations for electric cars are installed in our underground parking garage, and we regularly cooperate with the public transport authorities in the area of ticketing.

Findings and subsequent steps

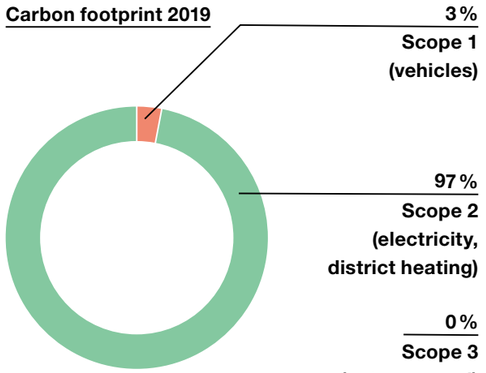
The new findings give us a better idea of where we can potentially reduce greenhouse gases. They provide the basis for documenting and evaluating the efficacy of the implemented measures. They reveal the need for more detailed data collection so that upstream and downstream emissions resulting from museum operations can be accurately identified. We are currently reviewing the possibility of installing our own photovoltaic system on the roof of the museum, as well as other CO_2-saving potentials together with facility management, our energy supplier, the municipal real estate agency and logistics service providers. The Museum Folkwang is committed to becoming climate-neutral as soon as possible.

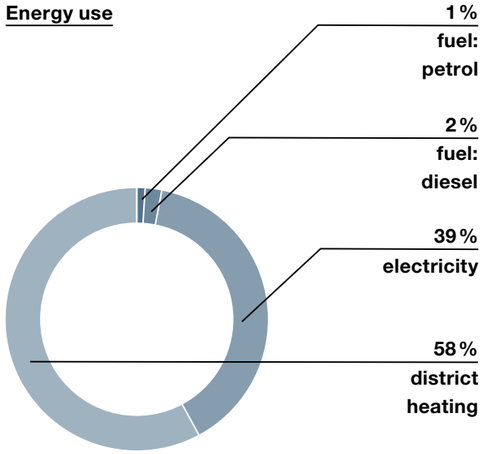
Project participants: Peter Gorschlüter (director), Thomas Grimm (administrative director), Sandro Di Sabatino (GVE, sustainability management), with support from the museum team and facility management

"To be a climate-neutral museum, technical innovations, responsible action and corresponding financial support are necessary. If we wish to remain a role model for society, we must combine the energy-intensive preservation of our cultural heritage, visitor-intensive museum operations and international cooperation with future-oriented sustainability management – a task we must devote ourselves to every day." — Peter Gorschlüter (director)

Saarländisches Staatstheater

The Saarländisches Staatstheater, located at the German-French-Luxembourg tri-border area, is known far beyond the state of Saarland thanks to its top-rate programme. The multi-genre theatre stages over 700 productions each season at its three performance venues. General theatre director Bodo Busse and his team of some 440 staff have made their institution a centre of modern European theatre. Situated near the border of France and Luxembourg, the Saarländisches Staatstheater collaborates on joint projects with theatres and theatre companies on both sides of the border.





Carbon footprinting

We had energy audits carried out for all our performance venues – the Großes Haus, Alte Feuerwache and sparte4 – as well as the workshops and administrative building. As could be expected, the results were suboptimal, i. e. our CO_2 emissions were significantly too high. What could we change? In cooperation with the management, we drafted a priority list of measures which we could implement with our available resources. For example, shifting to LED lighting. We applied for additional funding from our funding provider since the theatre's regular operating budget could not feasibly finance the (political) goal of achieving CO_2 neutrality.

The position of an environmental protection officer was created at the beginning of the year; Holger Sand has since accompanied every activity inside the theatre and is regularly consulted with regard to all decisions related to environmental protection.

Findings and subsequent steps

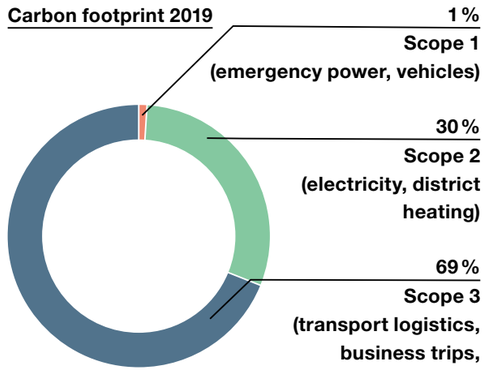
The measures we have already implemented or plan to implement shortly include: reducing overnight energy consumption in the administrative offices and workshops, shifting to recycled copy paper, immediate waste separation (paper, plastics, residual waste), sending invitations and work schedules in digital form only with few exceptions, energy-saving renovation measures of the roof of the administrative building, continued shift to LED lighting in all areas, installation of motion sensors in corridors, participation in the "JobRad" (bike leasing) project for members of the theatre.

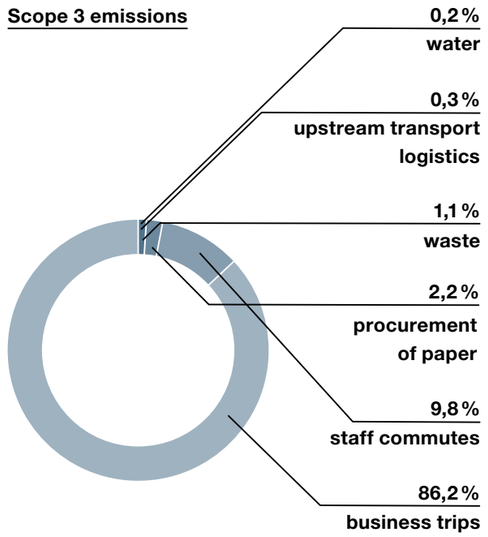
Project team: Holger Sand, environmental protection officer; Benjamin Jupé, Orchestra of Change; Prof. Dr Matthias Almstedt, commercial director; Ralf Heid, technical director; Eckart Janke, authorised officer; Dirk Schauer, head of building systems; Daniel Müller, organisational director for lighting

"My advice for anyone who does this job: Keep at it and ask questions again and again and again!" — Holger Sand (environmental protection officer at the Saarländisches Staatstheater)

Schaubühne am Lehniner Platz

The Schaubühne is one of five major ensemble and repertory theatres in Berlin known for producing modern, contemporary works and engaging in international collaborations. Its programme is marked by a critical-analytical and often political perspective on social reality and includes classical pieces as well as contemporary works. The theatre presents six to ten new productions every season and is invited to guest perform at venues around the world. Founded in 1962 in Berlin-Kreuzberg, the Schaubühne relocated to the former cinema "Universum" in 1981 which was refurbished for theatre purposes. The building is part of a larger complex designed by Erich Mendelsohn in the 1920s on Kurfürstendamm in Berlin-Charlottenburg. The Schaubühne is the tenant in the state-owned, listed historical building. With 225 staff and some 145,000 visitors a year, the theatre presents over 550 performances in Berlin. Around 50,000 visitors watch its productions at guest performances and festivals in more than 100 performances around the world. Its international orientation and strong focus on guest performances and co-productions, along with its annual international festival (F.I.N.D.), has shaped the profile of the Schaubühne under the artistic direction of Thomas Ostermeier since 1999. The proceeds from its international performances have since become an important source of revenue for the theatre.





Carbon footprinting

Due to the time constraints of the pilot project, the first priority was to collect the data for our central location on Kurfürstendamm, i.e. the theatre building itself with its workshops and studio stage, as well as the total performance and guest performance activities. In the future, external locations like the rehearsal stages and warehouses will also be included in the calculation. With targeted queries and detailed data collection in all areas (including staff commutes), we were able to gain a comprehensive view of our CO_2 equivalents.

Findings and subsequent steps

By using district heating and certified green energy, we had already achieved a significant reduction in CO_2-generating sources. Consequently, our Scope 3 emissions comprise the largest proportion of the entire balance with just under 70 %. The majority of these emissions (over 85 %) are caused by business trips and guest performance tours. This plainly reflects the artistic and economic orientation of our theatre.

Consequently, all the necessary measures to reduce our carbon footprint going forward will focus on international cooperation, which is ultimately a matter of cultural political significance. Beyond this structural challenge, our staff – at their own initiative – established a working group to incorporate measures into the theatre's day-to-day operations. For example, one of its main tasks will be to achieve greater sustainability in the area of set construction.

Project team: Tobias Veit (director), Holger Ackermann (technical director), Christian Tschirner (head dramaturge), Sebastian Hampl (technical assistant) and Ivo Jacoby (operational inspector)

"The calculation of a carbon footprint is a decisive impulse for the Schaubühne. It generates awareness of our own share of greenhouse gas emissions and forces us to play a more active role in the transformation process shaping all of society." — Tobias Veit (director)

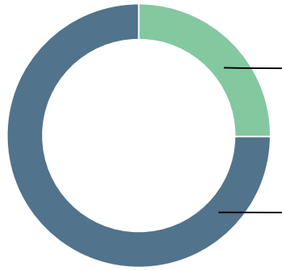
Staatliche Kunstsammlungen Dresden

Albertinum

Kunstgewerbemuseum

The Staatliche Kunstsammlungen Dresden (SKD) consists of 15 museums at various locations in exquisitely restored and reconstructed historical buildings. These include the Albertinum and the Kunstgewerbemuseum. The Albertinum reopened in 2010 after extensive renovation and has since presented masterpieces of Romanticism, Impressionism, Expressionism, New Objectivity and contemporary art. At the Kunstgewerbemuseum in Pillnitz Castle – a listed Baroque-period monument – historical works are presented alongside international pieces of contemporary design.

Carbon footprint 2019 Albertinum

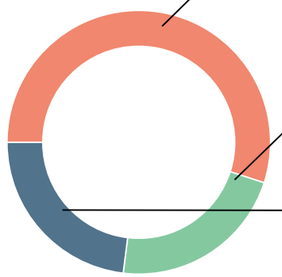


0 %
Scope 1
(no relevant data)

25 %
Scope 2
(electricity, district heating)

75 %
Scope 3
(business trips, staff commutes, service provider mobility, waste, plastics, procurement, other)

Carbon footprint 2019 Kunstgewerbemuseum



55 %
Scope 1
(heating/fossil energy, vehicles)

22 %
Scope 2
(electricity)

23 %
Scope 3
(business trips, staff commutes, service provider mobility, transport logistics, procurement, other)

Carbon footprinting

We calculated the carbon footprints for two institutions which we considered exemplary based on their building technology systems: The Albertinum as a modern, fully air-conditioned museum and the Kunstgewerbemuseum in a Baroque palace with no installed air conditioning or heating technology. The differences in terms of building technology were especially evident in the Scope 1 and 2 results. The Scope 3 emissions were proportionally similar in distribution.

We examined the transports of four large exhibitions, whereby combined transports were preferentially used, while direct trips and empty runs were avoided. The data showed that courier transports and flights over shorter distances could be the focus of negotiation in the future. Visitor travel was largely disregarded, but we plan to consider this data more strongly in our future carbon footprint calculations.

Findings and subsequent steps

In addition to the carbon footprinting project, we established a sustainability working group to facilitate knowledge transfer between our departments and museums. We plan to apply the carbon footprinting processes to other SKD venues in order to develop and implement site-specific measures and ideas. Furthermore, reference data will be collected retrospectively to help us come up with concrete control measures. All the findings will be analysed and compiled in a catalogue of measures. We are also in dialogue with other cultural institutions in Dresden and the Free State of Saxony.

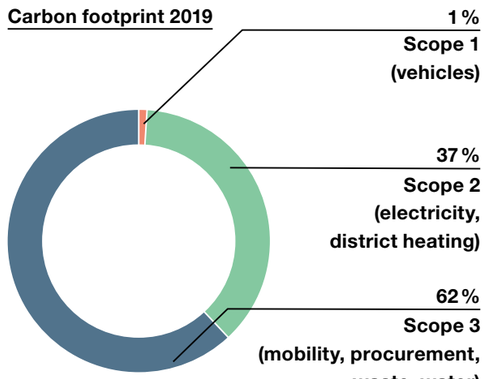
Aside from the environmental aspects, we wish to focus more strongly on social and societal sustainability – and for us, that includes adopting a sustainable attitude toward our fellow employees and intensifying knowledge transfer to future generations.

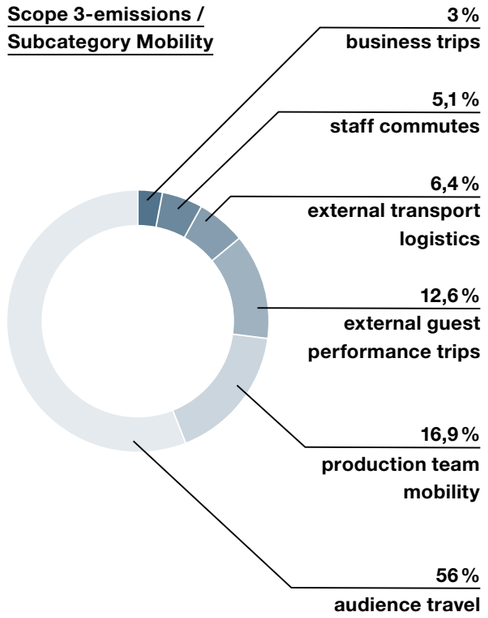
Project team: Hilke Wagner, director of the Albertinum; Flavia Sommer, Albertinum; Thomas A. Geisler, director of the Kunstgewerbemuseum; Nils Hilkenbach, Kunstgewerbemuseum; Astrid Köhler, construction, technology, safety; Denise Drutschmann, human resources; Andrea Vogt, marketing; Carolin Baer, media and communication; Michael Mäder, research and scientific cooperation

“Though the effort needed for collecting data shouldn’t be underestimated, it provides valuable information on the internal processes at one’s institution. Carbon footprinting resulted in greater awareness – also of what we can do to pursue a more sustainable mission.” — Thomas A. Geisler (director of the Kunstgewerbemuseum and spokesperson of the SKD Sustainability Working Group)

Staatsschauspiel Dresden

The Staatsschauspiel Dresden and the Semperoper Dresden jointly comprise the Sächsisches Staatstheater. As Saxony's largest theatre, it stages plays in the historic Schauspielhaus (ca. 800 seats) and three venues in the Kleines Haus (totalling ca. 500 seats), where the Bürger:Bühne is also located. In addition to its repertory performances, it produces up to 30 new productions each season. It also organises festivals and special events. Carbon footprinting is part of an overarching strategy to incorporate sustainability into the artistic activities of the Staatsschauspiel Dresden and anchor it as an interdisciplinary topic across all areas of theatre operation.





Carbon footprinting

The carbon footprinting process was essentially conducted in three steps. We began by defining the limits of the data collection. For the centralised top-tier administrative units and the set and costume workshops, we referred to an operational allocation key.

In the next step, we collected and processed the necessary data. The sources we used were primarily invoices, operational master data, a visitor survey and data sets from municipal statistical analyses.

Another task involved converting the corresponding emissions factors into CO_2 equivalents so that the CO_2 emissions could be calculated in tonnes for each position. And finally, we evaluated the calculated results.

Findings and subsequent steps

We were surprised to find that around 40 % of our total carbon footprint was generated in the area of mobility. About 56 % of this amount was attributable to audience travel. We have taken steps to concretely address this: Starting in the 2021/22 season, our audience members will be able to use public transportation free of charge with the purchase of an admission ticket. We are interested in seeing whether the audience's mobility behaviour will change as a result.

In terms of institution-wide comparability and usefulness of future carbon footprint calculations, it is important to create standardised guidelines and certification rules. It will also be necessary to calculate and uniformly apply branch-specific emissions factors as CO_2 equivalent in future.

Carbon footprinting project team: Peter Keune (technical director), Tino Ressel (head of operations and facility management), Julius Kählig (assistant to the technical director), Pierre-Yves Bazin (deputy commercial managing director), Michael Stöhr (head of visitor service and sales), Gertrud Aringer (head of press and public relations), Sarah Schramm (advisor to the general theatre director)

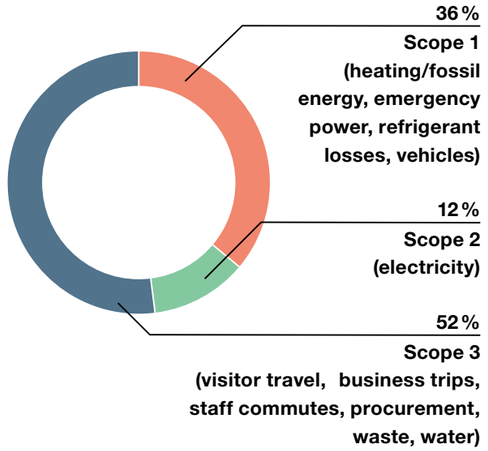
Advice from the project group: "Carbon footprinting means a lot of work for everyone involved. We had staff from very diverse departments participate in the process which greatly enriched the project. We made the issue visible, engaged in conversation, and so doing, automatically generated awareness of sustainability and climate protection."

Staatstheater Darmstadt

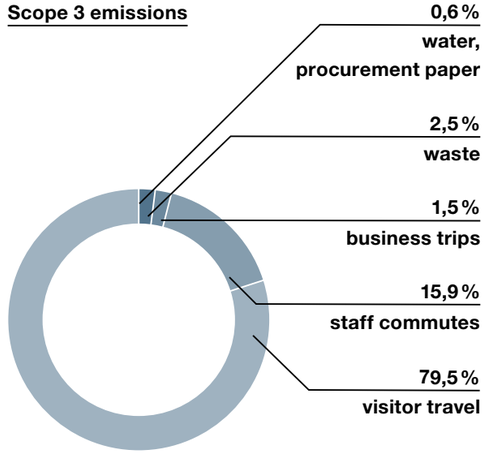
The Staatstheater Darmstadt operates five artistic divisions: music theatre, dance theatre, dramatic arts, concert performances and education. The theatre employs some 550 staff members.

The “Großes Haus” holds space for 956 audience members, and the “Kleines Haus” seats 482 visitors. Following extensive renovation measures from 2002 to 2006, the Staatstheater Darmstadt is now able to stage chamber plays with seating for up to 200 visitors.

Carbon footprint 2019



Scope 3 emissions



Carbon footprinting

For our calculation, we examined the Staatstheater premises in particular and the touring activities of all the artistic divisions. The collected data is based on the Staatstheater’s waste and energy consumption figures from 2019. Logbooks exist with records of all trips with the theatre’s company vehicles, and we estimated the distance travelled by private car based on an average kilometre rate. It was more difficult to calculate visitor travel, however. Had the theatre not been forced to closed during the coronavirus pandemic, it would have conducted a visitor survey, available at the box office and on our homepage, or via our theatre’s newsletter. Absent this possibility, we opted to calculate this value based on the statistical visitor data from 2019. Staff commutes were calculated using a survey tool and extrapolated accordingly.

Findings and subsequent steps

The Staatstheater Darmstadt is steadily upgrading the lighting throughout the entire building with LED fixtures. With the addition of motion sensors, we hope to save even more electricity. Over time, we will be gradually retrofitting our stage lighting with LED technology.
It would be practical to create special budgets earmarked for this purpose which could be considered in the overall budget planning. In summer 2021, a number of extensive renovation measures for the Kleines Haus are set to begin. Many of these were conceived and planned with our carbon footprint and environmental sustainability in mind. Starting next season, a public transportation ticket will be included in the price of admission to our performances. Meanwhile, the theatre management is negotiating with the city of Darmstadt to set up a tram stop nearby to connect the theatre more directly to the public transport system.

Project participants: Accounting/controlling/budget, sales, building and facility technology, general theatre direction, IT, human resources, stage tech. The core group directly involved in the pilot project consisted of general theatre director Karsten Wiegand, stage inspector and deputy technical director Uwe Czettl and head of building technology Manfred Kern.

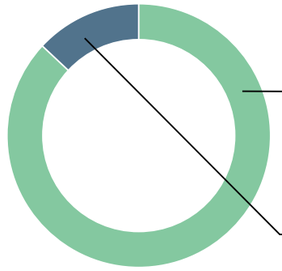
Advice from Uwe Czettl (stage inspector):
“There should be a contact person in every department responsible for carbon footprinting. This allows the necessary data to be precisely obtained. It’s also a good idea to form a project group to create synergetic effects.”

Stadtbibliothek Berlin-Pankow

Stadtbibliothek Berlin-Pankow: Janusz-Korczak-Bibliothek

The Stadtbibliothek Berlin-Pankow is a municipal library with eight branches. It is currently undergoing a major process of transformation due to increasing digitalisation and the need to appeal to new, diverse target groups. No longer is it merely a place that lends books; the library provides visitors with a social infrastructure, a place that promotes knowledge and encounter. The Stadtbibliothek actively addresses important social issues such as demographic change, the growing and changing city, and social and environmental sustainability.

Carbon footprint 2019



0 %
Scope 1
(no relevant data)

87 %
Scope 2
(electricity, district heating)

13 %
Scope 3
(transport logistics, business trips, staff commutes, procurement paper, waste, water)

Carbon footprinting

Carbon footprinting the Stadtbibliothek Pankow was an exciting challenge, even if it meant calculating individual carbon footprints for each of our eight branch libraries which employ a total of 100 staff. It was a very labour-intensive and sometimes exhausting process, since collecting the necessary data under pandemic conditions wasn't always easy on account of the sluggishness of the municipal administration. But our work and patience paid off: Upon reviewing the results, we found significant differences in GHG amounts at the individual branches. Yet some questions remained unanswered, e. g. how purchased books, CDs, DVTs, electronic media like e-books and streaming services affected the carbon footprint. Furthermore, we determined it would require an enormous effort to calculate visitor travel to and from the Stadtbibliothek.

Areas with the greatest potential for CO_2 savings

The Stadtbibliothek Pankow can achieve massive savings by converting to green energy for its electricity usage. We are also considering installing our own photovoltaic systems. Moreover, we are assessing whether it is feasible to draw district heating from less CO_2-intensive sources. However, these projects are rather longer-term goals which are not so easily implemented.

The simplest measures involve, e. g. the use of thermostats on radiators. Timer switches and light switches installed at the colleagues' individual workstations would make it possible to decouple devices from the power grid which would otherwise waste energy in stand-by mode. We are currently developing a strategy for the area of upstream logistics which would use more environmentally friendly possibilities for inner-city transports, such as cargo bikes and electric cars.

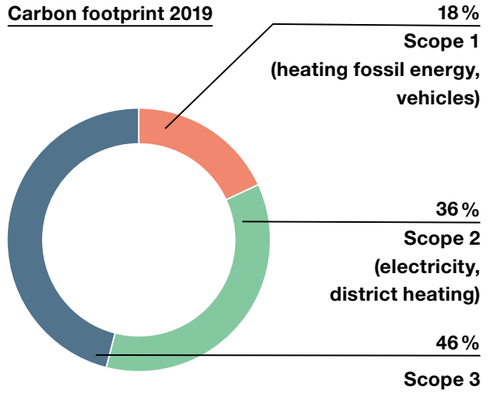
Project team: Danilo Vetter (project manager), Tim Schumann, Layla Bayraktar

"Carbon footprinting offers us the chance to implement efficient measures for reducing GHG and take these findings into account when planning future buildings." — Danilo Vetter (director of the Stadtbibliothek Berlin-Pankow)

Stadtbücherei Norderstedt

Stadtteilbücherei Glashütte

The Stadtbücherei operates four branches in Norderstedt. Each branch is responsible for setting its own areas of focus based on the needs of its local community. The libraries have adopted the concept of the "Third Place" and cooperate closely with cultural and educational organisations in this city of 80,000 inhabitants. The libraries employ a total of 39 persons who share the responsibility of 29 positions. The two smallest libraries operate as "open libraries" with opening hours from 8 am to 8 pm. The Stadtbücherei Norderstedt received the Library Award of the state of Schleswig-Holstein in 2018.



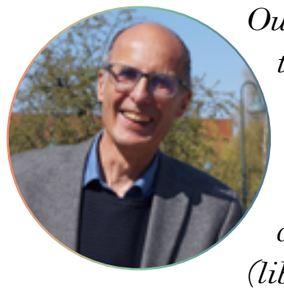
Carbon footprinting

The carbon footprints of the four locations were individually assessed and calculated due to their distinct energy requirements. Energy and resource consumption was measured with support of the municipal energy management agency. As we had no prior data on consumer materials and the resulting waste, we calculated these based on random samples and used estimates in some cases. We especially focused on the impact of the sometimes extensive repackaging of media (e.g. with plastics). Because of complexity and the excessive effort it would entail, our calculation excluded the media and its transport to the libraries, staff commutes and the emissions generated by the users in the libraries. Nonetheless, these would be important factors for a comprehensive calculation.

Findings and subsequent steps

The project enabled the team to gain awareness of environmental issues and encourage creative engagement with the topics of carbon footprinting and sustainability. Each library appointed its own "Climate protection officer" to serve as a contact partner. Further results were obtained thanks to our close cooperation with the Stadtbibliothek Pankow and discussions with colleagues from another library. Certain structures were put in place to ensure climate protection remained a focal topic. Over the course of the project, it became clear that the libraries could play an active role at various levels – internally through staff actions (reducing plastic waste when repackaging media, using recycled paper etc.), externally with customers (through public relations, skill-building measures, creating collection points etc.) and through improved networking (cooperation with other green libraries and environmentally friendly organisations).

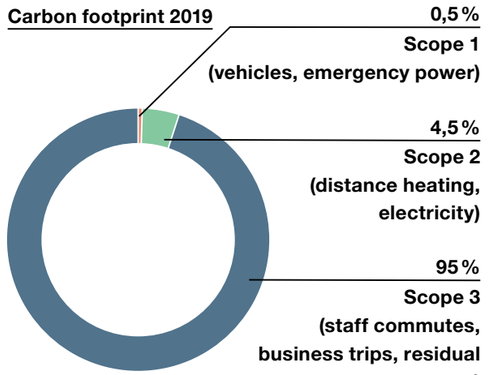
Project team: Vanessa Klein (library IT and librarian), Sabine Schröder (librarian) and Ingo Tschepe (library director). With strong support by municipal administrative staff: Birgit Farnsteiner and Ina Streichert (Department of Environmental Affairs Norderstedt) and Olaf Dierks (Office for Facility and Energy Management)

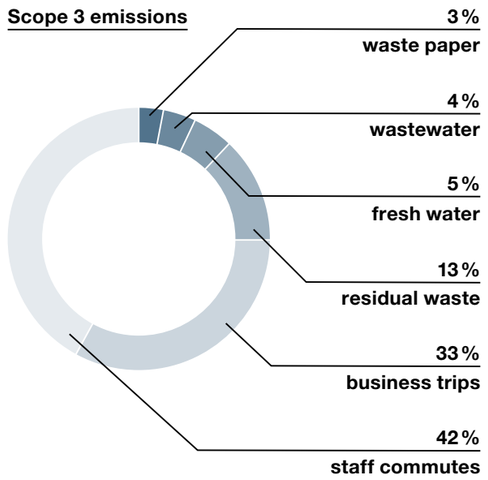


Our advice: "Get your staff actively involved in the process – that increases the willingness to provide information and encourages participation in the study and development of environmental processes of transformation. It's also advantageous to collaborate with a library which is also calculating their own carbon footprint." — Ingo Tschepe (library director)

Zentrum für Kunst und Medien

The ZKM | Centre for Art and Media in Karlsruhe brings all artistic genres and media art together under one roof. Housed inside the historical industrial landmark "Hallenbau A" since 1997, it stages ca. 30 exhibitions and organises 200 events for 250,000 visitors a year on 15,000 m². It employs approximately 100 staff responsible for tours and workshops, exhibitions, the collection, research, administration, technology, communication, restoration, video production and publications.





Carbon footprinting

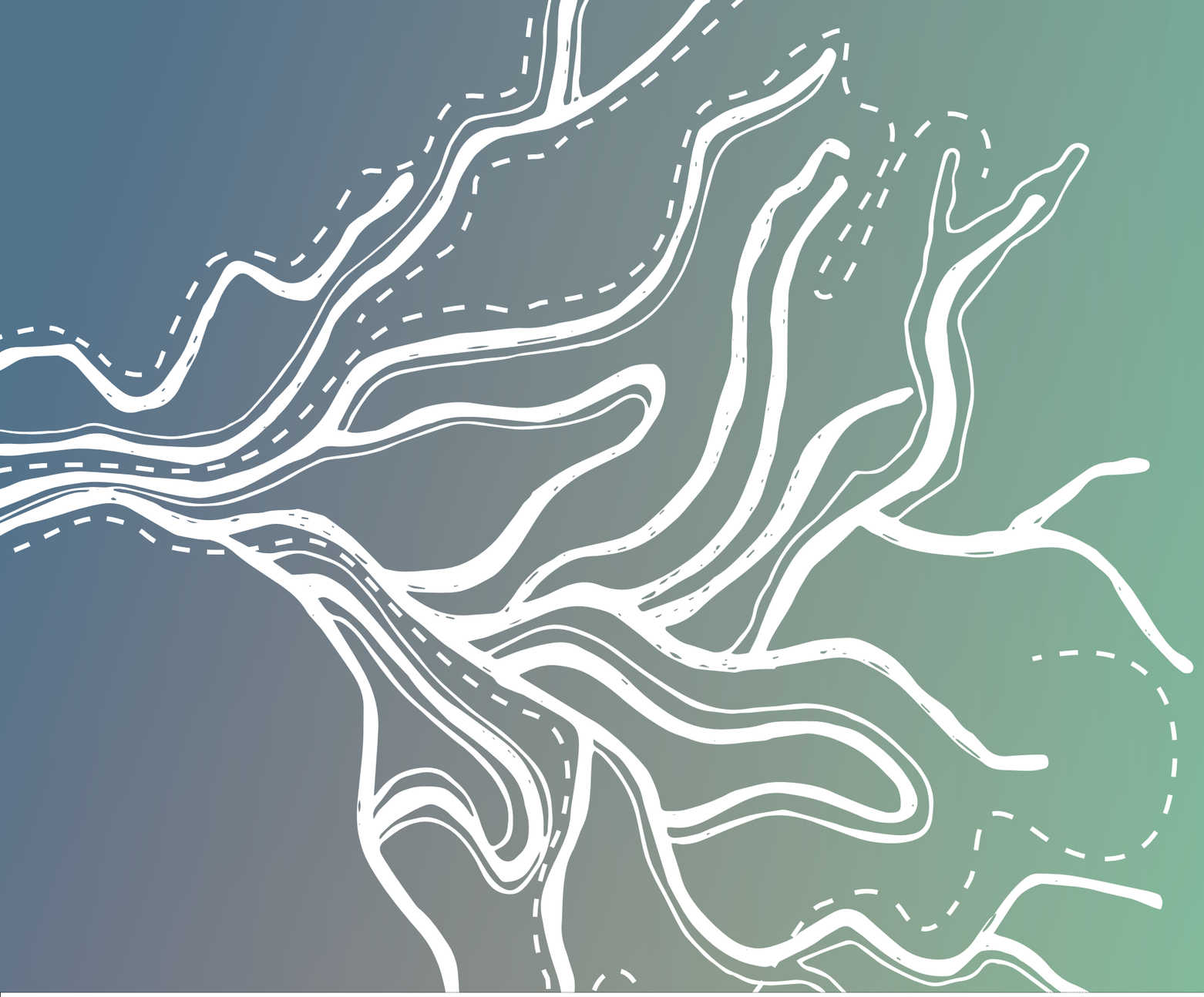
Data on Scope 1 and 2 emissions were collected for Hallenbau A, as well as selected data on Scope 3 emissions. The Scope 3 calculation presented us with a challenge. While it was possible to determine and assess the type of commute to the workplace using a practical online survey, the data related to business trips had to be gathered by hand. We had to use roadway distances as the basis for our data on railway travel, as data on track kilometres are not available online. In this first step, we could not gather information on (art) transport logistics. The prescribed parameters of *Distance* and *Type of transport* required for the calculation do not accurately depict the resulting emissions as these do not account for different freight weights, the option of additional cargo or self-organised transport.

Findings and subsequent steps

With regard to the energy analysis, our expectations were essentially confirmed. We were positively surprised by the calculated emissions for staff commutes, as it turns out that a high percentage of our employees travel to work by bike or public transportation. With regard to our vehicle fleet, we were aware of potential savings even before completing the calculation which will now be attained by trading in frequently used transporters with electric vehicles. In the lead-up to our exhibition "Critical Zones", we established a "Green Team" which also accompanied the carbon footprinting process at the ZKM. Together with the facility management and building technology departments, they have been working to implement green measures, such as cultivating the meadow orchard, increasing bike transports and reducing waste.

Project team: Dominika Szope (head of communication and marketing), Tobias Klingenmayer (executive staff)

"In order to consolidate the data collection process in the coming years, it is worth introducing smart, automated solutions that would simplify data retrieval and analysis. Establishing a concrete in-house workflow would certainly benefit the calculation." — Dominika Szope (head of communication and marketing)



This table is also available as a PDF download from the website of the German Federal Cultural Foundation:
https://www.kulturstiftung-des-bundes.de/data-collection

SAMPLE TEMPLATE FOR DATA COLLECTION / INITIAL ASSESSMENT

Emissions source		Scope (1, 2, 3)	Relevance (yes/no)	Within system limits (yes/no)	Data available (yes/no/ partially)	Absolute amount (specify unit)	Data source (specify document)	Unit	CO_2e-conversi-onfactor (*)	CO_2 equivalents [kg CO_2e]
Electricity	general	2						kWh		
Heating fossil fuels	heating oil	1						l		
	district heating	2						kWh		
	natural gas	1						m^3		
Heating renewables	wood pellets	1						kg		
	woodchips	1						kg		
	biogas	1						m^3		
Emergency power	diesel / petrol / natural gas	1						l		
Waste	residual waste	3						m^3		
	organic waste	3						kg		
	waste paper	3						kg		
	plastic, mixed	3						kg		
	wood	3						kg		
	metal	3						kg		
	other waste products	3						kg		
Refrigerant losses	refrigerants	1						kg		
Vehicle fleet	diesel fuelled cars	1						l		
	petrol fuelled cars	1						l		
	natural gas fuelled cars	1						l		
	lorries 3.5 - 7.5 t	1						l		
Business trips (**)	public transport (suburban railway, tram, subway)	3						p.km		
	public transport (bus diesel)	3						p.km		
	railway - short-distance	3						p.km		
	railway - long-distance	3						p.km		
	car/rental car - diesel	3						l		
	car/rental car - petrol	3						l		
	car/rental car - electric	3						kWh		
	airplane - domestic business	3						p.km		
	airplane - domestic economy	3						p.km		
	airplane - international business	3						p.km		
	airplane - international economy	3						p.km		
	public transport (suburban railway, tram, subway)	3						p.km		
	ÖPNV (Bus Diesel)	3						p.km		
	Bahn – Nahverkehr	3						p.km		

CARBON FOOTPRINTING: PLANNING AND IMPLEMENTING MEASURES

Organisation:

Responsible staff member:

date:

Measure	Responsibility		Timeline		Status	Negative enviromental impacts	Investments	Benefit and efficiency		Verification of measure's success
Title / brief description	responsible	together with	Established (dd.mm.yyyy)	target (dd.mm.yyyy) traffic light system			euro	CO₂e savings	Economic (financial savings) euro	

This table is also available as a PDF download from the website of the German Federal Cultural Foundation: https://www.kulturstiftung-des-bundes.de/Planning-and-implementing-measures.

Related Literature and Links

Guidelines

Please note: The following links and resources are mostly available in German only.

Sustainable Production Compass for the Cultural Sector (German Federal Cultural Foundation, 2020)
https://www.kulturstiftung-des-bundes.de/nachhaltigkeitskompass **(German only)**

Climate Management at Companies – Development of Components Based on the Environmental Management System (EMAS) (German Environment Agency, 2020)
https://www.umweltbundesamt.de/publikationen/klimamanagement-in-unternehmen

Introduction to Climate Management – Step--by-Step Guide for Effective Climate Management at Companies (Global Compact Netzwerk Deutschland, 2017)
https://www.globalcompact.de/wAssets/docs/Umweltschutz/Publikationen/001-Einfuehrung-Klimamanagement-DGCN_web.pdf

Annett Baumast, Jens Pape, Simon Weihofen, Steffen Wellge (eds.): Betriebliche Nachhaltigkeitsleistung messen und steuern. Stuttgart: UTB 2019. (For theoretical and practical examples of concepts and indicators for measuring sustainability)

The Road to GHG Neutral Administration. Steps and Assistance (German Environment Agency, 2021)
https://www.umweltbundesamt.de/publikationen/der-weg-zur-treibhausgasneutralen-verwaltung

From Emissions Report to Climate Strategy. Fundamentals for a Standardised Emissions and Climate Strategy Reporting System (WWF, CDP, PwC – klimareporting.de 2014)
http://klimareporting.de/wp-content/uploads/2014/02/Klimareporting_Vom_Emissionsbericht_zur_Klimastrategie_2014_02_20.pdf

Sustainability Compass – Web portal for sustainable public procurement (Engagement Global / GIZ)
https://www.kompass-nachhaltigkeit.de/

Voluntary CO_2 Compensation through Climate Protection Projects (German Environment Agency, 2018)
https://www.umweltbundesamt.de/publikationen/freiwillige-co2-kompensation-durch

Work Materials

Calculators

Calculation of the ecological footprint (Global Footprint Network)
https://www.footprintcalculator.org/

Calculation of the CO_2 footprint (German Environment Agency)
https://uba.co2-rechner.de/de_DE

Calculation of the CO_2 footprint (KlimAktiv)
https://demo.co2ckpit.de/de_DE/footprint

Calculation of the CO_2 footprint in the cultural sector (Julie's Bicycle)
https://juliesbicycle.com/resource_hub/introducing-the-creative-green-tools/

Calculation of the CO_2 footprint of events (Energieagentur NRW)
https://www.energieagentur.nrw/klimaschutz/eventrechner

Specific conversion factors / Calculators and databases

Carbon footprinting standards (Greenhouse Gas Protocol)
https://ghgprotocol.org/

Conversion factors (UK Government 2020)
https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020

Refrigerants (German Environment Agency 2019)
https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/treibhauspotentiale_ausgewaehlter_verbindungen_und_deren_gemische.pdf

Meals and food (Klimateller App)
https://www.klimateller.de/klimateller-app/

Passenger and freight transport (German Environment Agency / TREMOD)
https://www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten#TREMOD

Railway travel (Deutsche Bahn)
https://www.umweltmobilcheck.de/

Transport emissions (EcoTransIT)
https://www.ecotransit.org/de/emissionsrechner/

Hotel accommodations (bookdifferent)
https://www.bookdifferent.com/en/

Sustainability / Climate reporting

Global Reporting Initiative
https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-german-translations/

German Sustainability Code
https://www.deutscher-nachhaltigkeitskodex.de/de-DE/Home/DNK/Criteria

Funding measures

Federal, state and EU funding programmes
https://www.foerderdatenbank.de/FDB/DE/Home/home.html

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