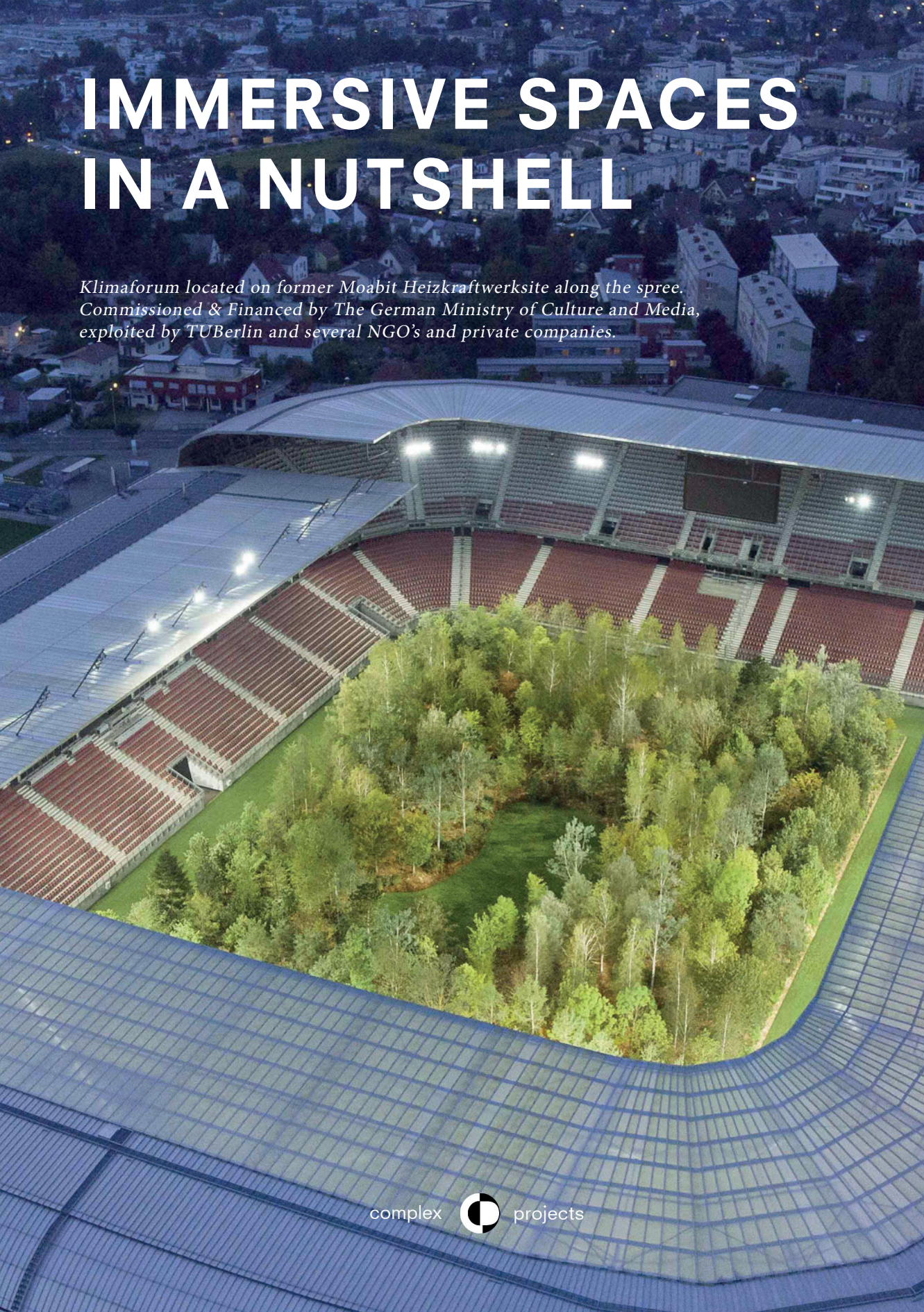
IMMERSIVE SPACES IN A NUTSHELL

Klimaforum located on former Moabit Heizkraftwerksite along the spree. Commissioned & Financed by The German Ministry of Culture and Media, exploited by TUBerlin and several NGO's and private companies.



complex projects

TU Delft

2021

COMPLEX PROJECTS
Bodies & Building Berlin
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Fig 1. Extreme wildfires in California (Weil, 2022)

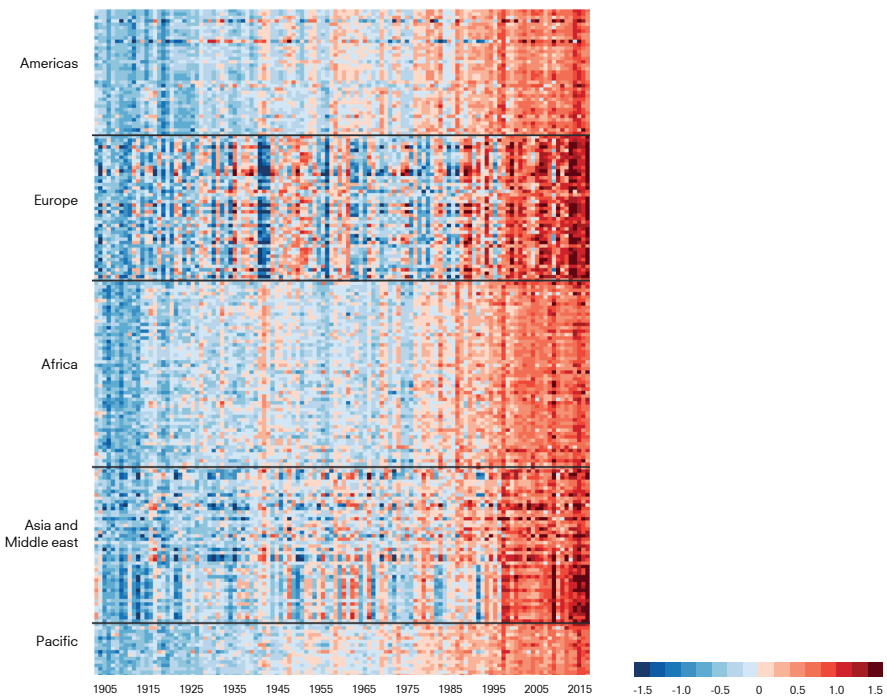

Fig 2. Average temperature changes around the world (Fleming, 2020)

Introduction

Problem statement

People from all around the world are witnessing how climate change can unleash havoc on planet earth. According to McKeever (2021) air pollution, extreme heat, food insecurity, infectious diseases and resulting mental health issues are the main problems coming from climate change. Ian Fry (2022), UN Special Rapporteur on the promotion and protection of human rights in the context of climate change even goes further by stating that: *'Human-induced climate change is the largest, most pervasive threat to the natural environment and societies the world has ever experienced'.*

Within the context of Germany, it's likely that the country will miss it's 2020 climate targets, notably those for emission reductions and energy efficiency. A report of CAN Europe (2018) states that Germany is certainly not one of the protagonists in the EU when it comes to battling climate change. It's conservative attitude towards progressive legislation has led to a delay in pressing decisions in energy and transport sectors. Also, the country wasn't determined to raise ambitions within global and European partnerships and while progressive, leftist parliaments call for zero emissions in 2050 or earlier, Germany is still tossing about whether it could actually catch up with the near emissions neutrality in 2050, as agreed upon within the framework of The Paris Agreement (CAN Europe, 2018).

Another issue is the partiality within climate change discourse. One's view on the matter has forever been influenced by a spectrum of factors, ranging from political philosophies, religion, demographic factors like age and gender and even language seems to influence the debate (Murray, 2021). As an example, The Yale Program on Climate Change Communication in the US found that, in trying to encourage support for climate policies, switching to "extreme weather" was more effective in winning over American conservatives. But, perhaps more importantly, it's the political climate and the tone of the media which are currently the decisive factors. And social media has turbocharged the divide in attitudes towards climate change. "People are moving into factions and social media has allowed us to become very tribal," says Hoffman (cited in Carman et al. 2021).

Objective

Climate change poses a substantial threat towards the survival of vast amounts of plants, animals, insects and ultimately to human life (WMO, 2022). Though, a solution to this problem is not so easily constructed and often multifaceted. However, according to Taylor (2022) citizens of developed, western countries could play a big role in averting the climate breakdown by making a few easy lifestyle changes, from taking the plane a little less often (no more than once per three years) to buying a maximum of three new clothing items a year.

WBGU (cited in Keller et al., 2019) states that it is very much necessary to raise the overall 'climate change awareness level' of humanity, for it is exactly this awareness which shapes people's engagement in the creation of a climate-friendly society. Teenagers and students should thereby be treated with special care (Moser, 2010), as they are the generation whose lives will be more affected than any other generation today (Ojala, 2012). As they grow older, they will become the decision makers of tomorrow, deciding over environmental and societal consequences of climate change (Corner et al., 2015; Ojala & Lakew, 2017). Carmi et al. (2015) says that in order to equip this generation with what they need to analyze and address climate change properly, the aims of current environmental education should be focused on the enhancement of teenagers' knowledge, attitudes, and behavior towards climate change.

Within the context of Complex Studio: Bodies & Building Berlin and the realm of architecture it is interesting to look at how architecture can take part in the search of a sustainable solution to this problem.

In aforementioned writings it became clear that the German state is doing too little to meet the 2050 climate goals. Despite the sometimes indifferent reactions, the general public can make a substantial difference by making easy lifestyle changes. Also, Carmi et al. (2015) argues to tackle the problem at it's roots by focussing on the enhancement of teenagers' knowledge, attitudes, and behavior towards climate change.

Maybe against expectations, the answer to this problem could lie beyond the classroom and school, but within museums and museum-like environments such as art galleries, archaeological sites, heritage sites, bio-diversity parks or botanical gardens (Insaf, 2021). And where conventional museums struggle to get young peoples' attention, they do visit interactive science & technology museums at a greater rate (+11%) than the national average (Ubimo, 2019).

The main objective of this research is to synthesize a design brief for an interactive art, science and technology museum specifically aimed at educating the younger generations about climate change in order to provoke action. The interactive component of such a museum could be the immersive experience as described by Mark Wigley (2016): *'The immersive experience is an opportunity to give visitors a sense of being detached enough from the world to reflect upon the world'.* A relevant research question could therefore be:

In which ways can immersive experiences in musea contribute to a greater awareness about climate change?

Theoretical Framework

In order to give an answer to this question a theoretical framework will be implemented which is structured along several sub-questions. Every sub-question will then be accompanied by a relevant theme and several case studies in order to be as complete as possible. The way of conducting research will be further elaborated in Research Methods.

The first sub-question *how can the museum make immersive experiences as accessible as possible?* deals with the idea of the museum as a place of stay and community, which is accessible for all and therefore doesn't discriminate. In his book The Great Good Place, Ray Oldenburg (1989) introduces the term the third place. To his understanding these are the public places that besides home (first place) and work (second place) fulfill a vital role in society. The third place is a social environment which contributes to social involvement, exchange of ideas and opinions and a healthy democracy. Since the public space is under pressure (it is shrinking, becoming more austere and it is commercializing), many cities have a great need for third places; special meeting places for which we want to leave the comfort of our home and workplace to relax, work and meet others. By intergrating these so-called third places, the new museum could grab it's opportunity to address exactly this problem while simultaneously creating 'a stage' for climate change discourse. Ray Oldenburg (1989) highlights a few examples, notably the Guggenheim Museum in New York and the Turbine Hall in Tate Modern in London. But also smaller scale examples are already to be found in most museum buildings, such as a cafe and restaurant or lecture hall and auditorium.

The second sub-question, *What are immersive spaces and how are they constructed?* has to do with the actual immersive experience or space itself. It is important that the term immersive space is understood correctly. According to Wigley (2016) an immersive space triggers the human senses by playing with light, sound, temperature, texture, form and sight.
Therefore one could say that in contrast with a conventional discursive exhibition, which uses a language of vision and words, the immersive exhibition or installation uses a multi-sensory language, creating a space where any sense of separateness is lost. Thus, spectators are no longer fully detached from the object they are looking at, but rather part of it. In this way, the immersive space could be an exact replica of an existing- or already extinct ecosystem and could even serve as breeding ground for climate researchers (Wigley, 2016).

Fig 3. Olufar Eliasson: The Weather Project in Turbine Hall, Tate Modern (Eliasson, 2004)

Fig 4. Biosphere 2 complex in 1991 (Makers of Sustainable Spaces, 2020)

Fig 5. Heizkraftwerk site Moabit along the Spree

The last sub-question deals with the part after the actual visit of the museum and it's immersive environments. *In which ways can one reflect on the museum-experience?* Here, the focus will be on the program which directly deals with reflection and contemplation such as auditoriums, lecture halls, workshop areas etc. As these are the places in the museum where people can meet each other (visitor/ artist or students/researchers), they could become breeding grounds for direct action says Robert Durback, a former trappist monk. He considers contemplation to be an activity that deepens our involvement with the world (cited in Krikke, 2005). Other examples of places for reflection or contemplation are gardens, foyers, cafes and even the (public) museum sqaure in front of the building.

Research Methods

According to aforementioned theoretical framework, this section will categorize the ways in which program, client(s) and site will be analyzed and evaluated.

Program
In order to better understand program and eventually to be able to synthesize a design brief for the new museum it is important to study precedents and relevant case studies.
In the program analysis relevant case studies will be selected according to each inidividual sub-question. For instance, while studying entrance areas, I will try to focus only on those museum buildings which are dealing with the principles of slow stay as introduced by Ray Oldenburg (1989). In this way the research will be as specific as possible and therefore obtain clarity. Although an interactive museum about nature and climate change isn't entirely new, the amount of examples is unfortunatly relatively scarce. Klimahaus in Bremerhaven, Museu do Amanha and Biodome Montreal are amongst the very few examples which come close to this idea. Through analysis of plans, sections and elevations, I will be able to make statements about the overall size as well as sizes of seperate programmatic parts. Since these references do not all contain the programmatic parts I have envisioned for the new museum, it is also necessary to conduct research outside the field of museums. The immersive environments for example ask for a different types of references, such a biodomes and botanical gardens. Some examples are the Biospehere 2 project in Arizona (see fig 4) or The Insectarium in Montreal.

Architectural drawings are of value, but not the only source of inspiration. Various books and journals deal with a scientific approach to these themes. One could think of annual reports (stating temperatures, ventilation, humidity etc.) from botanical gardens and hydrangeas, encyclopedia of plants and flowers and even sound design of movies and documentaries could be of high value in recreating these ecosystems. Another way of finding out about these topics is to visit various projects and interview staff about day to day operations at such a facility.

Client
Identifying the right clients from the start can help informing the needs and sizes of program. Van der Linden et al. (2017) argues that the client is often the architects' main reference point when it comes to obtaining important information about (future) users. They even go further by stating that a 'good' client is key to the project's success.

Analyzing precedents and relevant architectural references will help inform the search for possible clients. In order to better understand a clients' perspective, it could be helpfull to also consult a professional client in either Germany or the Netherlands, one could think of a (real-estate) developer or educational institution. Thereby it is important to review the clients' reputation, (architectural) ambition level, the organisational structure and it's history. This creates a clear overview of the client and can prevent unexpected suprises during the design- and construction phase.

Site
The ambition of reaching a million visitors per year, poses high demands upon accessability, recognizability, historical relevance, flows etc. In order to obtain relevant information about these topics in relation to site I will make photos and sketches and search for historical maps of Berlin.

To be able to develop an understanding of demographics and flows, it can be helpful to make use of a geographic information system or GIS. GIS is opensource database which contains geographic data (or more specifically, descriptions of phenomena for which location is relevant), combined with built-in tools to process, manage, analyse and visualize (Chang, 2016). Analyzing and identifying public- and private transport possibilities, visualizing population densities and locating important cultural clusters can all be done using such software.

Another way to obtain information about site is to interview neighbors. Asking them how they feel about the neighborhood and site and what their expectations are for the project can be of value. In this way one can also find out about certain 'hidden themes' which aren't always visible for outsiders.

Design Brief

To briefly summarize the idea for the new museum in Berlin: Klimaforum will be Berlin's new interactive art, science and technology forum about climate, located on a soon to be vacant Moabit heizkraftwerk site along the Spree river. Funded by the German Ministry of Culture & Media, the City of Berlin, several NGO's and private companies, the new public building is specifically aimed at attracting the younger generations.

Program

Through benchmarking of type specific buildings such as Klimahaus in Bremerhaven, Museu do Amanha and Biodome Montreal, there has been a synthesis of the preliminary program bar of Klimaforum (fig. 6 & 8). This programbar has been distributed along 4 main programmatic parts: respectively the reception area, research area, support area and exhibition area. The programmatic parts have been analysed according to specific themes: reception area has been analysed through slow stay, research area through 'behind the scenes', support area through 'net zero' and exhibition area through 'immersive spaces'. In this way the different programmatic parts have been analysed very thoroughly, resulting in a much clearer overview.

Client & Users

Klimaforum will be commissioned and financed by the German Ministry of Culture and Media and the City of Berlin. Both organisations have a strong ambition to make Berlin climate neutral by 2030, and in order to meet this ambition they are convinced to phase out all the coal based energyplants within the innercity.

The new Klimaforum will be exploited by the Klimaforum organization, part of the Staatliche Museen zu Berlin, more specifically in the Moabit - Kulturforum section. The research part of the program will be exploited by the TU Berlin, mainly students or lecturers (enrolled in environmental or biodiversity studies) with an affinity to work with groups and visitors of the museum.

The leisure part of the program will be exploited by several NGO's and private companies. Amongst them is Greenpeace Deutschland, which main objectives are the preservation of habitats and biodiversity, the promotion of sustainability in agriculture, forest management, and water supply and distribution, as well as to enhance the significance of nature conservation in society (Greenpeace, n.d.).

Next to the NGO's are several private companies, which will host pop-up initiatives. Amongst them are Ettresex Stockholm, a second hand clothing shop; Das Erste, the broadcasting channel in Germany and Noma, a fine-dining restaurant whos work is counted to that of the best restaurants worldwide.

Site

The municipality of Berlin will be phasing out coal by 2030 leaving current plants vacant (Steitz et al., 2022). Since the anti-thesis between the former industrial development along the spree and the renewned strategy to greenify and culturally densify the city of Berlin, the site location will be the Moabit Heizkraftwerk site. Next to the fact that the site is

20%
Entrance / Foyer

10%
Research / Offices

20%
Back of House

10%
Circulation

50%
Exhibiting

Fig 6. Preliminary program breakdown for KlimaForum (own illustration).

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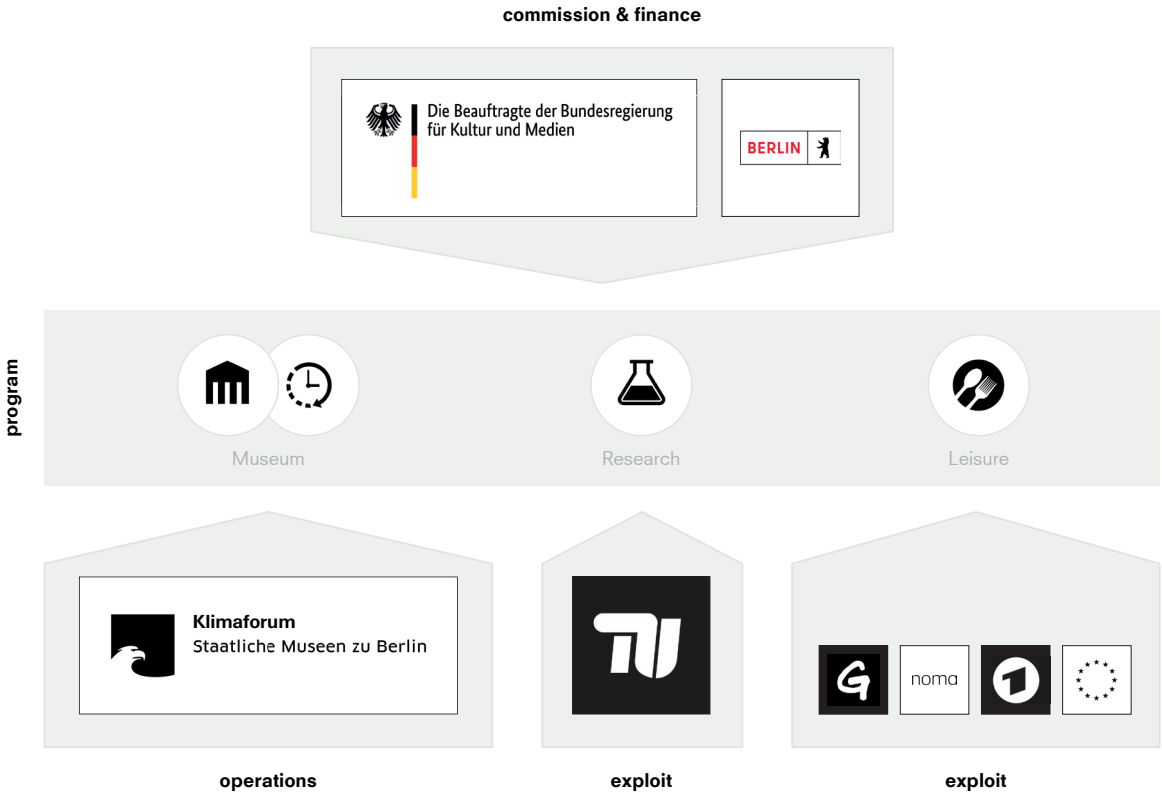
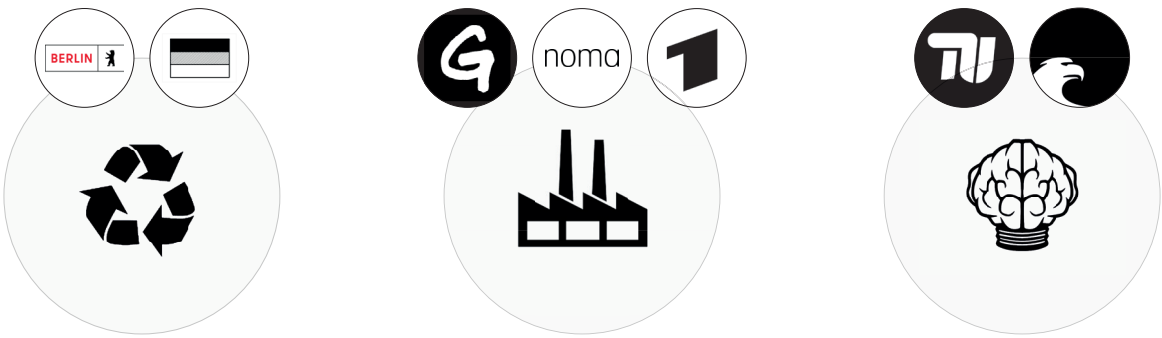
Appendix 1: Clients & Users Klimaforum

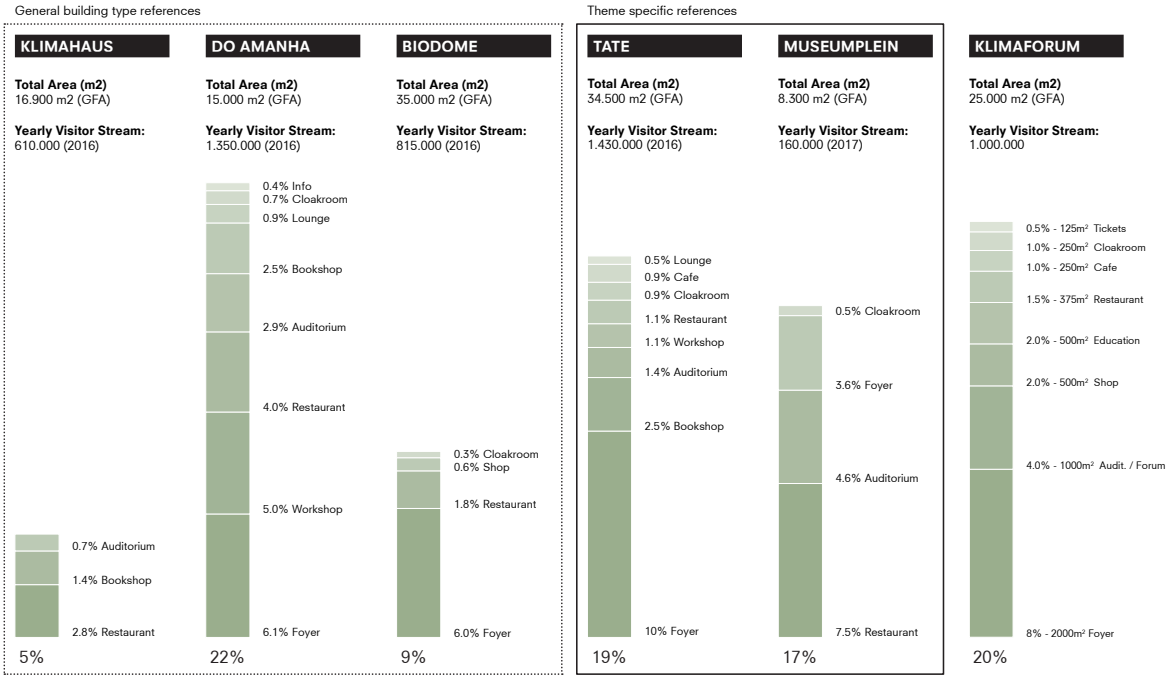




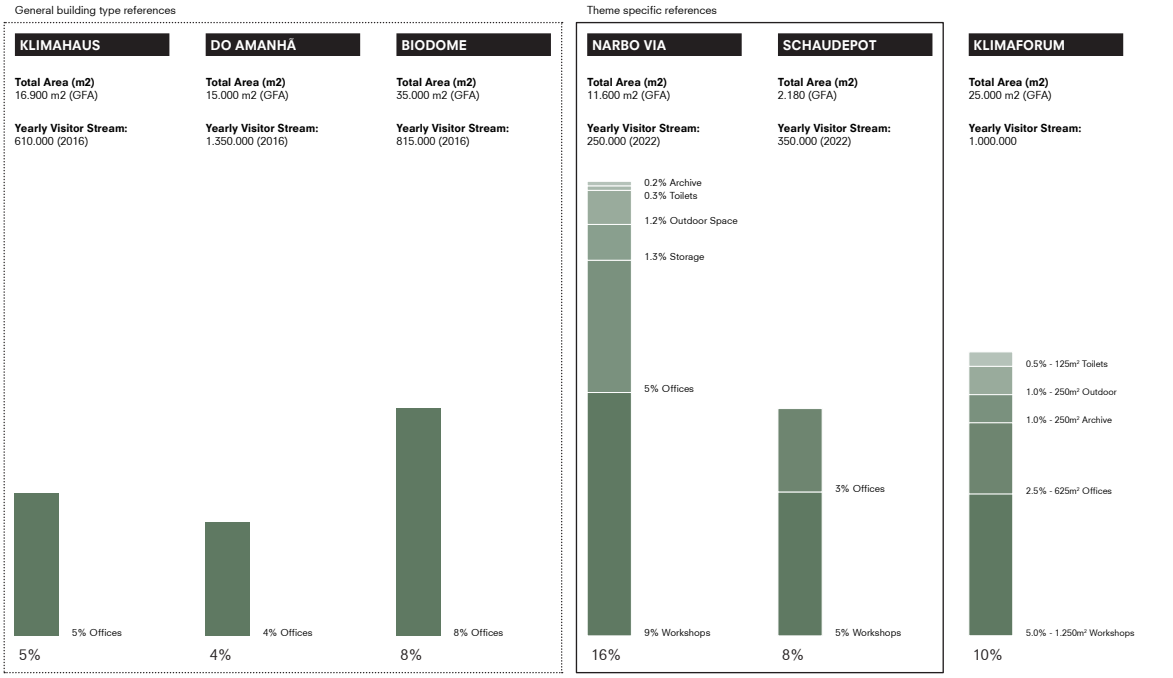
Appendix 2: Location Klimaforum

Appendix 3: Program Klimaforum: 25.000m2 GFA

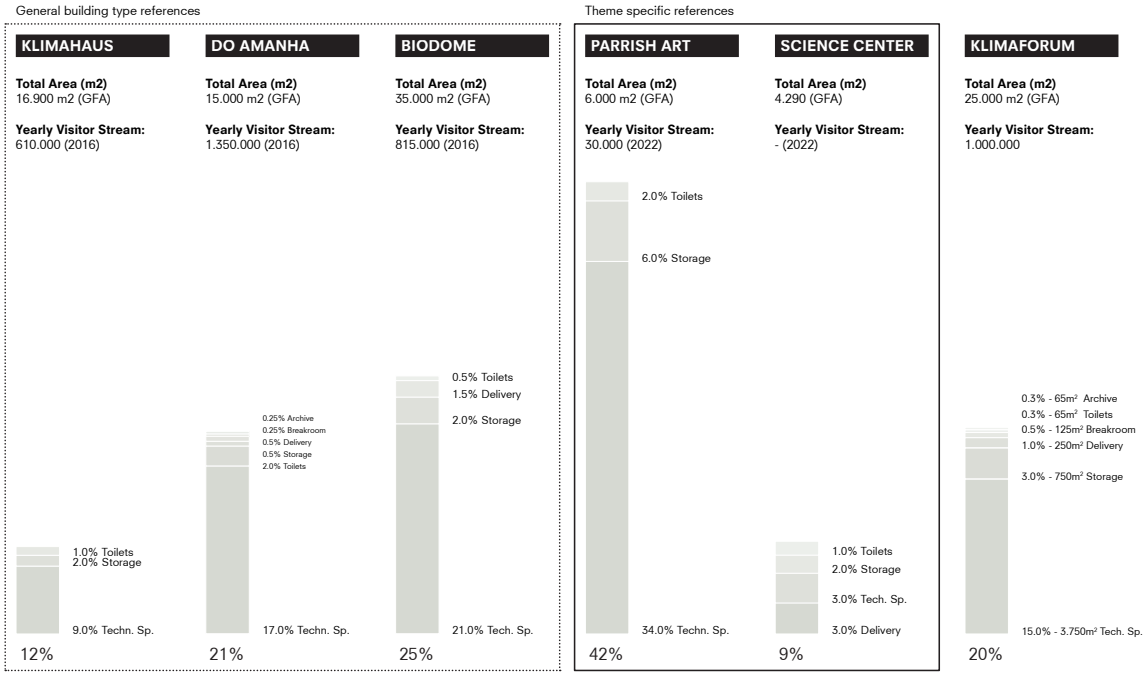
Reception Area - Slow Stay



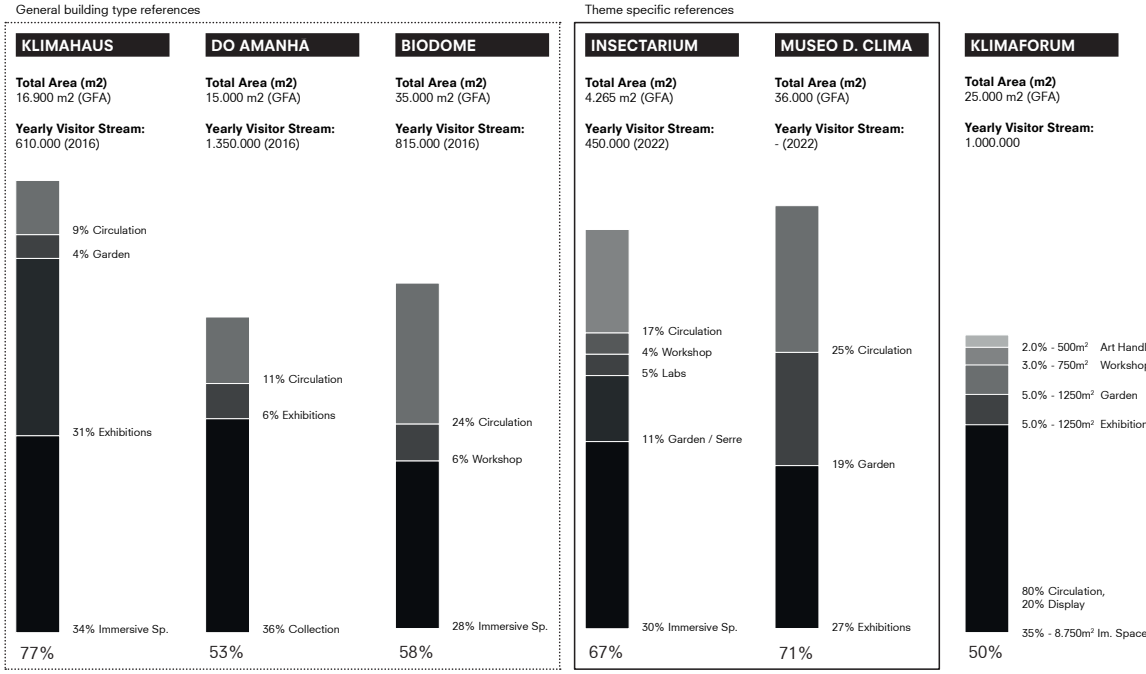
Research Area - Behind The Scenes

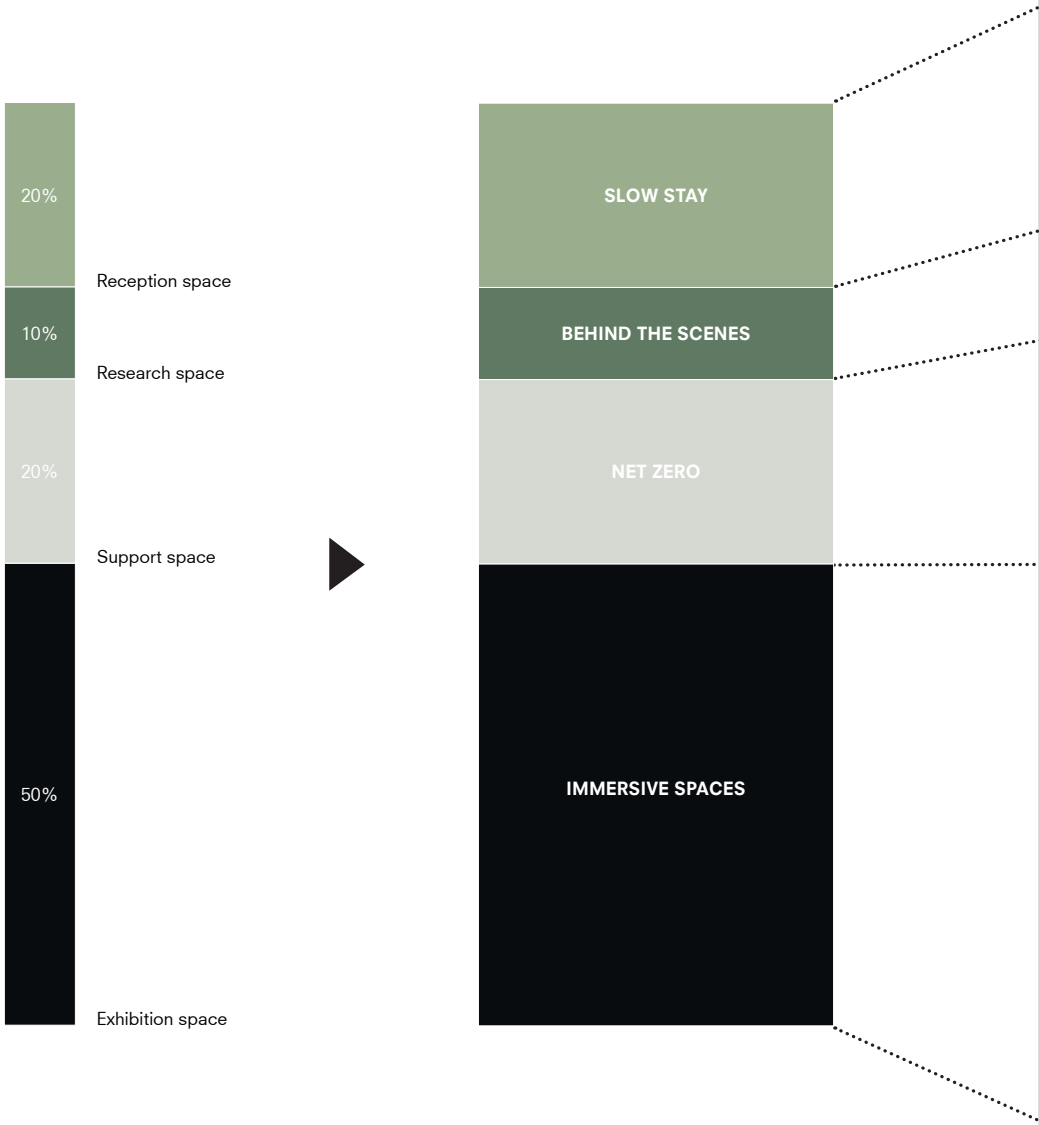


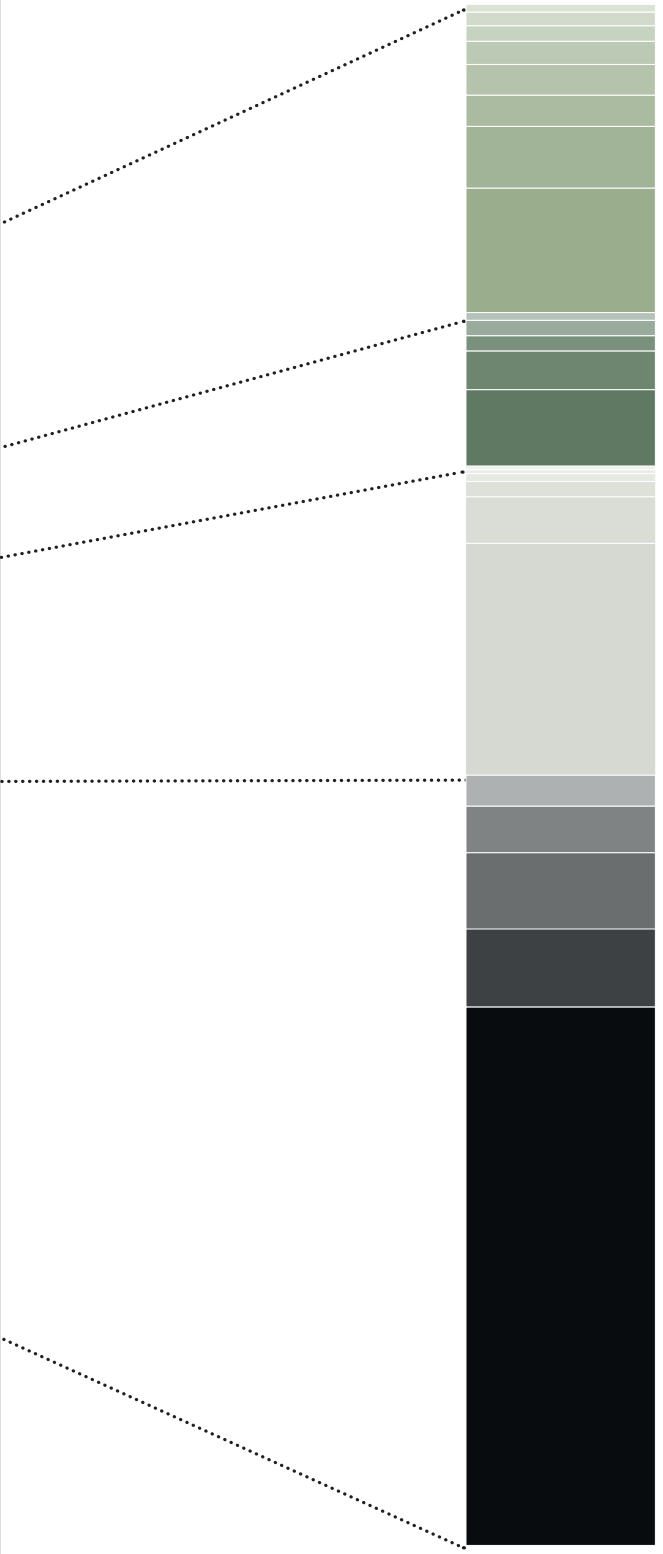
Supper Area - Net Zero



Exhibition Area - Immersive Spaces

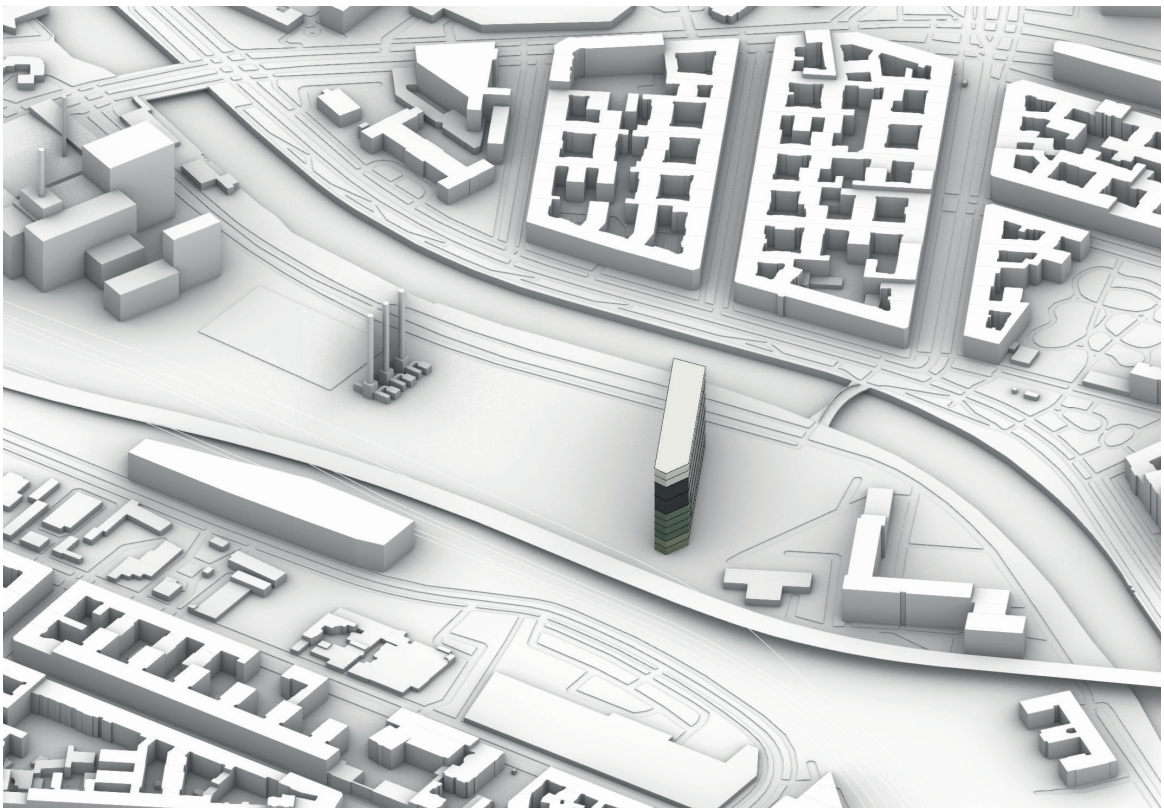


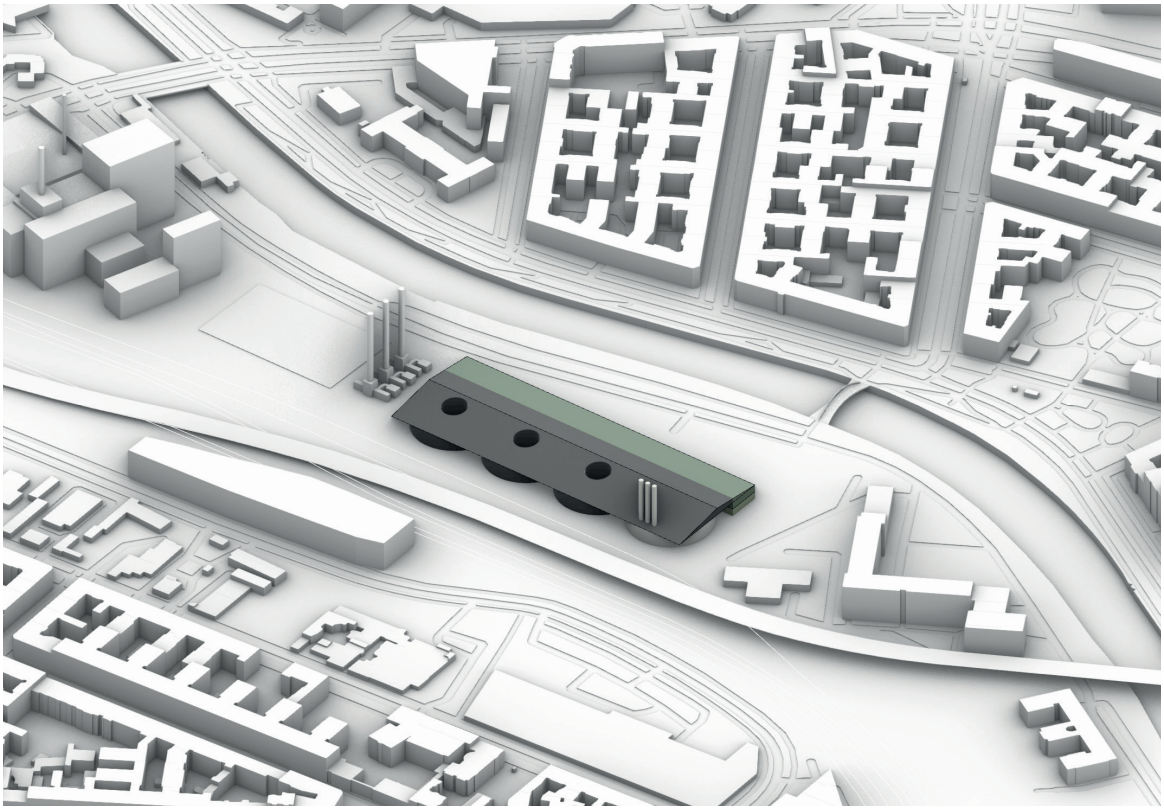

20%
Reception space
10%
Research space
20%
Support space
50%
Exhibition space
SLOW STAY
BEHIND THE SCENES
NET ZERO
IMMERSIVE SPACES

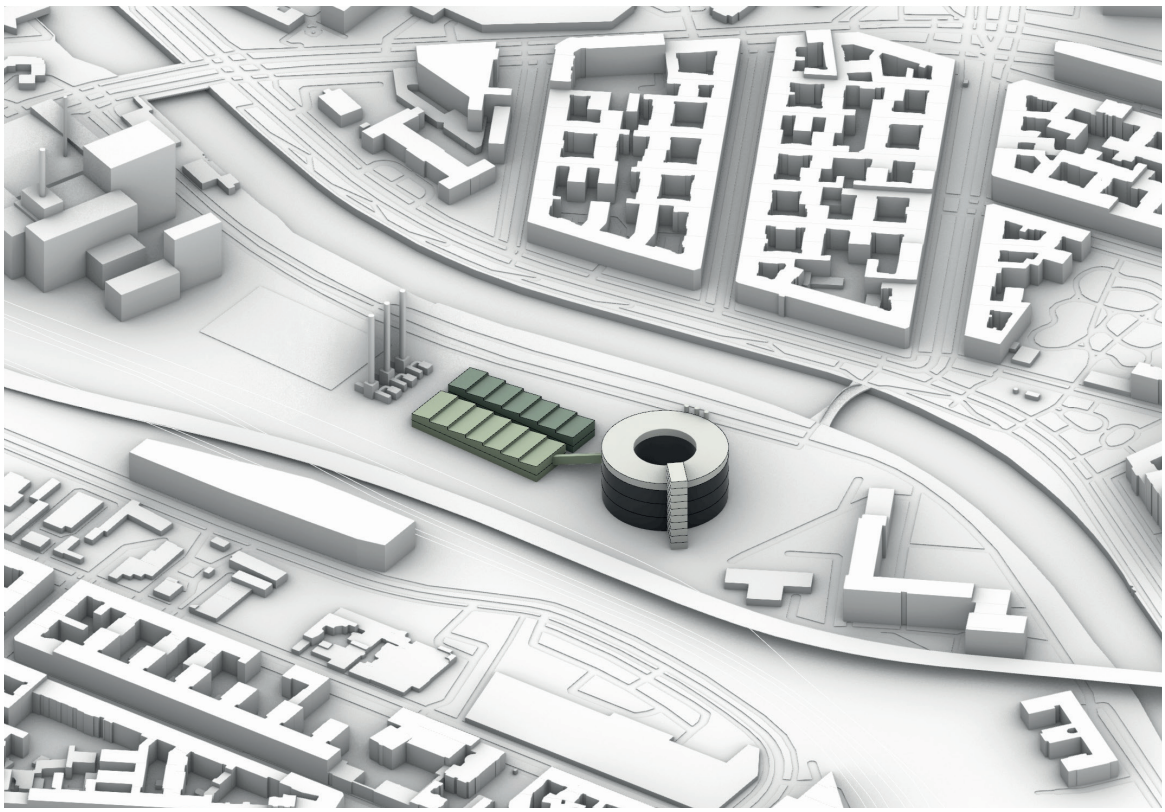


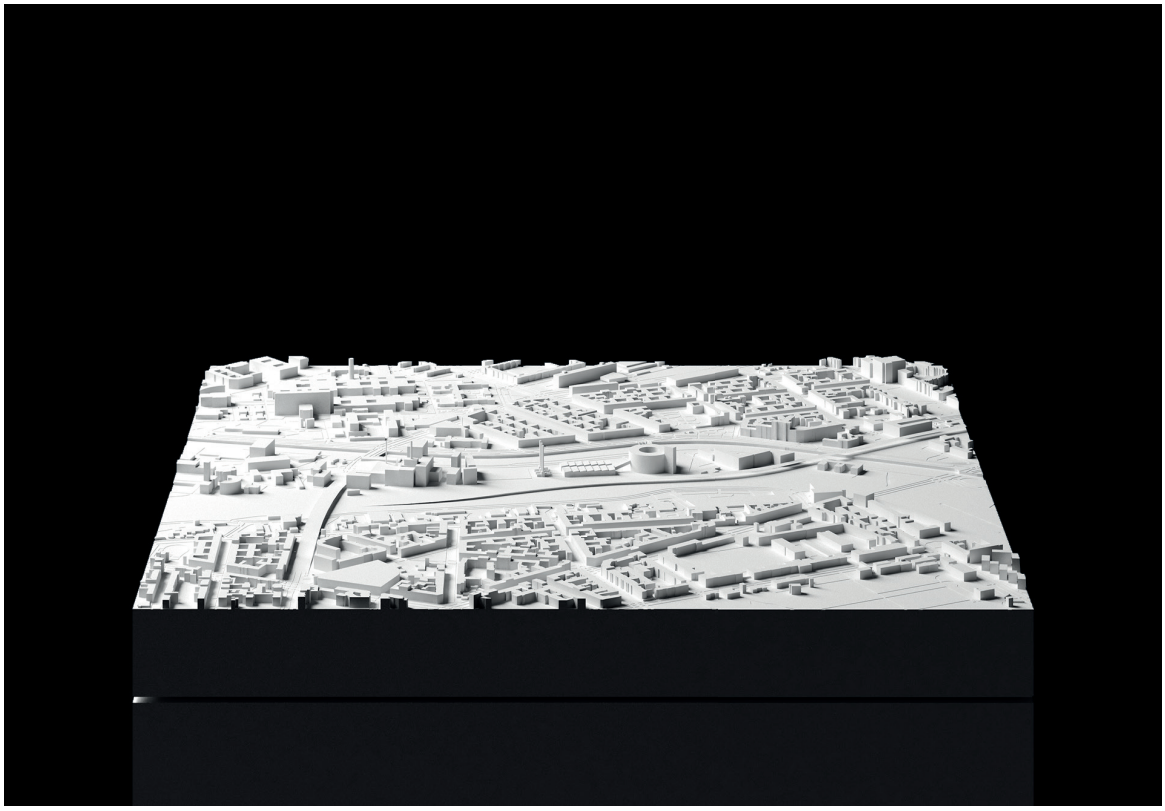
Tickets / Info	0.5% - 125m²	
Cloakroom	1.0% - 250m²	
Cafe	1.0% - 250m²	
Restaurant	1.5% - 375m²	
Workshop / Education	2.0% - 500m²	
(Book) Shop	2.0% - 500m²	
Auditorium	4.0% - 1000m²	
Foyer	8% - 2000m²	**20% - 5.000m²**
Toilets	0.5% - 125m²	
Outdoor Space	1.0% - 250m²	
Storage + Archive	1.0% - 250m²	
(Private) Offices	2.5% - 625m²	
Workshops	5.0% - 1.250m²	**10% - 2.500m²**
Archive	0.25% - 62.5m²	
Toilets	0.25% - 62.5m²	
Breakroom	0.5% - 125m²	
Delivery	1.0% - 250m²	
Storage	3.0% - 750m²	
Tech. Spaces	15.0% - 3.750m²	**20% - 5.000m²**
Art Handling / Storage	2.0% - 500m²	
Workshops	3.0% - 750m²	
Garden	5.0% - 1250m²	
Collection / Exhibition	5.0% - 1250m²	
Immersive Spaces	35% - 8.750m²	**50% - 12.500m²**

Appendix 4: Modelstudies Klimaforum









Appendix 5: Images Klimaforum