Ca' Foscari
University
of Venice

Master's Degree in

Economics and Management of Arts and Cultural Activities

Final Thesis

The 2020s Activist Museum

The Cooling Solution as a possible answer to the new wave of climate change activism

Supervisor
Dr. Chiara Carolina Donelli

Assistant Supervisor
Ch. Prof. Enrica De Cian

Graduand
Serena Andreucci
Matricolation Number 873743

Academic Year
2022/2023

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"Yes, 'n' how many times can a man turn his head

And pretend that he just doesn't see?"

Bob Dylan, "Blowing in the Wind", 1963

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ABSTRACT

Climate change is increasingly considered a priority in public policies and public opinion. However, change is not happening fast enough and new groups of activists are raising to advocate for new strong rules, manifesting their anger also attacking artworks. Although museums are usually defined as shrines of evidences from the past, experts agree in saying that they possess great potentialities to engage actively in the environmental discourse, as they had already did for other social debates such as feminism and post-colonialism. This research wants, as first, to fill a gap in the literature and investigate the backgrounds that led to the formation of new climate activist groups, especially focusing on their actions against cultural heritage and the consequent reactions of governments and the cultural sector itself. Subsequently, examples of what a museum can and should do to respond to climate protestors' call to action are provided. In particular, *The Cooling* Solution exhibition is described as an example of the important role of museums as bridges between science and visitors, as well as great influencers in people's behaviors for their visual and emotional impact. Ca' Foscari and the curatorial team allowed us to analyze this project highlighting the impact of the chosen media and display on the visitors, alongside with some insights in people's cooling strategies according to their age and geographical provenience.

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TABLES OF CONTENTS

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LIST OF FIGURES

LIST OF TABLES

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INTRODUCTION

July 2023 has been the hottest month ever recorded with regions of the Southern Hemisphere reaching summer temperatures even during winter. Climate change is an escalating crisis, a global challenge that transcends borders, discipline, and ideologies. As our planet faces an unprecedented emergency, society finds itself at a crossroads, divided between the reticence of giving up the comforts of the *status quo* and the need to develop innovative cross-sectoral solutions. Amidst this urgency, according to international definitions, museums are seen as bastions of culture and history, able to guide society towards new equilibriums and sustainable behaviors. Moreover, due to their statutes and consistent public funding, cultural institutions should take an active part in the debate around issues concerning society, from racism to climate change. However, facts have shown how museums are finding it difficult to engage with the environmental crisis, afraid of losing some of their partners and their audiences. A new wave of young climate activists, risen in 2020, is directly calling on cultural institutions, even with symbolic attacks at paintings and other cultural heritage sites.

This thesis embarks on a journey into the heart of climate activism within museums, examining their activist role, the escalating climate emergency, the pressing demands from activist groups, and why museums should be at the forefront of promoting best practices and enhancing scientific research. This paper wants to answer the following questions: what historical, social, and cultural events led climate activists to attack artworks and heritage sites? And how can cultural organizations respond to activists' call to action in an impactful way for their audiences?

A case study is provided as well, considered an example of best practice of how art and culture can work as bridges between science and people's lives using the accuracy of academic research together with the power of images and storytelling to influence positively visitors' behaviors and opinions.

The thesis is structured as follows…

Chapter I dives into the literature to define the activist role cultural institutions play in order to answer society's concerns and enhance social, cultural, and environmental debates. Museums, traditionally known for preserving the past, have evolved into dynamic spaces capable of shaping the future. Although ICOM has witnessed it only

recently, museums have been involved in topics like racism, feminism, immigration, and other forms of inequalities since the early 1900s, becoming proper hubs for social change in the 60s, always among the first ones to address openly society's concerns. Despite that, cultural institutions have shown their reticence in engaging with the current climate crisis, even though it has been recognized by public opinion, scientists, and international policies, as one of the most serious challenges of contemporary society. Therefore, after an overview of why the environmental downfall should be considered the priority in the 2020s agendas, this chapter analyses the reasons why museums should be at the center of the debate on climate change, starting from their recognized behavior-shaping power and their potential as catalysts in the implementation of sustainable policies.

Consequently an overview of a new wave of climate activism, that rose in late 2020, is reconstructed. Mainly composed of international networks of young people deluded by governments' insufficient actions to contrast the environmental emergency, these international networks have solid historical backgrounds, which have contributed to shape their present identity. Movements such as the Suffragettes, Art not Oil, and Fridays For Future had a key role in inspiring what is defined in this research as the 2020s climate activism wave. After a historical analysis of their founding principles, an analysis of the networks and national groups at the center of the new movement is provided, trying to underline their similarities as well as their distinctive characteristics and requests. The second part of Chapter II focuses on the last 18 months, from May 2022 to August 2023, analyzing the tens of attacks against cultural heritage realized by these networks all over the world. Finally, the reactions of Governments and the cultural sectors have been examined, assessing the coexistence of the need to preserve artworks and the urgency for cultural institutions to finally engage with the topic and step out its pretended neutrality. Examples of some attempts in that direction have been provided as well.

Chapter III deepens the potentialities of the cooperation of science and art to enhance sustainable development practice among population providing a case study of an example of best practice. Held in Ca' Foscari Esposizioni, Venice (Italy) between May and July 2023, *The Cooling Solution* exhibition represents a valid example of how art can mediate from scientific research on climate change and people's everyday realm, using its communication power to bridge between pure aseptic statistical data and audiences' emotions through visual representations, suggestions, and storytelling.

In an era marked by unprecedented man-made climate changes, the role of museums is rapidly evolving. They are no longer mere observers of history; instead, they are becoming key agents of change. Through the three chapters, this research wants to uncover the critical role cultural institutions can and should play in shaping the climate narrative, preserving cultural heritage, and at the same time responding to activists' call to action using their behavior-shaping power. This thesis is a testament to the dynamic nature of museums in the 21st century, a journey into the intersection of culture, activism, and environmental stewardship, offering a glimpse into the transformative power of cultural institutions in a world in desperate need of change.

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CHAPTER I: CLIMATE CHANGE AND THE ACTIVIST MUSEUM, A LITERATURE REVIEW

"It's not a museum. It's not a place of artifacts; it's a place of ideas"

- Jeanie Kahne

2022 and 2023 have witnessed the emergence of a new wave of climate activism that directly targets artworks and cultural heritage sites. Present events challenge the very values and priorities of contemporary society, exposing its underlying hypocrisies. Throughout history, cultural institutions, including museums, galleries, archaeological parks, libraries, and performing art centers, have played a notable role in shaping societal narratives and fostering public discourse. These organizations occupy a unique position in society, serving as repositories of the millennia-long history of humankind and as primary sources of inspiration for future development and innovation. With the escalating urgency of the climate crisis, museums[1] are increasingly seen as potential platforms for awareness, education, and advocacy related to environmental issues (Hamilton *et al*, 2020). However, they are not promptly responding to activists' call to action, displaying a somewhat hesitant attitude and hiding behind a neutrality façade (Janes, 2019).

This literature review explores the dynamic evolution of museums' contribution to social debates, transitioning from passive institutions solely focused on artwork preservation to active and proactive organizations driving social change. Additionally, the review addresses the rising prominence of the climate crisis within public opinion. It delves into the pivotal role that cultural institutions play in responding to public concerns about the topic by providing insights and scientific validation. The analysis specifically elucidates the considerable influence museums have on public perceptions, behaviors, and policy development. Furthermore, it provides a concise analysis of complex interplay between museum's duties to move towards environmentally sustainable practices and their present stasis.

[1] This research uses the term 'museum' in a broader sense, including galleries, archaeological parks, visual and performing art centers, and other cultural organization with a temporary or permanent exhibition that are open to the public regardless their ownership, therefore also private institutions are considered.

1.1 The activist role of museums

Cultural institutions are generally associated with museums, places where evidences from the past and the present are preserved, studied, and displayed for visitors' enjoyment (). However, their mission is not limited to that. They have a central role in shaping the environment they belong to: museums contribute to enriching the cultural panorama of their town, provide educational programs for any kind of visitor, and generate positive externalities implementing local economies.

Museums have increasingly embraced an activist[2] role within modern society, addressing socio-cultural issues and even environmental challenges. Especially the late 2010s and early 2020s have seen a gradual change in museums' priorities, which led to a consequential shift in their practices and role within society (Visser, 2017). Only one decade ago, the idea of cultural institutions as active subjects acting against inequalities was met with scepticism. Activism was considered a political activity not belonging to the core purposes of museums: preserve, study, and promote cultural heritage (Janes and Sandell, 2019).

In their essay *Posterity has arrived*, Janes and Sandell (2019) addressed directly the hypocrisies of a cultural system so lost in its mission of taking care of art collection for posterity that is has not understood that posterity has already arrived. Present society needs are completely different because social and environmental crisis requires immediate action to avoid a complete downfall. The role of museums of shrines of memories is not questioned, yet they are forgetting to tell the story of the 21st century to their audiences, focusing on the certainty of the past rather than on the controversies of the present. There is the need of a new story that engages with the transition from an industrial consumeristic society to a post-industrial era, which is currently struggling to understand the importance of communities' cohesion, individuals' rights, and environmental sustainability.

A mindful museum, as defined by Janes (2010), is an activist museum, based on ethical and informed values and advocating for political, social, and environmental change through tangible actions. This vision is not new, however it has always been considered inappropriate by museums practitioners and academics, who are scared of a politicization

[2] The term activist is used to indicate an active effort of museums in engaging with controversial social issues and ongoing debates, taking a stance and supporting the cause though exhibitions, initiatives, research, and statements.

and contamination of the purity of art (Sandell, 2011). What they are forgetting is that art has always been political. Art was shaped by culture, social norms, and political messages and, at the same time, art shaped society fostering innovation and social changes (Haskell, 1974; Haskell, 1980; Murray, 1995).

Moreover, contemporary society is exhibiting a raising level of skepticism due to the unreliability of internet-based information and the shallowness of social media interactions. Individuals not only do not trust their peers, but also have even greater mistrust toward public institutions and corporations (Rainie and Anderson, 2017). Despite these trends, museums and other cultural organization continue to hold audiences' trust, being the most reliable source of information according to American citizen (American Alliance of Museums, 2021). However, this perspective can considerably vary according to the demographics of who is being interviewed. Minorities, like people of color, First Nations, and Inuit, still consider museums to fall short in providing an inclusive all-encompassing vision of human heritage and history (British Market Research Bureau Limited, 1998). Concurrently, audiences who are actively involved in ongoing discussions about social issues and climate change would like to see a heightened level of engagement from museums in addressing present matters.

Museums must ceased adhering to outdated principles aimed at defending the pretended purity of art for an undefined abstract future. It is imperative for these institution to acknowledge the evolving needs, demands, and expectations of the contemporary society. By doing so, they would honor audiences' trust by assessing their opportunity and obligation to question the *status quo*, establishing themselves as platforms that facilitate constructive dialogue, provides credible scientific information, and propose viable alternatives (Janes and Standel, 2019).

1.1.1 A new definition of museum by ICOM

Museums have always been able to adapt to changes in social priorities and believes, and inherit strength that allowed them to survive through centuries. Their identity evolved through history, from elite assemblages to public collections, from a wealth showcase to educational tools.

The International Council of Museum (ICOM) is an international forum of professionals and academics founded in 1946 during the first UNESCO plenary session. It was charged with providing guidelines, analysing new trends, and most importantly providing a definition of museum that is internationally recognize and veridical.

Before ICOM, attempts to define the museum institution appeared with their establishment in late 18th and early 19th century, when private collections belonging to royal and aristocratic families were sized and made available to every citizen (Simmons, 2016; Fiorio, 2018). These tentative definitions recognized the preservation of cultural heritage as the preeminent purpose, alongside with aims of collecting, educating, and exposing (Lehmannová, 2020).

These elements were used by ICOM to write the first internationally recognized definition of museum institutions, published in 1946.

"The word 'museum' includes all collections, open to the public, of artistic, technical, scientific, historical or archaeological material, including zoos and botanical gardens, but excluding libraries, except in so far they maintain permanent exhibition rooms"

(Lehmannová, 2020)

Although the definition have undergone minor changes and refinements since its first version in 1946, three have been the mayor steps in its evolution.

1974 marked the year when academics and professionals were finally accepted as part of ICOM, explicitly recognizing the need to open the doors to new voices in order to be flexible and dynamic: the world is not static and neither should be cultural institutions (Sandhal, 2019; Lehmannová, 2020). That year a new definition was approved, moving towards the activities and final goals of museums rather than the subjects of its collections (Brown and Mairesse, 2018).

"A museum is a non-profit making, permanent institution in the service of the society and its development, and open to the public, which acquires, conserves, researches, communicates, and exhibits, for purposes of study, education and enjoyment, material evidence of man and his environment."

(Lehmannová, 2020)

Changes respect the previous formulations are evident and caused heated debates, especially around the strong statement that museums are "in the service of society" (Soarova, 2019; Lehmannová, 2020). One faction considered the unacceptably political definition a threat to the purity of art. The others recognized the ever-existing role culture played within history and society, a constant exchange without which neither of them would have existed (Sandhal, 2019; Soares, 2020). As commented by de Varine (2017) an 'integral museum' was emerging, that would become "an agent of local development".

In 2007, the General Conference enlarged the definition[3] and recognized the existence of the 'intangible heritage', as important and worthy of attention as its material counterpart. Actually, it is more endangered because of its own nature, being based on expertise, traditions, folklore and oral knowledge that can exist only if the repository community survives. Another major change that, however, did not cause any debate was the change from "… man and his development" to "…humankind and its environment". With the new formulation, ICOM added gender equality among its goal and recognized the importance of environment in human life.

Despite the importance of the correction proposed by 2007 definition, it did not represent a ground-breaking revolution in the ICOM idea of museum which basically remained the same written in the 70s, more than thirty years before (Soares, 2020).

To overcome the impasse, in 2019 Jette Sandahl (2019) presented a new proposal to be discussed at the Kyoto General Conference. The proposal was based on the idea that previous definitions lack in clear values from which museums operate with and within society (Brown and Mairesse, 2018; Mairesse, 2019).

> *"Museums are democratising, inclusive and polyphonic spaces for critical dialogue about the pasts and the futures. Acknowledging and addressing the conflicts and challenges of the present, they hold the artefacts and specimens in trust for society, safeguard diverse memories for future generations and guarantee equal rights and equal access to heritage for all people. Museums are not for profit. They are participatory and transparent, and work in active partnership with and for diverse communities to collect, preserve, research, interpret, exhibit, and enhance*

[3] 2007 ICOM definition of museum "A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment." (Lehmannová, 2020)

understandings of the world, aiming to contribute to human dignity and social justice, global equality and planetary wellbeing"

(Lehmannová, 2020)

Like in the 70s, this proposal caused skepticism and heated discussions. However, this time the revolutionary approach was not a winning strategy and the proposal was rejected. Several museums, mostly European, did not accept how Sandhal's formulation completely re-defined the identity of the museum, forgetting about its very essence: the collection (Lehmannová, 2020). Moreover, the use of terms like 'democratising', 'conflicts', 'equal rights and access', 'transparent', 'dignity', 'social justice', and 'global equality' sounded too political and innovative. Opponents underlined how certain countries possess incredible heritage currently exposed for the public, but their national legislation do not reflect values of democracy and equity, therefore neither do its museums. Approving the new definition would mean questioning local governments as well as de-recognized certain cultural institution (Mairesse, 2019).

ICOM nominated a new working group, understanding the need to find a new definition of museums that both respected the history of the organization and acknowledges the changes in present society (Sandhal, 2019).

ICOM finally approved a new definition in August 2022. Among the 500 voting museums, 92.4% agreed with the modifications (Giardini, 2022). The new definition states:

"A museum is a non-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing"

(ICOM, 2022b)

Maintaining the original structure, this last intervention added major changes in the role of museums within society, recognizing the importance of communities' participation, sustainability, and inclusivity, as well as knowledge sharing (Seymour, 2022). It should be noted how elements of the 2019 proposal have been implemented in a more politically

correct way, employing words with a less ideological implication. For instance, instead of saying 'transparency', they used 'operate and communicate ethically and professionally'; while 'democratizing, polyphonic spaces for critical debate' has been substitute with 'reflection and knowledge sharing' (Villa, 2022). Lastly, the words 'sustainability' and 'diversity' wanted to tackle topics like social justice, environmental issues, equality and human rights, framing them in a broader less political picture.

Although the major changes and implementations, some voting members had higher expectations and consider the newly approved definition not to be progressive enough (Villa, 2022). Inkyung Chang, director of the Iron Museum in Seoul and the Vice President of ICOM Korea, considered the absence of terms such as 'decolonization' and 'repatriation' as an over-compromise from conservative bodies (Giardini, 2022). However, he underlined how the opportunity to act more strongly is left to each museum.

It is reasonable to think that it was no longer possible for ICOM to postpone a substantial revision of its definition. Especially, emerging activist waves and the escalation of international social and environmental crisis have forced cultural institutions to change, as clear also in the words of Alberto Garlandi[4], ICOM President. He fondly believes in the power of this new decision to foster the role of museums within societies globally (Seymour, 2022). Besides positive or negative reactions, and besides the technicalities of the modifications approves, what cannot be ignored is indeed the recognition of a change in the cultural sector that is already happening, regardless the official definition. Individuals and communities are expecting more from museums, they want to be listened, included, represented, and taught.

"The new museum exists out there. Whether we define it or don't define it, it is already in motion. Ladies and gentlemen, it is going to happen", said Muthoni Thangwa, development manager at the National Museum of Kenia, to *The Art Newspaper* (Seymour, 2022).

[4] During an interview with The Art Newspaper, Alberto Garlandi said: "This new definition is aligned with some of the major changes in the role of museums today. We have been forced to change" (Seymour, 2022)

1.1.2 Museums as historical forum for socio-cultural debate

The new museum as intended by Munthon Thangwa already exists, and has existed for more than a decade now, gradually engaging in more controversial and urgent issues of 21st-century society. Cultural institution should now move beyond outdated traditional practices, and implement innovative strategies to reach new audiences and to respond to new expectations and needs. Museums preserve, acquire, display, promote, and study various kinds of art, but any one of them should understand what Nina Simon defined 'the art of relevance' (Simon, 2016). In the homonymous book, she explained how museums should, in order to be and stay relevant to actual or potential audiences, listen actively, involve individuals in decision-making processes, and co-create experiences with them. Relevance means also taking risks, embrace failure, and be brave enough to move away from conventions; to experiment new approaches that recognize the museum as a contested space (Giannini, 2019). In other words museums must be innovators (Visser, 2017).

What follows is an attempt of classifying the different topics in which museums have taken a stance, supporting one of the two sides in the debate to overcome discriminations. Issues like racism, feminism, gender equality, migration, colonization and cultural appropriation, and the violation of human rights have been at a certain point in history hot topics in public debate, and cultural institutions have joined the protests with exhibitions, talks, or even founding new museums to witness the importance of those topics.

The majority of museums deals with history in a way or another. However, there is nothing more controversial than history, which is well known to have been written by the winners. Contentious and contested narratives emerge when dealing with historical events, such as slavery, colonization, war, and discrimination. Topic like these might evoke highly emotional reactions, even discomfort, in the public as they tackle ethical, political, and social believes and ongoing issues (Luke and Chu, 2011). Museums should serve as an impartial, yet not neutral, space for differing perspectives to be shared, discussed, and understood (Boyd, 1999).

The African American community is perhaps among the ones mostly subjected to inaccurate narrations and racial discriminations. In 2016, with the opening of the

Smithsonian's National Museum of African American History and Culture[5] (NMAAHC), African American culture became the subject of an entire museum and was recognized as an integral part of American history (Gardullo and Bunch, 2017). The museum explores the history of deportation, slavery, segregation, and fight for civil rights the African American community has undergone since the 17th century. The opening had a great impact on public opinion because it answered to a contemporary social debate: the 2015 political campaign for 2016 elections and the role of the activist movement Black Lives Matter. A further example of museum engaged in controversial history is the National Museum of Memory (NMM) established by the National Center for Historical Memory (NCHM) in Bogotà, Colombia, in 2011. The newfound cultural institution was meant to address the long history of conflicts that characterizes Colombia. Armed conflicts and social injustices emerged from unsolved issues, such as narco-trafficking, land dispossession, a week democracy, and the absence of institutions in marginalized areas (Lleras, 2019).

Moreover, Cultural institutions took active part in the social and political debate around feminism. In this case, the role of activist artists foster the museums' engagement, forcing the debate inside exhibition halls. Artists like Guerrilla Girls, Louise Bourgeois, Judy Chicago, Yoko Ono, Barbara Kruger, and Cindy Sherman reshaped the art panorama between 1970s and 1990s, breaking the centuries-old belief that dismissed feminist cultural production and considered it not worth to be exposed (Mullin, 2003). Contemporarily, female academics and writers dared questioning the men-dominated art world with essays such as *Why Have There Been No Great Women Artists?* (Nochlin, 1971) and *The Pink Glass Swan: Selected Feminist Essays on Art* (Lippard, 1997). Nowadays, institutions like the Women's Museum in Denmark or the Women's Rights National Historical Park in Seneca Falls, New York, traces the history of fights for gender equality and acknowledges women role in scientific research, technological advancement, and humanities (Ipsen et al, 1990; Ipsen, 2010; Alia, 2014; Rose, 2018).

Recently, the debate has moved towards the broader field of gender equality, identity, and LGBTQ+ rights. Since the first gay liberation movements in the 1960s, the debate around non-cis sexualities and non-binary gender has spread world widely, advocating for equal rights, anti-homophobic laws, and elective identity recognition. Although a sixty-year-

[5] The Smithsonian's NMAAHC is located in Washington D.C., United States

long history, museums rarely collect evidence of LGBTQ+ issues and histories (McIntryre, 2007). Only during the last decade, a timid number of cultural institutions has recognized the importance to represent this minority, implicitly joining the fight for social justice led by the Pride movement (Frost, 2018). GLBT History Museum in San Francisco opened in 2011 to give voice to the underrepresented Bay's Area queer history. It collected evidence for over fifty years, involving communities, demonstrating queer belonging, and empowering gay, lesbian, bisexual, and transgender individuals (Romesburg, 2014). These initiatives are not always welcomed by local communities, especially when LGBTQ+ individuals lives among conservative groups. In their study, Boita *et al* (2020) explored the complex panorama of queer art and activism in Latin America, where museums have been attacked by homophobic extremist after they opened exhibitions on LGBTQ+ history and rights. One of the most remarkable examples was the blockade at the Santander Cultural Center in Porto Algere, Brazil, in occasion of the *QueerMuseu* exhibit in 2017. Being an activist museum is not always easy, whenever social fights are involved there would always be an unsatisfied outraged side. However, it is cultural institutions' role to take the side of social justice and equity (Sandell, 2017).

Cultural organizations engage also in issues related to post-colonialism perspectives, social justice and human rights, migration, and political fights.

The National Museums and Monuments of Zimbabwe (NMMZ), Harare, and the Quai Branly Museum, Paris, addresses the controversial history of cultural appropriation, colonialism, and decolonization from two opposite perspectives. The former expressed the colonized country trying to preserve its heritage, while the latter is carrying the burden of the great colonizer now dealing with repatriation claims (Lebovics, 2020; Chipangura and Marufu, 2019).

Discriminations, inequalities, and violations of human rights are further hot topics of social debate that gradually have been brought within the halls of museums since 1980s (Orange, 2016). For instance, the Apartheid Museum in Johannesburg, South Africa, deals with a long history of racial segregation, from the British arrival to Mandela's fight for equality (Labuschagne, 2012). In 2006, the Cultural Spot Museu de Maré in Rio de Janeiro, Brazil, became the first museum in the world dealing with the social downfall of *favelas*, involving in its activity civil society, NGOs, and governmental entities (Murta, 2019). Finally, the Museum of Homelessness in London, U.K., which was one of the

founders of the campaign *Enough is Enough*, advocating for better housing policies after the Grenfell Tower fire in 2017 (Heal, 2019).

Preserving their own identity is problematic for immigrants, especially when integration is exercised as imposed cultural brain-wash instead of open dialogue. This is the reason behind the creation of institutions such as the Mucem. The Musée des Civilisations de l'Europe ed de la Méditerranée[6] is located in Marseille, France, a city that has always been a crossroads in the Mediterranean area, with continuous cultural encounters, exchanges, and contrasts. With its temporary exhibitions and permanent collection, this avant-gardist organization wants to tackle the 'migrant problem' concerning Southern European public opinion and explain how migration has always been the strength of Europe throughout history (Chougnet, 2020). A philosophy echoed by museums in Greece, embracing an 'Ethics of care' rather than stigmatization (Bounia, 2020).

Although the provided examples did not encompass the whole realm of activist museums, it is evident that each theme deals with matters inherent to the socio-cultural sphere. Although, over the past half-century, the environment and climate change have been addressed more than once by artists in their creative researches (Nurmis, 2016), they have rarely become the center of an entire exhibition, let alone of an entire museum.

Only since 2015, with the emergence of activists groups and the ratification of the Paris Agreement, cultural institutions have taken the first actions. These initiatives regards mostly the decision to part ways with the fossil fuel industry, among one of the biggest sponsor, seldom accompanied by temporary exhibitions about the Anthropocene (Lyons and Bosworth, 2019; Reyes Carranza, 2023). Considered the geologic epoch in which humanity has overpowered nature, it includes questions about the long-term sustainability of the consumeristic oil-based post-industrial society. One of the first examples of cultural organization completely devoted to fostering the research in climate change is the Climate Museum in New York City. Founded in 2015, but hosting exhibitions only since 2018, its main goals are spreading awareness about the ongoing emergency, and engaging people in the development of constructive debates and innovative alternatives to polluting behaviors. It positions itself within the fight for climate justice and the green transition, creating new pathways to face the climate crisis and break the climate silence (Massie and Reyes, 2021).

[6] translation: The Museum of the Civilizations of Europe and the Mediterranean

Nevertheless, before moving forward with an analysis of how museum could and should address this new emergency, it is important to explain the issue of climate change, its perception within public opinion, and the rationale behind its integration into the proactive and activist initiatives undertaken by cultural institutions.

1.2 Climate Change as the new priority

In July 2023, a bewildering new record was set, making it the hottest month in recorded world history. According to data registered by Copernicus Climate Change Service (C3S, 2023), the global average temperature for July reached 16.95 °C (62,51 °F), surpassing the previous record of 16.63 °C (61,934 °F) set in July 2019. During the same month, the world record for the average global air temperature was broken for several consecutive days, from July 3 to July 6 when it reached 17.23° (63.01 °F). These anomalies have pushed world's average temperature approximately 1.5 °C above the levels recorded between 1850 and 1900, the precise increase set by the Paris Agreement as the limit beyond which the habitability of Earth would be jeopardized (C3S, 2023).

Despite the exponential increase in exceptional weather events and temperature anomalies over the last decade, which has pushed the climate emergency to the forefront of international organization's agendas, levels of denial remain discouragingly high, and national governments' actions to counter global warming are still timid and insufficient.

1.2.1 Scientific evidence and institutional denial

While climate change has only recently entered public debate, the scientific community has been studying it since 1930s. Furthermore, the first hypothesis regarding the interdependence between CO_2, the greenhouse effect, and global warming dating back to the 1820s (NASA, n.d.). To be precise, it was Joseph Fournier who observed a discrepancy between Earth's size, its distance from the Sun, and its temperature, suggesting the existence of something acting like an insulating blanket (Fourier, 1824). The discovery of greenhouse gases by John Tyndall in 1860s led the Swedish scientist Svante Arrhenius to predict in 1896 that an increase of CO_2 concentration in the atmosphere would cause a rise in temperature (Tyndall, 1863; Arrhenius, 1896). The final theorization of climate change caused by carbon dioxide rising levels was formulated by Gilbert Plass in 1956, precisely sixty-seven years ago (Plass, 1956).

Since then, evidence has been collected about the escalating global warming, its effects on living organisms, and its undoubted relation with human activities.

Anthropogenic (human-caused) climate change is supported by robust and well-established studies on:

- Temperature records: global temperature averages shows a consistent increase over the past century. The twenty warmest years ever recorded occurred in the last thirty years, while temperature tracking started in mid-19th century. As of 2023, planet's surface temperature has already increased by 1 °C since the pre-industrial era (NOAA, 2023).
- Greenhouse gas concentrations: studies have shown how present levels of CO_2, NH_4, and other pollutants have reached levels not seen in hundreds of thousands of years (WMO, 2021).
- Extreme weather events: these are perhaps the most evident results of the escalating aggravation of global warming. The frequency and the severity of heatwaves, hurricanes, storms, floods, and droughts are rising at a concerning rate.
- Ocean warming: oceans are the main thermo-regulators of the planet, absorbing and releasing heat during the year. However, as air temperature is rising, oceans are absorbing a higher amount of heat, causing waters to warm endangering sea life. Data registered since 1969 shows an increase of 0.33 °C in the top 100 meters as of 2017 (Levitus *et al*, 2017).
- Sea-level rise and Artic ice loss: these two events are closely interconnected and both represent a threat to unique habitats as well as human survival. Artic is not the only ice affected, snow cover and glaciers from all around the world are retreating because of the rising of the freezing altitude (NASA, 2023).
- Ocean acidification: increasing levels of CO_2 have been found also in ocean water, causing irreversible damage to marine ecosystems. According to Sabine *et al* (2004), ocean has absorbed 20-30% of anthropogenic greenhouse gas produced in recent decades.

Despite models developed in the 1970s[7] proving to be accurate and the current frequency of significant weather anomalies, climate change denial is affecting a large portion of public opinion due to misleading campaigns by opinion leaders, corporations, and governments.

[7] According to Supan *et al* (2021) corporations like Eni and ExxonMobil knew about anthropogenic climate change since the 1970s, when Exxon itself developed a projection of global warming exponential worsening that perfectly fits present levels of atmospheric pollution and temperatures.

Climate change denial should be intended as the rejection or downplaying of the scientific evidence on human-caused alteration of Earth's natural climate cycles (Lavik, 2016). This phenomenon can be supported by several factors, including misinformation, ideological and political beliefs, distrust in empirical sciences, and selective data interpretation. While factors like personal doubts and believes might be harder to address and are often linked to individual motivations, misinformation and political propaganda can be attributed to corporations and politicians who are more interested in their financial benefits than in human wellbeing (Wright and Nyberg, 2015; Supran and Oreskes, 2021).

1.2.2 Growing awareness and protests

In 2015, Lee *et al* (2015) recognized the significance of climate change awareness and perception levels in the development of policies aimed at mitigating its effect and stop its escalation. In contrast to the majority of surveys primarily conducted in countries belonging the Western world, their study encompassed 119 countries globally. Levels of awareness above 75% were observed in Europe, North America, Russia, Australia and some countries in South America. East Asia and the Middle East reached awareness levels between 50% and 75%. Conversely, Africa reported concerning levels of misinformation, with the majority of countries having awareness levels below 40% (Lee *et al*, 2015). Surprisingly, further studies conducted among the portion of population aware of climate change have revealed that even if people acknowledge its existence, they do not necessarily perceive it as a significant threat. Only countries from South and Central America, along with a few African countries and India, registered levels of serious concern above 80-89% or 90%. North America and Europe exhibited variable levels ranging from less than 50% up to a maximum of 70-79%, as seen in countries like Canada, Spain, and France. Asia and Russia registered the lower levels, categorizing global warming as a normal event.

More recent analysis have shown a consistent growth in levels of concern about climate change, due primarily to increasing evidence and more frequent weather anomalies. Within Europe, for instance, levels of environmental awareness and concern have increased significantly from 2009 and 2019. The majority of surveys shown climate change as one of the first four most important challenges and of a fairly to very serious problem (Baiardi *et al*, 2021).

Although more or less structured attempts to block climate change debate from reaching public opinion, the 2020s have seen a significant increase in awareness and protests. The climate change movement has gain momentum, driven by different factors including youth activism, further scientific evidence, harsh impact of weather anomalies, and the general recognition of the urgency of the climate emergency.

As reported by Baiardi *et al* (2015), "the positive *Thunberg effect* appears to have prevailed over the *negative Trump* effect". This statement evidently refers to the impact of Greta Thunberg's campaign Fridays For Future and the denial propaganda of the former US President, Donald Trump. Youth-led movements are perhaps the real novelty of this decade, driving activist movements and campaigns forward without backing down in front of authorities and potential consequences (Waldinger *et al*, 2023; Damoah *et al*, 2023). The post-pandemic scenario reveals the emergence of new youth-led international networks, which are even more radical than 2010s movements. Among these collectives are 350.org, Extinction Rebellion, and A22. Their influence on public opinion has been unparalleled, largely attributed to their strategic use of social media campaigns featuring hashtags and viral posts (Belotti *et al*, 2022).

1.2.3 New policies on climate change

The ratification of new local global agreements and goal in regards to climate change have a central role in rising awareness as well. Policymakers have been influenced by increasing demands of green policies by activists and scientists (Wynes *et al*, 2021; Schaffer *et al*, 2021).

The most significant result dates back to 2015 and are the Paris Agreement and the delineation of 17 international Sustainable Development Goals (SDGs) (Pajno and Śmigiel, 2022). The former is legally binding for the 195 parties that have ratified it and sets ambitious goals to mitigate and adapt to the effects of climate change, the most significant is "keep warming 'well below 2 degrees Celsius'. Continue all efforts to limit the rise in temperatures to 1.5 degrees Celsius" (*Paris Agreement*, 2015). Moreover, it includes a section for 'Loss & Damage', recognizing the irreversibility of certain processes.

Conversely, SDGs serves as guidelines for national governments. In particular, they acknowledge the interconnection between environmental sustainability and social justice, emphasizing the pursuit of both objective simultaneously (UN DESA, 2023). The term 'sustainable development' was firstly used by the Brundtland Commission to indicate the development process necessary to meet the needs of the present without compromising the ability of future generations to do the same; in other words the ability of a society to last for a long time (WCED, 1987). This idea was institutionalized only in 2015, when United Nations published the SDGs' list composed by a series of 17 objectives and 169 targets. In regards of climate change, the UN explicated the right to "a safe, clean, and sustainable environment", as well as the right to "participate in public decision-making about environmental matters" (Curating Tomorrow, 2019). At the same time, States are obliged to protect environmental rights and ensure an immediate and effective enforcement of environmental standards.

The green cause is present in six out of the seventeen goals. It is implicitly necessary to reach SDGs 6 and 7, respectively concerned with clear water availability and consumption/production patterns. While it is at the very core of SDGs 7, 13, 14, and 15, which state:

" SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all.

SDG 13: Take urgent action to combat climate change and its impact.

SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. "

(UN DESA, 2023)

In alignment to the principles and vision of new policies, as well as the need to adhere to new regulations, certain corporations and local industries have decided to optimize their production chain, choosing to adopt renewable energy sources, favouring biodegradable materials over plastics, and outsourcing from local producers (Celsia, 2023; UNEP Copenhagen Climate Center, 2021). Numerous corporations are investing in research initiatives and environmentally friendly campaigns. This commitment can be part of a

genuine belief in the green cause, as well as a strategy to enhance their brand and improve their public image through greenwashing activities (Çetin *et al*, 2023; Choudhury *et al*, 2023).

Finally, cultural and artistic expressions have played a pivotal role in spreading awareness about the climate crisis and its repercussions on the most vulnerable ecosystems and marginalized communities. Artists, musicians, writers, and other cultural figures use their platforms to evoke emotional responses from their audiences. Their communication encompasses not only scientific information but also, and more significantly, the tangible effects of the ongoing emergency, rising emotions such as empathy, compassion, and concern (Chan et al, 2023; Sommer *et al*, 2021; Sommer *et al*, 2019).

1.2.4 Climate change, equity, and social justice

The climate crisis is not just and environmental issue. It is intertwined with economic, social, and political dimensions. Numerous studies have shown that climate change disproportionally affects vulnerable populations, aggravating existing inequalities and challenging social justice principles. This raises questions about the complex, strict, and multifaceted relationship between climate change, equity, and social justice.

According to Chomsky (2022), history has shown how groups with greater growth rates were the ones in control of fossil fuels, often at the expenses of other communities living is extraction sites. Her study depicts climate change as a problem that cannot be fixed only by transitioning to renewable energy sources and enhancing technologies. A major reorganization of global socio-economical system is needed, because, as Cripps (2022) said, "climate change is, above all, about privilege". Privileges of countries[8] that at the same time represents the ten biggest polluters, with 60% of global greenhouse gas emission, and some of the largest economies[9] in the world (Aczel, 2022).

The founding assumption of climate injustice is the disproportionate distribution of impacts, among which extreme weather conditions, sea-level rise, and temperature

[8] According to Climate Trade (2019), the ten biggest emitters of CO_2 are China (30%), the U.S.A.(almost 14%), India, Russia, Japan, Germany, Iran, South Korea, Saudi Arabia, and Indonesia, with a total of 24.382 giga-tons over a global total of around 33.5 giga-tons (10^9 tons).
[9] Biggest polluters' ranking for GDP: USA (1), China (2), Japan (3), Germany (4), India (6), South Korea (10), Russia (11), Indonesia (16), Saudi Arabia (18), Iran (43) (Silver, 2022).

anomalies. Marginalized communities, such as low-income individuals, indigenous people, and ethnic minorities, are more vulnerable to these events (Bullard, 1993). These reflects existing social and economic inequalities, like inadequate infrastructures, limited resources, location, and uneven access to information, appropriate healthcare, and policy-making processed (Cutter *et al*, 2012; Adger *et al*, 2006).

In order to reach environmental justice, the burdens of climate change and the benefits of adaptations measures should be equally distributed, regardless of race, gender, age, nationality, income, or other factors (Parks and Roberts, 2010). Context-specific mitigation measures should be implemented through participatory approaches, in order to empower local communities and address the specific needs of each area (Djoudi et al, 2016). Furthermore, equitable community engagement is a key strategy for the inclusion of marginalized groups in decision-making processes and community resilience-building (Hailwood, 2015).

Mitigation policies, however, may give rise to new social injustices if not meticulously designed. For instance, the implementation of renewable energy sources should ensure universal access to clean energy, including vulnerable communities (Sovacool and Dworkin, 2014). Therefore, a robust legislative and policy framework becomes imperative to address the intersection of climate change, equity, and social justice. The intricate balance among these three factors should not be underestimated by policy makers, as any inconsiderate change in one can significantly affect the other two (Venn, 2019).

1.3 Museums as catalysts for the debate on climate crisis

As outlined in Paragraph 1.1, the history of museum activism in regards with climate change is extremely recent and problematic similarly to the public debate around it. The environmental emergency, however, has emerged as one of the most significant concerns of modern society and a foremost priority demanding immediate attention from both international and national governments.

Avoiding environmental topics and controversies is seen by academics as an attempt of cultural organization to maintain neutrality, therefore scientific objectivity. However, neutrality is only a utopia, a myth (Janes and Sandell, 2019; Lyons and Bosworth, 2019; Prescha, 2021). It is true that museums should provide unbiased impartial information, but it is also impossible not to take a stance on controversial political and social matters (Evans *et al*, 2020). Disregarding the climate emergency is not a stance of neutrality; rather, it constitutes a definitive declaration in support of the *status quo* (Steinhauer, 2018). As already stated in Paragraph 1.1, museums are among the most trusted institutions in many countries (Shiraiwa and Zabalueva, 2021); however, audiences are developing higher expectations: being scientifically accurate is no more sufficient and museums should address controversial topics taking a stance. Consequently, activists are increasingly calling upon cultural organization to justify their inaction in regards with the climate emergency (Janes and Sandel, 2019; Evans *et al*, 2020).

Nowadays accountability is one of the obligation, both moral and legal, of cultural organizations (Museums Association, 2016; Morse, 2018). Accountability should be intended in all its dimensions – public, social, cultural, and economic. Therefore, museums are asked to be accountable to and transparent with their audiences, ensuring communication, cooperation, participation, engagement, and responsiveness (Philips, 2003; Adair *et al*, 2011; Golding and Modest, 2013). Moreover, accountability is not limited to the present, it encompasses also the past – preserving past heritage – and the future – ensure future enjoyment of collections (Gray, 2011).

This paragraph is devoted to the analysis of the literature about museums' role in addressing the emerging environmental challenge, especially considering audiences' and supranational institutions' expectations.

1.3.1 The role of museums in Sustainable Development Agendas

Cultural institutions have been recognized as key players in addressing contemporary societal issues, climate change included (OECD/ICOM, 2018). In particular, after the publication of the SDGs list, UNESCO produced a Recommendation to clarify the role of museums and collection within society. In this document, museums are defined as "spaces for cultural transmission, intercultural dialogue, learning, discussion and training, [which] also play an important role in education […], social cohesion and sustainable development" (UNESCO, 2015). Due to their distinctive position, they provide unique opportunities to facilitate collective actions, encompassing network-building, economy development, heightened public awareness, scientific research enhancement, and knowledge dissemination (ICOM, 2017).

Meanwhile, academics have tried to reposition culture in the sustainable development agenda. Indeed, initially it was seen as an instrument to support and achieve the goals, related to three pillars – economy, environment, and society. Further analyses, however, have demonstrated how culture is a pillar of sustainability as well (Loach *et al*, 2017). In particular, culture has a triple role in SDGs agendas: it is an independent forth sphere of action, it is a driver to achieve sustainability in the other three area, and it is the foundation on which all the process should lay on (Rayman-Bacchus and Radavol, 2020).

Even ICOMS President, Professor Toshiyuki Kono, has stated in 2019 that heritage practices cannot remain static in 'business as usual', while the world is struggling to fast transition to the 1.5°C goal (FSBAC, 2022).

Although these very explicit call to action, museums' potential is still under-expressed (Curating Tomorrow, 2019). It has emerged that, even if 8 in 10 European museums have acknowledge the climate emergency, only 25% have been consulted by public entities for the development of sustainable policies, barely 1 in 10 museums are aware of local regulations in matter of climate regulations, and less than 4 in 10 museums posses protocols and criteria to measure and control their environmental impact (NEMO, 2022).

Therefore, international organizations, supranational political bodies, and cultural networks have recently developed several reports and *memorandums* to collect evidence motivating the need and urgency of museums' intervention in the environmental debate.

Curating Tomorrow's Report (2019) draws a distinction between the role museums can play in the implementation of SGDs and, at the same time, the benefits SDGs guidelines would bring to museum realm. The points of the report that could be useful for this research are summarised in *Table 1*.

Table 1: Reasons for the importance of SDGs for Museums and of Museums for SDGs

WHY THE SDGs NEED MUSEUMS	WHY MUSEUMS NEED SDGs
1. Cultural and natural heritage used for learning and research programs in support of the SDGs	1. Developing programs diving into SDGs' topics means supporting people interested in them
2. Museums reach a wide public that can be engaged in active participation and education in matter of SDGs	2. Use their resources for something meaningful for society wellbeing
3. Museums are trusted, they can support the SDGs agenda	3. Be part of the change participating in an ambitious agenda for people's benefit
4. Museums have significant impact through their operations, so they can inspire sustainable practices	4. Generate a tangible long-lasting impact
5. Museums participates in and initiate cross-sectoral partnerships, bridging the gap between the legal realm and people's everyday life	

They all revolve around the assumption that "business-as-usual will not support positive change, and 'comfortable' is not necessarily a position that will help a museum […] in the long term" (Curating Tomorrow, 2019). In general, museums can intervene in the implementation of SDGs through new approaches in their operability and through new educational and research programs. On the operation level, they can avoid partnerships with Big Oil corporations, reduce the use of plastic, implement energy-saving protocols, and initiate co-productions with communities, institutions or corporations that have distinguished themselves for their green approach. However, the real potential of cultural organizations lays in their ability to empower people. In this regards, the Bremerhaven

Declaration (NEMO, 2020) listed six ways museums can follow: education, training, public access to information, public participation, public awareness, international co-operation. It is not sufficient to teach people the theory behind climate change, in order to generate a real impact individuals needs to care about the issue and feel part of the solution (UNFCCC, 2017). In particular, cultural institutions are crucial for the achievement of SDG 9, supporting the creation of resilient infrastructures able to foster scientific research, enhance civil engagement, and implement sustainable practices (Curating Tomorrow, 2019).

In the 21st century, the minimum infrastructural unit is the city. Cities have turned into what Mirzoeff (2016) has defined as 'global cities', based on globalization, over-production, speed, hyper-technology but also cultural impoverishment, diversity erasement, discriminations, and pollution. To contrast this trend, UNESCO (2019a) sustains a more positive vision, which acknowledges the several problematics affecting megalopolises but, at the same time, proposes an alternative optimistic perspective. The UNESCO Creative Cities Network (UCCN) was funded in 2004 to "strengthen cooperation with and among cities that have identified creativity as a strategic factor for sustainable urban development as regards economic, social, cultural and environmental aspects" (UNESCO, 2004). Through the use creative thinking, nourished and catalysed by culture and research of which museums are the highest exponents, cities could become examples of best practice and innovators for the improvement of sustainable ways of live and produce, especially in matter of green economy and environmentally friendly lifestyles (UNESCO, 2019b).

Concretely, museums could and should act on five different yet intertwined levels (NEMO, 2022):

- Support mitigation within society, which means helping people to be resilient by empowerment, education, inclusion, and awareness rising (McGhie, 2021).
- Mitigate their environmental impact, for example by reducing waste and greenhouse gas emissions. Museums are indeed great polluters themselves mainly due to conservation reasons and safety standards (McGhie, 2021).
- Support society in the adaptation process to new environmental conditions and new green protocols through a Disaster Risk Reduction approaches (McGhie, 2020).

- Adapt their practices to climate change and new green policies, ensuring the conservation of artworks whenever it is possible or at least reducing the 'loss and damage' to the bare minimum (FCBAC, 2022).
- Ensure that climate actions do not undermine social justice, equity or any other point of Sustainable Development.

Especially the last point delves into the sphere of climate justice and human rights. Museums, as long-term institutions, should ensure intergenerational equity; at the same time, they have the moral obligation to educate present society about ongoing crisis and empower it to face the said emergency actively and consciously (Chong, 2018; Coffee, 2022). This is another reminder and piece for evidence of how culture embodies multiple roles within the realm of sustainability, independent yet always intertwined and connected with other delicate matters.

1.3.2 The use of storytelling for public engagement, education and behavior shaping

The literature analysed up to this point clearly advocates for cultural institutions' intervention in the sustainable transition, reporting the main fields of action and institutional expectations. However, becoming an example of best practice and spread scientific knowledge in not sufficient to shape audiences' behaviors and convince them of the urgency to act immediately, even on the individual level.

Behavior shaping in strictly connected with emotions. Although scientific evidence is undoubtedly more reliable and objective, suggestions and feelings are biggest influencers of people's consciousness (Klöckner, 2015). Marco Scottini, in his interview for *Fondazione Beni e Attività Culturali* has underlined how art has the power and the "fundamental goal of re-enchanting the world" (FBAC, 2022). Re-enchanting has to be intended as the process of giving back to individuals their autonomous and cognitive capacity and the awareness of their interdependency from phenomena. Anthropocene has reached its climax, transforming the 'human being living in the world' into a 'hyper-independent *logos* ruling the physical world', forgetting about values, relationships, and, most importantly, its unbreakable interconnection with the environment (Chernilo, 2016; Seppelt and Cumming 2016; Küpers, 2020; Beery *et al*, 2023). Re-enchanting means also giving humans their imagination back. Art stimulates creative thinking both in the

ideation/production process and during its fruition, thus art sets people in motion (Buckland, 2013). Nowadays societies would need to re-invent their lives in order to successfully fight climate change; art and culture could and should be the driver of this imaginative process (FBAC, 2022). Lastly, re-enchanting means giving people hope: to imagine a new better future it is fundamental to believe that getting there is feasible. Raw data and catastrophists predictions could be scientifically accurate, but put individuals in a 'no-way-out' perspective.

The new climate museum, or less revolutionary, the new approach of museums towards environmental themes, should be dialogic rather than merely didactic, telling stories that matter in compelling, emotional, participatory ways (Newell, 2020). Art has a great potential that climate scientific communication lacks: it uses metaphors, comparisons, and storytelling. Moreover, it uses unexpected and unusual perspectives to analyze critically the issues it wants to tackle. These tools enables cultural institutions to take complex concepts and theories and make them easily understandable and catching for any audience (Jacobson, 2016; Roosen *et al*, 2017). Hence, cultural organizations could be the bridge between scientists, public institutions and normal people (Jucan and Jucan, 2014). By building an impactful, emotionally engaging, relevant, and easy to understand communication, artworks would stimulate further perspective-taking and critical thinking in visitors, who might be inspired to follow suggested behaviors or act against the evidence shown.

1.4 What can a museum do?

This literature review has encompassed three main spheres – the activist role of museums, the urgency of tacking action against climate change, and the actual controversial position of museums within the climate debate, between stakeholders' expectations and pretended neutrality. It has emerged that museums are evolving from shrines of historical memories, to dynamic spaces engaging in contemporary issues, yet they still struggle to address the present environmental challenges. The theory supports the need for museums to take a stance in the debate, using their unique tools and potentialities to be examples of best practice, to mediate between the abstract world of science data and the concrete realm of everyday life, and to inspire behaviour-changing in their audiences.

2022 and 2023 have seen an unpreceded wave of climate activism within museums' halls, expressing the frustration in front of the cultural sector's irresponsiveness in regards to the imminent environmental downfall. This new movement has not been analysed yet, at least not it its historical backgrounds and its recent decision to act 'against' cultural heritage. Especially, literature still lacks of positive examples for how museums could and must respond to activists' call to action not only with visualizations of the tragic situation humankind is facing, but with stories of hopes and examples of best practice that could help people reinvent their lives to mitigate climate change and deal with its consequences.

Therefore, this research wants to dive into contemporary events, and respond to the following questions:

What historical, social, and cultural events led climate activists to attack artworks and heritage sites?

Taken that museums have an obligation to participate in Sustainable Development policies, therefore address the climate emergency, how can cultural organizations respond to activists call to action in an impactful way for their audiences?

CHAPTER II: 2020s NEW WAVE OF CLIMATE ACTIVISM INSIDE MUSEUMS

"Activism is the rent I pay to live on this planet"

Alice Walker, "Alice Walker: Beauty in Truth", 2013

The previous chapter focused on the literature's discussion of activism inside museums and the concept of activist museum, emphasizing the role that cultural institutions currently play or should play in the discourse surrounding climate change. Chapter II, instead, reconstructs the stages that led to the ongoing activist protests inside exhibition spaces and against cultural heritage. Representing a genuine historical movement, the 2020s new wave comprises a series of closely timed events occurring worldwide, highly mediatized, coordinated throw online networks and meetings, and characterized by shared dynamics and methodologies.

2.1 Historical backgrounds of social and environmental activism inside museums

Similar to any other ecological and social movement, the 2020s new wave has roots in long-established practices and successful protests from the past. Nothing emerges from nothing, not even what might seem a highly revolutionary and unpreceded trend, such as systematically gluing hands to frames or throwing soup at paintings. However, the deliberate choice to attack art to attract media attention and gain wider resonance originated during some of the most important social movements in the history of the Western Civilization. Tracing the roots of this practice can provide a deeper comprehension of current events, their potential impact, their long-term consequences, as well as a clearer insight into the activists' rationale.

2.1.1 The first case: the Suffragette movement

History documents a multitude of actions taken against artworks or cultural heritage in name of political, social, environmental, or cultural causes. Attacking art strikes at the heart of a community that identifies itself with the damaged heritage, encompassing historical, cultural, and social dimensions. However, a distinction should be made between political iconoclasm and activist attacks. The latter seeks attention, while the former damages art for ideological reasons. Indeed, the decision of French revolutionaries, later adopted by Napoleon, to destroy churches and seize aristocracy's treasures cannot be considered the source of inspiration for nowadays events. In that context, war spoils and iconoclasm fueled actions that signaled the emergence of a new order, erasing the former glory of aristocracy and clergy. Artworks were attacked to dismantled their symbolical aura belonging to bygone social situations (Idzerda, 1954; Wrigley, 1993).

Conversely, the Suffragettes are the true pioneers of utilizing art to amplify their social fight. Funded in early 1900s, the movement engaged in acts of civil disobedience and advocated for women' right to vote in U.K. elections. After years of milder campaigns, the group adopted more militant tactics in 1912, including widow smashing, hunger strikes, and chaining themselves to railings. As part of this more confrontational approach, the Suffragettes began attacking paintings in museums, symbols of both civic democracy and the male chauvinist *status quo*. Gauld (2019) suggests that the movement deliberately chose museums as site for its protests, rejecting the pretended neutrality of cultural institutions. Rather, they recognized their civic influence as spaces where diverse social classes and communities mingled together (MacLeod, 2006).

On April 3, 1913 thirteen paintings were targeted in Manchester Art Gallery by three women after closing hours. The Suffragettes aimed at the protective glass covering major masterpieces, demonstrating a clear intent to gin media attention without causing substantial damage, exactly like 2020s activists (see Paragraph 2.3). Numerous similar attacks happened throughout the country, compelling museum directors to implement exceptional security measures. Between March and July 1914, nine women attacked fourteen paintings, leading to their subsequent arrest. Among them, Mary Richardson became infamous for slashing Velazquez's *Rokeby Venus* at London National Gallery. declaring, "I care more for justice than I do for art" (Gauld, 2019). Following her and

other Suffragettes' arrests, further acts of violence were directed at artworks, especially portraits of male political figures and aristocrats, along with female nudes, considered to be a symbol of British patriarchal society. Suffragettes displayed acute awareness in their actions and target selection, as evident from the words of Bertha Ryland, another Suffragette arrested in June 1914:

I attack this work of art deliberately as a protest against the Government's criminal injustice in denying women the vote, and also against the Government's brutal injustice in imprisoning, forcibly feeding, and drugging Suffragist militants, while allowing Ulster militants[10] to go free

(Bertha Ryland, 1914[11])

Militants were not solely advocating for women's voting rights, but also highlighting the disproportion in punishments to which women were submitted. This underscored the British government's fear of women expressing their political preferences, a threat to the centuries-old aristocratic and patriarchal norms.

While Suffragettes' protests inside museums ceased in July 1914 due to World War I, their legacy was impossible to forget during post-conflict socio-economical reconstruction. As MacLeod (2006) recalls, the National Unemployed Workers' Committee Movement (UWCM) continued this 'tradition' by attacking the Walker Art Gallery in Liverpool in 1921.

Comparing these historical cases with contemporary ones reveals significantly more violent actions in the 1910s and 1920s, resulting in lasting and irreversible consequences for the artworks. Nevertheless, similarities are undeniable, from the museum's identification as potent tool for gaining attention to recognizing art's inherent power, along with the courage demonstrated by militants in facing imprisonment in name of a bigger cause.

[10] The Ulster Defence Association (UDA) is a Northern Ireland para-military association active to contrast the Irish Republican Army (IRA) attempts to turn Ulster into Irish territory.
[11] 'The National Archives, 1914

2.1.2 Art Not Oil: artists and activists against British Petroleum

If Paragraph 2.1.1 recalls the first-ever group that attacked art during its protests, this section moves forward in time to highlight one of the initial environmentalists' protests staged inside a museum. This protest called attention to the institution's responsibility to adhere to sustainable practices.

The Art Not Oil Coalition (ANOC), established in 2004, advocates for the immediate cessation of Big Oil's cultural sponsorship of major English museums, including Tate, the British Museum, the Royal Shakespeare Company, and the National Gallery of London. While ANOC acknowledges the necessity for cultural insitutions to secure alternative funding due to insufficient public supports, it deems oil sponsorships a "stain on our [British] cultural institutions" (ANOC, n.d. a). This form of large-scale accepted greenwashing enables corporations to gain social legitimacy. Furthermore, ANOC emphasized the role of cultural institutions as examples of best practices and promoters of sustainability, as outlined in the Museum Association *Code of Ethics* (2016), the U.N. SDGs guidelines (Curating Tomorrow, 2019), and the literature analyzed in Chapter 1.

The internationally significant national network comprises twelve member groups, among which the most significant are BP or not BP?, Reclaim Shakespeare Company (RSC)[12], Shell Out Sounds (SOS)[13], and Liberate Tate (LT) (ANOC, n.d. b). The collective 350.org, one of the first international environmentalist networks, is also a member, though its affiliation holds less prominence, leaving its analysis to the subsequent section (see Paragraph 2.2.1). What distinguishes ANOC and its main members from many other activist collectives is the prevailing presence, often exclusive, of cultural workers, artists, performer, and scientists within its ranks. Consequently, their actions diverged from those of the Suffragettes and contemporary activists; rather than targeting artworks and museum collections, Art Not Oil challenged the system through artistsi and theatrical performances held within cultural institutions.

[12] RSC gathered together in 2012 after BP was welcomed among the sponsors for the World Shakespeare Festival. The group encouraged theatergoers to tear the BP logo from their programs. Moreover, they organized a series of 'guerilla interventions' during BP-sponsored plays

[13] The excessive attention granted to BP-sponsored activities, appeared to move the focus away from the ones supported by Shell, the international biggest oil producer. Hence, Shell Out Sounds was formed in 2013 by musicians and campaigners from Southbank Centre. The choir performed during breaks in Shell-sponsored performances and concerts. After only one year, in 2014, the support given by Shell was abruptly ceased.

Lastly, each group independently addresses specific institution's sponsorship contracts with Big Oil firm. As proudly reported by ANOC itself, as of February 2022, twelve British cultural institutions[14] and six around the world[15] have ceased fossil fuel funding, primarily due to creative campaigns orchestrated by the network (ANOC, 2022). In June 2023, the British Museum finally terminated its 27-year partnership with BP, joining the ranks of institutions that cut ties (Addley, 2023).

For the purpose of this research, the cases of Liberate Tate and BP or Not BP? are briefly examined. British Petroleum ties with Tate dates back to 1990, when the oil giant sponsored a temporary exhibition with the intention of creating an enduring relationship for enriching people's lives through new cultural programs. Despite the Deepwater Horizon oil spill[16] scandal in spring 2010, Tate and BP reaffirmed their relationship the same year with another exhibition (Motion, 2019). Consequently, Liberate Tate emerged in direct opposition to the objectionable contract between BP and Tate. The contract was viewed as a means for BP to reposition its brand in public opinion through modest funding of cultural activities (Clarke *et al*., 2017). Indeed, disclosures in 2014, facilitated by the enforcement of the Freedom of Information Act[17], revealed that over their 17-year partnership BP contributed a mere £ 3,800,000, averaging less than £ 224,000 annually. According to Liberate Tate, this sum cannot be considered sufficient to impact Tate's operations, and it failed to justify a connection with an environmentally irresponsible corporation (Motion, 2019).

Liberate Tate's protests consisted in creative acts of civil disobedience, mainly expressed through artistic performances within Tate's museums halls. Activists employed actions like oil spilling, art installations, dancing, acting, and even self-coating in oil were to showcase BP's deep influence on Tate's activities. *Human Cost* (2011), considered the most iconic action, took place for the anniversary of Deepwater Horizon disaster. It

[14] Tate, Royal Shakespeare Company, Edinburgh International Festival, the National Portrait Gallery, the Scottish Ballet, the National Theatre, Southbank Centre, the National Gallery National, Galleries Scotland, the Natural History Museum, Royal Opera House, and the Edinburgh Science Festival

[15] Mauritshuis and Museon in The Hague, Field Museum in Chicago, the Canadian Museum of History in Gatineau (QC), Van Gogh Museum in Amsterdam, American Museum of Natural History in New York City, and Nemo Science Museum in Amsterdam

[16] Industrial disaster happened in the Gulf of Mexico from April 20, 2010 when the BP's oil platform underwent a gas blowout followed by an explosion and the release in the ocean of 4.9 millions of barrels of oil, making it the worst sea oil spill in America history (Treccani, 2012).

[17] Liberate Tate fought legally with Tate to get accessed to data regarding BP's funding. The museum appealed and requested to be exempted from the transparency duties, however the court decided for the disclosure of until then restricted information (Brown, 2015).

involved 87 minutes to symbolize the 87 days of the oil spill. During the performance, two women poured oil over a man lying naked in fetal position on the floor of Tate Britain, clear representation of the death of life in the Gulf of Mexico. With their infamous campaign, Liberate Tate unveiled the incongruity between Tate's claimed ethical and environmentally friendly stanca and its acceptance of BP's support (Mattera, n.d.). By associating Tate with unethical funding, they aimed to compel Tate's Director, Nicholas Serota, to reject further funding from fossil fuel companies. Surprisingly, after six years of actions, BP itself terminated the sponsorship in 2017 (Khomani, 2016). While BP asserted that Liberate Tate's campaign was not the reason for the decision, experts viewed it skeptically (Motion, 2019; Khomani, 2016), particularly when considering the broader context. Indeed, BP was silently ending its long-standing partnerships with various U.K. cultural institutions (e.g. 34-year-long partnership with Edinburgh International Festival), likely due to a balance tipping towards more image damage than greenwashing opportunities (Mahony, 2017).

Despite terminating some of its most important contracts in 2017, that same year BP renewed its partnership with the British Museum for another five years (from 2018 to 2023). Hence, other collectives shifted their focus and worked together to remove BP's logo from the funders list of U.K. cultural institutions. Among them, BP or Not BP?, launched in 2012 to free the Royal Shakespeare Company from Big Oil money, achieved its goal in 2019 (Bañuelos, 2021). Similar to Liberate Tate, their language of civil disobedience involves unauthorized performances within museum halls. Despite the shared characteristics, BP or Not BP? took a step further in its campaign: it engaged with communities affected by BP's extractions activities, raising awareness about environmental injustices and racism. In aligning with community interests, they tackled a funding point in *Museum Code of Ethics*: museums are institutions trusted by communities and must take responsible, ethical, and well-considered decisions to maintain that trust (Museum Association 2016). BP's sponsorship of an itinerant exhibition on Australian Aboriginal art[18], while the same company was endangering First Nations through new drilling in the Great Australian Bright, violated the implicit relationship of trust between the British Museum and its publics. Thus, activists embarked on a new even more ambitious project: a rebel exhibition. *A History of BP in 10 objects*

[18] The exhibition Indigenous Australia: Enduring Civilizations was hosted firstly in the British Museum in London from April 23 and August 2, 2015, and then in the National Museum of Australia, Canberra (ACT, Australia) from November 26, 2015 and March 28, 2016 (*Indigenous Australia*, 2015).

opened April 4, 2016, at the British Museum in occasion of the first day of Hartwing Fisher as the new director. Echoing the title of the museum's exhibition *History of the World in 100 Objects*, this display offered visitors the opportunity to see artefacts from regions most impacted by BP's drilling (Serafini *et al*, 2019). With the contract set to expire in late 2023, activists expected the British Museum to cut its cord with BP. That was not the case and, although a new contract was not signed, the oil company continued financing exhibitions and cultural projects.

Finally, on June 2, 2023 *The Guardian* (Addley, 2023) reported the news of the termination of Tate's 27-year partnership with BP This development aligned with George Osborne[19]'s project of turning the British Museum in a net zero institution (Addley, 2023). Nevertheless, another spokesperson provided an alternative statement in an interview with the press. They asserted that *The Guardian*'s article was inaccurate and clarified that "in times of reduced public funding, corporate sponsors like BP allow [them] to fulfil [their] mission to deliver unique learning experiences to visitors" (Sutton, 2023). Apparently, the final decision has yet to be determined, and even if BP does not secure another 5-year contract, opportunities for project-oriented support are still open.

The context of 2023 is marked significantly by new environmental activist networks that are less patient and mindful than groups like Liberate Tate and BP or Not BP?. People are angrier and more disillusioned due to the lack of responsiveness from governments, public institutions, and even the cultural sector. Presently, the case-by-case efforts of the Art Not Oil collective appear inadequate in addressing the global climate crisis. Furthermore, while art-based protests have substantial communication potential, they do not enable universal participation. Consequently, the new wave of activism in the 2020s sees museums as one of its various platforms, akin Art Not Oil. However, it employs more disruptive tactics to capture attentions, akin to historical movements such as the Suffragettes.

[19] British Museum's new director appointed in 2022.

2.2 Rising and articulation of 2020s new wave of climate activism

Present climate protests are rooted in a phenomenon that emerged during the 2010s, and grew exponentially after 2019 (Sloam *et al*, 2022). Following significant letdowns, like the inconclusive climate conference in Copenhagen in 2009, people globally recognized that they could no longer rely on governments and leaders to make the change; they themselves needed to be the change. Some of the pivotal components of this 'new wave' are international cooperation and coordination, assertive and scientifically substantiated demands, disruptive actions, and a considerable presence of young people and students. Notably entire movements are almost exclusively composed of individuals under the age of 25.

2.2.1 Between Copenhagen 2009 and Paris 2015

In 2009, the United Nation Framework Convention on Climate Change (UNFCCC) in Copenhagen, known as Copenhagen Summit or COP15, failed to reach an agreement that either set new targets for emission reductions or legally bind nations to promote green sustainable economies. From that day on, local informal coalitions of businesses, activists, NGOs, academics, and other stakeholder united to make themselves heard by governments. According to Michael Jacobs (2016), it was this spontaneous yet cohesive awakening of consciousness that paved the way for the constructive outcomes of the Paris Climate Summit, or COP21, six years later. Besides the undeniable role of businesses, scientific and economic communities, the game-changer was the disruptive actions of new NGOs, predominantly comprised by young students eager to claim their right of a bright safe future.

One of the most impactful entities, both in terms of resonance and results, was 350.org, funded by Bill McKibben, an American writer and activist. From its inception, it fought for the disinvestment from fossil fuels by universities and other public, cultural, or research institutions. Concurrently, an online campaign known as Avaaz was advocating for immediate action against fossil fuel consumption. Within a few years, Avaaz gained millions of followers through petitions, targeted email campaigns, and paid newspaper advertisements.

These two networks synergized for the first time in September 2014. Over 400,000 people marched in New York City, joined by many more all around the world, to ask for tangible outcomes from the recently opened New York Climate Summit 2014. This remarkable demonstration is etched in history as the *People's Climate March*. The ground for Paris 2015 was ready, and the momentum of climate protests had already captured international headlines and even garnered support from the Pope himself, who decided to spiritually join the protest with the encyclical *Laudato Sì* (Papa Francesco, 2015). Referencing *The Canticle of Creatures* by Saint Francis from Assisi, the Pope explicitly condemned the thoughtless, egoistic, and destructive use and abuse of natural resources[20].

Empowered by the newfound support from heads of government, political parties, and other sectors, the climate movement recognized that Paris 2015 "had to become another make-or-break moment" (Jacobs, 2015). Indeed, on November 29, 2015, a day before COP21 commenced, more than 785,000 people from 175 countries participated in what is now known as the *Global Climate March.* This massive gathering advocated for two straightforward yet revolutionary points: "keep fossil fuels in the ground and finance a just transition to 100% renewable energy by 2050" (350.org, 2015). Young generations made themselves heard as well. On November 30, as the conference began, the first Student Climate Strike took place drawing more than 50,000 students from over 100 countries into the protest.

In contrast to COP15, the Paris Conference culminated in an actual legally binding international UN treaty under the UNFCCC. Ratified by 196 Parties, the primary objective of the treaty is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" (*Paris Agreement*, 2015). To achieve this, the year 2025 was identified as the peak after which greenhouse gas emissions should and must decrease at least of 43% by 2030.

Despite the significant outcome, not all climate activist groups were satisfied by the treaty outcome. Using a disillusioned metaphor, Friends of the Earth International (FOEI, 2015) described a "Titanic Scenario [where] the ship is sinking and the band plays on the warm applause of our political leaders, while the poor are being denied a place in the lifeboats". In their view, the agreement fell short in delivering climate justice and established standards and protocols insufficient to compel affluent countries to reduce emissions and

[20] Francesco, Papa (2015) p.3

aid emerging nations in achieving sustainable development. This desire for improvement, coupled with accrued experience and newfound awareness in matter of coalitions' powers, internationalization, and youth participation, laid the groundwork for the new movements emerging in late 2010s and early 2020s.

2.2.2 Fridays For Future

On August, 20 2018, in Stockholm, a 15-year-old girl named Greta Thunberg chose to skip school to sit outside the Swedish Parliament, demanding urgent action on the climate crisis from the upcoming government. Over the following three weeks, she continued this solitary act every Friday, advocating for the planet's defense. Greta Thunberg, who has since become a globally recognized figure in the fight against climate change, eventually assumed the leadership of Fridays For Future (FFF). This movement spontaneously originated from her solitary *Skolstrejk för Klimatet* (tr. School Strike for Climate) and on September 8, 2018 she held her first public speech in Stockholm during the *People's Climate March,* declaring their intention to continue striking each Friday until governments established clear policies to limit global temperature rise well below 2°C. The aim of the students collective is "to put moral pressure on policymakers, to make them listen to the scientists, and then to take forceful action to limit global warming" (FFF, n.d.). On December 3, 2018, during COP24, the UNFCCC in Katowice (Poland), Greta met Luisa-Marie Neubauer[21] with whom she initiated the international expansion of FFF, beginning with Germany.

To add structure and legitimacy to their protests, the group outlined four primary demands they expect politicians and international organization to respect:

1. *Create a safe pathway under 1.5°C*
2. *Climate justice and equity for everyone*
3. *Follow the Paris Agreement*
4. *Unite behind the science*

(FFF, 2019)

[21] 26-year-old climate and political activist from Germany, founder of FFF Germany, she is currently one of the most prominent representative of the German climate movement.

The inheritance of the 2014-15 movements and lessons of COP15 are evident in their list. They understood that change is possible only if people are joining forces, that science should be the base and leading force for every new public policy, and that 1.5°C is the goal but it should be reached respecting the most disadvantaged and poorest people. This list evolved into the *Declaration of Lausanne* when, in August 2019, 400 climate activists from 38 countries signed the re-formulated point:

1. *Keep the global temperature rise below 1.5°C compared to pre-industrial levels*
2. *Ensure climate justice and equity*
3. *Listen to the best united science currently available*

(FFF, 2019)

Furthermore, FFF has been supported since March 2019 by Scientists For Future (SFF), a coalition of 26,000 researchers, professors, led by Gregor Hagedorn[22]. Only one month later, 3,000 members signed and published a paper in the scientific research journal *Science* supporting FFF (Kühne, 2019).

March 15, 2019 marked the first globally impactful climate strike, uniting over a million young people worldwide. Milan hosted the largest gathering, with 100,000 participants. However, the catalyst for the creation of a compact international network, extended beyond just students, was the *Climate Action Week* from September 20 to 27, 2019, coinciding with the UN Climate Action Summit in New York City. This week saw one of the history's largest coordinated global protests, with approximately 7.6 million individuals of all ages, regions, faith, and background participating in more than 6,100 events across 185 countries. Trade unions (73), companies (3,000), websites (8,500), and civil society organizations (820) supported these demonstrations. Italy stood out again with 1.5 million participants (Global Climate Strike, 2019). On September 23, 2019 Greta Thunberg addressed the UN Summit, imploring leaders from all around the world to take decisive steps towards the 1.5°C goal. Her words "How dare you!" became the tagline of the protest. She stressed how elder generations have ignored scientific evidence of global warming for more than 30 years leaving the youth to confront the consequences of this

[22] Gregor Hagerdorn is a German botanist and academic currently part of the directing team of the Natural History Museum in Berlin, coordinating the national and international infrastructure.

betrayal. She concluded her speech with a premonition proved prescient: “the world is waking up. And the change is coming, whether you like it or not” (Greta Thunberg, 2019).

Not even Covid-19 Pandemic was able to stop the revolutionary wave. Indeed, during spring 2020, the fifth global school strike for climate took place completely digitally gaining the name of *Digital Strike*. Presently, with the easing of pandemic restrictions, in-person strikes have resumed worldwide, reaching over 260 weeks of protests as of August 11, 2023. Nevertheless, newer and more vociferous networks of activists have emerged, exhibiting heightened media impact and less diplomatic approach.

2.2.3 A22 international network

“We are the last generation” (A22, 2022). With these words, the newly formed network A22 positions itself as both the final defender of the planet and the first wave of change. Their identity, as outlined in the A22 Statute, underscores their role as the vanguard of those who recognize the urgency of the crisis and are actively working to enact change. This generation stands ready to go to any lengths necessary to secure a safe and equitable future for humanity on Earth.

The network was formed in 2022, following the abatement of Covid-19 pandemic restrictions in many of countries that had previously curtailed public gatherings and movements. Comprising eleven national groups, A22 united to create a compact front against climate injustice and inaction, clearly echoing the lessons of the climate marches during 2010s and the global impact of Friday for Future.

From a financial perspective, the network is funded by private donations and funds, with the Climate Emergency Fund (CEF) being its primary supporter. Established in 2019 in California with the aim of financing brave and disruptive protests, CEF sustained 44 climate activist groups across the globe with a total of $5.1 million in 2022 alone (CEF, 2022). This alignment between CEF and A22 highlights their shared conviction that incremental and passive endeavors have proven ineffective, and that forceful activism is the only way forward. Despite its philanthropic future-oriented façade, the relationship between A22 and CEF raises questions. In late 2022, a report by *Welt am Somtag* published evidence that activists from several national groups, particularly Letzte Generation, were being remunerated for their protests, with payments reaching up to

1,300 €/month according to the level of engagement and significance of their actions (Dinger and Pfahler 2023). After the inquiry, the money seemed to originate from the Berlin-based organization Wandelbündnid, but a trail led back to CEF. Notably, large sums from heirs and heiresses of oil fortunes are being contributed to support anti-oil movements, possibly as a form of image greenwashing. The most significant example is Aileen Getty, the granddaughter of Jean Paul Getty[23], funder of Getty Oil, who is known internationally for her role in climate activist campaigns, she is indeed one of the founders of CEF itself.

This paragraph proceeds with the presentation and analysis of the national groups within A22, presented in alphabetical order. No hierarchy or chronological timeline has been followed.

ÅTERSTÄLL VÅTMARKER – Sweden

Återsäll Våtmarker (tr. Reseal Wetlands) was funded in March 2022 by Helen Wahlgren and Alfred Westh, coinciding with the formation period of most A22 groups. True to its name, the ì collective's pcore objective is the restoration of Swedish wetlands, a peculiar ecosystem whose ecological and economic significance has been largely overlooked. Therefore, extensive excavation over the past decades has inflicted substantial damage. The destruction of wetlands undermines their natural capacity to absorb toxins and greenhouse gasses within the Swedish environment (Toth, 2021). Consequently, Återsäll Våtmarker is advocating for the cessation of peat mining and the reintroduction of moisture to excavated areas to reactivate their natural function as pollutant absorbers. There is the potential to reduce Sweden's emissions by up to 25% (Återsäll Våtmarker, 2022). Although the group's main rival is the government itself, which continues to endorse oil drilling, it has recently started a collaboration with the green party Klimat Alliansen (tr. Climate Alliance).

DECLARE EMERGENCY – U.S.A.

[23] Jean Paul Getty founded Getty Oil, a billionaire oil company running both in the Middle East, Saudi Arabia and Kuwait especially, and the U.S.A until 2012. Between the 50s and 60s he was recognized as the richest living American and one of the world's richest private citizen. At his death, is art works collection gave birth to the nucleus of the Getty Museum in Los Angeles.

The United States, often hailed as a beacon of innovation and a Western role model, are the world's biggest economy, with a GDP of around $ 25.463 trillion in 2022 (WorldData, 2023 and Statista, 2023b). Simultaneously, it stands as the second-largest global emitter of pollutants, preceded just by China. As reported in *BP Statistical Review of World Energy*, in 2021 the U.S. produced 5,167.9 million tons of CO_2, 13.2% of global emissions (BP, 2022). Furthermore, the nation leads in natural gas and crude oil extraction, with daily averages of 12,662 thousand barrels of oil and 124,609 million cubic feet of gas in May 2023 (EIA, 2023). Extracting processes are ecologically destructive and historically detrimental for local communities, rendering pumping and fracking sites epicenters of environmental injustice and, at times, racism. Typically, marginalized low-income communities and ethnic minorities inhabit areas near oil pumping stations, where levels of air, water, and soil pollution are a considerable threat to people's heath (Opperman, 2019).

Curiously, approximately 30% of Americans deny, either partially or wholly, the existence of human-caused climate change. Data from by YouGov's *Cambridge Globalism Project* between 2019 and 2023 reveals that 15% of Americans acknowledge climate change but attribute it to non-human causes, while over 5% categorically deny any climate change (YouGov, 2023). In 2019, the U.S. were the first country in the world for percentage of individuals asserting that "man-made global warming was a hoax invented to deceive people" (YouGov, 2019), reflecting the influence of the then-President Trump's campaign, known for being 'climate change denier'. Although hopes for a change in political trajectory emerged with Biden's elections, he "has failed to be the climate change President" (Declare Emergency, 2022). Indeed, the share of public opinion sensible to the topic considered the decision to rejoin the *Paris Agreement* not sufficient if not paired with significant attempts to stop the total rely on fossil fuels.

In this context of public denial of a scientifically proved ongoing phenomenon, younger generations have developed climate change anxiety, an emotion condition caused by the uncertainty surrounding the future due to global warming (Schwartz *et al*, 2022). In response, members of Generation Z and Millennials are more incline to unite and confront against elder generations and politicians denial in order to reduce their discomfort. They are more vocal on the topic, engage more with climate change content, and are more proactive in aprticipation (Tyson *et al*, 2021).

Declare Emergency emerged from disillusioned conscious citizens, predominantly young adults, who were tired of waiting for governments to take meaningful actions to secure their future. The group's agenda centers on urging the U.S. government to implement renewable energy alternatives, stop intensive and reckless oil pumping and fracking especially in areas inhabited to Native Americans or communities facing environmental threats (Declare Emergency, 2022). Presently, the group is fighting against the unjust sentence fot to The Degas Two, especially highlighting the incongruity between the imposed fine and the actual damage cause (see Paragraph 2.3).

DERNIÈRE RÉNOVATION – France

The French collective known as Dernière Rénovation coalesced in March 2022, claiming for the climate-friendly refurbishment of buildings by 2040, following the model of the Citizens' Convention for the Climate. Citizens issued an ultimatum to President Macron, who had been publicly accused of insufficiently expending compliance with Convention obligation. Dernière Rénovation's statute underlines the strategic wisdom of concentrating efforts on a single actionable objective. This singular focus not only underscores its paramount importance for environmental reasons but also anticipates a surge in employment opportunities and enhancements in quality of life (Derniére Renovation, 2022).

Stressing the idea of the climate clock[24], activists from Dernière Rénovation uses countdowns as impactful slogans to tackle public opinion and underline the urgency of reducing greenhouse gas production.

Parallel to other activist groups within the A22 network, Dernière Rénovation employs road blockades and marches, often leveraging symbolic landmarks (e.g. the Panthéon in Paris climbed by an activist October 31, 2022) or internationally mediatized events (e.g. Tour de France stopped July 12, 2022). Another tactic they employ is throwing orange paint at institutional buildings façades. This method serves to confront directly governmental bodies responsible for the green transition. Notably, in January 2023, the headquarters of the Ministry of Economy and the Ministry of Ecological Transition, as

[24] The Climate Clock project was launched in 2020 to effectively communicate the deepness of the current climate crisis. The red part, deadline, shows the time left to act before reaching an irreversible temperature increase of 1.5°C. The blue part, lifeline, is indeed a positive counterpart tracking social and environmental progresses in key solution pathways, such as women political inclusion and land owned by First Nations.

well as the residence of the Prime Minister, were targeted by the collective (Dernière Rénovation, 2023). Although their actions are concentrated in Paris and Toulouse, a few episodes involved the entire national territory with coordinated actions in multiple cities. Indeed, on March 16, 2023, members of the collective adorned statues located in eleven different cities (Bourdeaux, Chambéry, Grenoble, Lille, Limoges, Lyon, Montpellier, Paris, Strasbourg, Toulouse, and Tours) with t-shirts denouncing the government inaction after summer 2022 heatwave and fall-winter 2022 drought (Albrand, 2023). This performance mirrors a similar occurrence on March 31, 2018, when other activist groups placed pollution facemasks on statues to stress the escalating level of pollutants in French cities (Morgan, 2018).

JUST STOP OIL – the U.K.

Founded in February 2022, the British activist network known as Just Stop Oil (JSO) draws inspiration from the truck drivers' protests in England during 2000[25]. Yet, instead of rallying against rising fuel prices, the new group is fighting the very structure of the oil industry. JSO emerged of disillusionment with the outcomes of COP26 and the U.K.'s new oil policies. The 2021 climate change conference in Glasgow yielded no new commitments to reduce global warming, even as the U.K. Government projected to expand oil and gas drilling in the North Sea and to lift the ban on fracking (GOV.UK, 2022).

In late March 2022, Larch Maxey, a JSO member and a veteran eco-campaigner, hold a recruitment speech in Camden (London). He underscored the urgency of acting immediately to avert societal collapse and the decline of civilization. "When your house is on fire you stop pouring petrol on the flames. That's basically the demand" he stated (Gayle, 2022 and Bring *et al*, 2020). TJSO's primary shift lies in their mode of protest: from merely pointing out governmental lapses to actively preventing mistakes through acts of civil disobedience. Consequently, their preferred forms of intervention involve obstructing roads and railways, as well as physically locking themselves to oil infrastructure. Among the most significant protests, it should be mentioned October 17,

[25] Series of campaign held all over the United Kingdom by truck drivers and transport companies to protests against the mayor increase in oil and diesel prices, making it the most expensive in Europe, when just 10 years before it was among the cheapest. The price rise caused a rise in goods shipping costs, damaging the entire on-wheel transportation sector.

2022 when two activists scaled the Dartford Crossing on Queen Elizabeth II Bridge (London), effectively blocking the M25 highway for 36 hours (Grierson and Badshah, 2022).

More recently, Just Stop Oil has sought to raise awareness about Prime Minister Rishi Sunak's oil-centered policies on a global scale. In late July 2023, aiming at U.K.'s energy security, he announced a new oil drilling and gas extraction scheme in the North Sea, involving the issuance of more than a hundred licenses. According to journalists, experts, activists, and other politicians, relying on fossil fuels for national energy safety is neither responsible nor feasible for a state that aims at Net Zero for 2050 (Wright, 2023). However, the enquiry of JSO's efforts extend beyond mere awareness-raising. Collaborating with journalists, they unveiled how Sunak's family businesses has signed a billionaire agreement with BP just a few months prior to the new project announcement. BP, a leading global oil company, stood to benefit significantly from the new extraction prospects. Activists perceive each new license as a crime against humanity, thus civil resistance is the only answer for a political group that appears more concerned with its financial interests than with citizens' health and future generations' rights. As a result, JSO plans to march against the North Sea project in October 2023, uniting with other British activists groups and anyone willing to protest and defend their future (JSO, 2023a).

LAST GENERATION – Germany, Italy, Austria

The Last Generation movement originated in 2021 from participants in the *Hungerstreik der letzten Generation* (tr. Hunger Strike by the Last Generation), a protest that led to the blockade of highways in Berlin. Soon after, the idea of a rising 'last generation' unwilling to wait for the older ones to save the planet gained traction across Germany, Italy and Austria. This, in turn, resulted in the establishment of, respectively, Letzte Generation, Ultima Generazione, and Aufstand der Letzten Generation, referred to as Letzte Generation Östereich.

In its declaration of intents, the Italian division calls upon the government to ceased investing in fossil fuels. It highlights Italy's severe vulnerabilities, indeed "Italy is destroyed by the Climate and Ecological Crisis: in mid-2023 we already reached 500 extreme weather conditions, 310 in 2022" (Ultima Generazione, 2023). Among the most

significant of these events in summer 2023: floods in Emilia-Romagna (mid-May), a European record temperature of 48.2°C recorded in Jerzu (Sardinia) (early-July), hailstorms in Friuli-Venezia-Giulia with the largest hailstone ever documented in Europe (mid-July), wildfires in Sicily (July), and tornadoes and lighting storms in the Milan metropolitan area (mid-July) (Coldiretti, 2023). Ultima Generazione's actions had a great resonance, especially in the regions affected by these exceptional weather events, where residents and workers, farmers as first, are struggling to save their belongings and businesses. Although the urgency of addressing climate change is gradually permeating public consciousness, the Italian government and media continue to portray Ultima Generazione as '*eco-vandali'* (tr. ecological vandals). While this label primarily pertains to their acts targeting cultural heritage sites and artwork (addressed in Paragraph 2.3), it significantly shapes public opinion and the narrative of climate change activism. Indeed, defining activists as vandals automatically discredits and delegitimizes any one of their actions, including the underlying motivations.

Given the potential for government and corporate entities with interests in fossil-fuel-based economies to employ discrediting and misleading narratives, Letzte Generation Östereich has published a public protest consensus on its website. Respectively point 10 and 12 state that participants "are prepared to accept all consequences of their actions. […] They won't let their will to resist to be broken" and that "they are aware that they are in the public eye and that their words can be used against us by politicians and media" (Letzte Generation Östereich, n.d.). The Austrian division's main demand involves reducing highway speed limits from 130km/h to 100km/h. This aligns with the proposal of the European Commission and the International Energy Agency (IEA) to decreas speed limits by at least 10km/h to save oil during the crisis caused by the Ukrainian war (IEA, 2022). Recent scientific reports highlights how such a speed reduction could save up to 180million liters of fuel annually, while also enhancing road safety, reducting of noise pollution, and improve the quality of air (ETSC, 2022).

RENOVATE SWITZERLAND – Switzerland

Born in spring 2022, Renovate Switzerland shares with the other groups the feeling of urgency for climate change mitigation and sustainable transition policies. Methods and actions are congruent as well, with roadblocks representing the vast majority of them.

What distinguishes Renovate Switzerland from the general A22 program is the decision to present one specific claim: issue an "immediate emergency plan for the thermal renovation of all buildings in the country by 2030". (Renovate Switzerland, 2023) With an even more ambitious goal, this collective follows the same strategy of Denière Rénovation, trying to focus energies and resources for one highly impacting project. Furthermore, the collective can rely upon a large support among Swiss citizens. Indeed a survey commissioned by Renovate Switzerland itself revealed that around 61% of Swiss people believe in the campaign (TTY, 2023).

The group gained new energy in mid-January 2023, when Moritz Bischof and Anaïs Tilquin, organizers of Renovate Switzerland, met in Amsterdam the other 'leader' from A22 network to debrief about the actions undertook during 2022 and to design a shared line of protest for the new year.

RESTORE PASSENGER RAIL – New Zealand

Restore Passenger Rail (RPR) rose independently in 2022 getting inspiration from Exinction Rebellion's actions and determination to overcome governments' policies inefficacy and insufficiencies in matter of climate change. As the name could suggest, the New Zealander group advocates for the restoration of interurban rail transport throughout all New Zealand territory, in order to reduce car usage. In particular, they demand the government to "restore affordable, regular passenger rail services connecting Whangarei (Northern New Zealand) to Wailohopai Invercargill (Southern point) […]. We demand the government to replace half price public transport with free public transport on permanent basis" (RPR, 2023). Moving around the country is mandatory in states like New Zealand and Australia, where distances between cities are enormous. Planes and cars have been the only option since now, however they are both extremely polluting and not affordable for everyone. Although the government has declined previous demands of an extension of the railway system because, according to them, not feasible with New Zealand territory geology, RPR is currently collecting evidence of past railways present and efficient in areas considered to be too harsh and wild.

NZ Government is currently declining the collective's requests for a meeting while taking tough actions against its members, considering their protests harmful for local communities' lives and wellbeing, because they cause financial damage to people that

cannot afford it. Although what appears to be a general failure, the group is growing day by day as its claim is considered a first necessity by NZ citizens. Moreover, members of RPR have declared how they tried more peaceful strategies, such as petitions and marches, but they had no results. “To win” they said “we need to be impossible to ignore” (Manhire, 2023) and blocking main highways around the country appears to be the only strategy to be mediatized.

SAVE OLD GROWTH – Canada

Unlike the majority of other groups belonging to the A22 network, Save Old Growth (SOG) rose independently in 2020 with a clear objective: contrast deforestation in British Columbia and force the government to end old-growth logging to preserve one of the largest forests in Canada. For several decades, old growth logging has been a significant issue in British Columbia, where, among the 13.7 millions hectares of forest land, 4.5 million are classified as old forest, but not even 10% of it is protected from logging. Moreover, environmental specialists esteem that, because of logging, British Columbia has been left with only 2.7% of its old growth forest (Price *et al*, 2020). Although Forest Industry is a multi-billion business providing employment for around 140,000 Canadians, the pollution produced by old-forest logging is estimated by Price *et al* around 190millions tons of CO_2 per year not to mention the impact on pollutants absorption, biodiversity, habitat and ecosystems’ disruptions, making the costs much higher than benefits in both the short and long term.

Old forest protection movement dates back to 1990s, but only recently it has gained momentum following the 2020s new wave and taking advantage of new media. Alongside with ending old-growth logging, SOG advocates for the restitution of lands to indigenous populations.

Currently SOG is not active because of a legal scandal happened August 2022. Olivia Mary Howe, a 19-year-old-student, pleaded guilty of protesting with SOG collective. However, her lawyer declared how she had been emotionally manipulated into participating (Karamali and McSheffrey, 2022). The case is still open and further investigations are being carried out to ascertain the facts.

STOP FOSSIL FUEL SUBSIDIES – Australia

Australia is currently undergoing what appears to be an endless sequence of climate disasters, the most significant of which are Black Summer (2019-2020 wildfires season), which burnt an area almost as big as the United Kingdom, and the Flood season in 2022, one of the worst ever recorded in the country.

Shortly after COVID-19 restrictions were removed, a group of activists gathered together in Sydney because of the irresponsiveness of the Federal Government to the effects of Black Summer. Fireproof Australia was funded that day by, among others, Violet Coco, former Extinction Rebellion member, and Alan Russel Glover, member of the Rural Fire Service. The collective advocates for the implementation of policies, standards, and technologies able to defend Australian citizens from the bushfire threat (Fireproof Australia, 2022).

Following the 'environmental elections' in May 2022, environmental issues appeared to be finally back in the Federal Government's agenda. Unsurprisingly, public institutions of all levels, from state to federal, are still investing in the fossil fuel industry systematically, giving subsidies up to $ 22,000 a minute (Stop Fossil Fuel Subsidies, 2022). The sense of disillusionment and rising concern led Fireproof Australia to rethink its own agenda: extreme natural events are caused by rising levels of pollution, whose primary cause is oil combustion; therefore contrasting fossil fuel usage is the key to prevent floods, wildfires, and other cataclysms. Stop Fossil Fuel Subsidies (Stop FFS) was born as a branch of Fireproof Australia but it has its own autonomy and mission, which allowed the collective to join A22 international network.

Although on A22 website Stop FFS is listed among 'past project', the climate activists group is still active and is proudly taking part in the 2020s new wave of actions involving also cultural institutions.

STOPP OLJELETINGA! – Norway

Started as a campaign of Extinction Rebellion Norway during winter 2022, Stopp Oljeletinga! has since then evolved into an independent organization affiliated with the A22 network. Its primary objective it to urge the Norwegian Government to stop oil exploration and establish a comprehensive employment plan to re-locate current oil

workers in alternative sectors (Extinction Rebellion Norway, 2022). Notably, Norway is the seventh larger exporter of carbon dioxide and the government is currently following a philosophy of "developing not liquidating" the oil industry (Stopp Oljeletinga, 2023). Projections from Norwegian Petroleum (2023) anticipate a growth in both gas and oil extraction in the upcoming years, with a preference for the former over the latter due to the rising demand of gas in Europe after Ukraine War broke out.

Despite its affiliation with the network, Stopp Oljeletinga has not received any financial support from the Climate Emergency Fund. Consequently, the organization has recently launched a crowdfunding campaign on Chuffed to be able to finance actions and legal assistance for activists fined or prosecuted. Unfortunately, since it has been launched it has obtained only kr 5,400 ($ 513.78), far from the goal of kr 100,000 ($ 9,514.50) by October 2023 (Chuffed, 2023). The October deadline has been set to coincide with a major collective action planed by the organization during that month.

2.2.4 Other relevant Climate Change activists groups for 2020s wave

A22 is not the only protagonist of current events, following its example other networks and independent groups has decided to attack museums and cultural sites to gather bigger attention and finally have their claims brought to newspapers front pages.

CLIMATE DEFIANCE – The U.S.A.

Established in Washington D.C. in mid-2022, much like the other groups, this collective is primarily formed by "young, livid, no-longer-willing-to-be-disposable" Americans (Climate Defiance, 2023). They are advocating for the cessation of fossil fuels extractions, exploration, and leasing in the Unites States. The initial objective of the collective is contrasting the Willow Project in Alaska, a venture expected to produce over than 600 million barrels, thereby endangering local wilderness (CEF, n.b. b). Currently, the collective has supporters in Washington D.C., Chicago, Pittsburgh, Boston, New York, Ohio, and Minnesota.

In addition to its aim of halting fossil fuel extraction on federal lands, Climate Defiance's mission also encompasses addressing climate injustice, aiding communities most severely

affected by environmental issues, and elevating climate change to the top-three priorities of American Government's agenda. To make themselves heard, members of the collective are prepared to employ disruptive actions and mass turnout, always in a non-violent philosophy.

Climate Defiance privileges tactics like barricades on highways, marches, and shutting down conferences and highbrow events. It is worth noting that, while they never appeared to be interested in attacking cultural heritage sites and museums' collections, Climate Defiance participated in a wave of protests defending The Degas Two in June and July 2023.

EXTINCTION REBELLION – International

Extinction Rebellion (XR) has already been mentioned several times in this research as an exemplary model for newborn climate activist organizations. Spontaneously risen in the United Kingdom in May 2018, XR is described as "the result of academic research and mass engagement" conceived by Roger Hallm and Dr Gail Bradbrook (Extinction Rebellion UK, 2023). The collective has rapidly spread world widely leading to the creation of local semi-autonomous groups. As of August 2023, their website lists 88 countries, 1029 groups, and 88 upcoming events (XR, 2023).

Always on their website, it is possible to find their annual report (XR, 2023) summarizing their statute, demands, principles, actions and their associated outcomes, and even a financial appendix. As stated in this paper, the collective is "a decentralized, international and politically non-partisan movement using non-violent direct action and civil disobedience to persuade governments to act justly on the Climate and Ecological Emergency". Likewise all the previous organizations mentioned in this chapter, the key aspects of the movement are 'non-violent' and 'civil disobedience', part of a long history of social protests dating back to world changing personalities such as Suffragettes and Gandhi. Furthermore, XR anticipated the A22 network in its international and decentralized leaderless structure, facilitated through social media and online connections, ensuring inclusivity for adherents who aligns with the movement's 10 principles. In this regards, XR did not pioneer any novel concept: global outreach had already been achieved by movements such as FFF a few years prior.

Considering XR's demands, there is a lack of a specific concrete objective; instead, there is a general imperative to tell the truth about climate change, prompt immediate action reach Net Zero by 2025, transcend national politics, and mobilize 3.5% of global population. The last goal draws inspiration from 20th-century movements, which reached that level of mobilization and were able to subvert governments.

In October 2019, two disruptive actions took place during XR's International Rebellion, a 15-days international campaign that drew 30,000 participants to London alone (Townsend, 2019). On October 15, 2019, Gail Bradbrook broke a window pane at the Department for Transport building to held a speech questioning how the expansion of roads and airports aligns with a net-zero target. Two days later, on October 17, 2019, XR activists targeted railways and train stations *en route* to Canary Wharf financial district. Tragically, these actions resulted in activists being assaulted by irate commuters, with videos of the incidents going viral on major social media platforms. Despite the leaderless autonomous structure of the network being perceived as a key factor in its success, the anarchy of fall 2019 events led many members to rethink the effectiveness of such hierarchy-less structure (Fotaki and Froruoghi, 2022). Consequently, a lot of activists decided to part ways with XR, deeming it too radical and at times inconsistent with its ideal of non-violent protest. Looking for more serene diplomatic forms of protest, former members helped national communities on an international scale to develop new networks and collectives, with the most notable being the A22 network itself.

In an open letter to XR (Wretched of The Earth, 2019), activists belonging to discriminated racial communities and minorities shared their concerns about a strategy not feasible for people who risk to be arrested on a daily basis and do not benefit of white privileges. Calling on XR to rethink its strategy, the letter shed light on an internal division between 'privileged' activists and 'discriminated' activists, where the division is almost always a matter of ethnicity.

Because of their willingness to be arrested and even imprisoned, similarly to 1961 mass arrest of the Committee of 100[26], XR's members are seen as 'environmental fanatics' (Murray, 2022). Lawsuits and bails are expensive, however XR Global Support, the international division of the network, is able to fund all XR national divisions. As 2022

[26] The Committee of 100 was an anti-war group active in 1960s. The names comes from the 100 public signatories to stop nuclear weapons implementation.

report states, in 2022 the income surpassed £ 288,000, mostly coming from crowdfunding campaigns and donations by Patagonia, Pulp Films, and CEF.

Currently XR is leading a second wave of protests inside cultural institutions after A22 network slowed down because of governments' legal actions against the participants.

FUTURO VEGETAL – Spain

Futuro Vegetal is a collective of civil disobedience advocating for a drastic change in humankind eating habits, proposing a transition to a plant based diet. Livestock farming is well known for being one of the biggest causes for greenhouse gas emissions and deforestation (FAO, 2006 and Welch, 2019). Furthermore, the meat sector in Spain, the fourth most important in the country, is a multi-billionaire business that, however, is concentrated in a few hands, to be precise four families controls the five most important conglomerates (Espallargas, 2022). Therefore, not only the sector is one of the biggest polluters but also contributes to wealth distribution disparities. Following evidence provided in PLOS[27] Climate 2022 report (Eisen and Brown, 2022), Futuro Vegetal wants to stress the incredible impact the reduction or elimination of livestock farming would have on greenhouse emissions world widely: complete stabilization of CO_2 emissions for 30 years, >50% reduction of N_2O emissions, and almost complete elimination of N_2O and CH_4 atmospheric exceeding presence by 2100.

"Promote socially and ecologically responsible alternatives based on plants to face the necessary change in agri-food system"[28] (Futuro Vegetal, 2022b). This is the demand for Spanish government, taking part explicitly in the second and third cause of Extinction Rebellion, respectively *Act Now* and *Go Beyond Politics*, and in the zero cause of XR Spain, *Climate Justice*. Indeed, Spain in facing a sequence of droughts with a crop losses tripled in 50 years affecting food self-sustainability and, consequently, the agricultural sector finance. On the other hand, Spain has the largest livestock population in the EU, reducing croplands and wild vegetation. Talking about consumptions, the average

[27] Public Library of Science
[28] original: "que ermine con las subverciones a la ganadería y las emplee para promocionar alternativas social y ecológicamente responsables basadas en plantas para afrontar el necesario cambio de sistema agroalimentario" (Futuro Vegetal, 2022)

Spanish consume is 275 grams of meat per day, when international recommendations set the limit on 300-350 grams per week (Greenpeace, 2020).

On the organizational level, unlike A22 network groups, Futuro Vegetal presents a clear organigram with distinctive offices and precise roles. In particular, there are nine *Groupos de Trabajo* (tr. work groups) dealing with communication, finance, education, office, external relations, action, legal aspects, strategy, and mutual support.

The most significant action undertook by the organization is undoubtedly the letter sent to the Government on March 11, 2022, where they asked to enhance plant-based transition providing scientific evidence to sustain their cause. The letter was addressed to the President of the Government, the Ministry for the Ecological Transition and Demographic Challenge, the Ministry of Consumption, the Ministry of Agriculture, Fisheries and Food and the General Directorate for Animal Rights. On March 13, 2022 the Ministry of Agriculture replied recognizing the extreme situation Spain is experiencing, but they let understand how the Government still wants to favor economic benefit over citizens and global safety. (Futuro Vegetal, 2022a) After the Government's reply and the aggravation of climate conditions in summer 2023, Futuro Vegetal's actions got more impactful: the collective vandalized luxury properties of wealthy people, such as sports cars (July 15, 2023), yachts (July 16, 2023), and private jets (July 14, 2023), created barricade along motorways, and sabotaged fast food chains shops, among which the internationally known McDonald's (June 20, 2023), KFC (July 12, 2023), and Burger King (June 11 and August 11, 2023). Along with that, the group is still targeting Government offices headquarters, spraying colored paint on the façades and laying on the ground 'dead' to simulate the faith of humanity if concreate actions will not be taken as soon as possible (Futuro Vegetal, 2023).

STOP FRAKING AROUND – Canada

Stop Fraking Around (SFA) is one of many anti-fracking movements risen all around the world since 2010, when Josh Fox[29] released the documentary *Gasland* denouncing the

[29] Josh Fox is an American film director and playwright involved in environmental activism. *Gasland*, his most famous documentary, was nominated for the Oscars and won the Emmy in 2010.

impacts of fracking[30] on both society and environment. Researches has shown how fracking can cause groundwater and surface water contamination, air pollution, noise pollution, and even earthquakes (Meng, 2017). On people's health side, chemical, physiological, and psychological effects have been found in the communities that lives around fracking sites (Kovats *et al*., 2014).

In Canada, fracking was firstly used in Virden, Manitoba in 1951, and in 1953 in Alberta, to access the great oil reserves in Pembina oil defiled, inaccessible without hydraulic fracturing. Since then, more than 200,000 wells have been fractured in Western Canada (Minkow, 2017) to extract both gas and oil, ensuring the country the second position for drilling sites, 345 in 2015, right after the United States (BOE Report, 2015).

Funded in August 2022, the collective is active in Canada, but sustains environmental causes all over the world. It demands Canadian Government to end fracked gas, both production and distribution, starting with the immediate cancellation of the Coastal GasLink Pipeline, affecting First Nations' territory without their permission or any form of compensation. Vancouver group further demands to stop heating buildings with fracked gas by 2025, taking advantage of the special jurisdiction of the city that can determines its own building code. Lastly yet importantly, SFA requires a People's Assembly to let Canadians decide on the national transition away from fossil fuels (SFA, 2022).

The collective cooperates on a daily bases with other activist groups, for civil rights, climate change, animal protection, and social justice. Therefore, it was not surprising when in November 2022 they followed Just Stop Oil example and brought the protest inside museums, challenging the public opinion with the question "art or life?". Unfortunately, SFA official website is not accessible without credentials, so information about demands, mission, and action undertaken are limited to what they have shared on their social media accounts.

THIS IS RIGGED – Scotland

[30] Fracking: "a method of getting oil or gas from rock by forcing liquid and sand into rock". The liquid is composed by water and lubricant chemicals and is pumped under great pressure into a well, to break the rock strata and release gasses. (Collins, 2023)

Scotland has one of the highest potential for renewable energy production in Europe, almost 10% of wave power and 25% of offshore wind. Although in 2019 97.4% of electricity generation in the State came from renewable sources (House of Commons Scottish Affairs Committee, 2021), the real potential is still unutilized. Indeed, it was estimated that only the area around Orkney, Shetland and the Western Isles can provide for 50% of the U.K.'s total energy demand. At the same time, 97% of oil extraction in the United Kingdom happens in Scotland, where 1 in 3 Scots cannot afford energy bills (CEF, n.d. b; Crowdfunder, n.d.). A contradiction that highlights a situation of deep climate injustice and lobbing: it is more financially convenient to extract fossil fuels than producing wind or wave power, but the wealth distribution is highly uneven and local populations are forced to live in an irreversibly damaged and polluted environment.

Eager to react to British Government's reckless politics, a collective of young Scottish gathered together at the end of 2022, following the example of many other groups formed earlier the same year. They claim Scottish Government to stop all new fossil fuel projects and to develop an agenda for the complete transition to renewable energy sources, re-locating former oil and gas workers.

A characteristic of this group is the artistic presence, which distinguishes it from any other analyzed in this paragraph and put it into ideal connection with Art Not Oil campaigns. The collective website, its flyers, posters, and even actions, presents original comics and drawings, which illustrates their ideals and reasons why. This is Rigged even organizes arts days, for the creation of new banners, t-shirts, and comics necessaries for upcoming protests. Everyone can participate, from Art Schools graduated to complete beginners.

On the side of actions, the artistic element in the group has soon led its participants to target museums following the example of the conational Just Stop Oil. Their targets have been accurately chosen for their symbolic power, starting from William Wallace sword (March 2, 2023) to testify their intention to rebel against injustices already attacked by Suffragettes. Their last action involved King Charles III's portrait (July 26, 2023), the symbol of the corrupted and inefficient British political system. Additionally, on June 23, 2023, the group directly addressed the street artist Bansky to join their protests, by substituting the cone on the Duke of Wellington statue, the artist's favorite art piece in the U.K. The action was part of a wider campaign that covered the streets of Glasgow in artistic posters, a clear reference to the *Beauty is the Streets* part of 1968 Paris Uprisings.

2.3 May 2022 – August 2023. 16 months of actions against cultural heritage

Among the forms of protest A22 uses, the most representative and common ones are

- blocking of streets, fossil fuel infrastructures, and train tracks
- spraying of orange – their distinguishing color – paint over luxury brand shops' windows and luxury private properties, such as yachts and sports cars
- attacking artworks inside museums and/or gluing hands to museums walls or monuments

If the first one is nothing new in the history of green activism, and the second is more of a symbolic statement against consumerism and uneven wealth distribution, it was the third point that made the A22 network, and its fellow companions, "the most prominent climate group in their home countries" (CEF, n.d. a). The Climate Emergency Fund also prized how the eleven groups were able to generate more than 23,000 press stories only in 2022, bringing the climate emergency to newspapers' front-pages, headings of broadcast news channels, and especially social media trends.

Acknowledging the lack of a complete list of all the action against art and cultural heritage sites by climate activist groups, this paragraph is designed as a short summary of what happened from May 2022 until the end of August 2023: more than seventy events in sixteen months. An escalation from a few non-coordinated attempts to the highly recognizable and mediatized actions that today have become the face of A22 network all over the world. A tentative list of all the actions is reported in Appendix 1.

Before getting into chronological details, it is important to state again how activist actions inside museum halls, not only for climate reasons, already existed before the new wave, as outlined in Paragraph 2.1. However, what is new is the systematic coordinated *modus operandi* of so many groups all over the world, together with their viral presence and circulation online.

What can be defined as a modern trend of manifesting for climate change started May, 30, 2022 in Paris: an independent activist disguised as an elder woman entered the Louvre Museum and threw a cake at the protecting glass of Leonardo's *Mona Lisa*. Since then some timid attempts of taking the debate into the cultural world started, especially in the U.K., where Art Not Oil protests worked as example for Just Stop Oil. The Last

Generation network joined the momentum especially from Italy, with the globally mediatized examples of the Vatican Museums (August 18, 2023) and the Uffizi Gallery (July 22, 2023).

October 14, 2022 can be considered a major turning point as well as the date in which the world finally recognized the power of the new activist wave: Just Stop Oil activists Phoebe Plummer and Anna Holland threw tomato soup at Van Gogh's masterpiece *Sunflowers* held in London National Gallery. "What is worth more, art or life?", was their simple question yet a clear challenge to the world to rethink its priorities. The painting was not damaged at all as protected by a glass, of which the activists were perfectly aware, demonstrating how they used the masterpiece to gather media coverage not with the purpose of irreversibly destroy it. Since then, mashed potatoes, pea soup, cakes, maple syrup, slime coke, flour, fake blood, and oil-like or orange painting have been thrown at artworks and sculptures, while charcoal and fluorescent substances have been used in fountains. However, the most symbolic and used action is gluing hands to museum walls, painting frames, or sculpture basements, clearly recalling environmental actions of activists chaining themselves to trees and excavators to stop deforestation.

October and November 2022 have been the most 'hot' months in A22 protest, counting eighteen actions in ten different countries, spread over three continents. The rapid escalation – from May to September the total was only of fifteen actions – forced museum directors and governments to take action in name of cultural heritage security (see Paragraph 2.3.1 and Paragraph 2.3.2). New laws have been designed to prosecute activists while enhanced controls and security system have been implemented to avoid new episodes. Moreover with the 'cold season' approaching the Northern Hemisphere, where climate activism is more located, protests inside museums slowed down considerably, with just a couple of actions a month world widely.

A further turning point can be identified with the arrival of Extinction Rebellion, known for being less diplomatic and more extreme, if not violent, in its protests. On April 27, 2023 two activists of Declare Emergency! were arrested and federally charged for throwing fake blood at Degas' *The Little Fourteen-year-old Dancer* in the National Gallery of Art in Washington D.C. . Their charges carry up to 10 years detention and a maximum fine of $ 500,000 , while the actual damages regarded only the protective case, worth not more than $ 2,400. Soon after the news about the charges disproportion with

facts, #FreeTheDegasTwo was launched to protests against a governing class more interested in punishing climate activists worried for the planet than oil multinationals actually destroying everyone's future. Since then, more protests have been carried out in major U.S. museums causing a second international wave. Indeed, between June and July 2023 other eighteen actions took place in museums or cultural heritage sites, after months of absence.

Figure 1 graphically shows the chronological distribution of actions between May 2022 and August 2023, combined with geographic trends from the most significant protagonist in climate change actions: Germany, Italy, the U.K., and the U.S.A. On the other hand, *Figure 2* reports the total number of action for each country. For simplification, the protest in Vatican Museums (Vatican City) has been counted together with the Italian ones.

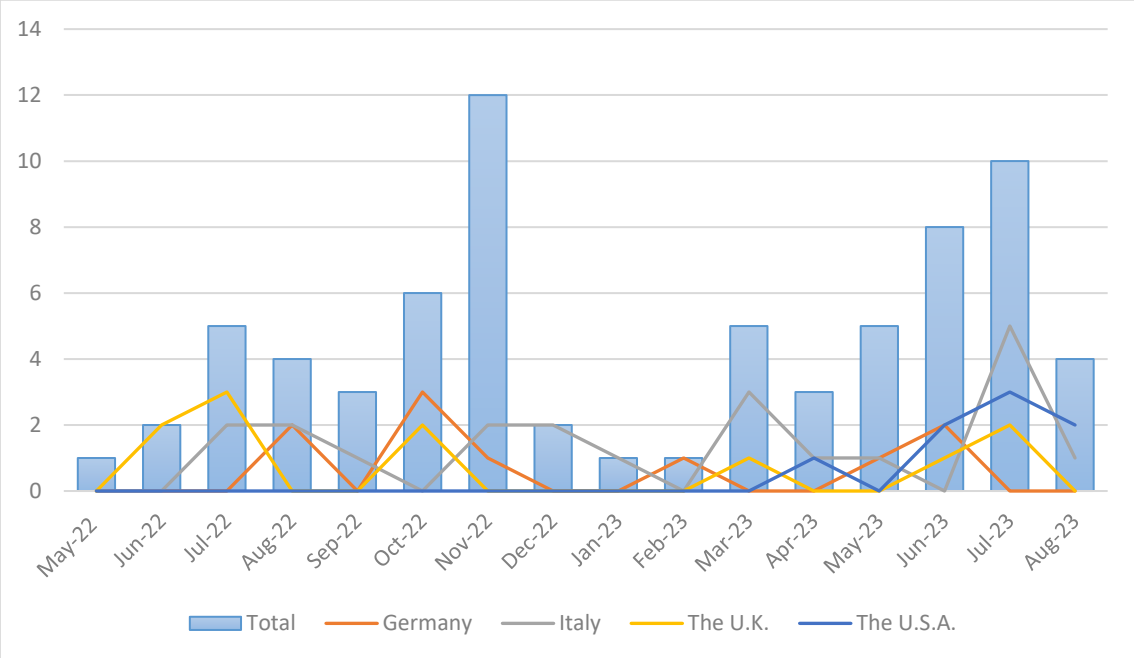


Figure 1: Number of heritage-related climate activist actions happened in the world each month between May 2022 and August 2023 with focus on the trends in Germany, Italy, the U.K., and the U.S.A.

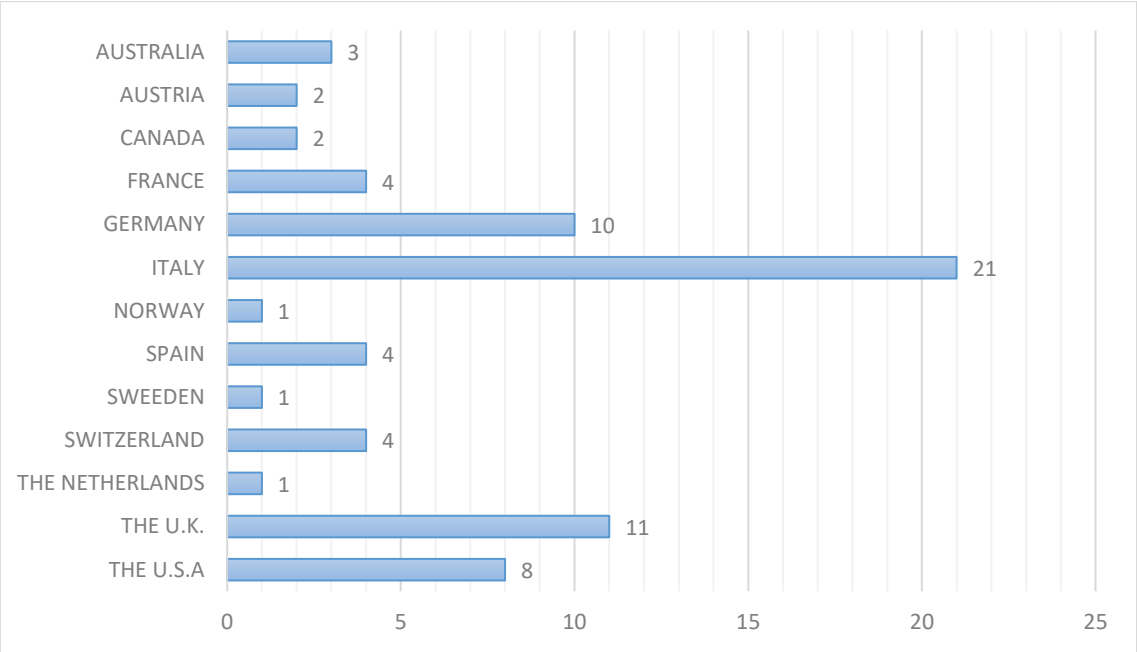


Figure 2: Number of heritage-related climate activist actions for each state between May 2022 and August 2023

Although it can be considered the initiator of the new wave approach, the U.K. movement Just Stop Oil stopped manifesting inside museums from November 2022 to June 2023 (with one episode in March led by This is Rigged), a decision probably linked with the strong reprisal the government has adopted against activists. New actions can be expected now that the Prime Minister has decided to approve the North Sea project. As a proof of it activists has already wrapped his house in black cloth.

Germany, instead, was a crucial protagonist in the first apex (August – November 2022), had an episode in February and is now going through a new chapter of protests because of the intervention of Extinction Rebellion.

Italy, on contrary, never underwent a complete silent moment. Unexpectedly during the climax in fall 2022, Italian activists did not organized a high number of actions. However, Italy represents alone more than 30% of total protests inside museums or related to a cultural heritage site. Indeed, despite the new law approved to contrast ‘eco-vandalism’ (see Paragraph 2.3.1), participants of Ultima Generazione and Extinction Rebellion Italy are still making themselves heard using what Italy is famous for: its art and architecture. Another characteristic of the Italian wave, together with the German one, is that slowly actions moved outside museums but still involve heritage sites, like the Trevi Fountain (Rome), Palazzo Vecchio (Florence), and San Marco Basilica (Venice).

Finally yet importantly, the U.S.A. are the latest addition to the scene. However, since the first performance in April 2023, American activists have been extremely involved due to the solidarity towards The Degas Two. It should be said that art in the Unites States is lived differently respect than in Europe: it is a niche sector privately led that is not as pervasive and identity shaping as in the Old Continent. Moreover, as previously recalled, the United States are struggling with other urgent crisis, like homelessness, racism, and housing prices rising, that are absorbing government's and activists' attention.

2.3.1 Legal consequences for the activists

All around the world, actions against cultural heritage are condemned on both the ethical and the legal level. On the most tragic extreme, the attack and damaging of buildings related to art or religion is considered a war crime by the International Criminal Court (ICC) (ICC, 2011). Considering the much less dramatic circumstances of the 2020s activist wave against the cultural heritage, militants involved have been immediately taken into custody by local authorities, who sometimes arrested and sued them. This paragraph recalls the main lawsuits and new law bills designed by the countries most affected by climate change activists' protests involving cultural heritage, underlying the different approaches Germany, Italy, the Vatican, the U.K., and the U.S.A. uses to judge activists.

Germany Parliament is currently divided between who consider necessary to design harsher penalties for climate activists' actions (the conservative CDU/CSU[31] party group), and who believe that *ad hoc* penalty laws should be avoided especially in situations of civil strikes. Moreover, as some members of the Federal Constitutional Court has underlined, the State has a legal obligation to protect its citizens from climate change, therefore the German Federal Republic is acting unlawfully by sustaining polluting activities (Kyllmann, 2023). Despite the desire of a share of the political and civil scene, no penal proceedings for incarceration have been initiated against any activist yet. Nevertheless, some of the protagonists of the main actions have been fined thousands of euros for the damage of public property. As an example, the case of the couple who glued

[31] CDU: *Christlich Demokratische Union* (tr. Christian Democratic Union). CSU: *Christich Soziale Union* (tr. Christian Social Union).

their hands to Raphael's *Sistine Madonna* on August 23, 2022. The painting is hung in the Gemäldegalerie Alte Meister in Dresden and was not damaged by the action, however the frame needed special treatments to remove the glue. Resulting in a property damage of around € 2,300, the protest costed the activists a fine of € 1,500 each and they have been banned permanently from all fifteen of Dresden State Art Collections Institutions (Solomon, 2023; MDR Saxony, 2023).

Italian Government's reaction has been firmer and harsher. Since November 2022, three *disegni di legge* (tr. bill) have been voted by the Parliament to modify existing acts implementing strict regulations regarding the damaging of art and cultural heritage. On May 11, 2023 the Senate have approved the bill S.693 presented by Gennaro Sangiuliano, Italian Minister of Culture, after it had been merged with bills S.364 and S.645 (Senato della Repubblica, 2023a). It is composed by four articles. Art. 1 introduces new regulations in matter of "destruction, dispersion, deterioration, defacement, soiling and illicit use of cultural and natural heritage"[32] (DDL S.693/2023, art.1) that has to be added to the already existing penal regulations. Depending on the gravity of the damaged, activists can be fined from €10,000 up to € 60,000, a sum that would be refund to the Ministry of Culture for the restoration of the damaged goods as first. In addition, art. 4 enlarges art. 639 of the Italian Penal Code, by introducing penal (reclusion from 6 months to 1 year) and administrative (fine from € 300 to € 1,000) consequences for whoever perpetrates the previously listed actions on cases, glasses, or similar protective elements (DDL S.693/2023, art.4). Such a merciless reaction is defined by the promoters of the bills as the only way possible for public authorities to contrast the increasing number of episodes in which Italian cultural heritage is damaged by activists or careless tourists. As reported in the presentation folder of bill S. 645 by Marco Lisei, in the past year someone tried to drive a Maserati SUV down the Spanish Steps (Rome), someone else drove a scooter in the Archeaological Park of Pompei (Naples), a third one decided to water-ski in the Grand Canal (Venice), to conclude with the man who wrote on Redentore Church's façade (Venice) mimicking activists' protests (Senato della Repubblica, 2023b). The bill is currently waiting to be analysed and approved by the *Camera dei Deputati* to be finally enforced as law.

[32] Original text: "*distruzione, dispersion, deterioramento, deturpamento, imbrattamento e uso illecito di beni culturali o paesaggistici* " (DDL S.693)

Although the new dispositions in Italy, the harsher condemn to some members of Ultima Generazione came from the Vatican Court. After months of hearings, Guido Viero and Ester Goffi have been condemned to nine months of imprisonment, € 1,500 fine and € 21,148 compensation for the damaged caused by their protests in August 2022, when they glued their hands to the pedestal of the sculpture *Laocoon and His Sons* (Di Bussolo, 2023). Catia Summaria, the Prosecutor for the Vatican, had requested € 3,000 fine each and two whole years of imprisonment, however the court reduced the sentence because the restoration work has costed 'only' € 3,148 over the extimated € 150,000 (Ho, 2023). Additionally, the damage provoked by the activists cannot be estimated precisely as the authorities decided not to use the solvent brought by Ester, which could have caused unnecessary additional harm to the sculpture. Currently the execution of the sentence is suspended for 5 years, but the two has still to pay the compensation and the legal expenses. Ultima Generazione wrote a letter directly to the Pope asking for his intervention in defence of Guido and Ester, and symbolically of the climate change activism. Although the Pontifex has already expressed his concerns for the climate crisis and his admiration for activists' actions, he never replied leaving a sense of defeat and betrayal in the group.

On the British side, a unique generalizing analysis is more difficult to be made. Each event has been judged by local courts with different results according to the sensitivity to the climate crisis theme of the judge themselves and the real material damage to artworks. In an interview with *ARTnews*, the lawyer Fait Farhat commented about the lenient sentence received by the activists who on June 2022 attacked Constable's *The Hay Wain*. Despite the prosecutor asked for jail time and a fine in the order of thousands, the court decided for a compensation of £ 515 each, the exact cost of the restoration. According to her, the crucial point of this process was the argument about the freedom of speech: activists did not permanently damaged the painting, which went back on view after a few days, they just used it as a way to gather the widest resonance as possible to engage and enhance public debate around climate crisis (Escalante – De Mattei, 2022). Differently, Phoebe Plummer and her companions were granted bail after their arrest for throwing soup at Van Gogh's *Sunflowers*. The girls who conceptually initiated the storm of actions is still waiting for her trial on July 2024, up until when they are restricted to enter any gallery or museum (Blake, 2023). Although they are not related to any museum action, two further cases should be mentioned, as they are crucial to understand the fractured

front of British Institutions in legally addressing climate activists. The first one involves two JSO members who last March have been found guilty of disruptions without being allowed to mention climate breakdown in their defence (JSO, 2023b).The second case, on contrary, saw the judge himself apologising for the inevitable conviction stating that activists "should not feel guilt for nothing" (JSO, 2023c). Two profoundly different results determined only by the judge personal position in matter of climate activism.

The most recent but also the one with the biggest consequences is without any doubt the case of the already mentioned Degas Two. As previously reported in Paragraph 2.3.1, two activists were found guilty after throwing fake blood at the protective case of Degas's *The Little Fourteen-year-old Dancer* and federally charged of up to five years detention and a maximum fine of $ 500,000 ($ 250,000 each), when the material damaged was limited to $ 2,400 (Porterfield, 2023). The federal accusation are alleged defacing of an art exhibition and conspiracy to commit an offense against the U.S. State while causing injuries to the museum property. The sculpture was not damaged, but it was removed from public view for thirteen days (Small, 2023). Such a punitive decision is willingly disproportionate if compared with both the material damaged provoked and the sentences previously analysed from other countries. Absurdly, as commented by Stu Waldman, a Rise & Resist member, The Degas Two would not have been charged so harshly if they had been graffiti artists. According to experts and other activists, the court's decision is unjustifiably harsh, based more on their motivations than on the action itself: a deliberate act of intimidation to disincentives climate activist protests especially inside museums. Indeed, the action against the little sculpture was the first significant one in the U.S.A., which missed almost completely the first wave in fall 2022. Currently activist groups from all over America are organizing more actions to protest against the system; the most relevant one on July 9, 2023 when they shut down eight halls at the Met, New York City. Moreover, they have launched an online petition asking the U.S. District Attorney following the case to drop the charges. The States again demonstrate to prefer chasing profit and defend climate criminal to defend citizens' health and wellbeing (Dafoe, 2023).

2.3.2 The reaction of the Cultural Sector

After the rapid succession of protests in October and early November, with activists attacking artworks directly, on November 11, 2022 ninety-two museum directors from some of the most important institutions all over the world signed a statement released by the International Council of Museum (ICOM):

> *"In recent weeks, there have been several attacks on works of art in international museum collections. The activists responsible for them severely underestimate the fragility of these irreplaceable objects, which must be preserved as part of our world cultural heritage. As museum directors entrusted with the care of these works, we have been deeply shaken by their risky endangerment.*
>
> *Museums are places where people from a wide variety of backgrounds can engage in dialogue and which therefore enable social discourse. […]"*
>
> *(ICOM Germany, 2022)*

Understandably, the greatest concern of directors was artworks conservation (Harris, 2022). Nonetheless, they recalled the function of museums as open forums to debate social issues and express discomfort and desires.

ICOM added to the directors' letter a further statement, mediating between people's environmental anxiety and experts' concerns for collections. Besides acknowledging both sides, it recognized explicitly the ongoing climate crisis and catch the opportunity to re-affirm the role of museums as carrier of "symbolic power and relevance in the discussion around climate change emergency", and as "key actors in initiating and supporting climate action", to be seen as allies in the fight for climate justice and environmental sustainability (ICOM, 2022b).

Eike Schmidt, director of the Uffizi Gallery, released an interview in occasion of the directors' letter publication, stressing again the shared opinion according to which activists are using art not only as a great marketing catalyst. Indeed, art is commonly understood as "an authority, like the State", however, it has a greater impact on society because "it is something more: it is part of life" (Scorranese, 2022), as well as everyone's culture and identity: there are artworks that represents entire historical periods, others that shapes a community uniqueness. Despite its carnal deep bond with reality and life, art has been idealized and abstracted to the point that it turned into Art, made by economic value

and fame. Even if in very different ways, both Eike Schmidt and climate activists are trying to take art back to its solid material realm, to its interdependence with social and environmental conditions. There could be no art on a dead planet, there could be no artistic value if humankind stopped existing. However, there could not be scientific critic reasoning without art and culture.

On their side, artists has had a key role in the climate emergency debate since the very beginning, even before the term was invented. Due to their higher sensibility, as well as an incredible attention for details, artists has always engaged with the natural world, its threats, and its needs. Artists from slums started using trash, artists from rain forests addressed deforestation, the ones belonging to regions exploited for resources extraction documented the 'before and after'. Therefore, it should not be a surprise knowing that even artists took part in the 2020s activist wave, recognizing how their art potential could be a catalyst for the debate. In other cases, it was the activist collective itself to address groundbreaking artists to join the protest (e.g. This is Rigged with Bansky). This niche of environmentally engaged and creative people is known as 'eco-artist' and it is getting more and more numerous because of the success their creations have among collectors, exhibitions, and publics.

On October 19, 2022, Andrea Crespi, an Italian physical and crypto artist, willingly vandalized one of his latest creations throwing Campbell's tomato soup at it. The performance clearly refers to Just Stop Oil attack at Van Gogh's *Sunflowers* happened just two days before. To make it impossible to misunderstand the reference, he added as location the National Gallery of London in its Instagram post. Crespi wanted to question the thin division between art and vandalism. Most importantly, he tried to talk to climate activists and try to make them understand that, as written on the art piece, "vandalizing art will not save the world", instead art itself will (Crespi, 2022). The power of art, his performance, can amplify a message, make it understandable by a larger public, and strengthen its emotional impact. His action can be interpreted as an attempt to redirect collective efforts towards the real topic, while media coverage is focusing only on the activists' action and the risks for arts, forgetting about activists' reasons.

Not only artists, but also cultural institutions decided to react to recent events and activists' call to action, understanding the urgency of fighting climate change.

Already in 2019 a group of artists, galleries, museums, and cultural workers mainly from London gave life to the Gallery Climate Coalition (GCC), to "develop a meaningful art world response to the climate crisis" (Gaskin and Moldan 2021). At present time, the coalition is an international charity of 231 artists, 210 art sector businesses, 316 galleries, 192 individuals, and 271 non-profit institutions (GCC, 2023). They are advocating and acting to facilitate the reduction of CO_2 emissions in the art sector by at least 50% by 2030, as well as near-zero waste operability. Using the sector's ability to thrive under pressure, adaptability, and transversal skills, the coalition provides sector-specific sustainability guidance, lobbying for systemic change, and fundraising initiatives to support frontline environmental initiatives (GCC, n.d.). On their website, they provide guidelines to reduce emissions in different areas of cultural organizations' daily activities, researches about hot topics, suggestions about ethical financing policies and sustainable shipping, as well as an entire page with member institutions' carbon reports. All these tools are an example of how the cultural sector is able to share expertise and resources internationally, using everyone's specific talents to reach a common goal in an as transparent as possible way.

Although GCC activity is undoubtedly pivotal for the sector ecological transition, through scientific evidence and concrete examples of best practice, it is directed to people already involved in cultural activities, workers, institutions, or even just curious. The larger share of population is not included in the network's activities and is hardly conscious of its own existence. In order to raise awareness among 'normal' people from any background, ethnicity, age, and gender, and respond at the same time to activists call to action, the cultural sector should do a step further and use its most powerful resource, art, to communicate on a larger scale the urgency to act now to contrast the climate emergency. Certainly, the new ICOM definition of museum[33] gave institutional recognition to a long forgotten role of cultural institutions: fostering sustainability while operating in an ethical way with the communities' participation and delivering educational experiences as well as enjoyment (ICOM, 2022b).

[33] ICOM museum definition 2022: "A museum is a non-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment , reflection and knowledge sharing" (ICOM, 2022b)

Reasoning about recent events and the new definition, Irene Popoli (Museum Strategy Consultancy, 2022) underlined how the encounter between art and publics should not be 'art for art's sake', instead a message should be communicate, and nowadays there are topics that cannot be ignored anymore. In her analysis, she took into consideration examples of museum activism on three major themes, women rights and freedom, LGBTQIA+ rights, and the climate emergency. These institutions demonstrated a reactive and proactive attitude, recognizing and responding to hot topics for the publics they are addressing and, more broadly, to 2020s society.

Among the considered projects, Leopold Museum in Wien stood out for its ability to promptly and smartly respond to A22 international network actions. Indeed the museum's halls have been stage for one of the collective's protests, when on November 16, 2022 activists splashed oil over the protective glass of Klimt's *Death and Life* asking for the immediate stop of fossil fuel extraction considered to be a death sentence to society. Immediately after the fact, the museum director Hans-Peter Wipplinger released a statement sharing activists' concerns for the climate emergency; however, he said, attacking works of art is not the right way to implement the targeted goal of preventing the predicted climate collapse (Wurmitzer, 2022). Andrea Mayer, Austria's Culture Minister, stepped in the debate, sharing Eike Schmidt already mentioned opinion that art and culture should be seen as allies and not enemies. Following the storm of attacks in Austrian and German museums, visitors are no longer allowed to carry bags or jackets with them during the visits to prevent any attempt to bring substances inside the exhibition halls. Nonetheless, Leopold Museum decided not to limit its interventions to the protections of artworks, instead it stood up to support the climate activists' campaign. On March 22, 2023 the museum together with Climate Change Center Austria[34] (CCCA) opened *A Few Degrees More (Will Turn the World into a Uncomfortable Place).* The exhibition run without any announce or title for an entire week, leaving visitors interdicted about why some of the masterpieces of the collection appeared tilted. The idea behind the project lays on problematic communicability of the dreadful effects of a temperature rise above 1.5°C. Therefore, curators decided to translate Celsius into geometric degrees, tilting paintings of landscapes by the exact temperature change that would affect the depicted area if nothing changes (A Few Degrees More, 2023). Although

[34] From Climate Change Centre Austria website (2023) "CCCA is a network agent and mouthpiece for Austrian climate and climate impact research as well as contact for climate change issues"

being an overall success prized by activists themselves, some experts and activists still thought it was not sufficient. Among them, Claudia Michl, CCCA's Head of Office, who pressed for further action and collaboration, with art institutions and artists working as bridges between scientific research and people (Bregam, 2023).

Following the steps of Wien, the University of Reading decided to project the *Climate Stripes* graphics on Dover White Cliffs in occasion of #ShowYourStripes 2023. The initiative started in 2019 and has been repeated since then every June 21. It invites people from all over the world to print, re-upload, share, even wear Professor Ed Hawkins's infographics. The model (*Figure 3*), designed in 2018 and constantly updated, vividly depicts how global average temperatures have risen for the past two centuries (Metag, 2020). The UK-based University decided to choose as set for its performance one of the national most treasured natural heritage, which is suffering the effects of climate change severely, with a registered erosion rate ten times higher than the past thousand years (Borg, 2021). Other organizations and public institutions joined the protest and lighted up their headquarters façades or monuments with the Climate Stripes, among the improvised projection screens Tate Modern's chimney in London (U.K.), CN Tower in Toronto (Canada), and Ben Franklin Bridge in Philadelphia (U.S.A.) (University of Reading, 2023). Professor Hawkins express his enthusiasm of the extensive use of his model, designed exactly with the purpose of making raw scientific data and statistics understandable and visible for anyone. However, also in this case the initiative aimed at spreading knowledge about what is currently happening, without giving people any answer or advice.

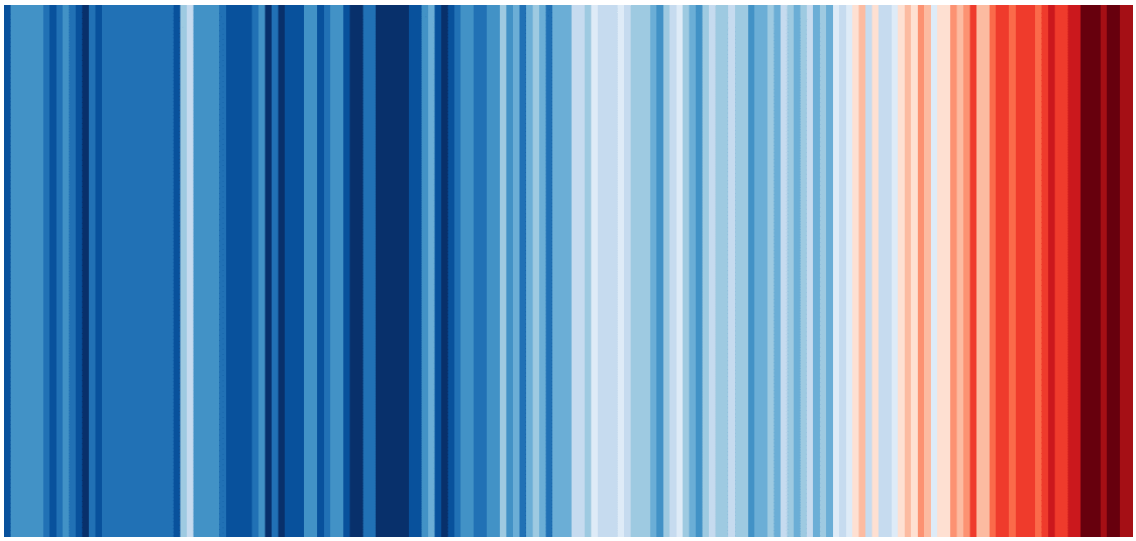


Figure 3: Climate Stripes *infographic updated in 2022*

Finally, *Dear Earth: Art and Hope in a Time of Crisis*, a project that is still running in Hayward Gallery, at Southbank Centre (London). Opened June 21, 2023, it includes art works by fifteen contemporary artists dealing with the ongoing climate emergency. Moving a step forward from what done by the Leopold Museum and the University of Reading, Hayward Gallery developed a project around a renewed sense of connection with nature, inviting people to reconsider the role art can play in the climate change debate (Kubrick, 2023). *Dear Earth* is only one of the many initiatives Southbank Centre has organized for its Summer Program, named *Planet Summer*, which advocates for a joint reaction to the climate crisis. This ambitious palimpsest echoes *Back to Earth*, an ongoing series in Serpentine Gallery (London), involving different arts, media, researches, and installations, all trying to investigate the common question about how art can respond to climate change. Lucia Pietroiusti, Head of Ecologies at the Serpentine Gallery, expressed her concerns about the rising diffidence museums have towards the public, fearing new attacks to their collections. According to her, rising barriers and getting more defensive cannot and must not be cultural institutions' response to a clear expression of discomfort from their public. They, instead, should break down barriers, sharing each other's skills, resources, desires, fears, and shames (Kubrick, 2023).

CHAPTER III: *THE COOLING SOLUTION*, HOW ART CAN BRIDGE THE GAP BETWEEN SCIENCE AND PEOPLE

"There is no more neutrality in the world. You either have to be part of the solution, or you're going to be part of the problem"

- Eldridge Cleaver

Academics have always been both the biggest supporters and the harsher criticizers of the activist museum. While artists are predominantly aware of present debates and future challenges, art scholars are more directed towards the past, which is finished and immutable, something they can attribute a value to because it has an history that have proven it. However, art experts are not different from any other professor and researcher; they perhaps are just more scared of leaving the now outdated romantic vision of pure art behind (Galenson et al. 2009).

Has emerged from the literature, science needs art to communicate its discoveries in an engaging, impactful, and understandable way. Simultaneously, art has the duty to participate in contemporary challenges such as green and sustainable agendas. In order to achieve both this objectives, a mutual recognition and an active cooperation between the two parties is needed. Research centers, including museums and universities, represents the perfect environment for these kind of multidisciplinary approaches to emerge.

The Cooling Solution, an exhibition held in Ca' Foscari Esposizioni, Venice, in 2023, is a perfect example of what the collaboration between science and art can achieve. This chapter wants to track back the most significant steps which contributed to its realization, from the very beginning of the research project. Moreover, the team designed two surveys to be submitted respectively online to partners or in person to visitors; the results are here analyzed. Additionally, an overview of the audience's opinion, social media coverage, and press release is provided as well, alongside with the future possibilities for this exhibition.

Data and information have been provided by thecoolingsolution.com, collected *in situ*, or emerged through informal conversations with Enrica De Cian and Jacopo Crimi, respectively head of the research team and responsible for the communication.

3.1 The phases of the project, from theory to art

The exhibition *The Cooling Solution* is only the final stage of a journey stared as a 'normal' scientific research on climate change, energy use, and adaptation techniques. The findings of the project, named EnergyA – Energy use for Adaptation, soon appeared pessimistic even though accurate. Moreover, the scientific papers published by the research team were destined, likewise every article, to a restricted group of readers mostly experts already aware of the ongoing emergency. Therefore, the team decided to take the brave decision to translate the numbers into something more impactful for a wider audience: photographs. Translation as the action to transport meaning from a language to another, allows the exchange of messages between two or more interlocutors through a *medium*, which can be a dictionary, a cultural mediator, or Google Translate. In this case, the language of science and data was able to become the language of people through pictures.

3.1.1 ENERGYA's research project

EnergyA is hosted by Ca' Foscari University in Venice, in the department of Economics, as well as by Fondazione CMCC (Euro-Mediterranean Center on Climate Change) since 2018. The team guided by Professor Enrica De Cian comprises fourteen professionals in economics, environmental studies, engineering, and data analysis of any level, from professors, to PhD students and even prost-graduates[35]. Another cardinal personality is Jacopo Crimi, communication professional at Element6[36], who curated the communicability of the project, its image on the web, the website, and all the graphics and design (Element6, n.d.).

The starting point of the project is the idea that adaptation is one of the major challenges of the 21st century, with energy as a key factor (De Cian, 2018). This project wants to investigate three main spheres, climate change, energy, and adaptation. In particular, how these three elements are intertwined and reciprocally influenced. On their website, the

[35] Members of the team: André FP Lucena, Enrica De Cian, Filippo Pavanello, Francesco Colelli, Giacomo Falchetta, Jagu Dattakiran, Lorenza Campagnolo, Malcom Mistry, Marinella Davide, Paula Borges, Roberto Schaeffer, Sebastian Renner, Talita Borges Cruz, Teresa Randazzo.

[36] Element6 is a design agency for researchers which wants to provide impactful yet understandable and accurate communication plans and audio-visual materials for research projects.

group further explains the direction of the research in each field (Energya, 2023). Specifically, they are collecting climate data to build models to influence climate use, analyzing the impact of climatic factors and socio-economic determinants on energy demand, and, finally, they aim to look for alternatives in the use of energy to support adaptation objectives.

The project lasted 60 months, from March 1, 2018 to July 31, 2023, a quite long duration only slightly influence by the Covid-19 pandemic and the decision to translate the research results into a photographic exhibition realized in parallel with the final articles. Indeed, the planned end date was February 28, 2023.

Figure 4 summarises the main phases of the research, Climate data and energy use patterns contributed, as first, to define a framework of investigation. In particular, data sets of both climate and energy use have been collected in Europe, India, Brazil, Indonesia, Mexico, and OECD[37] during the first year of the research, 2018.

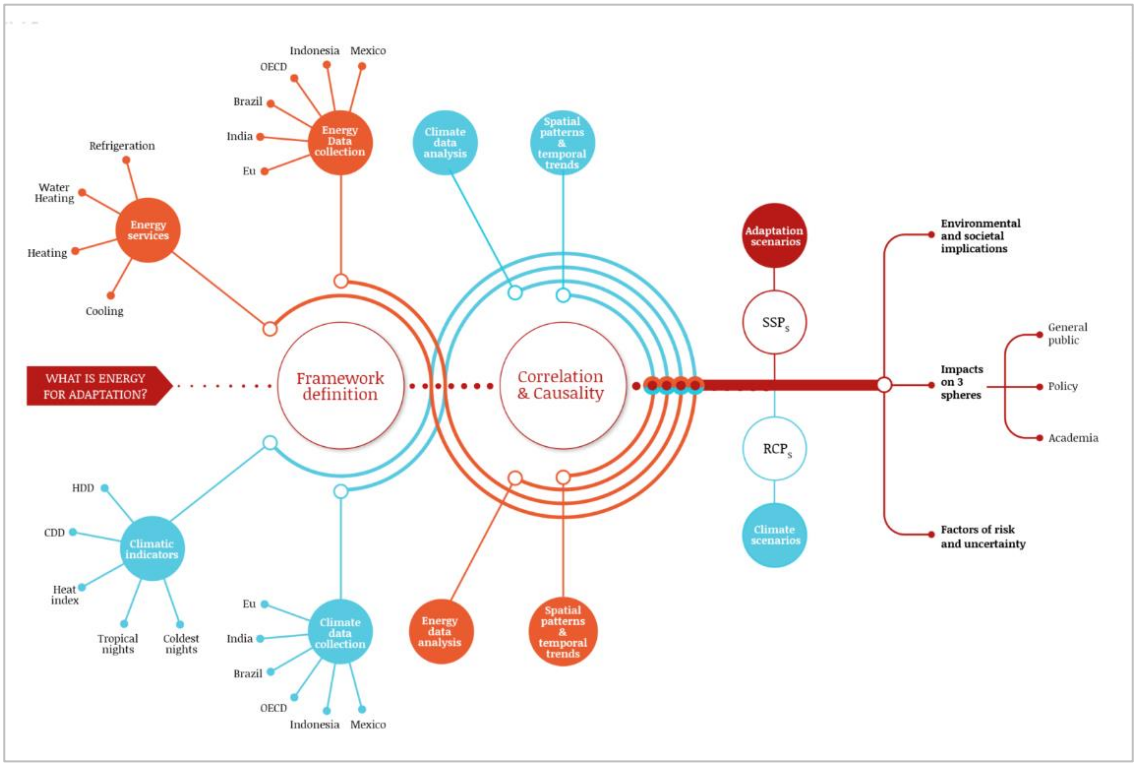


Figure 4: EnergyA research project scheme

Subsequently, data collected were analyzed to highlight correlation and causality among the three factors, especially energy use behaviors in relation to weather shocks in variable

[37] OECD stands for Organization of Economic Cooperation and Development, which works internationally to build better policies to increase life quality. As of 2023, it includes 28 states (OECD, 2023).

conditions. Building on that, the research team develop projections of future energy needs for adaptation, further expanded in 2021 and 2022 considering different variables (CMCC, n.d.).

The entire project is communicated through its website, structured in three main sections, one for each topic, and designed as a blog where the authors can publish insights on their work. Additionally, information from the world about the climate emergency, adaptation techniques, curiosities, and new policies are provided as well.

As of September 2023, the research group released twenty-five scientific articles and one exhibition catalogue, which is the foundation of the exhibition *The Cooling Solution*. Moreover, the catalogue works as a summary of all the other papers, presented in a compelling, impactful, and easily understandable way. Articles encompass, among others, questions about methodologies for adaptation measurement (Colelli *et al*, 2023; Colelli *et al*, 2020), energy demand (Rizzati *et al*, 2022; Davide *et al*, 2019; De Cian *et al*, 2019), projections of the possible impacts of the Paris Agreement (Schleypen *et al* 2022; Campagnolo and De Cian, 2019), the systematic use of air conditioning (Pavanello *et al*, 2021; Randazzo *et al*, 2020), and socio-cultural adaptation methods and patterns in specific geographical areas (Colelli and Mistry, 2022; Bezerra *et al*, 2021; Falchetta and Mistry, 2021; De Cian *et al*, 2019).

EnergyA received funding from the European Research Council (ERC) under the European Union's Horizon 2020 (H2020 ERC Starting Grant) research and innovation program. The project total costs was € 1,495,000 and the entire amount was assigned to Ca' Foscari University of Venice, as the hosting research institute (Università Ca' Foscari Venezia. n.d.).

3.1.2 From theory to art: the photographic project

The idea of a photographic project inspired by EnergyA research emerged at the beginning of 2019: the staff responsible for the communication and the research team noted how their findings had great potentialities to affect public opinion. However, in order to do so, it would be necessary to translate them into something more comprehensible for every person, regardless to their demographic, social, and cultural backgrounds.

The work was a joint effort of the research team, the Department of Economics at Ca' Foscari University of Venice, and THE NEW INSTITUTE Center of Environmental Humanities (NICHE).

In fall 2019, a small group visited India with the intent of taking pictures of the cooling strategies adopted during the hot season. At that stage, there was not a clear idea of an artistic project for an exhibition yet, even if the photographer Gaia Squarci was already part of the team. The most relevant points of this first mission were the decision to register the levels of temperature and humidity whenever taking a picture, and the collection of case studies, examples of best practices and alternative architectures. The takeaways of this experience were major. The team understood the real potentialities of its idea, which evolved in something more articulated: communicating data in an easy way was no more sufficient, there was the need to take a step further and demonstrate that even though the situation is alarming there are alternative options, there is hope. To concretize this ambitious goal, the need an anthropologist emerged. The decision to cooperate with the Antonella Mazzone, professor and researcher at Oxford University, demonstrated a great sensibility and open-mindedness. Cooling solutions alternative to AC have always existed and relies on traditional and cultural components. To understand how heat and humidity affect people's lifestyle and wellbeing in specific areas, a research on the field is essential.

Covid-19 pandemic stopped the project for almost two years, allowing at the same time the group to better design the journey and their objective.

In March 2022, as soon as the borders re-opened, they left for Brazil taking advantage of the little number of tourists to have a more realistic picture of inhabitants' realities. The focus this time was less on techniques and more on people's lived experience, giving voice to the most disadvantaged individuals living in *favelas* and hardly ever benefit from AC systems. The interviewed collected this time were stories of common people, telling about how they survive Brazilian heat especially inside their 'houses' mostly made by sheet metal.

A few months later, in November 2022, the team moved to Indonesia to document a new environment characterized by another kind of weather and traditional vernacular architectures.

The last reality they decided to photograph was Italy. They wanted to provide a European example for multiple reasons. First, depicting a Western country prevented falling into

paternalizing perspectives and stereotypes of the disadvantaged emerging countries. Secondly, it helped the narration to trigger emotional reactions and recollections in the local public of the exhibit, showing how the issue of adapting to high levels of heat and humidity is present also 'here at home' and not just 'there' in realities far from ours.

Over the years, the group was able to gather funds from multiple sources included research centers, among which the European Research Council (ERC). Fondazione CMCC, and the ACTION Marie Curie project added small funds as well. A sum of € 150,000 was provided, a consistent amount for a university initiative but below average for the kind of project realized. Nevertheless, people involved understood the importance of what they were creating and still had to reduce their own cachet to limit expenses.

Once the material was collected, there was the necessity to edit, select, and organize it in a synergic and impactful narrative.

Firstly, in October 2022 a curatorial team was hired, Kublaiklan, specialized in finding new ways to make photography accessible, awareness-building, and science-engaged. Since November 2022, they worked with Gaia Squarci and the rest of the team on the editing process and the selection of contents. Of over 500 pictures post produced, only 107 became part of the exhibition. Alongside the photographs post-production, a great attention was given to accompany each pic with a contextualization and a brief history, based on the interviews and data collected during the missions (*Figure 5*).

Figure 5: Example of information provided for each picture in The Cooling Solution *exhibition catalogue*

The exhibition's narrative and layout were designed starting from working on the catalogue between January and February 2023. In this stage, differences in priorities for each component of the team became visible: the curatorial team aimed at immediacy and attractiveness, the photographer focused on the aesthetic juxtaposition of images, while the scientific side wanted to give more relevance to data and information. Nonetheless,

they agreed on the role of catalogue as summary of all souls of the project and not only of the artistic display. The goal was summarizing EnegyA findings and make them more understandable using a simple catching language, images, and diagrams. The final design comprises five sections, mirrored in the five chapters of the catalogue, based on research findings. Moreover, each section starts with a question, to which the data, stories, and photographs tries to answer (*Table 2*).

Table 2: Example of correspondence between photograph and description with temperature information, contextualization, and time/date

N°	Title of the section	Question
1	Air-conditioning	Why has AC become the leading cooling solution?
2	Reasons	What will drive AC adoption and use in the coming years?
3	Environment	How will AC affect the environment and the changing climate?
4	Society	Who will remain vulnerable to the increasing heat?
5	Alternatives	How can we keep cool without overheating the planet?

It is important to remark how statistic data were always provided through infographics, such as histograms, maps, or pie charts (*Figure 6 and 7*). The specific designs were selected after a process of proof testing to adopt the most effective graphic for each data set.

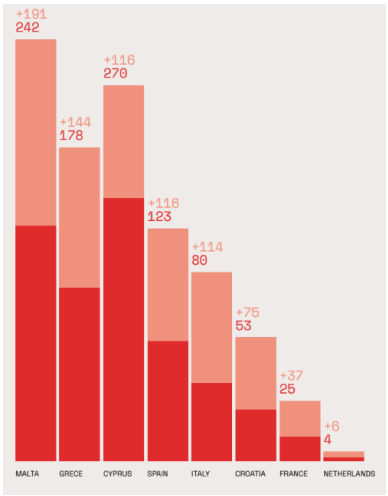


Figure 6 (left): Example of histogram used, in this case about hot days today and in 2050
Figure 7 (right): Example of pie charts used, in this case about CO_2 emissions due to AC today and in 2050

According to Jacopo Crimi, the design of the catalogue was the real challenge of the whole project because of multiple needs: scientific precision, artistic representation, and communicability. Once the catalogue was ready, the design of the exhibit display was easily realized following the book's sections and comprising two thirds of the photographs present in the publication.

The exhibit was hosted in Ca' Foscari Esposizioni, an exhibition space in one of the libraries of Ca' Foscari University from May 19 to July 31, 2023. Following the square shape of the room, the display was designed with a flux layout, starting with the respective chapter question (*Figure 8*).

Figure 8: Flux layout of The Cooling Solution *exhibition in Ca' Foscari Esposizioni*

Sixty-seven photographs were hung on the white walls together with abstracts from the catalogue (nine quotes and five introductory banner) and individual label, always reporting temperature, air humidity percentage, a brief description, location, and year. Seven infographics were displayed too on lower supports. Considering the stylistic choices, the exhibition contrasted the whiteness of the space with colorful pictures and banners. Black frames and background lines were added to give movement and dynamism to the portrait section, an effect enhanced by the various sizes of the pictures. Sections about living conditions and alternative designs were highlighted with pastel color backgrounds (*Figure 9*).

Figure 9: Graphic layout of the exhibition The Cooling Solution *in Ca' Foscari Esposizioni*

A second part of *The Cooling Solution* exhibition was hosted in the courtyard of Ca' Foscari University main campus. In this case, seven of the most significant pictures were re-proposed together with the core topics, data, and interrogatives in a 25-meter-long linear display (*Figure 10*). The white panel which worked as background was interrupted by four colorful sections with an interactive survey.

Figure 10: Display set up of The Cooling Solution *section in the courtyard of Ca' Foscari main campus*

3.2 Exhibition impacts on visitors and the surveys

The Cooling Solution is not only the outcome of a long scientific and photographic project, it is also a medium through which scientists and artists are trying to raise public awareness about climate change and coping mechanisms. Moreover, the exhibition was complemented by an online questionnaire and a physical interactive survey, which worked as enhancers of audience engagement but also allowed the collection of data from which it would be possible to draw insights and even start new research projects.

3.2.1 Online questionnaire: the quiz on Google Form

The Cooling Solution exhibition was launched together with an online survey on Google Form. The questionnaire, named 'quiz', was accessible through the exhibition's webpage. Moreover, the link was sent via e-mail to some of the project partners, including researchers and interns. In particular, the survey was used to gather information about people's cooling solutions, their willingness to buy an AC and their general thoughts about AC's impact on the environment.

The quiz was designed to take no more than a couple of minutes to the responders and it was structured in five questions plus an optional one (*Appendix 2*). Answers included opened and closed options, divided between single answer and multiple choice.

Question 1 and Question 2 regarded demographic data, respectively country of residence and age. Collecting this kind of information may help segmenting the responders and identify patters in other answers according to geographical and cultural factors. It is important to underline how Q2 is not mandatory, allowing responders to keep their age secret. Moreover, it was added in a second phase, therefore data up to June 29, 2023 do not have age information. Question 3 represented the core of the quiz and asked people to select from a list of 23 options the five preferred solutions adopted to cool down during hot days. Among the possible answers, there were technological solutions, such as AC and fans, but also behavioral options, including going to different locations or changing eating habits. Question 4 is the optional one and left responders the possibility to better specify what made them select some answers rather than others in Question 3, as well as

make further consideration about the survey in general. Questions 5 and Question 6 regarded AC specifically, investigating the grade of likelihood for people to buy it and their level of awareness and concerns about its impacts on the environment.

The following considerations have been made after an analysis of the spreadsheets with the answers collected directly by Google Form. Cross comparisons have been made as well to uncover patterns of preferences and behaviors between different segments. A further step was comparing the answers distribution between 'age' and 'no age' replies, intending respectively the answers from responders who indicated and who did not indicate their age.

Between May 15 and September 11, 2023, 163 people filled in the form. Among the main questions, Questions 1, 3, 5, and 6 were answered by everyone, while Question 2 collected only 139 answers. The complete spreadsheet of data collected is reported in *Appendix 3*.

Table 3: Results of Question 1 "What is your country of residence?" from The Cooling Solution *quiz*

COUNTRY	AGE	NO AGE	COUNTRY	AGE	NO AGE
Brazil	42		Netherlands	1	
Canada	1		Norway	1	
Denmark	1		Panama	1	
France	1		Philippines	1	
Germany	3	2	Poland	2	
Greece	-	1	South Korea	-	1
Hong Kong	1		Spain	1	1
Hungary	1		Sweden	1	
India	1		Turkey	2	
Indonesia	3		United Arab Emirates	1	
Italy	58	16	United Kingdom	-	2
Japan	14	1	Unites States (USA)	2	

Considering people's country of residence, 24 different States appeared (*Table 3*). Italy and Brazil together represents more than 70%, with Italy covering exactly 45% of all answers (*Figure 11*). This result can be explained with a different international circulation of the survey. Italy not only was the location of the exhibition, but also Ca' Foscari Univesity and EnergyA were hosted there. Therefore, it is understandable how more Italians respect any other nationality were involved in the project or have got in touch with the exhibition. Brazil, whereas, have built a very close connection with the researcher team and demonstrated to be more interested in actively participate also in the

survey activity. Surprisingly neither India nor Indonesia, the other two states part of the photographic project, reached high levels of participation to the questionnaire. Unexpectedly, 15 responders come from Japan. After a discussion with Professor Enrica De Cian, it emerged that most likely this great number of answers from Japanese people is due to their strong cultural sense of duty. In fact, the link for the survey was sent to any collaborator and partner all around the world; however, the disproportion between the number of Brazilian responders and Japanese responders is huge, especially if the major involvement of the formers in the photographic project is considered. From the comparison between 'age' and 'no age' responders, it is evident how the first group to which the questionnaire was sent comprised mostly Italians, probably a trial group composed by researchers, family, and other partners involved in the project.

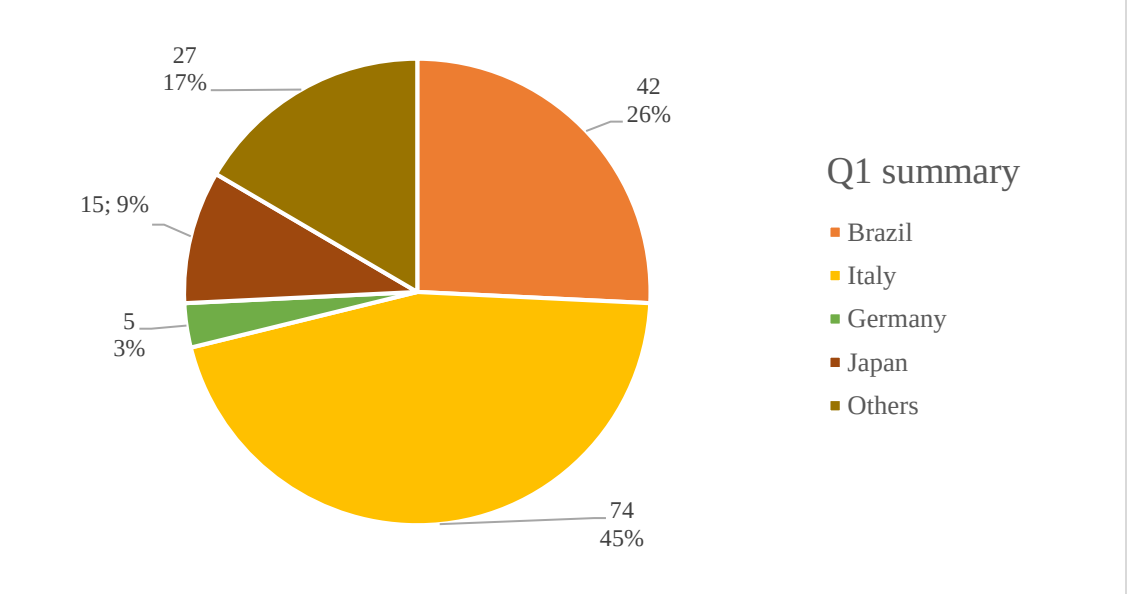


Figure 11: Provenance distribution of responders to The Cooling Solution *quiz'*

As previously stated, Q2 was not answered by all responders. Indeed, up to June 29, no information about the age was collected. Despite that, over 163 answers, only 24 people did not indicate their age, less than 15%. In general it can be observed how the categories 'Under 20' and 'Over 60' registered respectively 0 and 2 answers, while the segment '20 - 39' represents almost the double of the '40 – 59' group (*Figure 12*). On average, Brazilian responders are slightly younger than Italian ones, with a respective proportion of 0.69% and 0.55% of '20 - 39' people over the total. However, it has to be noted that 16 people from Italy did not state their age, so the real total could be slightly different.

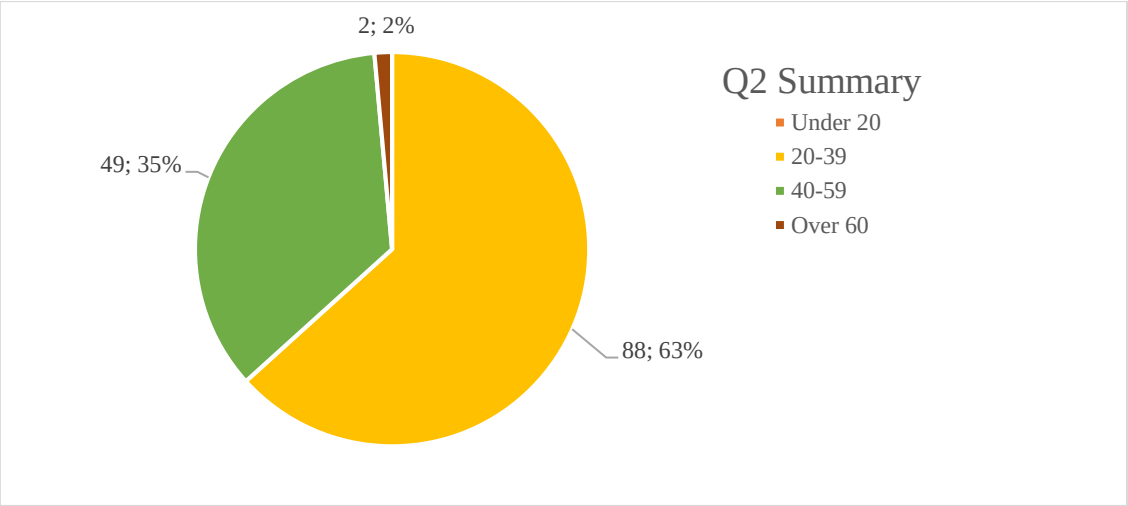


Figure 12: Distribution of answers to Question 2 "What is your age?" in The Cooling Solution *quiz*

Question 3 presents a great distribution of answers considering that each responder had the possibility to select up to five answers among 23 options, plus 'others'. Data shows how the most popular strategy to cool down is drinking water, listed by 136 people (*Figure 13*). Ventilation strategies are the second most common, together with optimizing clothing. In particular, 87 people indicated fans as one of their 'go-to' option when they need to cool down. Unsurprisingly, AC registered 79 preference, slightly more than natural cross ventilation systems, showing how people are gradually moving towards technology. Interestingly, who indicated fans and cross ventilation presents also environmental friendly behaviors like window shading, avoid cooking, and walk in the green. On contrary, the AC 'fans' listed at least another mechanic cooling option, like fans and dehumidifiers, together with visiting malls for the AC systems and frequent showers. The latter, however, is very popular also among who did not list any mechanic ventilation solution, showing how cold showers can be used as a copying mechanism for people who cannot access cooling ventilation systems. Another interesting point is the results related to the answer 'drink alcohol', selected four times only from Brazilians between 20 and 39 years. The result reflects the high popularity drinking have reached especially among young people in the country as observed by Plens *et al* (2022). A final observation should be made about the distribution of answers by responders who indicated their age and the ones who did not. Overall, the preferences of the latter reflects the ones of the former group. However, the first group who answered the survey appeared to be more keen to use dehumidifiers, evaporative coolers, avoid cooking, and home insulation as ways to cope with heat.

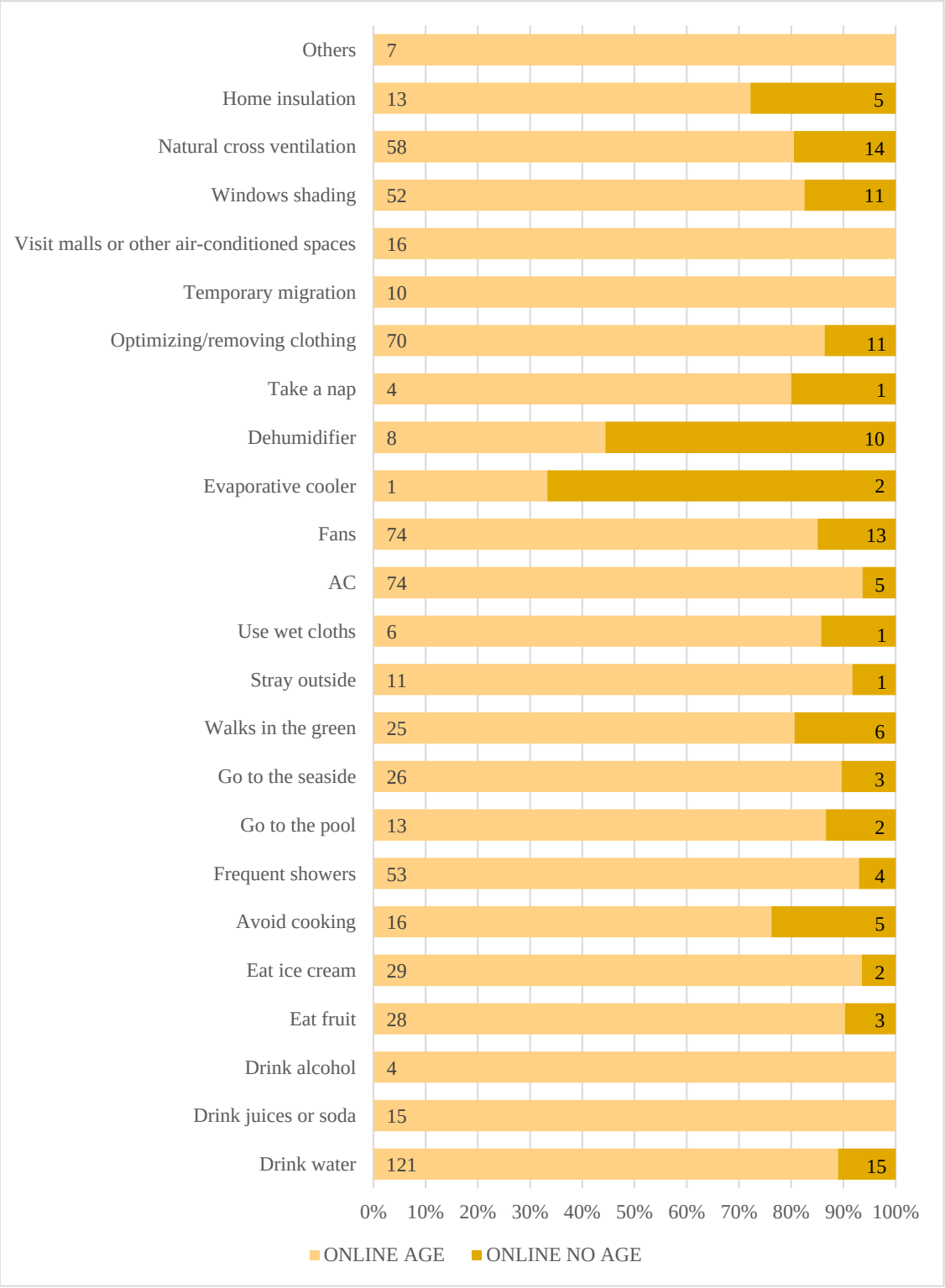


Figure 13: Proportion of the answers to Question 3 "What is your cooling solution?" between 'age' and 'no age' responders in The Cooling Solution *quiz*

Further interesting considerations can be made on the geographical provenience of the responders for each option. As it emerges from *Figure 14* and *Figure 15*, every coping mechanism has different geographical distributions, caused by cultural and climatic conditions. A detailed list of precise data and percentages is provided in *Appendix 4*.

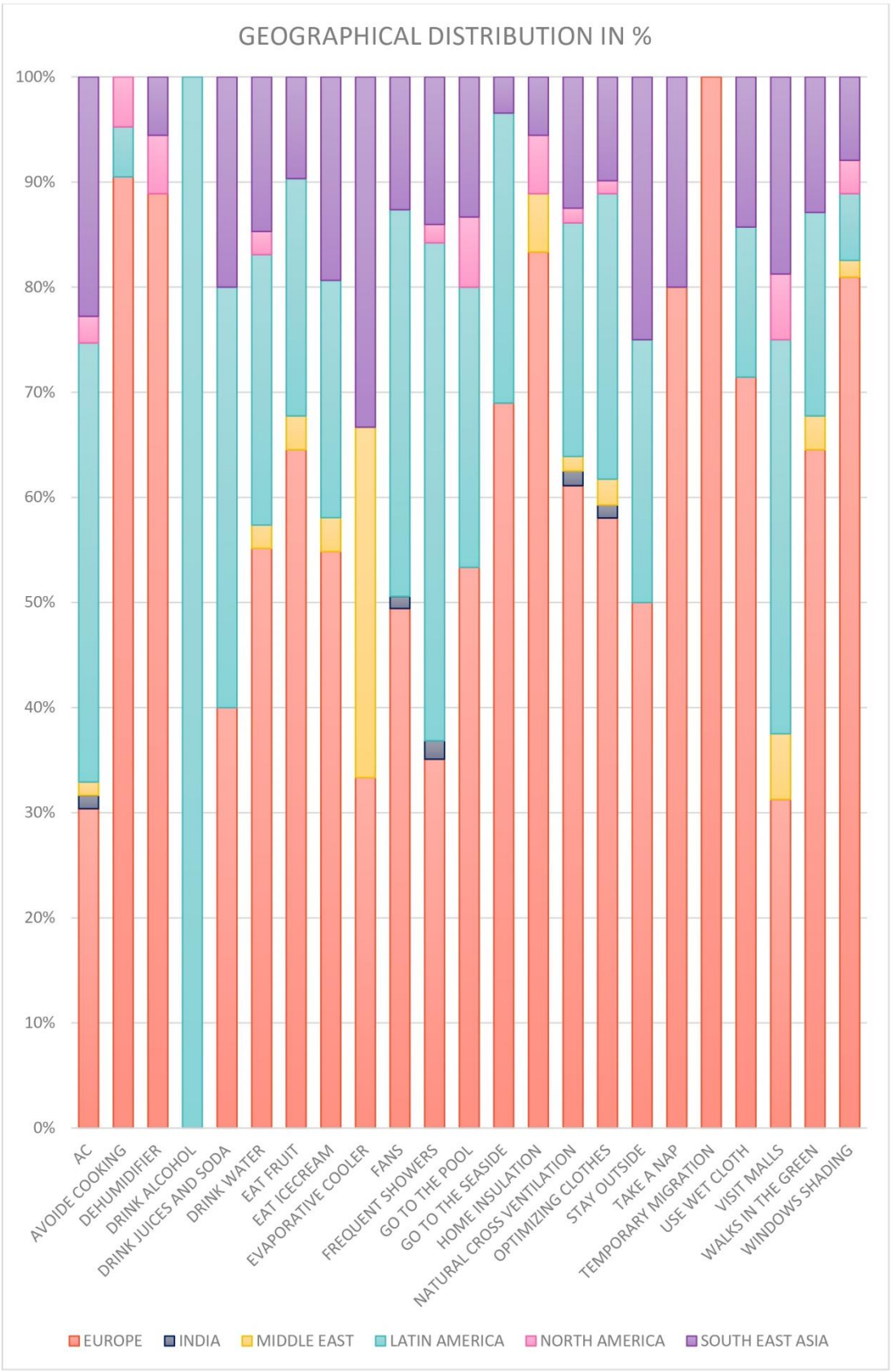


Figure 14; Geographic distribution of preferences for each option provided in Q3 of the questionnaire, percentage is calculated for each element as preference from area X over total of preferences

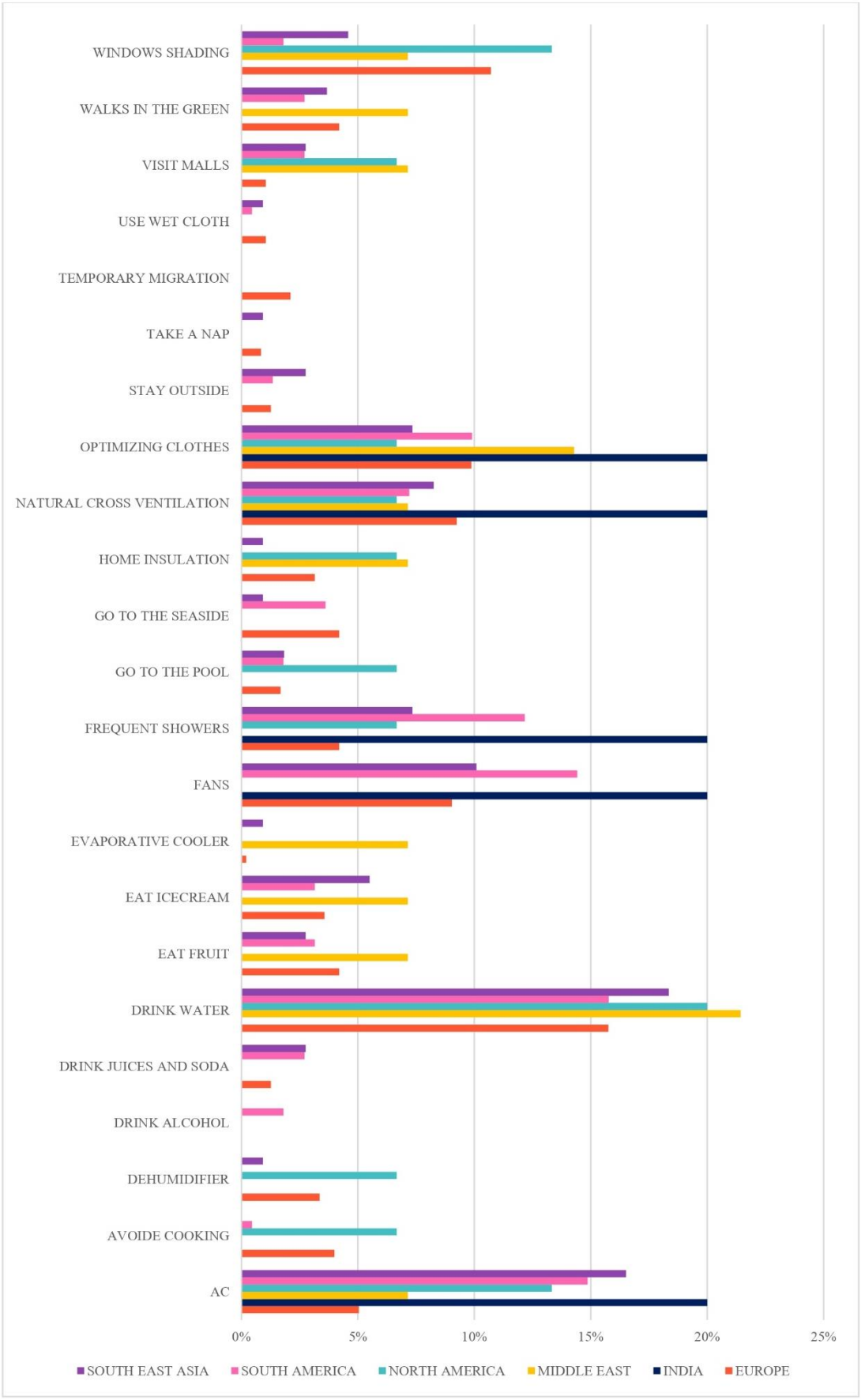


Figure 15: Normalized results showing the % of preference for each option among a geographical group, calculated for every geographical region as n° of preference for option N over n° or responses from that area

People have been divided into six groups corresponding to six geo-cultural areas. Europe embraced Italy, France, Spain, Greece, Germany, Denmark, Sweden, Norway, the U.K., Poland, and Hungary. Even though climate differs sensibly from Southern Italy to Northern Norway, socio-culturally speaking Europeans shares very similar behaviors, habits, and wealth levels. Although Turkey is part of the European Union geo-politically speaking, it belongs to the Middle East area, for culture, climate, and geography. Therefore is has been put in the same group of the United Arabic Emirates. India, whereas, has been left alone because it does belong neither with the Middle East nor with the South East Asia block, composed by Japan, South Korea, Hong Kong, Philippines, and Indonesia. The Americas have been separated in Latin, Central and South, and North, with a more Western culture.

Europeans clearly preferred cooling options like windows shading, home insulation, avoid cooking, dehumidifier and temporary migration. People in Europe cook more than average, in other countries eating out, delivery, and canned meals are way more popular. Avoid cooking is therefore seen as a change in everyday life. Temporary migration is also more easy for Europeans because of the vast presence and diffusion of seaside areas and mountains. Moreover, it is very easy to travel within Europe from North to South or *vice versa* because of the affordable and diffused public transportation infrastructures. Surprisingly AC, visiting malls, and evaporative cooling are the least voted options.

Not the same can be said for South East Asia, where on contrary AC and evaporative cooling systems have been listed in the top three coping mechanisms together with staying outside. In those countries, going to the seaside, shade windows, and using dehumidifiers are not feasible options, or at least not options taken into considerations.

AC has been indicated as one of the ‘go to’ solutions by Latin Americans as well. People from Brazil (only one was from elsewhere, Panama) combine air conditioning with frequent showers, and drinking juices other drinks. Avoid cooking and windows shading were barely mentioned, demonstrating again the great difference with the European approach given by different kind of heat and cultures.

A further consideration based on the environment itself, emerges when looking at Middle Eastern results. It is true that only three answers cannot be considered representative, but them alone represented the 30% of evaporative cooling votes. Using evaporated water helps people living in those areas to cope with extreme dry climate conditions.

North America confirmed its preference for AC with 2 votes over 3 responders. Moreover, pools and malls are the favorite spots visited during hot days. Avoid cooking is also listed, even though in big cities delivery, take out, and eat out are still much more popular than homemade food.

India is represented in this survey by only one response, which have no statistical value. However, it can be noted that the responder indicated AC, fans, and cross ventilation, demonstrating how people try to use all the systems available to cope with extreme heat, maybe using AC only when climate conditions gets unbearable.

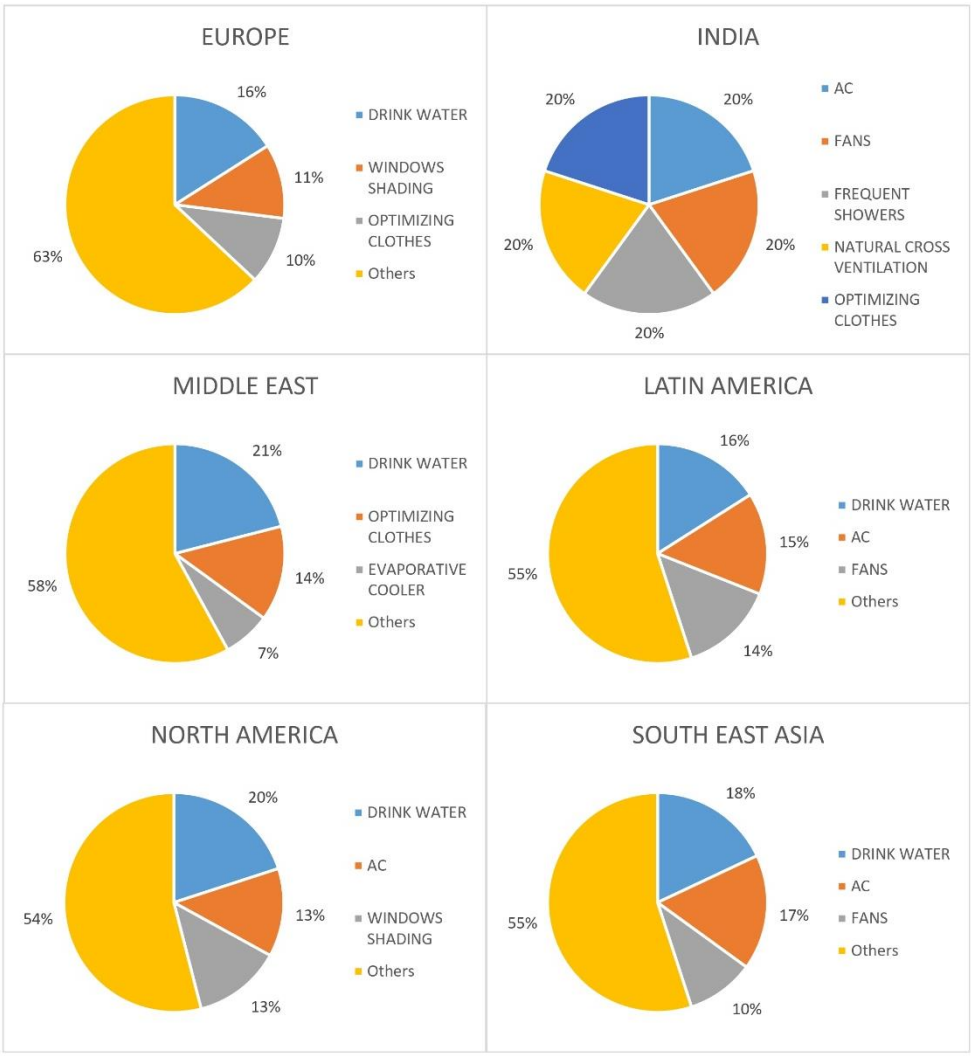


Figure 16: Share of preference for the top three cooling solutions for each geographical region

Figure 16 summarizes the results of Q3 showing the three preferred cooling strategies for each geographical areas and the percentage of preference. As India presents only one response all the options possess the same percentage of preference, again, this result is not representative of the whole country behavior. For the Middle East, instead, after two

very strong preferences all the other selected ones share the same percentage. However, evaporative cooler has been selected as third option as no one of the other countries indicated it so often, showing a frequent use of it. Europe appears as the geographical region with the most variegated preferences for cooling strategies, result highly influenced by the great differences in climate from northern and southern regions. AC compares as the first or second choice in four regions over six, third *ex equo* in the Middle East even though it might be even second because only three responders are not sufficient to get a realistic picture.

Table 4: Answers to the open question "Do you want to specify anything abut your answers on your main cooling solutions?" in The Cooling Solution quiz

Answer general topic	N°
Ac first	3
Ac as last option	7
If there are AC or fans and it's hot I use them	1
Other ventilation options	3
Natural ventilation can be uncomfortable	1
Ac for work or medical conditions	2
Details about cultural approaches	3
Active attempts to cool living spaces in alternatives ways to save energy	2
Clothing preferences	1
Details on diet	1
Moving to the mountains	2
Considerations about house shading	2
I cool down as a form of adaptation	1
We need more nature-based solutions	1
Considerations about the survey structure and question formulation	3
No	5

In order to analyze the results of the open Question 4, the answers have been grouped according to their main topic (*Table 4*). Some answers presented multiple themes so they have been inserted more times. In general, there was a predominance of people reporting whether they consider AC as their first option or last resource: three people considered AC their 'go-to' solution, seven said they use it only in very hot days when other strategies do not work. In particular, office hours emerged as the most delicate ones, when people tend to suffer more for the heat, probably due to formal clothes and lights. Medical conditions have been named as a reason for AC usage as well. Interesting is the presence of cultural strategies. For example, in the Philippines it is common to go to the mall to enjoy AC, India adopts more traditional strategies like fan, clothing choices, and fresh coconut drinks, and Italians are the most keen to travel to the mountains for the day or as

summer vacation. Moreover, a few responders described their active attempts to use alternative non-mechanic cooling solutions to save energy. Lastly, yet importantly, three people noted their personal considerations about the formulation of Question 6 of the questionnaire ('How will AC shape our environment?'), saying that it is not easily understandable. Among them, one person also suggested to specify 'cold' in the option 'drink water'. There were no answers to Q3 by 'no age' responders.

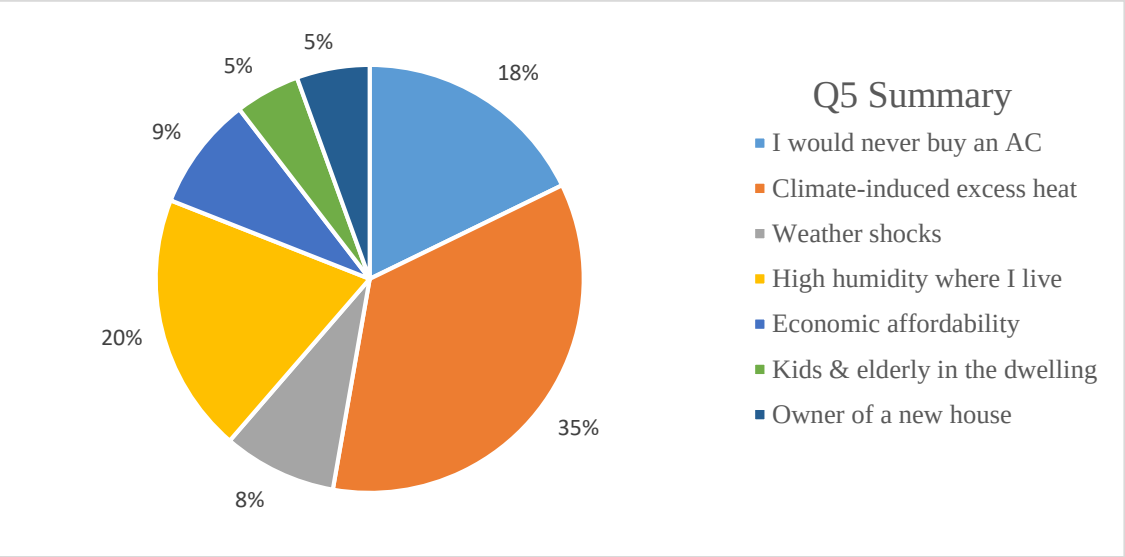


Figure 17 Distribution of answers to Question 5 "Why will you buy an AC?" in The Cooling Solution *quiz*

Moving to the final section of the questionnaire, the one dedicated specifically to AC use, Question 5 allows to understand the reasons why people have bought or are considering to buy AC systems. Almost 60 people identified in the 'climate-induce excess heat' the first cause to choose air conditioning, the 35% of all responders (*Figure 17*). Therefore, it is not surprising that other 32 people blamed the high levels of humidity in their areas. As highlighted by EnergyA research and *The Cooling Solution* exhibition, heat and humidity are equally responsible for climate-cause discomfort. Remarkably, 29 people stated that they would never buy an AC. Among them, 18 are Italian and 15 belongs to the 20-39 segment[38]. Making further considerations, five of the responders come from country, like Canada, Norway, Sweden, and Denmark, where the weather is generally colder and ventilation systems are not as necessary as in hotter regions. Furthermore, the high presence of young people among the one less willing to buy AC could be caused by multiple factors. First, younger generations are dealing with a power of purchase lower

[38] It is important to note that 5 out of 29 answers do not present the age of the responder, therefore the real proportion between 20-39 and 40-59 who would never buy an AC could slightly vary respect to the one reported.

than older ones; they generally have less savings and have to deal with higher rents or house prices. A second important aspect is that younger generations are, on average, more sensible to pollution and the environmental crisis, as noted in *Chapter II*. Lastly, the presence of kids and elderly, as well as the purchase of a new house, are not as powerful motivators as climate conditions: AC is not perceived as a general appliance, but as a need to cope with unpleasant heat waves and high humidity.

Considering now the different distribution of answers between 'age' and 'no age' responders, it can be noticed how the second group is slightly more than average sensitive to humidity levels or reticent towards the purchase (*Figure 18*). On the other hand, people from that segment are more concerned than average about the wellbeing of kids and elderly. These results should be interpreted keeping in mind the predominance of Italians (>66%) among the 'no age'. Italy, especially Northern regions, suffer high levels of humidity, which increases the perceived temperature. Moreover, the Italian population is older than the global average, with a percentage of elderly above 24% and an average age of 46.4 years, making it the oldest country in the European Union (Statista, 2023a).

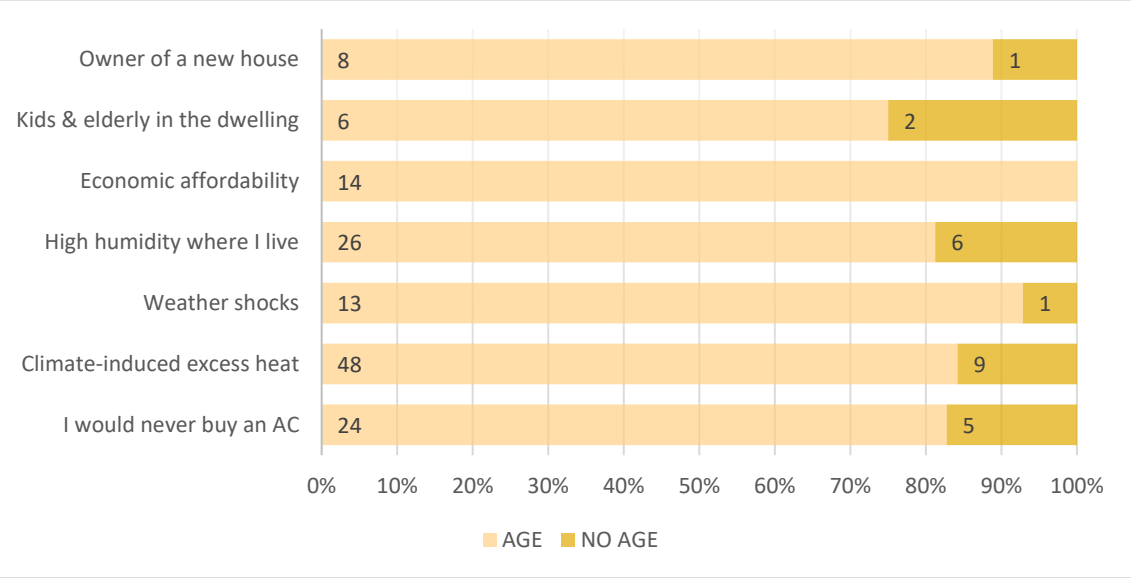


Figure 18: Distribution of answers to Q5 between 'age' and 'no age' responders to The Cooling Solution *quiz*

The last question, 'How will AC shape our environment?', wants to gather an insight into people awareness and concerns about AC use impacts. Before analyzing the questionnaire results, some considerations on the question formulation should be made. As reported by three people, the meaning of the question was not clear. Choosing the world 'shape' might have sounded poetic but it can also be confusing, as AC does not directly shape the

environment, rather, it directly impacts environmental equilibriums. Moving forward with the analysis, among the four options, the production of greenhouse gasses was selected by more than 90 people, the 56% (*Figure 19*). E-waste followed with 38 answers, showing a rising understanding of the inefficiencies of AC system on the market, especially the most affordable ones, therefore the most popular. Concerns about energy waste are particularly popular among younger generations, as emerged from the survey: more than 63% of people how voted for e-waste belongs to the 20-39 segment. The general answer air-pollution got only 22 'votes', followed by concerns about the reduction of ozone in the atmosphere. It should be noted that air pollution and ozone depletion are directly linked with the production of greenhouse gasses, therefore responders selected the answer that in a certain way can be interpreted the cause for the other two.

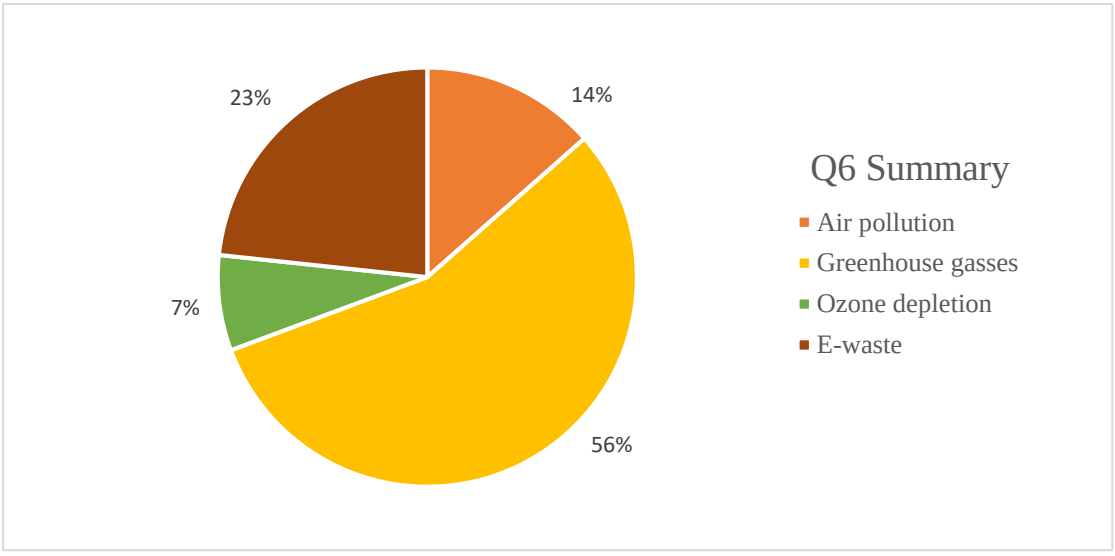


Figure 19: Distribution of answers for Q6 "How will AC shape our environment?" in The Cooling Solution *quiz*

In this case, the 'no age' group showed a lower concern for energy waste and ozone depletion, alongside with a double than average preoccupation for air pollution caused by AC use (*Figure 20*). Even in this case, the predominance of Italian responders could be the reason for this disproportion. Northern Italy, the Padan Plain as first, are heavily industrialized areas with consequent higher levels of air pollution, especially in metropolitan areas. According to IOAir (2023), in 2022 Italy was the 52nd most polluted country in the world with an air quality index of 18.9, a concentration almost four times higher than WHO guidelines.

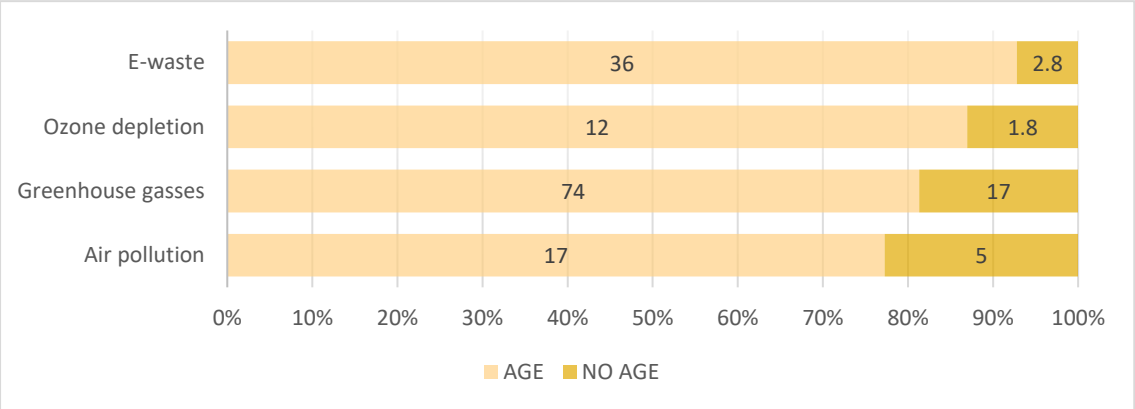


Figure 20: Distribution of answers to Q6 between 'age' and 'no age' responders to The Cooling Solution *quiz*

Summing up, the questionnaire revealed how, on average, people decide to use AC because of unbearable heat and humidity conditions after other ventilation options have failed. It is often complemented with other cooling strategies encompassing eating habits, clothing, temporary migrations, and showering. Cultural and geographical factor emerged as the most influencing in cooling strategies; certain areas benefit of colder climates and therefore can avoid AC, at the same time countries with warmer weathers have developed over time traditional coping mechanisms that can be used instead of AC. Nevertheless, people are gradually moving towards air conditioning because of global warming which causes extreme heat waves even where the climate used to be temperate. Although recognizing the inevitable need for more cooling strategies, especially mechanic ones, responders have demonstrated good levels of understanding of AC impacts on the environment and its energetic inefficiency. Some differences in answer patterns have been noticed between 'age' and 'no age' responders. However, they could have been determined by the higher predominance of Italians.

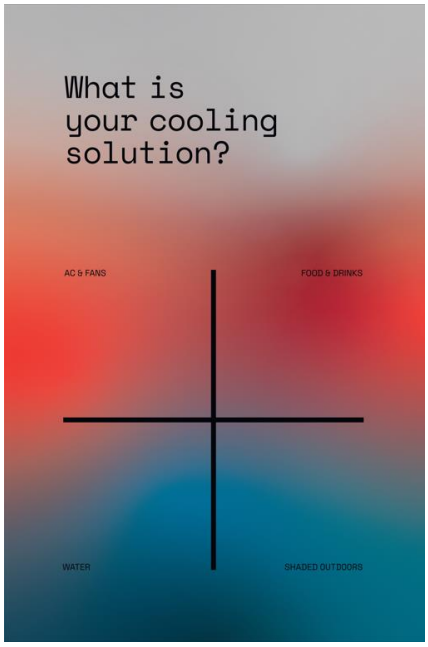
Despite the positive depiction that emerges from the results and the variety of nationalities of the responders, the questionnaires cannot be considered representative of global population: 163 people are a too little pool to have a statistical significance in that sense. As an example, there was just one person from the U.S., country where AC is present in nearly 90% of houses (EIA, 2022). Moreover, the survey was diffused through institutional channels and reached probably a group of people with high levels of education who were connected with the research and/or the university. That could have generated a biased final picture, as it is well known that educated people tend to be more sensible to climate change issues (Angrist *et al*, 2023). Furthermore, the population under 20 and over 60 did not participate at the survey. Younger generations could have shown

even higher levels of interest and concern for the topic, while elder generations might have added insights on traditional ways of cooling, changes in climate during the past few years, and the importance of livable temperature conditions for the elders.

For future development, the quiz should be filled in by a greater number of people, possibly from a wider spectrum of backgrounds, geographically, educationally and age wise. Moreover, Question 6 should be reformulated in a more understandable way as multiple people found it not clear, for example the word ‘shape’ can be substituted with ‘impact’. The addition to the adjective ‘cold’ to Question 3 answer ‘drink water’ is not as urgent as it is only a clarification of an already implicit concept.

3.2.2 Interactive survey: four panels in Ca’ Foscari courtyard

The online questionnaire was not the only instrument the team designed with the aim of collecting statistical data. Indeed, as previously said, four panels with a survey were hung in Ca’ Foscari courtyard, working as separators between each one of the four sections (*Figure 7*).



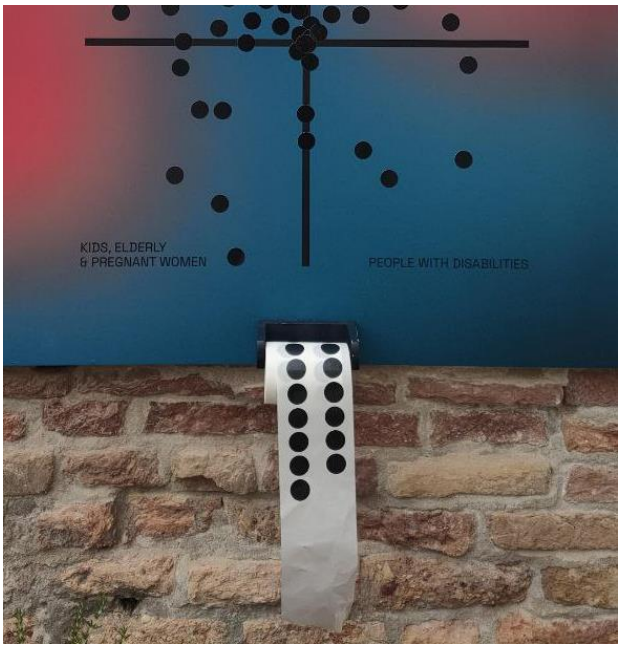


Figure 21 (left): Design of one of the panels in Ca’ Foscari courtyard for the survey
Figure 22 (right): Detail of the sticker roll and the stickers’ distribution on one panel right after the vernissage

In this analysis, the panels have been numbered from #1 to #4, from the left extreme (nearby the entrance of the courtyard) which is also the logical start of the exhibition.

Each panel was designed with a colored background using the gradient of the whole exhibition: from Alizarin Crimson to Sherpa blue[39]. For what concerns the structure, every panel presents a very direct brief question stated in the top part. A Cartesian diagram occupied the remaining area, dividing it into four quadrants, each of which has on the most external corner a possible answer (*Figure 21*). Underneath every panel a roll of black round stickers, in a second moment integrated with gray ones, allowed visitors to get one an stick it to the area that reflects the most their personal idea (*Figure 22*).

Data were collected on July 14, 2023 in order to be counted and analyzed, even though the panels remained hung until the end of the month. Pictures of the panels have been taken, including close details. Moreover, a physical manual count was necessary for the areas with higher concentration of stickers glued on top of one another in order to get a better idea of how many layers were super-imposed (*Figure 23*). Although initially the use of an AI software was considered, the final counting has been made completely manually. Indeed, basic softwares were not able to tell one sticker from the other whenever they were connected or overlapped. Another complication was the difficulty to distinguish the stickers, especially the gray ones, from the colored uneven background (*Figure 24*).

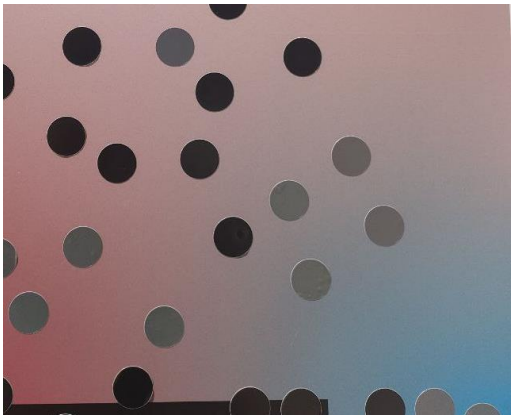


Figure 24 (left): Detail of panel #4 showing the overlay of stickers in the central area
Figure 23 (right): Detail of panel #2 showing how gray stickers were very close in color to the background

The methodology used for the count consisted in applying a grid overlay to the entire pictures of each panel, to divide the area in square zones (*Appendix 5*). As the center of each diagram appeared to be the area with the highest density, it has been chosen to include it in one single square, whiteout aligning the grid with the axes (*Figure 25*). The

[39] The colors Alizarin Crimson and Sherpa Blue, respectively RGB 227, 38, 54, HEX #e32636 and RGB 0,68, 88, HEX #004458, corresponds to two specific shades of red and blue.

basic grid was based on 17 columns and 20 rows, which become 18 in panel #2 and 23 in panel #3 in order to avoid empty areas or to include stickers attached on the top border. Once divided the space, the stickers contained in each segment were counted and noted down in an excel table with the same number of columns and rows of the picture grid. Whenever a sticker was between multiple cells, it was counted in the total of the one containing most of its surface. For panel #4 and panel #3 the data collected *in situ* for the central part were directly transferred because more reliable than the picture where layers were not distinguishable. Every sticker was counted even when glued on a margin which was not supposed to be part of the diagram. The only exceptions which were not considered are the stickers put inside the question, clearly a joke of some visitor or student (*Figure 26*).

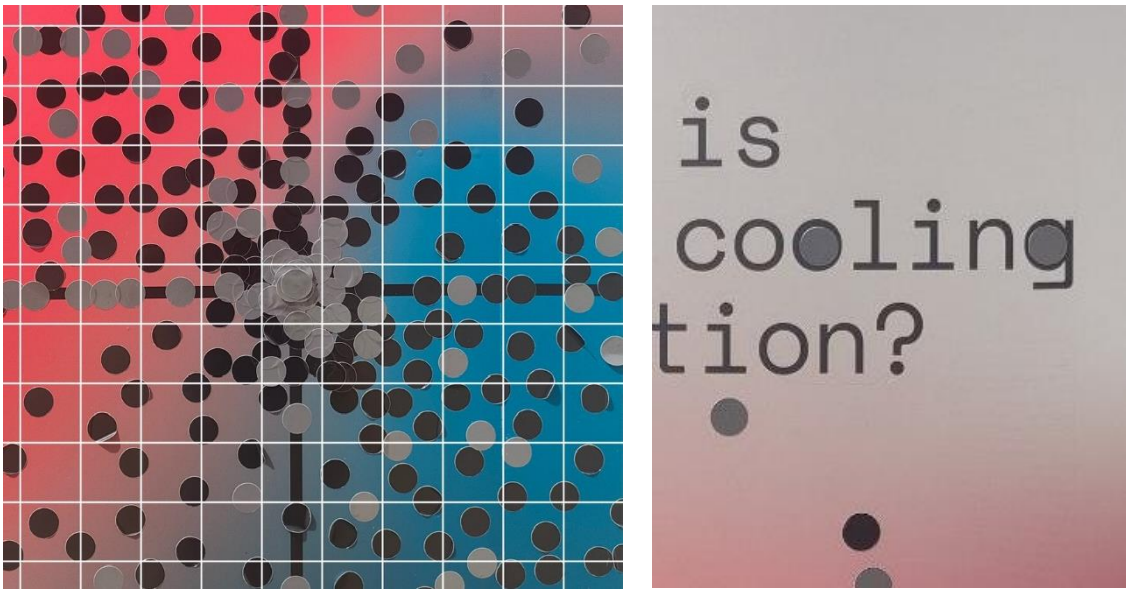


Figure 26 (left): Detail of panel#4 to show the positioning of the grid respect the axes and the diagram center

Figure 25(right): Detail of panle#1 where some stickers have been put inside the text to fill the letters

Since the survey was designed to reveal the tendency of public opinion towards one of the options, the heat map model was found to better represent graphically the results. To realize the model Excel function 'color scale' was used, selecting a personalized gradient with a pastel light blue for the minimum value, a bright yellow for intermediate ones, and a raspberry red for the maximum value (*Figure 27*). In order to get the best representation of the scale, the variation parameter was set on 'proportion' and not 'percentile'. Moreover, each panel was analyzed separately; therefore, the highest number of each panel would have the same color regardless of its absolute value. The obtained table was

then transported into Microsoft Word for creating the final image adding the two axes of the diagram and a black spot in the bottom margin to represent the sticker roll.

Figure 27: Gradient set for the creation of the heat maps on Microsoft Excel

Moving forward with the results analysis, the first consideration that should be made regards the total number of sticker found on each panel. Despite the margin of uncertainty due to the counting methodology, a huge difference was registered between the first and the last panel which cannot come exclusively from counting errors: 353 more stickers where found on panel #1 respect panel#4 (*Table 5*).

Table 5: Total number of sticker found on each panel

Panel number	Total number of sticker
#1	733
#2	573
#3	408
#4	380

The decreasing participation of visitors along the exhibition path is a normal phenomenon linked with loss of interest and limited attention span (Krukar and Conry Dalton, 2020). Moreover, panel #1 was located nearby the entrance to the courtyard, which faces a busy *calle* leading to the Academia Gallery and San Marco Square. As the entrance is public and there are no restriction to access, it is possible to assume that people passing by noticed the exhibition and decided to step in to have a quick look, focusing only on the first section. Despite these, 51.84% of visitors staid engaged and actively participated until the end.

Respect to the questionnaire, which obtained only 163 answers, the panels provide data more statistically useful. For what it concern the pool of people, the location of the panel favored the participation of students and professor heading to classes and offices. Moreover, people present at the vernissage had the chance to participate, as well as relatives of students who graduated in July. As already said, it is possible that also curious

passersby entered quickly in the courtyard to have a look. In general, it can be said that probably responders are generally younger than the people who answered the questionnaire, because Bachelor's students are easily under 20.

Panel #1 contained the signature question of the exhibit: 'what is your cooling solution?'. The four options were food&drinks, shaded outdoors, water, and AC&fans. From both the numbers (*Figure 28*) and the heat map (*Figure 29*) it is possible to see how responders tends to choose water and shaded outdoors to cool down, in some cases integrated with fresh food and drinks or ventilation systems. Indeed, the squares along the negative part of the y-axis are the only ones to registered more than 10 sticker per cell, with the maximum value of 18 reached in the center. Overall 73.67% of the stickers were concentrated in the two bottom quadrants, with 12.28% of them placed along the negative y-axis.

	1														
						1									
	1		1	1			1								
1	2		1	1			2				1	1			
1	2	3	2	2	2	3	1	2	2	1	3	1		1	1
1	2	3	2	2	2	2	1	3	2	4	1	2	2	3	1
	1	2	1	4	2	2	2	2	3	4	3	3	2	2	1
1	2	1	2	3	2	2	3	3	2	3	2	2	2	2	1
1	2	3	1	1	3	3	4	3	3	1	3	1	1	2	1
3	3	5	3	7	5	4	7	18	6	3	5	3	4	3	2
3	3	3	3	4	4	4	4	10	8	5	3	5	4	3	3
2	3	3	5	4	4	4	6	14	7	5	4	6	3	4	2
2	3	3	2	5	5	5	5	12	7	4	5	5	5	4	4
2	4	4	6	4	4	3	6	12	3	5	5	4	6	4	5
2	2	3	4	4	5	4	3	11	5	4	4	2	3	4	3
1	4	3	4	4	3	2	2	13	4	3	6	4	5	4	4
2	2	3	2	3	2	2				3	3	3	4	3	3

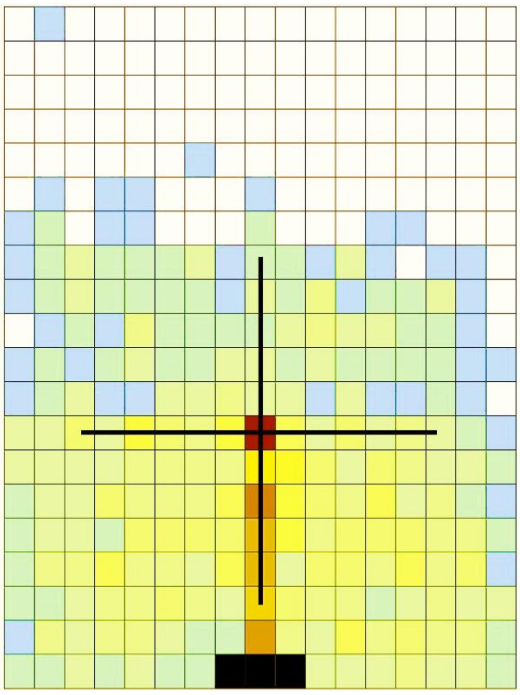


Figure 29 (left): Image of the table reporting results from panel #1
Figure 28 (right): Heat map of answers' distribution in panel #1

Comparing this result with the answers given in questionnaire, it is possible to notice that people still see water as one of the preferred options: 42.97% of answers belongs to its quadrant. There is not a direct correspondence between the panel answer 'shaded outdoors' and the questionnaire's options. However, it is possible to compare it with the answers 'stay outside' and 'walks in the green'. While in the questionnaire these two solutions did not registered high levels of possibilities, in the panel shaded outdoors were the preferred option with 45.29% of votes. Another difference between the results of the

questionnaire and on panel is that in the latter fans and AC obtained only 21.83% of preferences, 14.32% without considering the area with the 'water' option along x-axis. In the online quiz, fans have been chosen by 53.38% and AC by 48.47% of the responders.

'Why will you buy an AC?' was instead the question stated on panel #2, whose options were 'it's getting too hot', 'I can afford it', 'for my children & elderly', and 'I don't want one'. From the numbers (*Figure 30*) it is understandable how a strong preference was not concentrated in a limited area, but it is spread predominantly in the third and fourth quadrants[40] (*Figure 31*). In the former case, 229 responders (199 without axes) voted for no AC, probably recognizing the existence of alternative systems or for the awareness of pollution and e-waste generated by that technology. On the other hand, 209 responders (190 without axes) would consider air conditioning just to be able to deal with excessive heat. Only seven people glued their sticker in the exact center, showing a sort of indecision between the desire not to buy an AC and the awareness of rising temperatures.

						1					1					
					1											
2	1	2	1	3	1	1	1							1		
1	4	2	5	3	3	3	3	3	1				2	1		
3	4	3	3	1	3	5	4	4	1	1	1	2	1	2		
2	3	5	4	4	7	4	4	2	1	1	1	1		1		
3	2	4	4	5	3	4	3	5	3		2	1	1	1		
2	3	5	4	6	5	5	3	3	2	1	1		1	1	1	
2	4	4	4	5	4	4	5	5	1		1		1		1	
3	3	4	4	4	5	5	3	7	2	1	1	1	1	1	2	1
1	1	1	1	2		1	3	2	4	6	4	5	4	4	4	1
		1	2	1	1	3	2	1	4	5	3	4	3	3	3	2
	1	1	1	1	2	1	1	3	2	6	5	6	3	3	4	2
	2	1	1	1	2	1	1	2	4	3	4	3	3	3	3	2
	1	1	2	1	1	1	3	2	3	4	3	3	4	3	5	1
		1		1	1	1	2	2	3	3	3	2	3	3	4	3
				2	1	2	1	1		2	5	2	2	4	4	3
			1	1	1	1					2	2	3	1	1	3

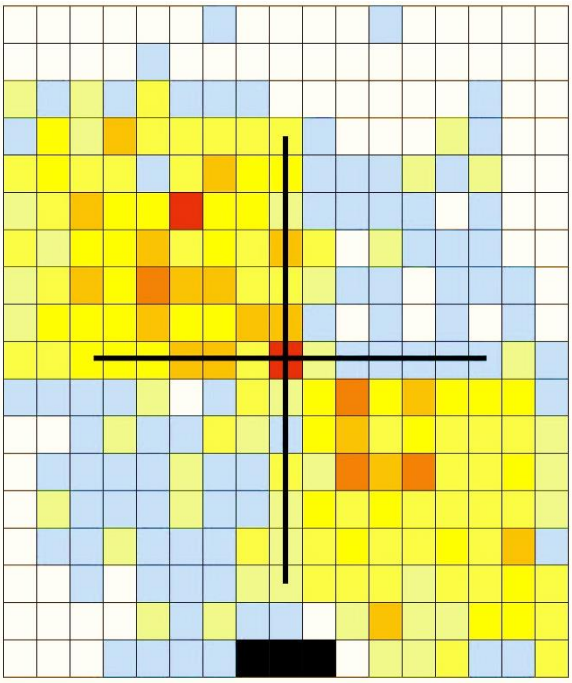


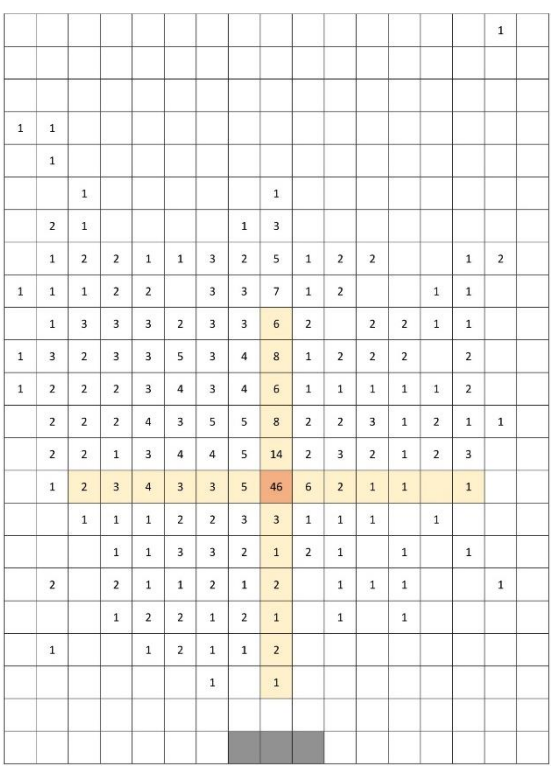
Figure 30 (left): Image of the table reporting the results of panel #2
Figure 31 (right): Heat map of answers' distribution in panel #2

The same question was asked in the questionnaire at point 5. From a first comparison, it can be noticed how in the survey only the 18% voted for no AC, whereas the panel shows 34.73% of responders trying to avoid it, 39.96% if counting also the areas along the axes. On contrary, while 63% of online answers were in favor of AC to face climate discomfort

[40] quadrants of 2D Cartesian coordinate system are numbered in counterclockwise direction.

of any kind (excess heat, weather shocks, and high humidity), just 33.16% of stickers were attributed exclusively to that motivation. The last difference is the slightly higher concern for children and elderly, which passed from barely 5% in the quiz to 11% in the panel, almost the 20% if also the areas along the axes are considered.

Panel #3 instead asked a question not contained in the questionnaire 'Who will remain more vulnerable to heat?'. The interest for this topic is given by the willingness to understand people's awareness about heat impacts of different demographical groups. Likewise the other panels, four options were provided – 'outdoor workers', 'people with disabilities', 'kids, elderly & pregnant', and 'low income classes'. Panel #3 showed a completely different result from the previous two: a pick of 46 votes was reached in the center, while the remaining areas stayed under 15 votes for every cell (*Figure 32*).



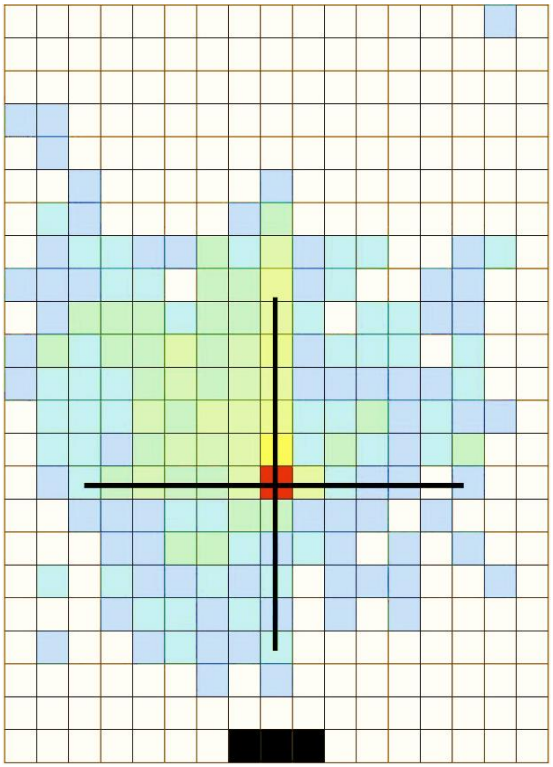
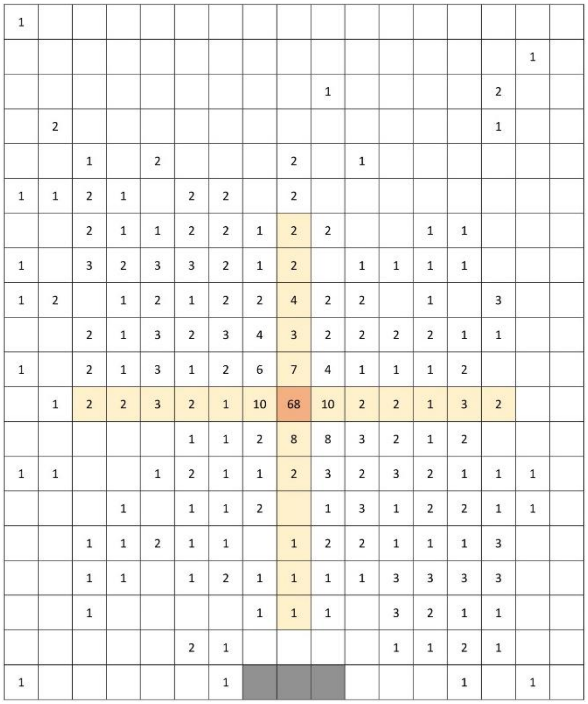


Figure 33 (left): Image of the table reporting the results of panel #3
Figure 32 (right): Heat map of answers' distribution in panel #3

In other words, 11.28% of responders consider heat waves as equally dangerous for all the categories listed. The second 'hottest' area of the heat map is the y-axis in its section between quadrant I and II, with 14.22% of stickers for nine cells, followed by quadrant II, which contained 34.31% of the stickers spread over the whole area, axes excluded (*Figure 33*). Low-income classes were in general considered the most seriously impacted by rising temperatures, probably for their poor living environment and their inability to purchase cooling devices. Opposite popularity was obtained by the quadrant dedicated to

'people with disabilities', which reached only 6.37% of votes. Between outdoor workers and fragile people, responders showed higher sensitivity towards outdoor workers, a social class unable to hide in air-conditioned offices during the hottest hours.

Lastly, panel #4 reported the same question that ended the quiz: 'How will AC shape our environment'. From quadrant I to IV, the options given were 'air pollution', 'greenhouse gasses', 'ozone depleting gasses', and 'e-waste', exactly the same present in the questionnaire. The concentration in the central area was even higher: 68 over 380 responders placed their sticker in the central cell, almost 18% of the total (*Figure 34*).



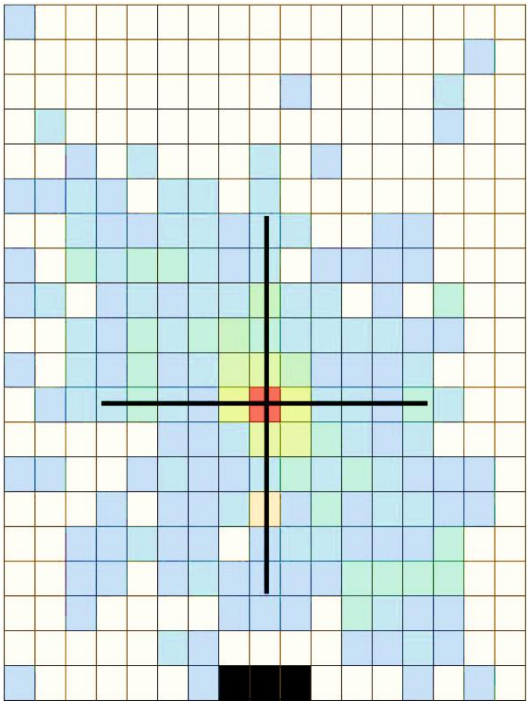


Figure 35 (left): Image of the table reporting the results of panel #4
Figure 34 (right): Heat map of answers' distribution in panel #4

Moreover, if the nearby zones are considered too, the central 3x3 area represents 32.37% of the preferences. This unambiguous result testifies people's climate anxieties, projecting on AC every bad phenomenon without being able to pick one over the others. Indeed, although it is true that AC contributes to all four the options, the impacts it has on each one of them is different. At the same time, considering all the consequences equally important means that people are aware how the multi-level influence human behaviors have on the environment. Moving to 'colder' areas of the heat map (*Figure 35*), which are also the most external ones, e-waste obtained more votes (20.79%), followed by greenhouse gasses (13.68%). This is quite surprising if compared with the answers given in the questionnaire: 56% of online votes went to greenhouse gasses and only 23% to e-waste. Conversely, both the quiz and the panel saw ozone depletion as the least

considered option, respectively 7% and 9.2%. It should be underlined how the online form did not involve multiple choice and forced responders to pick one single option, while the panel allowed people to vote on a spectrum.

The many differences emerged between the online survey and the panels reflects the different pool of people among which the two surveys have been conducted. Firstly, the higher number of replies on the panels allows for a more representative objective image of the respondents group. Secondly, the demographic characteristics of the two pools are not ignorable. The quiz was sent to partners who took part in the research or the project themselves so they were already involved and maybe knowledgeable on the topic. On contrary, people getting in touch with the panels are, hypothetically, university students and professors not necessarily informed about climate change and cooling systems. Moreover, as already explained, the courtyard was visited by graduating students' families and was accessible to any passerby. The only similarity between the two cases is the high predominance of Italians, if we assume that Ca' Foscari students and employee are mostly Italians, and the averagely medium-high level of education of responders.

It must be said that while the survey presented a yes/no answer type, the panels allowed responders to indicate their degree of preference, answering on a spectrum.

Additionally, the data collected with the panels have a high level of uncertainty given by both the methodology of answers collections, the stickers, and the manual counting method. The former represents an issue in locating the sticker in the Cartesian diagram: measuring the precise coordinates of each point would have taken too much time to be efficient. Although the use of the grid allowed a faster counting process, it introduced some approximation, which could have been avoided if, for example, a digital dispositive was used. However, the higher level of impreciseness was given by the way the dots have been counted because of the design of the survey itself. Especially in the areas with higher concentrations and multiple layers, it was not possible to count every single sticker because there were some hidden at the bottom of the pile or others perfectly stick together. A possible solution for future similar survey could be proceeding with the counting once the panels are removed from the exhibition and count the stickers while removing them one by one from the panel itself. In this way, the count would be as precise as possible and even the most 'buried' ones would be reached.

3.3 Visitors' and media thoughts on *The Cooling Solution* exhibition

Although it has been exposed not even for three entire months, *The Cooling Solution* was able to gather a discrete level of attention from the media as well as to generate a unique impact on visitors.

Collecting and analyzing visitors thoughts, articles and media contents is a key part of the post-opening phase of an exhibition. Indeed, it allows the team to understand if the messages were correctly delivered, if the format was appropriate, and if the project reached its goals.

Therefore, this paragraph focuses on what people have said about the exhibition, starting from an analysis of the messages contained in the guestbook, moving on with some considerations regarding the press release, and finally providing an overview on the social media content produced about it.

It was not possible to analyze data about the website statistics and online users behavior.

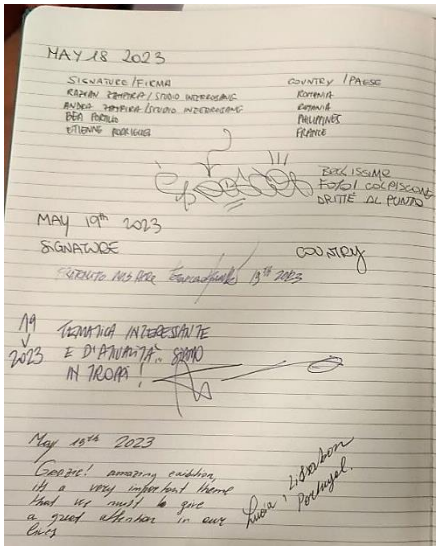
3.3.1 The guestbook

Unfortunately, it was not possible to collect any data on visitors of the two parts of the exhibition. Indeed, one section was open air in a public space, the courtyard of Ca' Foscari University central campus; while the second was open for free in a room connected to the extremely busy Ca' Foscari Zattere library, therefore it was very easy for students to pop in and have a look. The only way to have counted visitors in the second venue would have been putting a guardian at the entrance, but that was not possible with the already limited budget.

The only information available about visitors are contained in the guest book present in Ca' Foscari Esposizioni nearby the entrance/exit.

As of July 13, 2023, the book presented 18 pages reporting signatures, reviews, considerations, and even some sketches. The initial idea of an ordinate list of signatures accompanied by the country of provenance was abandoned already on the second day, May 18, as visible in *Figure 36*. Although this excluded any opportunity to gather statistical demographic information on visitors, it allowed for a more extensive and

personal expression of their thoughts on the exhibition (*Figure 37*), which hopefully constitute the first step of a long individual reasoning about the topic exposed.



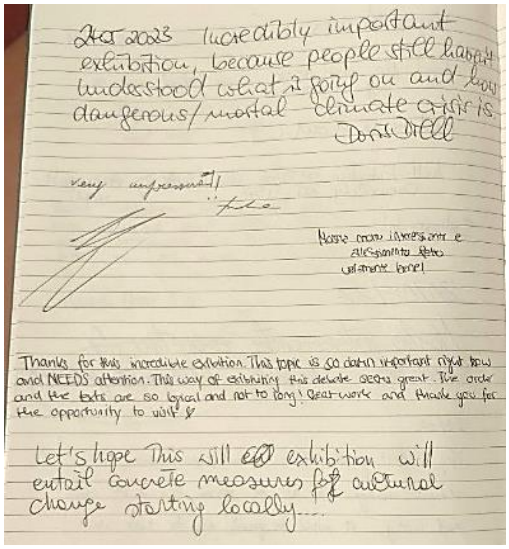


Figure 36 (left): First page of the guestbook of The Cooling Solution *exhibition*
Figure 37 (right): Example of more articulated review and comments in The Cooling Solution *guestbook*

In general, commenters wanted to compliment the curators, artist, and researchers for the great result accomplished. In particular, people recognized the importance of the topic and the gravity of the climate emergency. Moreover, the choice to translate scientific contents into art, in this case photographs, was appreciated because it made possible to understand the impacts of climate change on everyday life. On May 20, 2023, Giorgia from Italy wrote:

"Studies shed light on the gravity of environmental issues of the present and, especially, of the future. The photographic exhibition reached the viewer thanks to its human dimension, and the everyday life of people from various countries and social statuses. Interesting from many point of view. Congratulations[41]*"*

(Exhibition's Guestbook, May 20, 2023)

Additionally, the choice of investigating AC systems to raise awareness on climate change was found to be a winning strategy as it highlights the irony of a technology invented to help people cope with increasing heat waves, while at the same time contributing to air pollution therefore climate change. As MMC wrote:

[41] Original version: "Gli studi mettono in luce la gravità dei problemi ambientali del presente e soprattutto del futuro. La mostra fotografica arriva allo spettatore per la dimensione umana e la quotidianità di persone appartenenti a paesi e classi sociali diverse. Interessante sotto più punti di vista, congratulazioni!"

"Very interesting exhibition. Make people aware of climate change via al AC system is kind of ironic and witty"

(MMC, May 24, 2023)

Interestingly some people made further suggestions for future studies. A visitor reported examples from Iran, Sri Lanka, and North Africa (Merako Maretania clay buildings) (*Figure 38*), while always MMC suggested investigating the role of materials in building constructions for thermoregulation. Having people making connections with unrepresented cases is a great result: it means visitors were sufficiently engaged and stimulated to recall memories and make connections with their lived experience and own knowledge.

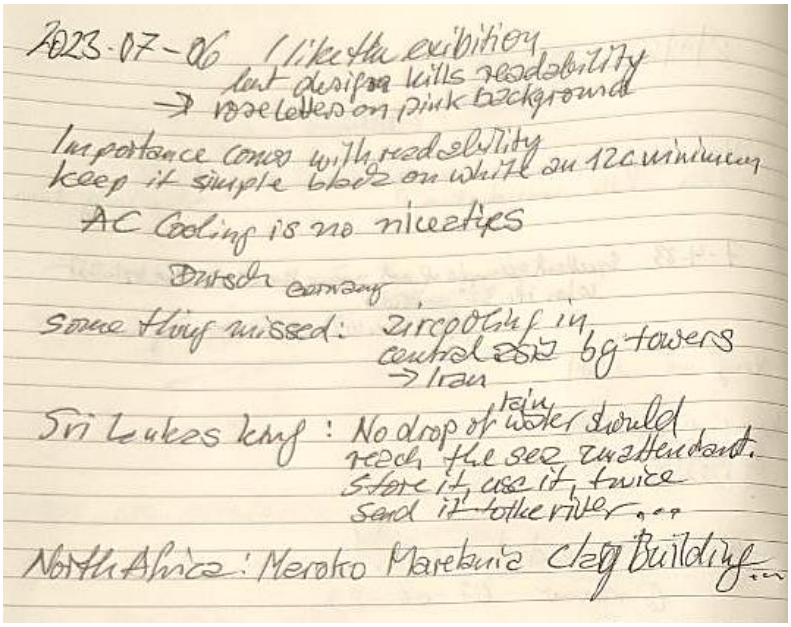


Figure 38: Suggestion for future research on linked themes and cooling strategies not treated in the exhibition, from the guestbook of The Cooling Solution *exhibition*

One consideration should be taken into account for future display solutions of this exhibition. Valentin wrote on May 21, 2023:

"Good installation, but how can you raise awareness about pollution due to raising temperatures and all that stuff with an AC inside the room?"

It is clear that Ca' Foscari could not remove an AC unit from a room for an exhibition, as well as, it is almost impossible not to find AC systems inside exhibition spaces nowadays because artworks have specific climate needs and people wants certain comforts while their visit. However, Valentin's words should raise further reflections on AC diffused

presence especially in public spaces, as well as, the importance in the future to mask AC systems or, on contrary, make them become part of the exhibition and the reasoning flow.

As in every guest book some jokes, off-topic comments, and sketches are present and demonstrate another time how easy it was for students to pop in and be a little silly between a study session and another.

Lastly, a visitor from the U.S.A. challenged everyone else with a simple question, tackling both the urgency to act now but also the general reticence to give up on everyday life comforts.

"Extreme heat requires radical solutions.

What are we willing to change in order to survive?"

(Anonymous, July 12, 2023)

3.3.2 Press release, web circulation, and social media presence

In 2020s it is impossible not to consider online presence as an integral and determining part of any initiative's success and impact. Indeed, nowadays, social media are the first channel of information distribution for amount of content shared, people reached, and users.

Although *The Cooling Solution* have its own website, connected with the one of EnergyA, it does not possess any social media account making it more complicated to trace its diffusion there.

A useful tool that can be used for a first approximate overview is Social Searcher, a search engine that allows to analyze social networks and the web to monitor specific public social mentions. Typing 'The Cooling Solution' in its search bar 117 results were found, however only seven are related to the exhibit. The remaining 110 referred to AC systems advertisements or other articles about cooling strategies.

Besides the webpages and social media accounts belonging to thecoolingsolution.com, energy-a.eu, and unive.it, the exhibition was mentioned also on cmcc.it and iamconsortium.org, the website of an organization for scientific research. Moreover, a post on LinkedIn and the link to the article on Foresight magazine were present as well.

Talking about the LinkedIn article, it was published by Antonio Di Bacco, a business consultant specialized in sustainable transition strategies for companies. In his writing he pointed out some cultural resistances that are keeping humankind from using more sustainable cooling strategies, like if going back to vernacular architectures and old knowledges would represent an involution.

On Instagram, Gaia was the biggest promoter of her own work, sharing eleven posts about it, followed by the curating group Kublaiklan with 'only' six posts. Among the 34 tags, there was also a reel by @erc_research, the founding institute of the research itself. Between sneak pick of the exhibition spaces, the catalogue, and views of Venice, the reel contains also footages taken from the vernissage (@erc_research, 2023). EURAC Research (2023), institution the phycologist Laura Battistel works for, posted on its account @euracresearch three pictures portraying the terraXcube project developed by the doctor herself and included in *The Cooling Solution* enquiry. Finally, the divulgation page @will_ita released a reel reporting EnergyA findings in matter of AC use, pollution, and climate crisis. Although the physic explanation of air conditioning system functioning and the indirect correlation between AC use and pollution was found a little confused and inaccurate by several users, the majority of the comment appreciated the topic and added further examples of cooling solutions (e.g. more trees in urban areas) to fight heat waves without turning AC on. Unfortunately, a few people demonstrate an arrogant denial and concerning levels of diffidence towards scientific evidences reported by news channels and divulgation pages. Someone even wrote "and after only one hot day they start talking about crisis, drought, global warming and all that bullshit from our miserable era of troglodyte eco-idiots"[42].

Moving forward, Ca' Foscari offices kept trace of the press release regarding the exhibit. The complete list is available in *Appendix 6*. As of the end of June 2023, 46 between newspaper articles and online posts were published, following the official press communication released by *The Cooling Solution's* team itself.

The first to appear was a post on meteoweb.eu on April 4, 2023 (Raso, 2023). Although it did not add anything new respect what was already stated on the exhibition's website, this article, likewise the majority of the following ones, stressed the complementarity

[42] Original text in Italian: "Ed eccoli che al primo giorno di caldo partono con crisi siccità riscaldamento e tutte le puttanante della nostra sciagurata era di trogloditi ecocretini".

between scientific research, photojournalistic enquiry, and storytelling. Moreover, the positive approach that distinguished the exhibition was prized, underlying the desire to both share scientific data and provide alternative solutions.

In an article about Fridays For Future and Ultima Generazione actions and the uncertain future of oil giants like Eni, the Italian newspaper *Domani* suggested readers interested in the topic to visit *The Cooling Solution*. As the journalist Ferdinando Cotugno (2023) provocatively affirmed, if humanity do not change its habits the future would be tragic. Nevertheless, there may be alternatives, and Venice exhibition provides examples of cooling strategies that will help people to reach temperature comfort in a more sustainable way.

A further publication that deserves to be mentioned is the article on the May edition of *Elle DECOR Italia*, which listed all the better contemporary art exhibition present in Venice besides the Biennial (Belloni, 2023). *The Cooling Solution* was presented among international exhibitions held by organizations such as the International Modern Art Gallery in Ca' Pesaro and the Querini Stampalia Foundation. A similar contribution was given by ansa.it, in an article for its rubric dedicated to the exhibitions worthy of a weekend trip. *The Cooling Solution* was named also in :venews, , a bimonthly regional magazine with a specific section for ongoing exhibitions.

On May 18, 2023, right before the vernissage, Climate Foresight published an article reporting, besides the usual information about scientific findings, Enrica De Cian's words about the importance to further studies on this topic which is going to be crucial in climate change polices and yet it is still extremely under analyzed (Mazzai, 2023).

Always in May, *The Cooling Solution* reached the radio and television broadcast network RAI, which dedicated a brief section of the regional news to the exhibit. Moreover, an article was also published on its webpage rainews.it. It was especially named by local news channels, radio, and newspapers in occasion of the *ArtNight*, an event taking place in Venice in mid-June when museums and other cultural institution prolong their opening hours until late in the evening. *The Cooling Solution* participated at the initiative especially because the event is organized and promoted by Ca' Foscari University itself, therefore the exhibit became the representative image of the campus.

Despite the numerous mentions, the most remarkable publications are the ones on Internazionale megazine, Blind magazine, Le Monde newspaper, and NBC News.

Internazionale is an Italian weekly magazine reporting the most relevant news from around the world. On June 15, 2023, it dedicated six whole pages to *The Cooling Solution*, with full-page reproductions of a selection of Squarci's photographs (Internazionale, 2023). Although the many similarities with other articles, in this one the role of the photographer was put at the center, leaving the research team in the background. NBC News, the news division of the American broadcast television network NBC, provided a similar perspective (Bush, 2023). Together with Squarci's photographic enquiry only a little mention was dedicated to the exhibition. It is true that the exhibition was already over for the time the article came out, but the pictures would have benefit from a better contextualization. Instead, NBC preferred to focus on the urgency to take action against both raising temperatures and the exponential increase of AC use. 'The paradox of air conditioning' was also at the center of the interview to Enrica De Cian published on Le Monde on August 22, 2023 (Laffont, 2023). Conversely respect to NBC, here the research and the findings were the very protagonist, wanting to highlight how a new kind energy poverty is threatening Europe, and not only Europe. Lastly yet importantly, the last article published appeared September 12, 2023 on Blind, an internationally famous magazine abut photography in both English and French (Squarci and Crimi, 2023). The text was written directly by Jacopo Crimi and Gaia Squarci, who stressed how July 2023 was the hottest month ever recorded and yet humanity is not doing enough to contrast man-made climate change. In this case, the scientific foundation of the photographic project was not only mentioned but also well represented by the inclusion of diagrams and other infographics together with some of Squarci's pictures. Conversely, from any other paper discussed in this section, the article on Blind can be considered a summary of the exhibition itself, reporting some of the catalogue contents in an even simpler and more engaging language.

3.3 The success and the possible future of *The Cooling Solution*

Despite the limited time it had to be appreciated by the public, *The Cooling Solution* has distinguished itself for its scientific backgrounds, innovative communicative strategies, and connections with contemporary issues. Its importance and innovativeness have granted the project international recognition from research centers, media, other cultural institutions, and even public opinion.

Therefore, its legacy could not end with the closing of Ca' Foscari installation. Instead, *The Cooling Solution* should re-invent itself and keep inspiring further investigations and a brother diffusion of the findings already reached. Moreover, this exhibition would help people understand how even the smallest change in individual habits would have a global impact, if it is shared by thousands of people (ICOM, 2022a).

3.3.1 The Cooling Solution special guest in international events

The international dimension, scientific accuracy, and artistic component allowed *The Cooling Solution* to be invited to exceptional stages as special guest during talks and presentations.

On June 16, 2023 CMCC invited Enrica De Cian, Gaia Squarci, Jacopo Crimi, Rica Cerbarano, and Antonella Mazzone to one of its Foresight Dialogues, unique opportunities to engage with experts, artists, and writers and discuss about the role of communication in the climate transition. The group was asked to share its experience with *The Cooling Solution*, highlighting the secrets and difficulties in translating a scientific research into a visual art project (CMCC Award, 2023d).

On July 27, 2023 Jacopo Crimi and Gaia Squarci were invited by CAMERA – Centro Italiano per la Fotografia (tr: Italian Center for Photography) to present *The Cooling Solution* project in dialogue with Monica Poggi, curator of the exhibition *Dorothea Lange. Racconti di vita e lavoro*. Both the exhibitions investigate the relationship between humanity and environment, a delicate equilibrium that is about to break irreversibly (CAMERA, 2023).

In September 2023, *The Cooling Solution* would reach the Jakarta International Photograph Festival (JIPFest) 2023 in Jakarta, Indonesia. Gaia Squarci will take active

part in the initiative holding a speech for the rubric 'artist talks'. Besides sharing her own personal and professional paths, she will present *The Cooling Solution* a 6 minutes video tackling the main findings and showing some of her photographs.

3.3.2 Climate Change Communication Award Rebecca Balestra

The Cooling Solution was among the candidates for the Climate Change Communication Award (CMCC Award) *Rebecca Balestra* for the category Photos & Videos.

CMCC Award was designed to give formal recognition to the world's best initiatives aiming at raising awareness on climate change. In particular, it wants to honor the memory of the artist Rebecca Balestra by "promoting positive transformation processed in the fields of science, humanities, economy, ecology, media, and art" (CMCC Award, n.d.). Projects can belong to arts, audio & podcasts, editorial contents, events, photos & videos, integrated campaigns, or even gaming. As of September 2023, more than 300 projects have received the award all over the world, from Greenland to Solomons Islands (CMCC Award, 2023b).

Several are the reasons exposed to motivate the decision to consider *The Cooling Solution* among the candidates for the award (CMCC Award, 2023c). As first, they appreciated the title choice, especially the use of the word 'solution' to question adaptation paradigms, AC use, and its numerous drawbacks. Secondly, the combination of photography, research, and storytelling was found able to bring together the results of a 5-year-long scientific research with people's lived experiences and everyday life in an accessible and impactful way. However, the real distinctive element of *The Cooling Solution* is its positive message: to be more environmentally responsible it is not necessary to sacrifice thermal comfort, there are green alternatives, innovations, and even vernacular architectures able to ensure thermal comfort without worsening the climate emergency.

Entering such an international and multiform panorama allowed *The Cooling Solution* to compare itself with other projects from different countries and institutions. Among many others, three examples in particular echo the Venetian exhibition in its scientific base, audio-visual format, positive approach – provide solutions not just data -, and contact with reality and lived experience.

In April 2021, Grape ESG presented the documentary *Amazonia 4.0: The Reset Begins*, a 29-minute video based on the research of the climatologist Carlos Nombre, who investigated the risk of 'savanization' threatening Amazon rainforest (CMCC Award, 2021). In order to contrast deforestation and intensive use of Amazon resources and ground for industrialization, the documentary advocates for science and business to cooperate and move towards a sustainable future, safeguarding natural environment and creating environmental and social impact while generating value. In other words, the film suggests how the future should not be a choice between economic progress and environmental safeguarding. The future should be a compromise, based on scientific research for sustainable development. The commonalities with *The Cooling Solutions* are multiples: firstly the scientific base of the project, then the projection towards the future, supporting a third way that is not an either/or choice, and finally the focus on Brazil, a country considered to be 'under development' but that have the potential to become the center of innovation for sustainable development.

Summer 2022 was characterized by an unusual number of heat waves in California, causing crop destruction, drought, wildfires, and changes in people's lives. Guided by the photographer Star Montana, two journalism students from University of Southern California (USC), Maria Eberhart and Shreya Agrawal, recorded stories of people experiencing one of the hottest summer in Los Angeles history. The project, named *My Story is a climate Story*, was used for the launch of the Center for Climate Journalism and Communication of USC (CMCC Award, 2022). It was structured in a format very similar to *The Cooling Solution*: photographs, in this case portraits, accompanied by stories of lived experience and a few contextualizing data.

Lastly, a project that will be launched in February 2024. *Be a Climate Hero*, a 501c3[43] non-profit, aims at activating communities to adopt low to zero-carbon technologies through educational, human-centered audiovisual materials, from documentaries, to interview, and even tutorials (CMCC, 2023a). The founding base of the initiative is empowering people through knowledge and direct involvement in ecological transition projects. As in *The Cooling Solution*, the language of science and technology have been

[43] Organizations, including public charities, private foundations, and private operating foundations, devoted exclusively to charitable purposes as defined by the section 501(c)(3) of the U.S: Internal Revenue Code published by the Department of Treasury (Foundation Group, n.d.).

translated in easy ready-to-use contents that allow people to get a real understanding of what is going on and what they can do to reduce their carbon footprint.

3.3.4 An international traveling exhibition?

The Cooling Solution exhibition closed on July 31, 2023 but the project is anything but finished. The team decided to turn it into an itinerant exhibition, able to bring EnergyA findings to public eyes in other cities and, hopefully, to raise awareness, stimulate critical thinking, and suggest alternative cooling practices.

In order to make the project more appealing through a formal presentation, an informative paper was realized. After a brief introduction, the exhibition is analyzed in its two components, indoor and outdoor sections, reporting technical information such as number of elements present and dimension of the exhibition space, all complemented with pictures. A section is also dedicated to the catalog's structure and contents, as well as the link to the exhibition website.

The second part of the document contains details about costs. In general, an institution to have the possibility to host and expose *The Cooling Solution* in its entirety should spend around € 15,000. This amount includes costs for photographs shipping, printing of PVC background and stickers, installation and disassembly, and an optional new curatorship in case the original design has to be adapted to the new location (*Table 6*).

Table 6: Costs for acquiring and hosting The Cooling Solution *exhibition*

COST ITEM	INDOOR EXHIBITION	OUTDOOR EXHIBITION
Packaging and shipping of photographs	€ 3,000 - 4,000	Site specific, cannot be re-used and need to be re-printed
Printing of PVC background and stickers	€ 2,500	€ 1,000 - 2,000
Installation and disassembly	€ 2,00 - 3,000	€ 1,000 - 2,000
Optional curatorship	€ 2,000 - 3,000	-
TOT	€ 9,500 - 12,500 (including curator)	€ 2,000 - 4,000 (without photos printing costs)

Unlikely the photographs hung in the indoor spaces, the panels for the outdoor section are site specific: they are adapted to the space and because of weather conditions they cannot be re-used. Indeed, during the disassembly of set up in Ca' Foscari courtyard, it has been noticed how last summer heavy rains alternated with heat waves and direct

sunlight exposition have ruined the photographs. Colors faded, glue melted, and paper was deformed (*Figure 39*). Therefore, a future host for *The Cooling Solution* should re-print the panels if it wants to expose the whole exhibition, which is not mandatory.

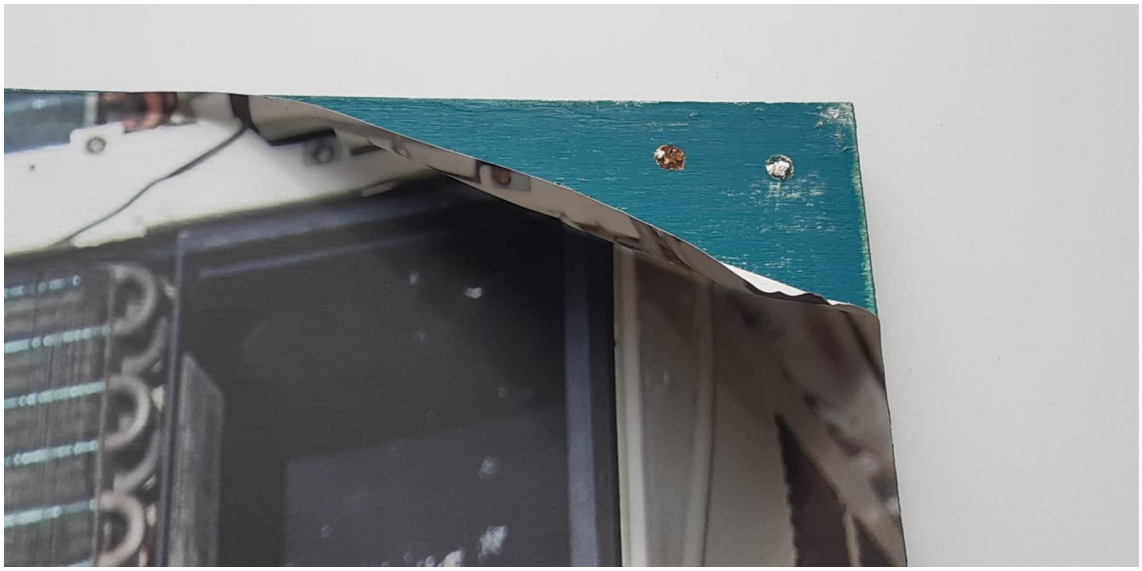


Figure 39:Weather damage to one photograph hung in the outdoor section of The Cooling Solution exhibition

In order to cut costs, an institution can decide to exhibit only the indoor part and adapt the original project without involving a professional curator. In that scenario, costs would be reduce to € 7,500 -10,500.

To the cost items listed in *Table 6* it should be added the ones related to the catalogue, which is not mandatory. However, nowadays exhibition catalogues have become more and more relevant to give credibility to the research underneath the exposition, even more for projects like *The Cooling Solution*, where the catalogue is a proper scientific publication written in easy words and accompanied by appealing images. Expenses for the catalogue are estimated in € 5,500 for the printing of 500 copies, € 11 each, plus shipping.

Summing up all the cost items for the realization of the whole exhibition in the worst-case scenario, the total amount an institution should cover is € 22,000, to which it should be add costs for catalogues shipping and outdoor photographs re-printing.

As of September 2023, the team has collected a list of institution and events that may be interested in hosting *The Cooling Solution*. The main criteria for the selection have been existing personal connection between a team member and the institution, expressed interested by the institution itself, and the institution’s goals and interests, which should match the exhibition perspective.

Oxford University represented one of the best candidates. It has taken part directly to the photographic research as a sponsor and through the work of Professor Antonella Mazzone. Furthermore, Oxford is a worldwide famous university with consistent financial resources: during the academic year 2021-22 Oxford obtained £ 831.8m (more than € 963.9m) only from public funds and donations (University of Oxford, 2022). Considering Oxford philosophy and research interests, *The Cooling Solution* appears to perfectly meet its vision based on "fostering a culture of innovation" and one of its strategic commitments to "change the world for the better" (University of Oxford, 2022). Moreover, Oxford University Council approved in 2021 an Environmental Sustainability Strategy, showing a great interest and sensibility for the climate emergency and the willingness to shift towards more sustainable practices. In this *The Cooling Solution* could provide not only a further showcase of the university's efforts to reach net zero, but also scientific knowledge for the implementation of alternative cooling strategies. Unfortunately, in September 2023 Oxford communicated the impossibility to host the exhibition.

Other institution interested in the project which however have not confirmed it yet are the Museo di Santa Giulia in Brescia (IT), the MUSE – MUseo delle SciEnze in Trento (IT), and IESEG in Lille (FR). Besides them, some other Universities in Italy have been contacted to discuss the possibility to host[44] *The Cooling Solution* as an example of how academic research could and should be communicated. Among them Bocconi University in Milan (IT), Trento University in Trento (IT), the Politecnico in Milan (IT), and the University of Naples (IT). Lastly, some research institutions (eg: EURAC), science festivals (eg. Festival della scienza in Genoa, IT), and even environmental ministry of India, Indonesia, and Brazil, together with local Italian embassies, have been listed among the possible future locations.

[44] It is important to remark how no one of those isntitutions have confirmed yet that they are going to host the exhibition.

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CONCLUSION

Heat waves and climate change have become a no longer ignorable issue influencing every aspect of any person's life; from Alaska to Saharan regions the effects of the environmental crisis are evident, tragic, and most of the times irreversible.

Literature shows how museums and any other cultural institutions have always been seen as shrines of human intelligence, not only in an historical perspective, but also and especially as the best hubs for innovation and research to happen. Moreover, for their prestige and reputation among people, they have often become the stage of social discussion and mediation in regards of anything the society considers a priority or a current issue. However, the 21st –century museums is struggling to engage with the climate crisis, falling short in answering audiences' concerns, especially now that a new wave of climate activists is raising. Academic papers already contain a vast list of reasons supporting museums' ethical duty to be at the forefront of the sustainable transition, becoming examples of best practice. What is missing is practice and people have noticed it and decided to take action, without waiting anymore for public institution to make the change.

This thesis wanted to answer the lack of literature about this new social movement. To fill this gap, its social and historical origins have been identified: what has been defined in this thesis as the 2020s new wave of climate activism emerged in Europe in late 2020, taking inspiration from 2010s movements such as International Climate marches and the youth collective Fridays For Future. Moreover, its decision to use the communication power of museums in order to get media attention was inspired by the Suffragettes, who were the first ones to attack artworks to make themselves heard already in 1910s. Even artistic collectives such as Art Not Oil were at the base of a vision in which museums should be accountable for their connections and activities, being the promoters of sustainable practice and parting ways with Big Oil companies. A further step was the reconstruction of the national and international networks taking part in the wave, underlying the commonalities and the specific requests. Moreover, a tentative list of their actions against cultural heritage sites between May 2022 and August 2023 was proposed: more than 70 attacks took place all over the Western world, forcing Governments to legally prosecute the responsible ones, giving the movement even more media resonance.

In this hectic panorama, the cultural sector timidly tried to respond to activists' call to action. Artists like Andrea Crespi used their creations to create a dialogue with climate defenders, letting them know that art is not their enemy, even if it can seem that modern society protects more paintings inside museums that the planet we all live in. Recognizing the leasing role of cultural institutions in promoting responsible and sustainable behaviors, a group of museum professionals and academics joined forces and founded the Gallery Climate Coalition, in charge of providing the sector with guides and materials about how to engage in the environmental crisis. Although the innovation of these answers, the most impactful initiatives were some displays organized by museums. The Leopold Museum in Wien, replied to Letzte Generation protest with the exhibit *A Few Degrees More*. In the U.K., country in which the 'trend' gained momentum, the Hayward Gallery in London joined the campaign with the project D*ear Earth: Art and Hope in a Time of Crisis*. Lastly, the international campaign #ShowYourStripes landed on Dover White Cliffs and the Tate Modern in London in summer 2023.

Part of the examples just mentioned already answer the second question of this research: how can cultural organization respond to activist call to action in an impactful way for their audiences?

A great example of best practice of how cultural organizations could bridge between science and people's lived experience has been provided by *The Cooling Solution* exhibition in Ca' Foscari Esposizioni, Venice. Born as a scientific research about AC impacts on the environment, the project developed into a photojournalistic enquiry between Indonesia, Brazil, India, and Italy. The exhibit used the engaging power and emotional impact of photographs to show people the reality of the present emergency in everyday life, using art to translate scientific data and, at the same time, tell stories. Visitors declared to have been moved by the images, considered a language able to leverage differences and put everyone on the same level. Although the short opening, the display have been mentioned by important newspapers and magazines. It have also been mentioned for the Rebecca Balestra prize for Climate Change Communication, again underlying the great ability of the team to turn complex aseptic scientific results into something not only able to be understood by the visitors, but also to move them towards more responsible and aware behaviors.

Two elements distinguished this project from the ones previously analyzed. First, its positive perspective, ensured by the presence of sustainable alternatives to AC, provided

by vernacular architectures, technological innovations, and cultural coping mechanisms. Secondly, and most importantly, the presence during and in the exhibition of two surveys. Using interactive quizzes and questionnaires not only helps raising levels of engagement and active thinking, but also embodies the perfect occasion to collect more data for future researches. In this thesis, the results of the two surveys have been briefly analyzed, showing geographical, demographical, and cultural differences in the choice of cooling strategies. However, there are still implications open to further discussion.

The interaction between science, art&museums, and people in the realm of climate change is still a subject not studied enough, and even less considered in practice. This thesis demonstrates how cultural organizations can be the bridge between the abstract niche of science and the various chaotic reality of ‘common’ people.

Future analysis should keep tracing the evolution of the 2020s activist wave, measuring its impact in the long term on public opinion, museum practice, socio-cultural policies, and the sustainable transition. Moreover, further research is needed on the impact of scientific-based artistic exhibitions on the public, starting from data collected with the surveys and enlarging it with new information, possibly with a wider and most various pool of responders.

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Figure 3: Climate Stripes infographic updated in 2022
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Figure 4: EnergyA research project scheme
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Figure 5: Example of information provided for each picture in The Cooling Solution exhibition catalogue
Original material provided by the exhibition communication team

Figure 6: Example of histograms used, in this case about hot days today and in 2050
Original material provided by the exhibition communication team

Figure 7: Example of pie charts used, in this case about CO_2 emissions due to AC today and in 2050
Original material provided by the exhibition communication team

Figure 8: Flux layout of The Cooling Solution *exhibition in Ca' Foscari Esposizioni*
Original material provided by the exhibition communication team

Figure 9: Graphic layout of the exhibition The Cooling Solution *in Ca' Foscari Esposizioni*
Original material provided by the exhibition communication team

Figure 10: Display set up of The Cooling Solution *section in the courtyard of Ca' Foscari main campus*
Original material provided by the exhibition communication team

Figure 21: *Design of one of the panels in Ca' Foscari courtyard for the survey*
Original material provided by the exhibition communication team

Figure 22: Detail of the sticker roll and the stickers' distribution on one panel right after the vernissage

Original material provided by the exhibition communication team

Figure 23: Detail of panel #2 showing how gray stickers were very close in color to the background

Original material provided by the exhibition communication team

Figure 24: Detail of panel #4 showing the overlay f stickers in the central area

Original material provided by the exhibition communication team

Figure 26: Detail of panel #1 where some stickers have been put inside the text to fill the letters

Original material provided by the exhibition communication team

Figure 39: Weather damage to one photograph hung in the outdoor section of The Cooling Solution *exhibition*

Original material provided by the exhibition communication team

APPENDIX 1: TENTATIVE LIST OF CLIMATE ACTIVISTS' ACTIONS AGAINST CULTURAL HERITAGE FROM MAY 30, 2022 TO AUGUST 31, 2023

	DATE	COUNTRY - CITY	MUSEUM or SITE	ARTWORK	ACTIVIST GROUP	ACTION
1	30/05/2022	FRANCE – Paris	Louvre Museum	*The Monna Lisa* by Leonardo		Throw a cake
2	29/06/2022	THE U.K. – Glasgow	Kelvingrove Art Gallery	*My Heart is in the Highlands* by Horatio McCulloch	Just Stop Oil	Glue hand and paint JSO logo
3	30/06/2022	THE U.K. – London	Courtauld Gallery	*Peach Trees in Blossom* by Van Gogh	Just Stop Oil	Glue hands and frame ruined
4	01/07/2022	THE U.K. – Manchester	The Manchester Art Gallery	*Tomson's Aeolian Harp* by Turner	Just Stop Oil	Glue hands
5	04/07/2022	THE U.K. – London	National Gallery of London	*The Hay Wain* by Constable	Just Stop Oil	Glue hands and hung an updated version
6	05/07/2022	THE U.K. – London	Royal Academy	*The Last Supper* by Giampietrino	Just Stop Oil	Glue hands
7	22/07/2022	ITALY – Florence	Uffizi Gallery	*The Primavera* by Botticelli	Ultima Generazione	Glue hands
8	30/07/2022	ITALY – Milan	Museo del Novecento	*Unique Forms of Continuity in Space* by Boccioni	Ultima Generazione	Glue hands
9	18/08/2022	VATICAN – Vatican City	Vatican Museum	*Laooconte* sculpture	Ultima Generazione	Glue hands
10	21/08/2022	ITALY – Padua	Scrovegni Chapel	-	Ultima Generazione	Protest
11	22/08/2022	GERMANY – Dresden	Old Masters Picture Gallery	*Sistine Chapel* by Raphael	Letzte Generation	Glue hands
12	25/08/2022	GERMANY – Berlin	Gemaldegalerie	*Rest in the Flight into Egypt* by Cranach	Letzte Generation	Glue hands
13	04/09/2022	ITALY – Venice	Gallerie dell'Accademia	*The Tempest* by Giorgione	Ultima Generazione	Glue hands and banners
14	11/09/2022	SWITZERLAND – Zurich	Kunsthaus	*Alpweiden at the Kunsthaus in Zurich* by Segattini	Renovate Switzerland	Glue hands
15	11/09/2022	SWITZERLAND – Lausanne	Cantonal Museum of Fine Arts	*Maloja in Winter* by Giacometti	Renovate Switzerland	Glue hands

16	09/10/2022	AUSTRALIA – Melbourne	National Gallery of Victoria	*Massacre en Coree* by Picasso	Extinction Rebellion	Glue hands
17	14/10/2022	THE U.K. – London	National Gallery of London	*Sunflowers* by Van Gogh	Just Stop Oil	Tomato soup and glue hands
18	24/10/2022	GERMANY – Posdam	Barberini Museum	*Les Meules* by Monet	Letzte Generation	Mashed potatoes and glue hands
19	26/10/2022	THE U.K. – London	Madame Tussaud's Wax Museum	Sculpture of Charls III	Just Stop Oil	Cake
20	30/10/2022	The NETHERLANDS – The Hague	Maurithius Museum	*Girl with Pearl Earring* by Vermeer	Just Stop Oil	Glue hands
21	30/10/2022	GERMANY – Berlin	Natural History Museum	Dinosaur skeleton	Letzte Generation	Glue hands
22	02/11/2022	GERMANY – Berlin	Alte Galerie	*The Clown* by Toulouse Lautrec	Letzte Generation	Fake blood
23	02/11/2022	AUSTRALIA – Canberra	Australian Parliament House	*Trust the Women As I Have Done* by Dora Meeson Coates	Stop Fossil Fuels	Glue hands
24	04/11/2022	ITALY – Rome	Buonaparte Palace	*The Sower* by Van Gogh	Ultima Generazione	Pea Soup
25	05/11/2022	SPAIN – Madrid	Museo National del Prado	*Maja Vestita* and *Maja Desdnuda* by Goya	Futuro Vegetal	Glue hands and wall writing
26	10/11/2022	AUSTRALIA – Parkes (ACT)	National Gallery of Australia	*Campbell's Soup* by Andy Warhol	Stop Fossil Fuels	Glue hands and graffiti
27	10/11/2022	GERMANY – Berlin	Pariser Platz	Brandenburg Gate	Letzte Generation	Hung posters
28	11/11/2022	NORWAY – Oslo	National Gallery of Norway	*The Scream* by Munch	Stopp Oljeletinga	Glue hands
29	11/11/2022	CANADA – Vancouver	Vancouver Art Gallery	*Stumps and Sky* by Emily Carr	Stop Fracking Around	Maple syrup and glue hands
30	13/11/2022	SPAIN – Barcelona	Egyptian Museum	Replica mummies	Futuro Vegetal	Slime coke
31	16/11/2022	AUSTRIA – Wien	Leopold Museum	*Death and Life* by Klimt	Letzte generation	Oil-like painting
32	18/11/2022	FRANCE – Paris	Burse de Commerce - Pinault Collection	*Horse and Rider* by Charles Ray	Derniere Renovation	Orange paint
33	18/11/2022	ITALY – Milan	La Fabbrica del Vapore	*1979 BMW M1* by Andy Warhol	Ultima Generazione	Flour
34	05/12/2022	ITALY – Bologna	Pinacoteca Nazionale di Bologna	*La Strage degli Innocenti* by Guido Reni	Ultima Generazione	Covered themselves in red paint

35	07/12/2022	ITALY – Milan	Teatro alla Scala	Teatro alla Scala	Ultima Generazione	Orange paint on the façade
36	15/01/2023	ITALY – Milan	Piazza Affari	*L.O.V.E.* by Cattelan	Ultima Generazione	Orange paint
37	18/02/2023	GERMANY – Hannover	Ernst – August Platz	King Ernst August I statue	Letzte Generation	Orange paint
38	02/03/2023	THE U.K. - Stirling (Scottland)	National Wallace Monument	William Wallace's sword	This is Rigged	Break protective glass
39	09/03/2023	ITALY – Milan	Piazza Duomo	Statue of Vittorio Emanuele II on a Horse	Ultima Generazione	Orange paint
40	11/03/2023	ITALY - Catania	Piazza Duomo	Fountain of the Elephant Liotru	Ultima Generazione	Glue hands
41	16/03/2023	FRANCE - 11 different cities	-	Statues	Dernière Rénovation	Accusing t-shirts
42	17/03/2023	ITALY – Florence	Piazza della Signoria	Palazzo Vecchio	Ultima Generazione	Orange paint on the façade
43	01/04/2023	ITALY – Rome	Piazza di Spagna	*Barcaccia* by Bernini	Ultima Generazione	Charcoal
44	27/04/2023	SPAIN - Madrid	Royal Palace	Fountain of the Triton	Futuro Vegetal	Strip naked and climb the fountain
45	27/04/2023	THE U.S.A – Washington D.C.	The National Gallery of Art	*Little Ballerina* by Degas	Declare Emergency	Fake blood
46	01/05/2023	FRANCE - Paris	The Louis Vuitton Foundation	Façade	Dernière Rénovation	Orange Paint on the façade
47	04/05/2023	AUSTRIA – Wien	Parlamentsgebäude (tr. Parliament Building)	Pallas-Athena-Brunnen	Letzte Generation Östereich	Fluorescent substance
48	21/05/2023	ITALY – Rome	Piazza di Trevi	Trevi Fountain	Ultima Generazione	Charcoal
49	22/05/2023	GERMANY – Berlin	Rathausstraße	Neptunbrunnen Fountain	Letzte Generation	Fake oil
50	22/05/2023	SPAIN - Cádiz	Plaza de la Catedral, CaizaForum	"Other Worlds" open air exhibition	Futuro Vegetal	Writings on NASA pictures
51	07/06/2023	THE U.S.A. – Pasadena	Norton Simon Museum	*The Little Fourteen-Year-Old Dancer* by Degas	Extinction Rebellion	Protest
52	14/06/2023	SWITZERLAND – Zurich	Kunsthaus	*The Door of Hell* by Rodin	Renovate Switzerland	Fake oil
53	15/06/2023	SWEEDEN – Stockholm	National Museum of Sweeden	*Garden at Giverny* by Monet	Återsäll Våtmarker	Red paint

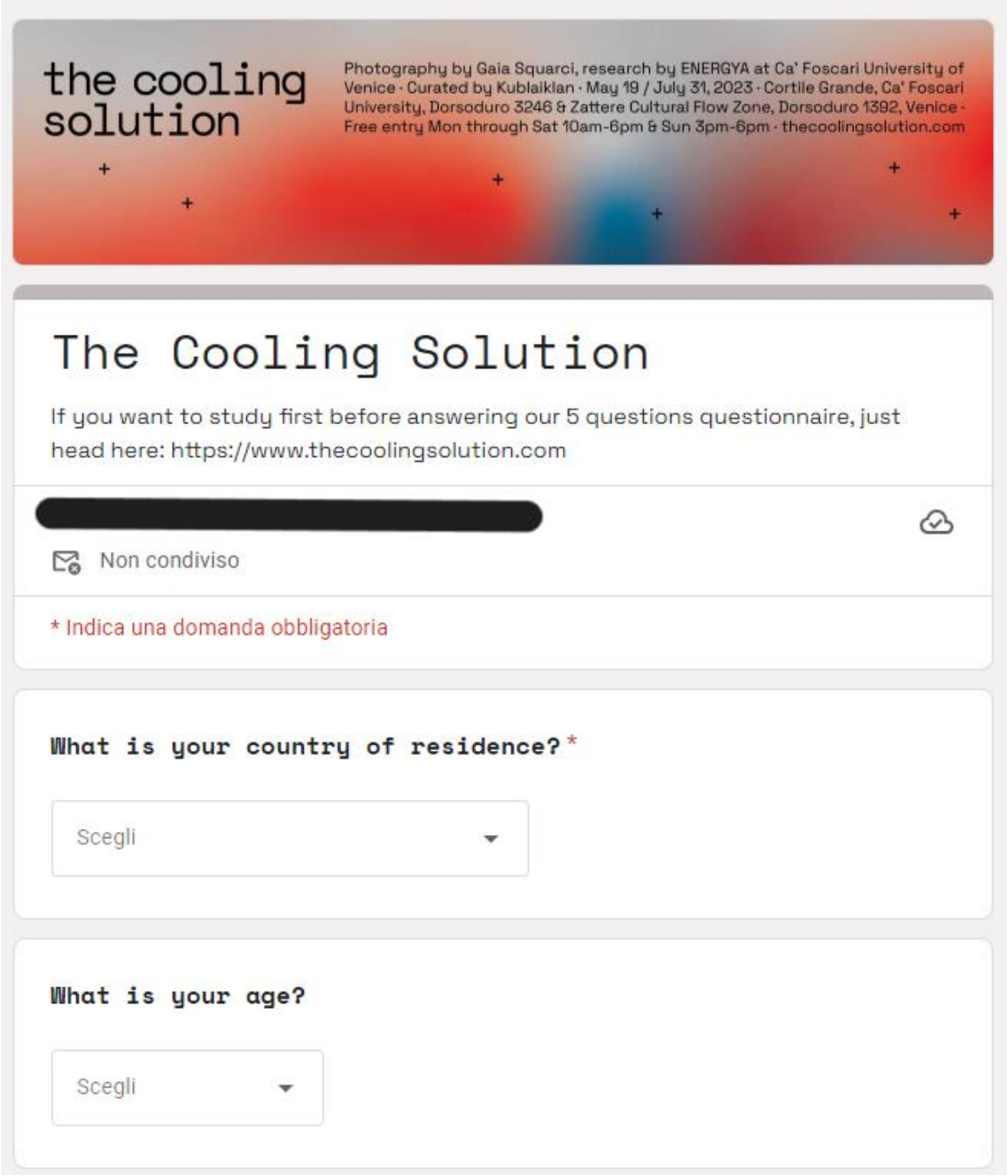
54	17/06/2023	GERMANY – Gottingen	Marktplatz	Gänseliesel-Brunnen Fountain	Letzte Generation	Fake oil
55	23/06/2023	THE U.K. - Glasgow (Scottland)	Royal Exchange Square	*Duke of Wellington* statue	This is Rigged	Raplace the cone and posters
56	24/06/2023	SWITZERLAND – Geneva	Parc des Bastions	*The Wall of the Reformers*	Renovate Switzerland	Blindfolded the statues
57	24/06/2023	THE U.S.A – New York City	The Metropolitan Museum of Art	*The Little Fourteen-Year-Old Dancer* by Degas	Declare Emergency, Extinction Rebellion and Liberate the Degas Two	Protest for activists
58	28/06/2023	GERMANY – Stuttgart	Natural History Museum at the Löwentor	Dinosaurs skeleton	Extinction Rebellion	Protest
59	01/07/2023	ITALY – Venice	Piazza San Marco	San Marco Basilica	Extinction Rebellion	Protest
60	03/07/2023	ITALY – Florence	Piazza di Santa Maria Novella	Battistero di San Giovanni	Ultima Generazione	Paint themselves and banners
61	08/07/2023	THE U.S.A. – New York City	The Metropolitan Museum of Art	-	Declare Emergency, Extinction Rebellion, Liberate The Degas Two, Rise and Resist	Shut down 8 exhibitions
62	09/07/2023	ITALY – Rome	Piazza Venezia	Altare della Patria	Extinction Rebellion	Banners
63	15/07/2023	THE U.S.A. – The Hamptons	Parrish Art Museum	Bank of America Gala	Various groups	Protest
64	22/07/2023	ITALY – Milan	Public Gardens	Statue of Idro Montanelli	Extinction Rebellion	Caution tape
65	22/07/2023	THE U.S.A – New York City	Madame Tussaud's Wax Museum	Oval Office Exhibition	Extinction Rebellion, Declare Emergency, Rise and Resist	Protest and sculpture alteration
66	22/07/2023	THE U.K. – Falkirk (Scotland)	The Helix Park	The Falkirk Kelpies sculptures	This is Rigged	Climb and banner
67	26/07/2023	THE U.K. – Edinburgh	The National Gallery of Scotland	King Charles III's portrait	This is Rigged	Spray on painting
68	28/07/2023	ITALY – Milan	Piazza Duomo	Statue of Vittorio Emanuele II on a Horse	Ultima Generazione	Spray on cover
69	02/08/2023	THE U.S.A. – New York City	The American Museum of Natural History	David H. Koch's Dinosaurs wing	Extinction Rebellion	Protest

70	02/08/2023	ITALY – Trieste	Piazza Unità d'Italia	Molo Audace	Extinction Rebellion	Protest, oil pouring
71	24/08/2023	THE U.S.A. – Washington D.C.	Smithsonian NMNH	Last American Dinosaurs exhibit	Declare Emergency	Dressed up like dinosaurs
72	29/08/2023	CANADA – Ottawa	Natonal Gellery of Canda	Tom Thomson's *Northern River*	On2Ottawa	Pink paint

APPENDIX 2: THE MODEL FOR THE QUIZ ON GOOGLE FORM

Screenshots taken from the Google form webpage on September 21, 2023

https://docs.google.com/forms/d/e/1FAIpQLSehUnNnMDA0mX5eSb1G4Aeco388yiE_dtTPKf-mNrH2XSXBrA/viewform



What is your cooling solution? *

Please select from the list below your 5 preferred and most common cooling solutions. The list is in casual order.

- [ ] Drink water
- [ ] Drink juices or soda
- [ ] Drink alcohol
- [ ] Eat fruit
- [ ] Eat icecream
- [ ] Avoid cooking
- [ ] Frequent showers
- [ ] Go to the pool
- [ ] Go to the seaside
- [ ] Walks in the green
- [ ] Stay outside
- [ ] Use wet cloths
- [ ] AC
- [ ] Fans
- [ ] Evaporative cooler
- [ ] Dehumidifier
- [ ] Take a nap
- [ ] Optimising/removing clothing
- [ ] Temporary migration
- [ ] Visit malls or other air-conditioned spaces
- [ ] Window shading
- [ ] Natural cross ventilation
- [ ] Home insulation
- [ ] Altro: _____

Why will you buy an AC? *

- ◯ I would never buy an AC
- ◯ Climate-induced excess heat
- ◯ Weather shocks
- ◯ High humidity where I live
- ◯ Economic affordability
- ◯ Kids & elderly in the dwelling
- ◯ Owner of a new house

How will AC shape our environment? *

- ◯ Air pollution
- ◯ Greenhouse gasses
- ◯ Ozone depletion
- ◯ E-waste

Invia Cancella modulo

APPENDIX 3: RAW DATA OF SURVEY 1

TIMESTAMP	WHAT IS YOUR COUNTRY OF RESIDENCE?	WHAT IS YOUR AGE?	WHAT IS YOUR COOLING SOLUTION?	DO YOU WANT TO SPECIFY ANYTHING ABOUT YOUR ANSWERS ON YOUR MAIN COOLING SOLUTIONS?	WHY WILL YOU BUY AN AC?	HOW WILL AC SHAPE OUR ENVIRONMENT?
5/15/2023 23:22:33	Italy		Go to the seaside, Fans, Avoid cooking, Frequent showers, Drink water		Climate-induced excess heat	Greenhouse gasses
5/16/2023 13:04:41	Italy		Home insulation, Optimising/removing clothing, AC, Drink water, Eat icecream, Window shading, Frequent showers, Go to the pool		Climate-induced excess heat	Greenhouse gasses
5/19/2023 10:53:03	Italy		Fans, Window shading, Optimising/removing clothing, Natural cross ventilation, Dehumidifier		Kids & elderly in the dwelling	Greenhouse gasses
5/20/2023 8:12:44	Italy		Walks in the green, Fans, Home insulation, Dehumidifier, Frequent showers		Climate-induced excess heat	Greenhouse gasses
5/20/2023 14:59:16	Italy		Window shading, Natural cross ventilation, Avoid cooking, Go to the seaside, Drink water		Climate-induced excess heat	Greenhouse gasses
5/21/2023 17:19:17	Italy		Drink water, Natural cross ventilation, Fans, Stay outside, Walks in the green		I would never buy an AC	Air pollution
5/22/2023 10:11:56	Italy		Frequent showers, Natural cross ventilation, Optimising/removing clothing, Drink water, Take a nap		Kids & elderly in the dwelling	Greenhouse gasses
5/23/2023 11:20:55	Italy		Window shading, Drink water, Fans, Optimising/removing clothing, Eat fruit		Climate-induced excess heat	Greenhouse gasses

5/24/2023 17:57:24	Italy		Window shading, Natural cross ventilation, Drink water, Avoid cooking, Optimising/removing clothing		Climate-induced excess heat	E-waste
5/25/2023 13:09:38	Italy		Eat fruit, Natural cross ventilation, Dehumidifier, Drink water, Window shading		I would never buy an AC	Greenhouse gasses
5/31/2023 20:57:18	Italy		Eat icecream, Optimising/removing clothing, Dehumidifier, Avoid cooking, Home insulation		High humidity where I live	Greenhouse gasses
6/1/2023 21:18:28	Germany		Fans, Dehumidifier, Evaporative cooler, Walks in the green, Natural cross ventilation		High humidity where I live	Air pollution
6/2/2023 18:37:59	Greece		Natural cross ventilation, Window shading, Fans		Weather shocks	Greenhouse gasses
6/3/2023 0:24:27	Italy		Natural cross ventilation, Optimising/removing clothing, AC, Fans, Dehumidifier		I would never buy an AC	Air pollution
6/9/2023 15:28:38	Spain		Go to the pool, Natural cross ventilation, Drink water, AC, Fans		Climate-induced excess heat	Greenhouse gasses
6/14/2023 11:55:23	Italy		Drink water, Home insulation, Optimising/removing clothing, Walks in the green, Natural cross ventilation		Owner of a new house	Greenhouse gasses
6/14/2023 12:30:39	Japan		Drink water, Natural cross ventilation, Optimising/removing clothing, Go to the seaside		High humidity where I live	Greenhouse gasses
6/16/2023 10:40:21	Italy		Walks in the green, Dehumidifier, Natural cross ventilation		High humidity where I live	Air pollution
6/16/2023 13:08:53	South Korea		AC, Fans, Window shading, Evaporative cooler		High humidity where I live	E-waste
6/16/2023 14:38:50	Germany		Optimising/removing clothing, Drink water, Fans		Climate-induced excess heat	Greenhouse gasses
6/20/2023 22:17:46	United Kingdom		Drink water, Window shading, AC, Dehumidifier, Home insulation		Climate-induced excess heat	Greenhouse gasses

6/21/2023 12:45:48	Italy		Window shading, Walks in the green, Dehumidifier, Natural cross ventilation, Fans		High humidity where I live	Air pollution
6/21/2023 14:08:43	United Kingdom		Drink water, Optimising/removing clothing, Window shading, Avoid cooking, Fans		I would never buy an AC	Greenhouse gasses
6/22/2023 1:52:27	Italy		Drink water, Dehumidifier, Use wet cloths, Eat fruit		I would never buy an AC	Greenhouse gasses
6/29/2023 4:56:45	Hong Kong	40-59	Drink water, Frequent showers, AC, Dehumidifier, Optimising/removing clothing	Ac first then the rest	High humidity where I live	Air pollution
6/29/2023 12:31:27	Italy	20-39	Go to the pool, Go to the seaside, Stay outside, Use wet cloths, Natural cross ventilation		I would never buy an AC	Air pollution
7/7/2023 13:45:01	Sweden	40-59	Drink water, Eat icecream, Avoid cooking, Frequent showers, Go to the seaside, Walks in the green, Stay outside, Use wet cloths, Temporary migration	I spend my summer at home in Italy and work remotely for my SW employer. Here it can get hot during my office hours and so I go by best by shading the windows and using wet cloths and wet hair. I do not like AC or ventilation as it get me sick with sinusitis.	I would never buy an AC	E-waste
7/8/2023 20:35:20	Italy	40-59	Drink water, Eat fruit, AC, Window shading, Natural cross ventilation	AC is last resort, not feeling first choice	High humidity where I live	E-waste
7/10/2023 17:08:27	Italy	40-59	Drink water, Eat fruit, Avoid cooking, Window shading, Natural cross ventilation, Home insulation, geothermal solution		I would never buy an AC	Air pollution
7/13/2023 11:04:34	Italy	20-39	Drink water, Frequent showers, AC, Fans, Optimising/removing clothing		High humidity where I live	Greenhouse gasses
7/13/2023 11:05:05	Denmark	20-39	Drink water, Go to the seaside, Stay outside, Optimising/removing clothing, Natural cross ventilation		I would never buy an AC	E-waste
7/13/2023 12:07:10	Philippines	20-39	Drink water, Eat icecream, Frequent showers, AC, Visit malls or other air-conditioned spaces	In the Philippines, mall culture is very big. People like to spend the weekends cooling off in shopping malls with their friends and families. Our malls are very	High humidity where I live	Greenhouse gasses

				big and we have all kinds of shops for utilities, leisure, etc.		
7/13/2023 15:44:21	United States (USA)	40-59	Drink water, AC, Dehumidifier, Window shading	AC: temporary window units in summer cottage, central in main residence.	High humidity where I live	Greenhouse gasses
7/13/2023 15:48:33	Italy	20-39	Drink water, Drink juices or soda, Eat fruit, Avoid cooking, Go to the seaside, AC, Fans, Optimising/removing clothing, Window shading	I use AC in the office and the fan at home	Climate-induced excess heat	Greenhouse gasses
7/13/2023 16:02:58	Italy	40-59	Drink water, Avoid cooking, Frequent showers, Optimising/removing clothing, Natural cross ventilation		Economic affordability	E-waste
7/13/2023 16:12:03	Italy	over 60	Drink water, Drink juices or soda, Eat fruit, Fans, Dehumidifier, Optimising/removing clothing, Window shading, Natural cross ventilation	I have AC but tend to use it as a very last resort, for the time being only 2/3 days a year, in a ground floor dwelling in Venice	High humidity where I live	Greenhouse gasses
7/13/2023 16:16:51	Italy	20-39	Drink water, Eat fruit, Frequent showers, Walks in the green, AC, Window shading,	AC mainly because I suffer of low blood-pressure	High humidity where I live	Ozone depletion
7/13/2023 18:43:22	India	40-59	Frequent showers, AC, Fans, Optimising/removing clothing, Natural cross ventilation	Fans and dressing for thermal comfort are the most common solutions preferred in my country.	High humidity where I live	Greenhouse gasses
7/13/2023 21:53:55	Brazil	20-39	Drink water, Frequent showers, Go to the seaside, AC, Fans		Economic affordability	E-waste
7/13/2023 21:55:46	Brazil	20-39	Drink alcohol, Frequent showers, AC, Visit malls or other air-conditioned spaces, Window shading		Climate-induced excess heat	E-waste
7/13/2023 21:57:09	United Arab Emirates	20-39	Drink water, Evaporative cooler, Visit malls or other air-conditioned spaces, Window shading		Climate-induced excess heat	Greenhouse gasses
7/13/2023 21:57:11	Brazil	20-39	Drink water, Drink alcohol, Frequent showers, AC, Fans		Weather shocks	E-waste
7/13/2023 22:18:56	Brazil	20-39	Drink water, Drink alcohol, Frequent showers, Go to the pool, AC, Window shading, Natural cross ventilation	I try to keep shirtless when it is hot	Climate-induced excess heat	Greenhouse gasses

7/13/2023 22:39:04	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Optimising/removing clothing, Natural cross ventilation		High humidity where I live	E-waste
7/14/2023 2:02:09	Brazil	20-39	Drink water, Frequent showers, AC, Fans		Climate-induced excess heat	Ozone depletion
7/14/2023 2:25:29	Brazil	20-39	Drink water, Frequent showers, AC, Fans		Climate-induced excess heat	Greenhouse gasses
7/14/2023 11:02:44	Italy	40-59	Drink water, Go to the seaside, Fans, Optimising/removing clothing, Window shading, Natural cross ventilation	I am trying to work on my apartment to cool it, trying to find solutions who are the least energy intensive while providing the most comfort. I am also trying to reduce the need for cooling wearing appropriate clothes, drinking a lot of water	I would never buy an AC	Greenhouse gasses
7/14/2023 11:36:49	Italy	20-39	Drink water, AC, Window shading		Kids & elderly in the dwelling	Greenhouse gasses
7/14/2023 11:55:05	Italy	40-59	Drink water, Eat icecream, Walks in the green, Fans, Optimising/removing clothing		Weather shocks	Greenhouse gasses
7/14/2023 12:21:33	Italy	20-39	Drink water, Dehumidifier, Optimising/removing clothing, Window shading, Natural cross ventilation	Window shading is very efficient, but not always feasible due to presence of indoor plants/green. Question "How will AC shape our environment?" is not clear.	Weather shocks	Greenhouse gasses
7/14/2023 12:52:39	Germany	20-39	Drink water, Go to the seaside, AC, Optimising/removing clothing, Window shading		Climate-induced excess heat	Greenhouse gasses
7/14/2023 15:54:34	Italy	40-59	AC, Optimising/removing clothing, Temporary migration	we move to the Alps in summer	High humidity where I live	Greenhouse gasses
7/14/2023 16:14:07	Spain	40-59	Drink water, Avoid cooking, Go to the seaside, Take a nap, Window shading, Natural cross ventilation	there is a point in which natural ventilation can be uncomfortable	Climate-induced excess heat	Greenhouse gasses
7/14/2023 17:10:26	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	Greenhouse gasses
7/14/2023 17:36:32	Germany	40-59	Drink water, Walks in the green, Optimising/removing clothing,		I would never buy an AC	Ozone depletion

			Window shading, Natural cross ventilation			
7/14/2023 19:41:03	Brazil	20-39	Drink water, Eat icecream, Frequent showers, Go to the seaside, Fans	Instead of ‘drinking water’ I would say ‘drinking cold water’	Climate-induced excess heat	Greenhouse gasses
7/15/2023 3:32:07	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	Greenhouse gasses
7/15/2023 6:47:01	Japan	40-59	Drink water, AC, Fans, Optimising/removing clothing, Natural cross ventilation	I use an AC only when necessary after trying cross ventilation.	Climate-induced excess heat	Greenhouse gasses
7/15/2023 7:06:45	Japan	20-39	Drink water, Frequent showers, Stay outside, Use wet cloths, Fans		Kids & elderly in the dwelling	Greenhouse gasses
7/15/2023 7:20:17	Japan	40-59	Drink water, Eat fruit, Frequent showers, AC, Window shading		Climate-induced excess heat	Greenhouse gasses
7/15/2023 7:33:57	Japan	20-39	Drink water, Eat icecream, Frequent showers, AC, Optimising/removing clothing		Economic affordability	Greenhouse gasses
7/15/2023 7:41:38	Japan	40-59	Drink water, Walks in the green, AC, Fans, Optimising/removing clothing		Economic affordability	E-waste
7/15/2023 9:30:14	Japan	20-39	Drink water, Stay outside, AC, Fans, Visit malls or other air-conditioned spaces		High humidity where I live	E-waste
7/15/2023 11:24:42	Indonesia	40-59	Drink water, Frequent showers, AC, Fans, Natural cross ventilation		Economic affordability	Greenhouse gasses
7/15/2023 16:06:17	Japan	20-39	Drink water, Eat fruit, Eat icecream, Go to the pool, AC, Fans, Optimising/removing clothing, Window shading, Natural cross ventilation		Economic affordability	Air pollution
7/15/2023 19:09:22	Italy	40-59	Drink water, Eat fruit, Frequent showers, AC, Fans, Window shading, Natural cross ventilation	Main solution: keep house closed and shadiwed in the day and let ventilate during the night	High humidity where I live	Greenhouse gasses
7/16/2023 11:22:23	Italy	40-59	Drink water, Eat fruit, Go to the seaside, Window shading, Natural cross ventilation		High humidity where I live	E-waste
7/16/2023 20:03:47	Brazil	40-59	Drink water, AC, Fans	Air condicionar.	Climate-induced excess heat	E-waste

7/16/2023 22:10:55	Brazil	40-59	Drink water, Eat fruit, Eat icecream, AC, Natural cross ventilation		Climate-induced excess heat	Ozone depletion
7/16/2023 22:14:34	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	E-waste
7/16/2023 23:08:47	Brazil	20-39	Drink water, AC, Fans, Optimising/removing clothing, Natural cross ventilation		High humidity where I live	Greenhouse gasses
7/17/2023 0:25:44	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Natural cross ventilation		Kids & elderly in the dwelling	Air pollution
7/17/2023 1:25:55	Brazil	40-59	Drink water, Go to the pool, AC, Fans, Natural cross ventilation		Climate-induced excess heat	Greenhouse gasses
7/17/2023 3:12:21	Indonesia	20-39	Drink water, Fans, Optimising/removing clothing, Natural cross ventilation, Home insulation, the house has a high ceiling	No, I dont	Climate-induced excess heat	Ozone depletion
7/17/2023 4:09:58	Brazil	40-59	Drink water, Drink juices or soda, Eat fruit, Eat icecream, Frequent showers, AC, Visit malls or other air-conditioned spaces	no	Kids & elderly in the dwelling	E-waste
7/17/2023 4:16:17	Japan	40-59	Drink water, Drink juices or soda, Eat fruit, Eat icecream, Walks in the green, AC, Window shading	Most of the actions that I took for cooling solution of myself is in the form of direct adaptation response	Weather shocks	Greenhouse gasses
7/17/2023 8:00:49	Italy	20-39	Drink water, Drink juices or soda, Fans, Temporary migration, Natural cross ventilation		Climate-induced excess heat	Greenhouse gasses
7/17/2023 9:22:17	Germany	40-59	Drink water, Go to the seaside, Fans, Optimising/removing clothing, Temporary migration		Climate-induced excess heat	Greenhouse gasses
7/17/2023 10:53:13	Japan	20-39	Drink water, Go to the pool, Walks in the green, AC, Natural cross ventilation		Economic affordability	Greenhouse gasses
7/17/2023 13:00:14	Panama	40-59	Walks in the green, Optimising/removing clothing		Owner of a new house	Greenhouse gasses
7/17/2023 14:14:07	United States (USA)	20-39	Drink water, Frequent showers, Go to the pool, AC, Visit malls or other air-conditioned spaces		Weather shocks	Greenhouse gasses

7/17/2023 14:55:11	Italy	20-39	Drink water, Eat fruit, Go to the seaside, Walks in the green, Optimising/removing clothing, Window shading, Natural cross ventilation, Home insulation		I would never buy an AC	E-waste
7/17/2023 15:25:50	Italy	20-39	Drink water, Drink juices or soda, Eat fruit, Eat icecream, AC, Fans, Window shading		High humidity where I live	Ozone depletion
7/17/2023 15:26:17	Italy	40-59	Drink water, Eat icecream, Window shading, Natural cross ventilation		I would never buy an AC	Greenhouse gasses
7/17/2023 15:27:45	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Natural cross ventilation		Economic affordability	Greenhouse gasses
7/17/2023 15:29:08	Italy	20-39	Drink water, Eat icecream, Optimising/removing clothing, Window shading, Natural cross ventilation		Owner of a new house	Ozone depletion
7/17/2023 15:29:25	Brazil	20-39	Drink water, AC, Fans, Optimising/removing clothing		High humidity where I live	Greenhouse gasses
7/17/2023 15:30:05	Italy	20-39	Drink water, Eat icecream, Walks in the green, Take a nap, Natural cross ventilation		Owner of a new house	E-waste
7/17/2023 15:30:21	Italy	20-39	Optimising/removing clothing, Visit malls or other air-conditioned spaces, Window shading, Natural cross ventilation, Home insulation		I would never buy an AC	Air pollution
7/17/2023 15:31:30	Italy	20-39	Drink water, Eat icecream, Avoid cooking, Visit malls or other air-conditioned spaces, Window shading		I would never buy an AC	Greenhouse gasses
7/17/2023 15:33:26	Italy	20-39	Drink water, Drink juices or soda, Eat icecream, AC, Natural cross ventilation		Owner of a new house	E-waste
7/17/2023 15:35:21	Italy	20-39	Drink water, Frequent showers, Go to the pool, AC, Window shading		High humidity where I live	E-waste
7/17/2023 15:35:21	Italy	20-39	Go to the seaside, Use wet cloths, AC, Fans, Window shading		Climate-induced excess heat	Greenhouse gasses

7/17/2023 15:43:03	Italy	20-39	Frequent showers, Go to the pool, Go to the seaside, Walks in the green, Dehumidifier		Climate-induced excess heat	Air pollution
7/17/2023 15:46:26	Italy	20-39	Eat icecream, Frequent showers, Walks in the green, AC, Fans, Optimising/removing clothing, Temporary migration, Visit malls or other air-conditioned spaces, Natural cross ventilation		Weather shocks	Ozone depletion
7/17/2023 15:47:41	Brazil	40-59	Drink juices or soda, Frequent showers, AC, Fans		Economic affordability	Greenhouse gasses
7/17/2023 15:48:06	Italy	over 60	Drink water, AC, Fans, Dehumidifier, Window shading		Kids & elderly in the dwelling	Greenhouse gasses
7/17/2023 15:48:42	Italy	20-39	Drink water, Go to the pool, Fans, Window shading		Weather shocks	Greenhouse gasses
7/17/2023 15:49:13	Italy	40-59	Drink water, Avoid cooking, Frequent showers, AC, go to the mountains	I use AC only in unavoidable cases (mainly in office for work) and at the lowest possible power.	Climate-induced excess heat	Greenhouse gasses
7/17/2023 15:49:27	Italy	20-39	Eat icecream, Frequent showers, Visit malls or other air-conditioned spaces, Window shading, Home insulation		Climate-induced excess heat	E-waste
7/17/2023 15:50:46	Brazil	20-39	Drink water, Avoid cooking, Frequent showers, Use wet cloths, Optimising/removing clothing	No, i don't.	I would never buy an AC	Air pollution
7/17/2023 15:53:06	Italy	20-39	Drink juices or soda, Frequent showers, Fans, Temporary migration, Natural cross ventilation		I would never buy an AC	Air pollution
7/17/2023 15:56:47	Italy	20-39	Drink water, Eat fruit, Walks in the green, Stay outside, Fans		I would never buy an AC	Air pollution
7/17/2023 15:57:36	France	20-39	Drink water, Fans, Optimising/removing clothing, Window shading		Kids & elderly in the dwelling	Greenhouse gasses
7/17/2023 15:59:18	Italy	20-39	Drink water, Eat fruit, Go to the seaside, Walks in the green, Stay outside, Optimising/removing		Weather shocks	Greenhouse gasses

			clothing, Temporary migration, Window shading			
7/17/2023 16:09:05	Brazil	20-39	Drink water, Eat fruit, Eat icecream, Frequent showers, Go to the seaside, AC, Fans, Optimising/removing clothing, Natural cross ventilation		Climate-induced excess heat	Greenhouse gasses
7/17/2023 16:16:46	Brazil	40-59	Drink water, Walks in the green, Optimising/removing clothing, Window shading, Natural cross ventilation	If/when the room has AC/fan I use to turn it on in very hot days	Weather shocks	Ozone depletion
7/17/2023 16:18:28	Italy	20-39	Drink water, Eat fruit, Frequent showers, Fans, Natural cross ventilation	I'm an Indian (from Chennai) living in Italy for the past 7+ years. My primary solution (also back in my town) is to drink water and also aloe vera/coconut water and to eat fruits like watermelon. I take a shower twice a day. I avoid going out in direct sunlight (if possible). In India, I am habituated to having a ceiling fan but during my last visit, I bought an AC because it was too much to handle despite following all of these.	High humidity where I live	Ozone depletion
7/17/2023 16:31:37	Brazil	20-39	Drink water, Go to the pool, Go to the seaside, AC, Fans		Climate-induced excess heat	Greenhouse gasses
7/17/2023 16:46:03	Italy	20-39	Drink water, Eat fruit, Fans, Take a nap, Optimising/removing clothing		High humidity where I live	E-waste
7/17/2023 16:50:04	Italy	20-39	Drink water, Eat fruit, Avoid cooking, Frequent showers, Fans, Optimising/removing clothing, Window shading, Go to the lake		I would never buy an AC	Greenhouse gasses
7/17/2023 17:47:26	Italy	20-39	Drink water, Optimising/removing clothing, Window shading, Natural cross ventilation, Home insulation, Staying inside, splashing water on body parts		I would never buy an AC	Greenhouse gasses

7/17/2023 18:03:06	Italy	20-39	Drink water, Eat icecream, Fans, Optimising/removing clothing, Window shading		I would never buy an AC	Greenhouse gasses
7/17/2023 18:04:43	Brazil	40-59	Eat fruit, Go to the seaside, AC, Fans, Natural cross ventilation		Owner of a new house	E-waste
7/17/2023 18:25:43	Italy	20-39	Drink water, Avoid cooking, Optimising/removing clothing, Window shading, leave the windows open during the night		I would never buy an AC	Air pollution
7/17/2023 18:44:00	Brazil	20-39	Drink water, Drink juices or soda, Eat icecream, Frequent showers, AC, Optimising/removing clothing, Visit malls or other air-conditioned spaces, Window shading		Climate-induced excess heat	Greenhouse gasses
7/17/2023 19:02:43	Italy	20-39	Drink water, Fans, Optimising/removing clothing, Natural cross ventilation		Climate-induced excess heat	E-waste
7/17/2023 19:28:11	Poland	20-39	Drink water, Eat icecream, Go to the pool, Walks in the green, Optimising/removing clothing		Climate-induced excess heat	Greenhouse gasses
7/17/2023 20:37:00	Brazil	20-39	Drink water, Eat fruit, Go to the seaside, Walks in the green, Stay outside, Fans, Optimising/removing clothing, Natural cross ventilation		I would never buy an AC	E-waste
7/17/2023 21:11:10	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Optimising/removing clothing		Economic affordability	Greenhouse gasses
7/17/2023 22:24:38	Italy	40-59	Drink water, Dehumidifier, Optimising/removing clothing, Window shading, Home insulation		Climate-induced excess heat	Greenhouse gasses
7/17/2023 22:34:41	Turkey	20-39	Drink water, AC, Optimising/removing clothing, Home insulation		High humidity where I live	Air pollution
7/17/2023 23:15:18	Brazil	40-59	Drink water, Eat fruit, Frequent showers, Stay outside, Optimising/removing clothing	n	Climate-induced excess heat	E-waste

7/18/2023 1:09:58	Brazil	40-59	Drink water, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	Greenhouse gasses
7/18/2023 2:28:10	Brazil	20-39	Drink water, Drink juices or soda, AC, Fans, Optimising/removing clothing		High humidity where I live	E-waste
7/18/2023 5:00:25	Japan	40-59	Drink water, Eat icecream, AC, Fans, Window shading		Climate-induced excess heat	Greenhouse gasses
7/18/2023 8:45:06	Italy	20-39	Drink water, Eat icecream, Fans, Optimising/removing clothing, Window shading		Climate-induced excess heat	E-waste
7/18/2023 10:59:31	Italy	20-39	Drink water, Frequent showers, Optimising/removing clothing, Natural cross ventilation		High humidity where I live	E-waste
7/18/2023 11:17:57	Japan	20-39	Drink water, AC, Fans, Natural cross ventilation	I am currently living in Tokyo and right now is summer, thus i tend to use a fan and also open the window for the circulation. i have an AC but i dont want to use it because it is very expensive to use it, but when the fan is not working i use the AC.	Climate-induced excess heat	Greenhouse gasses
7/18/2023 11:29:18	Italy	20-39	Drink water, Frequent showers, Window shading, Natural cross ventilation	Sometimes, esplecially in Rome I use ventilation (not air conditioning)	Climate-induced excess heat	Air pollution
7/18/2023 12:38:30	Italy	20-39	Drink water, Fans, Window shading, Natural cross ventilation		Climate-induced excess heat	E-waste
7/18/2023 13:59:24	Brazil	20-39	Drink water, Frequent showers, AC, Fans		Climate-induced excess heat	Greenhouse gasses
7/18/2023 14:33:54	Brazil	20-39	AC, Fans		Economic affordability	Greenhouse gasses
7/18/2023 15:03:31	Hungary	20-39	Drink water, Eat icecream, Go to the pool, Go to the seaside, Use wet cloths, Optimising/removing clothing, Temporary migration, Visit malls or other air-conditioned spaces		Weather shocks	Air pollution
7/18/2023 17:29:06	Italy	20-39	Drink water, Eat icecream, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	Greenhouse gasses

7/18/2023 18:42:40	Italy	20-39	Drink water, Eat fruit, Avoid cooking, Fans, Window shading, Natural cross ventilation		Economic affordability	E-waste
7/19/2023 3:01:33	Brazil	40-59	AC, Fans, Optimising/removing clothing, Visit malls or other air-conditioned spaces, Natural cross ventilation		Weather shocks	Greenhouse gasses
7/19/2023 7:13:13	Japan	40-59	Drink water, Walks in the green, AC, Optimising/removing clothing, Natural cross ventilation		Owner of a new house	Greenhouse gasses
7/19/2023 10:56:20	Italy	20-39	Drink water, Avoid cooking, Walks in the green, Fans, Optimising/removing clothing, Temporary migration, Window shading, Home insulation	I live close to the mountains, so on particularly hot days I temporarily move to higher altitudes, even for some hours only	I would never buy an AC	E-waste
7/19/2023 11:59:29	Italy	40-59	Drink water, Eat fruit, Avoid cooking, Go to the seaside, Fans		Owner of a new house	Greenhouse gasses
7/19/2023 12:11:02	Italy	20-39	Drink water, Avoid cooking, Frequent showers, AC, Window shading		High humidity where I live	Greenhouse gasses
7/19/2023 15:17:08	Brazil	20-39	Frequent showers, Go to the seaside, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	Greenhouse gasses
7/19/2023 23:45:25	Brazil	20-39	Drink water, Frequent showers, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	E-waste
7/21/2023 10:46:35	Japan	40-59	Drink water, Eat icecream, Frequent showers, AC, Fans		High humidity where I live	Greenhouse gasses
7/21/2023 14:27:10	Indonesia	20-39	Drink water, Drink juices or soda, AC		Climate-induced excess heat	Greenhouse gasses
7/21/2023 19:30:43	Brazil	20-39	Drink water, Eat icecream, Frequent showers, AC, Fans, Optimising/removing clothing		High humidity where I live	E-waste
7/23/2023 16:41:51	Italy	40-59	Drink water, Eat fruit, AC, Dehumidifier, Optimising/removing clothing, Window shading, Natural cross ventilation, Home insulation	My house is very well insulated. My office is not. I apply the solutions I checked in order of increasing energy use. I use the deumidifier and the AC only in extreme cases, say about 10 days per year, an only for limited time. But as	Climate-induced excess heat	E-waste

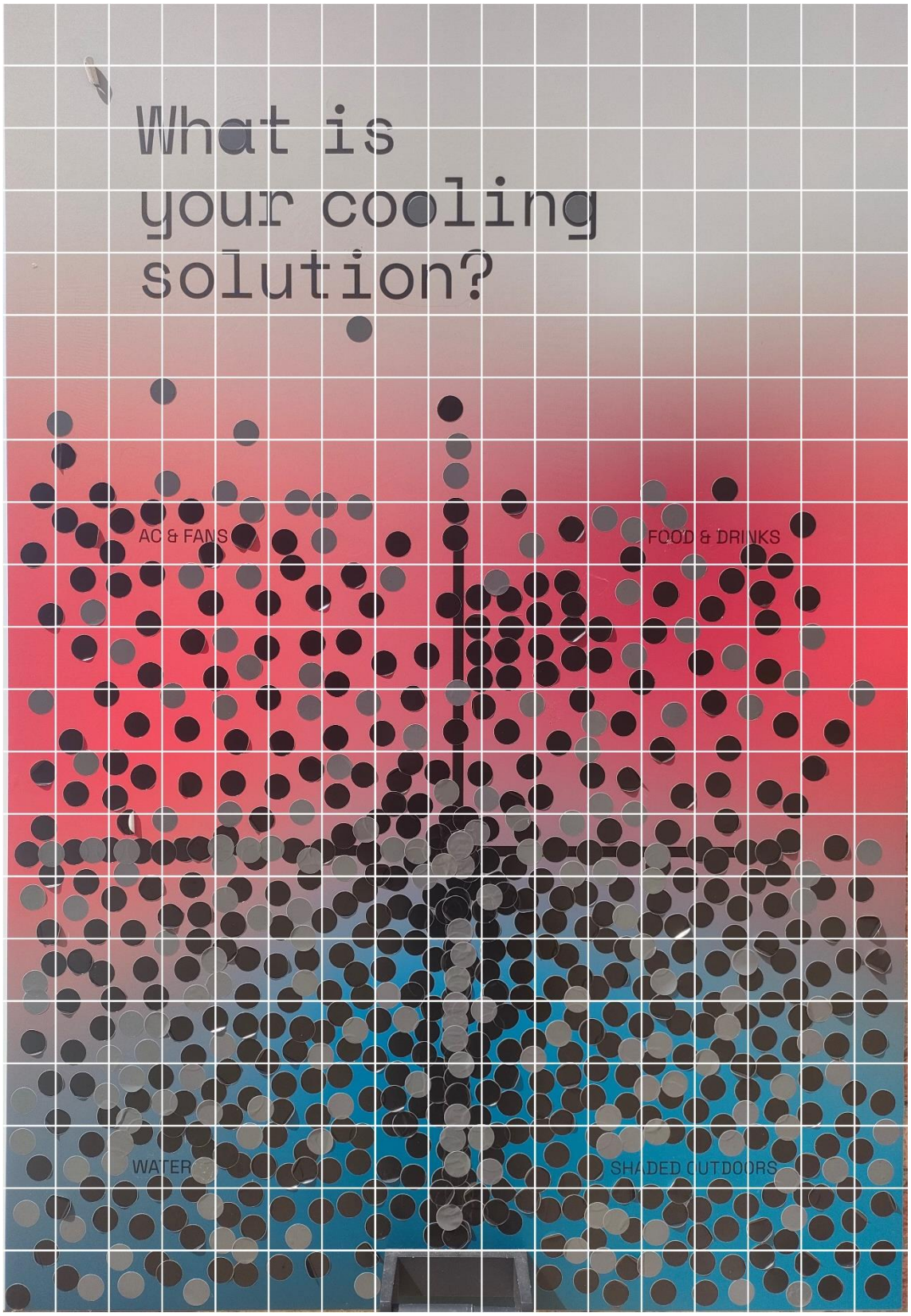
				temperature increase, it will get harder to keep up.		
7/24/2023 3:02:51	Brazil	40-59	Drink juices or soda, Frequent showers, Walks in the green, Fans, Natural cross ventilation		Climate-induced excess heat	Greenhouse gasses
7/24/2023 3:59:10	Japan	20-39	Drink water, Drink juices or soda, Frequent showers, Stay outside, AC, Take a nap, Visit malls or other air-conditioned spaces, Natural cross ventilation		Climate-induced excess heat	Greenhouse gasses
7/24/2023 16:47:22	Brazil	20-39	Drink water, Drink juices or soda, Drink alcohol, Eat fruit, Frequent showers, Go to the seaside, Walks in the green, Fans, Optimising/removing clothing, Natural cross ventilation		Climate-induced excess heat	Ozone depletion
7/25/2023 9:29:16	Netherlands	40-59	Drink water, Optimising/removing clothing, Window shading, Natural cross ventilation	I am afraid I do not understand the last question "How will AC shape our environment?", so my answer there is random	I would never buy an AC	Air pollution
7/26/2023 11:55:49	Italy	40-59	Drink water, Walks in the green, AC, Fans, Optimising/removing clothing		Climate-induced excess heat	Air pollution
7/26/2023 19:36:04	Italy	20-39	Drink water, Go to the seaside, Fans, Optimising/removing clothing, Temporary migration		I would never buy an AC	Greenhouse gasses
7/26/2023 21:50:42	Brazil	40-59	Drink water, Eat icecream, Frequent showers, Go to the pool, AC, Fans, Visit malls or other air-conditioned spaces		Weather shocks	E-waste
7/28/2023 15:45:47	Brazil	20-39	Drink water, Walks in the green, Stay outside, Visit malls or other air-conditioned spaces, Natural cross ventilation		Economic affordability	Air pollution
7/31/2023 10:08:15	Norway	40-59	Drink water, Fans, Home insulation		I would never buy an AC	Greenhouse gasses

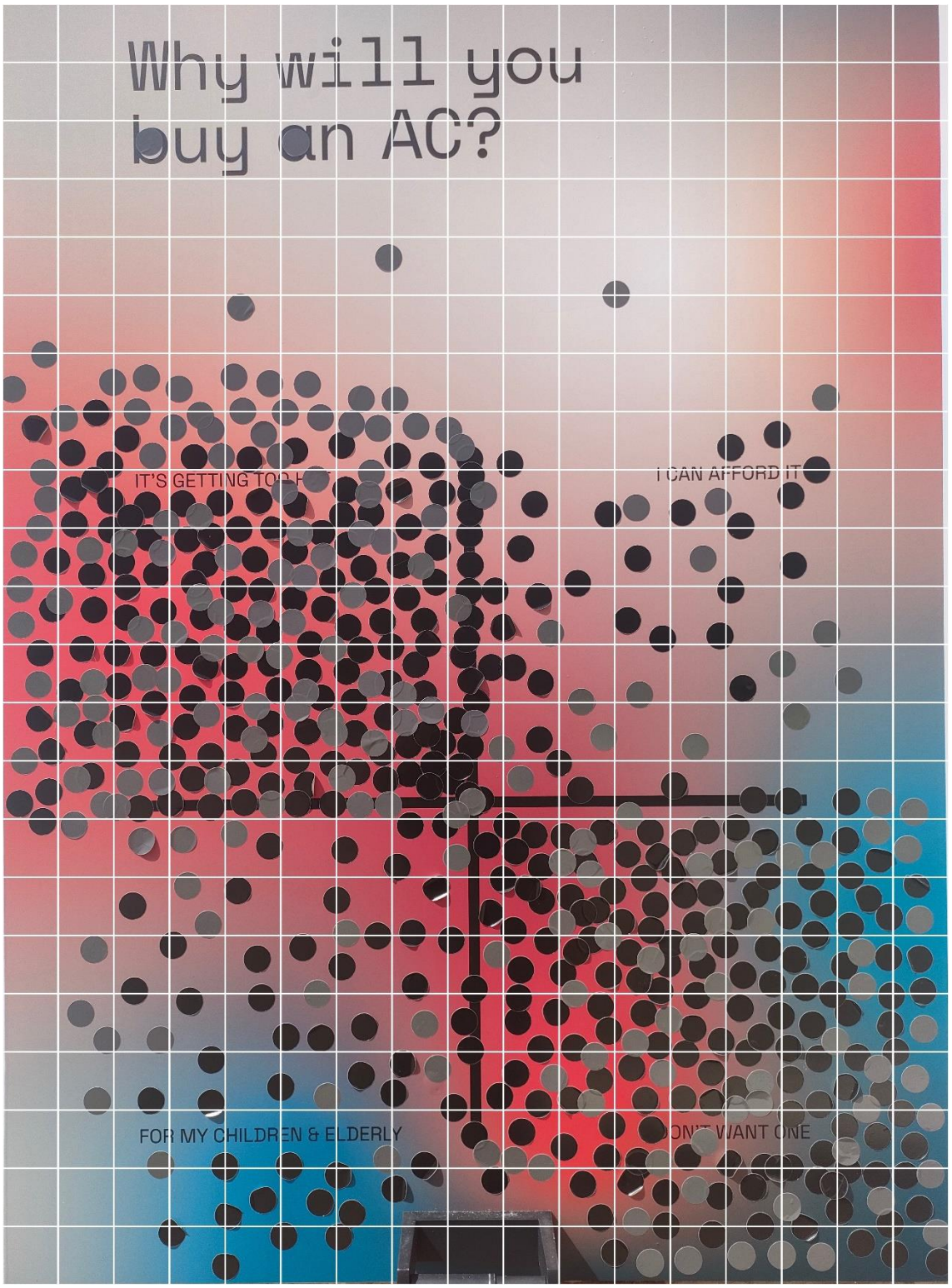
8/1/2023 14:45:52	Italy	40-59	Drink water, Go to the seaside, Optimising/removing clothing, Window shading, Natural cross ventilation, Home insulation	no	Owner of a new house	Greenhouse gasses
8/6/2023 14:57:00	Italy	40-59	Drink water, Avoid cooking, Go to the seaside, Fans, Optimising/removing clothing		Climate-induced excess heat	Greenhouse gasses
8/9/2023 23:04:41	Poland	40-59	Drink water, Walks in the green, Window shading		Weather shocks	Greenhouse gasses
8/10/2023 3:08:08	Brazil	20-39	Drink water, Optimising/removing clothing, Natural cross ventilation		Economic affordability	E-waste
8/10/2023 8:03:21	Italy	20-39	AC		High humidity where I live	Greenhouse gasses
8/11/2023 11:09:29	Turkey	40-59	Drink water, Eat fruit, Eat icecream, Walks in the green, Optimising/removing clothing, Natural cross ventilation	We need more nature-based solutions.	I would never buy an AC	E-waste
9/3/2023 22:40:20	Canada	40-59	Drink water, Avoid cooking, Optimising/removing clothing, Window shading, Natural cross ventilation, Home insulation		I would never buy an AC	Ozone depletion

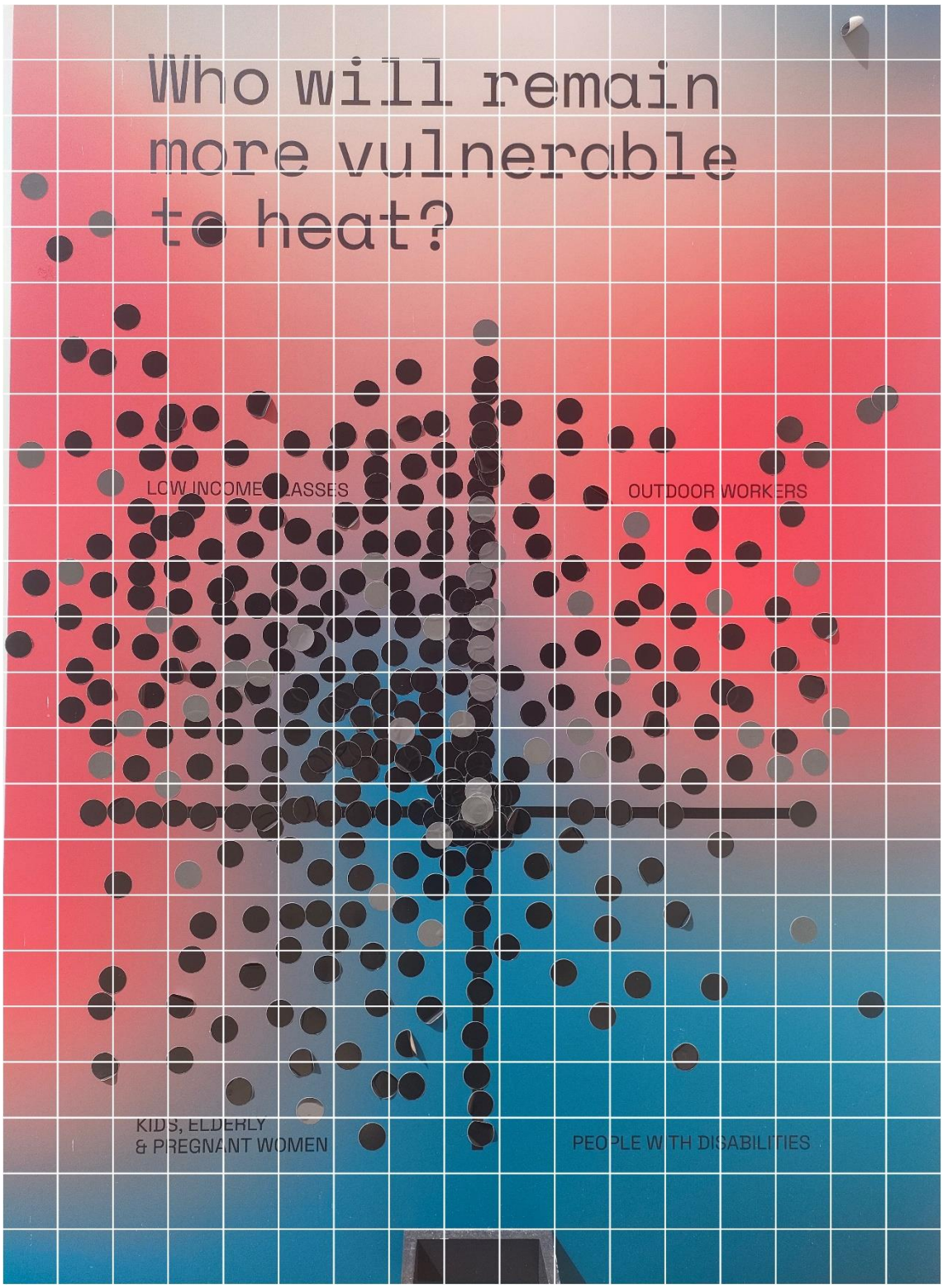
APPENDIX 4: DATA ABOUT THE GEOGRAPHIC DISTRIBUTION OF PREFERENCES FOR Q3 OF THE QUESTIONNAIRE

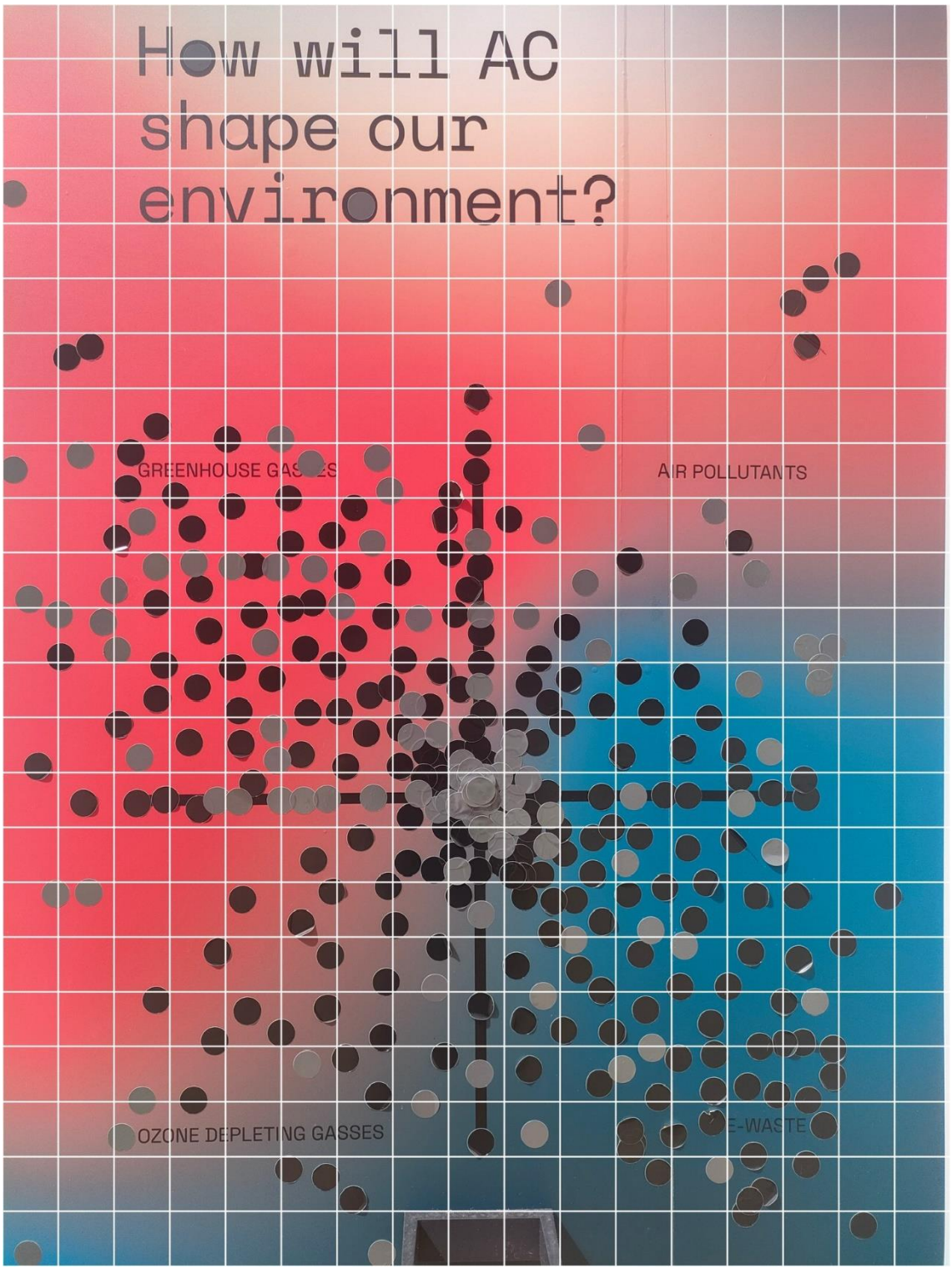
	EUROPE	INDIA	MIDDLE EAST	NORTH AMERICA	SOUTH AMERICA	SOUTH EAST ASIA
AC	24	1	1	2	33	18
AVOIDE COOKING	19			1	1	
DEHUMIDIFIER	16			1		1
DRINK ALCOHOL					4	
DRINK JUICES AND SODA	6				6	3
DRINK WATER	75		3	3	35	20
EAT FRUIT	20		1		7	3
EAT ICECREAM	17		1		7	6
EVAPORATIVE COOLER	1		1			1
FANS	43	1			32	11
FREQUENT SHOWERS	20	1		1	27	8
GO TO THE POOL	8			1	4	2
GO TO THE SEASIDE	20				8	1
HOME INSULATION	15		1	1		1
NATURAL CROSS VENTILATION	44	1	1	1	16	9
OPTIMIZING CLOTHES	47	1	2	1	22	8
STAY OUTSIDE	6				3	3
TAKE A NAP	4					1
TEMPORARY MIGRATION	10					
USE WET CLOTH	5				1	1
VISIT MALLS	5		1	1	6	3
WALKS IN THE GREEN	20		1		6	4
WINDOWS SHADING	51		1	2	4	5

APPENDIX 5: PICTURES OF THE PANELS IN CA' FOSCARI COURTYARD WITH THE APPLIED GRID, FROM 1 TO 4




Why will you buy an AC?
I CAN AFFORD IT
FOR MY CHILDREN & ELDERLY


Who will remain more vulnerable to heat?
LOW INCOME CLASSES
OUTDOOR WORKERS
KIDS, ELDERLY & PREGNANT WOMEN
PEOPLE WITH DISABILITIES



Pictures taken personally in Ca' Foscari courtyard on July 4, 2023. Grid applied with post production software Grid#

APPENDIX 6: PRESS RELEASE UP TO THE END OF JUNE 2023

The information have been provided by Ca' Foscari offices. Titles are in the original language.

DATE (dd/mm/yy)	NEWS PAGE	TITLE	PAGE
27/04/2023	Meteoweb.eu	Clima: The Cooling Solution, un progetto di arte e scienza sull'adattamento a temperature crescenti	
27/04/2023	Facebook.com	*@ CmccClimate 27/04/2023 15:46:00 - La mostra "The Cooling Solution"*	
27/04/2023	Mobilitasostenibile.it	*Venezia: The Cooling Solution il progetto fotografico di arte e scienza*	
27/04/2023	Politicamentecorretto.com	*The Cooling Solution | Mostra fotografica, 19 maggio - 31 luglio 2023*	
04/05/2023	La Nuova di Venezia e Mestre	*Il senso dell'uomo per il clima, le fotografie di Gaia Squarci alla mostra "The Cooling Solution"*	34
05/05/2023	Cmccc_it	*The Cooling Solution: between art and science*	
05/05/2023	Esgnews.it	*The Cooling Solution: Gaia Squarci tra arte e scienza*	
13/05/2023	Bebeez.it	*The Cooling Solution*	
13/05/2023	Editorialedomani.it	*Segnalazione mostra The Cooling Solution*	
18/05/2023	Tiscali.it	*Dialogo tra arte e scienza negli spazi di Ca' Foscari*	
18/05/2023	Ansa.it	*Dialogo tra arte e scienza negli spazi di Ca' Foscari*	
18/05/2023	Altoadige.it	*Dialogo tra arte e scienza negli spazi di Ca' Foscari*	
18/05/2023	Gds.it	*Dialogo tra arte e scienza negli spazi di Ca' Foscari*	
18/05/2023	Giornaletrentino.it	*Dialogo tra arte e scienza negli spazi di Ca' Foscari*	
01/05/2023	Elle Décor	*Artshow - L'arta della resilienza*	319/21

19/05/2023	Facebook.com	*@CmccClimate 19/05/2023 13:05:00 - Scientific research meets photography in "The Cooling Solution"*	
22/05/2023	Rai3 Veneto	*TGR VENETO H 19.30 (Ora: 19:51:32 Min: 2:02)*	19:51
23/05/2023	Rainews.it	*Venezia, arte, scienza e fotografia unite per salvaguardare l'ambiente*	
23/05/2023	Rai Radiouno Veneto	*GR REGIONE VENETO H 12.10 (Ora: 12:20:11 Min: 2:10) The Cooling Solution*	12:20
23/05/2023	Rai3	*TGR LEONARDO (Ora: 14:59:49 Min: 1:55) The Cooling Solution*	14:59
24/05/2023	Ansa.it	*Le mostre del weekend, dal Giro d'Italia a Saffaro e Rivalta- The Cooling Solution; Cercando il cuore.*	
01/06/2023	Venews	*exhibitions - The Cooling Solution; Cercando il cuore*	190/91
24/05/2023	Altoadige.it	*Le mostre del weekend, dal Giro d'Italia a Saffaro e Rivalta*	
24/05/2023	Gds.it	*Le mostre del weekend, dal Giro d'Italia a Saffaro e Rivalta*	
24/05/2023	Giornaletrentino.it	*Le mostre del weekend, dal Giro d'Italia a Saffaro e Rivalta*	
01/06/2023	Ospite di Venezia	*Mostre - The Cooling Solution*	42
07/06/2023	La Nuova di Venezia e Mestre	*L'arte libera la notte (e viceversa) .Musei, palazzi, fondazioni, librerie. 156 eventi*	33
06/06/2023	Veneziatoday.it	*Tutto pronto per l'Art Night: attesi a decine di migliaia tra calli e campi veneziani*	68/73
15/06/2023	Internazionale	*Troppo caldo*	11
01/06/2023	Acer	*AQ - I prossimi appuntamenti: The Cooling Solution*	1
16/06/2023	Il Gazzettino – Ed. Venezia	*La notte dell'arte mostre ed eventi in tutta venezia il programma di domani (A Sperandio)*	
15/06/2023	Veneziatoday.it	*Conto alla rovescia per la notte dell'arte veneziana*	

15/06/2023	Twitter.com	*@CmccClimate 15/06/2023 14:02:00 - Tomorrow, join us for: "The Cooling Solution. Photography, science and the future of air-conditioning"*	1+22
17/06/2023	Corriere del Veneto – Ed. Venezia (Corriere della Sera)	*Art Night a Venezia. Fino a notte fonda 156 eventi in scena*	1+22
17/06/2023	Corriere del Veneto – Ed. Padova e Rovigo (Corriere della Sera)	*Art Night a Venezia. Fino a notte fonda 156 eventi in scena*	1+22
17/06/2023	Corriere del Veneto – Ed. Treviso (Corriere della Sera)	*Art Night a Venezia. Fino a notte fonda 156 eventi in scena*	1+22
17/06/2023	Corriere del Veneto – Ed. Vicenza (Corriere della Sera)	*Art Night a Venezia. Fino a notte fonda 156 eventi in scena*	1+22
17/06/2023	Corriere di Verona (Corriere della Sera)	*Art Night a Venezia. Fino a notte fonda 156 eventi in scena*	26
19/06/2023	La Nuova di Venezia e Mestre	*L'Art Night conquista la citta' di bellezza per fare il pieno di bellezza*	
18/06/2023	Veneziatoday.it	*Cambiamento climatico, diritti civili, arte e scienza: ecco l'Art Night 2023*	
19/06/2023	Facebook.com	*@willmediaITA 19/06/2023 19:00:00 - Il paradosso dell'aria condizionata*	
20/06/2023	Greenreport.it	*Condizionatori per resistere alle ondate di caldo in Europa e India, ma si rischia il boom delle emissioni*	
20/06/2023	Meteoweb.eu	*Condizionatori soluzione al caldo in Europa e India, ma si rischia boom delle emissoni*	
20/06/2023	Cmccc.it	*Aircon wide adoption to fight the heat in India and Europe, a risk for a dramatic rise in emissions*	
01/06/2023	Foto.it	*Gaia squarci the cooling solution*	5
21/06/2023	Ecodellecitta.it	*Clima: l'aumento dei condizionatori per resistere al caldo portera' ad un boom delle emissioni*	

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ACKNOWLEDGMENTS

This research would not have been possible without the help of Professor Chiara Carolina Donelli, who decided to support me and my project even with a newborn.

I would like to thank also Professor Irene Popoli, whose course about sustainable development in, for, and from culture inspired the very first idea of this thesis.

The biggest gratitude to Professor Enrica De Cian and Jacopo Crimi, who welcomed me in *The Cooling Solution* project and proposed me the possibility to widen my research with a case study on their exhibition. With them, I want to thank also EnergyA, Gaia Squarci, Kublaiklan, Element6, Niche, and anyone else who took part in the realization of the photojournalistic enquiry I had the pleasure to analyze.

Thank you to my university, Ca' Foscari. Our time together has come to an end after more than five long years. Despite the numerous times I cursed you, you gave me much more than knowledge, insomnia, and stress. I grew up, I found out whom I want to be, I traveled, I met new people, all because of you. I will never forget you.

Of course thank you to my family, who always supported me even when we had diverging opinions. Thank you to my mom who grew me up to not let anyone trample over me, to be independent and a leader. Thank you to my dad who is always my biggest supporter when it comes to pack and leave for new adventures, even when they imply moving to another country. Thank you to my brother, even if you are trying to kick me out our room and call me in the middle of the night.

Thank you to my one and only Branco di Lama. I never thought I could find other girls so different from me and so similar at the same. You are family now.

Thank you to myself, for having always chased my dreams even when things got rough, for have never given up. Big things are coming.