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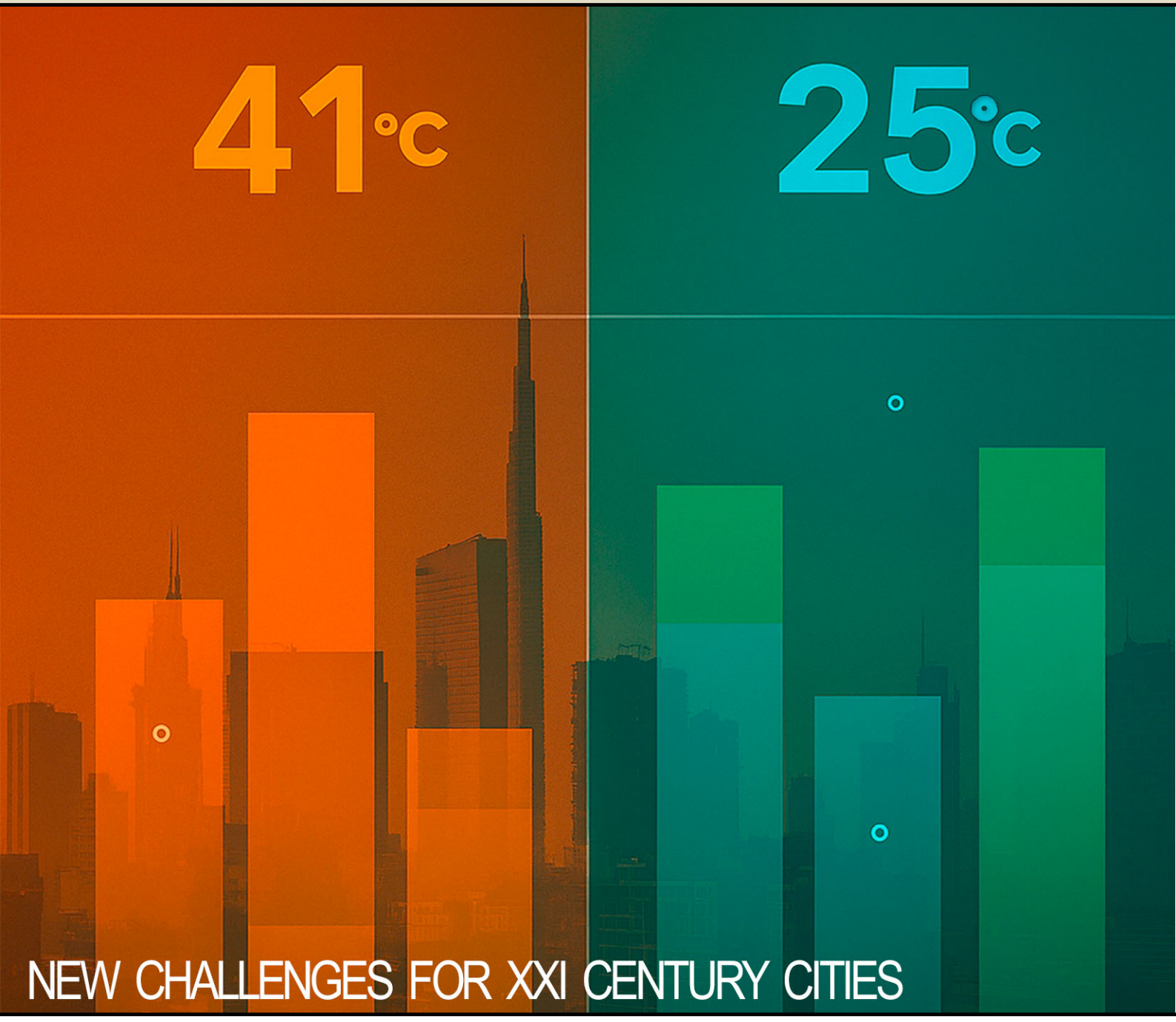

NEW CHALLENGES FOR XXI CENTURY CITIES

Multilevel scientific approach to impacts of global warming on urban areas, energy transition, optimisation of land use and emergency scenario

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TeMA Journal was established with the primary objective of fostering and strengthening the integration between urban transformation studies and those focused on mobility governance, in all their aspects, with a view to environmental sustainability. The three issues of the 2025 volume of TeMA Journal propose articles that deal with the effects of Global warming, reduction of energy consumption, immigration flows, optimization of land use, analysis and evaluation of civil protection plans in areas especially vulnerable to natural disasters and multilevel governance approach to adaptation.

TeMA is the Journal of Land Use, Mobility and Environment and offers papers with a unified approach to planning, mobility and environmental sustainability. With ANVUR resolution of April 2020, TeMA journal and the articles published from 2016 are included in the A category of scientific journals. The articles are included in main scientific database as Scopus (from 2023), Web of Science (from 2015) and the Directory of Open Access Journals (DOAJ). It is included in Sparc Europe Seal of Open Access Journals, and the Directory of Open Access Journals.

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TeMA - Journal of Land Use, Mobility and Environment offers researches, applications and contributions with a unified approach to planning and mobility and publishes original inter-disciplinary papers on the interaction of transport, land use and environment. Domains include: engineering, planning, modeling, behavior, economics, geography, regional science, sociology, architecture and design, network science and complex systems.
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REVIEW NOTES
Urban planning literature review

Global warming reports: a critical analysis of R&D centres publications

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Abstract
Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always remaining in the groove of rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is the expression of continuously updating emerging topics concerning relationships between urban planning, mobility, and environment, through a collection of short scientific papers written by young researchers. The Review Notes are made of five parts. Each section examines a specific aspect of the broader information storage within the main interests of TeMA Journal. In particular, the Urban planning literature review section presents recent books and journals on selected topics and issues within the global scientific panorama.
For the second issue of TeMA Journal volume no. 18, this section provides a critical analysis of recent reports and documents on climate change, published by different types of stakeholders. This review examines the landscape of climate change reporting through a comparative lens, focusing on key findings, strengths, weaknesses, and implications of selected publications. This contribution seeks to explore the perspectives of research and development (R&D) centres on climate change, highlighting their function in advancing scientific knowledge and supporting its translation into actionable insights for society, while also critically evaluating the strengths and possible shortcomings of their approaches to reporting.

Keywords
Global warming, Research centres, Climate change, Adaptation

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1. Introduction

Due to the continuous increase in extreme weather events, climate change has become a challenge for all cities around the world. Scientific literature on climate change has grown significantly in recent decades, indicating the urgency and global importance of the issue (Herziger & Hurst, 2025; Almulhim & Cobbinah, 2024). Since the late 1980s, with the establishment of the Intergovernmental Panel on Climate Change (IPCC) and the adoption of the United Nations Framework Convention on Climate Change (UNFCCC), more and more research centres have been focusing on climate change, developing an increasingly complex network (Haunschild et al., 2016). Their work shows that the crisis embraced different filed from ecological stability, socio-economic resilience, to global equity (Stiuso, 2025).

The research centres play a key role in transforming scientific knowledge into climate planning, providing the basis and tools to support policy decisions (Isola et al, 2024). Their activities focus on different thematic areas, from mitigation strategies, energy transition and adaptive urban planning, while others focus on climate modelling and impacts. Strong, localized climate observation and data transparency are the building blocks of good governance (Francini et al., 2021). They are also necessary for setting baseline conditions and proving that interventions are needed right away (Nyashilu et al.,2024).

In addition to developing research in various scientific areas, research centres can be of different types. There are academic institutes, linked to universities, which focus on theoretical and applied research, and then there are independent institutes or "think tanks" that carry out policy-oriented research and have no affiliation (Etzkowitz & Kemelgor,1998). Finally, there are institutions that actively collaborate with government agencies in supporting policy decisions. It is worth specifying the distinction between research centers with IGOs and NGOs. The former are responsible for coordinating the policies of member states, while the latter are more focused on raising awareness and implementing local projects. This distinct institutional landscape is important because the problem needs a mix of solutions: measuring the crisis in real life, making existing systems more useful, and completely changing how people consume (Pratt, 2023; Drescher & Skoyles, 2024).

The aim of this review is to offer a critical reading of the role of scientific research in supporting adaptation to climate change. To this end, three reports produced by three different national and international research centres have been analysed, highlighting the main issues and assessing the strengths and possible weaknesses of their approaches in reporting and supporting policy makers.

2. Reports summary

This section provides a detailed analysis of three reports published by different research centres, offering insight into the diverse perspectives and approaches adopted. Each report focuses on a different aspect of climate adaptation and through a comparative reading of these reports, it is possible to understand how different institutions frame and implement climate action across sectors.

The selected reports are presented in the following Tab.1

Title	Organization	Publication date
Climate in Italy in the 2024	National System for Environmental Protection (SNPA)	2024
Risk Analysis. Climate Change in Italy	Mediterranean centre for climate change (CMCC)	2020
A Climate for Sufficency. 1.5 Degree Lifestyle	Hot and Cool (HC)	2025

Tab.1 Overview of the reports analysed, including their title, publishing organization and year of publications

Climate in Italy in the 2024

The report Il Clima in Italia nel 2024 (The Climate in Italy in 2024) is published by the National System for Environmental Protection (SNPA) and coordinated by ISPRA. It provides a detailed overview of the state and evolution of the climate in Italy over the last few decades, taking into account the global and European climate context. Unfortunately, the article has only been published in Italian, but there are numerous images that aid understanding of the text. The central theme of the report is the monitoring and climatic evolution of extreme events. The aim is to inform policy makers of the context in which they must act and, at the same time, to help them with territorial planning in a climate crisis scenario. The report is divided into two main parts. The first describes and illustrates climate indicators in Italy, starting with variables related to temperature and precipitation. The second part focuses more on the national, regional and local scales, concentrating on extreme events that impact the urban environment. In summary, the report also illustrates how 2024 was the hottest year in Italy since 1961, with minimum temperatures being particularly high. Italy is currently divided into two parts: the north, affected by heavy rainfall, and the south and islands, affected by severe water shortages.

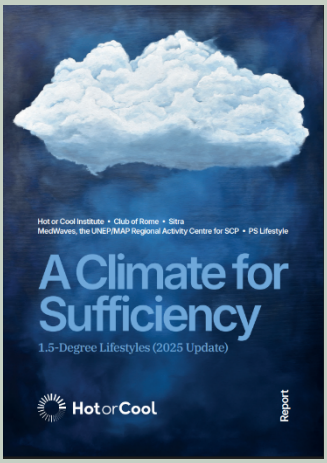
Retrieved From: https://www.snpambiente.it/wp-content/uploads/2025/07/Rapporto-SNPA-Il-clima-in-Italia-nel-2024.pdf

Risck Analysis. Climate Change in Italy

The report Risk Analysis: Climate Change in Italy was produced by the Euro-Mediterranean Centre on Climate Change (CMCC). It addresses the issue of climate change in Italy, focusing on risk analysis. The aim of this document is to provide a scientific basis to support public decision-makers and, at the same time, to disseminate information and raise public awareness. The report is structured in five chapters, each of which explores the different steps of risk analysis, starting from the scenarios expected for Italy. Climate and impact projections were defined using IPCC emission scenarios (RCP 2.6, RCP4.5, RCP8.5), thus allowing for the evaluation of different mitigation and adaptation policies. Regional climate models such as CSMO-CLM and EURO-CORDEX were also used, which have a different spatial resolution, allowing local variability to be captured. In addition to examining the expected risk for key sectors such as the urban environment, hydrogeological risk, water resources, agriculture and fires, the report also focuses on the economic assessment of impacts, analysing the economic opportunities to be exploited in order to adapt in the best possible way. Finally, the last chapter of the report presents examples of local adaptation initiatives, considering them as best practices. The chapter concludes with an appeal to policy makers, stating the urgent need to take action by integrating adaptation. Finally, the last chapter of the report presents examples of local adaptation initiatives, considering them as best practices. The chapter concludes with an appeal to policy makers, stating the urgent need to act by integrating adaptation into local urban planning, not only in terms of climate action but also as an opportunity for sustainable development and improving the resilience of the territory.

Retrieved from: https://www.cmcc.it/it/analisi-del-rischio-i-cambiamenti-climatici-in-italia

A Climate for Sufficiency. 1.5 Degree Lifestyle



The report A climate for sufficiency: 1.5 Degree Lifestyles was produced by the Hot or Cool Institute, an independent research centre located in Berlin, in collaboration with other research centres. The report presented in this review, in particular, is an update of the previous one and adapts to the new carbon budget, which has been significantly reduced. The aim of the report is to redefine lifestyles by adapting to rising temperatures and reducing consumption in order to stay within the 1.5-degree limit. The report is divided into four chapters. It begins by explaining why reducing consumption is the fastest and most effective strategy, and then clearly quantifies and outlines the changes needed in specific areas. The climate targets for limiting the global average temperature increase to 1.5 °C are translated into practical and tangible measures and actions for citizens. For example, in the Mobility and Food sectors, limits on car use and the quantity and type of food to be consumed are defined, while other areas considered include Housing and Goods and Services. With this report, the Hot or Cool research centre wants to demonstrate that time is not on our side and that reducing consumption is no longer an ideological choice but an urgent necessity.

Retrieved from: https://hotorcool.org/wp-content/uploads/2025/10/A_Climate_for_Sufficiency_report_FULL_REPORT-1.pdf

3. Critical overview and comparative analysis

Together, the three reports offer a comprehensive overview of the climate crisis. Each focus on three different phases of climate challenge. The first report analyses and monitors climate trends in Italy, providing a scientific basis for understanding the situation. The second CMCC report focuses on adaptation strategies, providing useful information for managing the now inevitable impacts by seeking to limit damage and maximise the resilience of the urban system. Finally, the latest report from the Hot or Cool Institute focuses on mitigation strategies, on how to meet the 1.5°C limit by changing lifestyles and limiting unnecessary consumption. In summary, the three reports can also be read consecutively, starting with the SNPA report, which provides information on the current situation, followed by the risk analysis to understand how to "protect" urban environments, and finally the Climate for Sufficiency report, which offers a possible solution on how to address the cause.

Although these documents use different approaches, they agree on the ongoing climate crisis, particularly on the speed at which increasingly frequent extreme weather events are spreading and how Europe, but especially Italy, are climate hotspots, whose warming is above the global average.

A more in-depth analysis of the individual reports, considering their strengths and weaknesses, shows that the SNPA report, given the reliability of the institution, is well structured and consistent. The data used are also homogeneous and validated in accordance with World Meteorological Organisation (WMO) standards. However, some of the variables used are the result of different interpolation methodologies, which may justify the difference in variable values compared to the data produced by individual regional services. The CMCC report focuses on translating risks into adaptation strategies, and one of its strengths is its multidimensional approach to risk, starting from the IPCC's definitions of risk components. In addition, the impacts are analysed with reference to modern climate models and with a spatial resolution of 8 km. An interesting aspect addressed by the report concerns the available financial resources and the analysis of expected costs. This highlights the importance of integrating climate issues into spatial planning tools. Finally, the Hot and Cool Institute report addresses the challenge of climate change from a different perspective. It certainly takes an innovative

approach, shifting the debate from how to produce sustainably to how much to consume. In this way, it seeks to directly address the increase in consumption (rebound effect) that undermines efforts to improve technological efficiency. Although this report represents a different point of view, based on the principle of social justice and equity, i.e. arguing that all individuals should be limited to the same carbon budget, its practical application could present significant challenges that need to be addressed. Sufficiency inevitably implies limitations that may not be in line with certain economic growth models in some sectors and may not be welcomed, especially by populations in high-income countries with significantly high per capita emissions.
A summary of all the considerations discussed is provided in Tab.2.

Report	Focus	Approach	Target Audience
Risk analysis. Climate Change in Italy	Vulnerability and Sectoral Climate Risk in Italy	Bottom-up. Highlights concrete actions	Policymakers, Public Administrations
A Climate for Sufficiency	Drivers of the Crisis and Inequality through the analysis of Lifestyle Carbon Footprints and the concept of Sufficiency.	Top-down; based on a survey Transformative/Ethical: Proposes systemic change (Sufficiency and taxation on the ultra-rich) to remain within the 1.5°C limit equitably global leaders' perceptions.	Global Leaders, Researchers, Citizens (with the potential for high impact, especially in high-income countries)
Climate in Italy in the 2024	Status and Trends of the Italian Climate in 2024 (T, P, SST) and analysis of Extreme Events (floods, drought).	Rigorous and homogeneous measurement of climate data according to WMO standards	Technical experts, Policymakers, and Citizens (as a basis for official knowledge)

Tab.2 Summary of key findings, similarities, and differences among the reports

4. Conclusions

Analysis of reports from some of the most authoritative research centres has shown that climate change is one of the most urgent and complex challenges of the 21st century (Lai & Zoppi, 2023). The position of research centres is now very clear: climate change is no longer a future threat, but a current crisis. Data provided by SNPA and CMCC show that Italy is experiencing a period of significant warming. 2024 was the hottest year since the 1960s, with an anomaly of +1.33°C compared to the decade 1991-2020. Faced with this reality, there are two paths to pursue. On the one hand, implementing adaptation strategies (Wamsler et al., 2013; Carter et al., 2015; Zucaro & Morosini, 2018): the CMCC report shows the urgency of managing risk and moving from vulnerability analysis to climate policies and tools for governing urban and territorial transformation. On the other hand, we must continue with mitigation strategies, seeking to minimise carbon emissions (Fawzy et al., 2020). The perspective offered by the Hot and Cool Institute is certainly innovative. It highlights that an approach based solely on efficiency is not enough, but that we must address the root cause of the crisis, namely consumption and excessive consumption driven by inequality.
In conclusion, the reports converge on the need for integrated, immediate and equitable action. Their critical comparison has made it possible to describe an essential framework for assessing the validity of the various strategies promoted at both national and international level.

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