EURO LCP Initiative
Local Climate Plans

1st FutureMed Workshop & Training School
29th September to 3rd October – Chania, Crete

FutureMed
TRANSDISCIPLINARY NETWORK

The quality and consistency of urban climate adaptation plans in 327 European cities

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Ministero dell'Università e della Ricerca

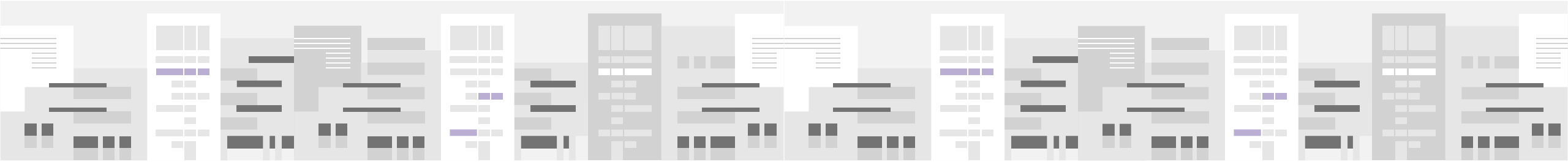
Italiadomani
PIANO NAZIONALE DI RIPRESA E RESILIENZA

NATIONAL BIODIVERSITY FUTURE CENTER

Introduction

Cities at the centre of global Climate Action:

- responsible for more than 75% of GHGs
- are facing a growing threat from climate change, with increased frequency and intensity of floods and heatwaves impacting infrastructure, public health, etc.



climate neutrality

i.e., achieving net zero GHG emissions by balancing emissions released so that they are equal to or less than the amount removed (UNFCCC)

climate resilience

i.e., a city's ability to survive, adapt and thrive in the face of climate-related shocks and stresses (Climate Resilient Cities)

There is an **adaptation 'gap'** between climate goals and the measures being undertaken

UN environment programme

Research questions

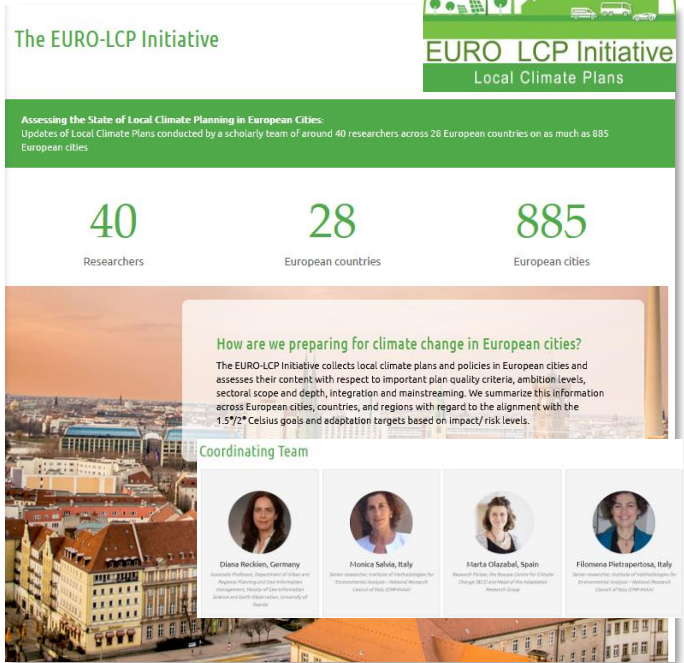
Are city governments addressing these climate threats in their official Adaptation Climate Action Plans (A-CAPs)?

Are these plans internally consistent, i.e, with clear alignment between climate risks, policy goals, measures and monitoring & evaluation?

We present evidence from two recent studies conducted by core members of the EURO-LCP Initiative to address these research questions

The **EURO-LCP Initiative collects local climate plans and policies in European cities** and **assesses their content** with respect to important plan **quality criteria, ambition levels, sectoral scope and depth, integration and mainstreaming**.

The Initiative **originated from the COST Action TU0902, 'Integrated assessment technologies to support the sustainable development of urban areas',** which took place from 2009 to 2013.



Two recent studies

(Reckien et al., 2023)

“Quality of urban climate adaptation plans over time”

npj Nature Urban Sustainability

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ARTICLE OPEN

Check for updates

Quality of urban climate adaptation plans over time

Diana Reckien[1✉], Attila Buzasi[2], Marta Olazabal[3,4], Niki-Artemis Spyridaki[5], Peter Eckersley[6,7], Sofia G. Simoes[8], Monica Salvia[9,10], Filomena Pietrapertosa[9,10], Paris Fokaides[11], Sascha M. Goonesekera[12], Léa Tardieu[13,14], Mario V. Balzan[15,16], Cheryl L. de Boer[1], Sonia De Gregorio Hurtado[17], Efrén Feliu[18], Alexandros Flamos[5], Aoife Foley[19,20], Davide Geneletti[21], Stelios Grafakos[22], Oliver Heidrich[23], Byron Ioannou[11], Anna Krook-Riekkola[24], Marko Matosovic[25], Hans Orru[26,27], Kati Orru[28], Ivan Paspaldzhiev[29], Klavdija Rižnar[30], Magdalena Smigaj[31], Maria Szalmáné Csete[32], Vincent Viguié[33] and Arja Wejs[34,35]

Defining and measuring progress in adaptation are important questions for climate adaptation science, policy, and practice. Here, we assess the progress of urban adaptation planning in 327 European cities between 2005 and 2020 using three ‘ADAptation plan Quality Assessment’ indices, called ADAQA-1/2/3, that combine six plan quality principles. Half of the cities have an adaptation plan and its quality significantly increased over time. However, generally, plan quality is still low in many cities. Participation and monitoring and evaluation are particularly weak aspects in urban adaptation policy, together with plan ‘consistency’. Consistency connects impacts and vulnerabilities with adaptation goals, planned measures, actions, monitoring and evaluation, and participation processes. Consistency is a key factor in the overall quality of plans. To help evaluate the quality of plans and policies and promote learning, we suggest incorporating our ADAptation plan Quality Assessment indices into the portfolio of adaptation progress assessments and tracking methodologies.

npj Urban Sustainability (2023)3:13; https://doi.org/10.1038/s42949-023-00085-1

INTRODUCTION

Since the Paris Agreement (PA) in 2015[1], there has been an increasing focus on assessing the progress of climate change adaptation across multiple sectors and regions[2–4], including subnational jurisdictions such as local and regional authorities[5–16]. The Paris Agreement set an agenda for the Global Stocktake of adaptation, with a view to ‘review the overall progress made in achieving the global goal on adaptation’ (PA, art. 14d). Hence, an important question is what ‘progress’ means and how it could be assessed, at the international, national, and local levels. With the first Global Stocktake due in 2023, researchers have sought to address the issue, whilst acknowledging ‘the challenge of lacking consensus on how adaptation at this level can be tracked’[17].

Hitherto, there is a wealth of information on climate responses at sub-national levels[18]. Cities and urban areas are increasingly recognized as important actors in climate responses[1,19], with the potential to influence neighbouring as well as upper levels of government. In urban adaptation studies, most assessments focus on tracking and analyzing outputs, such as approved adaptation plans, as these currently represent the majority of adaptation activities on the ground[20,21] and are often more easily comparable and trackable[22] than, e.g., impacts and outcomes. Analyzing plans cannot tell the whole story in terms of actual progress in collective reduction (or redistribution) of climate risks[23,24]. However, it can provide information about the quality and relevance of adaptation processes and actions (also referred to as ‘measures’ in policy and planning literature), and help to assess the likelihood that we are advancing adaptation goals by reducing risks and increasing resilience in an equitable manner[25,26]. Scholars argue that ‘the best method to ensuring robust adaptation is to ensure rigorous adaptation planning processes’[27]. Indeed, higher quality plans have been found to decrease the cost of disasters more than

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(Reckien et al., 2025)

“Explaining the adaptation gap through consistency in adaptation planning”

Nature Climate Change

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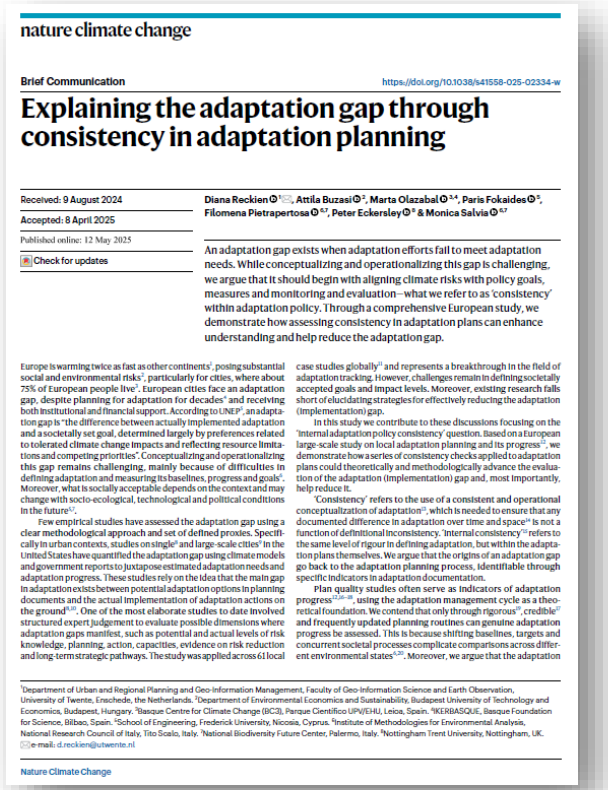

nature climate change

Brief Communication

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Explaining the adaptation gap through consistency in adaptation planning

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Check for updates

Diana Reckien[1✉], Attila Buzasi[2], Marta Olazabal[3,4], Paris Fokaides[5], Filomena Pietrapertosa[6,7], Peter Eckersley[8] & Monica Salvia[6,7]

An adaptation gap exists when adaptation efforts fail to meet adaptation needs. While conceptualizing and operationalizing this gap is challenging, we argue that it should begin with aligning climate risks with policy goals, measures and monitoring and evaluation—what we refer to as ‘consistency’ within adaptation policy. Through a comprehensive European study, we demonstrate how assessing consistency in adaptation plans can enhance understanding and help reduce the adaptation gap.

Europe is warming twice as fast as other continents[1], posing substantial social and environmental risks[2], particularly for cities, where about 75% of European people live[3]. European cities face an adaptation gap, despite planning for adaptation for decades[4] and receiving both institutional and financial support. According to UNEP[5], an adaptation gap is “the difference between actually implemented adaptation and a societally set goal, determined largely by preferences related to tolerated climate change impacts and reflecting resource limitations and competing priorities”. Conceptualizing and operationalizing this gap remains challenging, mainly because of difficulties in defining adaptation and measuring its baselines, progress and goals[6]. Moreover, what is socially acceptable depends on the context and may change with socio-ecological, technological and political conditions in the future[6,7].

Few empirical studies have assessed the adaptation gap using a clear methodological approach and set of defined proxies. Specifically in urban contexts, studies on single[8] and large-scale cities[9] in the United States have quantified the adaptation gap using climate models and government reports to juxtapose estimated adaptation needs and adaptation progress. These studies rely on the idea that the main gap in adaptation exists between potential adaptation options in planning documents and the actual implementation of adaptation actions on the ground[8,10]. One of the most elaborate studies to date involved structured expert judgement to evaluate possible dimensions where adaptation gaps manifest, such as potential and actual levels of risk knowledge, planning, action, capacities, evidence on risk reduction and long-term strategic pathways. The study was applied across 61 local case studies globally[11] and represents a breakthrough in the field of adaptation tracking. However, challenges remain in defining societally accepted goals and impact levels. Moreover, existing research falls short of elucidating strategies for effectively reducing the adaptation (implementation) gap.

In this study we contribute to these discussions focusing on the ‘internal adaptation policy consistency’ question. Based on a European large-scale study on local adaptation planning and its progress[12], we demonstrate how a series of consistency checks applied to adaptation plans could theoretically and methodologically advance the evaluation of the adaptation (implementation) gap and, most importantly, help reduce it.

‘Consistency’ refers to the use of a consistent and operational conceptualization of adaptation[13], which is needed to ensure that any documented difference in adaptation over time and space[14] is not a function of definitional inconsistency. ‘Internal consistency’[15] refers to the same level of rigour in defining adaptation, but within the adaptation plans themselves. We argue that the origins of an adaptation gap go back to the adaptation planning process, identifiable through specific indicators in adaptation documentation.

Plan quality studies often serve as indicators of adaptation progress[12,16–18], using the adaptation management cycle as a theoretical foundation. We contend that only through rigorous[19], credible[17] and frequently updated planning routines can genuine adaptation progress be assessed. This is because shifting baselines, targets and concurrent societal processes complicate comparisons across different environmental states[5,20]. Moreover, we argue that the adaptation

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Nature Climate Change

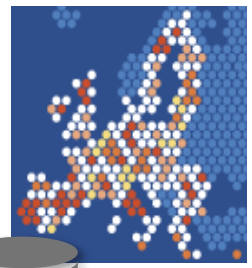
1 Quality of urban climate adaptation plans over time

Developing a methodology to measure the quality of urban adaptation plans

1 Sample selection

2 Gathering of planning documents

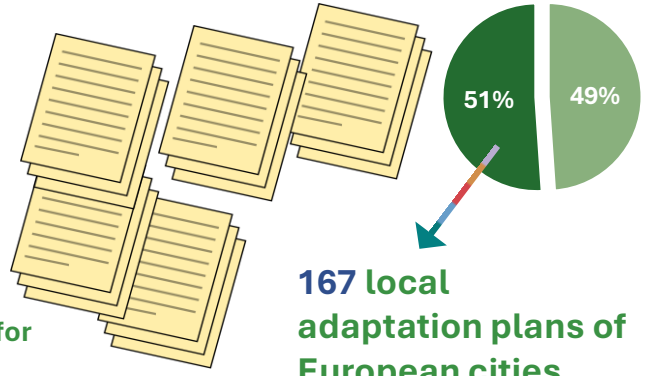
eurostat



327 European cities
(*Eurostat's City statistics database*, formerly Urban Audit)

The City statistics database (Urban Audit)

Native research analysts for each country
Online search



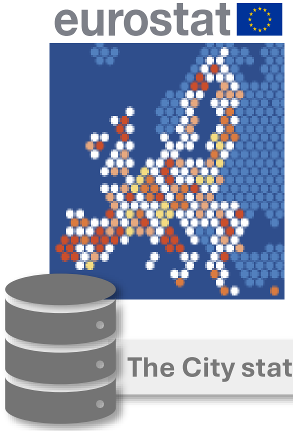
167 local adaptation plans of European cities

1 Quality of urban climate adaptation plans over time

Developing a methodology to measure the quality of urban adaptation plans

1 **Sample selection**

2 **Gathering of planning documents**



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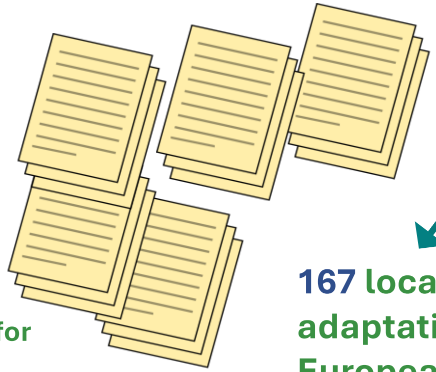
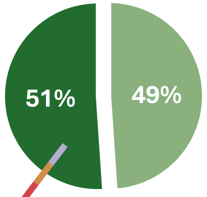




167 local adaptation plans of European cities

3 **Content analysis**

4 **Data cleaning**

Category	Questions
General info on the LCAP	1. Name of the Country 1.1 Does the country have a national adaptation plan or strategy? 1.2 Name of the city that you analyze 1.3 Is there a national, regional, or local 1.4 Name(s) of the Local Climate Chang 1.6 Where did you find the plan? 1.7 If online save the plan and paste all 1.9 Provide the year of adoption, appro
Impacts and risks	2.1 General CC impacts/ risks: Does the 2.2 Specific CC impacts/ risks: Does the 2.3 Specific CC impacts/ risks: Which im **2.4 Equity/ justice of impact/ vulnerab** 2.5 Does the plan identify certain indus
Goals	3.1 Specific adaptation goals: Does the (e.g. we want to reduce the casualties during heat/ storm) 3.2 Quantitative adaptation goals: Does the plan identify at least one quantitative adaptation goal? If yes, specify
Industries and sectors	4.1 Buildings (and related land use planning): Does the plan include at least one measures in the building sector and, if yes, which ones? 4.2 Transport: Does the plan include at least one measure on transportation and, if yes, which ones? 4.3 Energy: Does the plan include at least one measure on energy and, if any, which ones? 4.4 Water: Does the plan include at least one measure related to water management and, if yes, which one? 4.5 Waste: Does the plan include at least one measure on waste management? 4.6 Agriculture and forestry: Does the plan include at least one measure on food security and agriculture and, if any, which ones? 4.7 Environment, greenery and biodiversity: Does the plan include at least one measure on resource management, green infrastructure and ecosystem services and, if any, which ones? 4.8 Health: Does the plan include at least one measure on the social and environmental determinants of health or social care provision systems and, if any, which ones? 4.9 Social and educational institutions and services: Does the plan include at least one measure on social institutions and, if yes, which ones? 4.10 Civil protection and emergency: Does the plan refer to the development or use of disaster response systems? 4.11 Tourism: Does the plan include at least one measure related to tourism? 4.12 Industries/ economies/ businesses/ financial institutions: Does the plan include at least one measure for particular industries? **4.13 Equity/ justice: Are specific population groups mentioned in relation to any of these measures above?**
Implementation	5.2 Priority: Does the plan prioritize certain actions for implementation and, if yes, how? 5.3 Responsibility: Does the plan identify a responsible party for at least one specific adaptation measure? 5.4 Timelines: Does the plan identify timelines for implementation? 5.5 Budget: Does the plan include considerations of human and financial resources required and/or a budget for implementation?
M&E	6.1 M&E: Does the plan include a section or separate plan that describes the envisaged M&E activities? 6.2 Responsibility: Does the plan identify responsible parties for M&E and, if yes, which ones? 6.3.1 Objectives 6.3.2 Indicators 6.4 Timeline: Does the plan include a timetable for M&E? **6.5 Equity/ justice: Does the M&E process consider assessing the outcome of adaptation on population groups and, if yes, which ones?**
Particip.	7.1 Participation: Does the plan identify the organizations and stakeholders involved in the plan making process and, if yes, which ones? **7.2 Participation, equity/ justice: Is there mentioning of particular population groups being involved/ heard during the plan making process, if any?**

1+6 categories corresponding to **quality principles** based on the **scholarly literature** and **practitioner guidelines**.

40 questions in total

Check of the interrater reliability

Reliability of 91%
deviation of 15 coded entries of 167 A-CAPs

Tested by an external team member on the M&E component

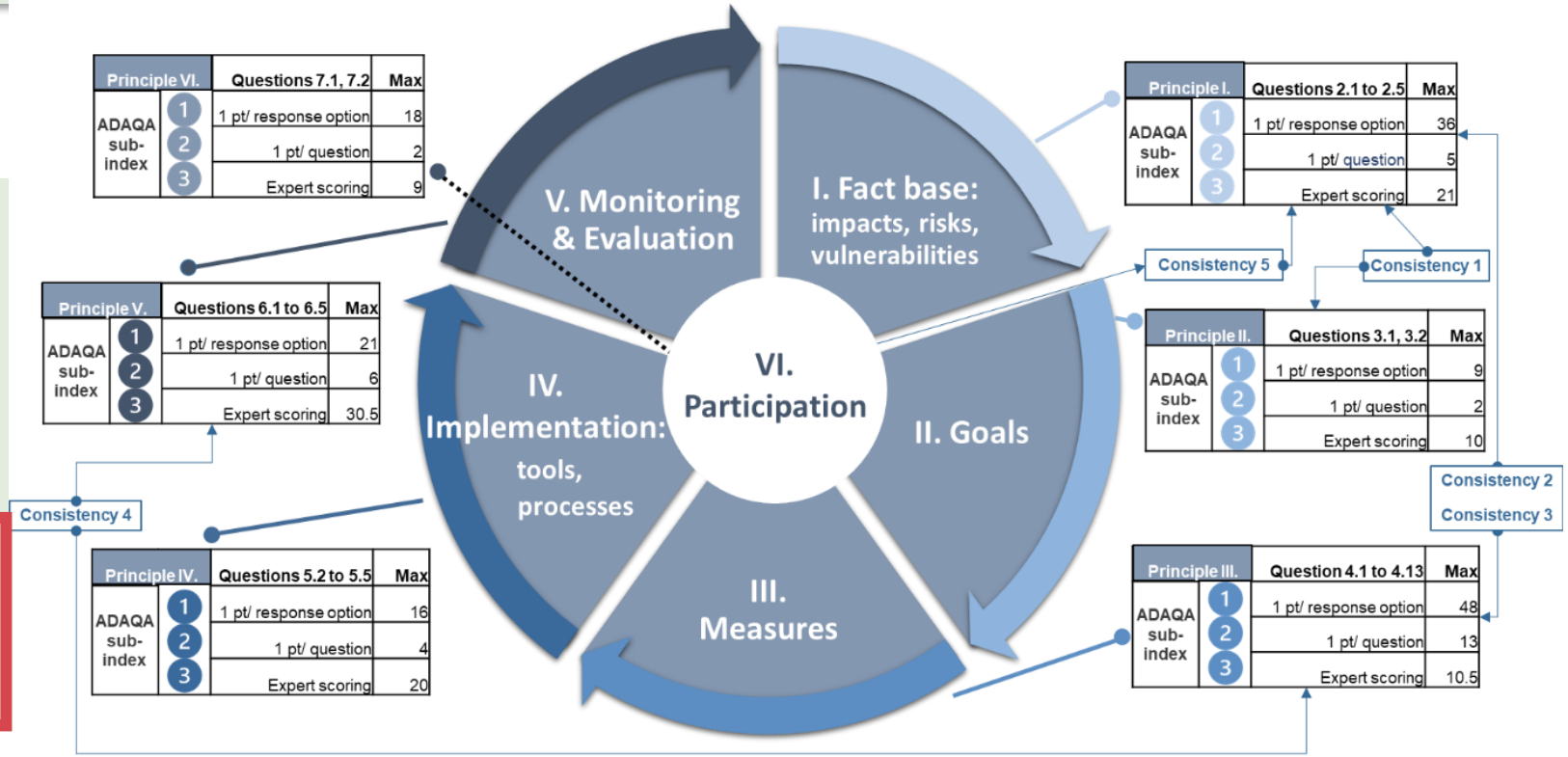
1 Quality of urban climate adaptation plans over time

5

The ADAptation plan Quality Assessment index: the ADAQA index

Index construction

- The **ADAQA** index is based on six well-established plan quality principles, i.e. **Comprehensive coverage + Consistency**
- Three different sub-indices developed, ADAQA-1, ADAQA-2, ADAQA-3
- ADAQA-3 uses complex heuristics and our expert judgement, stressing the need for consistency between different parts of the plan.



Plan quality is defined as the strengths of plans assumed to lead to effective implementation and reduced tradeoffs and maladaptation.

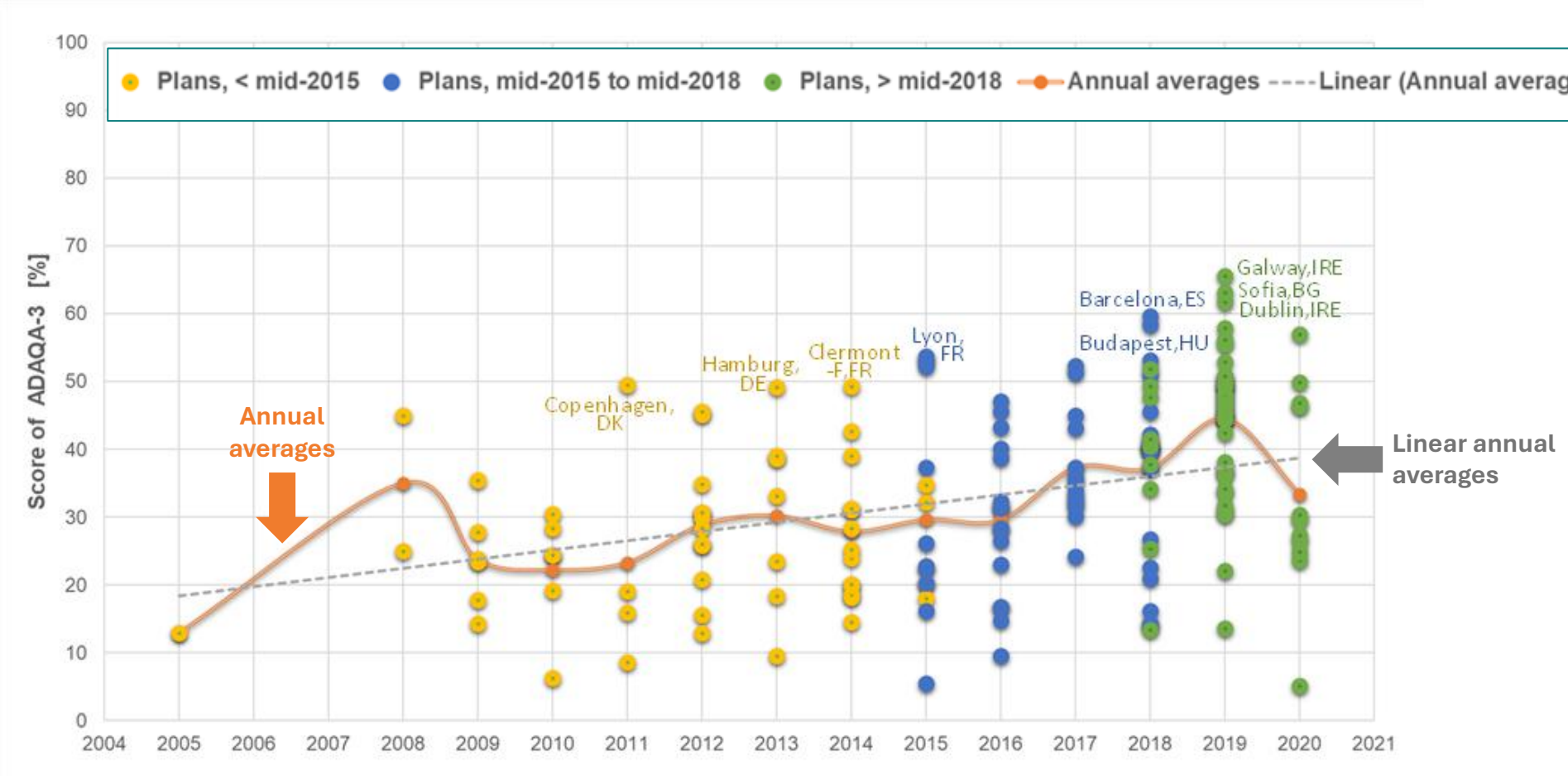
1 Quality of urban climate adaptation plans over time

6

Data analysis

Finding#1:

Plan Quality in European cities is increasing from 2005 to 2020, by about 1.3 percentage points/ year.



1 Quality of urban climate adaptation plans over time

6

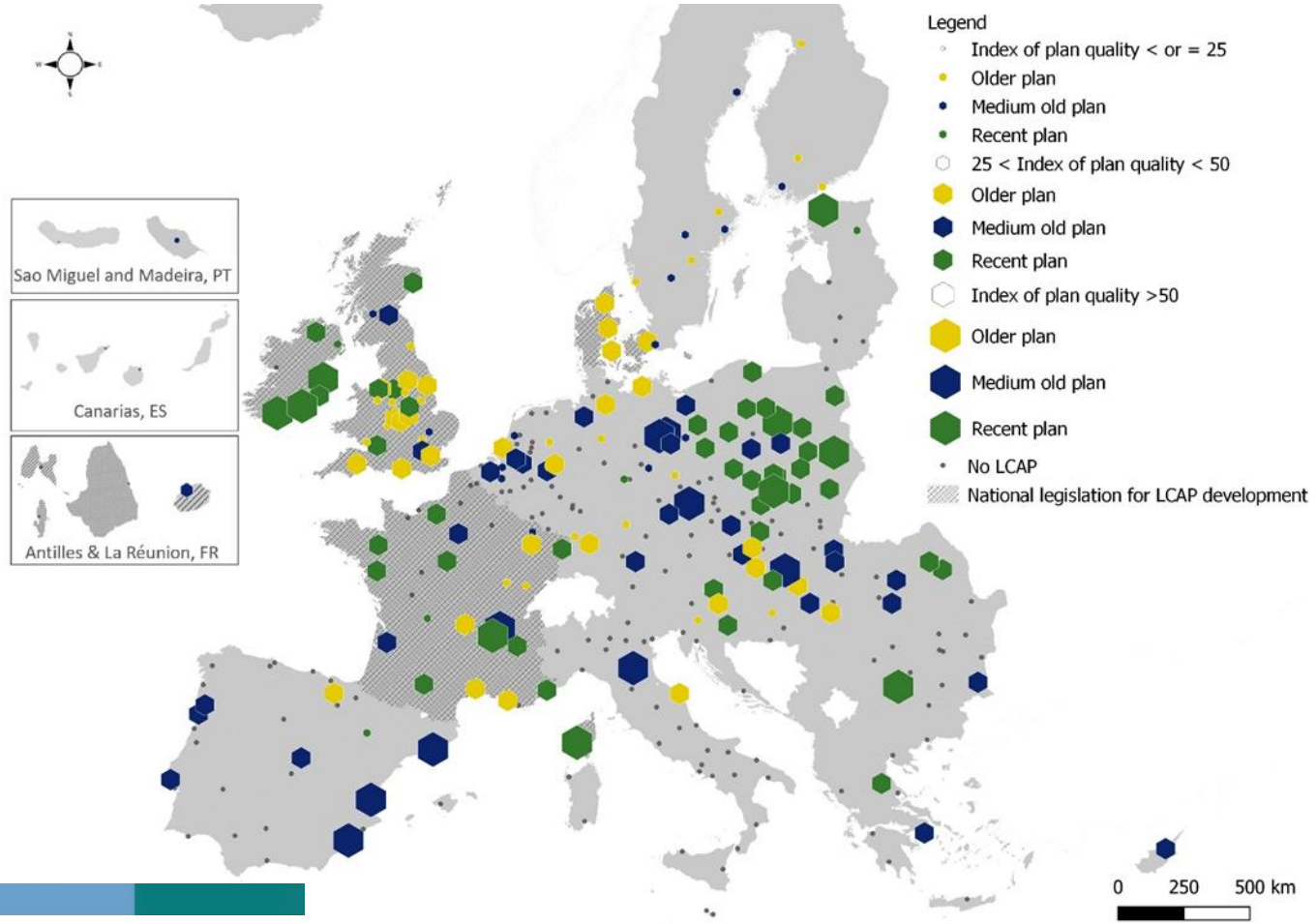
Data analysis

Finding #2:

Newer plans (in green) are higher in quality. These are mainly found in cities in Ireland, France, and Eastern Europe, in particular Poland. Most of these cities follow a national model.

- There are also some good plans before 2018, mostly in larger cities.

Top-ranking cities are **Sofia** (BG), **Galway** (IE), **Waterford** (IE), **Dublin** (IE), and **Potsdam** (DE).



1 Quality of urban climate adaptation plans over time

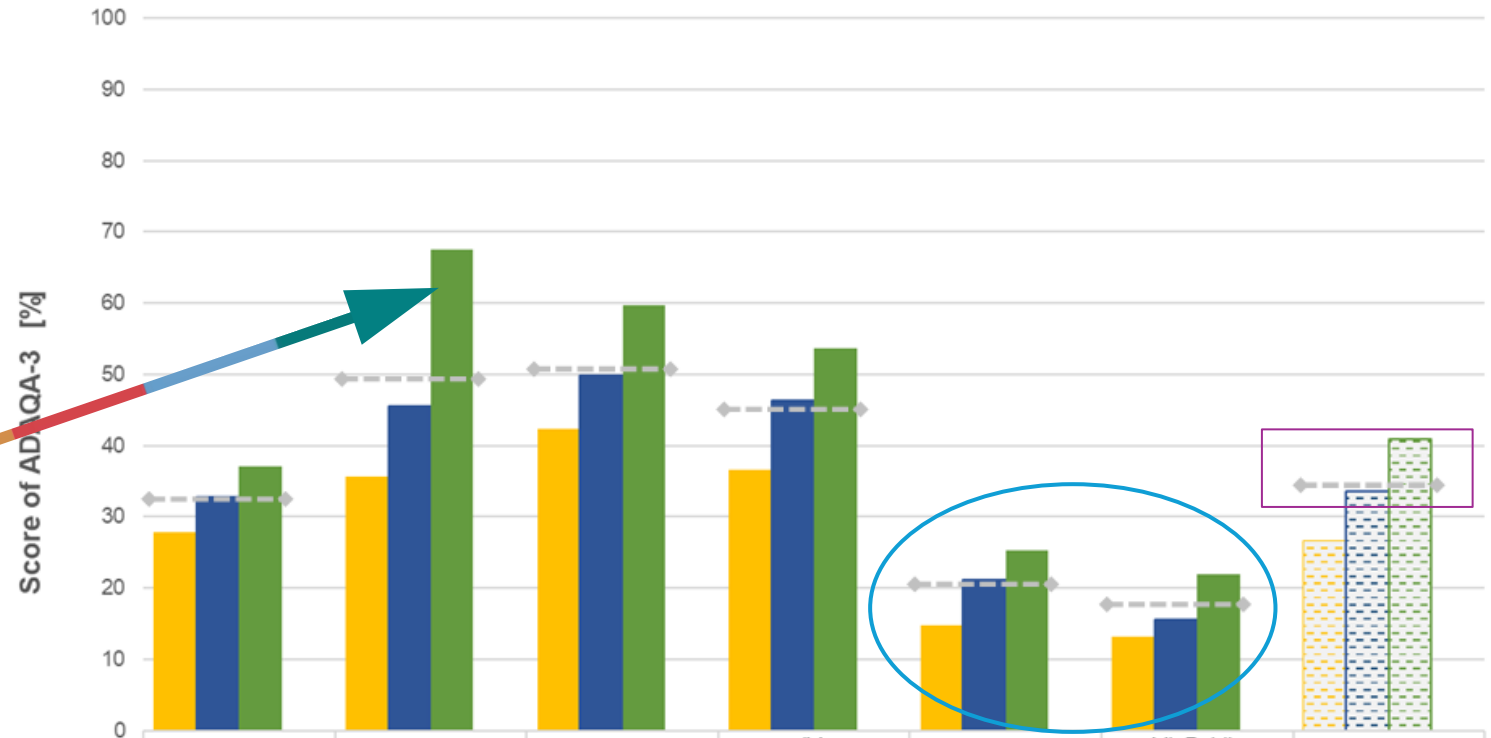
6

Data analysis

Finding #3:

Across principles,

- adaptation goals improved most in **recent plans** (in green).
- Specifying M&E, and participation is generally low.
- On average, plans reach 34% of coverage/ comprehensiveness.



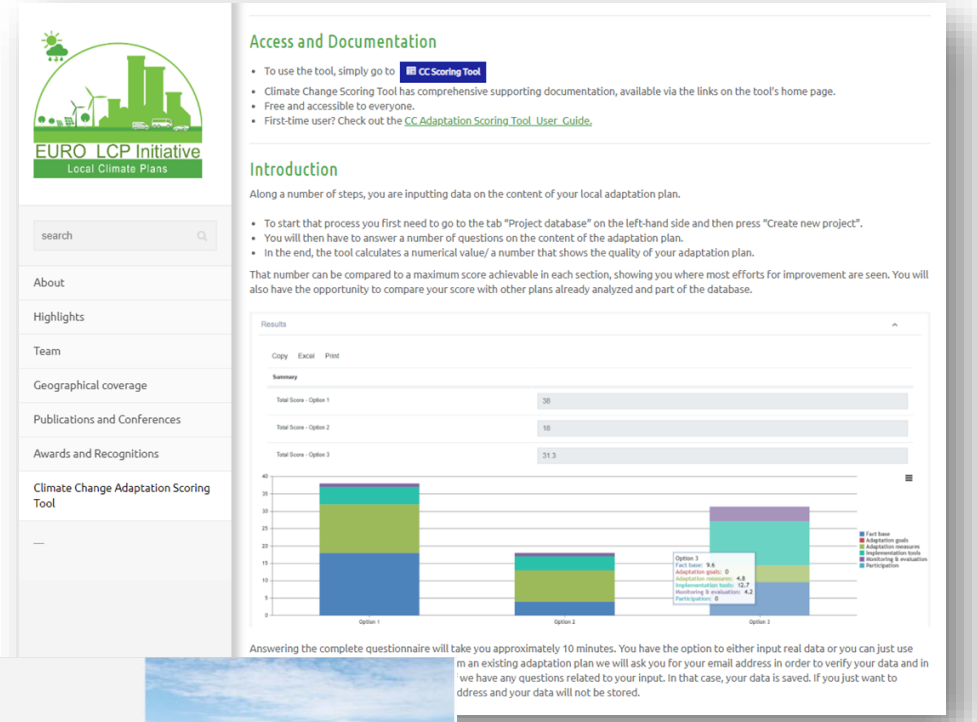
	I. IMPACTS, risk & vulnerability	II. Adaptation GOALS	III. Adaptation MEASURES	IV. IMPLEMENTATION tools & process	V. MONITORING & Evaluation	VI. Public PARTICIPATION in plan creation	Average of termporal group
Plans, < mid-2015	27,82	35,72	42,40	36,60	14,79	13,17	26,67
Plans, mid-2015 to mid-2018	32,80	45,60	49,87	46,32	21,11	15,51	33,52
Plans, > mid-2018	37,10	67,48	59,78	53,73	25,23	22,00	40,91
Average	32,58	49,60	50,68	45,55	20,38	16,89	33,70

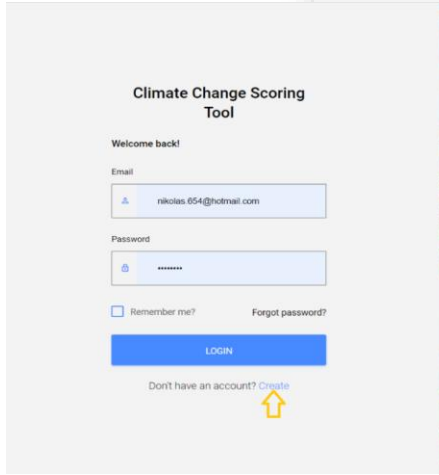
1 Quality of urban climate adaptation plans over time

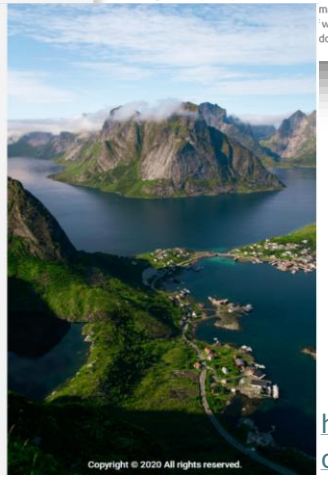
Further developments:

1. The ADAptation plan Quality Assessment (ADAQA) index was incorporated into the **Climate Change Adaptation Scoring Tool**:
   - **An online scoring tool** to help decision makers and practitioners to measure and track the quality of A-CAPs

https://climate-adapt.eea.europa.eu/en/mission/solutions/tools/018_climate-change-adaptation-scoring-tool-euro-lcp-initiative







A scoring tool to assess the quality of municipal adaptation plans based on indicators included in the planning document (data input through a simple questionnaire).

https://www.lcp-initiative.eu/climate-change-scoring-tool/

1 Quality of urban climate adaptation plans over time

Further developments:

2. Contribution to the **EEA** Report on urban adaptation

European Environment Agency

TH-AL-24-003-EN-N_Urban_adaptation_29_04_24.pdf

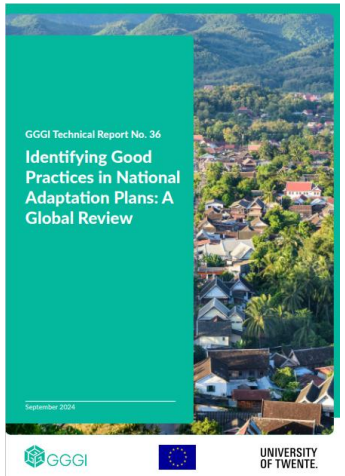
3. Collaboration with **EU Joint Research Centre (JRC)** to apply the methodology to the adaptation pillar of **SECAPs** in the Global Covenant of Mayors (GCoM) database

Joint Research Centre JRC

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

4. Collaboration with **Global Green Growth Institute (GGGI)** to apply the methodology to review the National Adaptation Plans (NAPs) of developing countries

Global Green Growth Institute



Report Release on 30th Sep 2024:
Identifying Good Practices in National Adaptation Plans: A Global Review — Global Green Growth Institute

Guidelines and recommendations for developing good quality, robust NAPs.

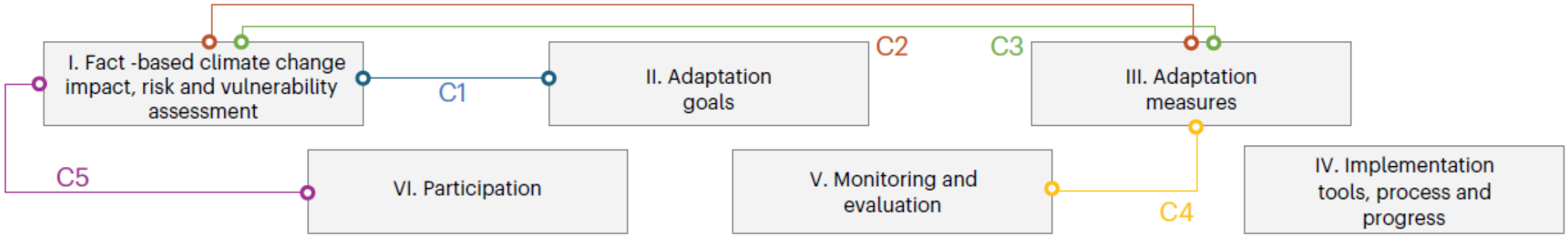
Global review and assessment on multi-level national adaptation planning for system transformation

https://www.youtube.com/watch?v=9tVlpoMJ3iI

2 Explaining the adaptation gap through consistency...

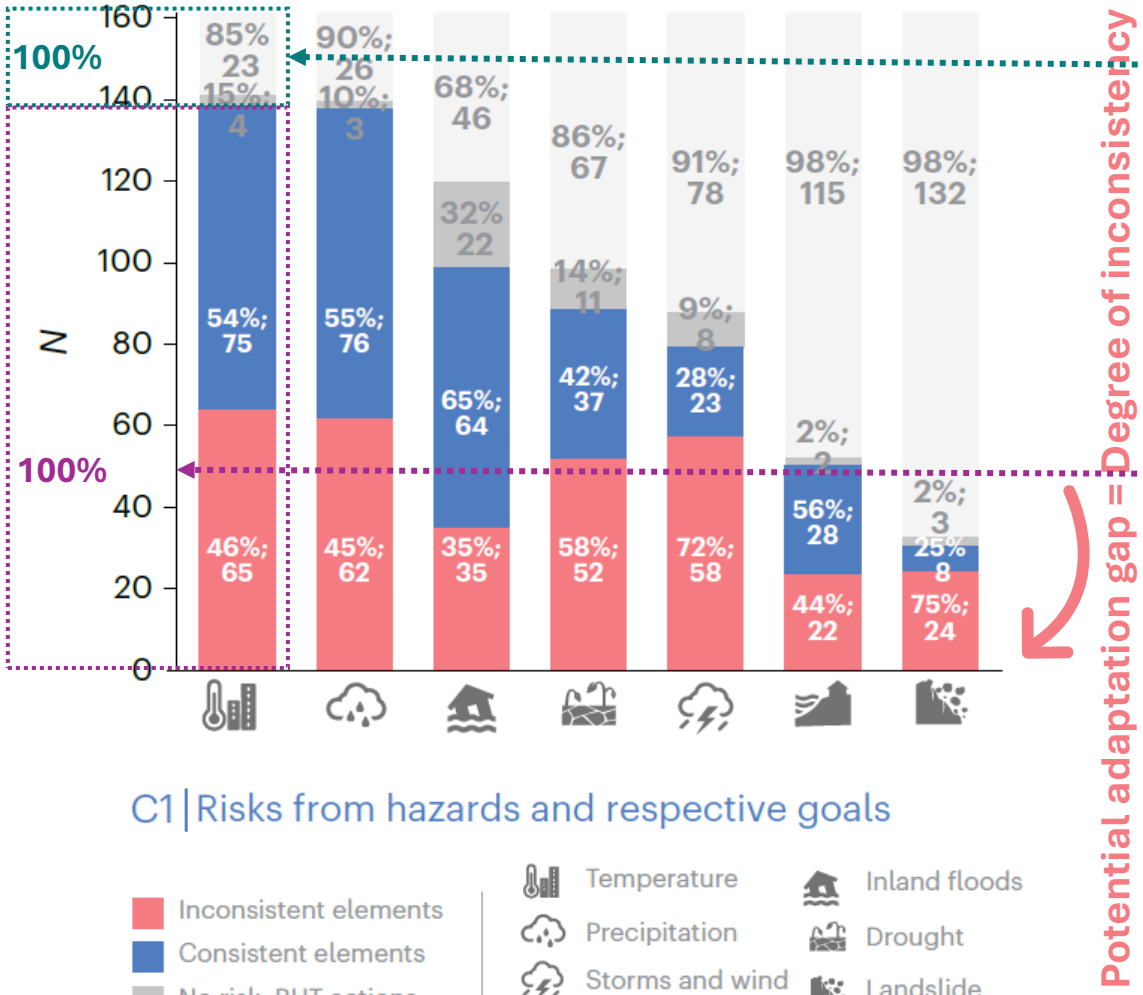
We assessed the **current adaptation gap** at urban level by **analysing 'consistency' in adaptation planning**.

5 'consistency checks' at **different stages of the adaptation management process**, using the same data on coverage and the five forms of consistency.

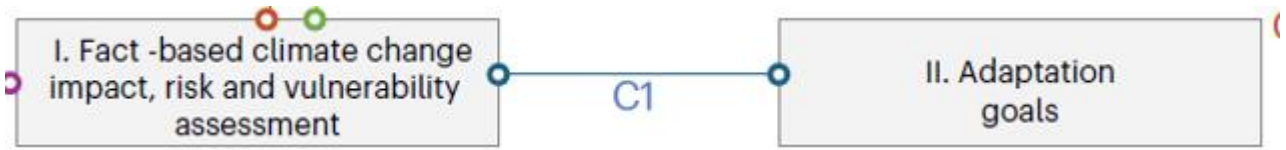


This highlighted gaps, misalignments and inconsistencies between the various planning phases of the 167 European cities.

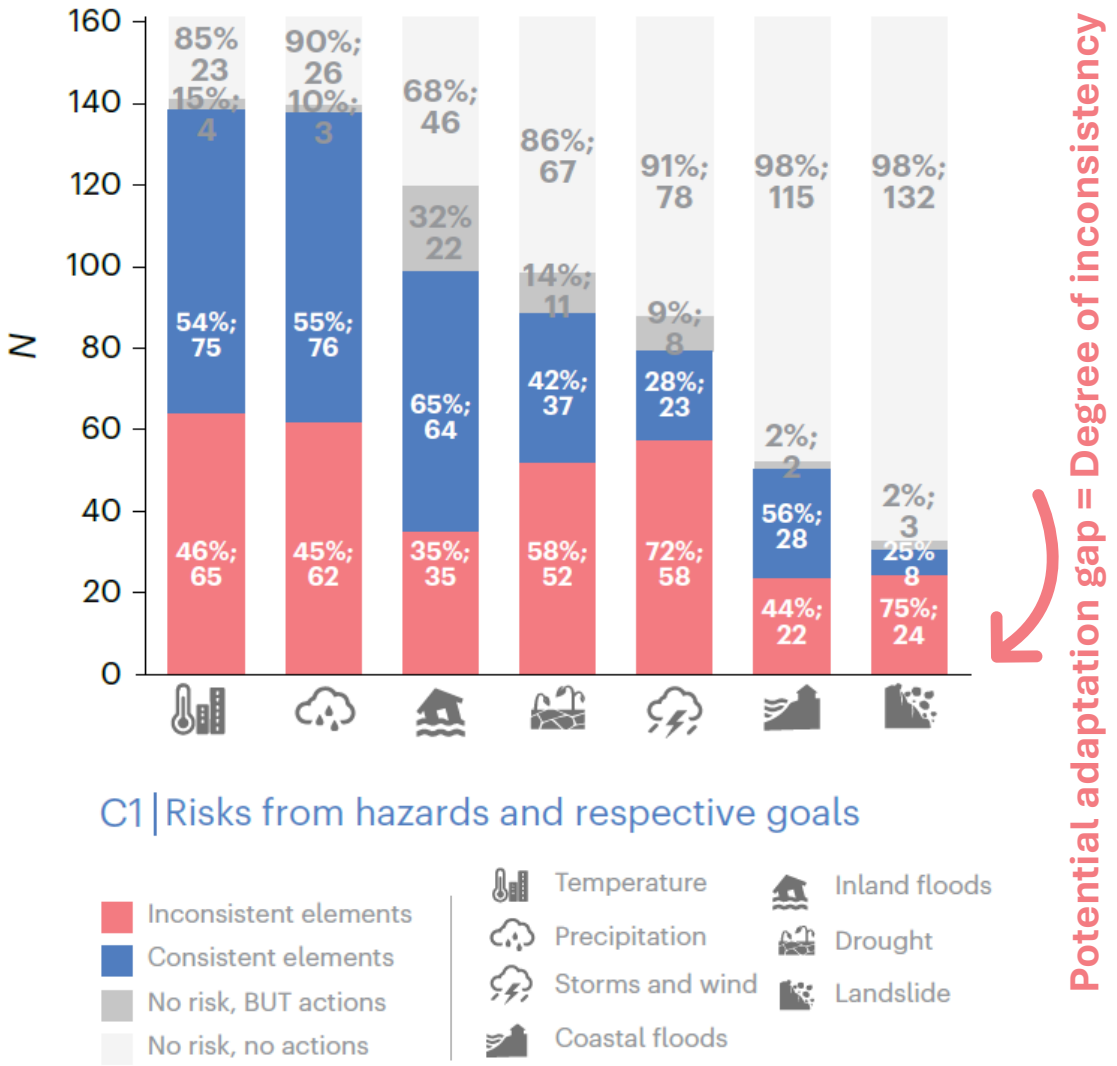
2 Explaining the adaptation gap through consistency…



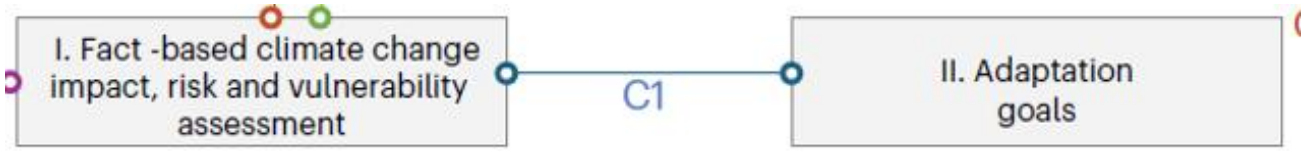
- percentage figures on grey bars add up to 100%, showing cities without risk information and measures (and with or without measures/actions).
- figures on coloured bars add up to 100%, representing cities with respective risk information or planned measures (and with or without the second element checked for consistency);



2 Explaining the adaptation gap through consistency...



Potential adaptation gap = Degree of inconsistency

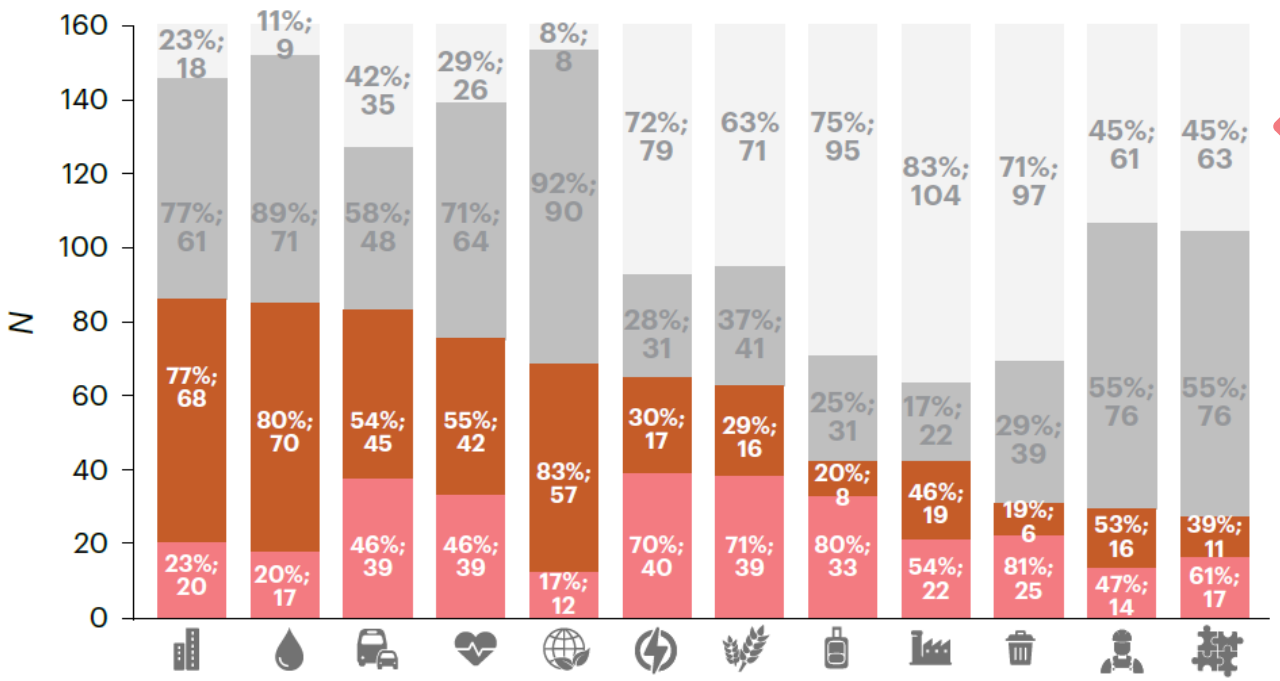


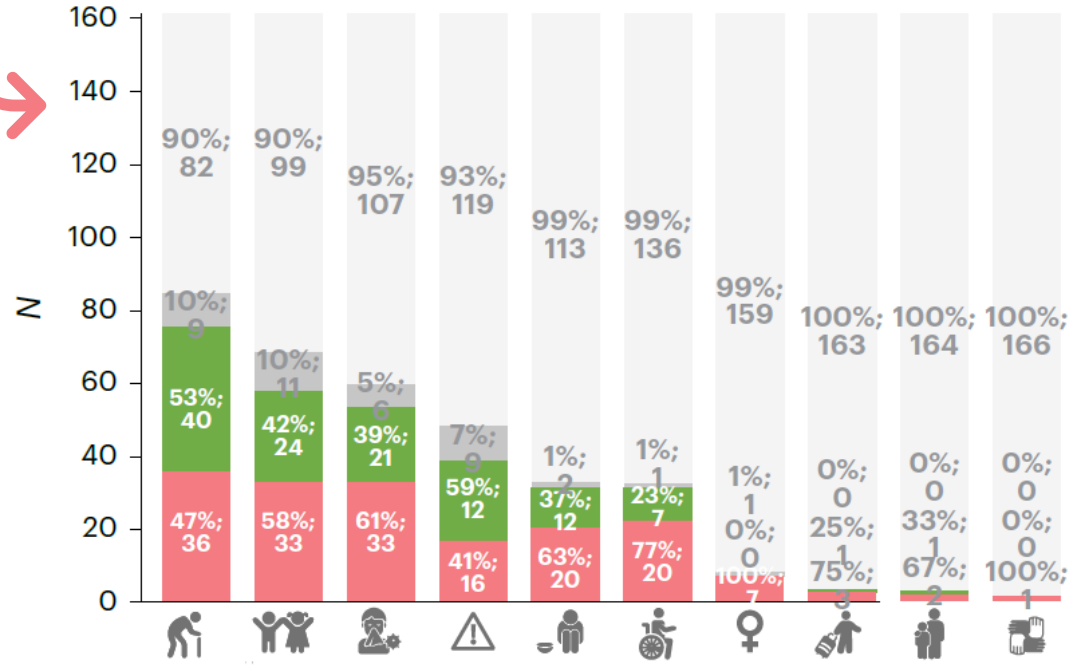
C1

- **2/5 of cities** with hazard risk information unearth a potential adaptation gap—that is, they **identify risks/hazards without a related adaptation goal**.
- Substantial **variation across hazards** exists, particularly for **landslides and wind/storm changes**, which are identified as a risk but not adequately followed up with an adaptation goal.
- About **1/3 of plans state an adaptation goal** related to **inland flooding without flooding** being identified as a risk—the largest such inconsistency among C1.

2 Explaining the adaptation gap through consistency…

Potential adaptation gap = Degree of inconsistency





C2 | Risks for sectors and respective measures

- Inconsistent elements
- Consistent elements
- No risk, BUT actions
- No risk, no actions

- Buildings
- Water
- Transport
- Health
- Environment
- Energy
- Agriculture
- Tourism
- Industries (general)
- Waste
- Civil protection
- Social institutions

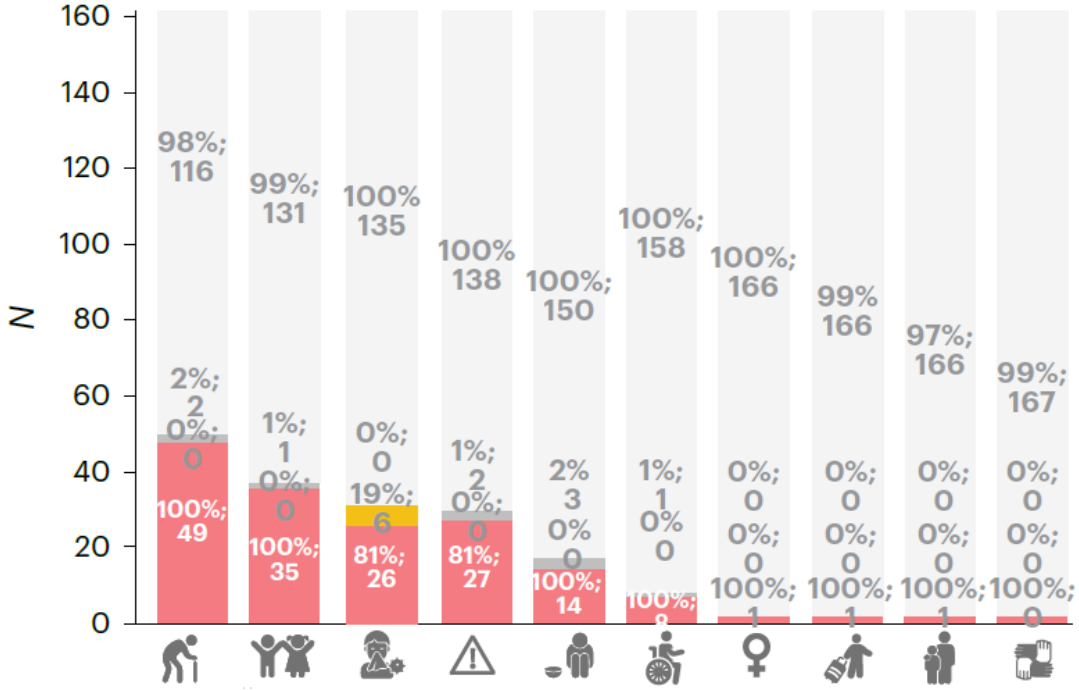
C3 | Risks for vulnerable groups and respective measures

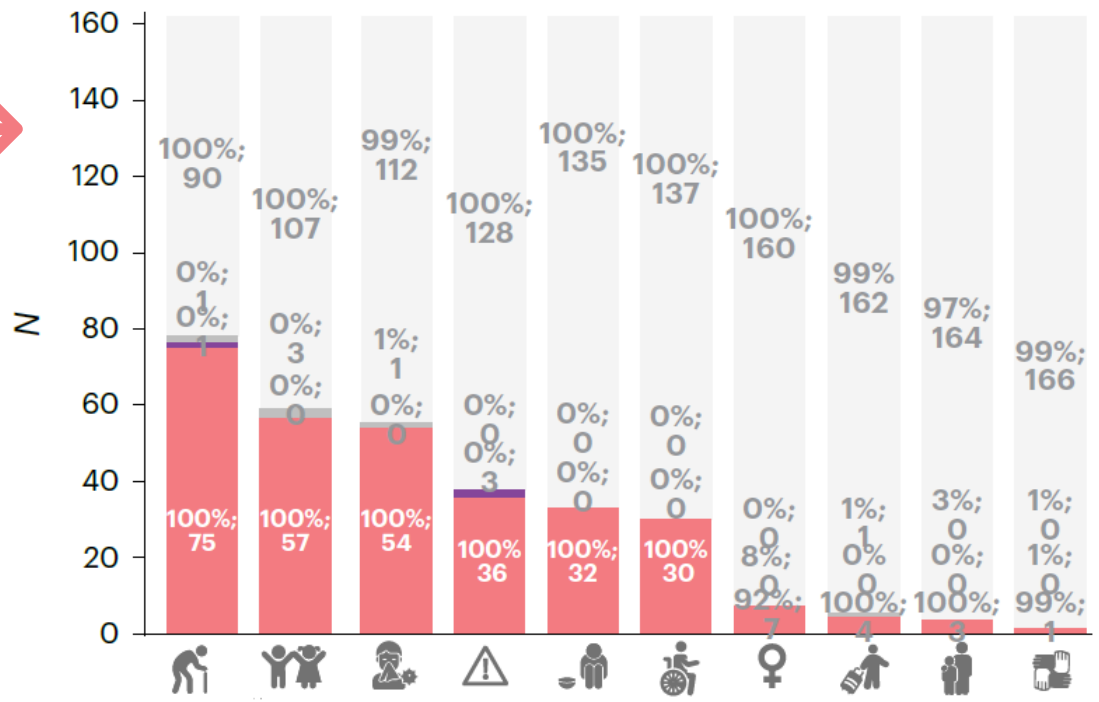
- Inconsistent elements
- Consistent elements
- No risk, BUT actions
- No risk, no actions

- The elderly
- Children
- Sick people
- 'Vulnerable'
- The poor
- Immobile people
- Women/gender
- Migrants
- Lone parents
- Ethnic communities

2 Explaining the adaptation gap through consistency...

Potential adaptation gap = Degree of inconsistency





C4 | Measures for vulnerable groups and respective M&E

- Inconsistent elements
- Consistent elements
- No risk, BUT actions
- No risk, no actions

- The elderly
- Children
- Sick people
- 'Vulnerable'
- The poor
- Immobile people
- Women/gender
- Migrants
- Lone parents
- Ethnic communities

C5 | Risks for vulnerable groups and respective participation

- Inconsistent elements
- Consistent elements
- No risk, BUT actions
- No risk, no actions

- The elderly
- Children
- Sick people
- 'Vulnerable'
- The poor
- Immobile people
- Women/gender
- Migrants
- Lone parents
- Ethnic communities

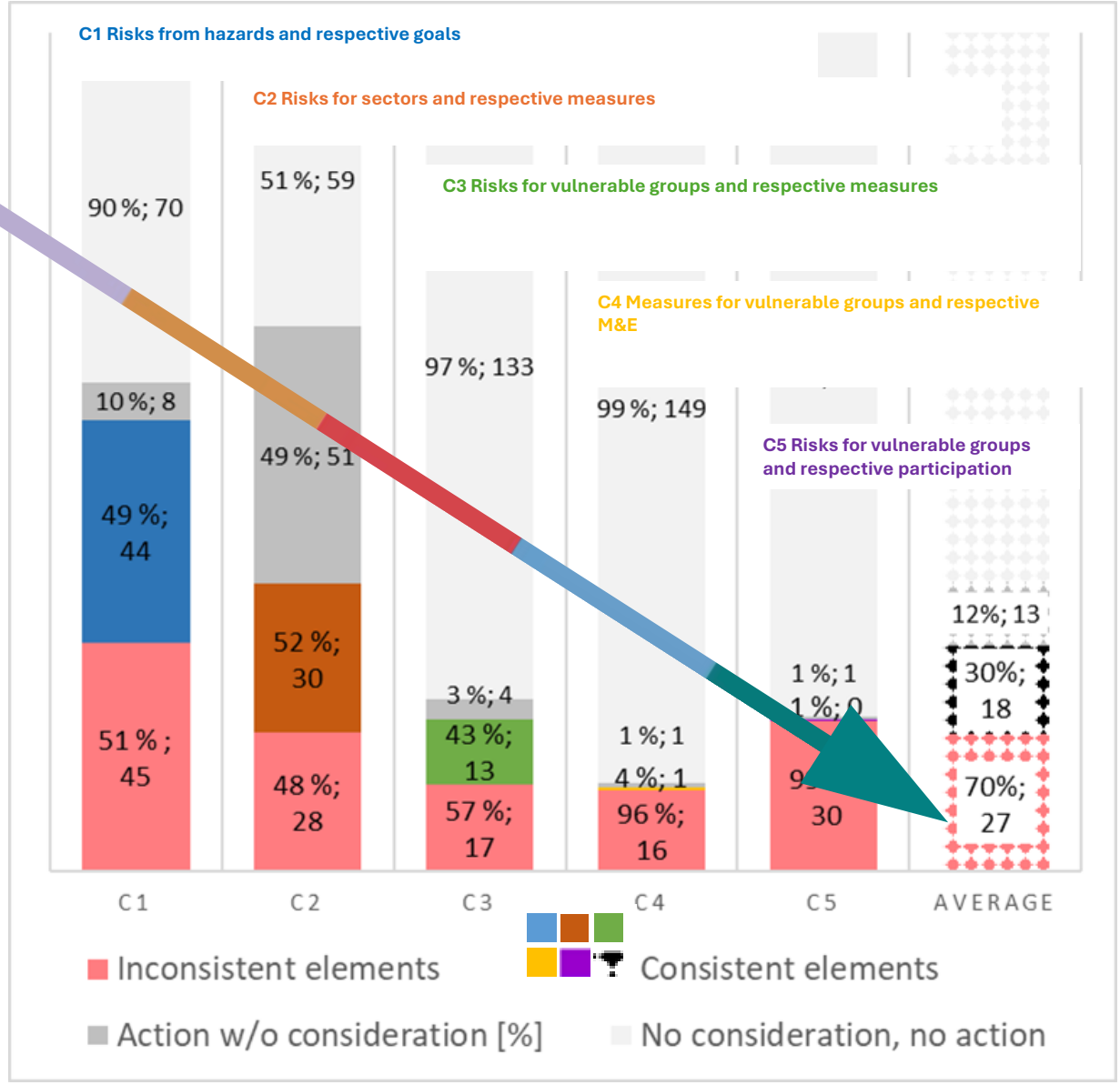
2 Explaining the adaptation gap through consistency…

On average:

→ **Adaptation gap: 70%** of our checks across all the CAPs identified inconsistencies within the adaptation process

→ i.e. if there is an identified risk, there is no related follow-up action

→ **Only 30% are consistent**

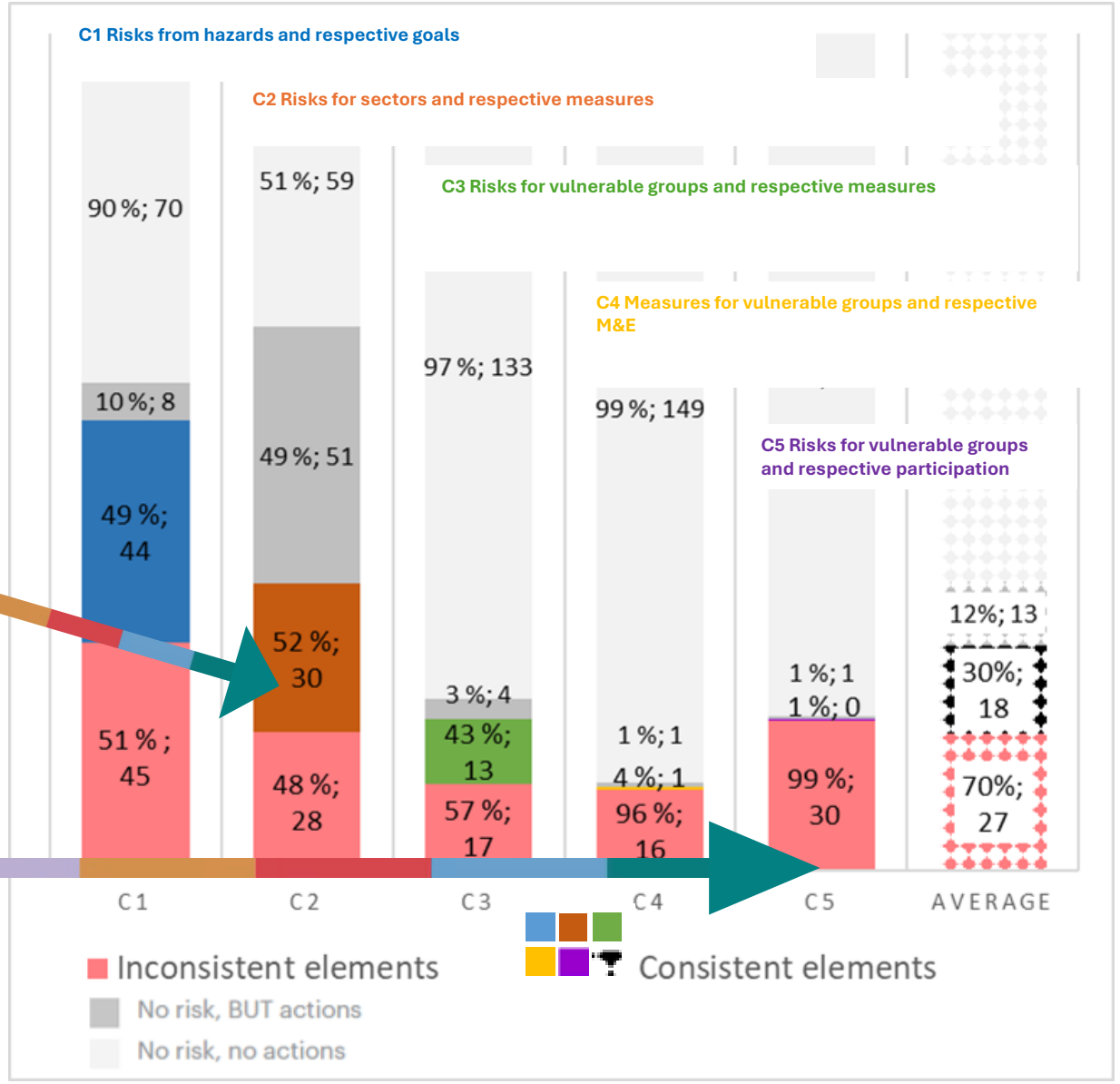


2 Explaining the adaptation gap through consistency...

On average:

→ **C2** shows **the highest consistency: 52%** of plans fully aligning sectoral risks with adaptation measures.

→ **C5** shows **the lowest consistency: only 1%** of plans effectively involve **vulnerable groups** in plan development.



2 Explaining the adaptation gap through consistency…

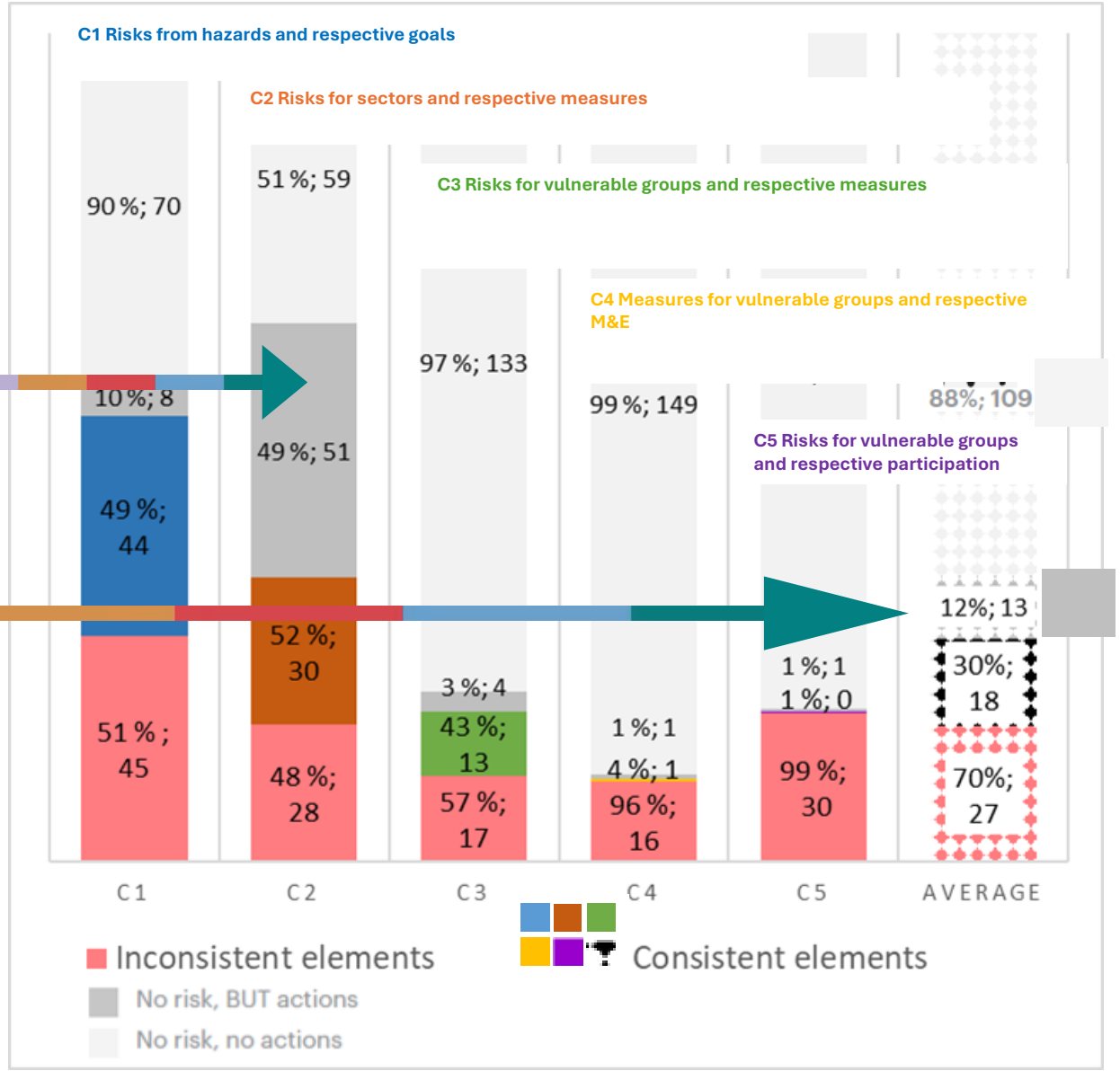
On average:

→ many adaptation goals and measures **lack preceding risk assessment**

→ **particularly in sector-specific planning** where **49%** of decisions are made without risk consideration

→ 12% of plans have actions w/o an identified risk/ need, e.g.:

→ A goal w/o risk; A measure w/o risk, Participation w/o risk, M&E w/o a measure

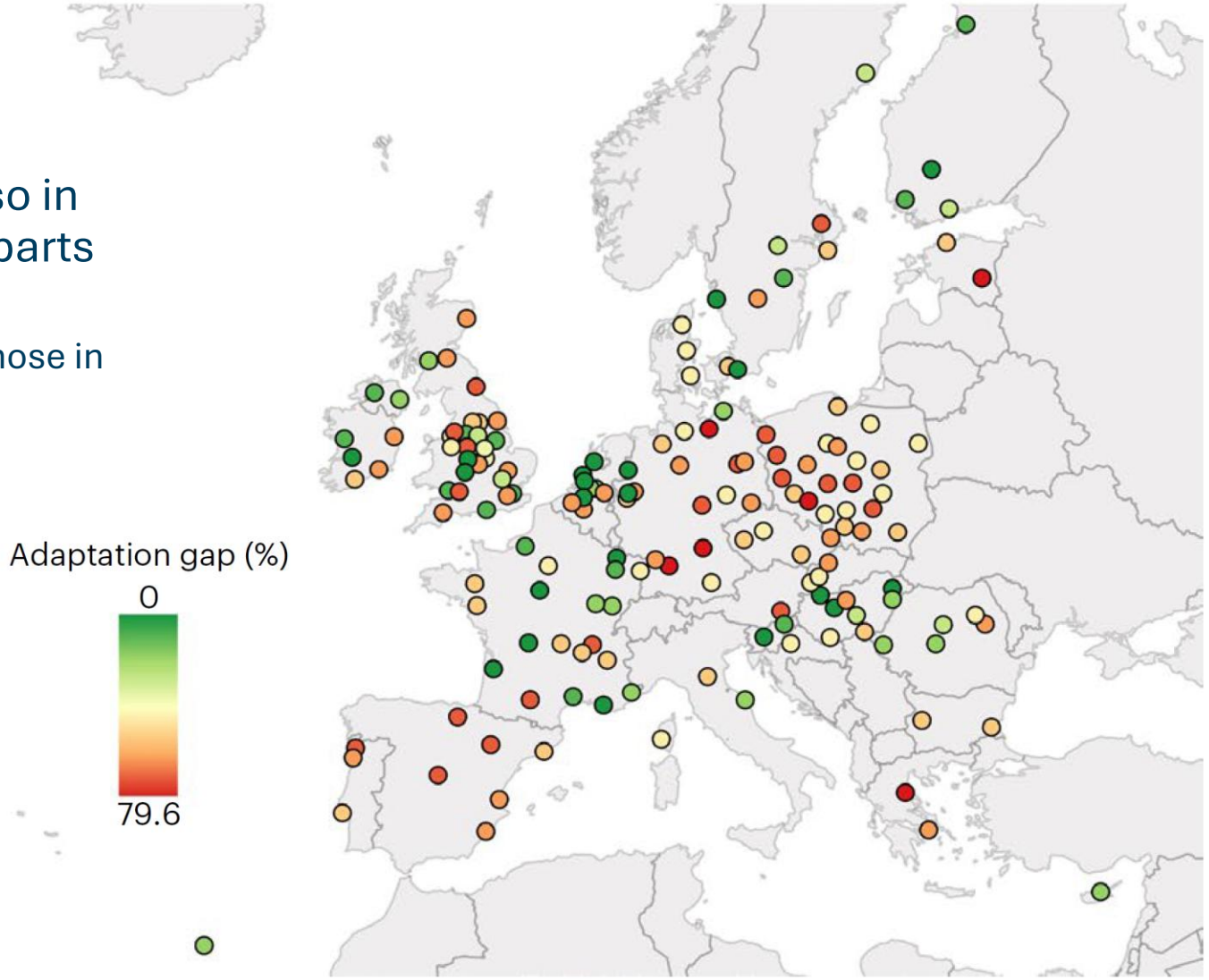


2 Explaining the adaptation gap through consistency…

→Plans in Eastern & Southern Europe, but also in Germany, are less consistent than in other parts of Europe

→ Lack of consideration of vulnerable groups and those in need

→Contributing to an adaptation gap



C1–C5 average scores

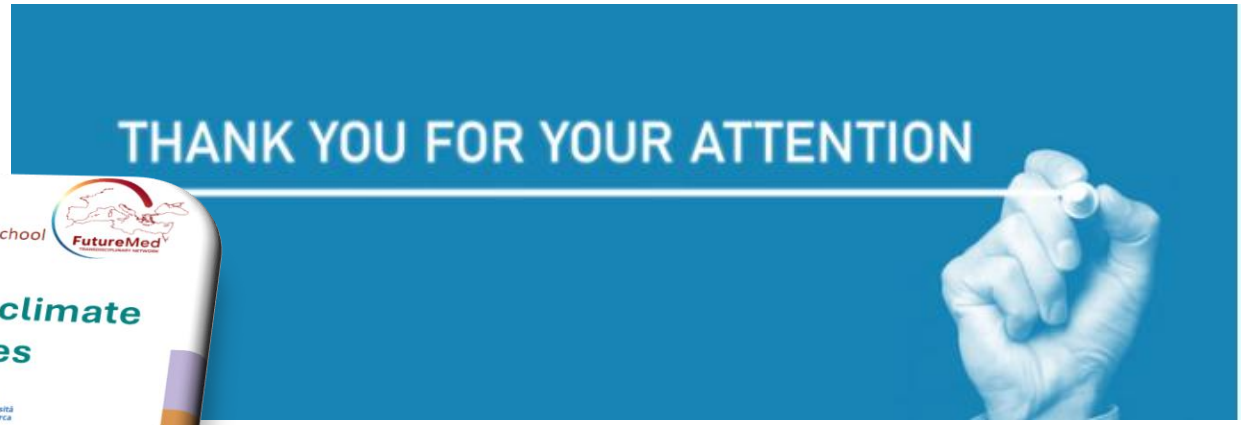
In conclusions

npj Nature Urban Sustainability (Reckien et al., 2023)

- Our findings suggest that, overall, **the quality of A-CAPs improved from 2005 to 2020**, primarily in terms of **setting adaptation goals**, proposing **varied and thorough adaptation measures**, and **detailing their implementation**.
- However, **there has only been a slight improvement** in **monitoring plan implementation** and **involving civil society** in the planning process.

Nature Climate Change (Reckien et al., 2025)

- **70%** of our checks across all the A-CAPs **identified inconsistencies** within the adaptation process.
- These mainly arise from a **lack of consideration of social vulnerability**, particularly regarding **planning the implementation of measures for vulnerable groups** and involving them in the development and evaluation of plans.
- **This could reduce the effectiveness of A-CAPs, as vulnerable groups are at risk of being exposed to more extreme weather events caused by climate change.**



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