CITY CLIMATE-ADAPTATION PLANS
Who's leading the pack?

Although local climate-adaptation plans are improving in Europe, they often neglect society's most vulnerable people. It's why local adaptation – and talking to those most at risk – is so important. **Peter Eckersley** reports

A solar-panel *zoneiland* supports a district heating scheme in Almere, the Netherlands

Although climate change is clearly a global problem, its effects are felt primarily at the local level. Different locations face different threats – including floods, heatwaves, storms, coastal erosion, drought and forest fires – that vary considerably in scale.

And that means that although it will take a concerted international effort to reduce greenhouse-gas emissions and limit the scale of climate change, it's subnational governments, private businesses and residents that must prepare for its inevitable impacts.

City adaptation plans matter for two reasons. First, many climate risks are particularly acute in densely populated areas. The urban heat-island effect creates hotter summer temperatures in cities than in the countryside and the prevalence of paved and otherwise sealed ground in urban areas exacerbates the risk of flash flooding.

And second, it's the people most vulnerable to climate impacts – including older people, infants, low-income families and people with disabilities – who most lack the resources to adapt by themselves.

This means that local authorities and governments more generally must take on some of these responsibilities.

We studied local adaptation plans to identify and compare their climate risk-assessments, proposed policies and monitoring and evaluation approaches

For example, older people are more likely to be affected by heat stress and are also less mobile, so find it more difficult to get away from urban hotspots. Meanwhile, low-income residents are less likely to have home insurance, air conditioning or the power to force landlords to retrofit their homes.

And it's the most vulnerable people who are more likely to live in places with less shade and/or in flood-risk areas where housing is cheaper.

ADAPTATION-PLAN IMPACTS

But how do we know whether adaptation plans are any good? It's tricky to identify how well different localities are adapting to climate change. It would take in-depth studies on individual cities to work out how far proposed policies have been

implemented, which would take up a lot of resources.

Evaluating how effective these policies are – in other words, to what extent they reduce climate threats – is even more difficult because this may only become apparent after a severe weather event. Even then, it can be difficult to measure how much a specific initiative has reduced that event's overall impact.

But we can study local adaptation plans to identify and compare their climate risk-assessments, proposed policies and monitoring and evaluation approaches.

We looked at how 327 cities in 28 European countries seek to adapt to climate change, focusing on the contents of their adaptation plans. We assembled 30 researchers from across Europe, with at least one expert from each country with local knowledge of its political, constitutional, climatic and linguistic context.

Just over half of our sample – 167 cities – had produced an adaptation plan that included a climate risk-assessment, a list of proposed policy measures, a monitoring approach and information about citizen participation in decision making.

We developed a scoring system to evaluate the quality of these strategy documents, based on six principles that previous studies have established as good practice:

- Evidence of impacts and risks in the local area
- The nature of local adaptation goals
- Information about adaptation policies and measures
- Details about implementing adaptation policies, including whether they've been allocated specific budgets
- Information about possible monitoring and evaluation of adaptation policies
- Participation from across society to create the plans.

COMMON CLIMATE CRITERIA

We used a shared set of survey questions that included multiple criteria relating to each of these six principles to examine how well each plan performed against three different scoring methods that we called ADAptation plan Quality Assessment (ADAQA) indices.

The most sophisticated index, ADAQA3, applies equal weighting to each of the six principles. It includes an assessment of plan consistency – the extent to which the city's planned goals, policies, monitoring procedures and approach to societal participation related directly to the climate risks that the plan detailed.

For example, if a city identifies that it's vulnerable to an increase in heatwaves, putting older people at particular risk, a good plan designs and implements specific heat-related measures that are focused on older people. And it includes ways to assess whether or not implementation has reduced the heat risk for this particular group.

An even better plan would involve these vulnerable groups to help identify the risks and then draft policies to respond.

More cities have produced adaptation plans since 2021 that are more comprehensive in setting out local climate risks and ways to address them

We've converted our survey questions into an online tool so that climate managers can assess their plans' quality and benchmark progress against our criteria; *see link overleaf*.

We concluded that plans are getting better, but there's still work to do. Our scoring system indicates that more recently drafted plans tend to be more comprehensive and detailed than those produced some time ago. This is obviously good news – cities are understanding climate risks better and coming up with ways to reduce their impacts on local residents and businesses.

We also found slight improvements over time in consistency, particularly in aligning risks with adaptation goals. More recent plans were also more likely to identify sectors particularly vulnerable to climate change – such as transport, construction and tourism – and to include measures to reduce these risks.

SCORING ADAPTATION PLANS

We grouped our 167 cities into three groups based on when they published their most recent plans. The results showed a general trend for higher scores over time. Geographically, we observed concentrations of more recent – and more comprehensive – plans in Poland, Ireland and France in particular. Italy stands out for a general paucity of plans.

More recent plans were slightly more likely to consider greater risks to vulnerable groups and to involve those groups in decision making. But overall, only a small number of the cities considered specific impacts of climate change on vulnerable groups and have drawn up policies to address those particular needs.

We also found that most cities don't plan to monitor and evaluate the impact of such targeted measures. Examples of targeted initiatives include assessing climate risks in care homes, hospitals or nurseries and fitting blinds, shutters or shading to keep these buildings cool in the summer and unsealing hard landscapes to reduce flood risks nearby.

Our top-scoring city was Bulgaria's capital, Sofia, closely followed by Irish cities Galway and Dublin. Irish cities scored particularly highly, probably partly because the government requires local authorities to produce adaptation plans that include certain features – such as assessing the area's climate risks.

And so Galway's plan includes a detailed risk assessment of climate impacts on the city's critical infrastructure, biodiversity, cultural capital, water resources and community services, and sets out a comprehensive action plan. This includes a detailed budget and timescales, and assigns responsibility to specific posts and teams within the municipality.

Specific initiatives include carrying out climate risk-assessments of all council buildings and infrastructure such as roads, integrating adaptation into planning decisions – for example, restricting development near coastal-erosion zones – upgrading stormwater drainage systems and planting trees.

Galway city is also running campaigns to inform the public about ways to reduce their exposure to climate risks and to raise awareness among businesses about funding they can tap to support adaptation. While drawing up the plan, the city involved a wide range of stakeholders and so scored well on public participation. Finally, Galway is monitoring climate impacts to review its policies and producing annual reports to evaluate progress.

In contrast, Lincoln in the UK had the oldest plan in our sample and – perhaps

unsurprisingly – achieved a much lower score. The municipality approved the city's plan in 2005 and hadn't updated it before our cut-off date at the end of 2020.

Lincoln moved earlier than many others to publish its plan – it was thinking about ways to combat climate threats when many cities elsewhere didn't consider this a priority – but the plan doesn't consider the specific needs of vulnerable groups or set out clear goals, timelines or priorities to act.

FUTURE CLIMATE PLANNING

Our research set a cut-off date of December 2020. Because we found adaptation planning becoming much more widespread and because plan quality improved steadily over the previous 15 years, we would expect these trends to have continued since then.

We expect that more cities have produced adaptation plans since 2021 that are more comprehensive in setting out local climate risks and ways that the municipality will address them. Research – not yet published – with colleagues at the Leibniz Institute for Research on Society and Space and the University of Potsdam suggests that German cities' adaptation planning and readiness has continued to improve.

In the meantime, this year's extreme weather across Europe and North America has hit home how climate change can and will affect local communities. It emphasises how important it is to put measures in place to counter these impacts. ●

Read the full article by Reckien, Buzasi, Olazabal, Spyridaki, Eckersley, Salvia, Simoes, Pietrapertosa and Fokaides at: https://www.nature.com/articles/s42949-023-00085-1

To self-assess adaptation plans' quality and benchmark progress visit: https://www.lcp-initiative.eu/climate-change-scoring-tool/

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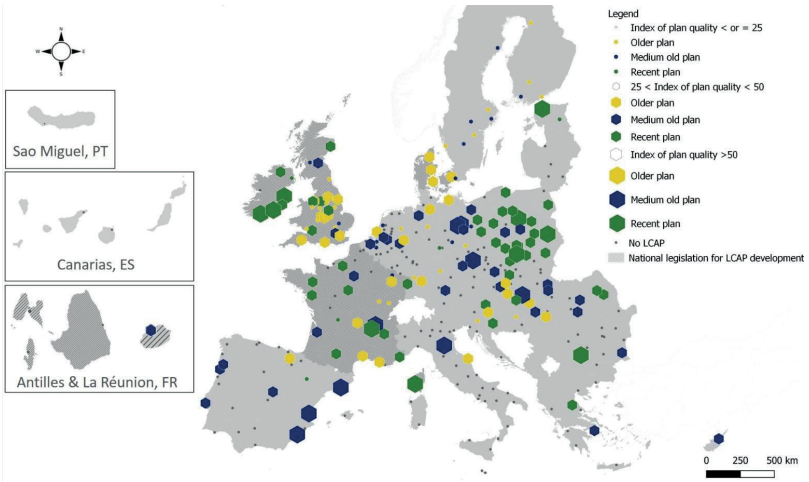
TOP-RANKED CITY ADAPTATION PLANS IN EUROPE

COUNTRY	CITY	SCORE	YEAR OF ADOPTION
Bulgaria	Sofia	62.1	2019
Ireland	Dublin	55.3	2019
Ireland	Galway	54.6	2019
Spain	Barcelona	51.2	2018
Hungary	Budapest	50.5	2018
France	Ajaccio	47.5	2019
France	Lyon	47.1	2015
Ireland	Waterford	46.3	2019
Estonia	Tallinn	44.8	2020
Poland	Katowice	44.8	2019

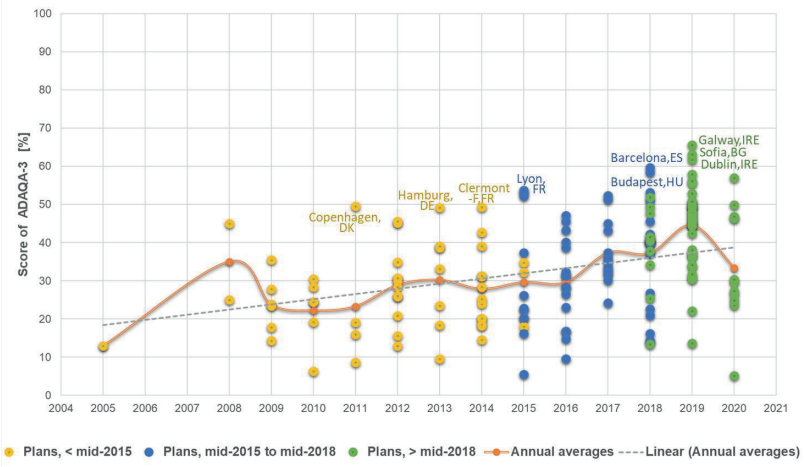
SOURCE: NATURE, 2023

EUROPEAN CITIES' URBAN CLIMATE-ADAPTATION PLANS



Notes:
For cities with adaptation plans, the size of the hexagon indicated the quality of ADAQA-3
Yellow depicts plans published before mid-2015
Blue depicts plans published betweek mid-2015 and mid-2018
Green refers to plans published after mid-2018
Small grey dots indicate cities without adaptation plans
France, the UK, Ireland and Denmark require cities, in law, to develop urban climate-adapation plans

SCORES OF THE PLAN-QUALITY INDEX ADAQA-3 PER CITY OVER TIME, 2005-2020. EACH DOT REPRESENTS ONE CITY'S PLAN/PLANS



Notes:
Yellow: older, before mid-2015
Blue: medium-old, mid-2015 to mid-2018
Green: recent plans, after mid-2018