Urban heatwaves: establishing risk financing strategies for emergency response plans and nature-based risk reduction measures

NATURANCE WEBSTIVAL

ADVANCE FINANCE INNOVATIONS FOR NATURE-BASED SOLUTIONS

WTW

12 February 2025

Overview of Innovation Labs

Lab 1 – Nov 2024 – problem definition & canvasing solutions

To understand the **challenges and solutions** for **financing preparedness and response measures** to manage **urban heatwaves**

Lab 2 – Feb 2025 – solution deep-dive in London

Solution 1: the **feasibility of applying a trigger-based financing** structure to the **Hot Weather Severe Weather Emergency Protocol (H-SWEP) in London**

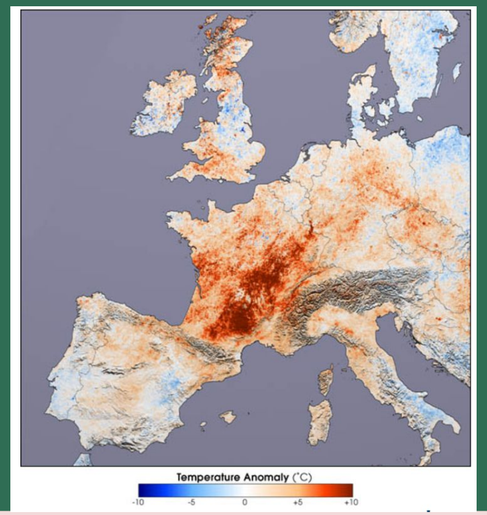
Solution 2: The use of **risk information and associated analytics** to manage the **impacts of urban heatwaves on green spaces in London.**

Lab 3 – March 2025 – business case discussion

University of Oxford
Smith School of Enterprise & Environment
Australasian Green Infrastructure Network
LSE
Grantham Research Institute on Climate Change and the Environment
UNU EHS
International Institute for Applied Systems Analysis IIASA www.iiasa.ac.at
Impact on Urban Health
London climate ready Partnership
CISL Cambridge Institute for Sustainability Leadership
ARUP
SHADE THE UK
ICLEI Local Governments for Sustainability EUROPE
Mayor of London
London Assembly

Context

Timeline of key historic events impacting European Cities



European Heatwave 2003

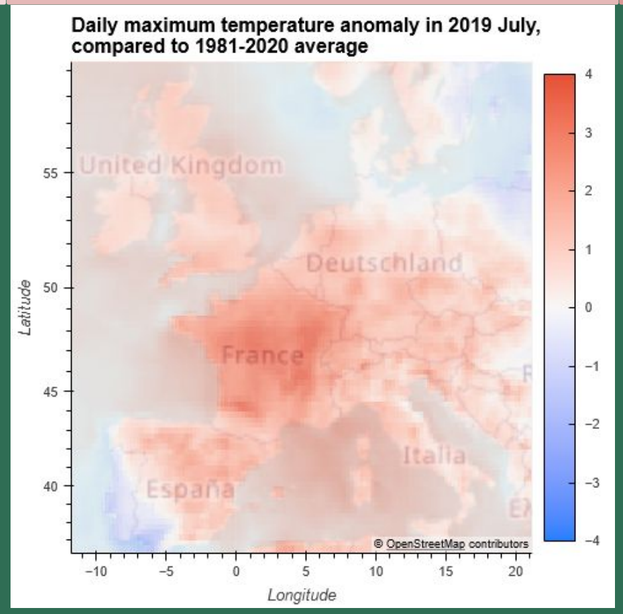
~70,000 excess deaths

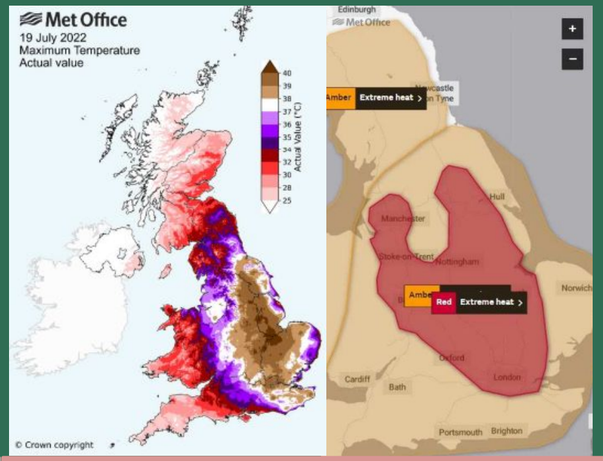
Paris, Rome and London among most impacted cities

Infrastructure impacted due to extreme heat **(railways, air travel and roads)**

Public cooling centres at capacity in Paris

European Heatwave 2019





European Heatwave 2022

Western Europe and U.K.

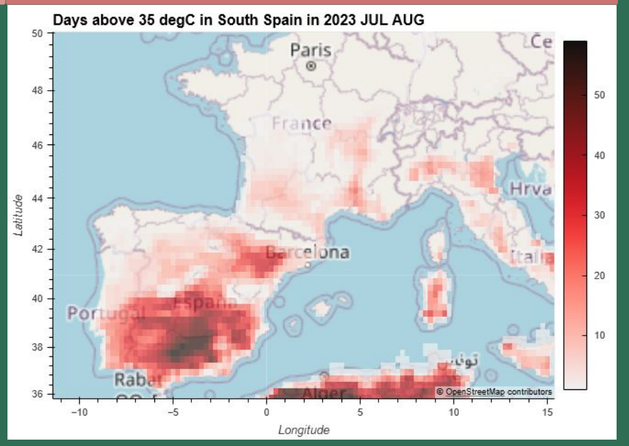
Over 61,000 heat-related deaths

First ever **extreme heat warning to be issued in UK (1/1000 year event)**

Southern Spain experienced up to 30 days of '**very strong heat stress**'

Milan and Paris hospitals saw surges in admissions

European Heatwave 2023



The impact of urban heat

Increased mortality rates, particularly of those in **care homes**

Higher risk of acute stress for **vulnerable populations**, including **elderly, children, outdoor workers**

Mental health impacts

Existing buildings have been built to **keep out heat**, making them uncomfortable to work and sleep in

Increase in **energy consumption for active cooling**

Railways/runways/roads buckling

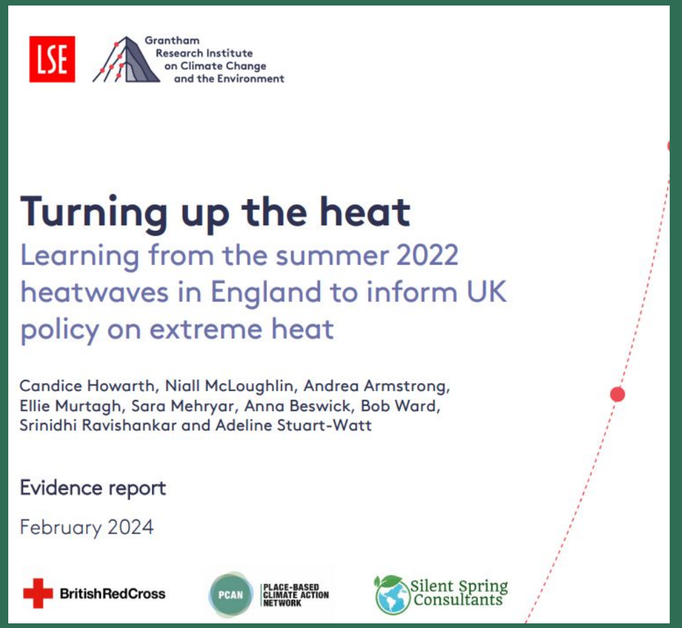
Urban trees react to **heat stress**, leading to **observed death of trees in parks**

Water scarcity, impacts BGI and leads to **cascading risks**

Increased pests and algae blooms, impacting BGI

£260-300 million per year in the UK economy

Reduced productivity leading to a **loss in labour hours** as a result of heat exposure



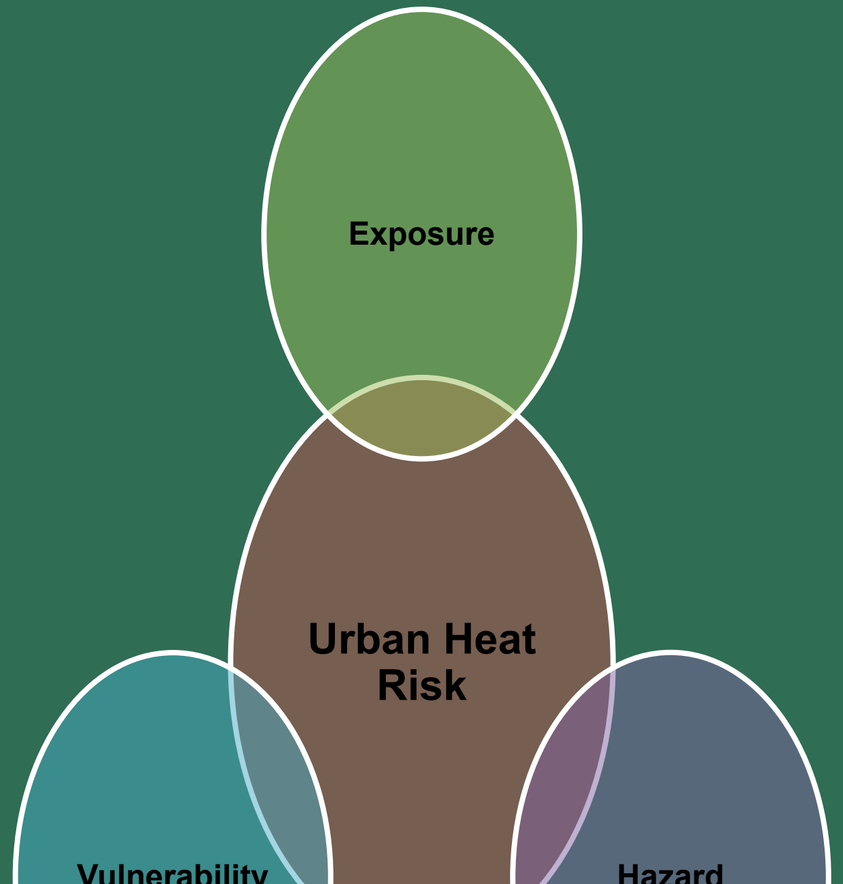
Overview of risk information

A thorough understanding of **risk information** and **cross-sector collaboration** is crucial for all stages of the **Disaster Risk Management** framework and is required when developing **risk informed financing products.**

The assets/people at exposed to the impacts of urban heat (e.g., green spaces, people, critical infrastructure, response costs of relevant agencies)

The characteristics of the exposure units which make them susceptible to the impacts of heat

(e.g., building material, age of population, underlying health conditions)



Temperature

This can be assessed through various **indices** (e.g., number of days above a temperature threshold, wet bulb temperature)

Risk informed, trigger-based finance as an option to manage urban heatwaves

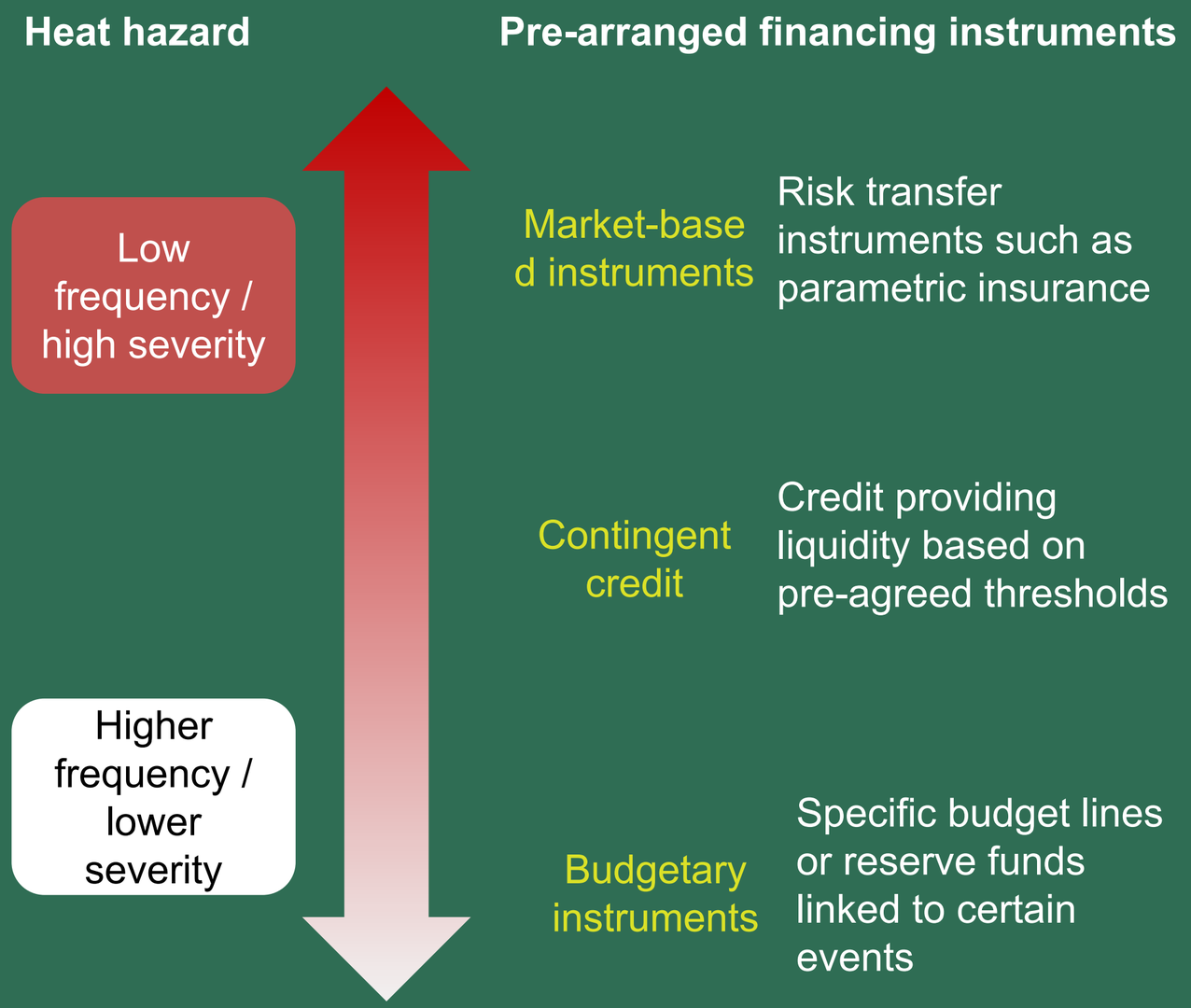
Guaranteed cash flow once a pre-defined hazard threshold has been met

Fast payment (e.g., parametric insurance payouts are usually made within 2 weeks)

Financing instruments can be designed to pay before **(anticipatory action),** during or after an event **(parametric insurance)**

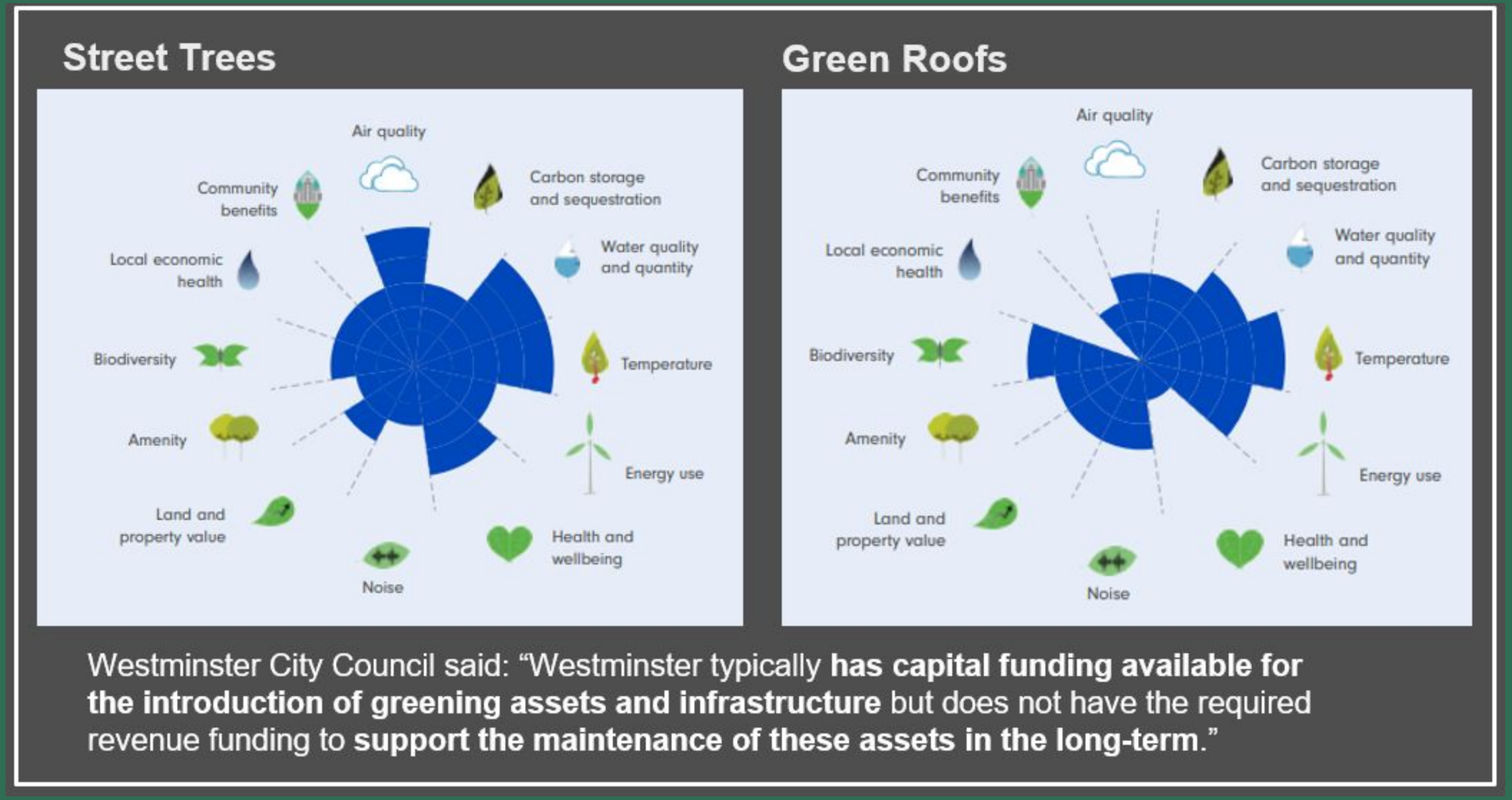
Payment (or no payment) of the instrument can generally be understood (no grey areas)

Payout's uses are flexible (e.g., **health, nature-based solution maintenance and restoration**)



Nature-based Solutions (NbS) bring multiple benefits in urban areas

The benefits of NbS in urban areas are well understood, particularly with regards to reducing the **Urban Heat Island effect.** NbS' ability to **reduce the hazard** is also at risk from heatwaves



Westminster City Council said: "Westminster typically **has capital funding available for the introduction of greening assets and infrastructure** but does not have the required revenue funding to **support the maintenance of these assets in the long-term**."

How can **risk information** be used to **manage the impacts of heatwaves on natural assets?**

Approach and Preliminary Findings

Approach – Innovation Lab 1

Introduction to the “problem statement” (WTW)

Breakout session 1: “The **key challenges** associated with urban heatwaves, specifically those challenges standing in the way of **obtaining financing for preparedness and response actions and protection and resilience-building for NbS/natural assets**”

Introduction to **potential solutions** to financing preparedness and response measures for managing urban heat waves, with a **focus on risk information and trigger-based financing (WTW)**

Breakout session 2: “Identify **priority population segments/natural assets, required hazard information, and preparedness and response actions** in the context of heat-waves and related information needs/gaps.”

Key Insights and Findings – Innovation Lab 1

Outline and validate the specific challenges faced by cities when financing various actions to **manage urban heatwaves** and outline **potential solutions to financing the various actions,** with a focus on risk **informed trigger-based financing,** and (a) different beneficiary groups and (b) natural assets

Challenges

Financing challenges (e.g., funding availability for some actions and not others)

Data information challenges (e.g., cost data, attribution, metrics)

Governance challenges (e.g., lack of central funding, short-term focus only, framing of heat risk)

Solutions / Advice

Many beneficiary groups to consider (e.g., elderly in homes, carers, jails).

Lot of NbS for cities, **difficulties defining the priority.** We should look at **one example** (e.g. an urban park).

The need to **pick the correct metric** to capture heat impact on people / green spaces / built environment (e.g., **clinical factors).**

Trigger-based solutions may be useful for shorter term but not longer term. Insurance is likely not cost beneficial.

Return on Investment Requirement

Outcome: Focus on **the application of trigger-based financing** for **one beneficiary group**; and the **use of risk information and associated analytics for a natural assets**.

Approach – Innovation Lab 2

- Overview of the London Plan by the Greater London Authority
- A worked example of a trigger-based financing structure for Central East London and discussion on how this could be applied to the pre-existing Hot Weather Severe Weather Emergency Protocol (H-SWEP) funding
- An overview of Shade the UK's work in Islington, focusing on the introduction of an Energy Performance Certificate equivalent for heat (e.g. a Climate Performance Certificate) to provide insights into overheating of buildings in future
- Discussion session on the use of risk information to manage the impact of urban heatwaves on green spaces in London

Key Insights and Findings – Innovation Lab 2

The feasibility of **applying a trigger-based financing structure** to the **Hot Weather Severe Weather Emergency Protocol (H-SWEP) for rough sleepers in London.**

Challenges

Hot Weather - Severe Weather Emergency Protocol **(H-SWEP)** can be **activated in extreme heat conditions** in London

"Overflow" precautions are mentioned in the protocol. **Demand for cool spaces and shelters can outweigh the supply**. This requires **additional finance to find additional accommodation.**

Added **governance challenges** prevent quick disbursal of attached funding for H-SWEP operationalisation

Feedback / Recommendations

Temperature data for a trigger-based financing product needs to **strike the balance** between **granularity** and **insurance market acceptability.**

Review **local initiatives** by **academics** who are creating climate data reflective of **hyper-local micro-climate**.

Data

Value proposition of trigger-based financing for the H-SWEP needs to be defined **(speed of funding, flexibility of funding)**

Reduction of risk and **cost benefit analyses** of different **financial instruments is recommended.**

Financial instrument

Additional engagement is required with H-SWEP team to understand **inefficiencies of current structure and whether trigger-based financing could fill those gaps.**

Further engagement

Key Insights and Findings – Innovation Lab 2

The use of **risk information and associated analytics** for managing **urban heatwave impacts on green spaces** in London

Challenges

London currently has a **ban on urban greening due to fire risk**

Compared to other European cities (e.g., Paris), **London does not prioritise maintenance of green spaces, nor do citizens feel "ownership" of these spaces**

London **lacks climate / heat resilient species** and we're not so good at putting **greenspaces in "the right place".** These legacy factors may be **challenging to overcome**

Feedback / Recommendations

Climate risk information can help **prioritise implementation measures for heat stress**

For green spaces, **longer-term lack of rainfall (drought) may be more important than acute heat stress**

Data

Some participants suggested that it may be **best to focus on people / indoor temperatures in the first instance**

Reducing **fire risk is considered more important** than addressing heat risk

Policy / Funding priorities

Reach out to the organisations responsible for managing green spaces – they will have the best understanding of pain points in terms of heat impact and lacking finance.

Further engagement

Looking Ahead

Host the final Innovation Lab (March 2025)

Fill out **scorecard** and **report** with sign off from Innovation Lab participants

Ensure all **stakeholders** are familiar with steps required to **take concept to product development / placement**

Maintain **relationships with stakeholders** with the aim of increasing awareness on how financial instruments can be used to manage the impacts of heat on **people and natural assets.**