Heavy Rain: How Cities and Municipalities Can Prepare Now

European cities must adapt to extreme weather. Practical measures include blue-green infrastructure, retention areas, and unsealing surfaces.

Heavy rain and flooding intensify across Europe. © Markus Volk – gettyimages.com

STUTTGART, GERMANY, September 29, 2025 /EINPresswire.com/ -- From flooding in northern Italy to torrential rain in Slovenia and submerged subway stations in Paris, extreme weather events have become a reality in Europe. Increasingly, heavy rainfall is causing flooded streets, evacuations, and billions in damage, placing enormous strain on cities and municipalities across the continent.

“Comprehensive flood protection and climate-resilient urban planning are crucial for the future of our communities,” says Gregor Grassl, Associate Partner and expert in climate-friendly building and urban development at Drees & Sommer.

> With Commit2Green, we are making a concrete contribution to the process of making European cities more resilient, greener and more livable.”
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> *Dr. Haris Piplas, Drees & Sommer*

One example of climate-effective urban development at the European level is the Horizon project Commit2Green, which is being implemented by Drees & Sommer together with 24 partners.

At Drees & Sommer, Gregor Grassl is engaging intensively with the challenges posed by extreme weather conditions:

“Periods of hot weather or rainfall in Europe are now becoming increasingly concentrated and intense – and they can affect every region of the continent, from Scandinavia to the Mediterranean.”

Heavy rain is particularly treacherous because it can be so sudden and so highly localized, which

makes it difficult to predict. But the good news is that, with the right expertise, it is possible for cities to adapt and improve their resilience.

Ways to Deal with Heavy Rainfall

1. Analysis of Local Risks

“The condition of the waterways and the capacity of sewer systems are key factors, because overloaded sewer systems are among the most common causes of urban flooding,” said Grassl.

This is why existing flood protection measures need to be reviewed regularly and tested to ensure that they are effective against extreme weather conditions. It is equally essential to ensure that there is access, at all times, to vital infrastructure such as emergency routes, fire stations, hospitals and emergency shelters.

2. Promotion of Blue-Green Infrastructure

The centerpiece of adaptation to heavy rainfall events is use of blue-green infrastructure, combining green spaces, water management and modern technology. Parks, green corridors and urban open spaces play a key role. During periods of heavy rainfall, they act as natural retention areas ready to absorb excess water and thus to buffer flooding in a specifically targeted way.

“In this context, another term we use is the sponge city, because green spaces act like a sponge soaking up the rainwater,” explained Grassl.

But these areas do a lot more than that: they provide protection from heat, improve the air quality, promote biodiversity and create valuable recreational spaces in urban areas. In this way, they not only contribute to climate adaptation, but also noticeably improve the quality of life in cities.

3. Unsealing of Surfaces

Many cities are dominated by asphalt, concrete and densely laid paving stones – materials that prevent rainwater from penetrating the ground. This water then flows unchecked into the sewer system, which quickly becomes overloaded during heavy rain.

“To counteract this, large areas of these types of surfaces need to be unsealed and replaced with alternative water-permeable options,” said Grassl.
Materials such as grass pavers, porous surfaces or green walkways allow for natural infiltration and help to absorb the rainwater in a decentralized manner wherever it falls. At the same time, unsealed surfaces will improve the microclimate, counteract overheating in cities and promote

groundwater recharge.

4. No More Counterproductive Dams

Traditional, rigid dams have long been considered to be effective flood protection. In many cases, however, they have the opposite effect: by restricting the natural flow of water and diverting it in a targeted manner, they increase the flow velocity – leading to more new or exacerbated flooding elsewhere.

“Instead of quickly draining water away from residential areas, it is important to slow it down and buffer it in a purposeful and precise way. This requires cities and settlements to be adapted more closely to natural features such as their terrain and original waterways,” says Gregor Grassl.

Through retention areas, permeable soils and near-natural designs, water can be retained on site for longer, infiltrated in a controlled manner or passed on with a delay.

5. Integration into Urban Planning and Development

In order to save costs and utilize synergies, it is essential to integrate protective measures against heavy rainfall into planned renovation and new construction projects at an early stage. In this way, infiltration areas, retention basins or green spaces can be considered from the outset and implemented efficiently.

“Integrated planning offers not only functional but also design added value: retention areas can simultaneously be used as parks, playgrounds or recreational spaces,” said Grassl.

Commit2Green: Nature-Based Solutions for Urban Resilience

With the Horizon Europe project Commit2Green, Drees & Sommer, together with 24 partners, is supporting eight European cities – including Barcelona, Milan, Warsaw and Mannheim – in developing urban greening and renaturalization strategies.

The aim is to embed nature-based solutions such as sponge-city concepts firmly into urban planning and to make cities more resilient to heat, heavy rainfall, and other consequences of the climate crisis. The project will run for 4½ years and will be funded with around €11.9 million.

A key component is the development of a transferable “Urban Transformation Toolbox” that will provide cities across Europe with practical tools for climate-resilient development.

“The climate crisis has long since arrived in our cities, with heat waves, floods and a noticeable decline in quality of life. With Commit2Green, we are making a concrete contribution to the process of making European cities more resilient, greener and more livable. This is about more

than just technology. It's about a shared vision of cities: close to nature, sustainable, and in dialogue with local people," says Dr. Haris Piplas, Leading Consultant and expert for climate-resilient urban development at Drees & Sommer.

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