00:04

What would the world look like if extreme climate change becomes reality? Well, here's just one example. If temperatures were to rise by three more degrees Celsius, Shanghai, a city of 24 million people in China, will be wiped off the map. And it's not just the only coastal city that's at risk of disappearing beneath rising sea levels.

00:22

Globally, 2019 was the second hottest year on record. Cities all throughout the world experienced record-setting summer temperatures. In June 2019, temperatures in Churu, India, exceeded 120 degrees Fahrenheit, to the point that the government warned citizens to avoid drinking coffee, tea and alcohol out of fear of overheating. Heat waves are becoming more severe and commonplace due to climate change, projected to lead to deaths at the same rate as all infectious diseases combined.

00:52

This map here shows the increase in the severity and prevalence of heat waves if the world follows a moderate warming scenario. By 2050, summertime highs of 95 degrees Fahrenheit, or 35 degrees Celsius, will become the new normal in nearly 1,000 cities, triple the number of cities that currently experience these sweltering temperatures.

01:12

But the irony is that cities are not just affected by climate change, they're also causing it. Cities consume between 60 and 80 percent of global energy resources and account for approximately 70 percent of global carbon dioxide emissions. As we can see here in this map, the light blue and the yellow areas correspond to those with the highest fossil fuel-based carbon dioxide emissions and also correspond to major urban centers. Aside from cities' energy consumption, growing urban areas convert the planet's green surfaces to buildings and pavement, and these can absorb more of the sun's energy than the natural grasslands and forests that they've replaced, making urban areas hotter than their surrounding environments. This phenomenon is called the "urban heat island effect."

01:54

Here in Singapore, downtown neighborhoods can be as much as seven degrees Celsius, or 13 degrees Fahrenheit, hotter than the rainforests that were once here. While it's true that cities are contributing to climate change, they're also key actors in forging low carbon emission pathways. In dense cities like New York City and Tokyo, for instance, the average resident is responsible

for over two tons of carbon dioxide emissions per capita. This is less than a single passenger car emits in a single year in the United States.

02:24

Cities around the world are stepping up to tackle climate change, with ambitious policies that often exceed the requirements of national governments. Take Copenhagen, for example. It's committed to become carbon neutral by 2025, and Glasgow in Scotland also plans to become carbon neutral by 2030. Today, there are more than 10,000 cities all around the world that are committing to their own ambitious climate actions, plans that include emissions reduction targets, clean energy and sustainable transit projects, and also energy efficiency policies that can save people and cities money, energy and emissions.

02:59

Recent analysis shows that just 6,000 cities, combined with regions and companies, are undertaking climate initiatives that can reduce global emissions by up to two gigatons of carbon dioxide equivalent in 2030. That's roughly four percent of the world's total annual emissions on top of what national governments have pledged. And this is just the start. Imagine what could happen if 20,000 cities were to band together to curb climate change.

03:24

While this potential for cities' climate action sounds really promising, cities must work to make sure that these policies are implemented fairly and equitably. Where you live in a city, your income, your race -- research is showing that these factors can determine your access to environmental benefits like green space and sustainable transit, and they can also determine your share of environmental burdens like air pollution and climate change.

03:47

We observe these neighborhood-level disparities particularly clearly in these side-by-side images of Los Angeles, comparing income on the left and tree cover on the right. The darkest green neighborhood has an average annual income of over 100,000 US dollars per person. And over 70 percent of it has tree cover. The blue neighborhoods towards the bottom of the map only have a third of the income per person and less than five percent tree cover. Seventy percent versus five.

04:13

This disparity has real consequences. Green spaces are often public spaces, and they're known to be associated with social and economic well-being. They can also reduce crime and foster social cohesion. Trees also can help to filter harmful air pollution and provide evaporative cooling and shade and relief for some of these high temperatures. So not only are those poorer neighborhoods at a greater disadvantage from access to green space, but they're also more vulnerable to air pollution and climate change.

04:40

We can observe particularly pronounced disparities in urban heat according to race. Our latest research shows that 97 percent of major urban areas in the United States are exposing Black populations and people of color to a full degree Celsius higher of urban heat than their white counterparts. Take a look at this map of my hometown of Greenville, South Carolina. Unlike the name suggests it is not green for everyone. The hottest areas of the county shown on the map in red correspond with the highest percentages of Black and poor populations. And we're seeing similar patterns throughout cities all across the United States.

05:16

To address these inequalities, cities are starting to strategize and develop plans that can ensure that climate benefits are provided to all of their citizens equally. Take Bogotá, the capital city of Colombia, for example. It has one of the most extensive bike networks in all of Latin America, connecting people to jobs, education centers and recreational opportunities. A new bike highway project can allow for around 42,000 daily bicycle trips and potentially avoid 270,000 tons of greenhouse gas emissions. In Africa, where many cities lack universal access to electricity, mini-grids are providing approximately 73 million households with clean electricity.

05:58

So as we can see from these examples, tackling climate change has to start in cities. Many cities are starting to flip the script on climate change, proving to be part of the solution and not just the problem, and bringing the kind of innovative solutions that we need for a more just and sustainable world.

06:14

Thank you.