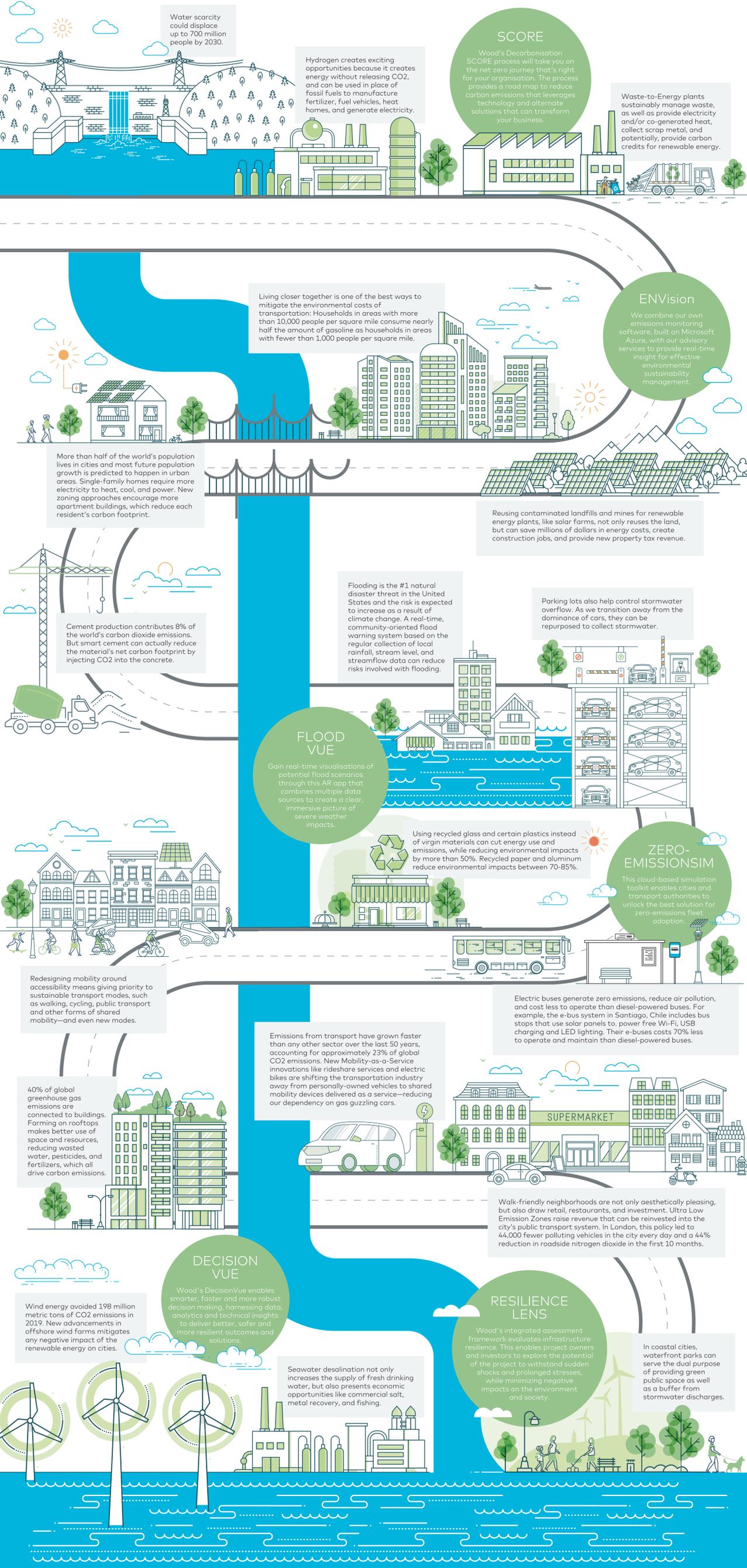# Building Climate-Smart Cities

More than half of humanity lives in urban areas, and cities are responsible for 70% of global greenhouse gas emissions. That presents an exciting opportunity to organizations and nations to make great strides in decarbonisation through smarter cities. By building connected, sustainable, resilient, and livable shared spaces for humanity's densest populations, we can make real progress to a net zero world.

In fact, the United Nations established this mission as their 11th Sustainable Development Goal: making cities more resilient, sustainable, inclusive and safe. Find out how pioneering governments and enterprises, with the help of Wood's digital solutions, are decarbonizing cities and paving the way for future sustainability.

Water scarcity could displace up to 700 million people by 2030.

Hydrogen creates exciting opportunities because it creates energy without releasing CO2, and can be used in place of fossil fuels to manufacture fertilizer, fuel vehicles, heat homes, and generate electricity.

## SCORE
Wood's Decarbonisation SCORE process will take you on the net zero journey that's right for your organisation. The process provides a road map to reduce carbon emissions that leverages technology and alternate solutions that can transform your business.

Waste-to-Energy plants sustainably manage waste, as well as provide electricity and/or co-generated heat, collect scrap metal, and potentially, provide carbon credits for renewable energy.

Living closer together is one of the best ways to mitigate the environmental costs of transportation. Households in areas with more than 10,000 people per square mile consume nearly half the amount of gasoline as households in areas with fewer than 1,000 people per square mile.

## ENVision
We combine our own emissions monitoring software, built on Microsoft Azure, with our advisory services to provide real-time insight for effective environmental sustainability management.

More than half of the world's population lives in cities and most future population growth is predicted to happen in urban areas. Single-family homes require more electricity to heat, cool, and power. New zoning approaches encourage more apartment buildings, which reduce each resident's carbon footprint.

Reusing contaminated landfills and mines for renewable energy plants, like solar farms, not only reuses the land, but can save millions of dollars in energy costs, create construction jobs, and provide new property tax revenue.

Flooding is the #1 natural disaster threat in the United States and the risk is expected to increase as a result of climate change. A real-time, community-oriented flood warning system based on the regular collection of local rainfall, stream level, and streamflow data can reduce risks involved with flooding.

Parking lots also help control stormwater overflow. As we transition away from the dominance of cars, they can be repurposed to collect stormwater.

Cement production contributes 8% of the world's carbon dioxide emissions. But smart cement can actually reduce the material's net carbon footprint by injecting CO2 into the concrete.

## FLOOD VUE
Gain real-time visualizations of potential flood scenarios through this AR app that combines multiple data sources to create a clear, immersive picture of severe weather impacts.

Using recycled glass and certain plastics instead of virgin materials can cut energy use and emissions, while reducing environmental impacts by more than 50%. Recycled paper and aluminum reduce environmental impacts between 70-85%.

## ZERO-EMISSIONSIM
This cloud-based simulation toolkit enables cities and transport authorities to unlock the best solution for zero-emissions fleet adoption.

Redesigning mobility around accessibility means giving priority to sustainable transport modes, such as walking, cycling, public transport and other forms of shared mobility—and even new modes.

Electric buses generate zero emissions, reduce air pollution, and cost less to operate than diesel-powered buses. For example, the e-bus system in Santiago, Chile includes bus stops that use solar panels to power free Wi-Fi, USB charging and LED lighting. Their e-buses costs 70% less to operate and maintain than diesel-powered buses.

Emissions from transport have grown faster than any other sector over the last 50 years, accounting for approximately 23% of global CO2 emissions. New Mobility-as-a-Service innovations like rideshare services and electric bikes are shifting the transportation industry away from personally-owned vehicles to shared mobility devices delivered as a service—reducing our dependency on gas guzzling cars.

40% of global greenhouse gas emissions are connected to buildings. Farming on rooftops makes better use of space and resources, reducing wasted water, pesticides, and fertilizers, which all drive carbon emissions.

### SUPERMARKET

Walk-friendly neighborhoods are not only aesthetically pleasing, but also draw retail, restaurants, and investment. Ultra Low Emission Zones raise revenue that can be reinvested into the city's public transport system. In London, this policy led to 44,000 fewer polluting vehicles in the city every day and a 44% reduction in roadside nitrogen dioxide in the first 10 months.

## DECISION VUE
Wood's DecisionVue enables smarter, faster and more robust decision making, harnessing data, analytics and technical insights to deliver better, safer and more resilient outcomes and solutions.

Wind energy avoided 198 million metric tons of CO2 emissions in 2019. New advancements in offshore wind farms mitigates any negative impact of the renewable energy on cities.

## RESILIENCE LENS
Wood's integrated assessment framework evaluates infrastructure resilience. This enables project owners and investors to explore the potential of the project to withstand sudden shocks and prolonged stresses, while minimizing negative impacts on the environment and society.

Seawater desalination not only increases the supply of fresh drinking water, but also presents economic opportunities like commercial salt, metal recovery, and fishing.

In coastal cities, waterfront parks can serve the dual purpose of providing green public space as well as a buffer from stormwater discharges.

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## Build the Sustainable Cities of The Future with Wood Solutions

At Wood, we work with clients to develop sustainable and resilient infrastructure. We have a framework for helping cities prioritize projects for investment, as well as an approach for decarbonizing portfolios. These solutions, and the training and capacity-building that go alongside them, create value by informing better decisions that help members make their cities more competitive and attractive to investment.

"Delivering a more sustainable, resilient and zero carbon future will not be possible without a concerted focus on improving quality of life in cities across the globe."

said Andrew Stewart, Executive President of Strategy and Development, Wood

### SCORE
- Navigate the decarbonisation landscape by gaining insight into the factors that contribute to variations in performance
- Lean on subject matter experts to develop a personalized roadmap to reduce carbon emissions
- Ensure robust and implementable solutions by transitioning your decarbonisation roadmap into achievable, measurable steps, including monitoring and feedback against decarbonisation objectives

### ENVision
- Assure Asset Operations Data: for day-to-day optimisation and reporting emissions data to meet regulatory and corporate commitments
- Real-time Portfolio Insight: across multiple assets, incorporating indirect and supply chain emissions, and feeding into decisions around carbon trading and offsetting
- Optimise Strategic Decision Making: quantitative target setting, transparent tracking of progress and effective interfacing with other key performance indicators
- Built on Microsoft Azure: delivering the security, scalability, and speed of Microsoft's cloud for enterprise grade data analytics

### ZEROEMISSIONSIM
- Simulate infinite possibilities. Use machine learning and real-world data to model and optimise route scenarios for battery electric or hydrogen fuel powered vehicles, charging and fueling infrastructure locations, and vehicle types and sizes
- Address range anxiety and life cycle costs. Understand the true capital and operating costs for hardware, infrastructure, energy, and utilities required for the network when scaling fleets
- Evaluate resilience of fleet adoption. Perform a 360-analysis of impacts and costs associated with facilities, people, environment and infrastructure to plan for the transition to zero-emission fleets over a set horizon

### FLOOD VUE
- Automated and scalable data collation: integrates flood risk data from both 1-dimensional and 2-dimensional applications to enable a high-level analysis
- Real-time visualisation: uses multiple geolocation selection methods including Observation Points, GPS, Bluetooth or Manual Entry to define positional and directional information for an immersive experience
- Smarter, more resilient decision-making: displays multiple data sources such as high-water mark geolocations, structural details, building information and flood flow information for better informed resilience planning

### DECISION VUE
- Supporting strategic option assessment through an analytically robust framework that breaks down complex problems into more manageable elements
- Informing real-time decision making in high risk environments with AI-enabled decision support tools analysing large data streams to deliver smarter, faster, and more reliable outcomes

### RESILIENCE LENS
- Enables project owners and investors to explore the potential of an infrastructure project to withstand sudden shocks and prolonged stresses, and minimize negative impacts on the environment and society
- Using the results of the screen and project database, infrastructure projects can be designed, built, operated and maintained (DBOM) to deliver resilience value over a project's lifecycle
- Developed in partnership with the Rockefeller Foundation and the Resilient Cities Network, ResilienceLens provides a link between infrastructure projects and finance, supporting the identification of a pipeline of 'bankable' projects which can demonstrate the value of integrating resilience in project design and delivery (the resilience dividend) as well as addressing the sustainable development goals

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