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Latvia University of Life Sciences and Technologies

# Impact of climate change on urban green areas

Online seminar «On the Way to More Resilient and Climate-Adaptive Urban Green Spaces in Latvia and Lithuania», 14 May 2026

Rasa Povilioniene, lecturer at LIK

This material has been produced within the Interreg VI-A Latvia–Lithuania Programme 2021–2027 project “Enhancing Urban Resilience through Climate-Adaptive Green Space Planning in Latvia and Lithuania” UrbanGreenAdapt (LL-00273) with the financial support of the European Union.
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# Impact of Climate Change on Urban Green Areas

**They breathe for us.**
**They shade us.**
**They are under threat.**

# The Greenhouse Effect

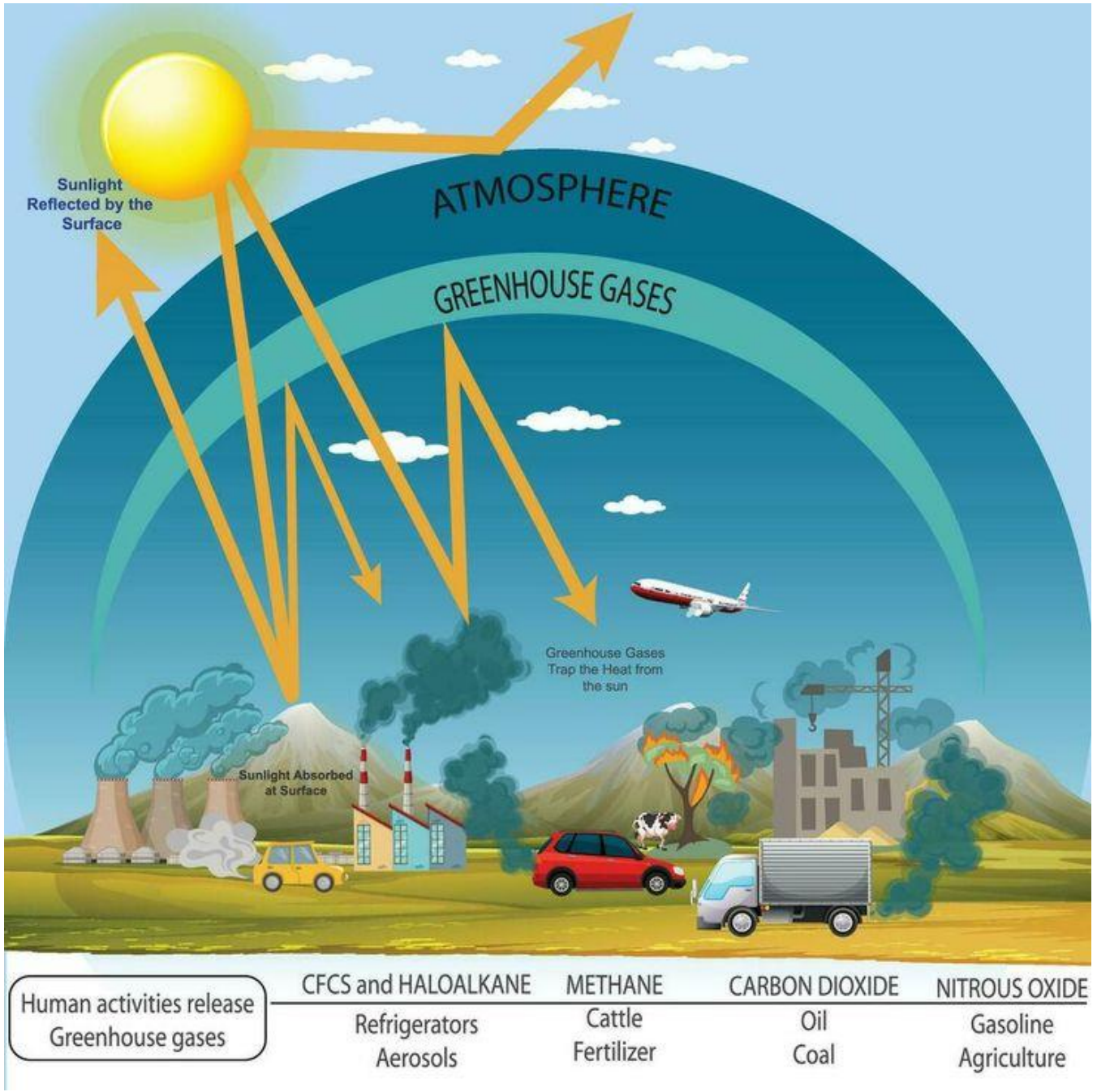
**Natural greenhouse effect:**

**keeps Earth warm enough for life.**

**Anthropogenic climate change:**

**human activity adds extra greenhouse gases**.

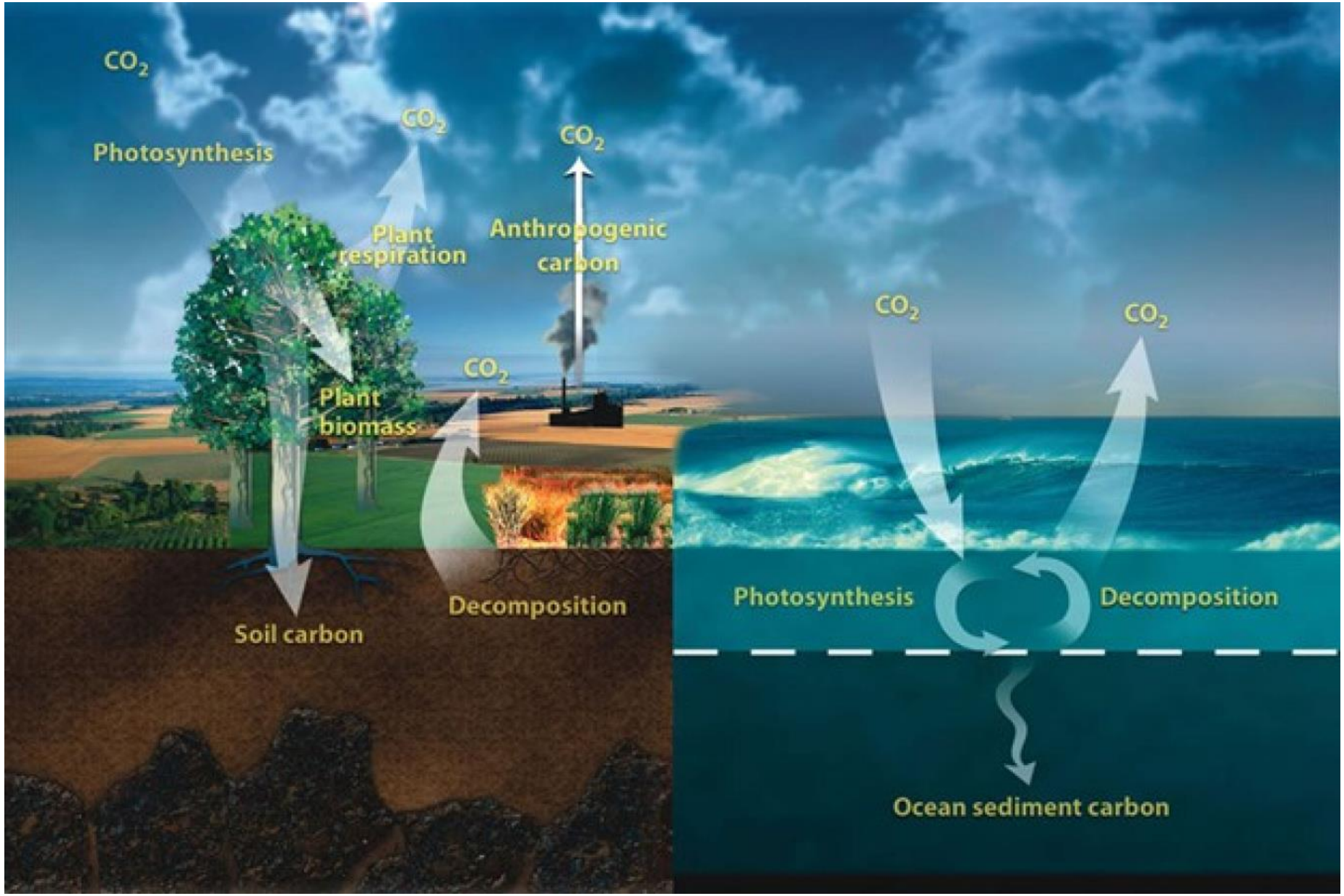
More $CO_2$ + $CH_4$ + $N_2O$, more retained heat




Source: @ProVector

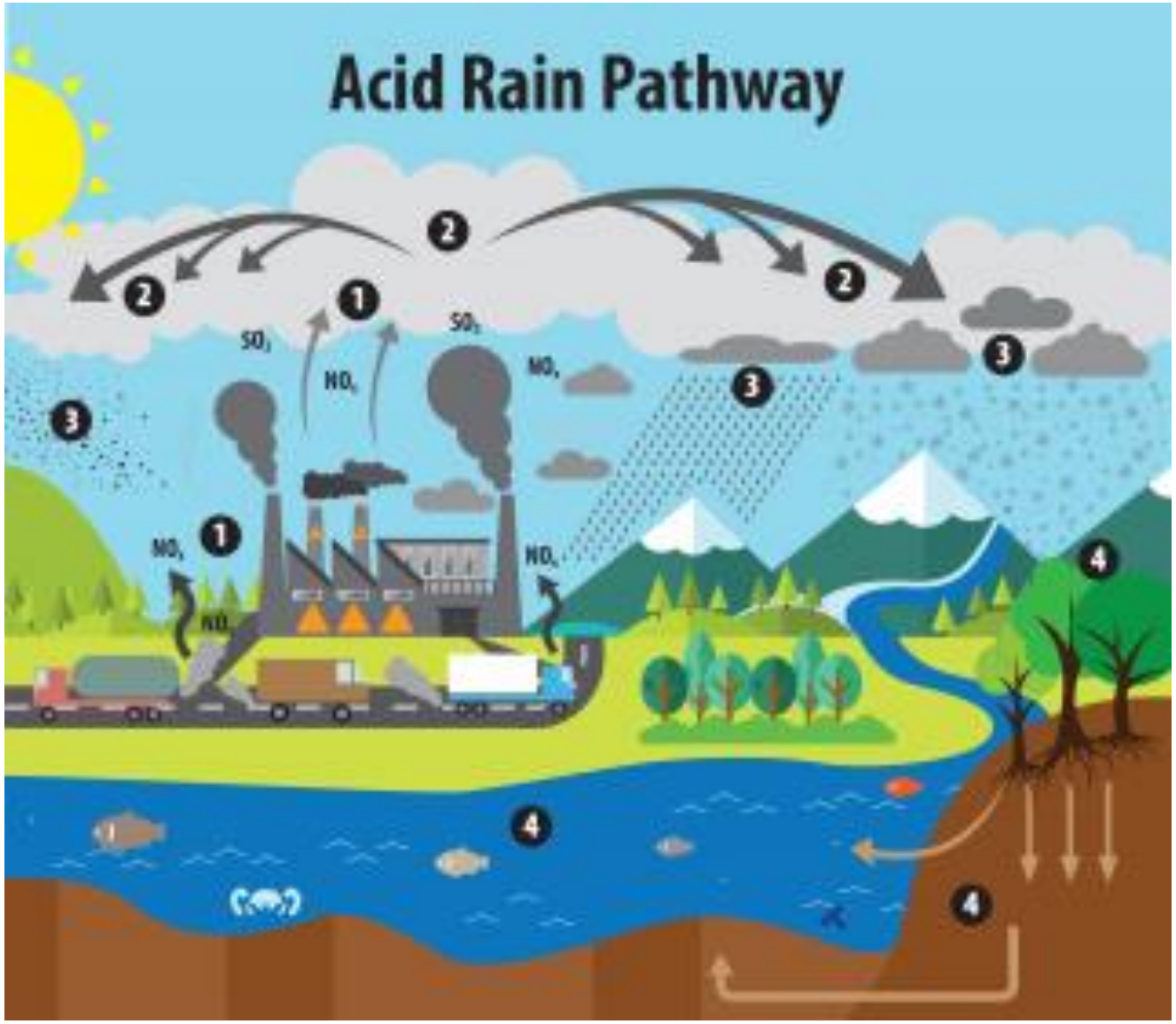
# We Are Burning Ancient Sunlight

**For millions of years:**
**plants captured sunlight and stored carbon underground.**
**In a few centuries:**
**we burn coal, oil and gas — and release that ancient carbon back into the air.**



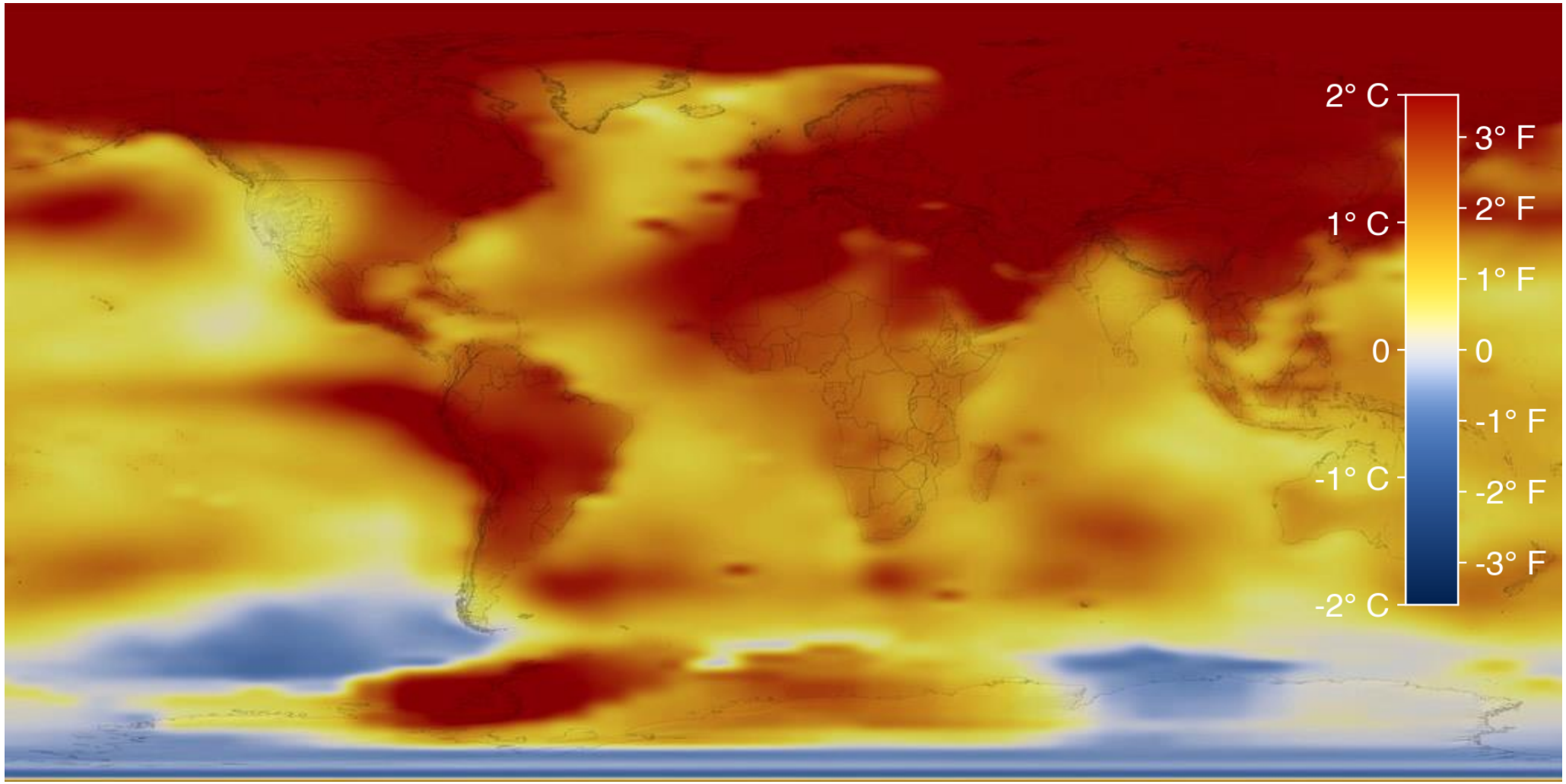
# The Hidden Cost of Combustion

**$CO_2$, $CH_4$, $N_2O$ - climate warming**
**$SO_2$ + $NO_x$ - acid rain**
**PM + VOCs + $O_3$ - respiratory disease**
**$H_2O$ vapour - warming feedback**




Source: US Environmental Protection Agency: (1) Emissions of SO2 and NOx are released into the air, where (2) the pollutants are transformed into acid particles that may be transported long distances. (3) These acid particles then fall to the earth as wet and dry deposition (dust, rain, snow, etc.) and (4) may cause harmful effects on soil, forests, streams, and lakes.

# Evidence of Global Warming




Source: NASA SVS: This color-coded map displays a progression of changing global surface temperature anomalies. Normal temperatures are shown in white. Higher than normal temperatures are shown in red and lower than normal temperatures are shown in blue. Normal temperatures are calculated over the 30 year baseline period 1951-1980. The maps are averages over a running 24 month window. The final frame represents global temperature anomalies in 2023.

# Heat or Shade?

**Same city.**
**Different design.**
**Different temperature.**

**Asphalt and concrete absorb heat.**
**Trees provide shade and cool the air through transpiration.**


Source: @YourPlanet Earth

# Flooding and Stormwater Management

**Climate change brings heavier rain.**

**Cities are often too sealed to absorb it.**

Rain gardens and bioswales work as living sponges:

- **slow water**
- **filter pollutants**
- **recharge soil**
- **reduce flood pressure**

Rain garden in Helsinki

# Drought,
# Heat Stress

**Climate change brings:**
**longer dry periods**
**hotter summers**
**stressed trees and soils**

**To adapt, urban planting must rely on:**

- **drought-tolerant species**
- **healthy, living soil**
- **mulch and groundcover**
- **rainwater storage**

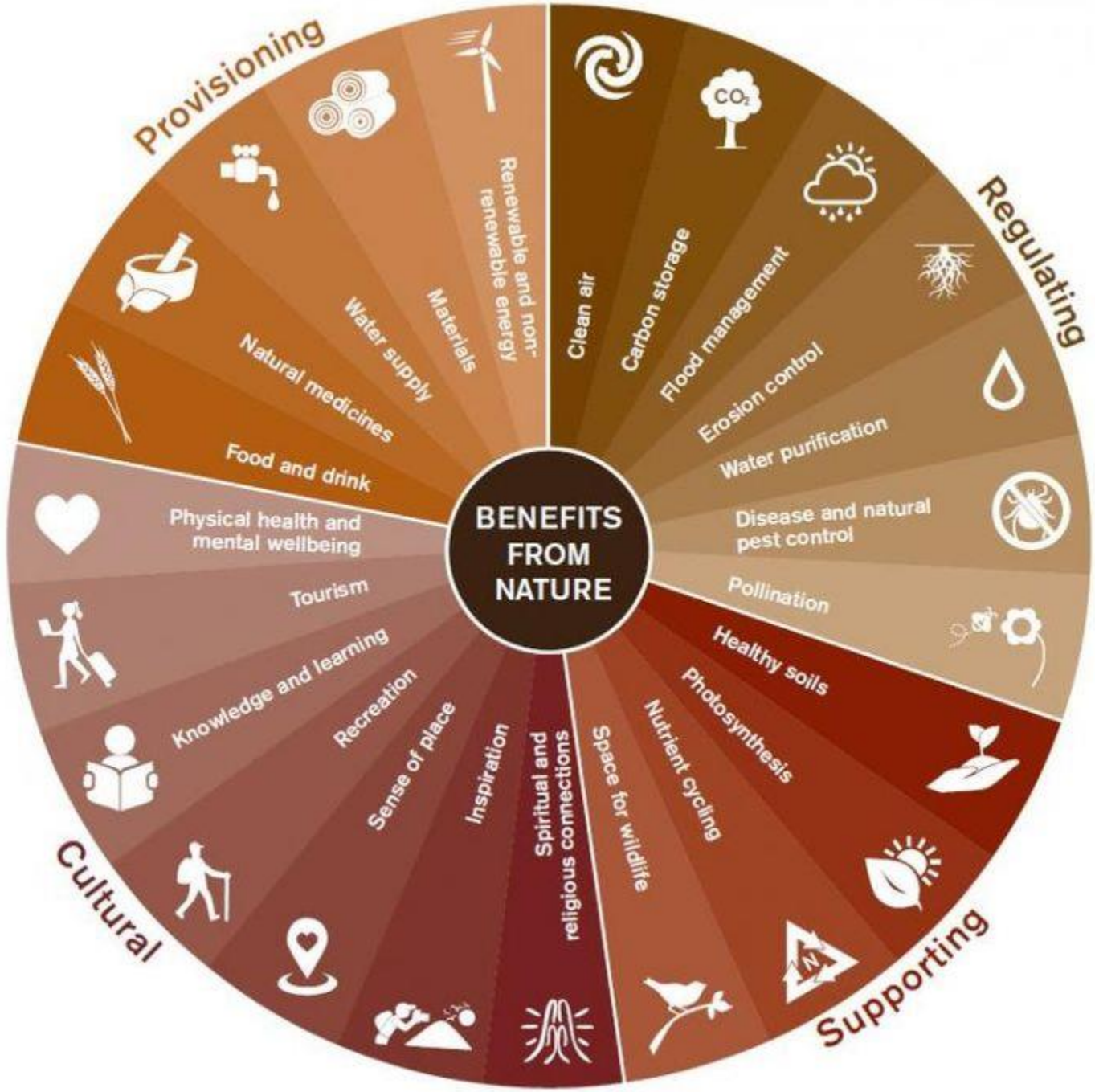
**Water-sensitive planting is climate-resilient planting.**

@WAGONLANDSCAPING

# Why invest in green infrastructure?

**Provisioning** – food, water, materials
**Regulating** – cooling, flood control, air purification
**Cultural** – recreation, beauty, identity, wellbeing
**Supporting** – soil formation, photosynthesis, nutrient cycling

**Urban green areas turn ecological processes into human wellbeing.**



# Green Roofs, Walls

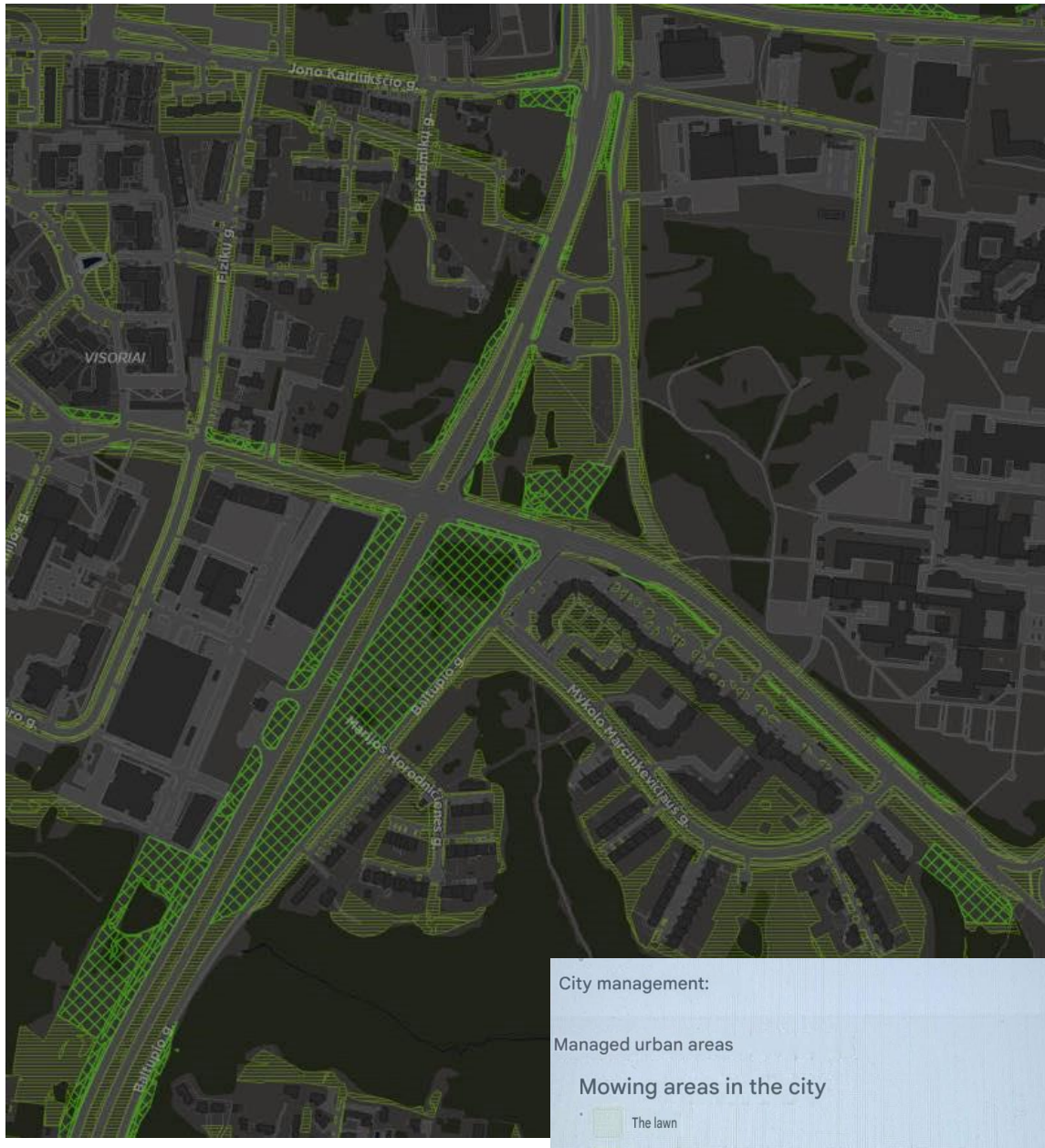
Green and brown roofs help cities to:

- **store rainwater**
- **reduce heat**
- **save energy**
- **support wild plants and pollinators**
- **turn buildings into living infrastructure**

Biodiverse „brown“ roof, central London, photo: Dusty Gedge

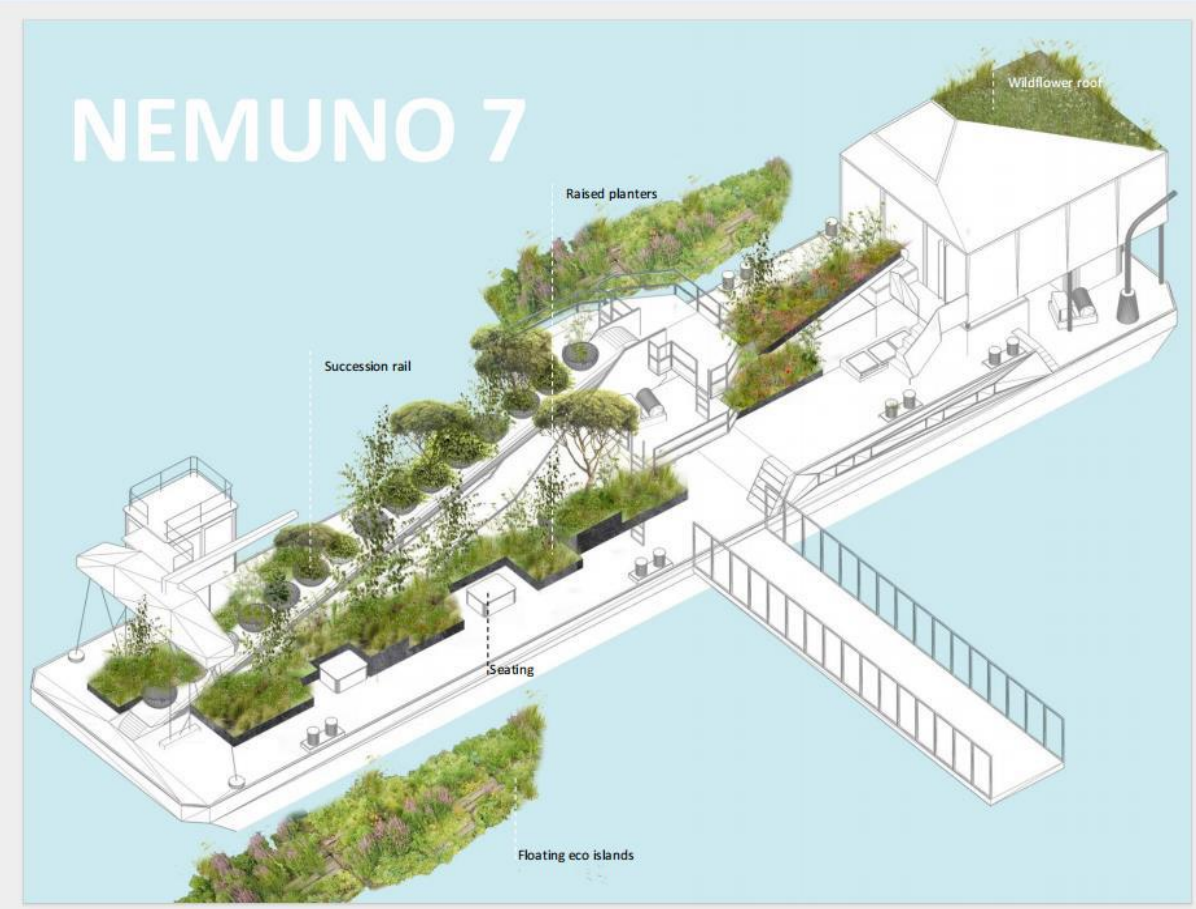
# Wildflower Meadows & Mowing

**A resilient meadow needs:**
**local perennial species**
**1–2 cuts per year**
**biomass removal**
**mosaic mowing**
**refuge patches for insects and birds**




Meadow mowing plan, Vilnius

# Industrial Reuse




Nemuno 7 at Zapyškis, Lithuania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