New paradigms in social environment and urban life

Maria Chiara Pastore

Urban Architect, Director of Research Division at Studio Boeri
(Designer of Vertical Forest)

LET'S TALK URBAN FORESTS!

6th CMC International Conference of Management Consultants

18.10.2018

Maria Chiara Pastore

Stefano Boeri Architetti

1

THE URBAN CONDITION

DATA

URBAN POPULATION GROWTH

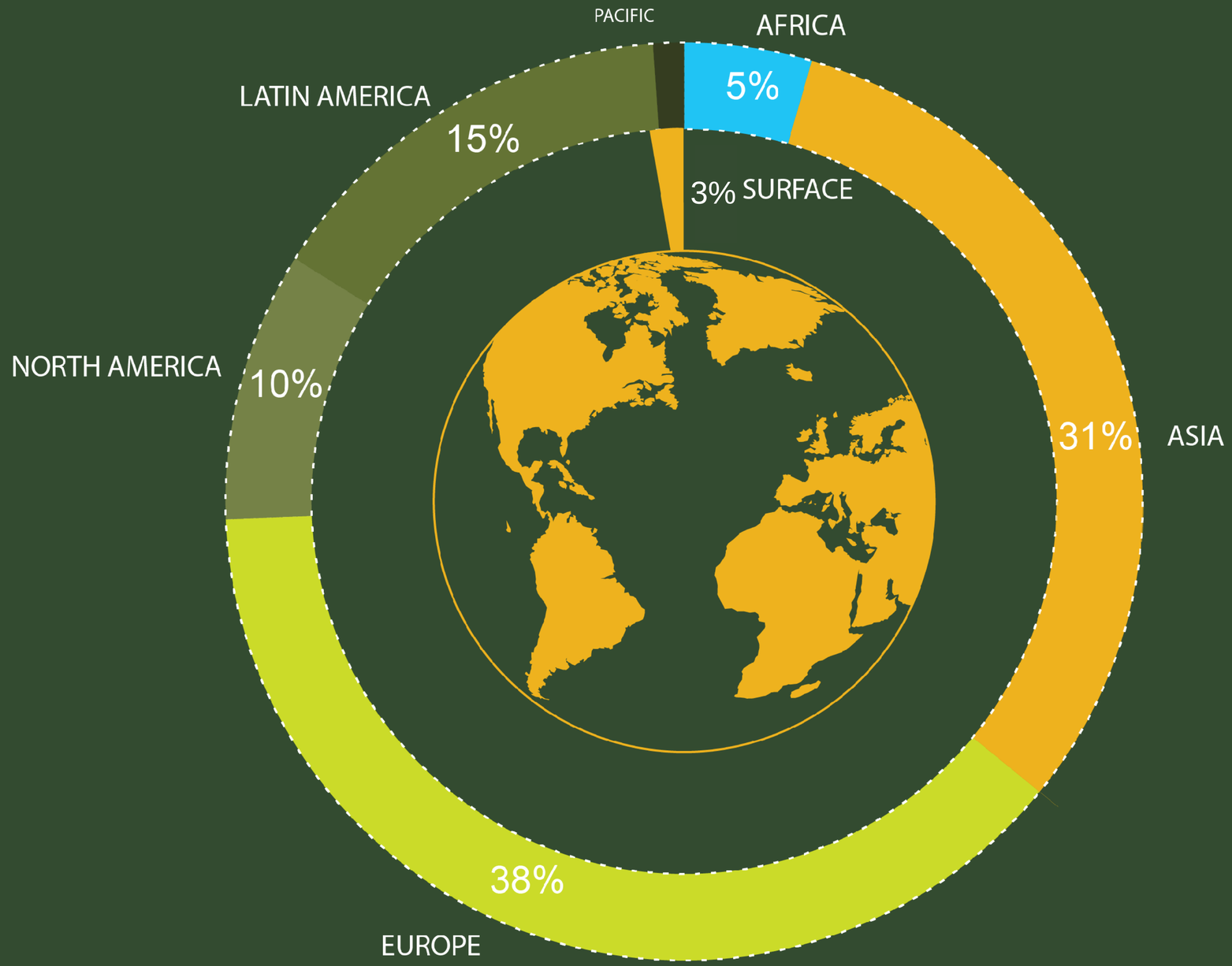
2014 **54%** of the world population is concentrated in cities.

2030 **60%** of the world population will be concentraded in cities.

2050 **70%** of the world population will be concentraded in cities.

URBAN POPULATION DISTRIBUTION

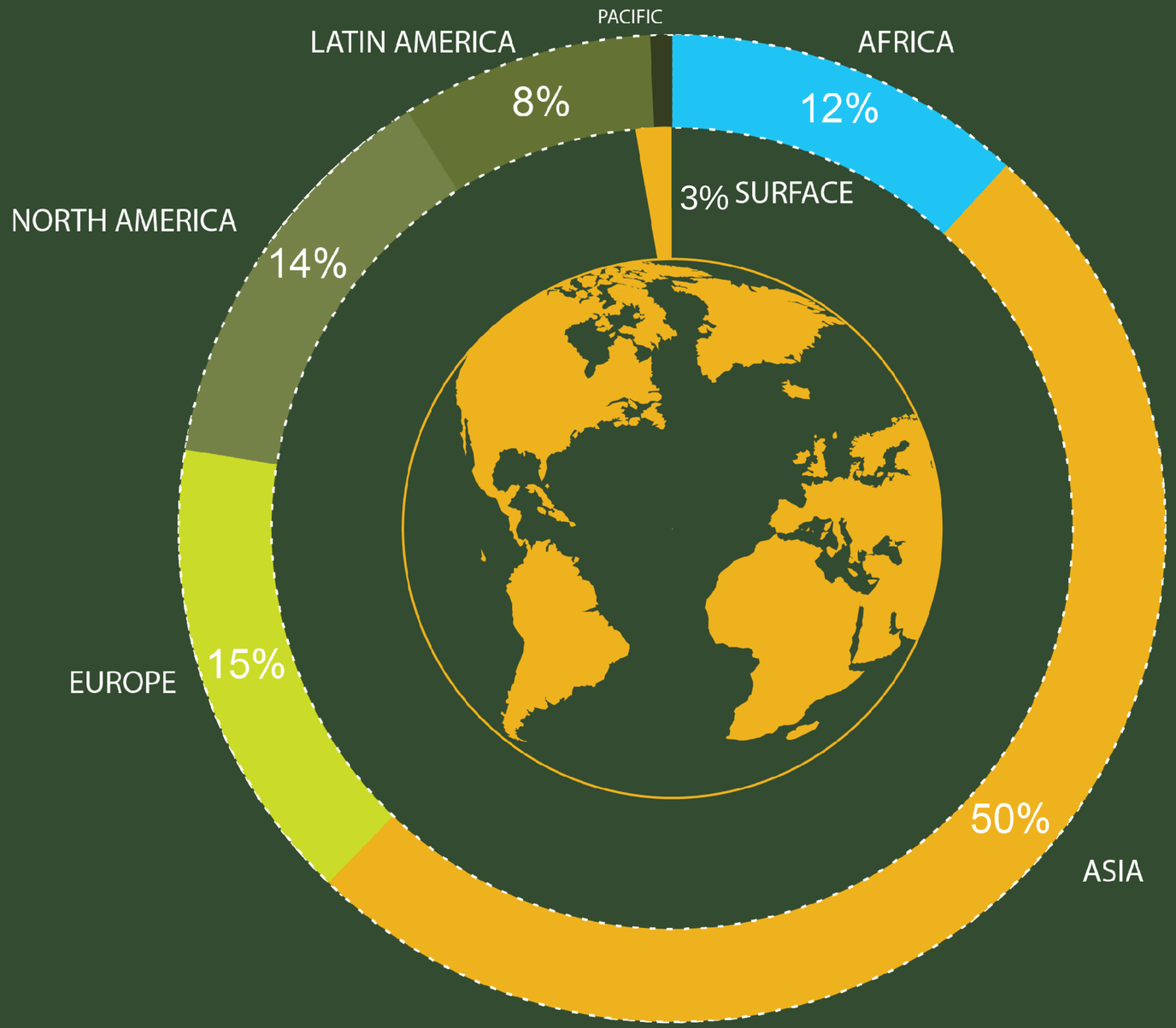
1950



source: W.H.O.

URBAN POPULATION DISTRIBUTION

2010



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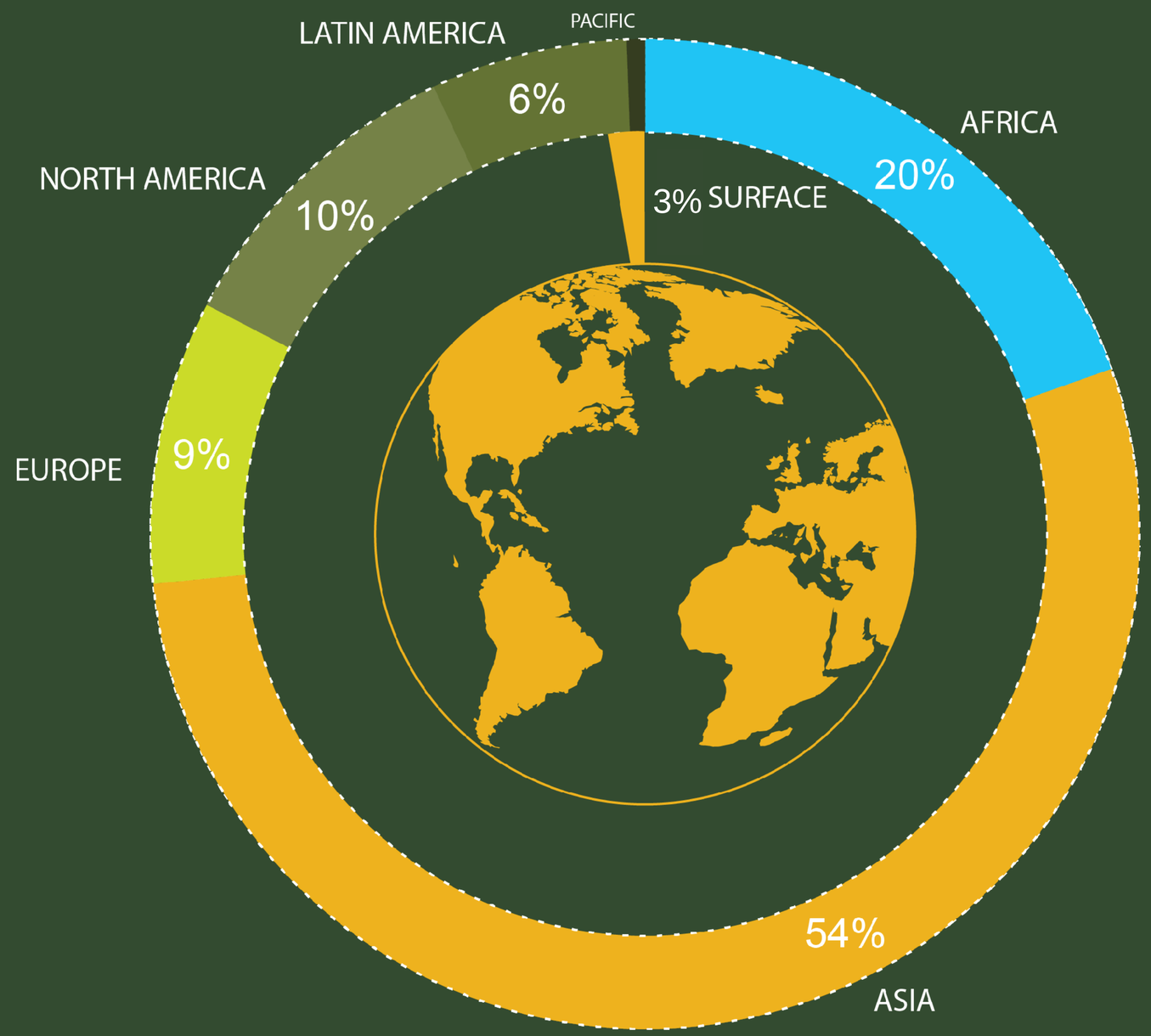
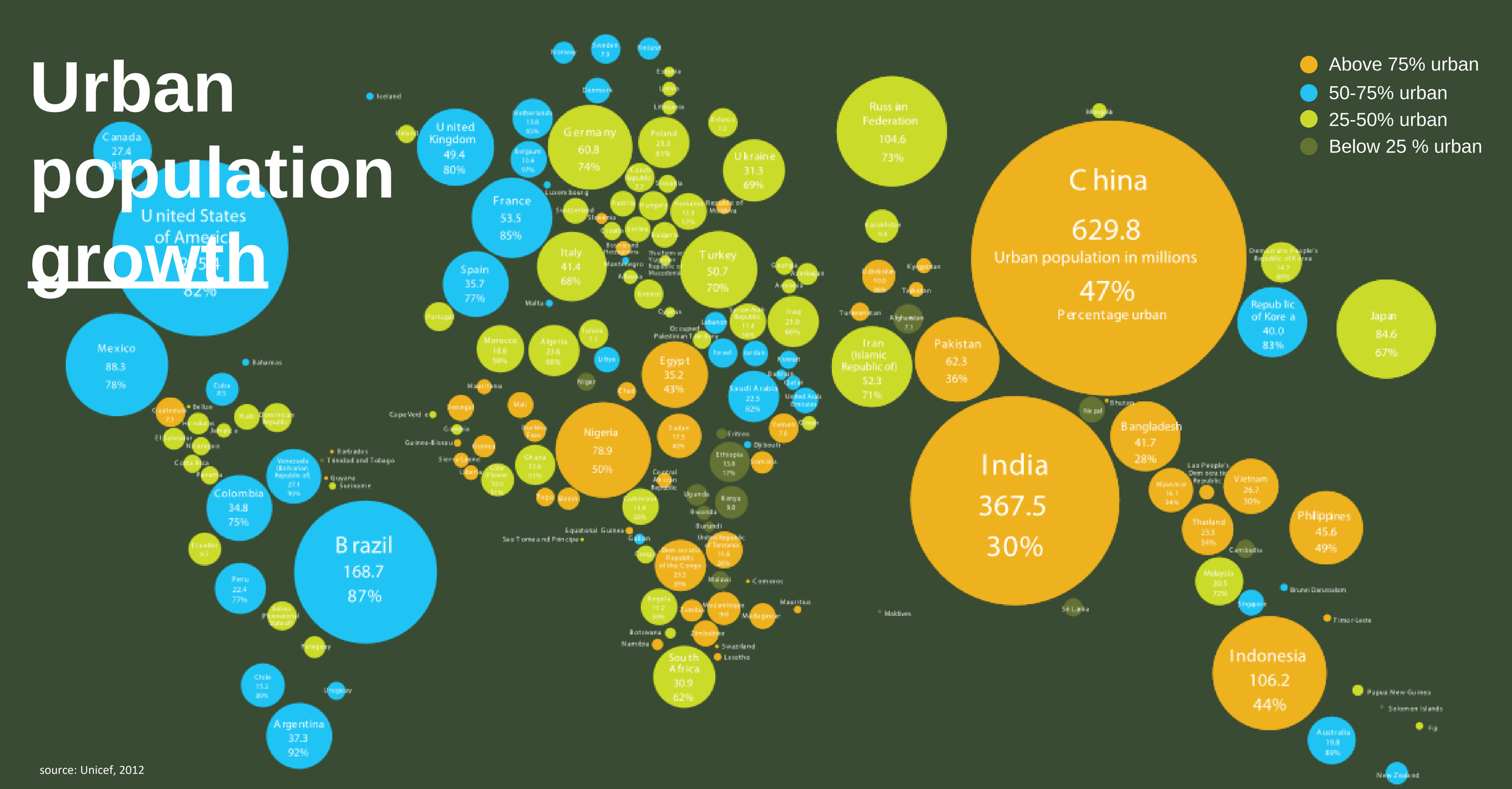
URBAN POPULATION DISTRIBUTION

2050



source: W.H.O.

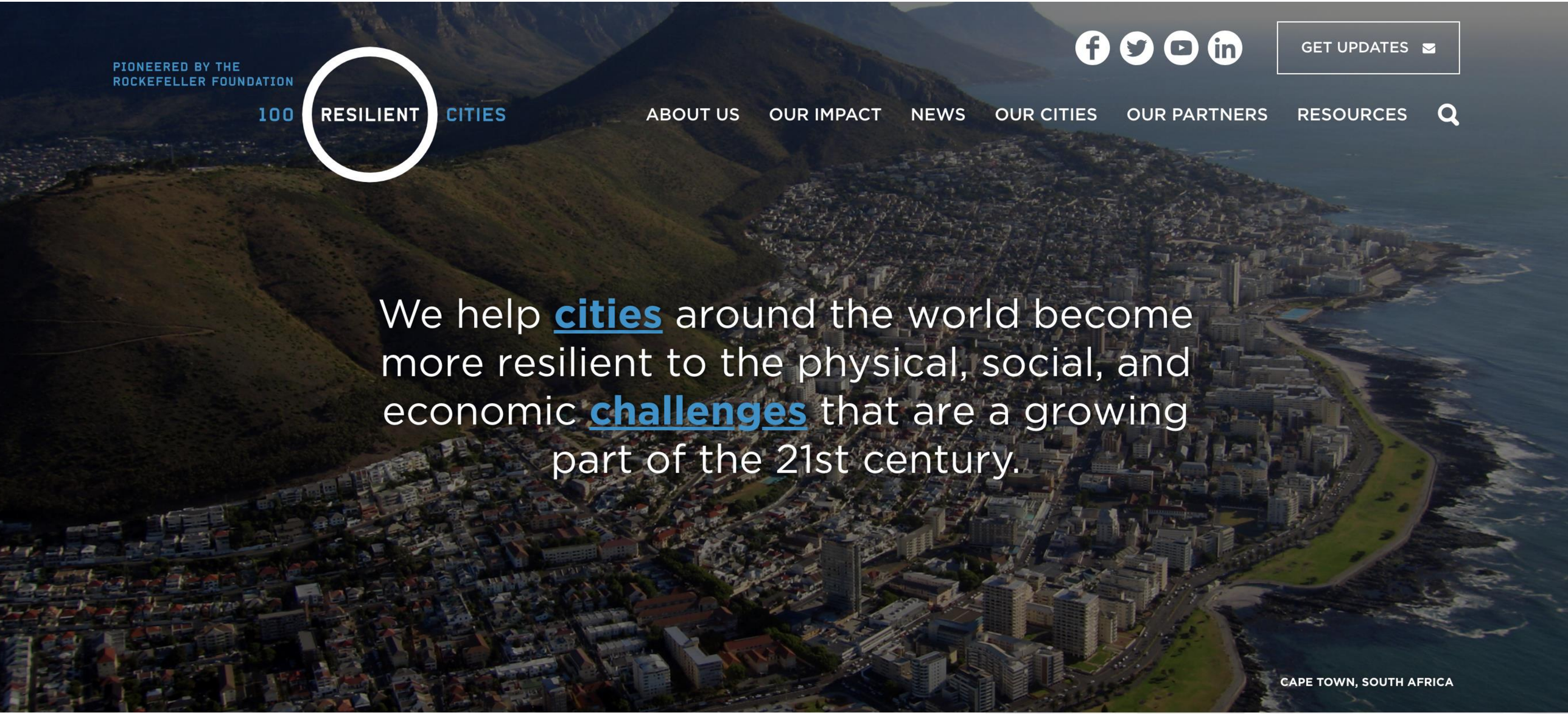
Urban population growth



source: Unicef, 2012

2

CHANGE IN MANAGEMENT SYSTEM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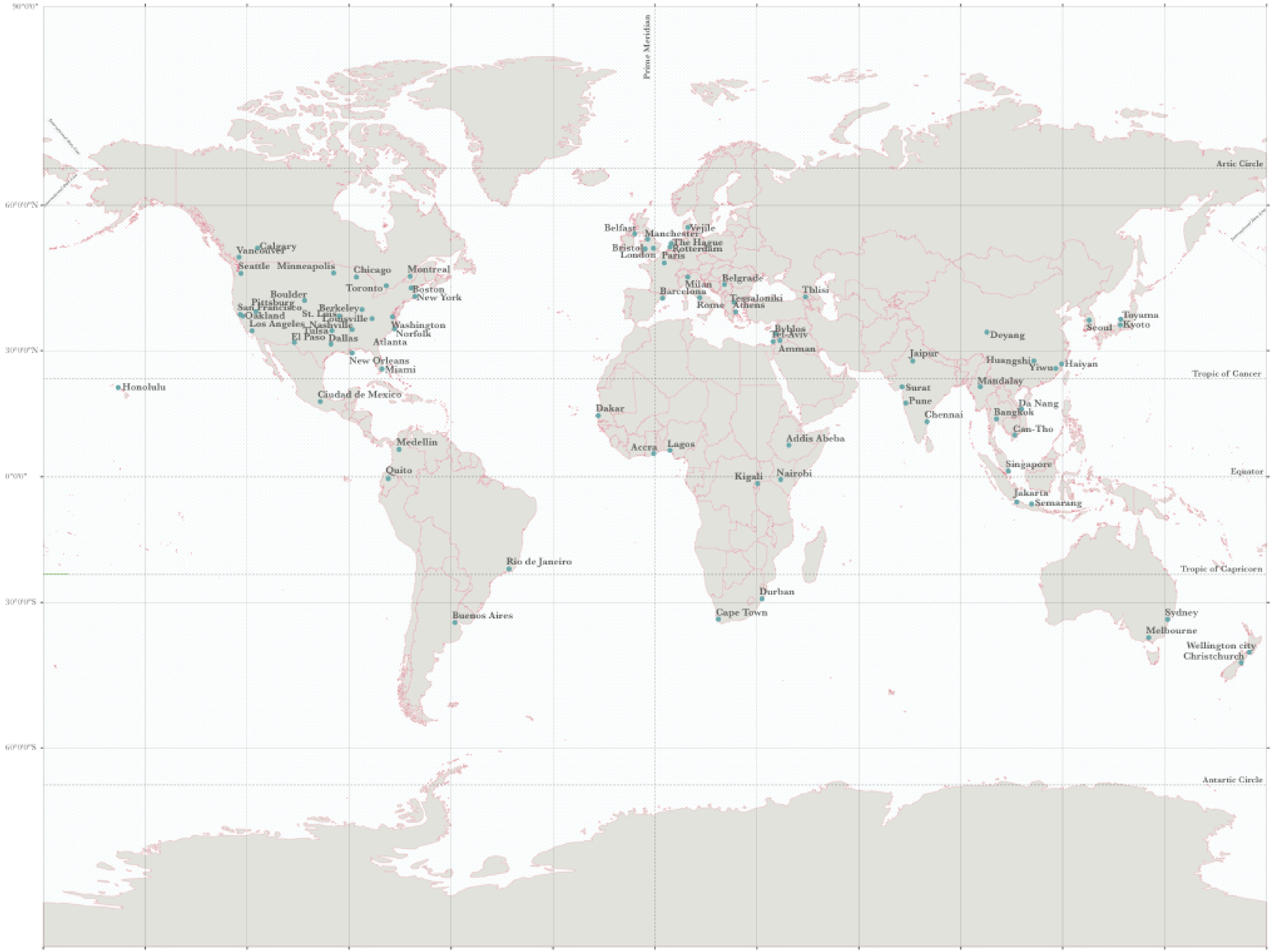
CAPE TOWN, SOUTH AFRICA



Contries

100 Resilient Cities NETWORK

01
Africa
Accra, Addis Ababa, Cape Town, Dakar, Durban, Lagos, Kigali, Nairobi, Luxor

02
Central East Asia
Deyang, Haiyan,Huangshi, Yiwu

03
East Southeast Asia & Oceania
Bangkok, Jakarta, Melbourne, Seoul, Singapore, Sydney, Can Tho, Christchurch, Da Nang, Kyoto, Mandalay, Semarang, Toyama, Wellington City

04
Europe
Athens, Barcelona, London, Milan, Paris, Rome, Rotterdam, Belfast, Belgrade, Bristol, Glasgow, Manchester, Lisbon, The Hague, Thessaloniki, Vejile

05
Latin America
Buenos Aires, Ciudad de México, Medellín, Quito, Rio de Janeiro, Salvador, Cali, Colima,Guadalajara, Juarez, Montevideo, Panama City, Porto Alegre, San Juan, Santa Fe, Santiago de los Caballeros

06
North America
Boston, Chicago, Los Angeles,Montréal, New Orleans, New York, San Francisco, Seattle, Toronto, Vancouver, Washington, Atlanta, Berkeley, Boulder, Calgary, Dallas, El Paso, Miami Honolulu, Louisville, Minneapolis, Nashville, Norfolk, Oakland, Pittsburgh, St. Louis, Tulsa

07
South and West Asia
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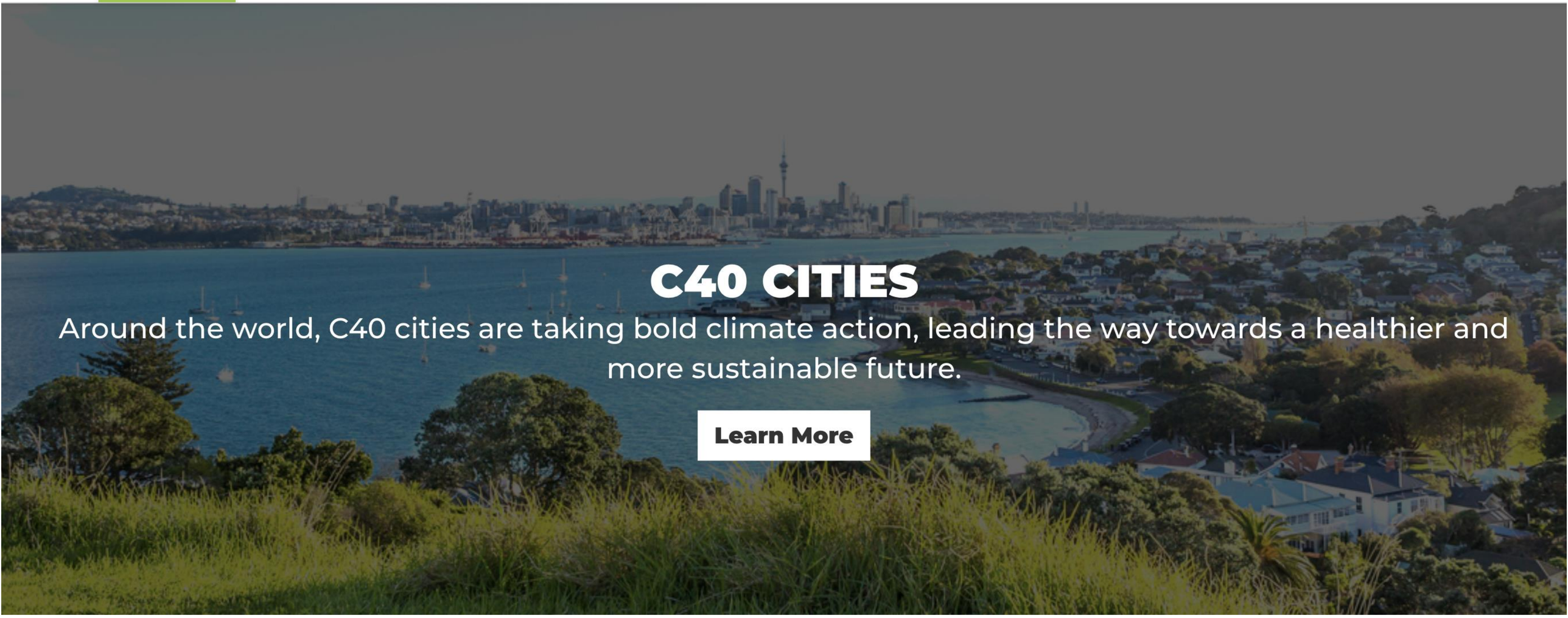

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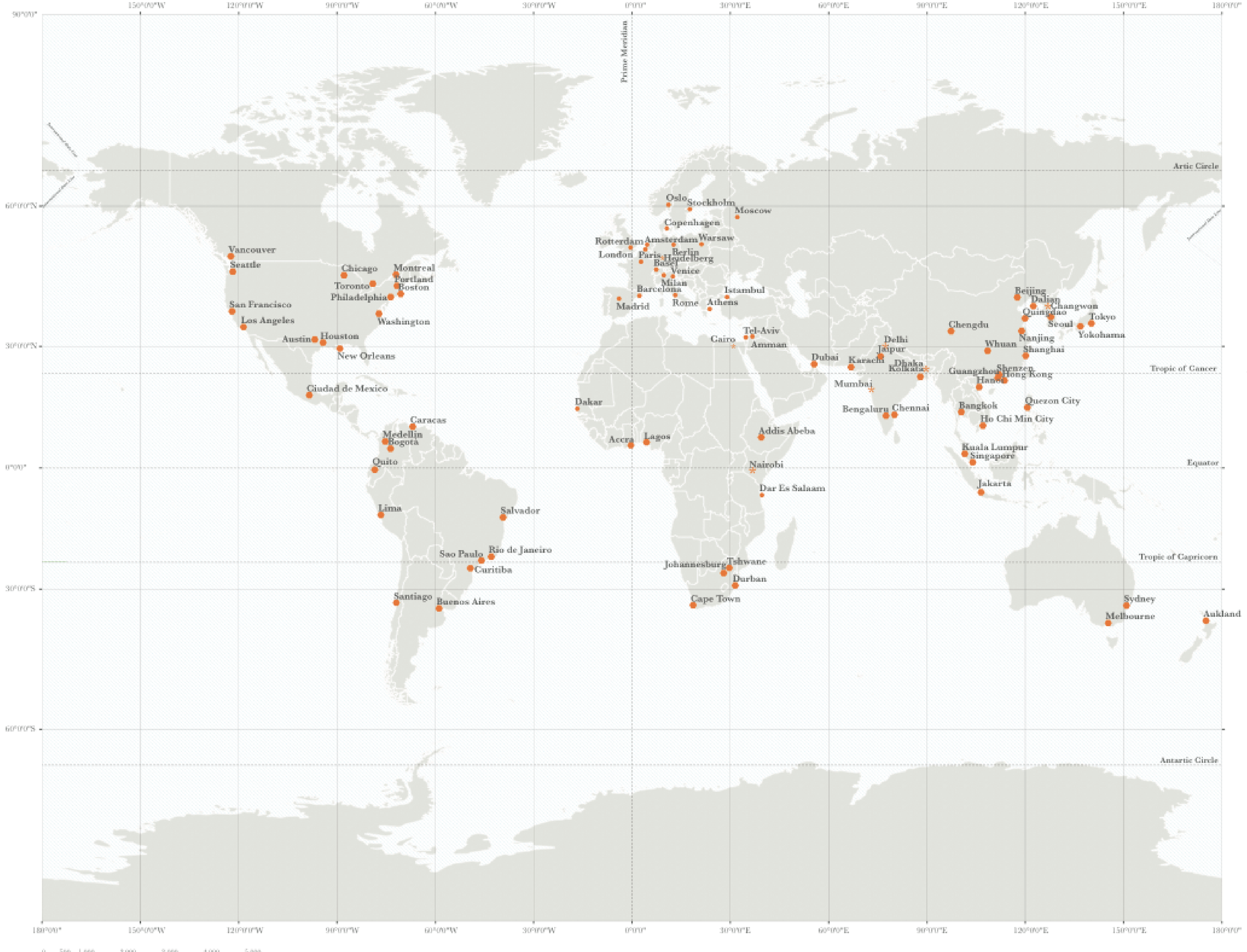

Contries

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.01 Africa
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.03 East, Southeast Asia & Oceania
Auckland, Bangkok, Hanoi, Ho Chi Minh City, Jakarta, Kuala Lumpur, Melbourne, Quezon City, Seoul, Singapore, Sydney, Tokyo, Yokohama

.04 Europe
Amsterdam, Athens, Barcelona, Basel, Berlin, Copenhagen, Istanbul, London, Madrid, Milan, Moscow, Oslo, Paris, Rome, Rotterdam, Stockholm, Tel Aviv, Venice, Warsaw

.05 Latin America
Bogotá, Buenos Aires, Caracas, Ciudad de México, Curitiba, Lima, Medellin, Quito, Rio de Janeiro, Salvador, Santiago, São Paulo

.06 North America
Austin, Boston, Chicago, Houston, Los Angeles, Montréal, New Orleans, New York, Philadelphia, Portland, San Francisco, Seattle, Toronto, Vancouver, Washington

.07 South & West Asia
Amman, Bengaluru, Chennai, Dubai, Jaipur, Karachi, Kolkata

C40 Temporarly Inactive Cities
Cairo, Changwon, Dehli, Dhaka, Heidelberg, Mumbai, Nairobi

Cities are the first cause of climate change

Cities occupy **3%** of Earth’s surface,
but account for more than the **70%**
of energy consumption and produce **75%**
of **CO_2** emissions.

source: C40 Cities

Cities are the first victims of climate change

70% of cities today suffer the effects of climate change.

Given that more than the **25%** of the urban population live in coastal areas**, a large number of cities are exposed to the risks of flooding, sea level rise and storms**.

source: C40 Cities; the Lancet

Cities can be the first resource for reversing climate change

Cities are our future.
We believe that the improvement of the future global condition lies in **urban innovation** and **action**.

Cities have skills, abilities, and can reverse climate change through **urban planning, urban forestry** and **environmental sustainability policies**.

source: C40 Cities

3

EVOLUTION IN THE KNOWLEDGE

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MATT SIMON SCIENCE 09.13.18 01:30 PM

EMISSIONS HAVE ALREADY PEAKED IN 27 CITIES—AND KEEP FALLING

MATT MAWSON/GETTY IMAGES

NOTHING AGAINST THE countryside, which is lovely, but cities are where things *happen*. They are magnets for trade, and they're where cultures meet. They're also where more than half the world's population lives, a

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Climate change means Hurricane Florence will dump 50% more rain

Scientific study finds diameter of storm heading for US east coast will be 50 miles wider due to human-caused warming of planet

A handout photo made available by European Space Agency (ESA) shows Hurricane Florence seen from the International Space Station (ISS), in space, on Wednesday. Photograph: Alexander Gerst/ESA/Nasa Handout/EPA

Oliver Milman

News

World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100

03.15.18

The National Forests Of The Future Need To Be In Cities

Green spaces in cities are saving us billions of dollars. We need to do more to protect and expand them.

[Source Photos: Daniel H. Tong/Unsplash, Dan Otis/Unsplash]

BY MARK WILSON 2 MINUTE READ

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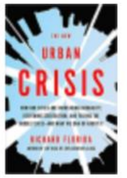
THE RECOMMENDER



The New Urban Crisis
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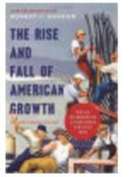

The Rise and Fall of American Growth
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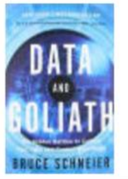

4

EVOLUTION IN TECHNOLOGY

Repubblica TV

2011

EXIT

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FLYING

GARDNERS

POLICLINICO GENERAL HOSPITAL

Milan, Italy

7,000 sqm
Green roof

100
Trees and shrubs

ORTI DEL POLICLINICO
area dedicata alla coltivazione di piante officinali

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le piante fioriscono durante diverse ore del giorno: un orologio naturale

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boschi di

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AREA GIOCO
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INGRESSO BLOCCO SUD

ARBUSTI
ricoprono le aree inaccessibili

Camellia Sinensis

Elicriso

Paeonia officinalis

Belladonna

Piper nigrum

Camomilla

Melissa

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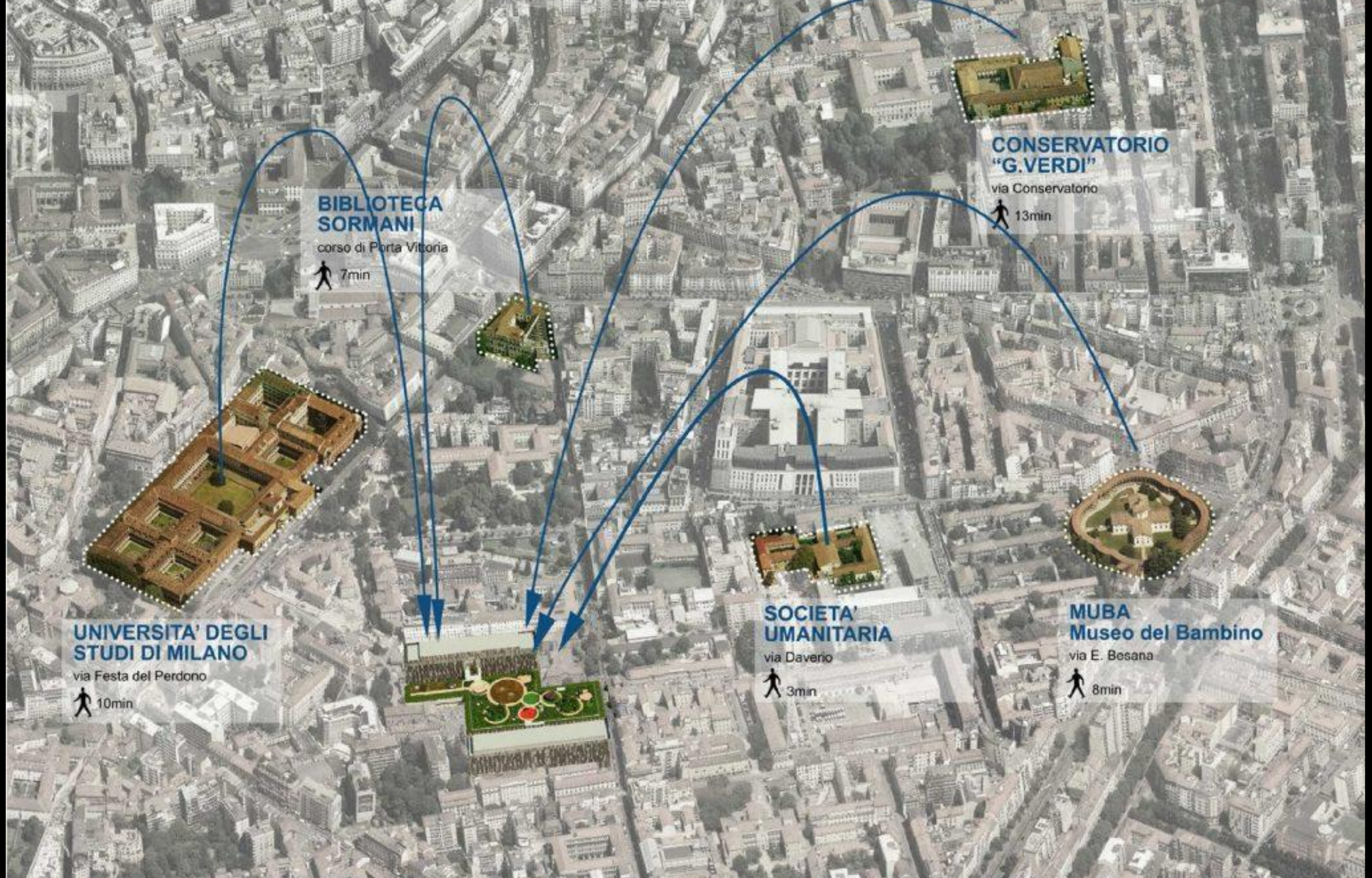
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ENTI COINVOLTI NELLA GESTIONE DEI VARI SETTORI DI CUI SI COMPONE IL GIARDINO:
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MILANO SPORT
attività sportive e riabilitative

CONSERVATORIO "G.VERDI"
spettacoli ed eventi

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THE EVOLUTION IN THE RELATION CITY NATURE

URBAN AND PERI-URBAN FORESTRY

Benefits, typologies and approaches

What is the urban and peri-urban forestry?

It is the practice of managing metropolitan forests, to ensure their optimal contribution to the physiological, sociological and economic well-being of urban societies.

source: FAO - Guidelines on urban and peri-urban forestry

What is the urban and peri-urban forestry?

It is an integrated, interdisciplinary, participatory and strategic approach to the planning and management of forests and trees in cities and surrounding areas.

source: FAO - Guidelines on urban and peri-urban forestry

What is the urban and peri-urban forestry?

It includes the assessment, planning, installation, maintenance, conservation and monitoring of urban forests and can operate on scales ranging from individual trees to landscapes.

source: FAO - Guidelines on urban and peri-urban forestry

What is the urban and peri-urban forestry?

It emphasises the commitment of citizens (also educating them on the value and benefits of trees and forests) in the care of the growth and life of plants, whether they are public or private.

source: FAO - Guidelines on urban and peri-urban forestry

What are the benefits of urban forestry?

What are the benefits of urban forestry?

- Reduces the “heat island” effect.
- Removes air pollutants and reduces noise pollution.
- Absorbs CO_2 and mitigates climate change.
- Reduces energy consumption through shadowing and the creation of a microclimate (evapotranspiration).
- Reduces water run-off and flooding risks.
- Increases biodiversity and permeable surfaces within cities.
- Promotes the creation of new green jobs.
- Improves mental and physical health of citizens.

ENVIRONMENTAL AND HEALTH BENEFITS

1 mature tree

- absorbs **0,4 ton CO_2/year**.
- **produces enough oxygen to cover the annual need of 10 persons.**
- **can transpire up to 450 litres of water per day.**

Woods and forests

- **contribute to decrease temperature from 2°C to 5°C.**

Source: Assoflora Lombarda 2017

ECONOMIC AND SOCIAL BENEFITS

Trees

- generate **economically valuable ecosystem services**.
- **provide an economic benefit of 4,7€ for every euro invested in planting and maintaining.**
- **by using trees to modify temperatures, the amount of fossil fuels used for cooling and heating by homeowners and businesses is reduced.**
  1 street tree provides 100€/year in energy savings.
- **a significant link exists between the value of a property and its proximity to parks, greenbelts, and other green spaces.**
  1 street tree provides 200€/year in increased property values.
- **tree canopy is associated with a decrease in neighbourhood crime.**

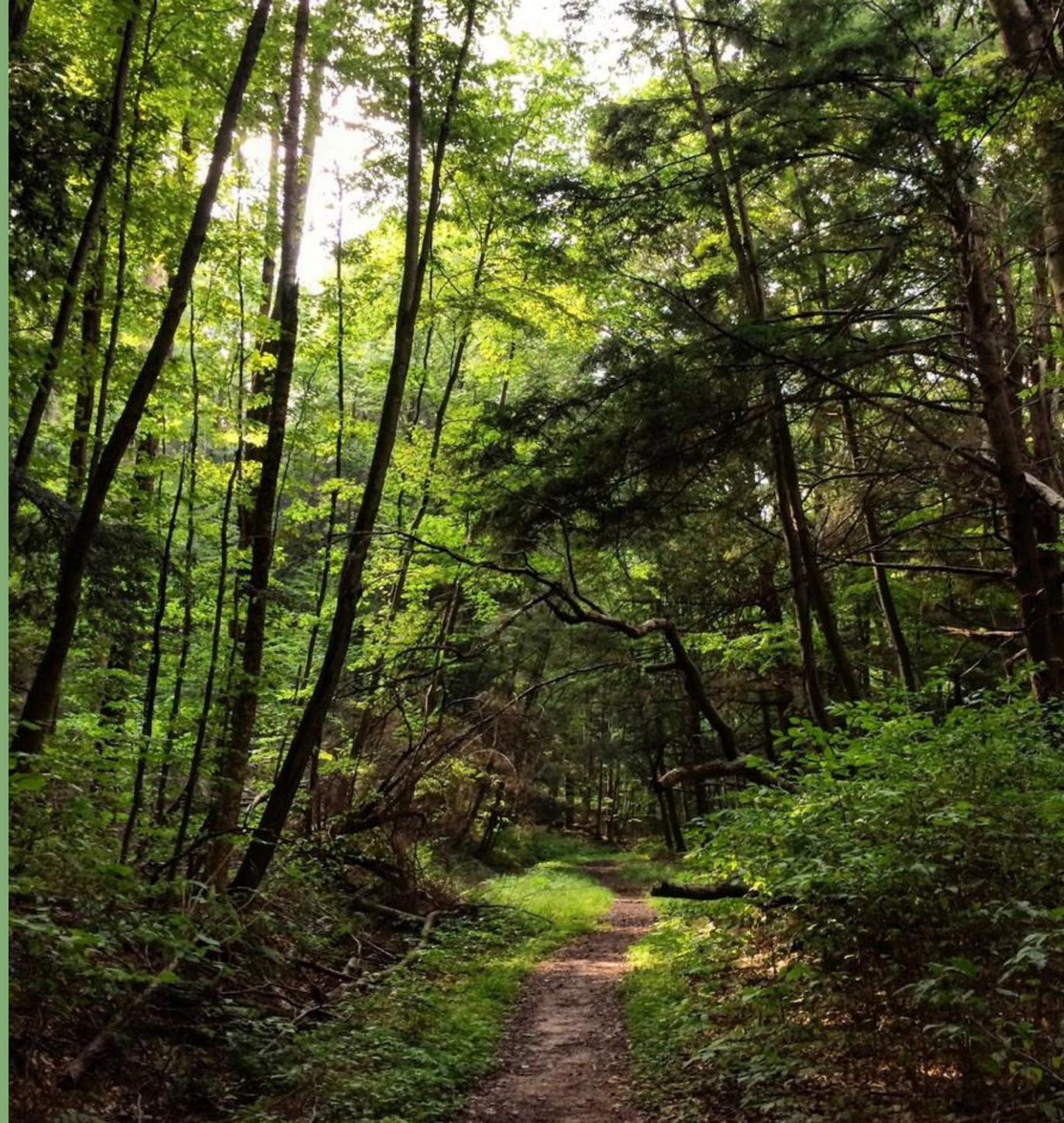
Source: MillionTreesNYC

Which are the forestry typologies?

- peri-urban forests and woods
- city parks and forests (> 0,5ha)
- small parks (< 0,5 ha)
- tree-lined avenues and small squares
- other green spaces with trees
- green buildings

Peri-urban forests and woods

- riparian forests
- wooden shielding
- agricultural/urban renaturalisation
- productive forests
- oasis



City Parks and forests (> 0,5 ha)

- big urban parks
- district parks partially equipped with leisure and recreation facilities

Small parks
(< 0,5 ha)

- small district parks with equipped areas
- private gardens
- green spaces

Tree-lined avenues and small squares

- rows of linear trees
- small groups of trees
- single trees in squares
- trees in parking areas

Other green spaces with trees

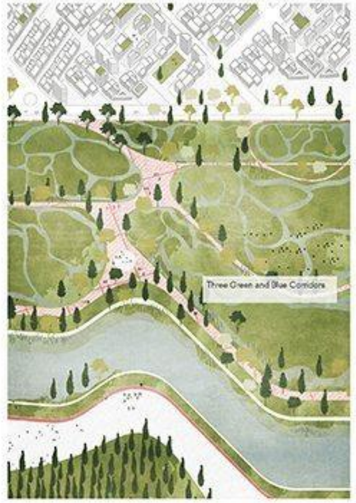
- urban farmland
- sports grounds
- empty areas
- lawns
- riparian areas
- open spaces
- cemeteries
- botanical gardens

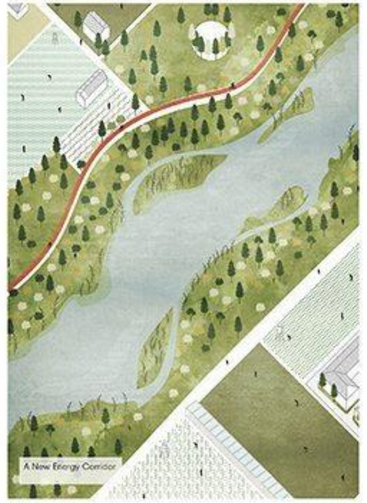
Green Buildings

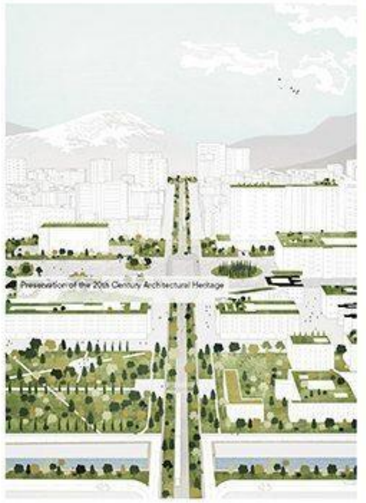
- vertical forests
- green roofs
- green façades

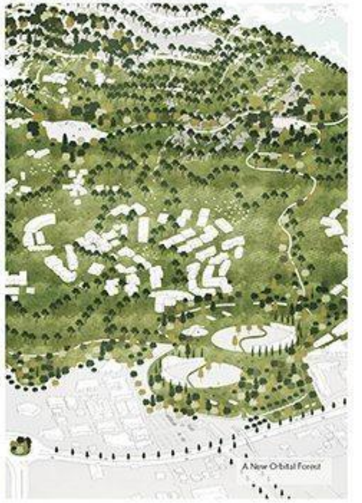
TR030

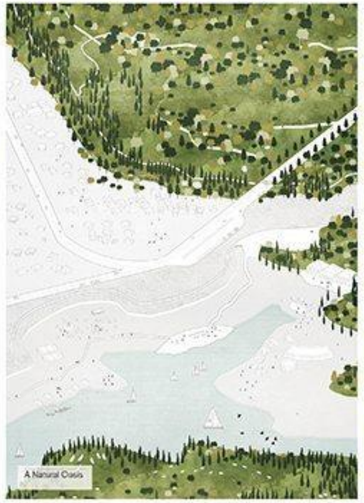
A kaleidoscopic metropolis

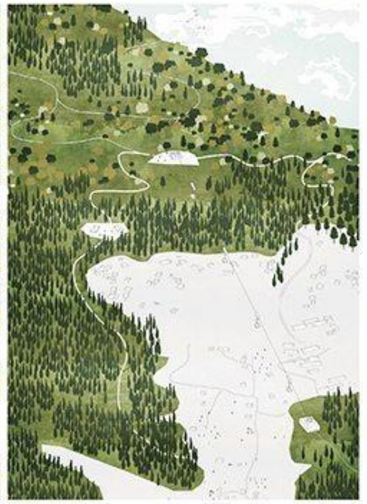


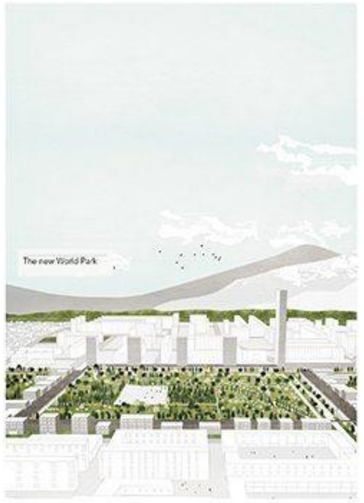












TR030

TR030 ATLAS

1. A New Orbital Forest
2. A Natural Oasis
3. The New 4th Ring
4. The New World Park
5. Three Green and Blue Corridors
6. 15 New Dynamic Epycentres
7. A New and Open Schools Diffuse Network
8. Preservation of the 2th Century Architectural Heritage
9. A New Agricultural System and a Diffuse Farmer' Market Network
10. High Quality Transit
11. Cycle Network and Diffuse Sharing Mobility
12. Tirana for All
13. A New Energy Corridor

Northern Gate
Northern Landmark Tower
Office Building
District-1
Western Gate 2
District-1 Service Hub
Green River Park
Western Gate
Lake
District-4 Service Hub
District-4
Villas Zone Gate
Villas
District-2
District-2 Service Hub
Eastern Gate
District-3
Mosque
Eastern Landmark Towers
Commercial Zone
Southern Gate

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Urban Forestry.

a call for action

In preparation of the first World Forum on Urban Forests promoted by FAO (Food and Agriculture Organization), which will be held from 28 November 2018 to 1 December 2018 in Mantova, Italy.

we, designers of the first Vertical Forest in Milan, invite

architects, urban planners, botanists, agronomists, forestry corps, tree growers, geographers, ethologists, landscape scientists, technicians, researchers and experts in green care and urban forestry, real estate developers, administrators and representatives of local institutions and civil society, members and representatives of international organisations, funding agencies, universities and research institutes, and NGOs

to consider that:

- by 2030, **60%** of the **global population** is projected to live in **urban areas**.
- cities consume **75%** of the world's **natural resources** and account for more than **70%** of **global CO_2 emissions**.
- cumulative **emissions** of **CO_2**, together with methane and other greenhouse gases, largely determine **global mean surface warming of the planet**, causing ice melting, biodiversity loss and rising sea levels.

and to consider also that:

- **forests and trees** – which are at risk of continuous erosion all over the world – **absorb** nearly **40%** of **fossil fuel emissions** largely produced by our cities every year.
- **leaves and roots** of a mature tree **absorb CO_2** through photosynthesis and help reduce the pollutants (responsible for a high percentage of respiratory diseases and premature deaths) present in the air.
- if a **single tree** can bring great benefits to the city and its inhabitants, an **urban forest** can be an extraordinary help to **improve the quality** of health and life in a city.

we believe that:

- **cities**, which are largely **responsible** for **climate change problems**, have the opportunity to become an **integral part of their own solution**, by increasing the number of **forests and trees** that can "fight the enemy" on its own ground (the city), using **CO_2 as fertiliser**.
- increasing **forests and trees** in world's cities can help absorb **CO_2**, drastically **reduce pollution**, **energy consumption** and the "**urban heat island**" effect, increasing biodiversity of living species and making cities safer, more pleasant, healthier and attractive.
- **a global action on urban forestry** will help to prevent global temperature from rising **above 2 °C**, the maximum acceptable treeshold defined by the COP 21 agreement in Paris (2015).

therefore:

we have the duty to launch a **global campaign on urban forestry** in order to **multiply the presence of forests and trees in our cities**.
Such a campaign should start with these major **actions**:

- protect and increase **permeable and green surfaces** in the city,
- create **new parks** and **gardens**,
- transform **city roofs** into **lawns** and **vegetable gardens**,
- transform **perimeter walls** and **urban barriers** into **green facades**,
- transform **urban voids** and **courtyards** into **green oasis**,
- promote **community gardens** and implement **urban agriculture**,
- use **tree roots** to decontaminate **polluted soils**,
- create a **network of green corridors** (tree-lined avenues, street trees…) to connect **parks**, **forests**, and **green buildings**,
- multiply the number of **green buildings** and **Vertical Forests**,
- create **new orbital forests** and **woodlands** all around our cities.

thus:

if we want to **reverse climate change**,

if we want to **favour the survival** of living species,

if we want our **cities** to be **greener**, **healthier and more pleasant places**, **urban forestry** should be a **priority** in the international agenda of governments and local and international institutions.

The next months will be crucial to pledge your support, and collect your experiences and urban forestry projects, in preparation for the first World Forum on Urban Forests, promoted by FAO (Food and Agriculture Organization) with Municipality of Mantova, SISEF (Società Italiana di Selvicoltura ed Ecologia Forestale), Politecnico di Milano, which will be held from 28 November 2018 to 1 December 2018 in Mantova, Italy.

join us. it's time to act.

share this call, suggestions and best practices with us at:

bestpractice@wfuf2018.com and urbanforestry@stefanoboeriarchitetti.net

for more info:
www.wfuf2018.com

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WE
Designers of the first Vertical Forest in Milan

World Forum on Urban Forests

Mantova 2018

28 November / 1 December

THANK YOU!

MARIA CHIARA PASTORE
Stefano Boeri Architetti

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