

Positive energy districts in the context of climate-neutral cities

Driving Urban Transitions for a regenerative and livable future

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Climate change: Make coal history says PM after climate warning



Science

Climate change: Big increase in weather disasters over the past five decades

By Matt McGrath
Environment correspondent
1 day ago | Comments

Joe Biden
'Climate crisis is here' says Biden in week of storms, floods and wildfires

The president warned that 'we need to act now' as trail of destruction blighted west, south and north-east

- Environment -

Biodiversity decline will require millions of years to recover

By Alex Reis - 24.05.2021

CNN health

More than 230 journals warn 1.5°C of global warming could be 'catastrophic' for health

By Angela Dewan, CNN

Updated 0010 GMT (0810 HKT) September 6, 2021

Madagascar on the brink of climate change-induced famine

By Andrew Harding
Africa correspondent, BBC News
25 August

cnn politics

THE POINT
WITH CHRIS CILLIZZA



Is this *finally* the moment we wake up to the climate crisis?

Analysis by Chris Cillizza, CNN Editor-at-large
Updated 2014 GMT (0414 HKT) September 2,

INDEPENDENT PREMIUM

Human-driven biodiversity loss faster than mass extinction when dinosaurs were wiped out, study finds

The pace and extent of humanity's destruction of life on our planet is 'unprecedented' even in comparison to previous mass extinctions, reports Harry Cockburn

Climate crisis
Humans 'pushing Earth close to tipping point', say most in G20

Global survey finds 74% also want climate crises and protecting nature prioritised over jobs and profit

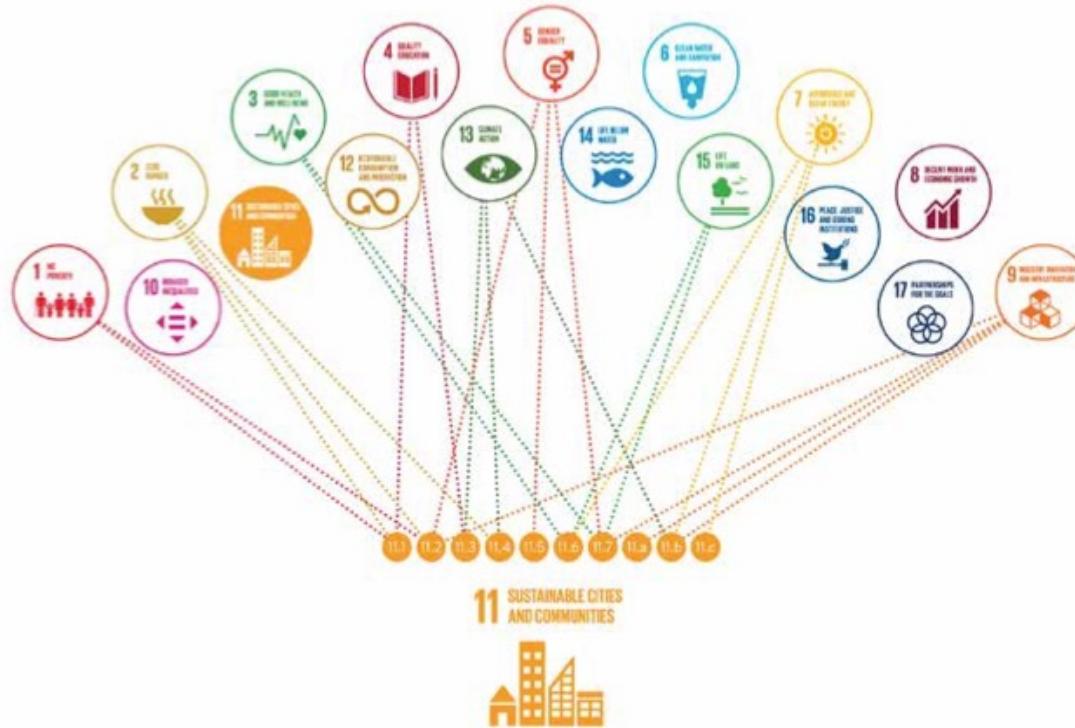
Jonathan Watts

@jonathanwatts
Mon 16 Aug 2021 23.01 BST

“If we want to have a chance of achieving the SDGs, we need to get our cities right.”

Maimunah Mohd Sharif, Executive Director of UN-Habitat
World Urban Forum #9, Kuala Lumpur in February 2018

SDG 11 as the entry point to UN's Agenda 2030



Strategic urbanism and urban policy context

Global



European



New European Bauhaus



Member States

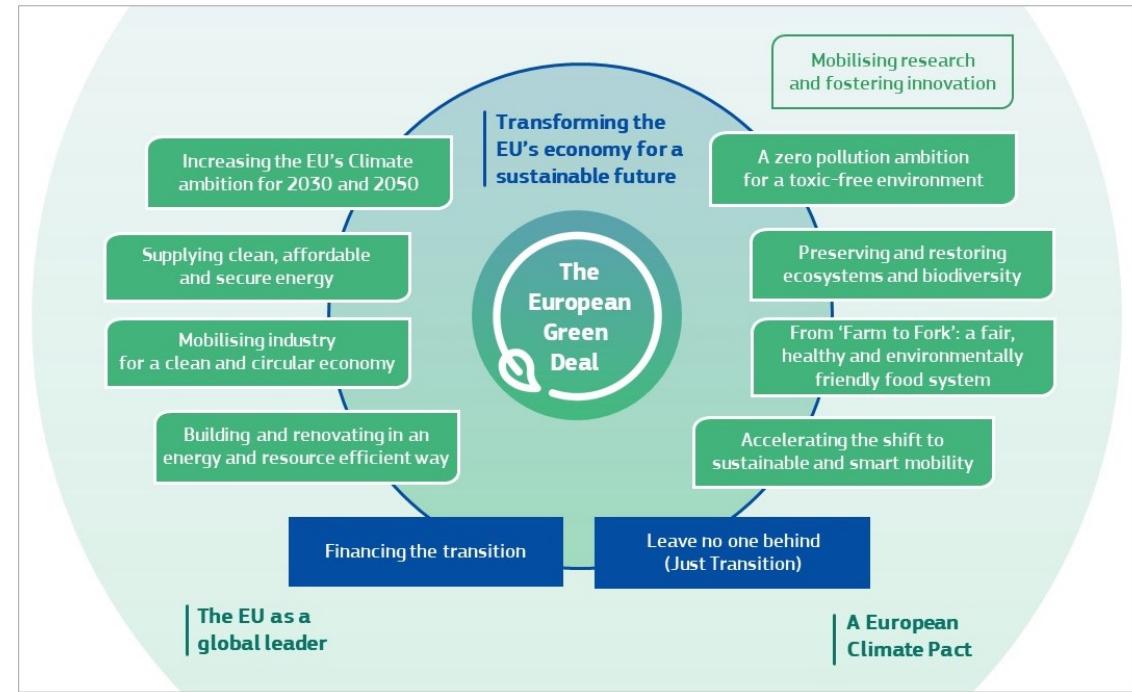




The European Green Deal: Striving to be the first climate-neutral continent by 2050

A high level policy framework to overcome challenges of our time, ensuring:

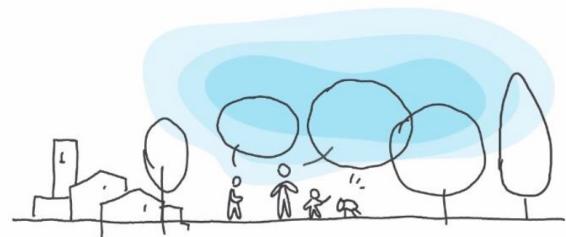
- no net emissions of greenhouse gases by 2050
- economic growth decoupled from resource use
- no person and no place left behind



The New European Bauhaus

... a creative and interdisciplinary initiative that wants to shape beautiful, sustainable and inclusive living spaces

... a project situated at the crossroads between art, culture, social inclusion, science and technology that brings a cultural dimension to the Green Deal and wants to accelerate the transition of the built environment



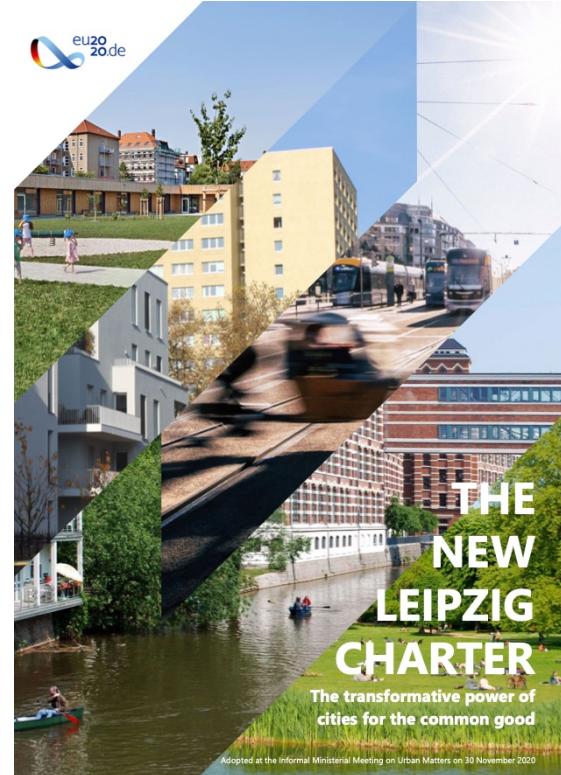
New European Bauhaus

The New Leipzig Charter

... includes the principles of modern urban development policy

... addresses the transformative power of cities and urban regions as key for tackling the challenges of our time by laying out the

... sets out the foundations for good governance for transformative urban development towards sustainable, resilient and crisis-proof futures



Global / European Agendas



spirit of urgency, common framework for action, critical mass, mobilise actors

local actions, testing solutions against different urban situations, good practice

Arenas for local experimentation and innovation



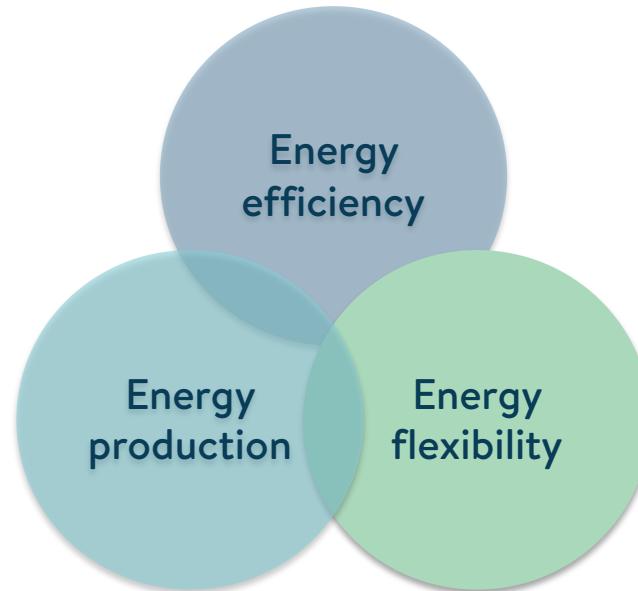
A framework for PEDs



“Positive Energy Districts are energy-efficient and energy-flexible urban areas or groups of connected buildings which produce net zero greenhouse gas emissions and actively manage an annual local or regional surplus production of renewable energy.”

A framework for PEDs

PEDs require integration of different systems and infrastructures and interaction between buildings, the users and the regional energy, mobility and ICT systems, while securing the energy supply and a good life for all in line with social, economic and environmental sustainability.



Sustainability

Inclusiveness & affordability

Resilience and security of energy supply

Quality of life

PED typology

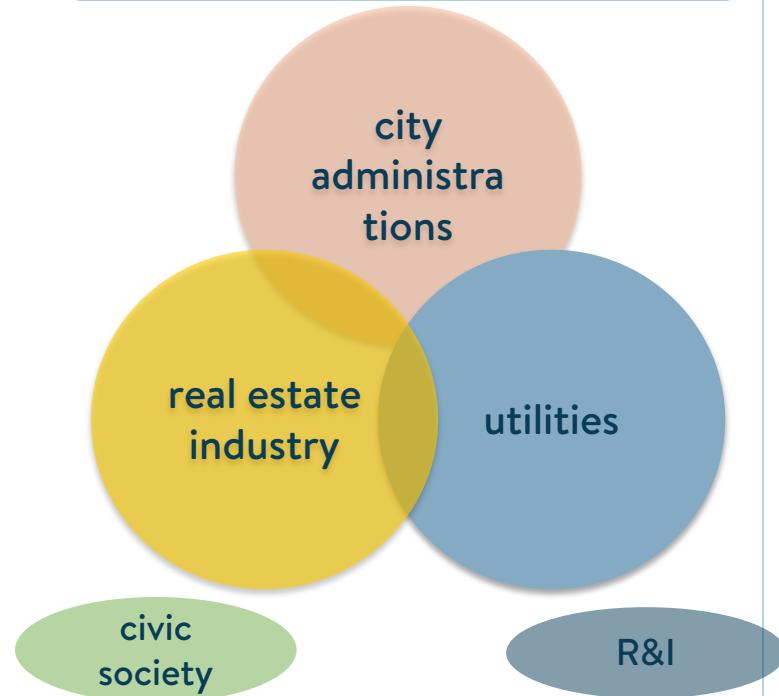
Different types of PEDs can be defined by their system boundaries:

- **Geographical boundary:** Spatial-physical limits of the PED (project area)
 - **Functional boundary:** Limits of the PED in terms of energy grids (integration in regional/national renewable energy grid)
 - **Virtual boundary:** Limits of the PED in terms of contractual boundaries
- Most PEDs will hardly achieve a positive energy balance within their geographical boundaries and thus be “autonomous”.
- Integration of mobility and grey energy into PED balancing requires a functional perspective on PED system boundaries.
- Mainstreaming PEDs requires therefore smart integration of PEDs into regional and national energy grids. This requires national strategies for PED development.

Key challenges

- Financing and business models: LCA approach, public-private partnership
- Transforming existing neighbourhoods: urban retrofitting, building heritage, complex ownership structures
- Governance: decentralization strategies and community-based development (energy communities)
- Data management and ICT
- Regulatory barriers, esp. regarding energy flexibility and construction

European and national framework





The PED Programme

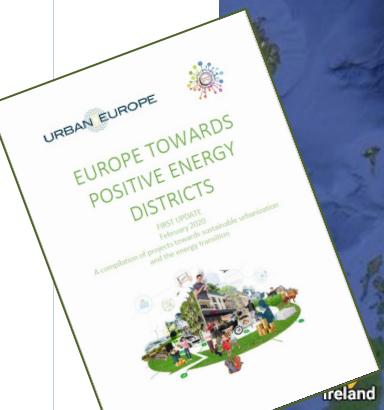
Mission: 100 Positive Energy Districts in Europe by 2025
synergistically connected to the energy system in Europe

Liveable, sustainable, inclusive urban neighbourhoods
PEDs as part of urban strategies towards
climate-neutral cities

a joint initiative of SET Plan Action 3.2 and JPI Urban Europe



A growing European PED community



PED Programme Mission: 100 PEDs by 2025

- PED Booklet: mapping of European projects
- rising awareness, diversity of local strategies
- lack of common operational framework and joint indicators for PEDs
 - with flexibility for different local and national contexts
 - integrating PEDs into national energy systems

PED Pilot Call Projects – Setting the scene

TRANS-PED

Goal:

To develop a novel governance approach that can be adopted by PED stakeholders to realise deep and holistic changes to cities.

PED-ID

Goal:

Set foundations for accelerated and improved decisions for Positive-Energy-Districts

Cities4PEDs

Goals:

- understanding how legal instruments and planning processes need to be adapted
- investigating solutions for the missing administrative existence of the district level

INTERACT

Goal:

Set up a competence network of successful PED approaches and enable the focus regions to introduce the Local Energy Communities and Sector Coupling based on a holistic approach.

PED Roadmap – identified needs for action

Preparing the energy system for PEDs

Strategies for PED energy functions (efficiency, flexibility and production)

Urban resilience and robustness / Security of energy supply

Life cycle analysis (LCA) principles and approaches and strategies for CO₂ balancing

Sector integration strategies

Integrated (urban) planning

Holistic concept, consideration of systems perspective in all planning phases

Climate change adaptation, urban revitalisation

Definition of system boundaries

Governance/PEDs for people

Policy frameworks on different political levels

Tackling affordability of housing and fighting energy poverty

Stakeholder-oriented strategies and process innovation

Citizen participation and communication strategies

Preparing mainstreaming and replication

Regulatory framework

Business cases and financing models

Standardization, certification and monitoring

Components for PEDs in different contexts (size, climate, RES available, etc.)

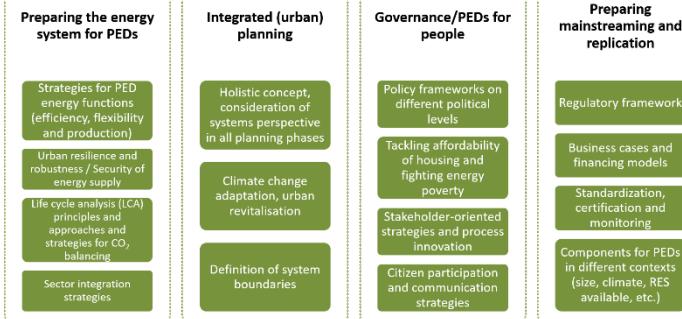
Integrated approaches for urban transformations: PED links to other DUT transition pathways

The 15-minutes City



- Integration of energy and mobility planning
- Sector coupling
- E-mobility
- Shared mobility
- Reduction of traffic volume & mixed urban neighbourhoods

Positive Energy Districts



Circular Urban Regenerative Economies



- Sector coupling
- Greening strategies and NBS
- Circularity, material flows, resource efficiency
- Economic impact of PEDs

“The start-up phase of New Urban Agenda and SDG implementation has been quite slow. The pace needs to accelerate rapidly in the Decade of Action to achieve the SDGs. “

World Cities Report 2020: The Value of Sustainable Urbanization. p. V.

Learnings and conclusions: From JPI Urban Europe to Driving Urban Transitions



Why Urban Living Labs and co-creative processes...

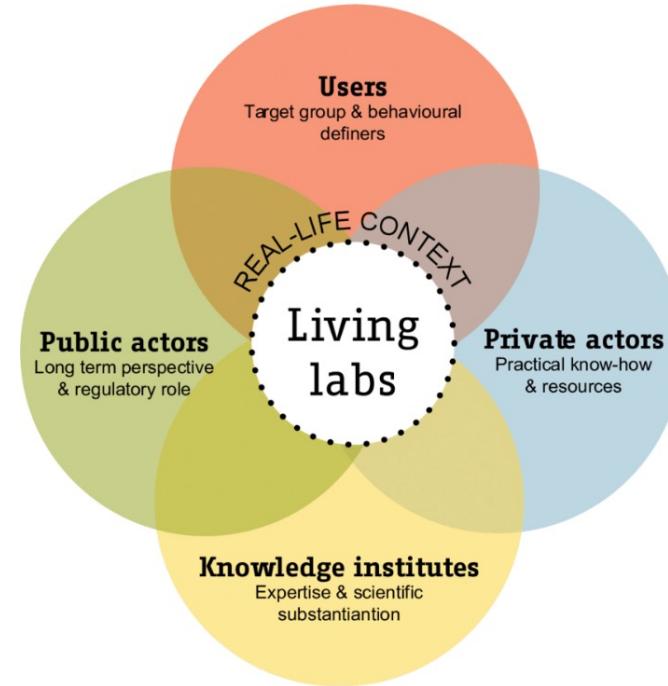
- Transition processes require appropriate policy frameworks
- Linear research and innovation models to tackle societal challenges is inadequate
- Urban living labs provide the frameworks for co-creation with science-policy-business-society
- Urban experimentation is the key practise to work with urban complexities



PlaceCity Project – Floridsdorf, Vienna

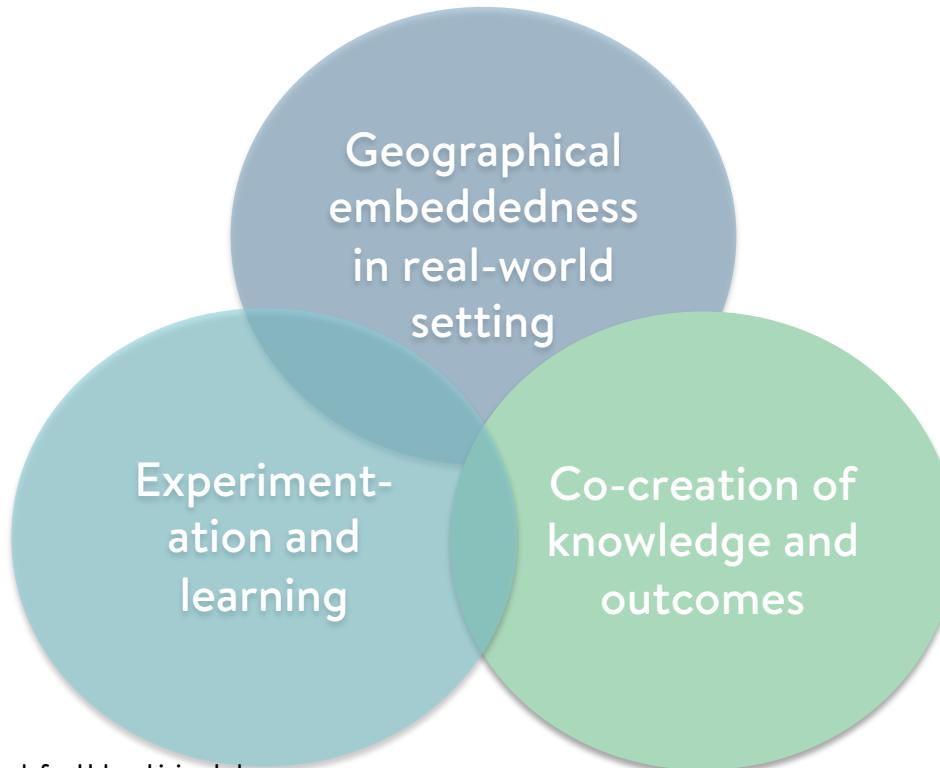
Urban Living Labs in JPI Urban Europe projects

- About half of JPI Urban Europe's projects implement urban living labs; **183** urban living labs implemented
- Address a broad range of issues including:
 - urban governance
 - water management
 - e-participation
 - public space design
 - mobility management
 - inter-ethnic co-existence
 - stakeholder involvement
 - urban food production etc.



Steen, K.; van Bueren, E. (2017) Urban Living Labs: A Living Lab Way of Working

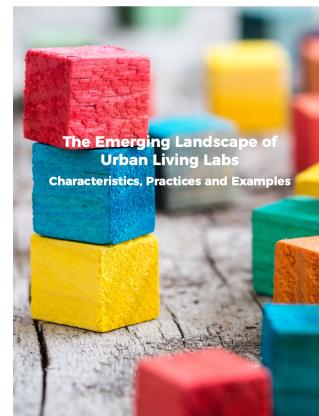
Key Characteristics of Urban Living Labs



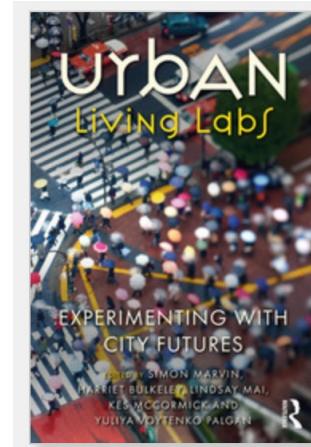
Further reading on urban living labs



<https://tinyurl.com/ULLkit>



<https://tinyurl.com/GUSTHandB>



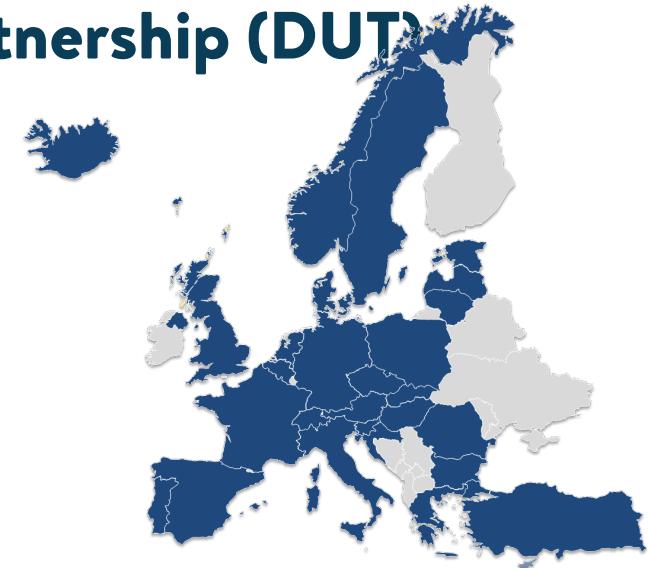
Marvin, S. (2018) *Urban Living Labs: Experimenting with City Futures*

<https://smarterlabs.uni-graz.at/en/>

Keynote by “Timo von Wirth: Urban Living Labs - Learning for Urban Transitions?” (Youtube)

The Driving Urban Transition Partnership (DUTP)

The DUT Partnership steps up the game to tackle urban challenges. We enable local authorities and municipalities, business and citizens to make global strategies into local action. We develop the skills and tools to make urban change happen and boost the urgently needed urban transformations.



by

- ... jointly investing in challenge-driven R&I on critical issues hindering the exploitation of new solutions, approaches and technologies
- ... fostering co-design of urban transition pathways and implementation strategies
- ... making knowledge and evidence available for mainstreaming and replication

DUT's Transition Pathways



**Positive Energy Districts
and Neighbourhoods**
transforming the urban energy
system

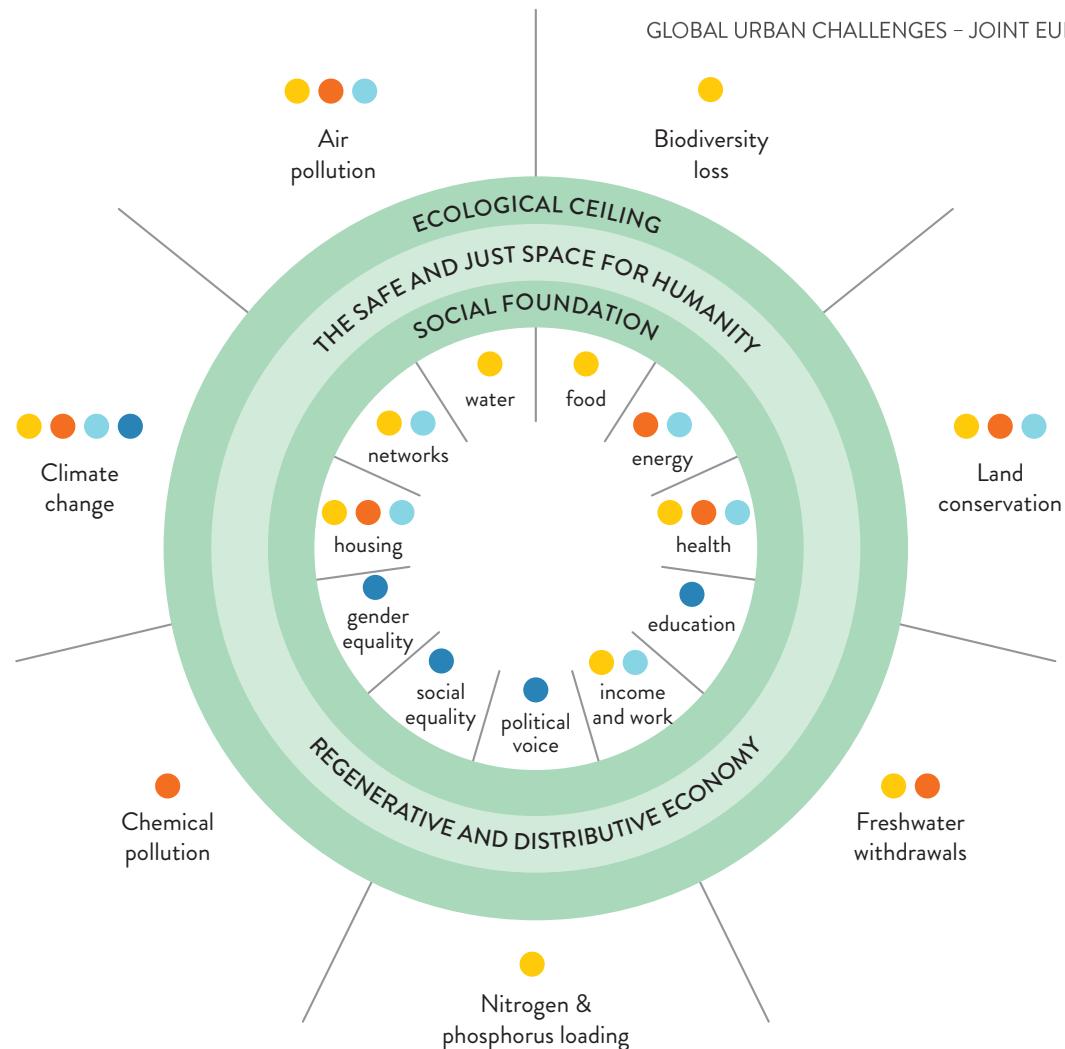


**Circular Urban
Regenerative Economies**
an integrated approach for urban
greening and circularity
transitions



**The 15 Minutes
Cities**
rethinking the urban
mobility system and space

DUT to transform towards principles of Doughnut Economics



Conclusions:

It is not only about the WHAT but about the HOW!

- Challenge driven, mission oriented R&I are essential to reach strategic sustainability goals
- Local context matters!
- Integrated urban approaches are key to build capacities to transform urban areas
- Positive Energy Districts are a concrete instrument towards climate neutrality
- A common understanding of Positive Energy Districts including a strong contribution from circular economy and regenerative studies is yet to be developed.

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