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# The COST Action CA17133 Circular City

**Nataša Atanasova and Günter Langergraber**

Thursday, 7 May 2020

Session GI1.2 - COST Actions in geosciences: breakthrough ideas,  
research activities and results  
EGU 2020, Vienna, Austria





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# COST Action Circular City

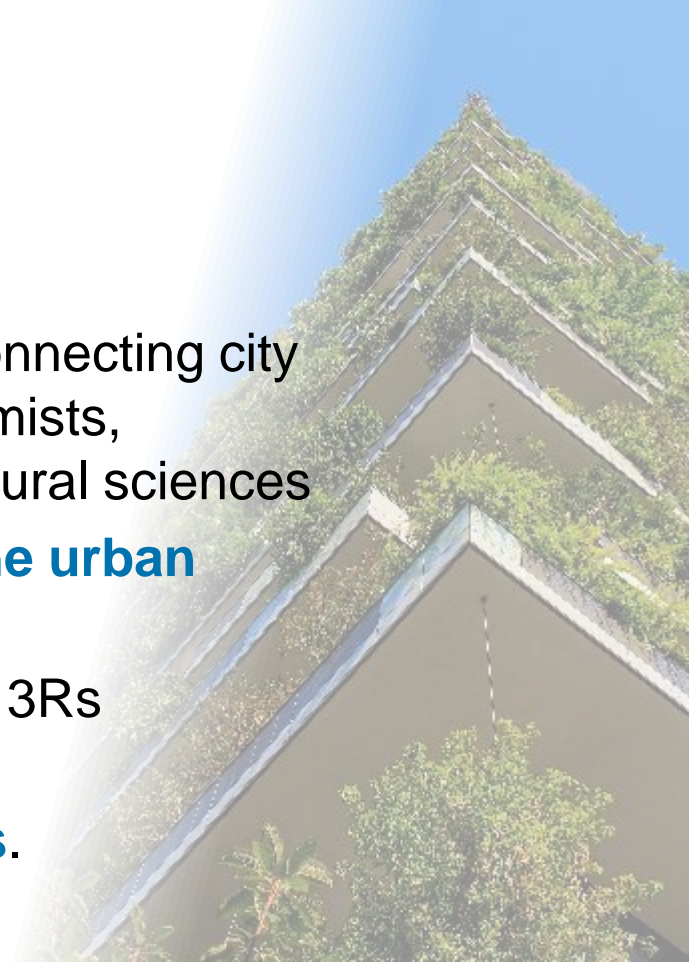
## Duration

22 Oct 2018 – 21 Oct 2022

## The main aim and objective

is to build an **interdisciplinary platform** for connecting city planners, architects, system designers, economists, engineers and researchers from social and natural sciences

- that **develop nature based solutions in the urban landscape** that
- facilitate **circular economies** based on the 3Rs (Reduce, Reuse and Recover) and
- allow cities to **cope with future challenges**.





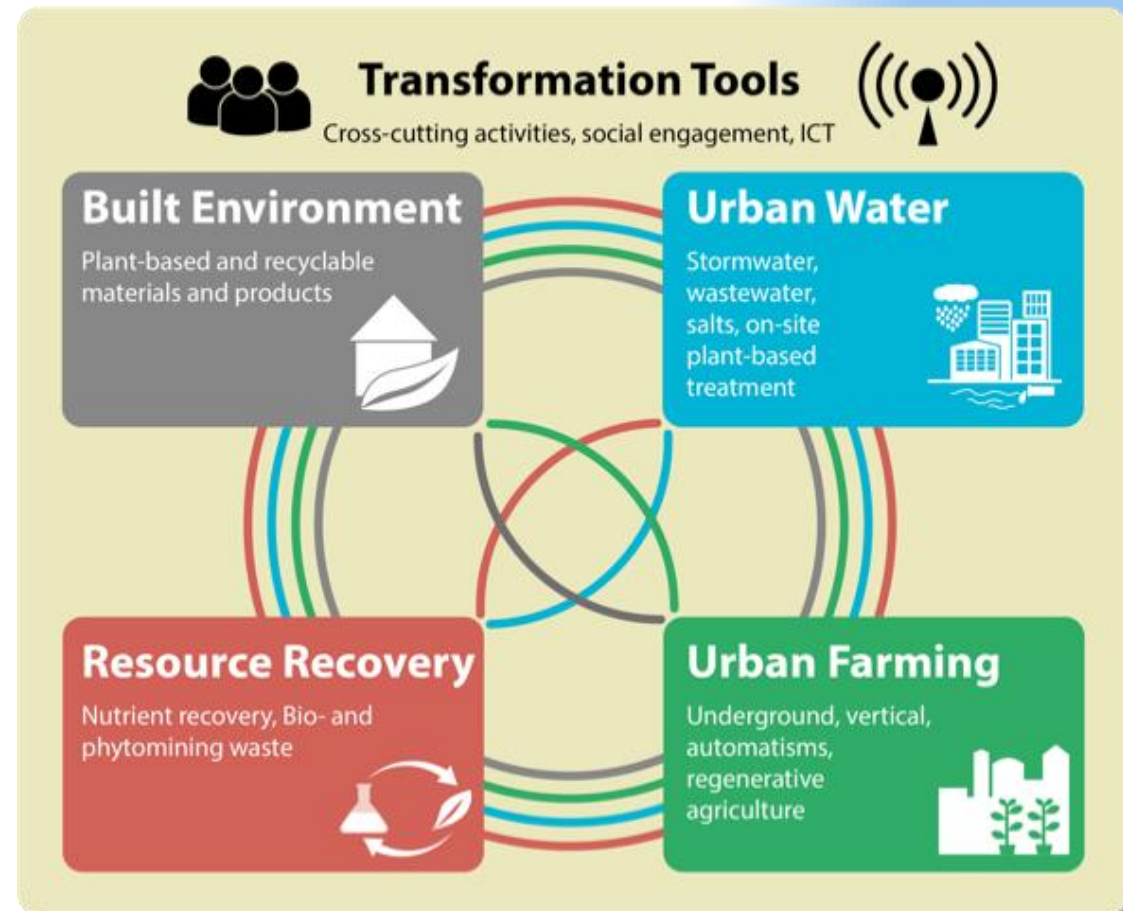
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## Working Groups

- WG1: Built environment
- WG2: Sustainable urban water utilisation
- WG3: Resource recovery
- WG4: Urban Farming
- WG5: Transformation tools





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## The network

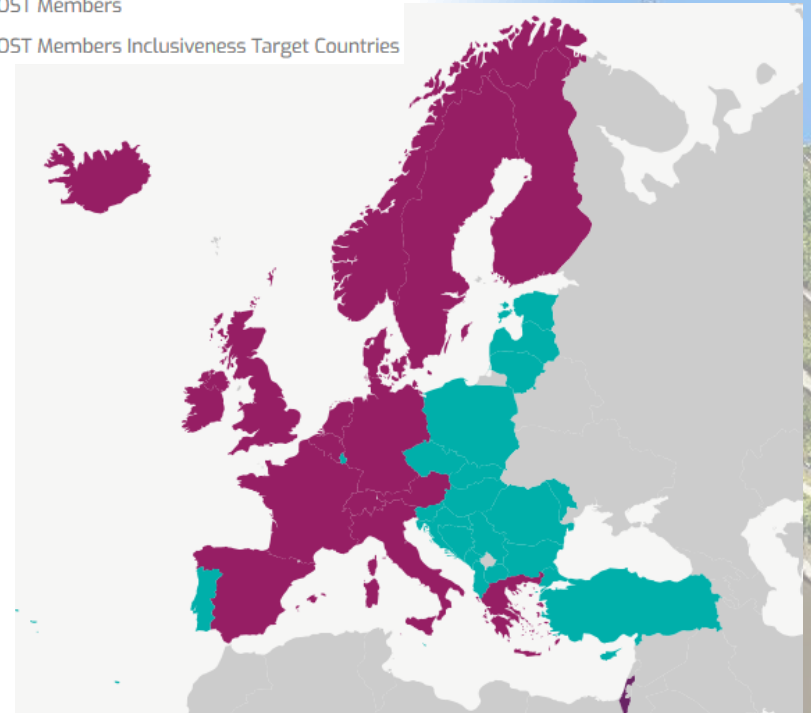
### All 39 COST countries participating!

- **EU 28**
  - **EU Candidates and Potential Candidates**
    - Albania, Bosnia and Herzegovina, Moldova, Montenegro, North Macedonia, Serbia, Turkey
  - **Other countries**
    - Iceland, Norway, Switzerland
  - **COST Cooperating Member**
    - Israel
- + MC Observers from
- Armenia, Colombia, Georgia, Taiwan, Russia, Tunisia

Legend

■ COST Members

■ COST Members Inclusiveness Target Countries





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## The network

39 COST Members

→ 78 MC Members

+ 95 MC Substitutes

+ 6 MC Observers

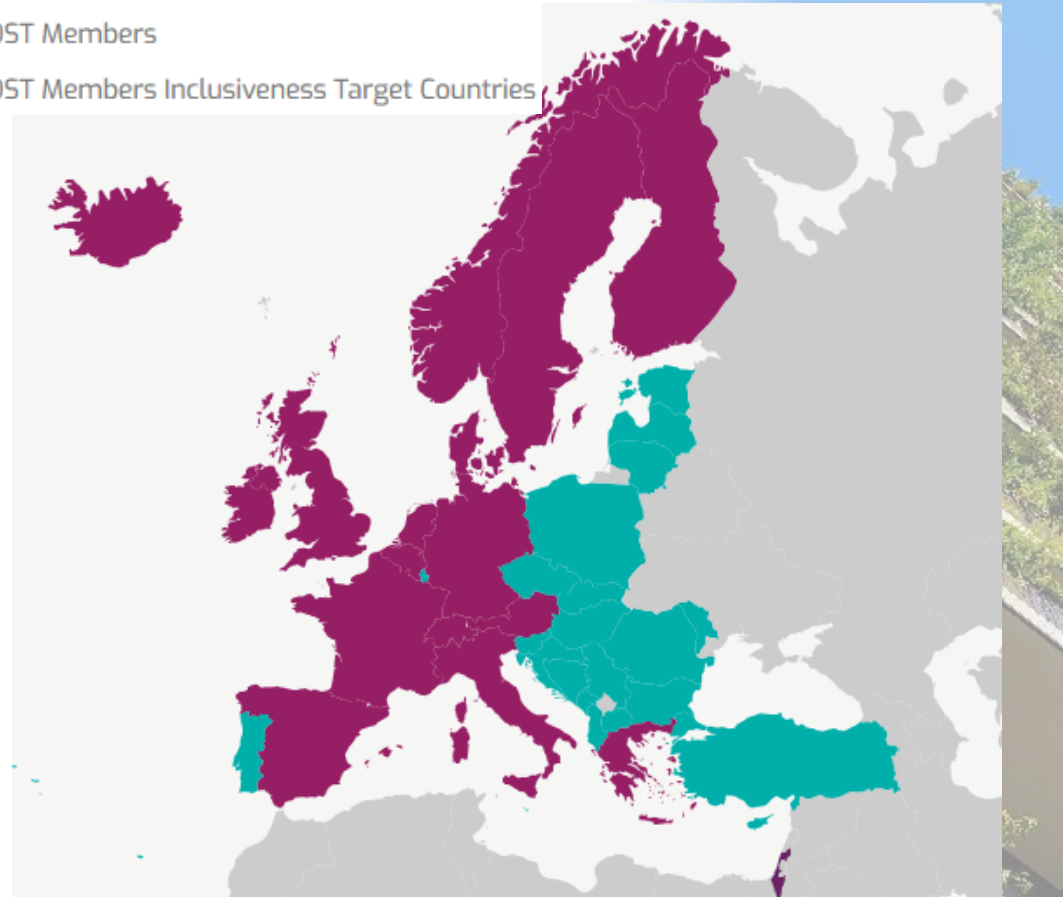
+ ca. 275 interested persons

→ **> 450 persons**

Legend

 COST Members

 COST Members Inclusiveness Target Countries







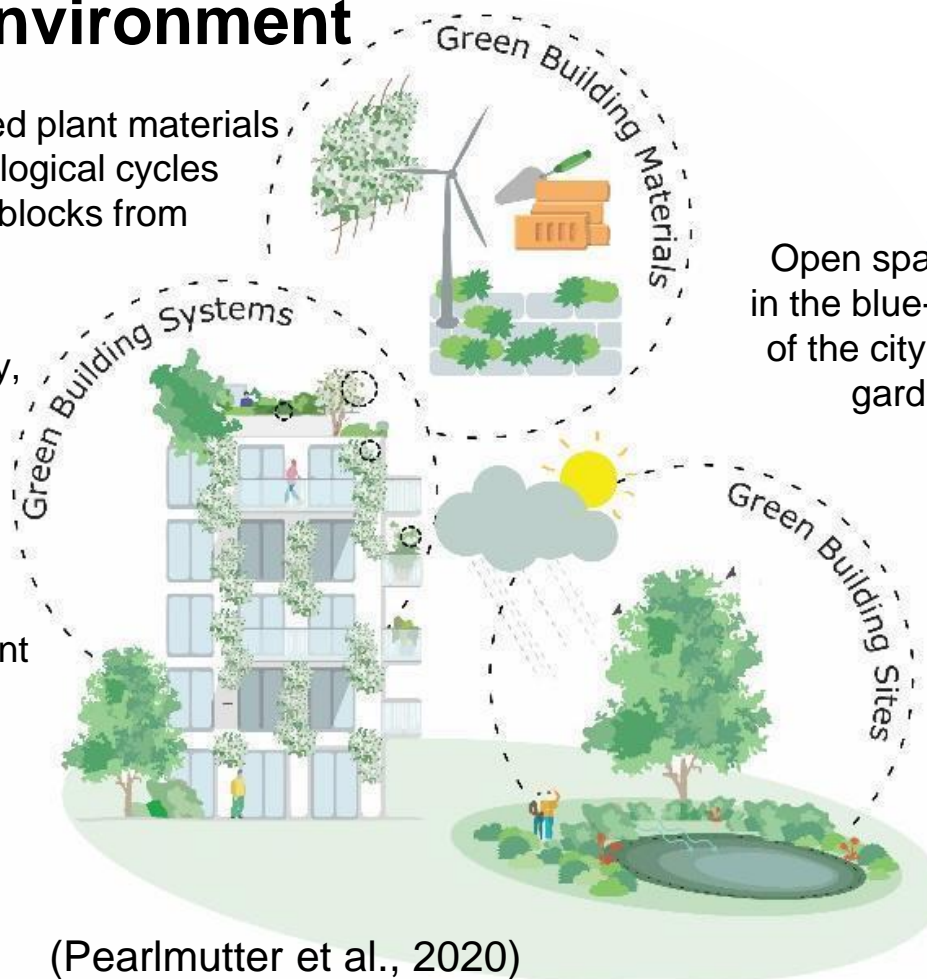
## WG1 Built environment

Living and harvested plant materials compatible with biological cycles (e.g. biocomposite blocks from agricultural waste)

Green roofs, facade greenery, (edible) living walls, building-integrated constructed wetlands

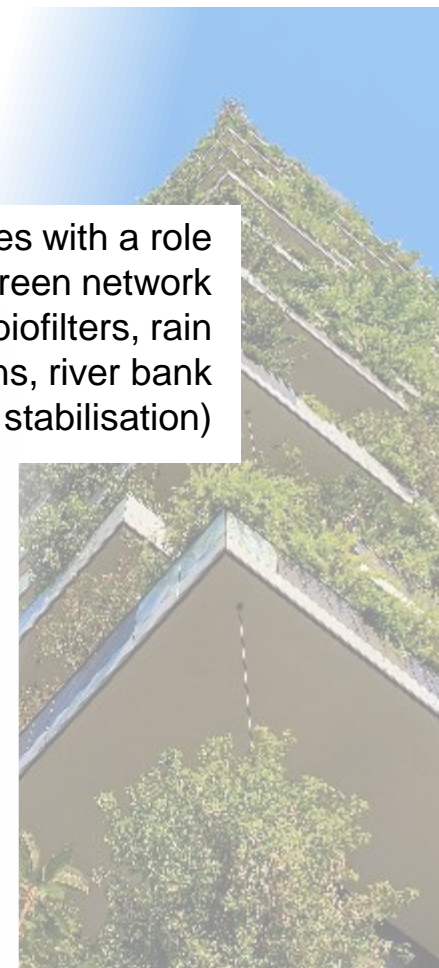
Multifunctional:

- Drainage & water treatment
- Reduce GHG emissions, operational energy use, „urban heat island effect“
- Enhance air quality
- Regenerative effect

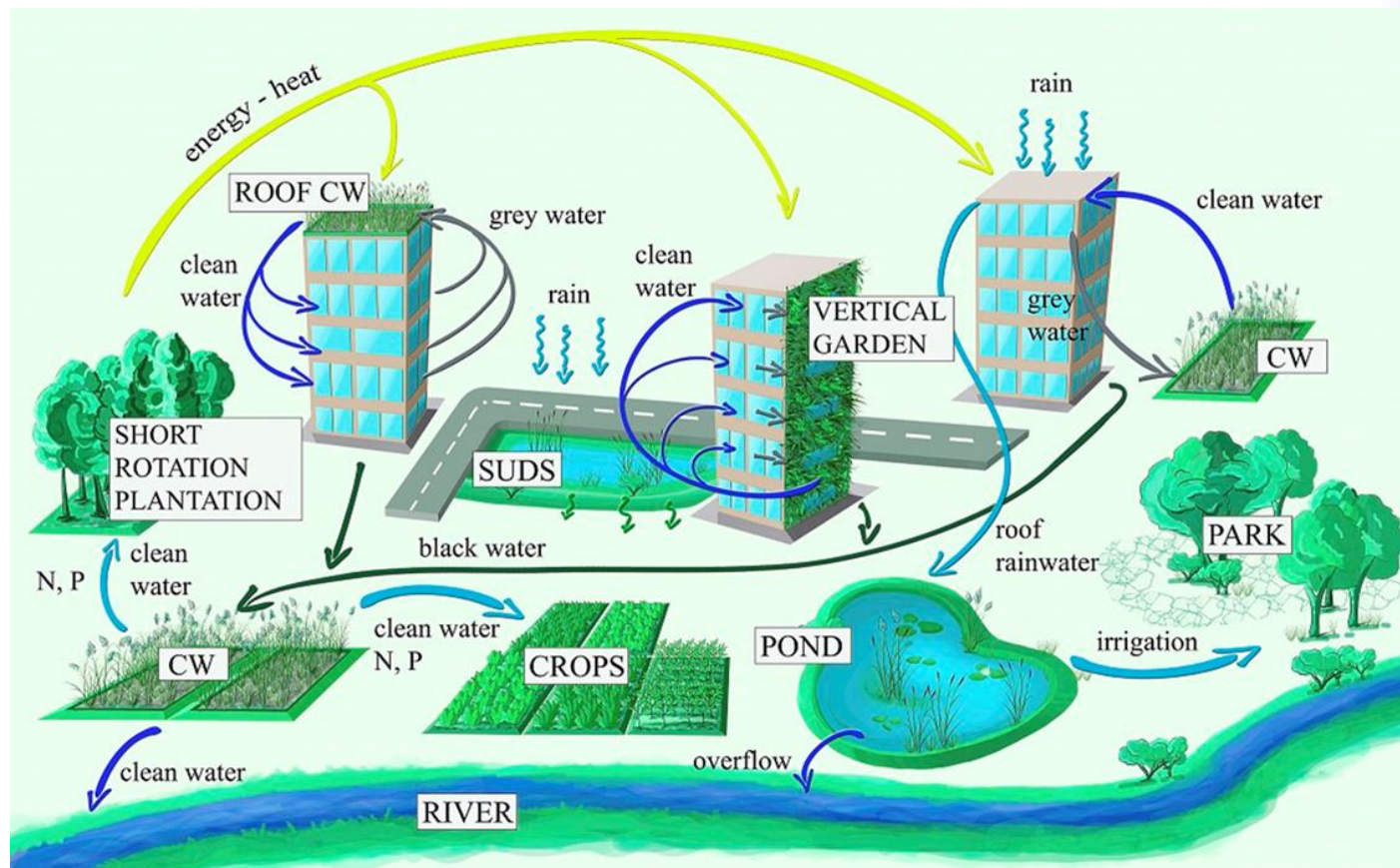


(Pearlmutter et al., 2020)

Open spaces with a role in the blue-green network of the city (biofilters, rain gardens, river bank stabilisation)



## WG2 Urban water







## WG3 Resource recovery

- 4 principal resource streams in cities + additional category:
  1. Urban wastewater
  2. Industrial waste and wastewater
  3. Municipal solid waste
  4. Gaseous effluents+ Source-separated waste
- Description
  - Technologies
  - Products
  - Barriers







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# WG4 Urban Farming

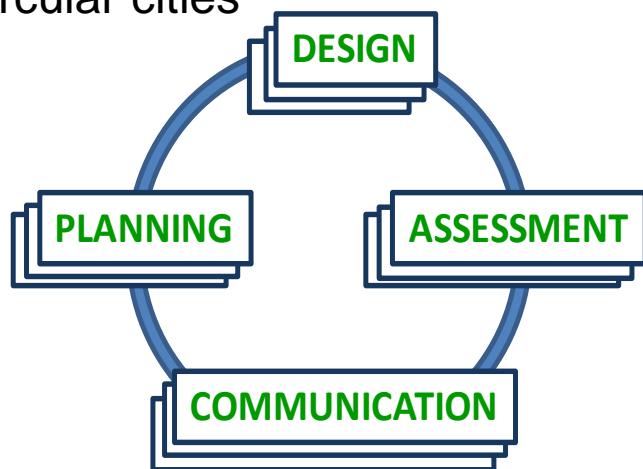
Urban farming is a key component of circular cities in the scope of sustainable urbanization.

Involvement of urban population										Involvement of professionals				
Urban gardening					Urban and peri-urban farming								Conventional farming	
Private Garden	Allotment Garden	Communi- ty Garden	School Garden	Rooftop Vertical gardening/ farming (BIA)	Urban farms	Community- supported agriculture (CSA)	Educational or leisure farms	Social farms	Local food farms				NO adaptation to the urban environment	
									CSA	Direct selling	City or farmers market	Boxes		
Mainly in building zone and affected by planning					Hybrid		Mainly in agricultural zone and affected by agricultural policy							

Typologies and social aspects of urban agriculture initiatives (Skar et al., 2020)

## WG5 Transformation tools

Response to the complexity of systemic implementation of NBS to transform the cities of today into circular cities



4 main interrelated steps for successful implementation of NBS for CC

- Goals
  - to identify and group specific tools and methods for assessing NBS for CC
  - to identify means of society and stakeholders' engagement and awareness, and
  - to identify barriers and facilitators within current policies and regulations in order to promote and enable the implementation of NBS for improving future city transitions.
- Methodology
  - Literature review
  - Project survey approach



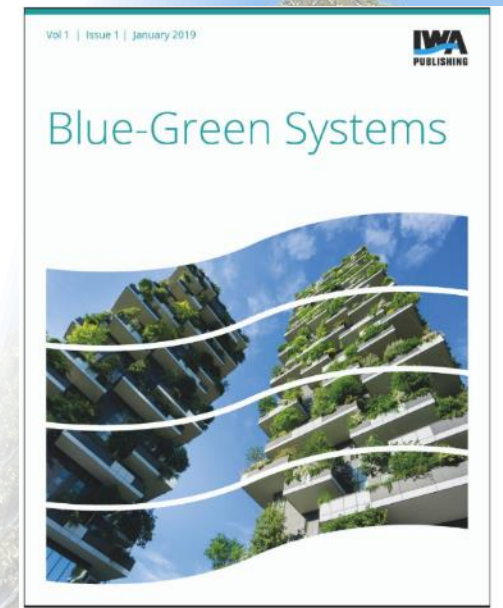
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## Main deliverables

- Report on the state of the art and existing case studies → **review papers on the state-of-the-art** → Special issue in the IWAP OA online **Blue-Green Systems** journal
- Catalogue of technologies for providing/recovering resources with NBS within each WG.
- Description of possible resource input provided from NBS systems
- **Guideline on combined NBS and CE possibilities within the urban environment**







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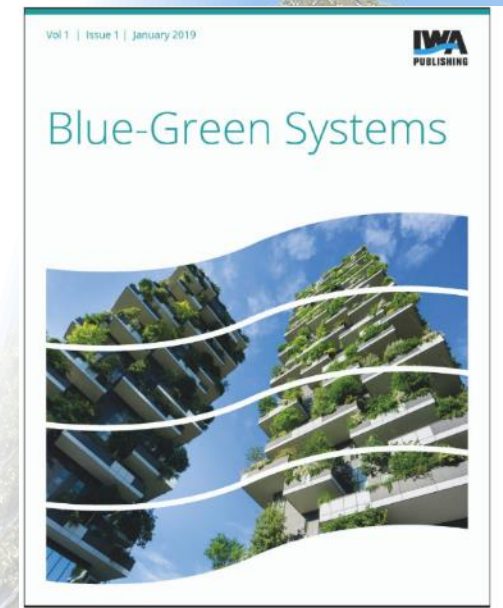
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## Special issue "Towards Circular Cities"

### Table of contents

- ✓ Langergraber & Atanasova, BSG 2(1), 137: Editorial
- ✓ Langergraber et al. BSG 2(1), 173-185: Intro
- ✓ Pearlmutter et al., BSG 2(1), 46-73: WG1
- ✓ Oral et al., BSG 2(1), 112-136: WG2
- ✓ Kissler et al., BSG 2(1), 138-172: WG3
- ✓ Skar et al., BSG 2(1), 1-45: WG4
- ✓ Katsou et al. BSG 2(1), 186-211: WG5

In total > 100 authors from 35 countries





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# COST Action Circular City

## Activities 1/3

- ✓ **22 October 2018**, 1st MC meeting, official start of COST Action (ca. 75 persons)

### Grand Period 1: 1 Nov 2018 – 30 Apr 2019

- ✓ 1st Circular City Workshop + MC Meeting, 13-15 February 2019, **Vienna** (ca. 150 persons)
- ✓ 2nd Circular City workshop, 28+29 March 2019, **Ljubljana** (ca. 60 persons)
- ✓ 3 Short-Term Scientific Missions granted
- ✓ 2 ITC Conference Grants
- ✓ Preparation of review papers for a Special Issue in the **Blue-Green Systems** journal





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# COST Action Circular City

## Activities 2/3

### Grand Period 2: 1 May 2019 – 30 Apr 2020

- ✓ review papers submitted
- ✓ 1st training school "Sustainable tourist resorts", 18-28 Jun 2019, Piran, Slovenia (with GWP)
- ✓ 2nd training school, 30 Sep – 4 Oct 2019, Malta (with H2020 ReNature project)
- ✓ 3rd Circular City workshop, 16-18 Sep 2019, **Finland** (ca. 60 persons)
- ✓ 4th Circular City workshop + MC Meeting, 4-6 Mar 2020, **Istanbul** (ca. 90 persons)







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# COST Action Circular City

## Activities 3/3

**Grand Period 2: 1 May 2019 – 30 Apr 2020 (cont'd)**

Conferences and workshops:

- ✓ Presentation of the Action at the session "NBS in Circular Economy" @ WETPOL 2019 conference, 17-21 June 2019, Århus, Denmark
- ✓ Workshop "Towards Circular Cities" @ IWA Resource Recovery Conference, 8 Sep 2019, Venice, Italy
- ✓ Presentation of the Action @ the stand-up innovation #3: Circular Cities, 28 Oct 2019, Vienna, Austria
- ✓ Presentation of the Action @ Stakeholder event "Circular Cities", 28 Jan 2020, Impact Hub Zurich, Switzerland





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# Workshop “Towards Circular Cities”

8 Sep 2019, Venice, Italy

- 15 participants (besides Action members)
- Introduction of the COST Action
- Discussion on **beneficial and hindering factors** for implementation of NBS and CE in cities:
  1. General
  2. Planning
  3. Implementation
  4. Standards





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## Upcoming Activities

### Grand Period 3: 1 May 2020 – 30 Apr 2021

- Sessions/workshops planned at
  - Symposium on Circular Economy and Sustainability, 1-3 Jul 2020, Alexandroupolis, Greece (**web-based**)
  - Closed Cycles symposium, 2-5 Sep 2020, Wädenswil, Switzerland (**web-based**)
  - Soilless Culture and Hydroponics, 1-4 Nov 2020, Lemesos, Cyprus
- 5 Training schools planned (starting in fall 2020)
  - For updates see Action website







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## About Circular City

Our world is approaching a situation where several resources are becoming scarce at the same time, e.g., energy, nutrients, water, space, while at the same time climate change is proceeding. This will cause problems even in areas where such problems may at present seem negligible. Wealth and wellbeing of coming generations will depend on our ability to adapt our economies to this challenge in the finite world we are living in. Transforming today's cities into sustainable cities is one of the main adaptations that will be necessary. A holistic approach looking at cities from a system's perspective is needed to achieve this goal.

[Read More](#)

## Contact

### **Dr. Guenter Langergraber** Chair, COST Action Circular City

University of Natural Resources and Life Sciences, Vienna (BOKU)  
Department of Water, Atmosphere and Environment  
Institute of Sanitary Engineering and Water Pollution Control  
Muthgasse 18, A-1190 Vienna, Austria

Tel.: +43 (0)1 47654-811 11  
Email: [guenter.langergraber@boku.ac.at](mailto:guenter.langergraber@boku.ac.at)  
<http://www.wau.boku.ac.at/sig.html>

### **Dr. Nataša Atanasova** Co-Chair, COST Action Circular City

University of Ljubljana  
Faculty of Civil and Geodetic Engineering  
Institute of Sanitary Engineering  
Hajdrihova 28, Ljubljana, Slovenia

Tel.: 386 1 4254 057  
Email: [natasa.atanasova@fgg.uni-lj.si](mailto:natasa.atanasova@fgg.uni-lj.si)  
<https://www.en.fgg.uni-lj.si/>



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