

Role of Cities in Circular Transition

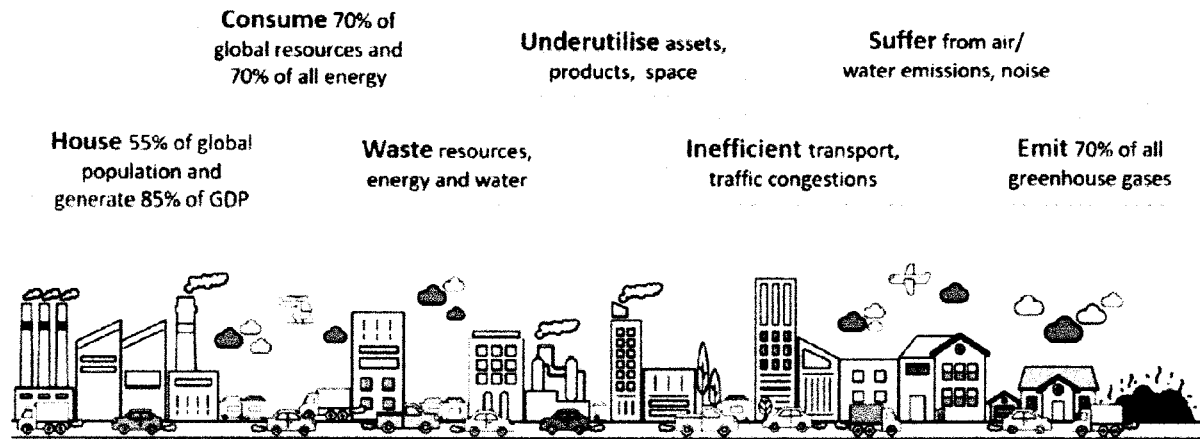
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- Most cities are operating based on the *linear “take-make-dispose” model*.
- In the coming decades, cities will be increasingly important as even *greater rates of urbanisation* are expected
- Significant *infrastructure investments* and developments are ongoing.
- A growing global population, largely concentrated in cities, and a *rising urban middle class*, lead to
 - an increase in the demands and pressures on urban infrastructure and government resources
 - an increase in the consumption of resources in cities.
- *Economic losses* as a result of structure waste and negative environmental impacts (combined with the lack of a holistic approach to urban management)
- Correspondingly, cities are increasingly recognised as the *central generators of circular change*.

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Wastage and Externalities in Linear Cities



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CE origins are mainly rooted in ecological and environmental economics and industrial ecology having as ultimate goal the decoupling of environmental pressure from economic growth of finite raw materials and resources and in this way increasing societal welfare.

This can be achieved by gradually designing out waste from economic activities, keeping products and materials in economic use and regenerating natural systems.

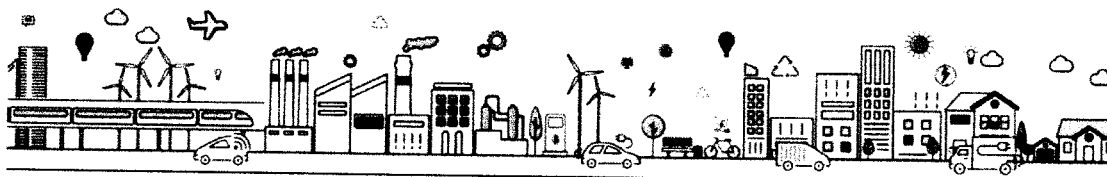
Main challenges arising by the linear economy impact:

- *economic losses* associated with waste (e.g., value in materials used "lost" to landfills)
- consistent *under-utilisation of resources*
- *effectiveness losses* in key sectors such as mobility, food, the built environment
- other *negative externalities* including air, water, noise pollution, the release of toxic substances, and greenhouse gas emissions.

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A Circular City of Tomorrow

- Assets/products are shared/leased with end-of-life recovery
- Urban bio-economy with organic by-product/waste recovery and urban farms
- Reverse logistics to facilitate re-use, repair and remanufacturing
- Digital tools facilitate sharing/recovery applications
- Mobility systems are clean and shared
- Production with local value loops and industrial symbiosis
- Energy production is renewable and local
- Buildings are modular, shared, and designed for disassembly



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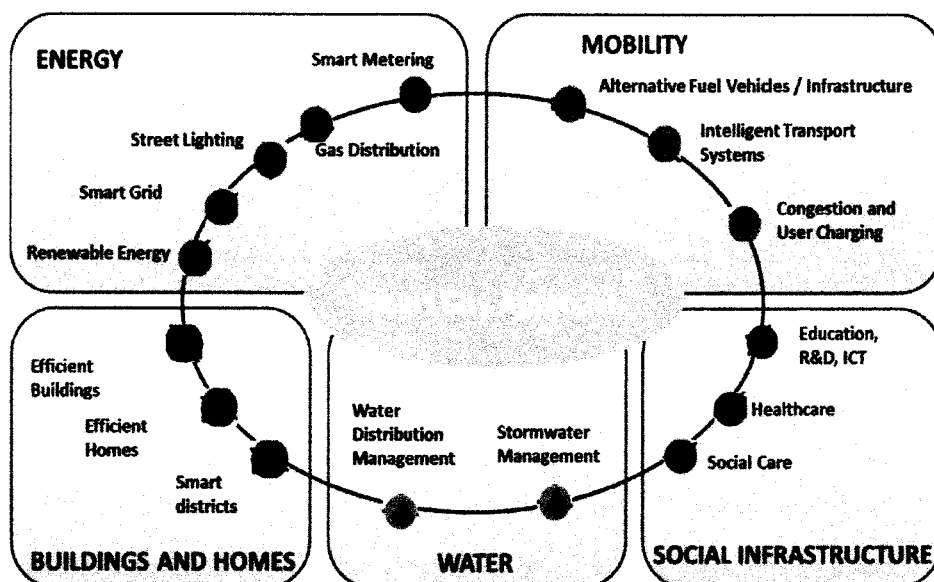
Cities and the Circular Economy

A circular city will likely include the following elements:

- **Built environment**
 - A built environment that is designed in a modular and flexible manner, sourcing healthy materials that improve the life quality of the residents, and minimize virgin material use.
- **Energy**
 - Resilient, localized and distributed energy systems that allow effective energy use, reducing costs and reducing our impact on the environment.
- **Mobility**
 - An urban mobility system that is accessible, affordable, and effective. A multi-modal mobility structure that will incorporate public transportation, with on-demand cars as a flexible but predominantly last-mile solution.
- **Food systems**
 - A system where nutrients will be returned to the biosphere in an appropriate manner, while generating value and minimizing food waste.

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Smart City Approach



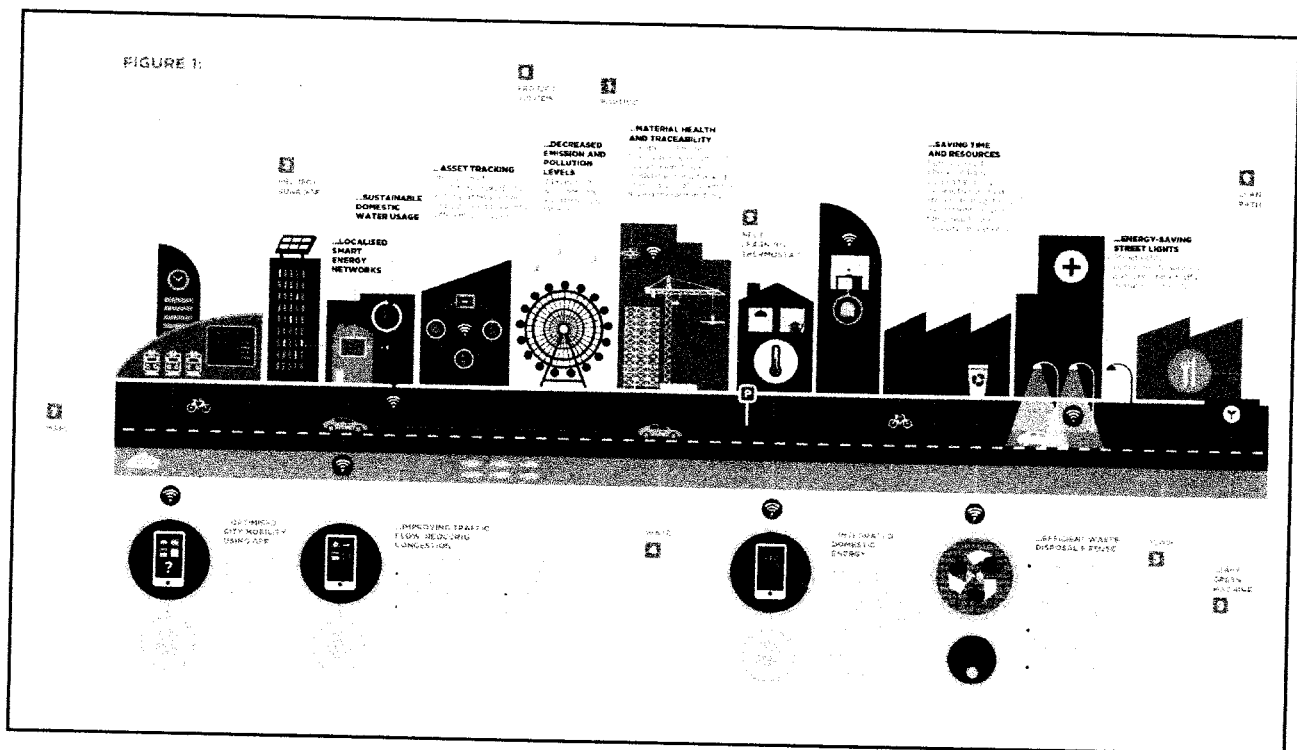
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Digital Technology: Enabling the Transition

The following technologies were identified as enablers of CE activity in cities:

- **Asset tagging**
 - For example, prolonging the life cycle of a car by monitoring its usage patterns and condition through sensors can trigger alerts about problems as they appear, to allow for an easy and quick fix.
- **Geo-spatial information**
 - For example, the ability to visualize traffic and pollution information on base maps, layered with valuable insights from other sources (i.e. census data, material information data)
- **Big data management**
 - For example, predicting energy consumption patterns at a local level, suggesting transport options that avoid peak hour traffic flows in real-time.
- **Connectivity**
 - For example, business models such as Uber or Airbnb would not be feasible without an accessible app that connects assets on offer with those who would like to use them.

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Conclusions

Cities are...

- are uniquely positioned to drive a global transition towards a circular economy with their *high concentration of resources, capital, data, and talent* over a small geographic territory
- could greatly benefit from the outcomes of such a transition, by *closing-the-loop production patterns*
- would thus succeed in increasing the *efficiency of resource use*, with special focus on urban and industrial waste
- are best suitable for implementing *digital technology options*
- may thus achieve a better *balance and harmony between economy, environment and society*

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Action Steps at Local Level

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The process of Circular Transition as a systemic process

- The interdependence of the various fields, sectors, regions, countries and continents is an unprecedented challenge
- There is a need for ...
 - planetary perspective, global leadership and inclusive management
 - clearly-outlined national priorities and goals (easily measurable and internationally comparable)
- CE is the only way to promote the principles of Ecocities
- In the current phase of discovery, exploration and innovation practice exchange is crucial
- Involvement of circular stakeholders required, with a dialogue between them

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Roadmap elements

- Identify priority areas for Circular Transition, based on previous examples of good practice
- Formulate recommendations
- Create a platform for constructive dialogue
- Organize regional consultations and meetings with stakeholders aiming at forming connections between the various stakeholders

Prerequisites

- Intimate knowledge of the national and regional characteristics
- Understanding of competitive advantages
- Identification of factors differentiating a region from another

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Role of (national and regional) governments

- Taking concrete and *effective cross-sectoral measures* for supporting the key points that represent the potential for a Circular society on local, regional and national levels
- Reinforcing its involvement in the Strategy of *Smart Specialization* and the established Strategic Research and Innovation Partnerships
- Actively working on a comprehensive *Circular Transition internationally* (e.g. in the European Union)
- *Involvement of circular stakeholders* required, dialogue between them

CE is the main method and effective mode of gaining sustainable development based on a systematic cities and building's planning, using natural resources in a viable way, respecting inhabitable ecological environment and strengthening buildings and cities against natural disasters etc.

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Cities as cradles & catalysts for circular change

Cities have **density and scale** of citizens, businesses, material and resource flows

Cities have **autonomy** to regulate/ incentivise

Cities can **connect** stakeholders and promote a culture of collaboration

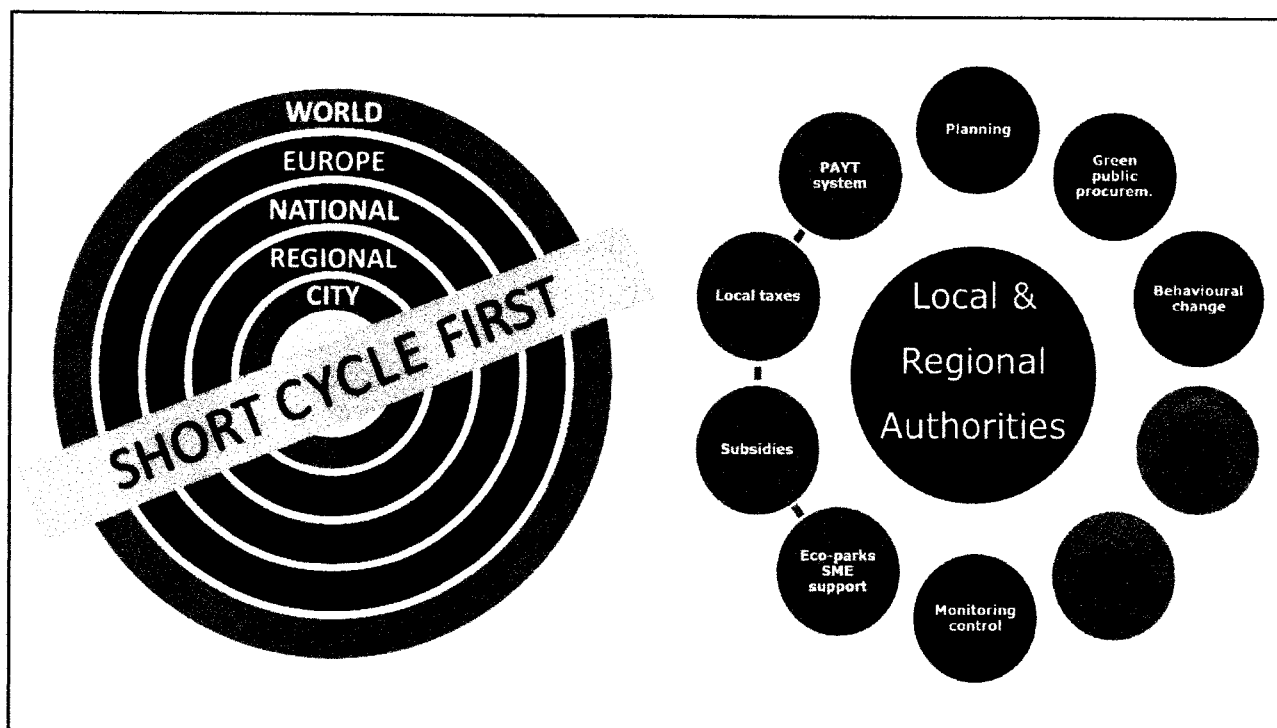
Cities can be cradles and catalysts for circular change

Cities can define and communicate circular **vision and strategy**

Cities can **lead** by example offer/procure circular solutions/services

Cities can embed **circular principles** in city infrastructure and services

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Purpose of a Guidebook

Guide and/or a roadmap for first action steps at local level, emphasis on:

- Outlining challenges cities are facing in today's linear economy
- Exploring the alternative of a 'circular city'
- Developing the key role finance can play in the transition towards CE

Advisory services & catalyst for networking with the aims to:

- Promote a common understanding of the CE concept
- Raise awareness about and promote circular solutions
- Involve stakeholders to identify and implement circular practices

Assemble actors from government, academia, industry, civil society

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Circular Economy in Smart Cities

Thessaloniki, Greece
3-5 October 2018

Υπο την Αιγίδα της Α.Ε.
του Προέδρου της Δημοκρατίας
κυρίου Προκοπίου Παυλοπούλου



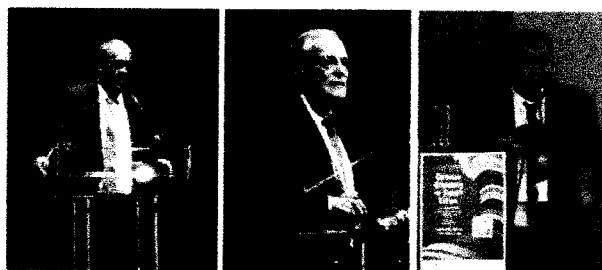
**ECOCITY
FORUM 2018**

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ECOCITY is a voluntary, non-profit environmental organization, focusing primarily on the quality and sustainability of the urban environment.

The ECOCITY FORUM 2018 on “Circular Economy in Smart Cities” (3-5 October 2018, Thessaloniki) aimed at presenting to regional and local authorities opportunities for implementing Circular Economy in their area of responsibility.

An important output of ECOCITY FORUM is the development of a Circular Economy Guidebook for European cities that is expected to prove very useful for communicating the results of scientific research to enterprises and authorities.

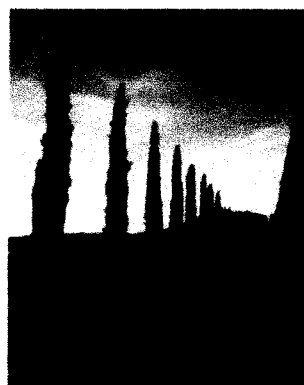


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Ecocity Forum – Guidebook

Generic structure of individual chapters

- Introduction – definitions, overall context
- Activities and experience
- Examples of best practices
- Perspectives
- Summary – main lessons learnt



ECOCITY FORUM GUIDEBOOK

Download from:

<http://aix.meng.auth.gr> www.ecocityforum.gr

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Ecocity Forum Guidebook Themes (1/3)

Trends in Energy, Industry, Agriculture and the Management of Wastes

- Decarbonisation and renewable energy strategies
- Energy recovery from bioeconomy and waste-to-energy options
- Industrial symbiosis, closed loop systems and eco-industrial parks
- Importance of innovations in product design
- Role of digital technologies – Industry 4.0
- Digital transformation of farming with the use of robotics and big data

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Ecocity Forum Guidebook Themes (2/3)

Urban and Regional Level Developments

- City planning to promote circularity
- Waste prevention and effective recycling
- Urban mining
- Transport sustainable mobility and air quality aspects
- Innovative logistics solutions and hubs
- Sustainability in ports

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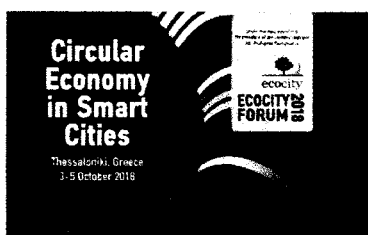
Ecocity Forum Guidebook Themes (3/3)

Quality of Life – Economic, Social and Governance Aspects

- Social well-being and health benefits
- Customer behavior and social interaction
- Policy and legal context of circular economy
- Business innovation and regional development options related to blue economy
- Tourism sector and sustainable development

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Thank you for your attention!



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