



# Environmental sustainability of circular economy strategies in cities – how can we prioritize?

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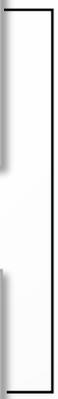
# The Circulus project

## Objective

To integrate political and material dynamics on the way to a sustainable circular economy

Identify how & why specific 'models' (story lines) of a circular economy translate into governance & practice

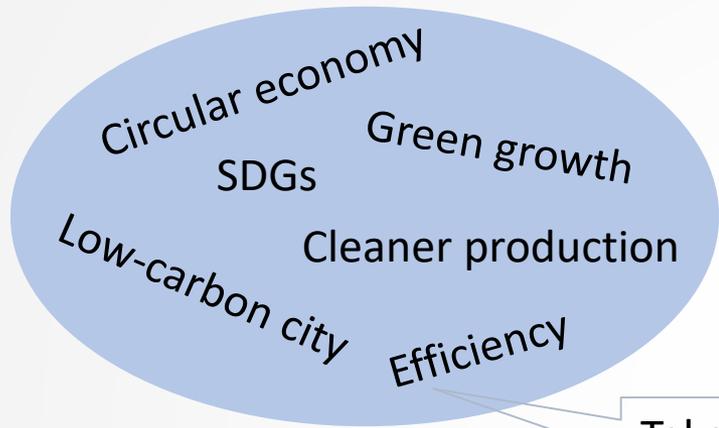
Identify & quantify sustainability impacts & trade-offs of circular economy initiatives



Relate sustainability impacts & trade-offs of circular economy initiatives with political story lines (expectations & goals)

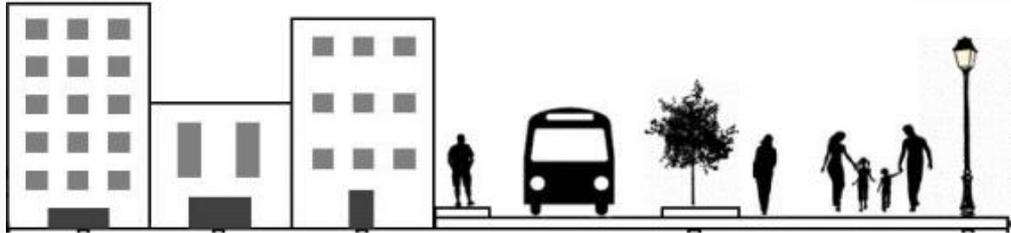
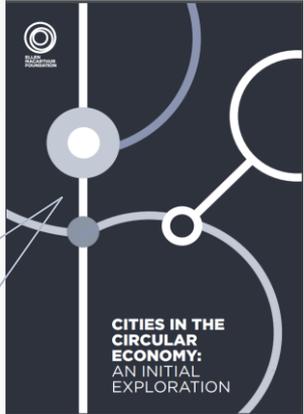


# Why cities? ...



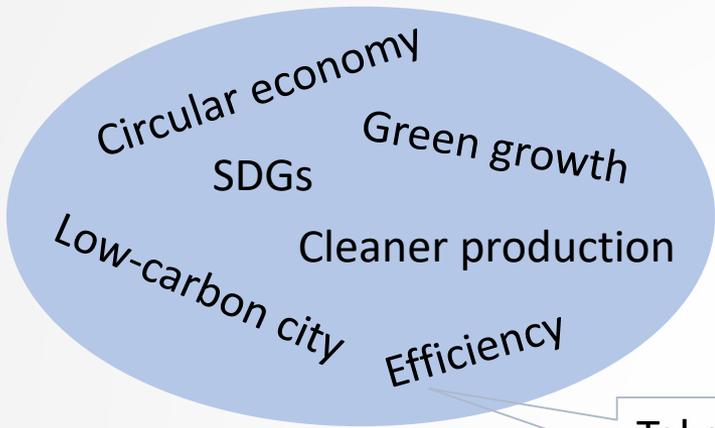
Take action NOW!

The circular economy will increase your livability and sustainability!



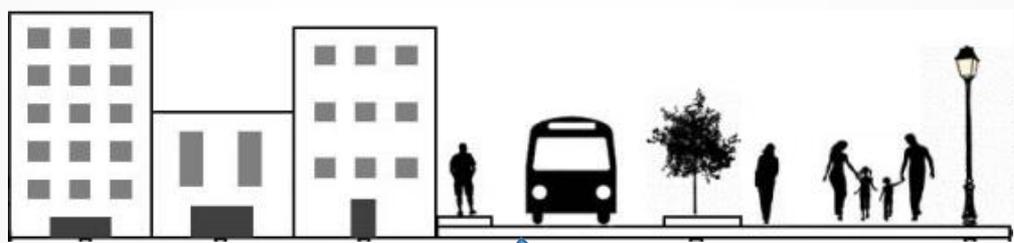
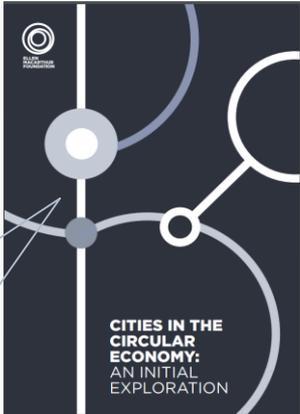


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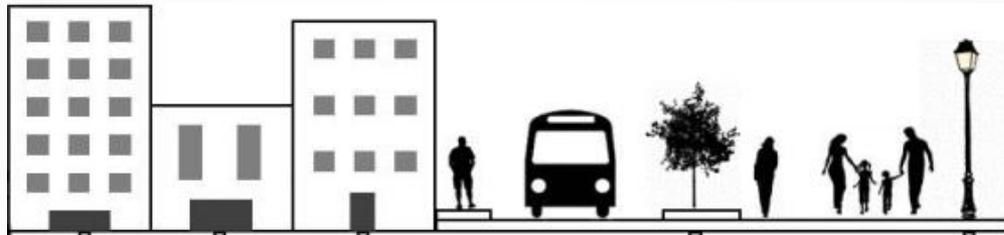


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CITY: Ok... How??



**How can cities better prioritize circular  
economy actions towards  
environmental sustainability?**



# What does the circular economy imply?

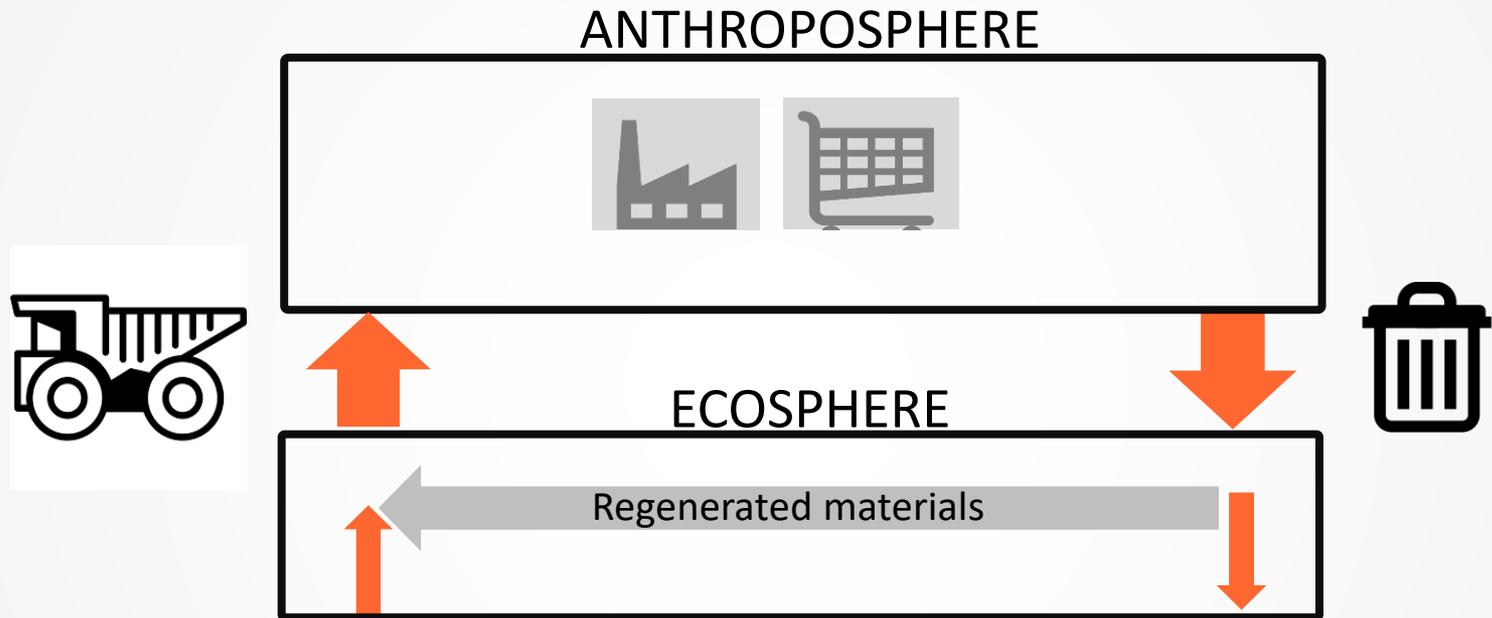


Chart adapted from Graedel, T. E. et al. 2011, Journal of Industrial Ecology;  
In: Helander, Petit-Boix, Leipold, Bringezu 2019, Journal of Industrial Ecology \*\*\* OPEN ACCESS \*\*\*

# What does the circular economy imply?

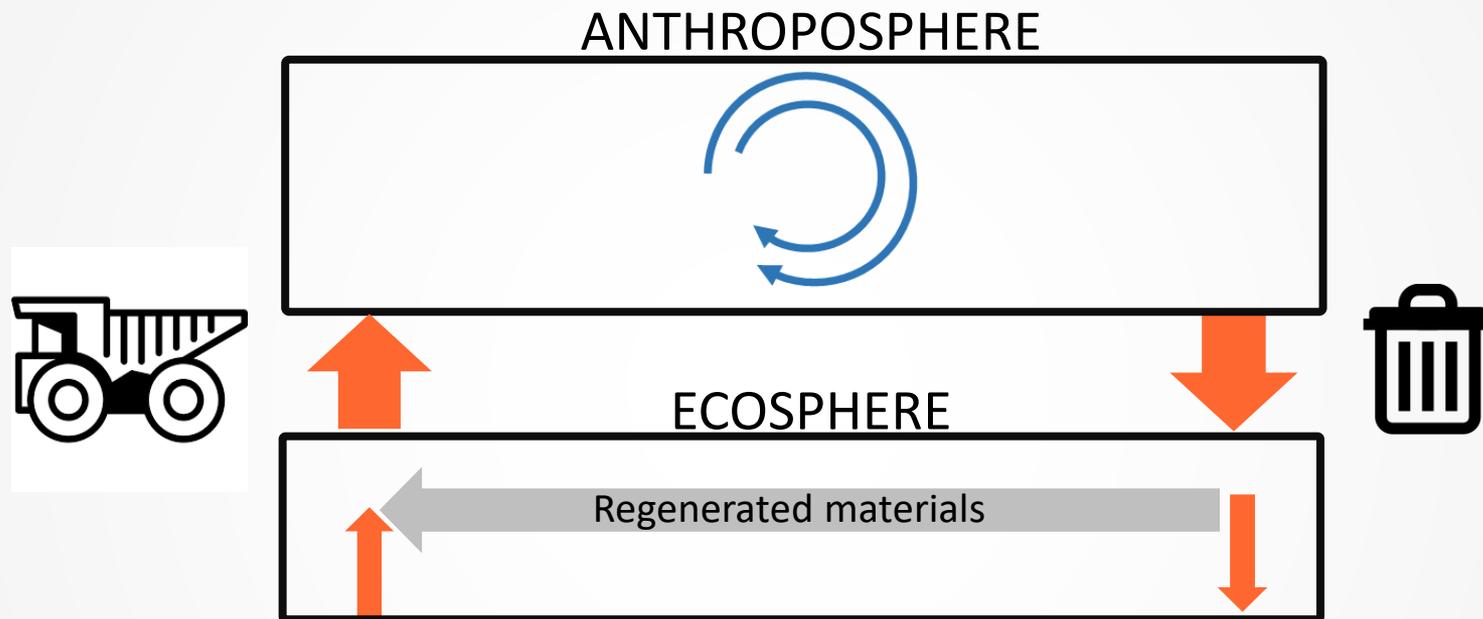
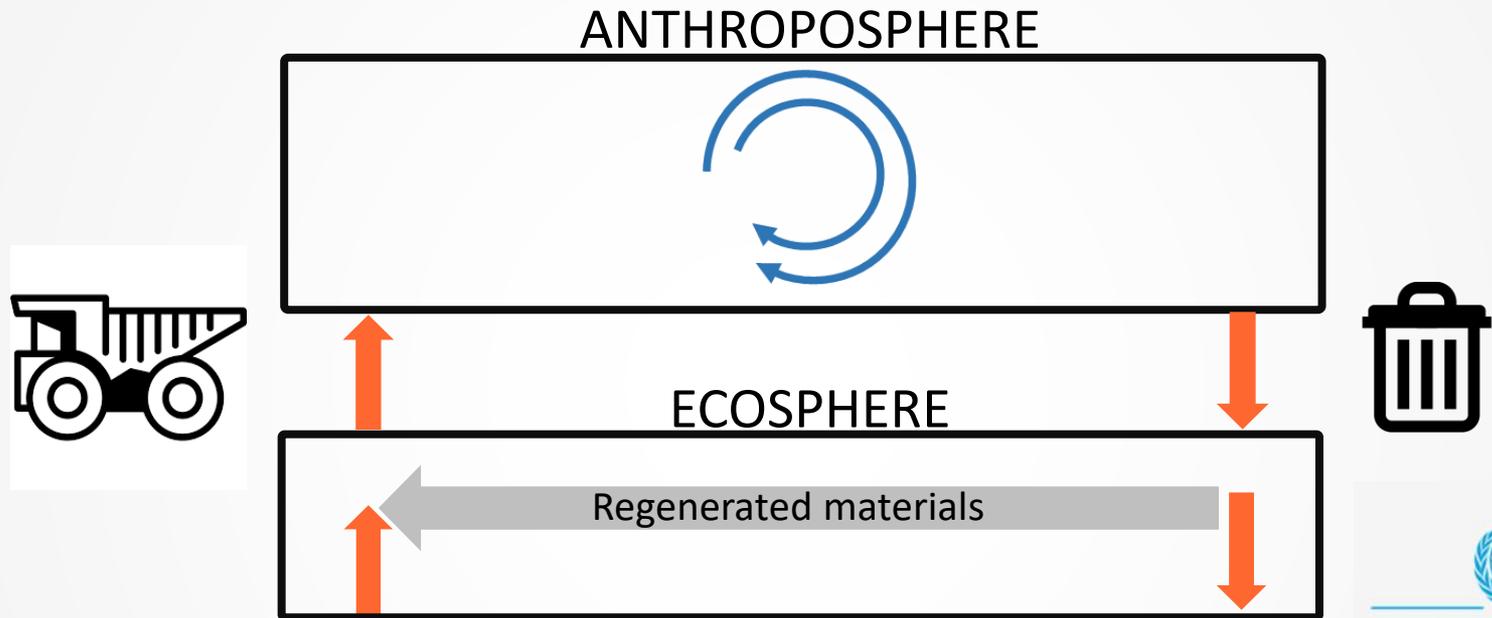


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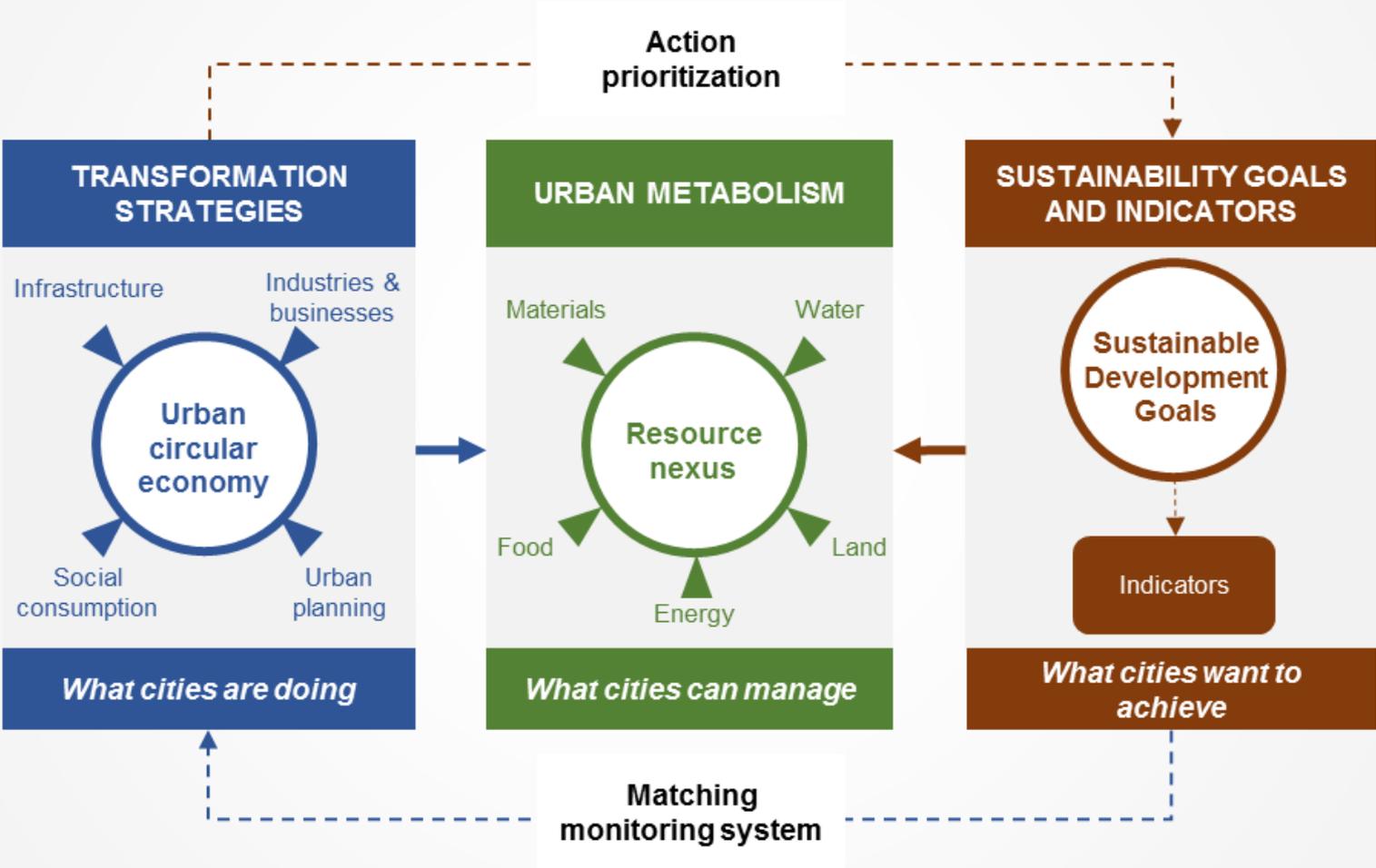


**We need to measure these flows!**

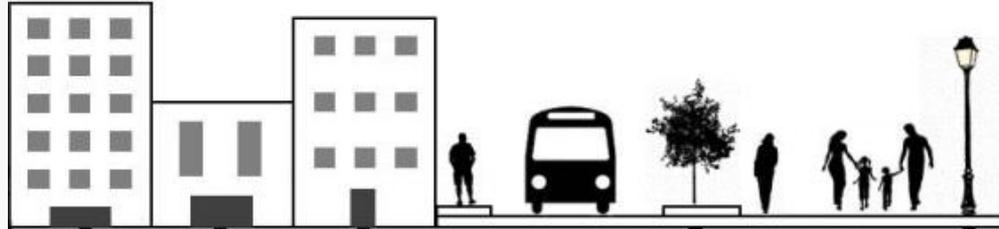


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# The means to the goals



Petit-Boix et al. From nexus to goals: monitoring resource circulation in cities (in preparation)



## How can cities better prioritize circular economy actions towards environmental sustainability?

1

What does the urban circular economy look like?

2

To what extent can the SDG indicator framework help prioritize strategies for a resource-efficient, circular economy in cities?



# What does the urban circular economy look like?

## City's understanding of circular economy

Methods

### A) Data collection

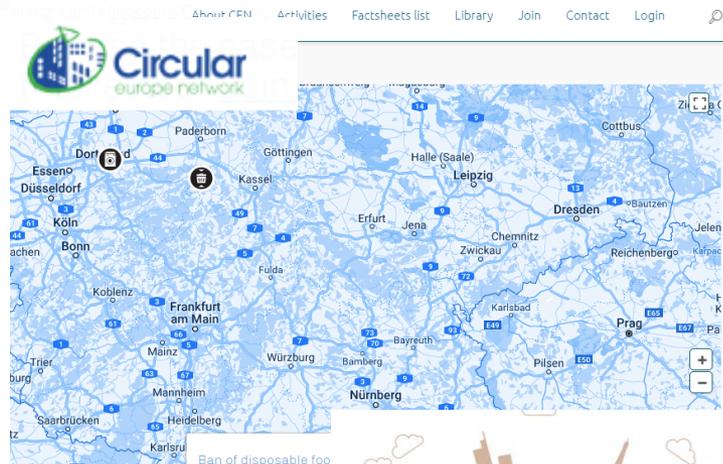
Practitioner community

Sample of local initiatives that promote the circular economy



83 cities

~ 300 records



### Governments Going Circular – Global Scan Best Practices



- <http://www.govsgocircular.com/>
- <http://www.circular-europe-network.eu/>
- <https://api-site.paris.fr/images/77050>



# What does the urban circular economy look like?

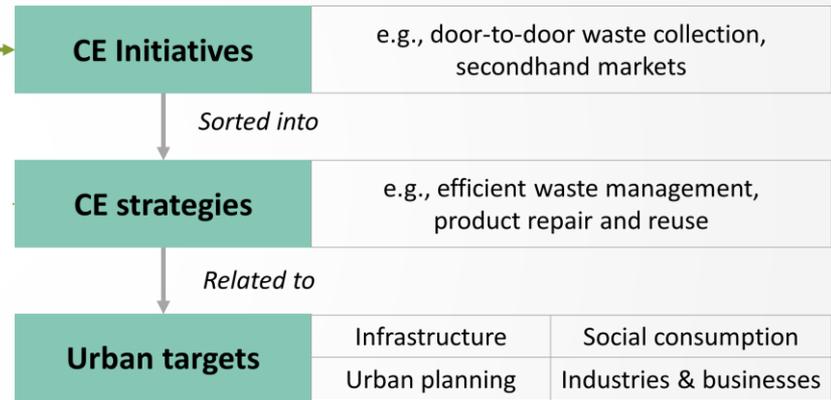
## City's understanding of circular economy

Methods

### A) Data collection



### B) Analytical framework

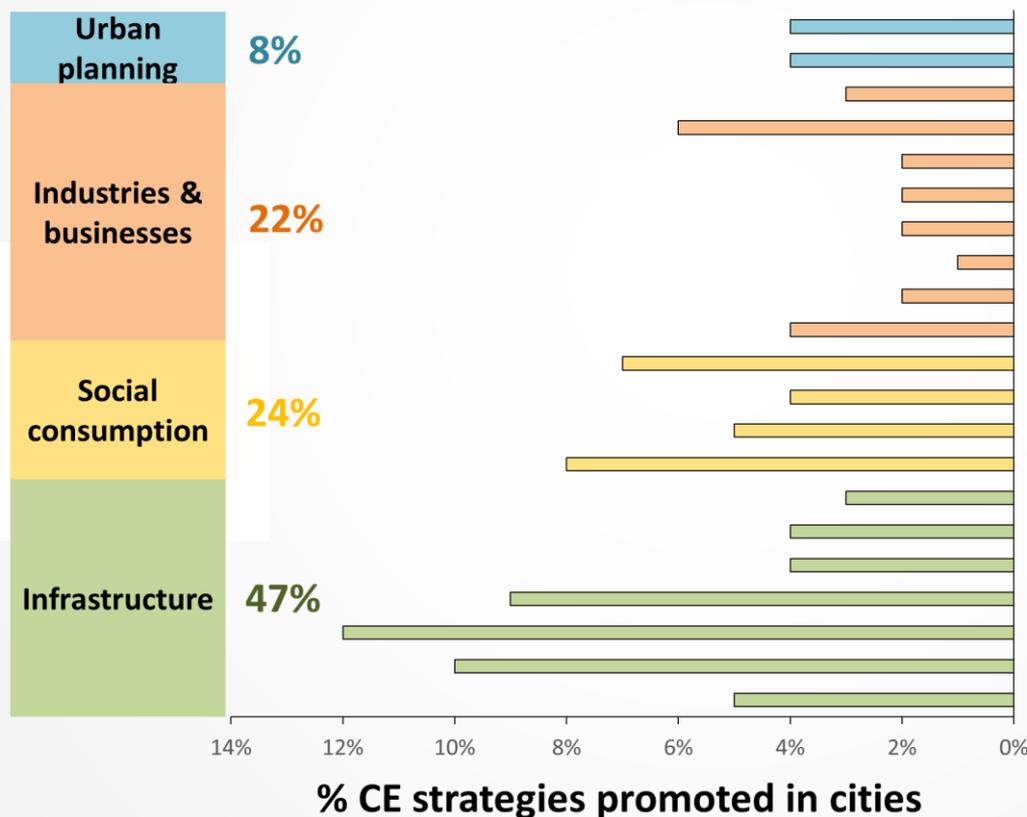




# What does the urban circular economy look like?

## City's understanding of circular economy

Results



## CE strategies

- Sustainable planning
- Land occupation and zoning
- Green procurement
- Waste/product reuse and cascading
- Upgraded technologies
- Material, nutrient and energy recovery
- Product eco-design/cradle-to-cradle principle
- Remanufacturing
- Use of recycled materials
- Industrial symbiosis
- Disposable product reduction
- Sharing initiatives
- Food waste management
- Product repair and (waste) reuse
- Green mobility
- Smart IT
- Water conservation and reuse
- Green construction and materials
- Efficient waste management infrastructure
- Energy production, recovery and efficiency
- Local food production

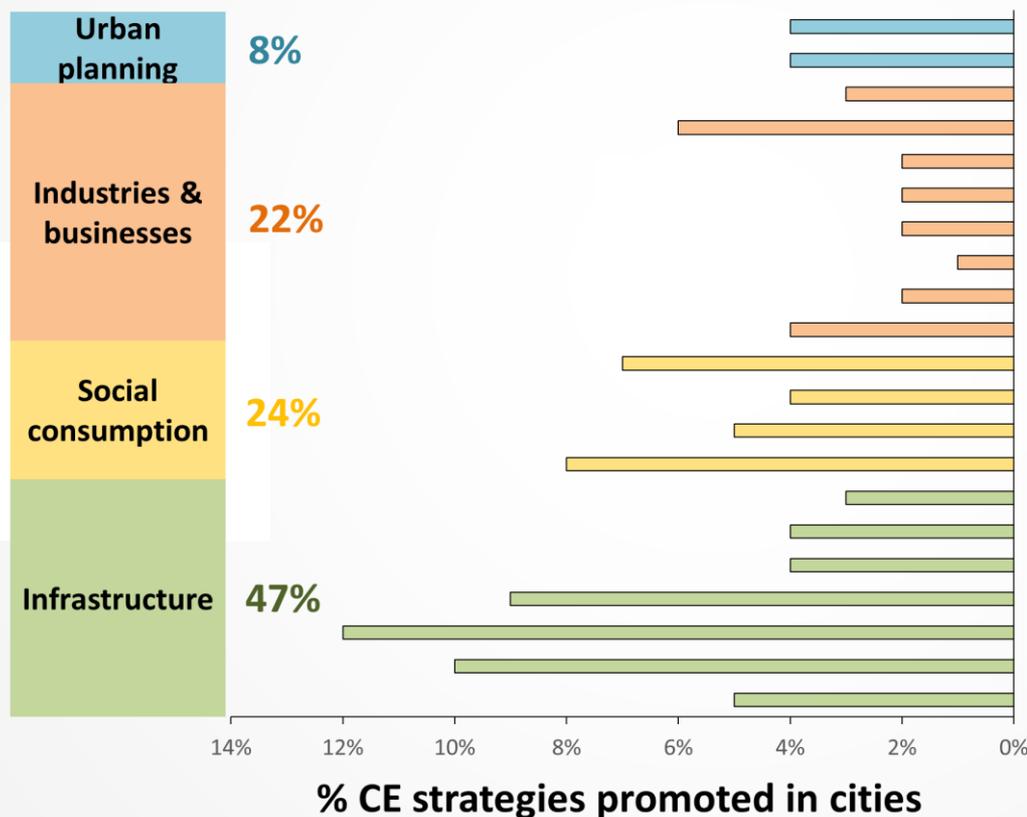
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## City's understanding of circular economy

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### CE strategies

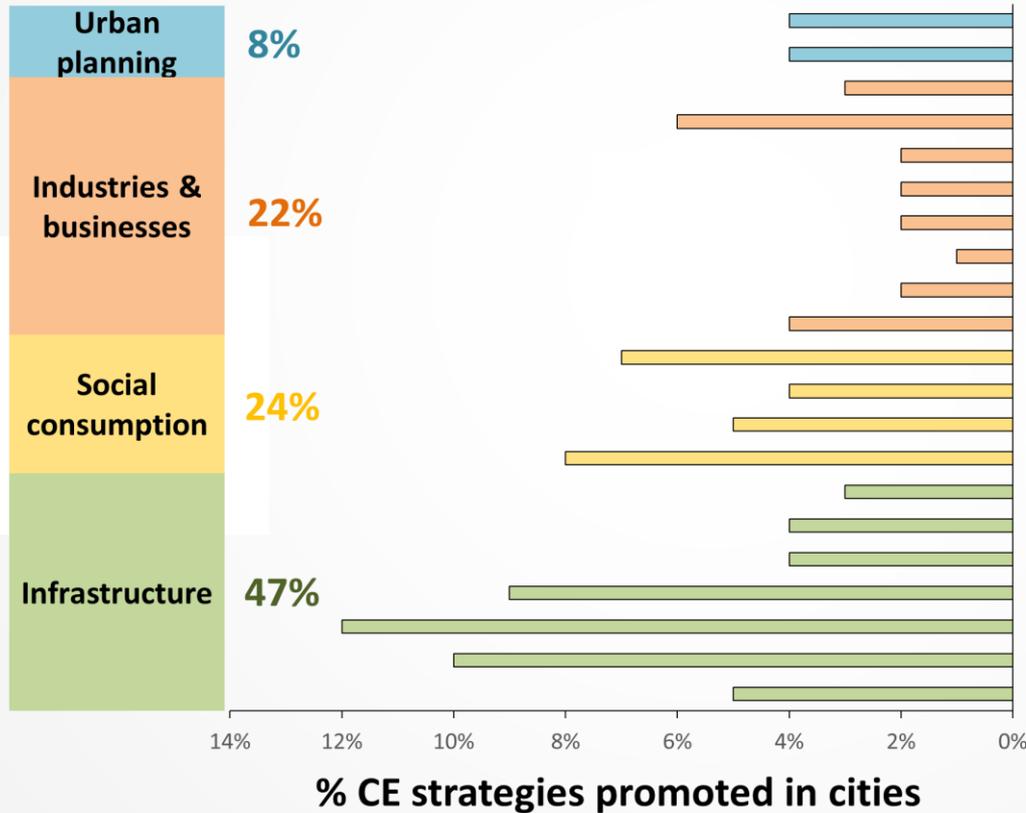
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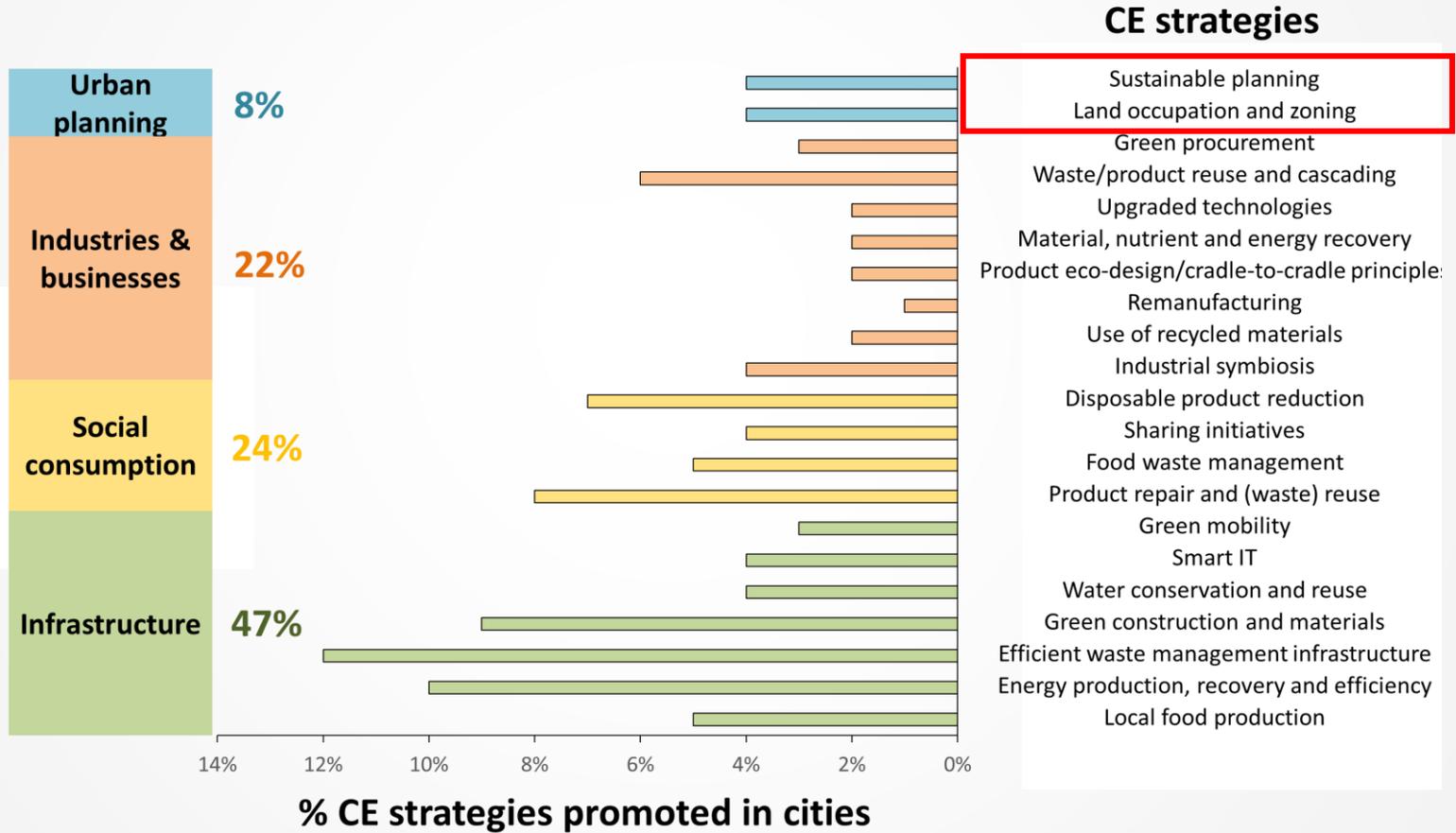
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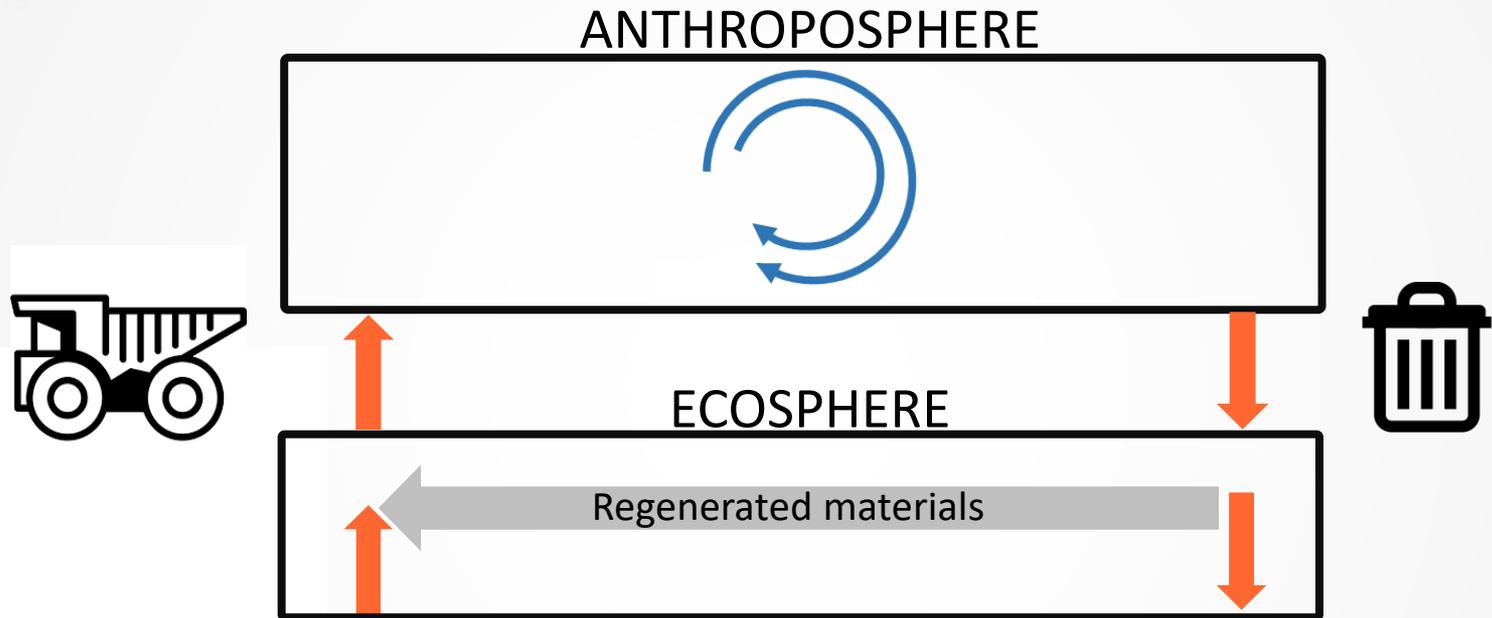


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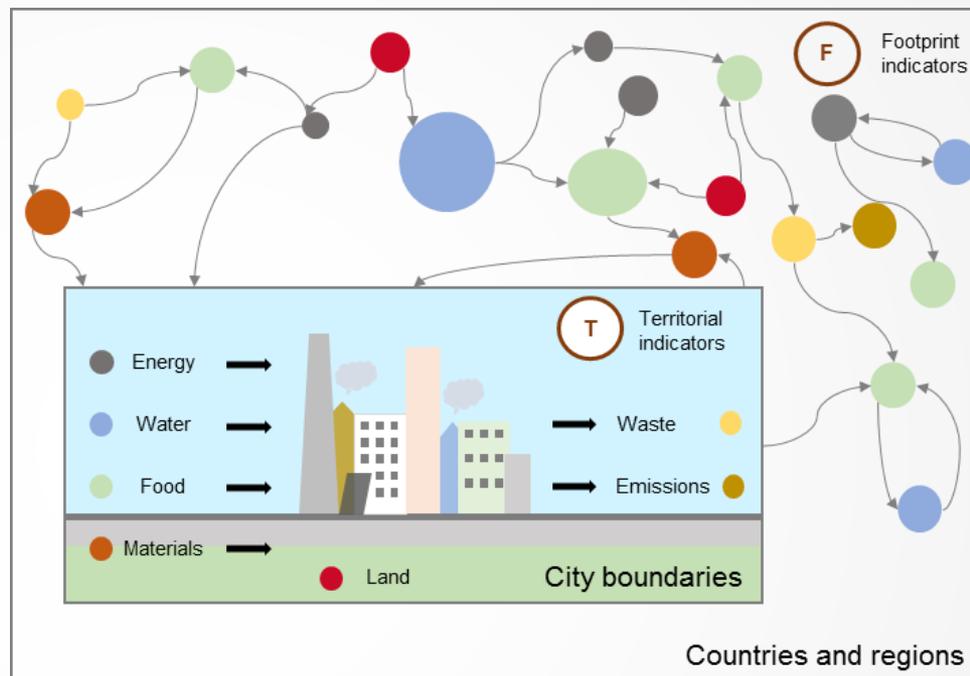


# We need to measure!

Results



# To what extent can we use the SDG indicator framework?



**We need to monitor:**

- (1) what happens in the city = what strategies are in place? - TERRITORIAL**
- (2) the effects of urban CE strategies on resource use - FOOTPRINT**

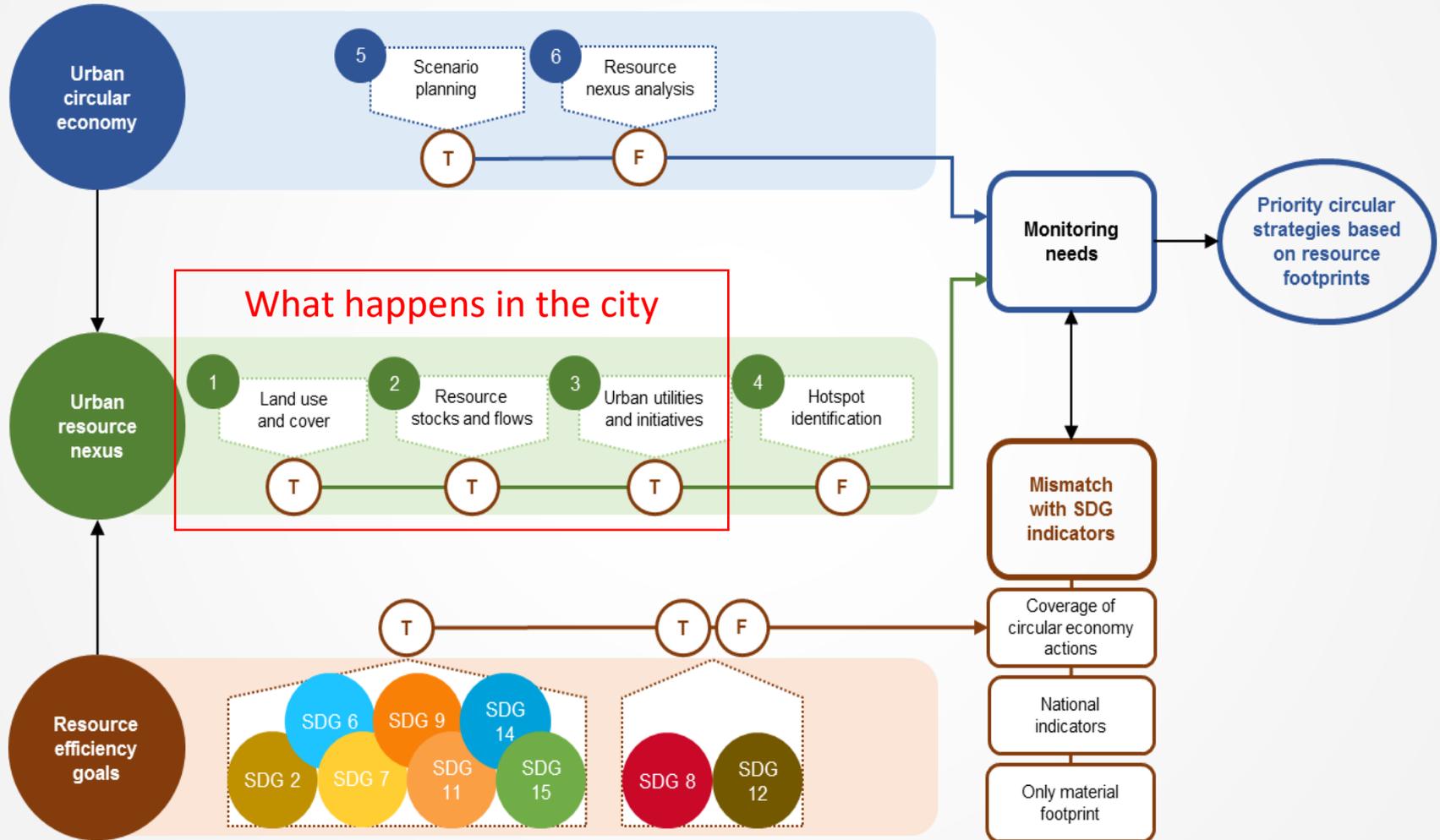
**Are these needs reflected in the SDG indicator framework?**



# To what extent can we use the SDG indicator framework?

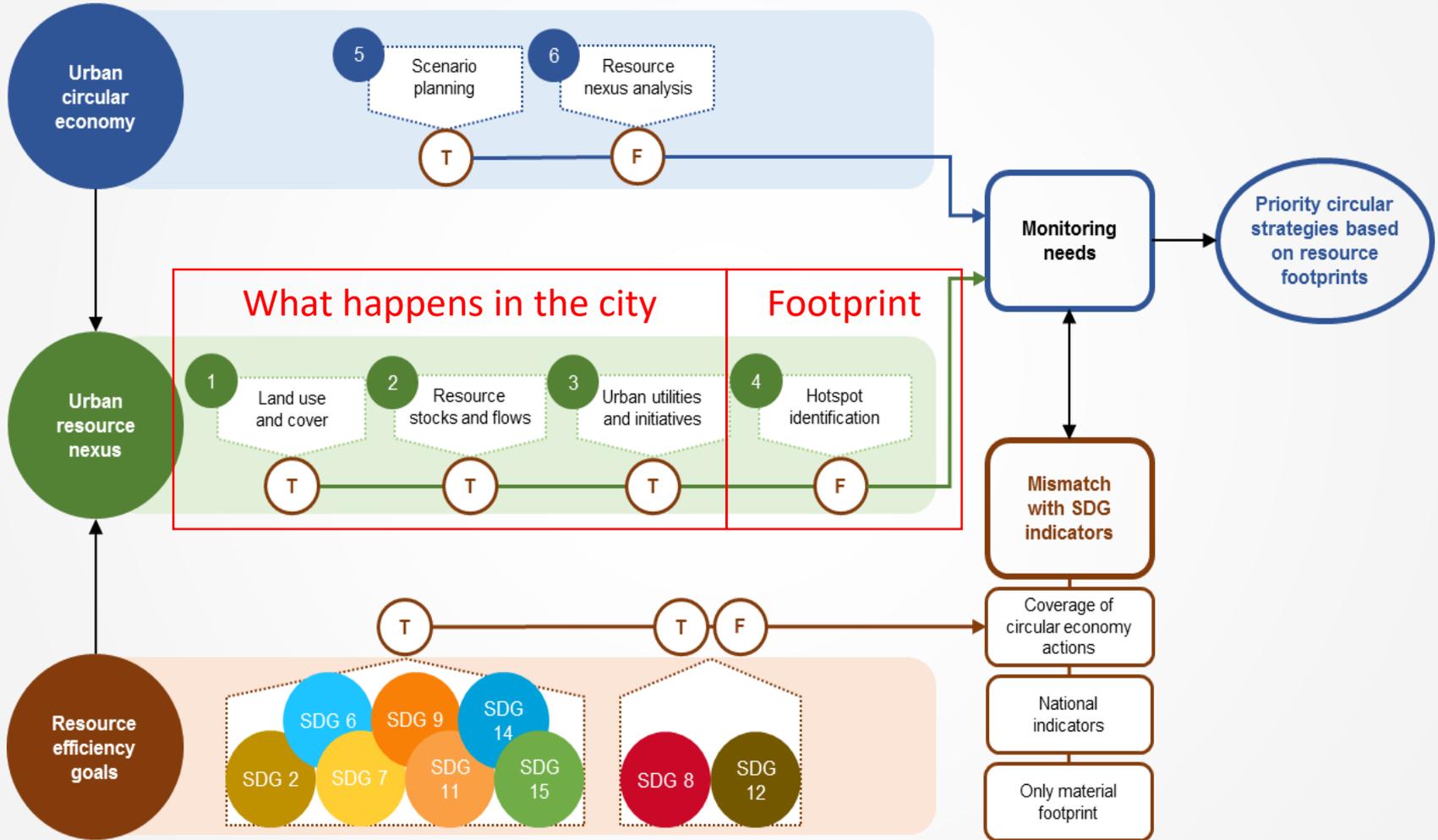


# To what extent can we use the SDG indicator framework?



Petit-Boix et al. From nexus to goals: monitoring resource circulation in cities (in preparation)

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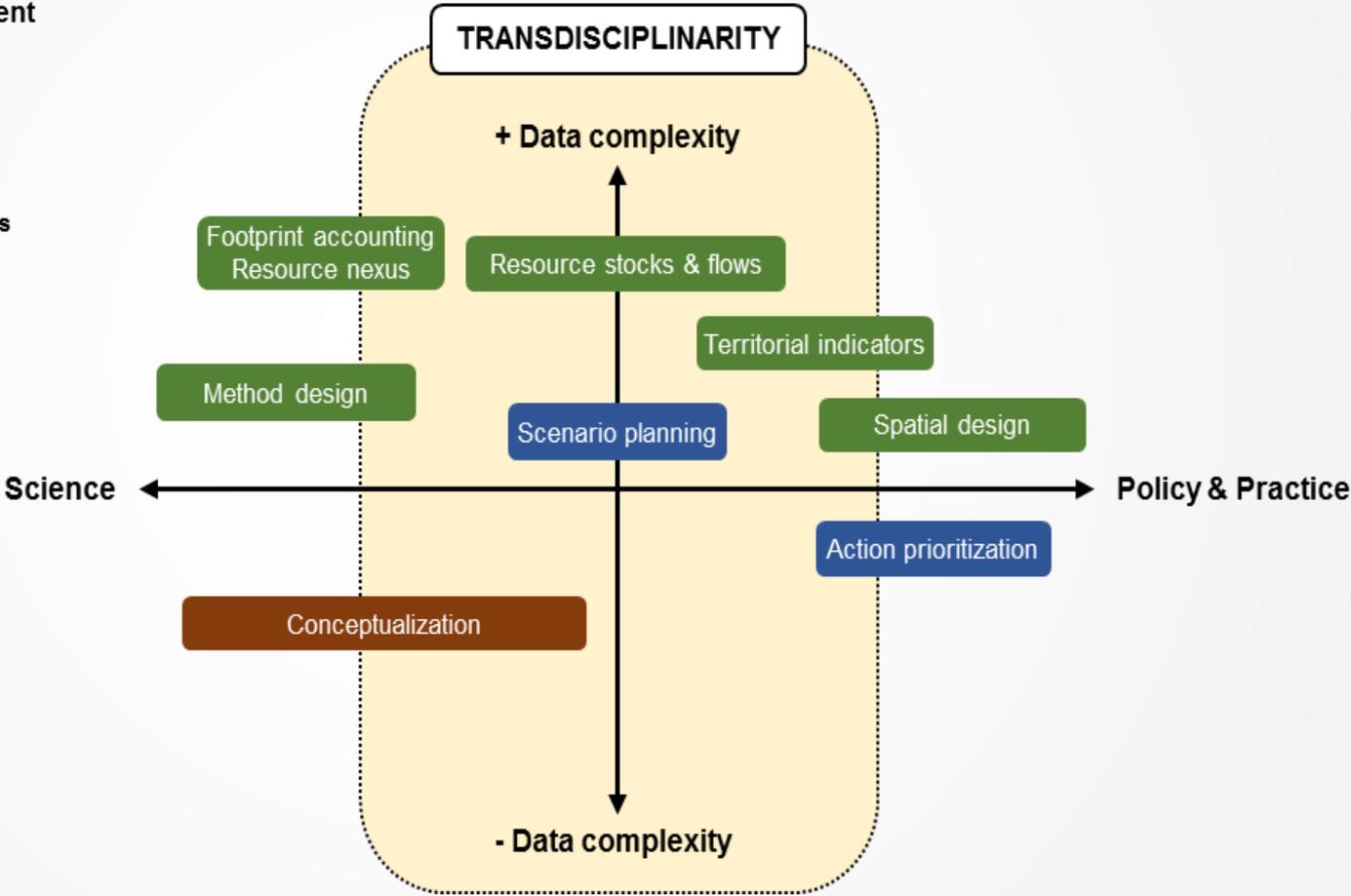


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# Need for transdisciplinary research

## Three pillars of resource-efficient transformations in cities

- Urban circular economy
- Urban resource nexus
- Resource efficiency goals



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## Take-home message

- **The large variety of circular strategies envisioned in cities call for prioritization.**
- **The SDGs could support this process, but the indicators available are insufficient to address footprint and territorial assessments.**
- **Transdisciplinarity is essential to facilitate data exchange and expert support to prioritize circular strategies aimed for specific sustainability goals.**



# Thank you! I look forward to your questions

Find out more about  
our research at  
[www.circulus-project.de](http://www.circulus-project.de)  
On twitter @SinaLeipold



**Journal of Cleaner Production**  
Available online 1 June 2018  
In Press, Accepted Manuscript — Note to users



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