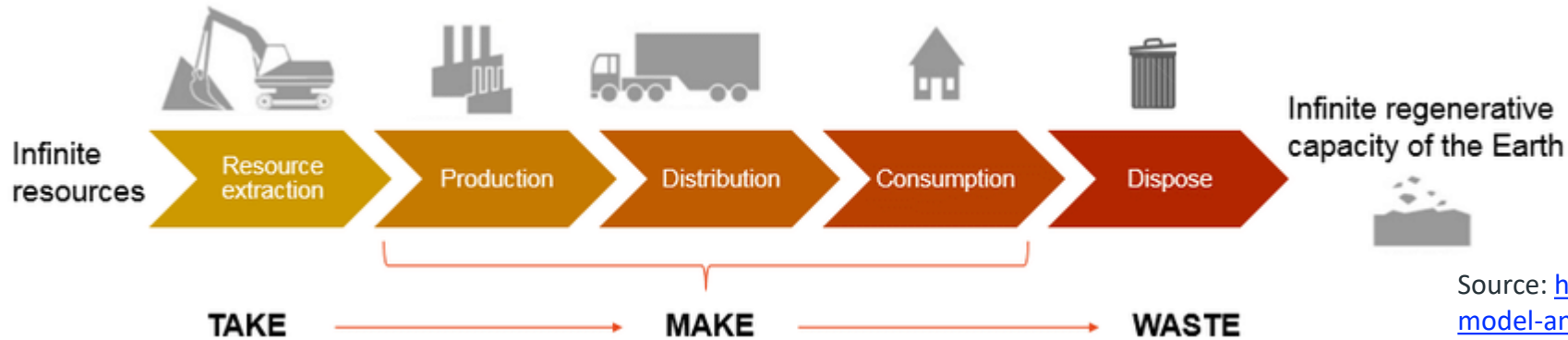


Circular cities

What is circular economy?



Source: Wautelet (2018)

Circular economy principles:

- designing out waste and pollution,
- keeping products and materials in use, and
- regenerating natural systems.

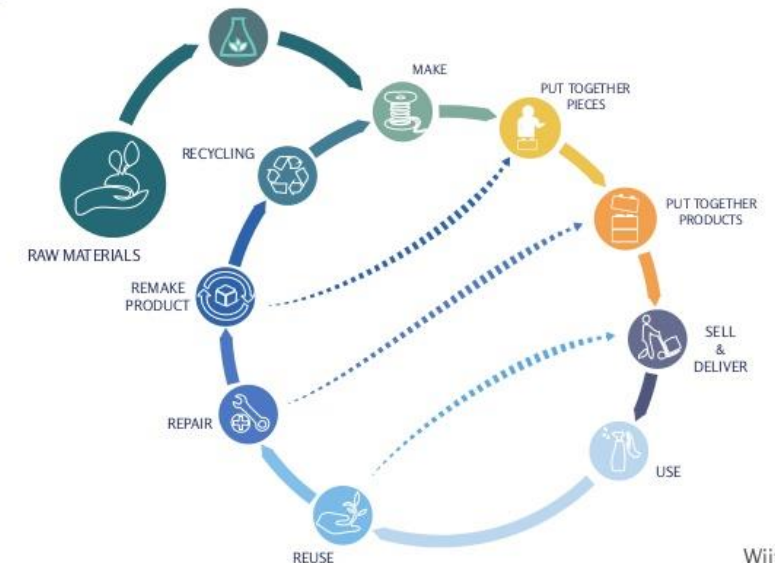
Source: <https://www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy>

Classification:

- Micro (product level); meso (symbiosis) and macro level (city or national level)
- Waste, producer, consumer

Source: <https://sisd.ae/wp-content/uploads/2018/06/business-model-and-circular-economy-4-638.jpg>

Circular economy in one scheme



Benefits of going circular

Include:

- If transport, food and construction become circular: emissions reduced with 48 % by 2030, and 85 % by 2050, compared with 2012 (Ellen MacArthur Foundation, 2015)
- Savings of around 600 billion euros through waste prevention, eco-design and reuse, aside from job creation (European Commission, 2019).

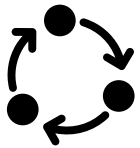
Circular cities

- Waste: 70% of the waste is generated in cities.
- Aside from waste: 75% of global material resources and 80% of global energy consumed in cities
- Political priority: climate neutral cities

But:

- What are circular cities? How to measure circular cities?
- What is the transition pathway, and what strategies can city governments apply?
- What are the social effects and impacts on sectors, people and the overall city landscape?

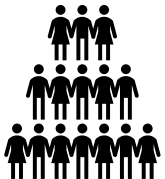
Aim of the Urban Circular Assessment Framework project: Supporting cities in becoming more circular



Co-develop an urban circularity assessment framework



Identify opportunities for recovery of resources and energy



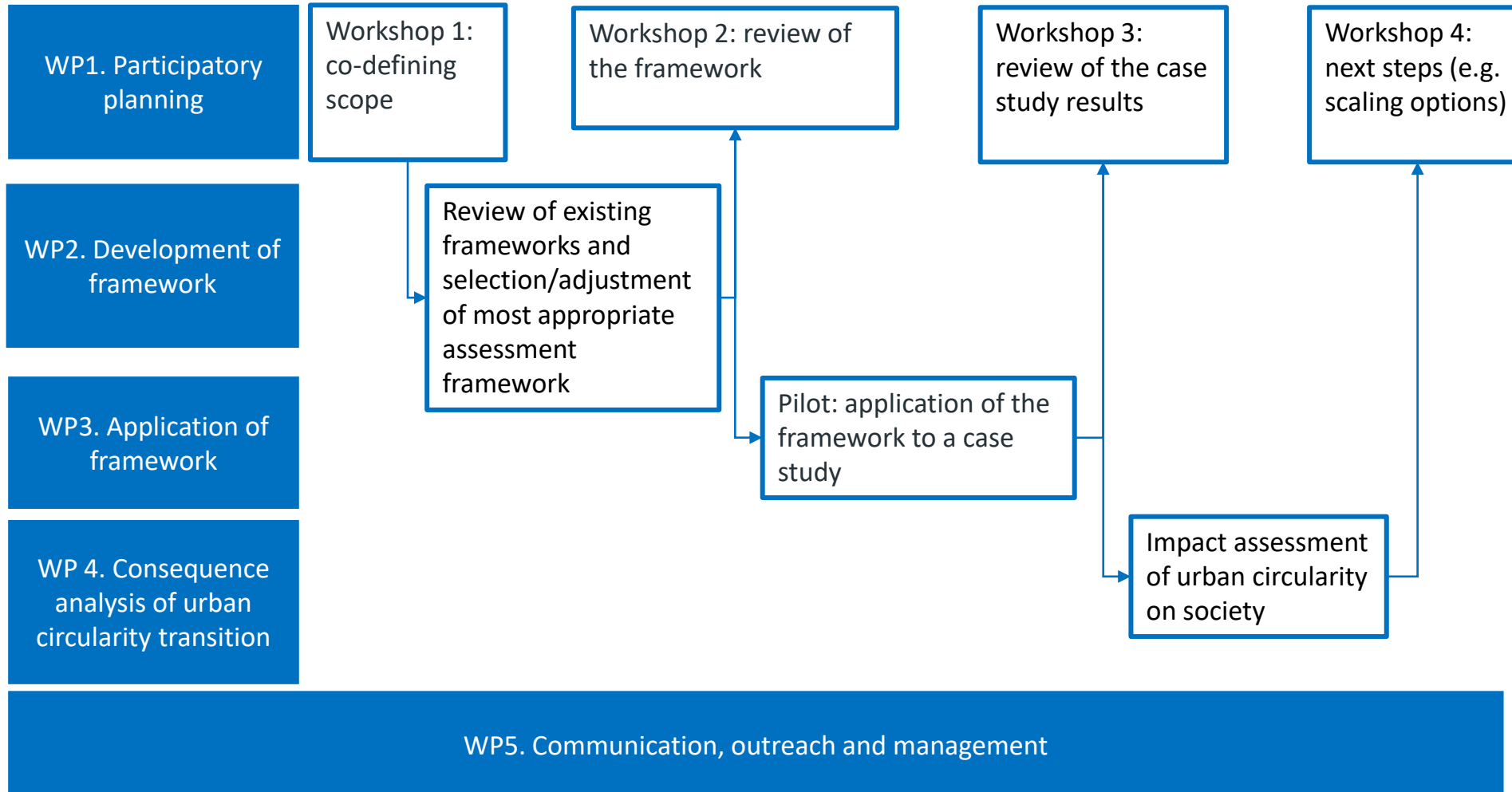
Map the impact of the transition to a circular economy for businesses, citizens and policy makers

We = SEI, KTH, Umeå kommun, Stockholm Vatten och Avfall, Ragn-Sells and WSP

Timing: 2020 to 2022

Output: An urban circularity assessment framework that is **robust, comprehensive, measurable, actionable** but also perceived as **useful and easy to use**

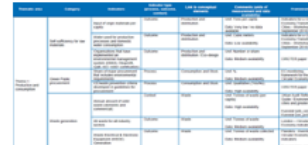
The project structure



Findings so far

Review of Urban CE Frameworks

- 16 frameworks were identified and analyzed
- 8 frameworks for monitoring at the urban level
- 8 frameworks for monitoring at the national or regional level
- 1 framework is only qualitative
- Total number of indicators: 266
- Next step: work through frameworks with all partners, shortlisting indicators and agreeing scope

General info			
Number	Name of the framework	Short summary	Image
1	Circular Economy monitoring framework (EU)	A monitoring framework for assessing circularity at EU and at national level with 10 main indicators (some divided into sub-indicators). Ten indicators grouped into four stages and aspects of the circular economy: (1) production and consumption, (2) waste management, (3) secondary raw materials and (4) competitiveness and innovation. Indicators: 1) EU-self sufficiency for raw materials 2) Green public procurement 3) Waste generation 4) Food waste 5) Overall recycling rates 6) Recycling rates for specific waste streams 7) Contribution of recycled materials to raw materials demand 8) Trade in recyclable raw materials 9) Private investments, jobs and gross value added 10) Patents.	
2	Circle City Scan tool	An online digital that give cities guidance on which focus areas to build their circular roadmaps on, and is now available for early users through a closed beta programme.	
3	Urban Agenda Framework	A framework with 30 indicators that are grouped in 4 thematic areas (1. Production and consumption, 2. Waste Management, 3. Secondary raw materials, 4. Competitiveness and Innovation) + overarching indicators. It is an expansion of the European Monitoring framework for the CE.	

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Circular city strategies

Listing cities and regions that have circular strategies

- Different focus – food, construction, E-waste, etc.
- Strategies: procurement, repair shops, digitalization
- Needs of cities: circular business models, material flow analysis, quantitative methods

Next step: supplementing with more cities, and discussing what works

Source: Petit-Boix, A., Leipold, S., 2018. Circular economy in cities: Reviewing how environmental research aligns with local practices. J. Clean. Prod. 195, 1270–1281. <https://doi.org/10.1016/j.jclepro.2018.05.281>

Table 1

Strategies applied in cities based on population size and urban systems. The number of recorded strategies is cumulative, meaning that it accounts for each time each strategy was promoted within each population range. Percentages refer to the total number of strategies.

Features of the CE strategies		Population size (number of inhabitants)							
		Total	20,000 VI	(20,000 - 50,000] VI	(50,000 - 100,000] VI	(100,000 - 250,000] VI	(250,000 - 500,000] VI	(500,000 - 1,000,000] VI	(1,000,000 - 5,000,000] VI
Number of municipalities (n)		83	5	10	6	15	9	19	15
Number of local strategies		210	6	13	6	26	22	61	53
Infrastructure (47%)	Local food production	5%					•	•	•
	Energy production, recovery and efficiency	10%		•		•	•	•	•
	Efficient waste management infrastructure	12%	•	•	•	•	•	•	•
	Green construction and materials	9%		•	•	•	•	•	•
	Water conservation and reuse	4%	•				•	•	•
	Smart IT	4%				•	•	•	•
	Green mobility	3%				•	•	•	•
Social consumption (24%)	Product repair and (waste) reuse	8%	•	•	•	•	•	•	•
	Food waste management	5%	•		•	•	•	•	•
	Sharing initiatives	4%				•	•	•	•
	Disposable products reduction	7%		•	•	•	•	•	•
Industries and businesses (22%)	Industrial symbiosis	4%	•				•	•	•
	Use of recycled materials	2%						•	•
	Remanufacturing	1%						•	•
	Product eco-design/cradle-to-cradle principles	2%				•		•	•
	Material, nutrient and energy recovery	2%					•	•	•
	Upgraded technologies	2%					•	•	•
	Waste/product reuse and cascading	6%		•			•	•	•
	Green procurement	3%		•		•	•	•	•
Urban planning (8%)	Land occupation and zoning	4%		•		•		•	•
	Sustainable planning	4%	•				•	•	•

Circular Economy project portfolio at SEI



REVAMP

Resource Value Mapping (REVAMP) helps city planners estimate resources and reuse potential in a city's wastewater and their financial values.



StratKIT

StratKIT aims to develop the agenda of Green Public Procurements in the Baltic Sea region, circular economy and social cohesion.



ReME

Rethink my Equipment (ReME) - Driving behavioral change to more sustainable consumption and production through reuse of existing products.



UrbanCircle

Urban waste into circular economy benefits (UrbanCircle) is developing a way to integrate waste management and resource recovery into a circular economy.



BONUS RETURN

BONUS RETURN – reducing emissions by turning nutrients and carbon into benefits. The project focuses on turning waste into circular solutions for the Baltic Sea



ENHANCE

EMAS as a Nest to Help and Nurture Circular Economy (ENHANCE) improves implementation of regional policy instruments to increase resource efficiency.



Urban Circularity Assessment Framework

This project provides cities with an adjustable framework to assess their level and potential for circularity.



CircPro

Smart Circular Procurement (CircPro) promotes the transition to a more circular economy by increasing the implementation of circular procurements.



Towards a Nordic-Baltic circular textile system

This new project analyses post-consumer textile waste in the Baltics for policy recommendations and sector development.



PEGaSus

Phosphorus management in pigs and poultry in the EU (PEGaSus) bridges gaps in the phosphorus value chain.