



Baseline Studies: Tartu, Riga, Kavala, Barcelona

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Train the Trainer (Success Factors for URCs) Part 1
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1. Construction and Demolition Wastes (CDWs)

- Most significant streams in terms of volume (**340 million tons**).
- **Priority waste stream** of EU Circular Economy (CE) Action Plan (EC, 2015).
- **70%** target recovery of CDWs by 2020.



2. Centres for Urban Resources, Reuse, and Remanufacture (CURE+)



- Promote and design **urban CE practices** to track, trace, reduce, reuse, repair, remanufacture, and upcycle household-related CDW.



- Develop **tailored-made solutions with local stakeholders** such as cities/municipalities, businesses, and universities while putting citizens at the forefront of this initiative.



- Focuses on **4 European cities** (2 in Baltic region, 2 in Southern Europe).



- Funded by the **European Climate Initiative (EUKI)**.

3. Methods



- **City Reports and Documents**
- **Interviews** with different stakeholders from:
 - Recycling plants
 - Waste management companies
 - Landfill plants
 - Municipality/City Representatives
 - Private (CE) companies
 - Universities
 - NGOs focusing on CEs, creative designs
 - Neighborhood associations



- **Validation Workshops** (in Barcelona October 2023)



- **Information:** CDW streams, Circular Strategies in CDWs, Barriers and enablers for CDW management -> Possible Design of URCs in each city.

4. Four European Cities

Riga Latvia

- Capital and largest city of Latvia.
- Total added value of **construction sector is 7.6% (2020)**.
- **Construction** is the 6th largest industry, around **98% of CDW** is recovered (Statista, 2023; Ec.Europa.Eu).
- Around **20,000 m³ of household CDWs** being collected per year.

Barcelona Spain

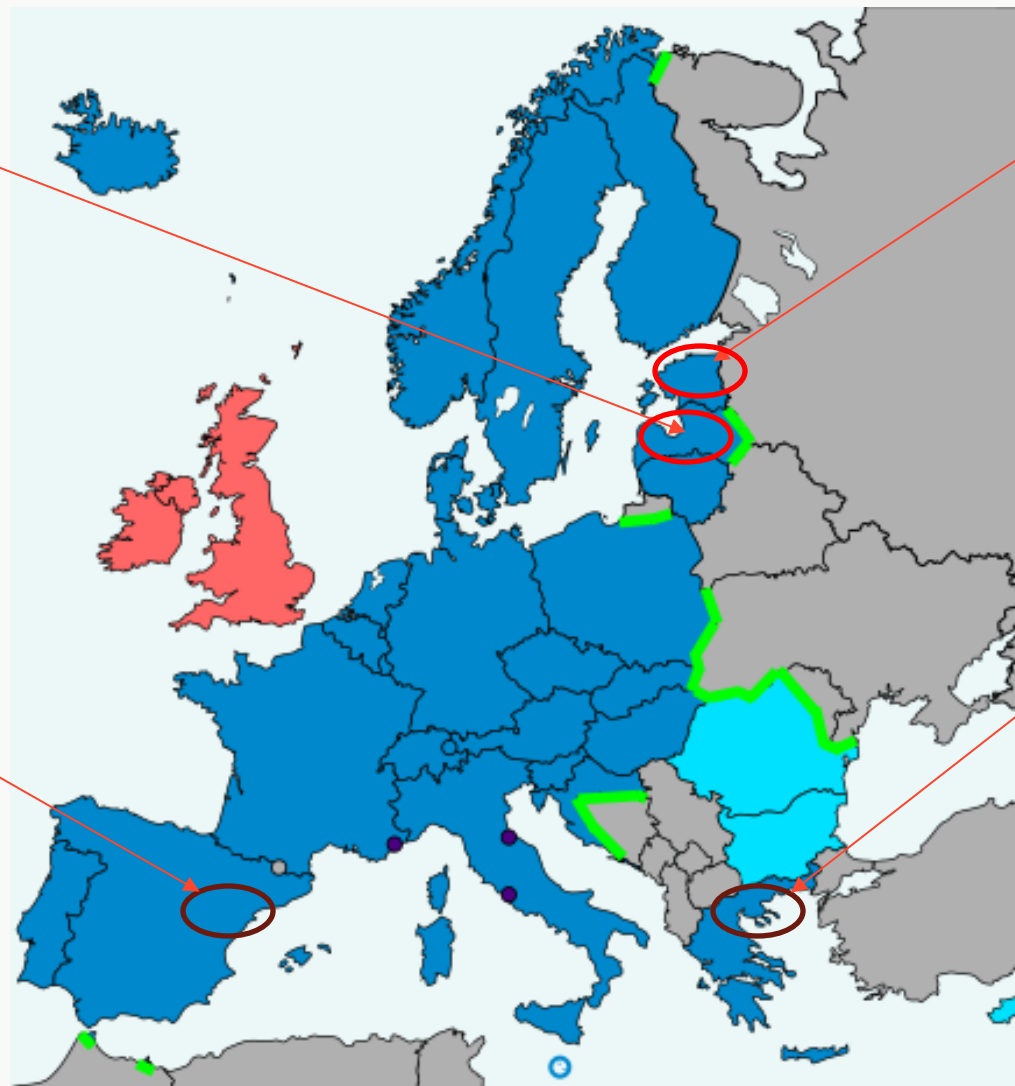
- Capital and the largest city of Catalonia.
- Considered as one of the **“Greenest cities in Europe”**.
- Around **31.34 million tons/year of CDW** are generated.
- **0.74 tonnes of CDW/inhabitant per year**.

Tartu Estonia

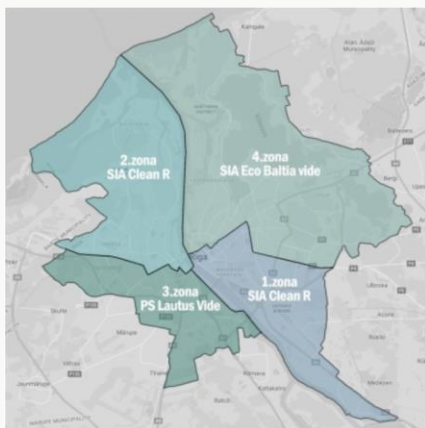
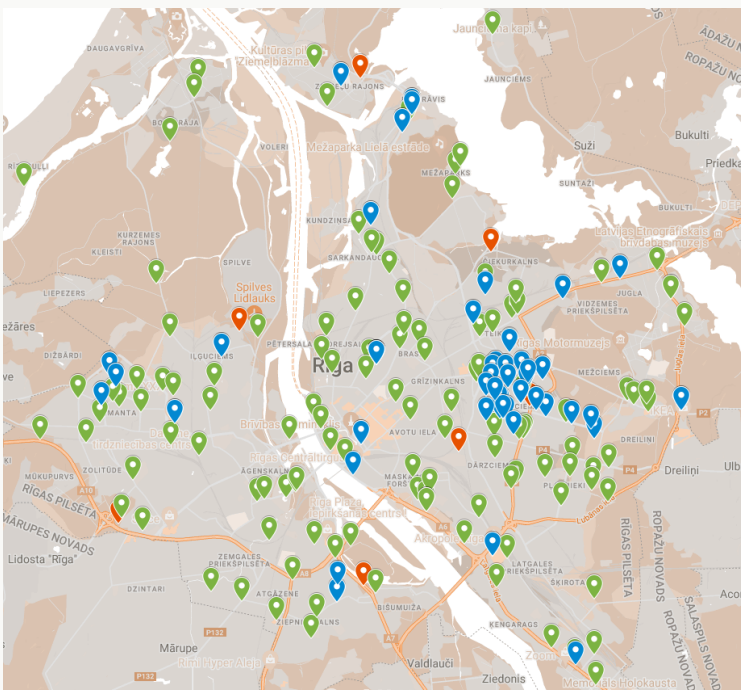
- **Intellectual capital** of Estonia.
- An average of **343,793 t/year of waste** was collected (in the last decade).
- **9%** of collected waste from households.
- CDWs accounts for **57% of collected waste (1M tons)**.

Kavala Greece

- Kavala - coastal municipality between E. Macedonia and Thrace region.
- An earthquake prone area.
- Significant number of **buildings in bad condition**.
- Several **small-scale renovations** due to booming tourism.

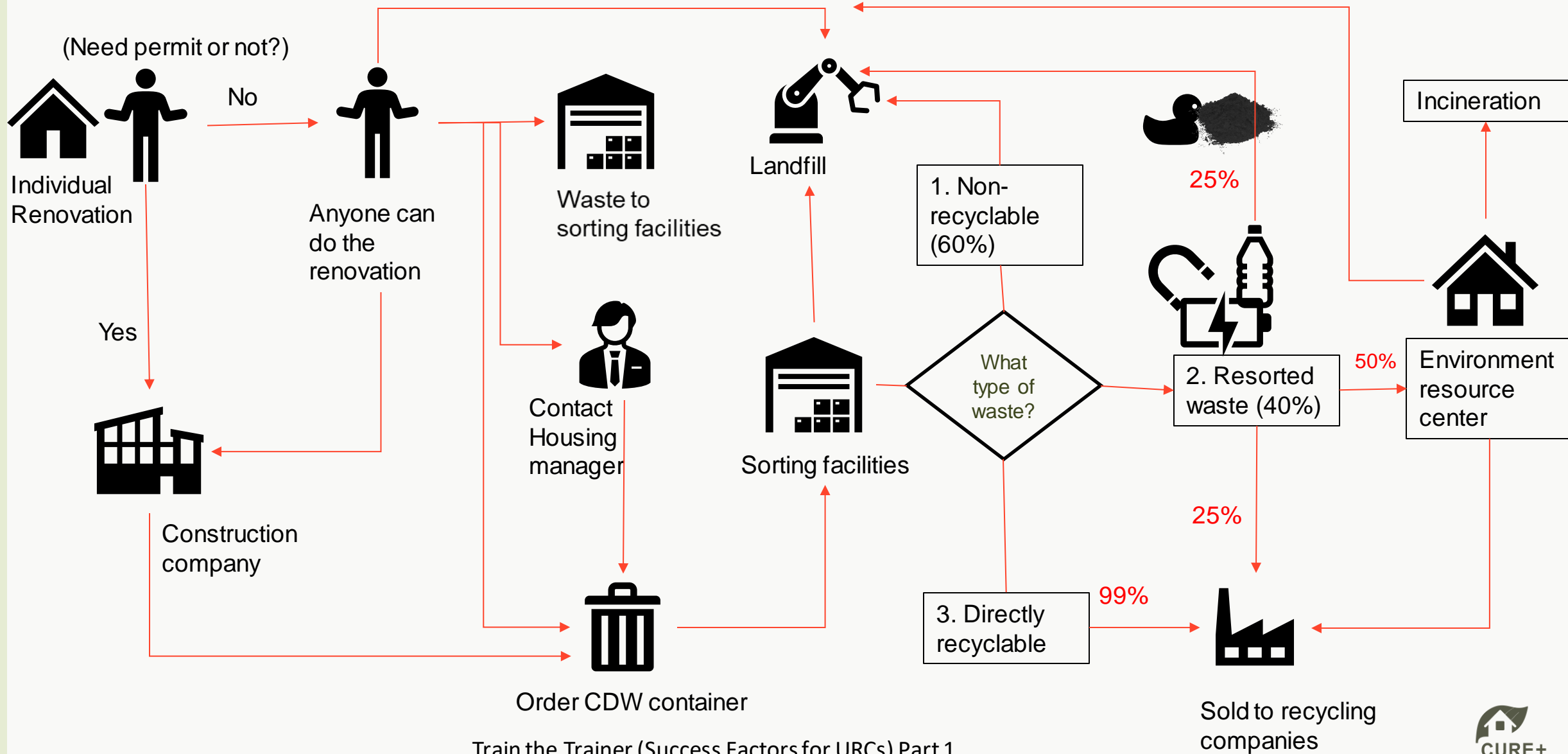


Riga



- **Free waste sorting** at home – plastic, paper, glass, metal (mandatory for houses with 10+ apartments)
- If the **pollution in the sorted waste is $\geq 20\%$** (meaning - incorrectly sorted waste), the **residents must pay** for this contaminated container in the same way as for unsorted waste
- Biowaste sorting is 40 % cheaper than unsorted waste
- Free waste sorting points in many places across the city:
 - **Textile**
 - **Paper, plastic, glass**
 - **Hazardous waste**
- 3 waste management companies serving **4 city zones**

4.1 Results of Baseline Studies (Riga)



(Innovative) Practices and Experiments

Downcycling – common practice in Riga. For example, bricks, concrete, tiles, asphalt, stones, and ceramics are used for road making. Clean bricks and soils for garden.



1. Recycling of Materials

- Sorted clean mix – directly sold to next customers & metal companies.
- CDWs with contamination of plastics -> Plastic Recycling facilities.



2. Exchange Points & Building Usage

- There is a room or space for materials where people can take, share, and leave their own materials (Free Riga).



3. Waste sorting centers + Waste separation technologies

- Around 2 waste sorting centers run by waste management companies (target of 8 in the coming years).
- There are companies that focus on sorting and separation of wastes for further recycling/reuse.



4. CleanR App

- An app where household can register to request the collection of their wastes, within the waste management zone service by CleanR.

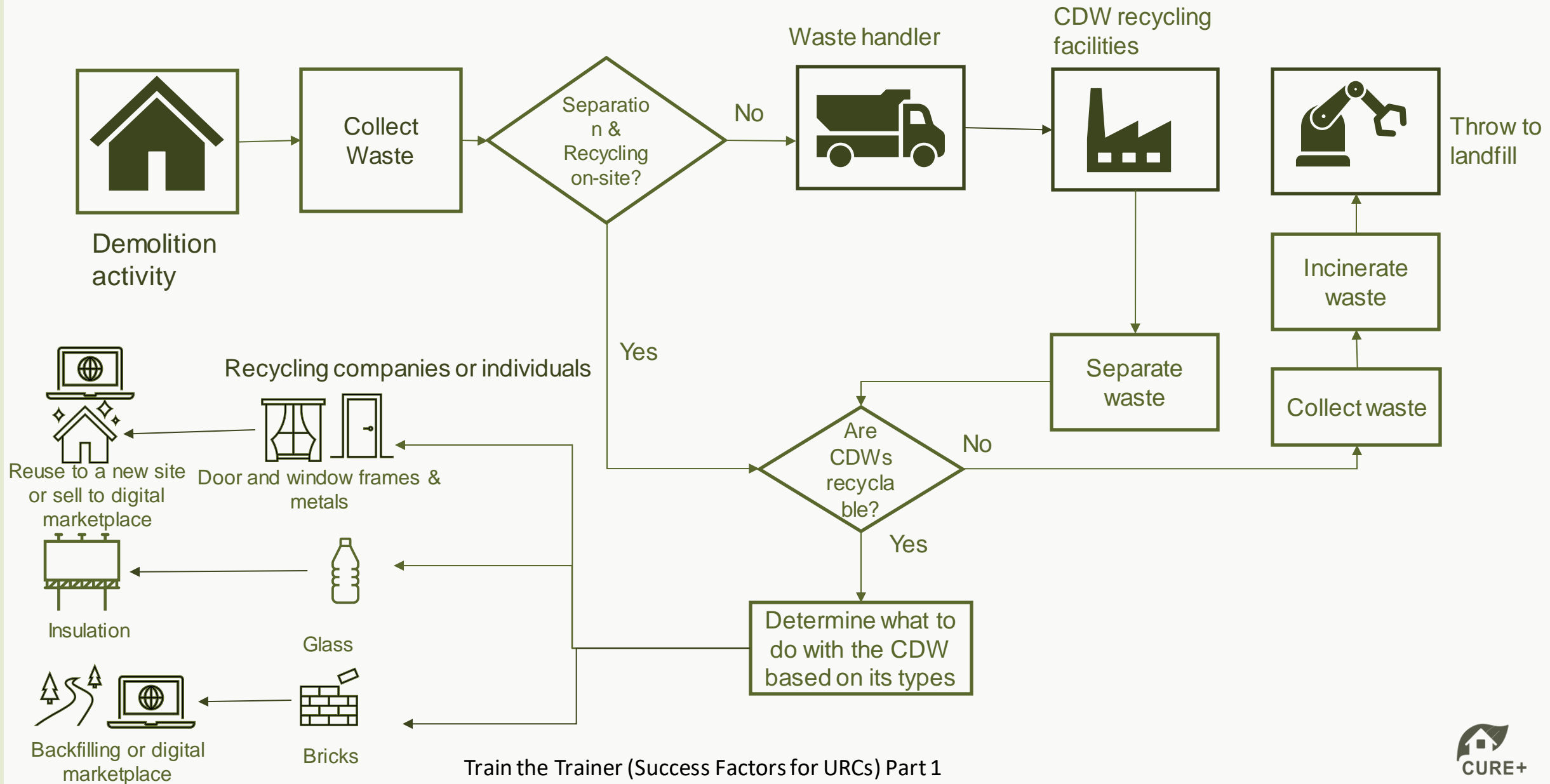
Tartu

- **Tartu's Waste Management plan:**

1. To prevent and reduce the generation of waste, including reducing the hazard of waste
2. To recycle waste or otherwise reuse it at the maximum level
3. To reduce the environmental risk arising from waste, by enhancing, among other things, monitoring and supervision

- **Polluter pays" principle** - primary waste holder bears the costs associated with waste management
- **Demolition permit** – at state (not local level)

4.2 Results of Baseline Studies (Tartu)



(Innovative) Practices and Experiments

Downcycling – common practice in Tartu. A large part of CDWs is used in soil fill and road construction.



1. Upcycling Materials

- High level valorization: ashes -> climate positive calcium carbonate to be used for white paints, white window frames, floor carpets, and other floor materials.



2. Green points or collection point

- Drop-off points for collected household wastes



3. Exchange platforms

- E.g. Materjalivoog.ee – a digital exchange platform that facilitates selling leftover and second-hand goods.



4. Repair Café/ Basement

- There are some repair shops that empower individuals to fix their own valuables and goods that they use at home.



5. “(Wo)men’s shed” movement

- Association of men and women (usually on their 40s, 50s, and 60s) who try to find purpose in their life by building something out of second hand or waste materials while at the same time socializing with each other.

Kavala

Integrated Action Plan (IAP)

- Based on 4 pillars (Human Resources, Methods and Infrastructures, Governance, Material & Natural Resources)
- Guide in formulating action points as part of the vision and strategies of Kavala in enhancing circularity in CDW management:



(1) Elaborate **guidelines for reusing recovered CDWs** products as raw materials, e.g., as raw materials for municipal projects;



(2) Achieve **stakeholder engagement and enhance knowledge on circularity**, particularly on construction and demolition materials;



(3) Demonstrate project on **selective demolition and source separation**;



(4) Pilot **CE standardization of recovered materials** from municipal project;

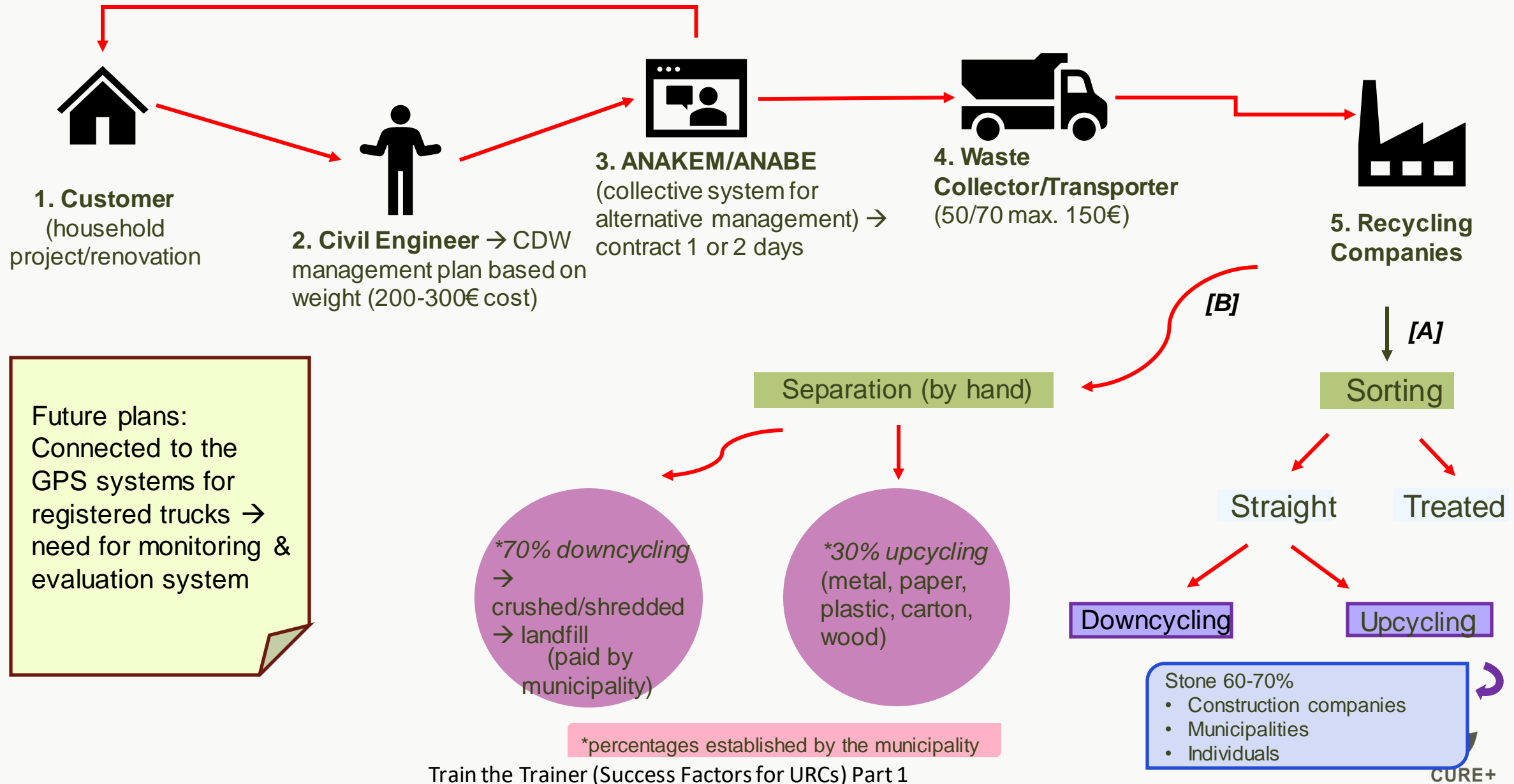


(5) **Integrated bulky waste management system**;



(6) Application of **green procurement** tendering guidelines in municipal projects

4.3 Results of Baseline Studies (Kavala)



(Innovative) Practices and Experiments



1. Recycling of Materials

- Asphalt and stones are produced as secondary materials.
- Smaller stones, woods, and other materials -> road industry & regenerating materials.
- Stones from Kavala – used as high quality sub-based material for concrete, asphalt mixtures
- Old Town of Kavala -> renovated using the same materials



2. Selective Demolition

- Contractors are present to save some valuable construction materials, before demolishing.

Barcelona

- Regions of Catalonia, in which Barcelona belongs, and the Basque Country, are considered **leaders in CDW management**
 1. **Generalitat de Catalunya** is the expert when it comes to administration
 2. **Waste Agency of Catalonia** (*Agencia de Residuos de Cataluña*)
 3. **City Councils of Barcelona**



A.) *Article 67-15 Management of debris by means of containers up to 1 m³*



B.) *Article 67.3 Management of debris*

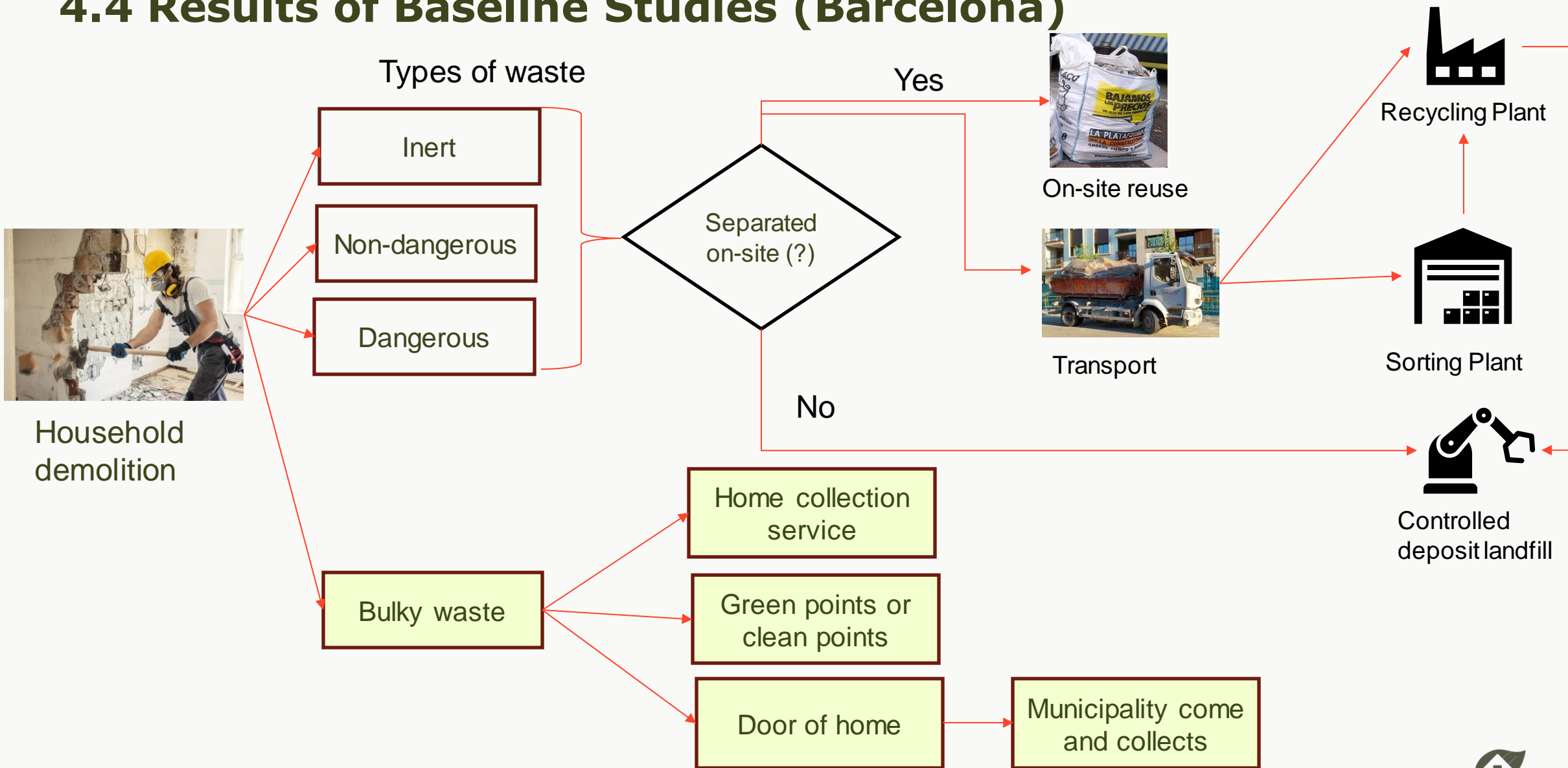


C.) *Landfill fees*



D.) *Dumping of bulky waste*

4.4 Results of Baseline Studies (Barcelona)



(Innovative) Practices and Experiments



1. Recycling of Materials



- Rubble recycling plants – focuses on recycling aggregates -> use for construction of civil works, foundations for roads or paths, and are also widely used in public works

2. Neighborhood Greenpoints



- Municipal centres for the selective reception and storage of municipal waste.
- There are multiple Green points in Barcelona city.

3. Inclusion of Developer in CDW Management



- Developer is now involved in the management of CDW in the beginning phase.

4. Presence of many initiatives (including 'URC' Types)



- Reuse centers, prototyping hubs, working space for repair and creative ideas, recycling center w/ second-hand shop, environmental and social activities.
- Banc de Recursus, Donation Project, Villadecans Collection Point, Ateneu dela Fabrica del Sol, Transfolab, Troc Shop, @22

Barriers and Enablers for CDW management

Barriers	Riga	Tartu	Kavala	Barcelona
1. Low reputation of 2 nd hand item/waste (Mindset) OR market is lacking or does not exist.	X	X	X	X
2. Lack of awareness that 2 nd hand items exists.		X		
3. Illegal dumping/improper disposal of (bulky) waste.	X	X	X	X
4. Unviable business model (high upcycling costs, costs of recovering wastes is very high).	X	X	X	X
5. Some CDWs are not separated on site.	X	X		
6. Not enough amount of CDWs for upcycling.	X	X	X	X
7. High logistics costs.	X			
8. CDW workers do not speak the language.	X			

Barriers and Enablers for CDW management

Barriers	Riga	Tartu	Kavala	Barcelona
10. National discussions on waste incineration with energy recovery.	X			
11. Waste trafficking.		X		
12. Landfill capacity getting limited.	X			
13. Partial or lack of legislative framework & not translated to local situations.			X	
14. Weak regulatory enforcements.			X	
15. Lack of regulation (or certification bodies) on the quality of materials.			X	
16. Lack of data on materials (old buildings & waste streams).			X	

Barriers and **Enablers** for CDW management

Barriers	Riga	Tartu	Kavala	Barcelona
1. Government subsidies for second-hand material or recycling.	X			X
2. Penalty system (Increase in landfilling gate fee, strict fining).	X		X	
3. Green procurement.	X			
4. Legislative measures for CDW management (5% recycling of aggregate or traceability).				X
5. Mandatory waste sorting.	X			
6. Systematic way of organizing CDW transport by municipality.			X	
7. Green points/Public points (plan or already there).	X	X	X	X
8. Presence of separation technology company, multiple CDW recycling plants.	X			X
9. Possible niche markets (or economy) or interests on construction leftovers.	X	X		

Barriers and **Enablers** for CDW management

Barriers	Riga	Tartu	Kavala	Barcelona
10. Sustainable financing of the banks.	X			
11. Educational centers (from Landfills)	X			
12. Recycling opportunities in landfill.		X		
13. Involvement of local engineers (or developer) before demolition happens (for selective demolition).			X	X
14. Presence of many CE initiatives, start-ups businesses.	X	X	X	X
15. Strong Social media/ marketplace community/digital platforms for CDW management.	X	X	X	X
16. Presence of certification bodies (for quality) and criteria (for level of use).		X		X
17. Community's willingness to pay for an idea of URC.	X			
18. Sorting containers for households are free.	X			

Organizing an Urban Resource Center



- 1. Purpose**
- 2. Stakeholders**
- 3. Ownership or governance**
- 4. Customers of CDW**
- 5. Operation in short- and long-term**

Idea of Urban Resource Center

CITIES	PURPOSE (OPERATION)	OWNERSHIP/ (INITIAL?)	STAKEHOLDERS
1. Riga	<ul style="list-style-type: none"> • Exchange point for construction materials, tools and items; • Creative design shop or upcycling station; • Neighborhood collection and sorting point; • CDW supplier for waste companies 	Municipality	Citizens, Municipality, Creative designers/NGOs, Waste management companies
2. Tartu	<ul style="list-style-type: none"> • Repair shop • Collection point • Marketplace • Social Hub 	Municipality	Citizens, Municipality, Men Shed's members, Universities, Repair cafes, Creative artists
3. Kavala	<ul style="list-style-type: none"> • Digital platform for exchange, delivery, or transfer of waste • Collection and pick-up point (physical location) • Capacity building and raising awareness/knowledge hub 	Municipality	Citizens, Municipality, University and Engineers, NGOs and Neighborhood associations
4. Spain	<ul style="list-style-type: none"> • Use of platform and creativity or innovation • Hub for technical designs (workshops, trainings) 	Elisava (Research Institute)	Students, Teachers, Citizens, Businesses, Subsidy providers

Business Model (How could these URCs operate in short- and long-term?)

Cities	How to sustain operation?
1. Riga	<ul style="list-style-type: none"> • Will charge small fees (or on a donation basis) to its members or citizens • Members make items that could be sold for a price, e.g., to circular store • Supply CDWs to a company • Larger scale collection points hold bazaars¹ • Set-up collaborations with other stakeholders (to share costs of running URC)
2. Tartu	<ul style="list-style-type: none"> • Fixed price or rent for repair cafes. • Sell good quality collected second-hand or recycled items or upcycle and sell to individuals and businesses. • Membership fee for free access to workshops, creative sessions, or training. • Members make items that could be sold for a price, e.g., to circular store

Business Model (How could these URCs operate in short- and long-term?)

Cities	How to sustain operation?
3. Kavala	<ul style="list-style-type: none"> • Collect small donations to members or citizens for organized workshops, creative sessions, or trainings • Grant applications • Members make items that could be sold for a price, e.g., to circular store • Raising funds via "income generating activities" such as organizing bazaars (e.g. quarterly, bi-yearly, or yearly) and festivals. • Use of storytelling (social aspects) when supplying upcycled CDWs to businesses or companies selling hand-crafted items to tourists, locals, etc.
4. Spain	<ul style="list-style-type: none"> • The operations within the URCs are part of school activities and therefore will not require costs. • Linking URC activities to various grant applications will help in the continuous existence of the project. • Catalog of inventories that will be offered to companies, could become a source of income generating activity once the supply gets established.