Construction Demolition Waste (CDW)
Bringing Buildings into the Circular Economy

Rome Cluster cooperation proposal for ASEAN Cities

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CINDERELA

CONDEREFF Interreg Europe

European Union European Regional Development Fund

DESIGNING CIRCULAR CITIES IN MALAYSIA

WEBINAR 29 June 2020

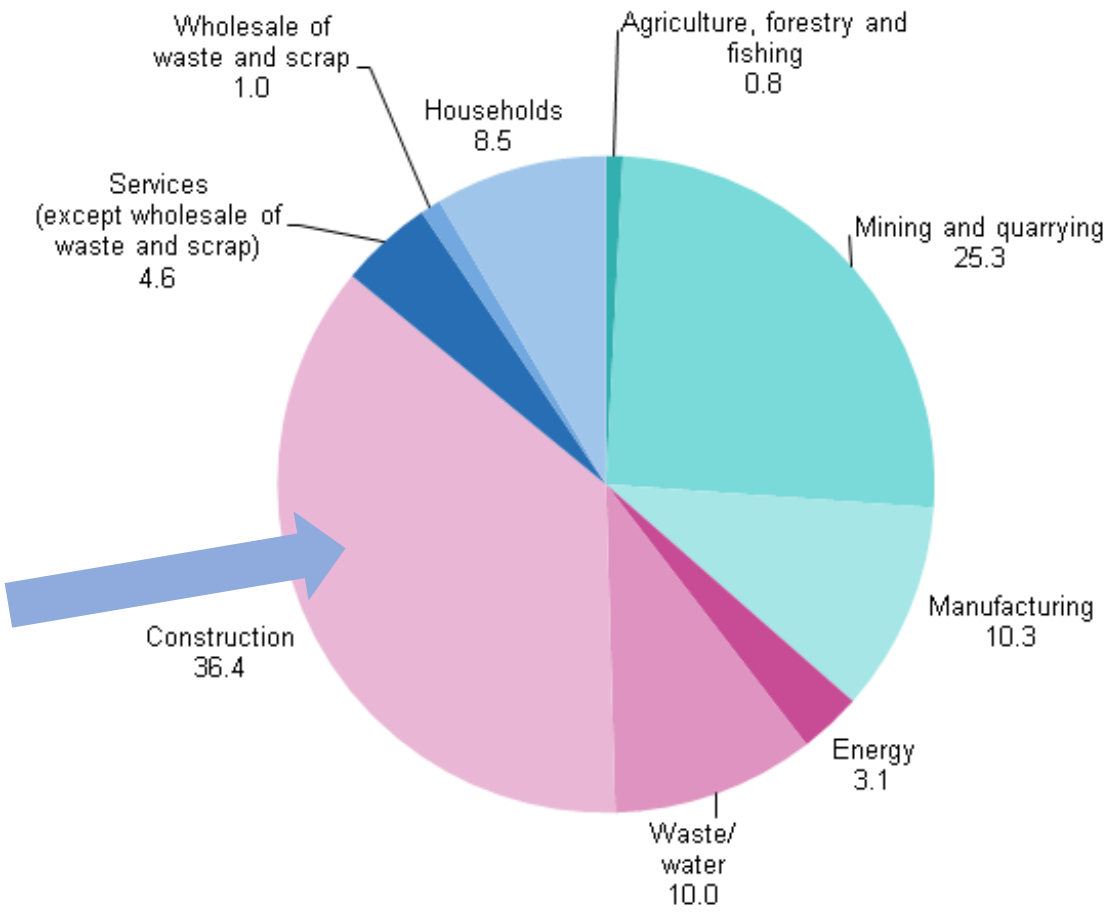
Some data on CDW

- Construction and demolition: 1/3 of all waste
- Buildings are responsible for 1/3 of **global greenhouse gas emissions**, with much of their life cycle impacts coming from materials sources and supply chains.

<u>In EUROPE</u>

- CDW was 374 million tonnes in the EU in 2016, excluding excavated soil
- EU countries are on track to meet the 70 % recovery target of 2030 with most countries already exceeding the target

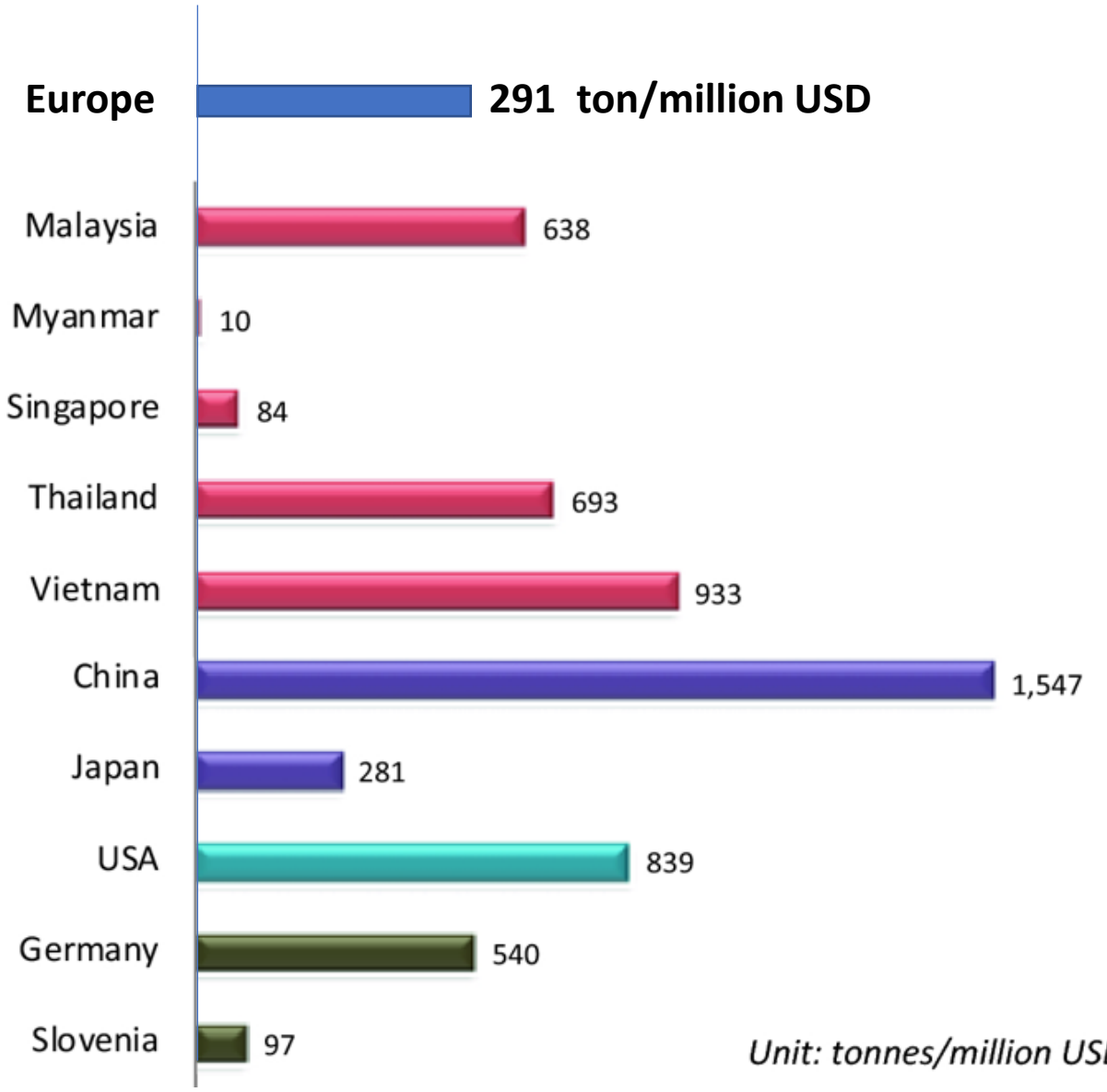
Waste generation by economic activities and households, EU-28, 2016
(%)

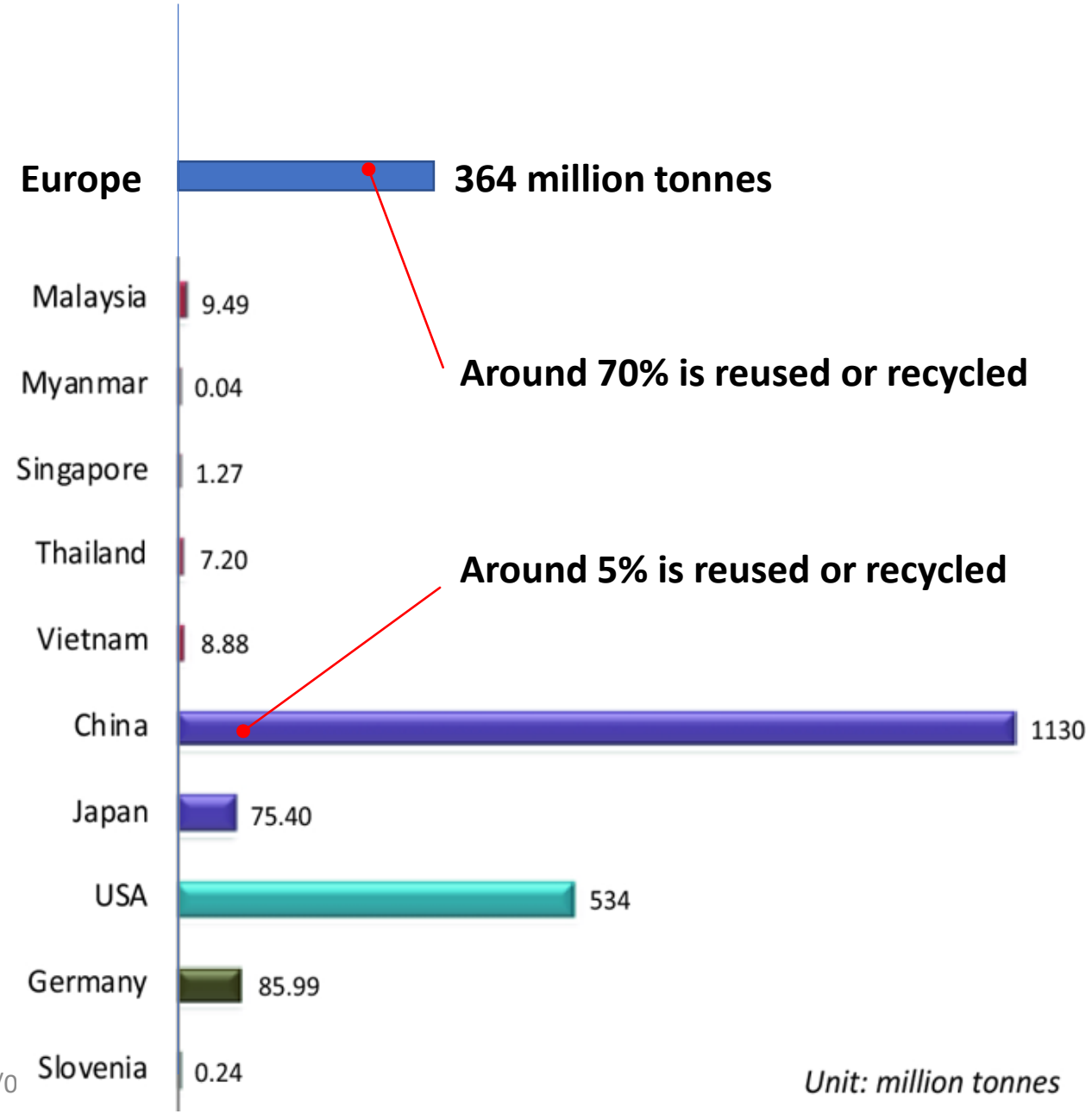


Source: Eurostat (online data code: env_wasgen)

eurostat

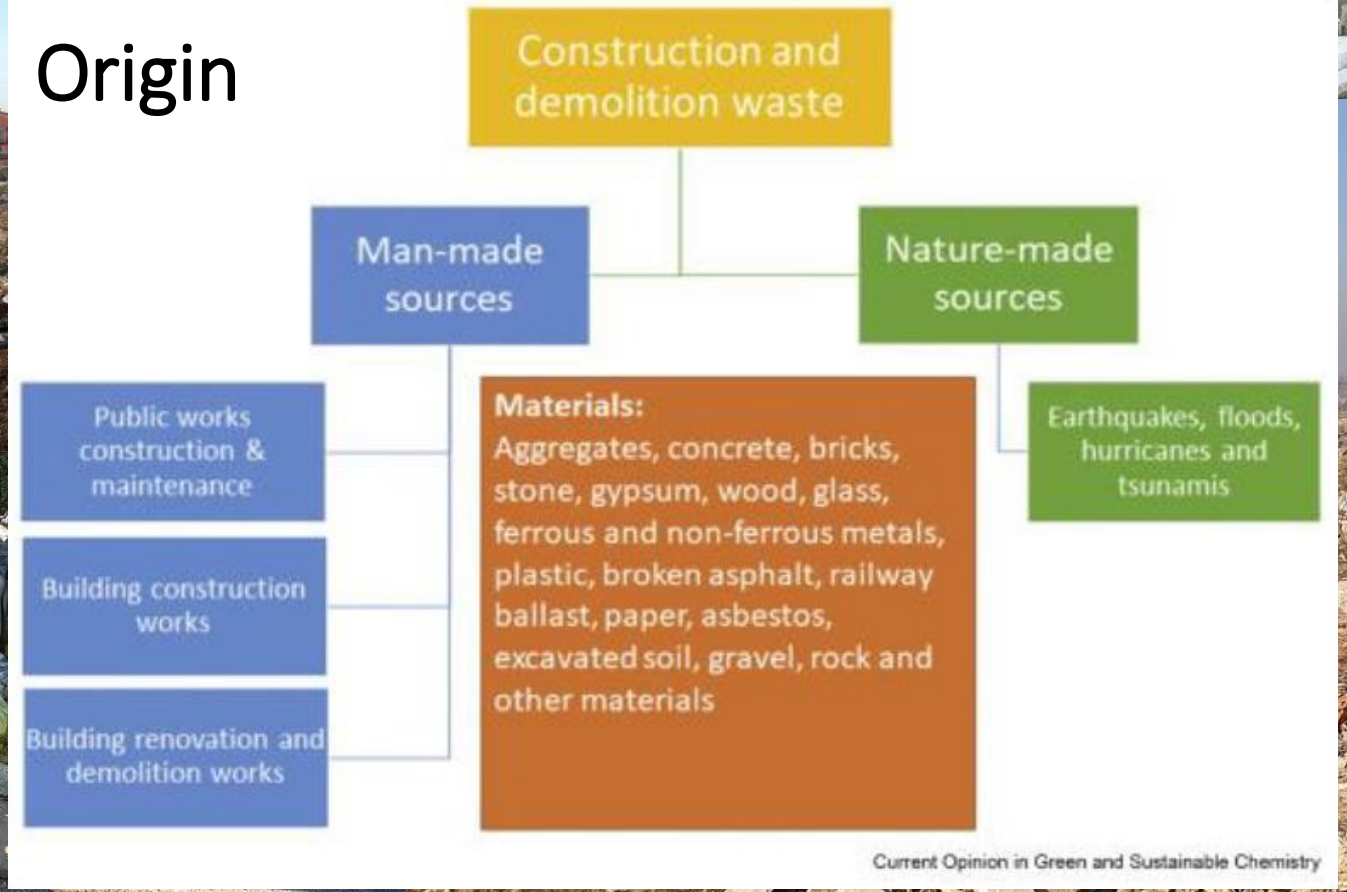
Some data on CDW





Most of the CDW in the world is LOST

Origin



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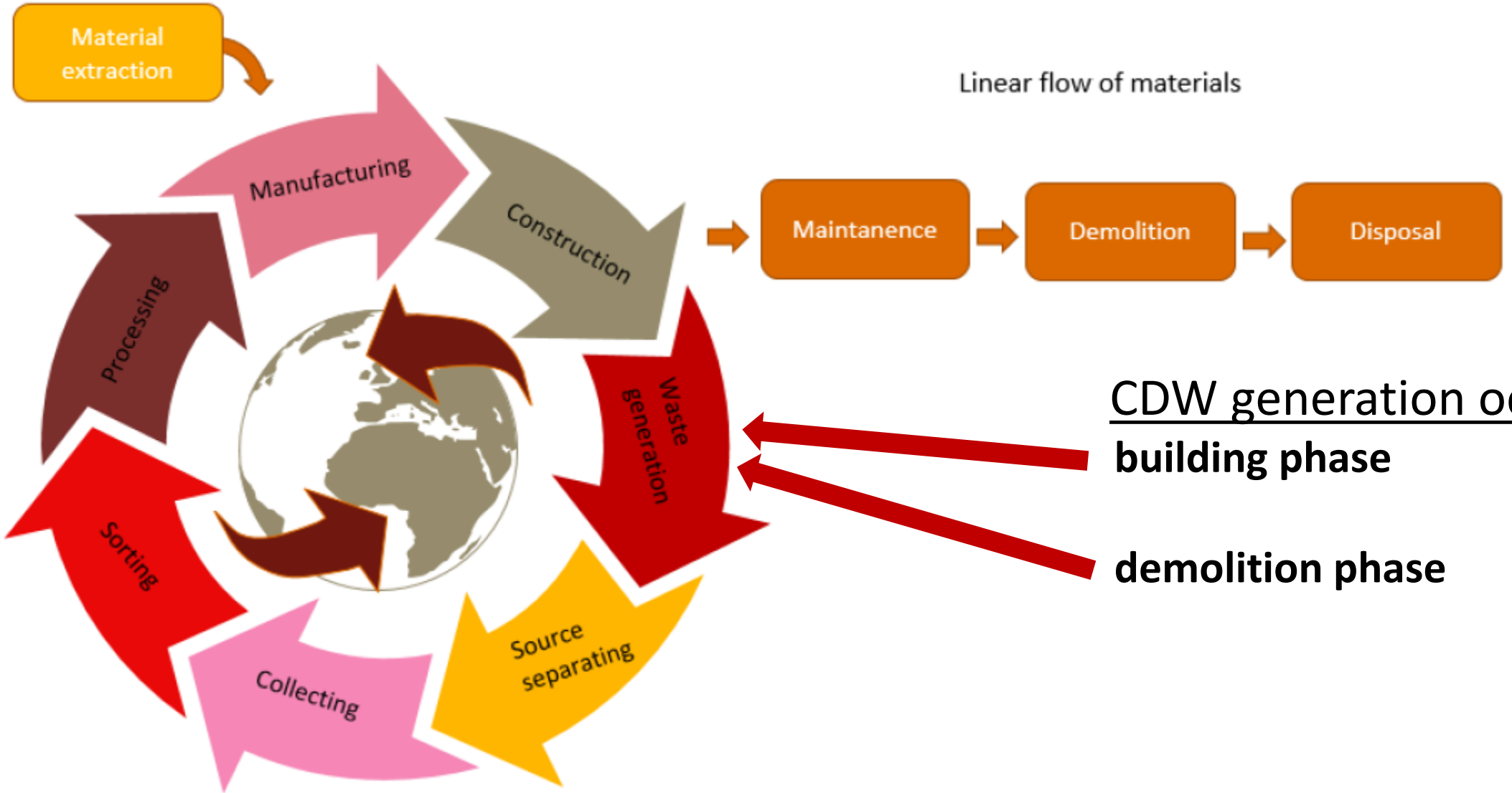

CDW generation occurs in

building phase

demolition phase

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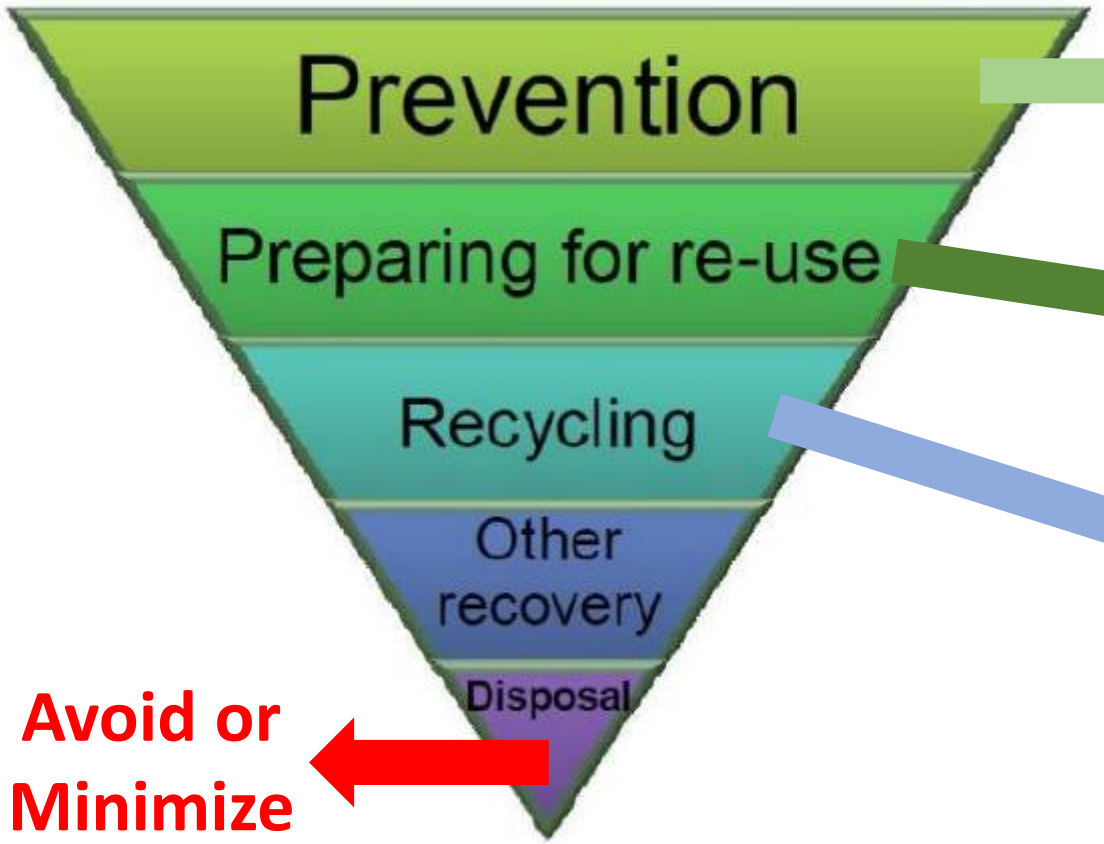


Avoid or Minimize Disposal

C&D Waste Reduction

SAPIENZA R&D Projects on Circular NZEB Buildings

CONDEREFF Interreg Europe

On-site Reuse solutions & Policies

CINDERELA

Secondary Raw Materials Market

Innovative recycling technologies and plants:

PPP for Competences & Investments

Joint International Research activities

Type of Policies addressing recycling of CDW

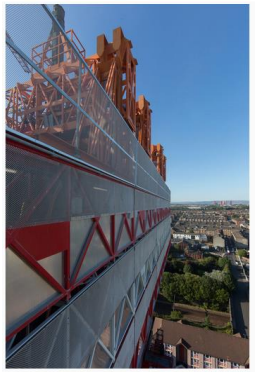
Research on new drivers to stimulate the demand for recycled aggregates offering a higher added-value.

Green Public Procurement (GPP) is definitely a driver as the incorporation of recycled aggregates and other circular values in public procurement could

- impact positively the demand, and
- foster efficient management of construction and demolition waste

	Rhône-Alpes	Lazio	Steiermark	Sachsen-Anhalt
Financial incentives (such as discounts or price incentives for companies to bring in clean, separated waste)				
Business support for local SMEs				
Regulation on the treatment and collection of mineral C&D waste				
Skills training for C&D waste management employees				
Awareness raising				
High landfill taxes and gate fees (to promote demand for recycled C&D waste)				
Government involvement in facility development/operation				
Promotion of technologies that ensure high quality of C&D waste				

Circular Buildings – Some Pilots



Demo 1 : Large Buildings Selective Demolition in urban center

The Tour UAP in Lyon had to be demolished and replaced with a taller, more technological skyscraper. Two towers in Glasgow were dismantled without use of explosives. In just three months the towers had disappeared. The Italian company Despe won twice the prestigious 'World Demolition Awards' performing these demolition safely, swiftly and with 95% of recycled materials.

Demo 2: Production of SRM construction products for building and civil engineering applications

Three pilot production plants of SRM-based construction products in Maribor (Slovenia), Umag (Croatia) and Madrid – Henares corridor (Spain) will be built as part of the CinderCEBM demonstration.

Circular Buildings – Some Pilots

Demo 3: Geotechnical works with the use of SRM-based materials to revitalise a degraded area

The largest quantity of SRM-based construction products replacing virgin materials can be utilised in the case of different geotechnical works.

Demo 5: Construction of a road with SRM-based materials

SRM-based construction products developed in the CINDERELA project can successfully replace virgin materials and decrease environmental impacts of road construction / maintenance works.

Demo 4: Construction of a building with SRM-based materials

In Maribor (Slovenia) a one storey facility will be built with the use of SRM-based construction products.

Demo 6: 3D printing of a building component with recycled plastics

3D printing of street furniture with recycled plastics from municipal solid waste is another demonstration of innovative technology and use of materials within the CINDERELA project.

Circular Buildings – Some Pilots

Demo 7 : Northala Fields Urban Park

London's largest contemporary park was built with 165,000 rubble trucks from selected construction sites. The transportation and redevelopment costs compensation created a profit of 7.5 million euros.

https://www.londongardenstrust.org/features/northala.htm

Demo 8 : Atlante Inerti – Design of SRM-based product

An Italian Start-up company focused on the market up-scaling of secondary raw materials products.

The integration of design competences and a circular economy approach to the market is the main lever for raising the value of CDW and increasing user's trust.

http://atlanteinertiproject.yolasite.com/prodotti.php

Cooperation on CDW – Challenges and Objectives

The **Rome Cluster proposal** within the IUC cooperation framework aims to

- (*General Objective*) Decarbonise the Building Sector
- strengthen the ***Urban Mining holistic approach***
- increase and share **know-how** on secondary materials
- promote adoption of ***Pre-Demolition Audits***
- turn buildings into ***Smart Circular Products***
- foster **business model** innovation
- improve effective **policy instruments**
- **standardization**: CDW protocol and guidelines

Research and innovation to solve CDW critical issues

At present, many factors are stalling efforts in shifting construction sector to a circular economy. R&D can help to solve these critical issues:

- many of the material streams from demolition and renovation works are not suitable for reuse or high-grade recycling → **Innovative Design & Selective Demolition**
- Hazardous components in construction have to be avoided → **Circular NZEB**
- Lack of information sharing on SRM and their properties → **GIS/BIM & platform**
- *More in general* :
- Recycling plants and technologies need specific **investments and incentives**
- Need to **increase users' trust** in the quality of materials from CDW
- CDW volume reduction is hindered by trends in construction sector

International R&D activities:
Innovative Design & Selective Demolition

Digitalisation of Construction and Demolition processes:

BIM and Big Data solutions to extend and decarbonize life cycle of buildings

Design and implement innovative Procedures and tools to reduce CDW and facilitate selective demolition

- Pre-demolitions Audits based on BIM
- Surveying and Analysis Tools to estimate materials composition, typologies and weights
- GIS applications for the optimization of reuse and recycling processes and secondary materials supply chains

Thank You

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