CINDERELA tests & large scale demos

Slovenia:

- Demo on extraction of phosphorous from sewage sludge in Maribor
- Modular and mobile pilot plant for recycled aggregates, manufactured aggregates, recycled soil, building composites
- Demo revitalization of degraded area for construction use with the use of SRM based materials
- BIM supported demo construction of a utility building made of green concrete
- Demo on road construction with SRM based materials

The Netherlands, Italy:

Simulation of operational environment for CinderCEBM

CINDERELA:

- ★ creates new business opportunities for construction industry and SMEs based on a resourceful use of available materials locally/regionally
- ★ provides evidence based knowledge on the enabling framework conditions for design, production and use of SRM based construction materials
- ★ helps build confidence in innovative SRM based construction materials providing reliable test data on their performance based on testing protocols in line with the construction sector requirements.
- ★ mobilizes stakeholders and resources for circular economy implementation in the construction sector on local/regional level.

CINDERELA project facts

Project duration:	June 2018 - May 2022 (48 months)		
Total Project budget:	7 635 365,25 €		
Project Coordinator:	Slovenian National Building and Civil Engineering Institute (ZAG)		
Contact:	info@cinderela.eu		

Project partners



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New Circular Economy Business Model for More Sustainable Urban Construction





The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 776751

Spain:

- Pilot plant for recycled aggregates, manufactured aggregates, recycled soil, building composites
 Demo revitalization of an old industrial park
- area with the use of SRM based materials Demo construction of a
- utility building made of green concrete
- BIM supported demo construction of an access road to the industrial park

Modular and mobile pilot plant for recycled aggregates, manufactured aggregates, recycled soil, building

Croatia:

- Composites
 BIM supported demo revitalization of post-industrial area in metallurgical slag deposit with the use of SRM based materials
- Demo construction of a fence and walls for separation units made of green concrete Demo construction of an industrial road

Poland:

Simulation of operational environment for CinderCEBM

The challenge

Construction sector is recognized as one of the most resourceintensive industry and one of the three key sectors where improvements in resource efficiency are needed as highlighted in the Roadmap to a resource-efficient Europe.

Resource efficiency of the urban construction sector could be increased by full or partial substitution of raw materials by secondary raw materials (SRM) recovered from different waste streams generated within urban and peri-urban areas. Regional and local economies and the environment could benefit substantially from transforming these wastes into assets. By increasing the local intake of waste and local availability of construction materials they could create opportunities for resource-efficient construction products and services and stimulate companies to innovate for a more sustainable market and new consumption pattern in the construction sector.

CINDERELA goal

CINDERELA unlocks the potential for a resource efficient urban construction sector by implementing a circular economy business model CinderCEBM supported by a comprehensive digital business ecosystem in a form of a one-stop-shop CinderOSS to facilitate the set up of waste-to-product material flows and associated business models for the urban construction sector on local/regional level, based on identified and valorised resources available locally/regionally.

CINDERELA approach

Analyzing Phase Waste streams valorization in urban areas

Developing Phase Setting the framework for CinderCEBM and CinderOSS

PreDemo Phase Testing the SRM based construction products and designs preparation

Demo Phase

Large scale demos on the use of SRM based materials and testing of CinderCEBM and CinderOSS in real environments

Optimising Phase

Optimisation of CinderCEBM based on the demonstrated performance and Life Cycle Assesment

Future Exploitation Phase

Development of marketing paths for project outputs

(CinderCEBM)	 A web-based interactive platform providing: Tracking and modelling of urban waste-to-product flows; Communication with potential supply chain partners and other users; An online marketplace for (waste)materials, products and construction services. 	Output Materials SRM based construction products produced through recovery processes to be marketed in new value chains	and will provide revenue. Recycled & manufactured aggregate	Recycled soil Building composites	Phosphorus Estimation of other valuable resources and their	Provides information on SRM-based construction products and using them in construction by the accompanying BIM-library, their producers and other stakeholders in the value chain. This module is supported by a BIM-library on the newly developed SRM-based construction products.
ular Economy Business Model	DEMORY DEMORY	Difference of the second	Business Business Coshern	CinderOSS one-stop-shop service	Notice of the service	ASSISTANT SUSTIMINABIL AND ASSISTANTICAL AND ASS
CINDERELA Circu	Provides know-how and information on development of SRM (construction product) technologies	Input Materials Materials considered as waste will be the source for secondary raw materials	Construction industry • C&DW including excavated soil	Municipality services • Heavy fraction • Sewage sludge	Industry • Industrial waste	Provides information on existing value chains and development of new markets and value chains, legal lisues, certification, policy and administrative procedures of producing and using SRM-construction products

CINDERELA waste to product path

The CinderCEBM concept encompasses economically feasible and technically viable recovery of materials from certain waste streams available in urban and peri-urban areas for production of SRM based construction materials.

Targeted waste streams materials ★ construction & demolition waste ★ certain types of industrial waste aggregates e.g. waste from power stations. combustion plants, iron and seel

e.g. inert heavy fraction from municipal solid waste and sewage sludge from municipal waste water treatment

industry, glass industry etc.

services

★ waste generated by municipal

CinderOSS concept

The role of CinderOSS is to provide a continuous knowledge support to CinderCEBM on:

- ★ the properties of waste and SRM based construction products and requirements (R&D module), addressing waste providers and the construction sector (Production & Construction module);
- ★ the best available and innovative technologies with regard to waste-to-product transformation, addressing technology owners and research and development actors (R&D module);
- ★ legislative and administrative procedures, addressing decision makers and policy developers (Market & Legal module);
- ★ data mining and modelling of processes from planning, procurement, construction, and the use of SRM based materials in buildings/infrastructure with ICT/BIM (Digital Business Ecosystem) and
- ★ acceptance of new model and service by end users and the general public, addressing local and regional communities (Market & Legal module).

SRM based construction

- * recycled and manufactured
- * recycled soil
- * building composites
- ★ phosphorus