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COPENHAGEN 2021

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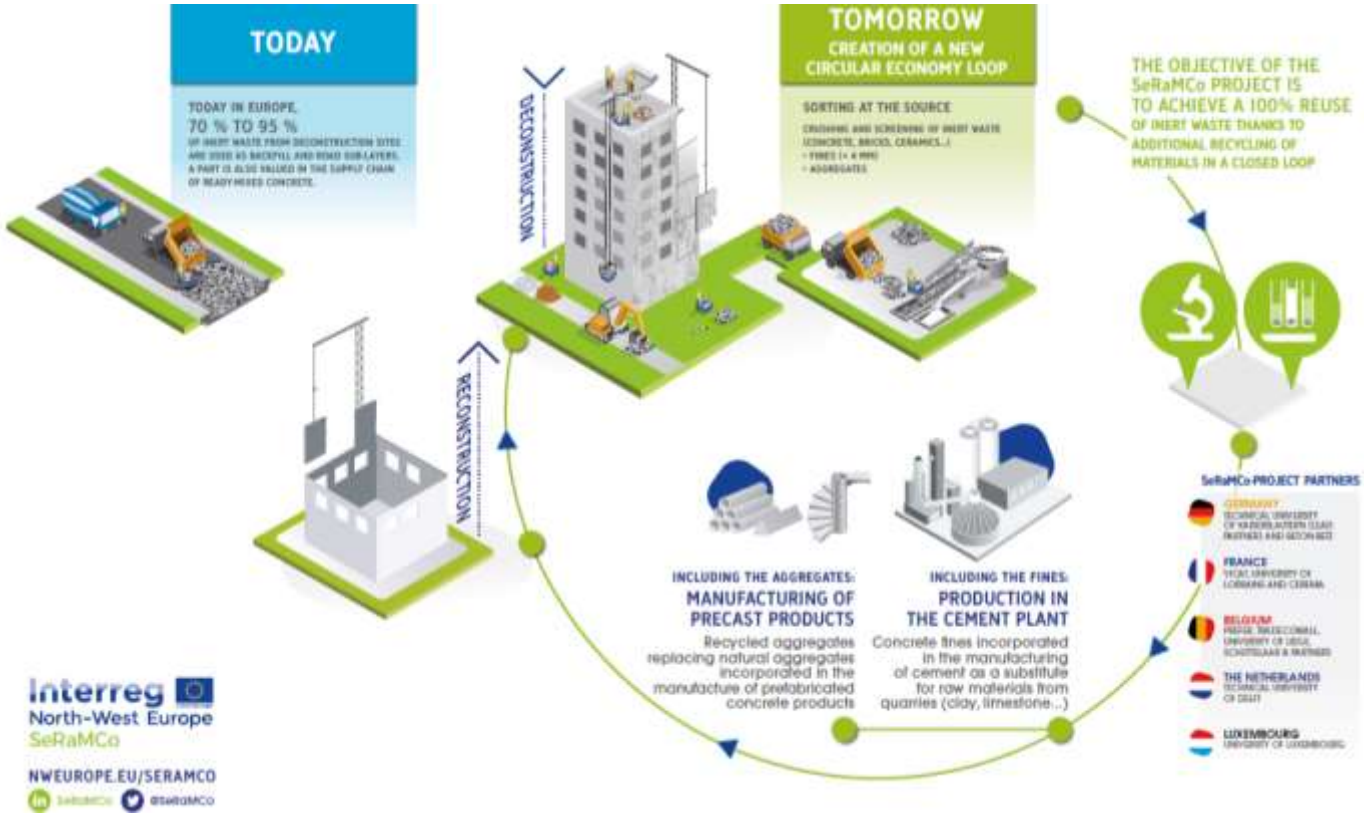
Copenhagen
November 14th-16th 2021

SeRaMCo - Project Secondary Raw Materials for Concrete Precast Products

Prof. Dr.-Ing. Christian Glock, November 15th 2021

INTRODUCTION AND OVERVIEW

Idea



INTRODUCTION AND OVERVIEW
Goals

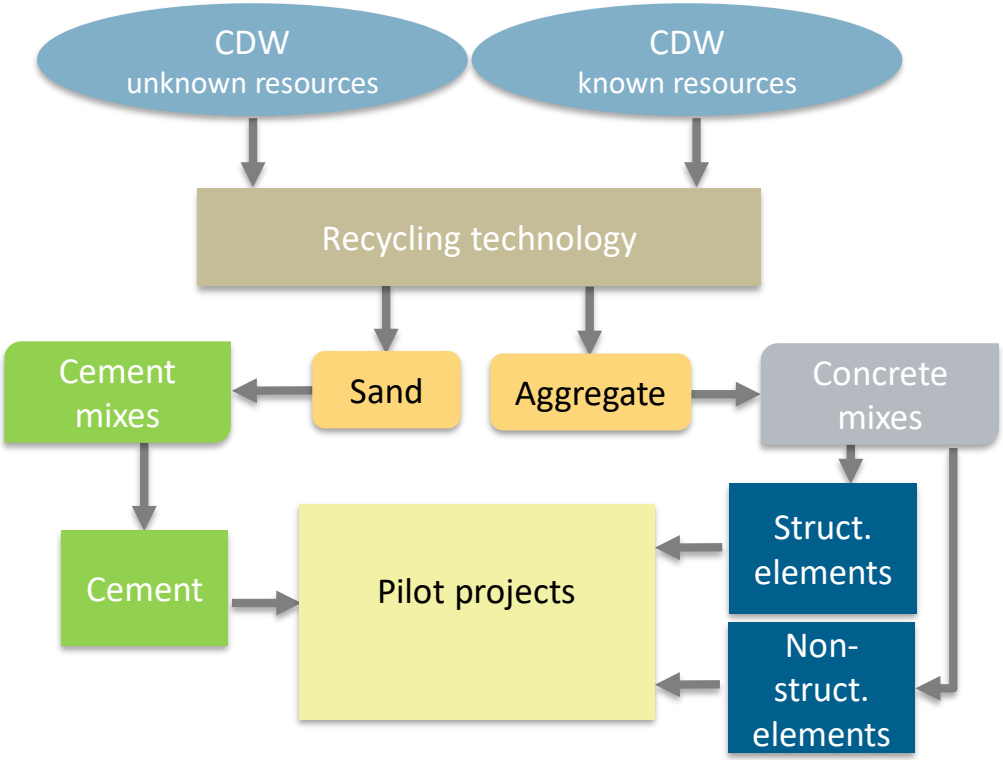
- **Increasing reuse of construction wastes** (mainly CBTC) for **production of cement and concrete**
- Developing **new processes for high quality recycling**
- Developing **new mixes of cement and concrete**
- Production of **innovative concrete precast products** from recycled aggregates
- **Informing the stakeholders** about the results
- **Implementing 3 pilot projects**

EU-Projekt SeRaMCo

INTRODUCTION AND OVERVIEW
Video Regio Star Award 2020

https://www.youtube.com/watch?v=6hf7D4EcHRg

INTRODUCTION AND OVERVIEW
Workflow



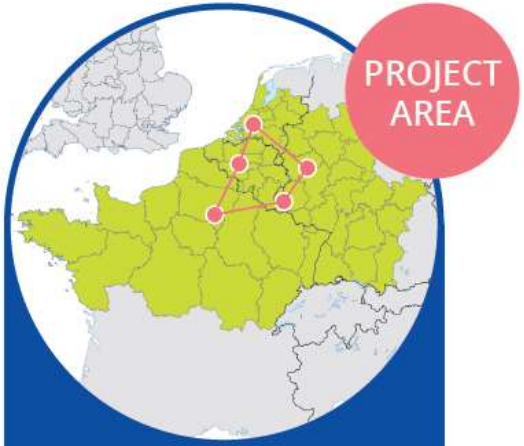
INTRODUCTION AND OVERVIEW

Project partner

- **17 partner from 5 European countries**
  (DE, FR, NE, BE, LU)
- **11 partner, 3 sub-partner, associated partner**

TECHNISCHE UNIVERSITÄT KAISERSLAUTERN · LIÈGE université · uni.lu UNIVERSITÉ DU LUXEMBOURG · UNIVERSITÉ DE LORRAINE · TU Delft · TRADECOWALL · BETON-BETZ · & partners Schuttelaar · prefer · Cerema · VICAT · bibm · EQAR · Seraing · Pirmasens · moselle.fr · Chaux de Contern Groupe Eurobéton · AREBS

Interreg North-West Europe SeRaMCo



Duration
March 2017 – March 2021

Budget
Total: € 7.28 million
EU funding: € 4.37 million

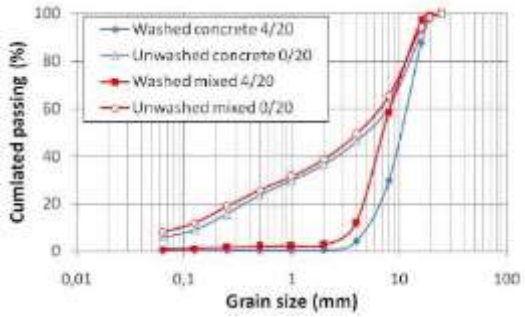
INTRODUCTION AND OVERVIEW
Project partner

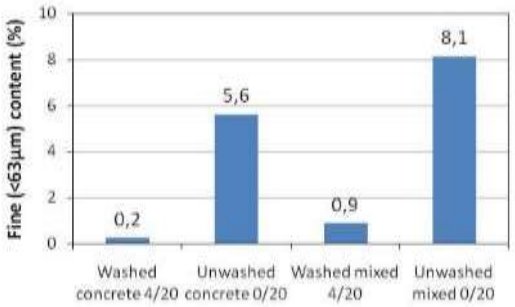
- **17 partner from 5 European countries**

MATERIALS
Waste treatment

Research of University Liège & Tradecowall show advantages of washing on the aggregates

- Reduction of fines
- Reduction of unwanted components (swimming parts, clay, gipsum etc.)
- Limitation of particle size distribution
- Increased resistance to fragmentation





MATERIALS
Cement production

Research of Universität Lorraine & VICAT
proof usability of fines

- Recycled aggregates mainly contain calcite and quartz in different proportions
- A huge amount of silicate, magnesium, sulfate and alkalis can limit the admixture rates
- Maximal achievable proportion rate 10-20%
- Proportions depend on recycled aggregates, quarry facilities and type of cement to be produced

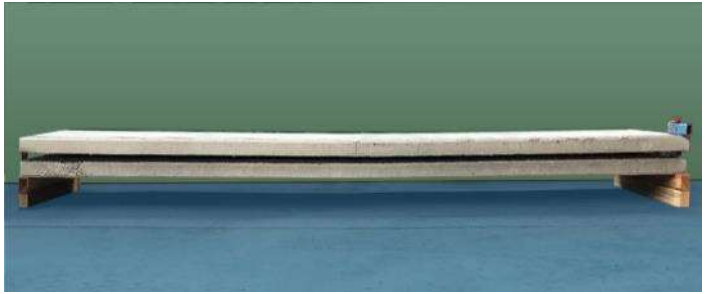
MATERIALS
Concrete production

Research of Universities Luxemburg & Kaiserslautern results in optimized mixtures

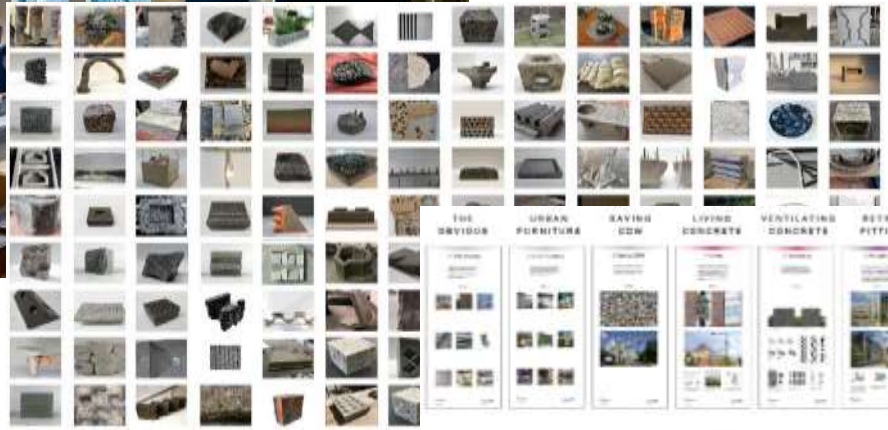
- High compressive strength achievable
- Higher water demand and reduced young's modulus
- High performance up to 10 % recycled fines and 30 % recycled aggregate
- 100% recycled aggregate possible

Practical application by Beton Betz & Prefer show good processability

- No significant changes for curing
- Slightly increased creep



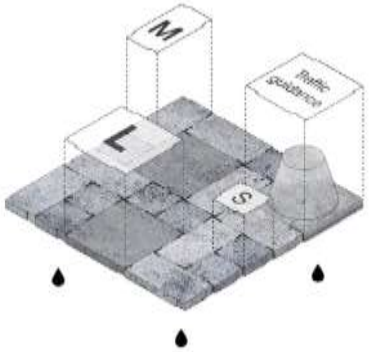
PREFABRICATED ELEMENTS
Development process



PREFABRICATED ELEMENTS
Examples

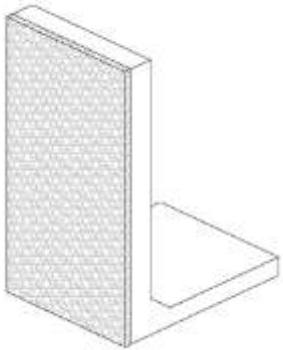
Hollow core slabs

Pavement and SeRaMCo elements

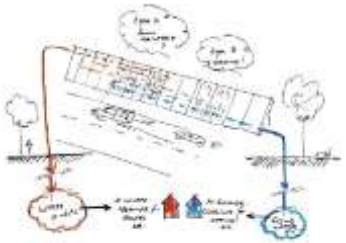


PREFABRICATED ELEMENTS
Examples

L-walls



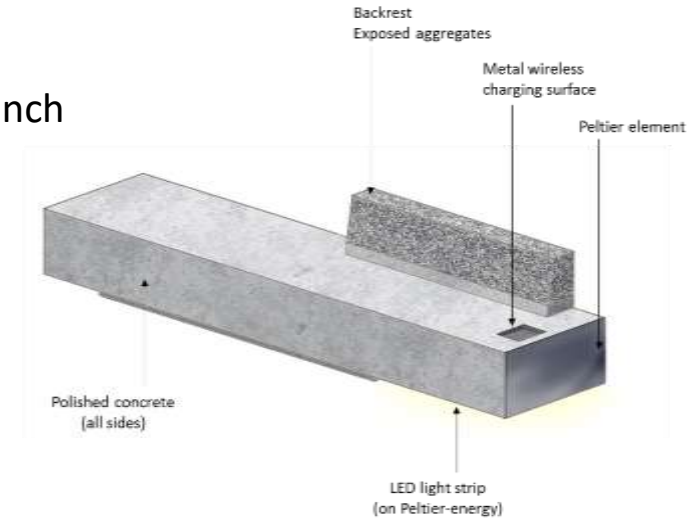
Sound absorbing energy walls



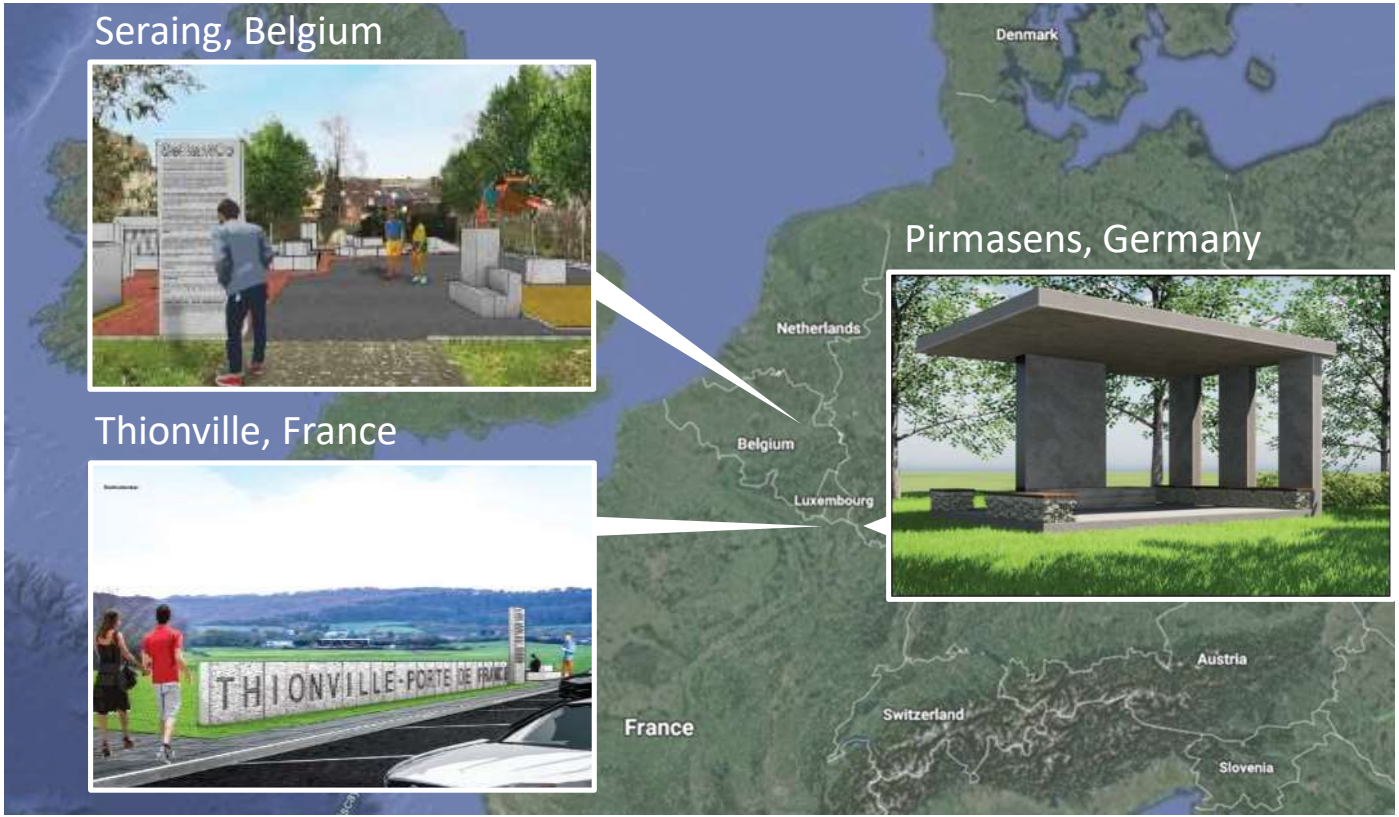
PREFABRICATED ELEMENTS
Examples

Salty concrete elements

Energy bench



PILOT PROJECTS
Overview



PILOT PROJECTS

Porte de France, Thionville, France

PILOT PROJECTS

Pavillon Pirmasens, Germany

PILOT PROJECTS

Pavillon Pirmasens, Germany

PILOT PROJECTS

Pavillon Pirmasens, Germany

PILOT PROJECTS

Pavillon Pirmasens, Germany

SUMMARY
Conclusion

- **Treatment process** for secondary raw materials on **high quality level**
- Use of **secondary raw materials** for production of **cement** and **concrete** is **very well feasible**
- Recycled concrete is **suitable for precast products**
- **Realization** of **products and pilots** prove **feasibility**
- **Construction law treatment** requires **time and costs**
- **No or few technical hurdles** for the application
- **Barriers** are **low priced raw material** and **legislative framework** of public sector

SUMMARY
Research results and information

- **SeRaMCo videos**
  - https://www.youtube.com/channel/UCjbd_EgKlTKuRXgbJzg6f0A
  - https://www.youtube.com/channel/UCfga7zKAKFbfSkuTc3zUo_A

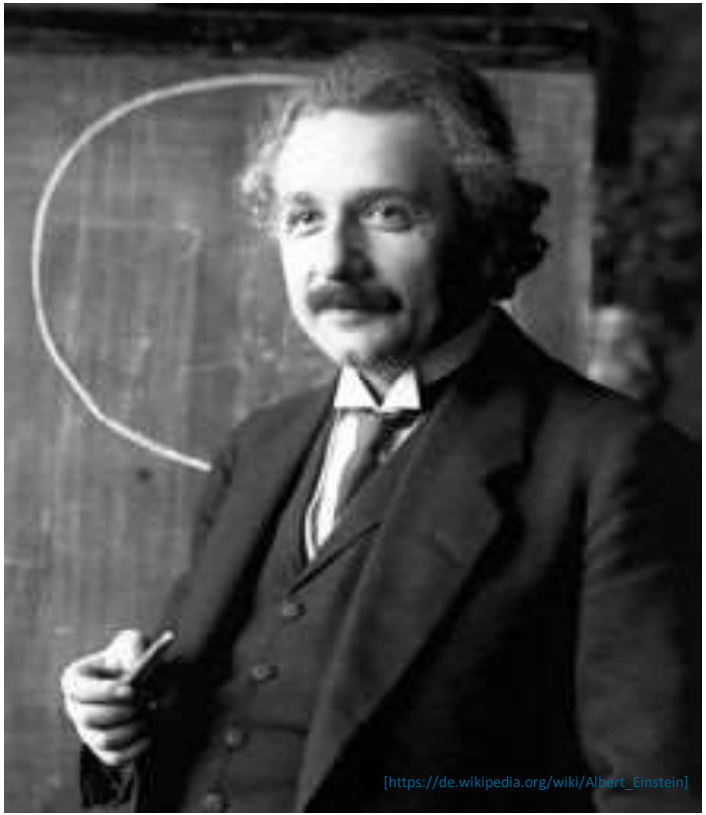
- **SeRaMCo presentations final conference**
  - https://www.nweurope.eu/projects/project-search/seramco-secondary-raw-materials-for-concrete-precast-products/project-results/final-seramco-conference-precast-in-the-circular-economy-event-presentations/

- **SeRaMCo conference paper final conference**
  - https://www.nweurope.eu/projects/project-search/seramco-secondary-raw-materials-for-concrete-precast-products/project-results/seramco-final-conference-booklet/

SUMMARY
Future mindset

„Problems can never be solved with the same mindset that created them."

Albert Einstein *1879 †1955


[https://de.wikipedia.org/wiki/Albert_Einstein]

Thank you for your interest !

Thanks to all of the SeRaMCo project team !

Leadpartner SeRaMCo-Project

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