
BUILD UP
The European portal for energy efficiency
and renewable energy in buildings
WEBINAR

# Unlocking the potential of SMEs: A holistic framework to train SME-workforce in Circular Construction

14th November 2023 / 11.00H – 12.30H CET

BUILD UP

The European portal for energy efficiency and renewable energy in buildings

# AGENDA

| Topic | Speaker name, title, and organisation |
|---|---|
| Introduction to Bus Go Circular + (Poll #1) | Sreeja Raghunathan, Built Environment Consultant (Circle Economy Foundation) |
| Framework for circular interventions in the construction value chain | Sreeja Raghunathan, Built Environment Consultant (Circle Economy Foundation) |
| Fundamental Training pack SMEs | Ira Ivanova, Project Lead (EnEffect) |
| Importance and benefits from training in circularity for SMEs in construction | Silviya Pavlova, MBA CMC Assoc CIPD, Certified Management Consultant in Strategy and International Business Development \| Founder, PropTech Bulgaria & CSEE PropTech |
| Q&A | All Speakers |
| Briefing about the interactive sessions | Otis Schwab, Project Manager (Circle Economy Foundation) |
| Interactive breakout session + (Poll #2) | All Moderators |
| Conclusion & sum up main takeaways + (Poll #3) | All Moderators |
| Upcoming webinars | Otis Schwab, Project Manager (Circle Economy Foundation) |
| Thank you from BUILD UP | BUILD UP |

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Shaping a Circular Sustainable Future

# Empowering SMEs in Circular Construction

## Unlock your potential as an SME in the Construction Sector

**Date: 14th November, 2023**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033740

# Why Circular Construction?

- The construction sector is responsible for more than **40% of the primary energy consumption** in Europe, and **36% of CO2 emissions in Europe** (Eurostat, 2020).
- A circular approach in construction can significantly **reduce the embodied emissions of building materials and material consumption,** since the construction sector is high-intensive material user.
- With **18 million people,** the construction sector generates about **9% of the GDP of the EU.**
- **Like any transition, we need a skilled workforce to make it happen.**

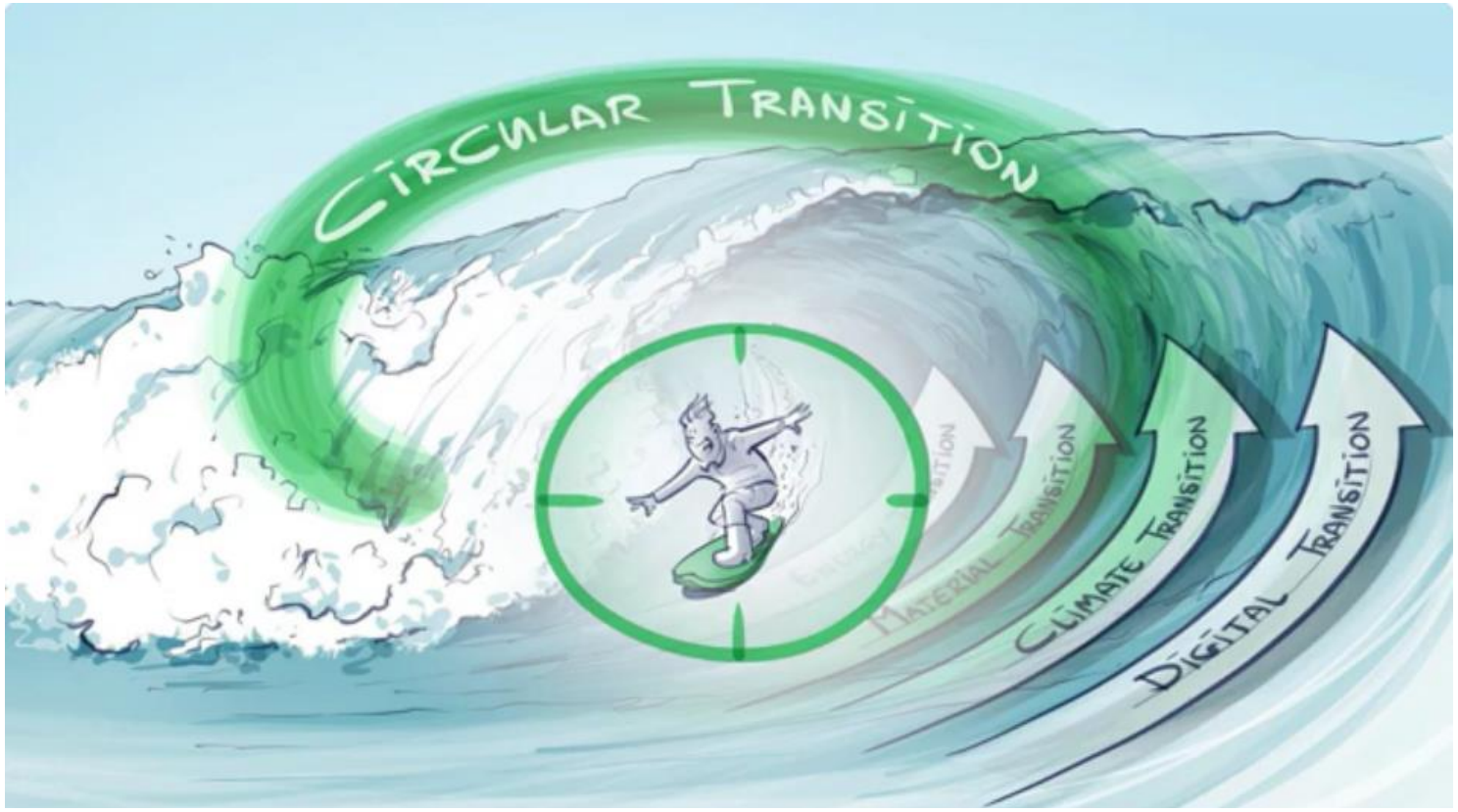
# Why SMEs?

In the EU, micro enterprises display the **biggest part of the sector with 94.1%.**


**99.9% of the European construction sector** is composed of micro, small and medium-sized enterprises (fewer than 250 employees).


To identify a reference point, in 2016, construction SMEs made up for **88% of total employment** and **80% of total value added** of the construction sector in the EU-28.

# Introduction to BUS GO Circular



slido

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# What is the main reason for your business to consider implementing circular economy training?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

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# Circular Construction Skills Framework

by Sreeja Raghunathan (Built Environment Consultant, Circle Economy Foundation)

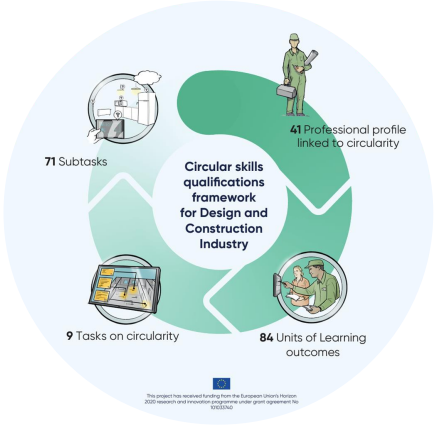
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033740

# BUS GO Circular Project Outcomes

Framework for Circular Interventions

Circular Skills Qualification Framework

Training Pack for SMEs




G1 Indicator that it is a essential module for a certain profile

€ Range of expected module cost, with range from €, very low to €€€, higher cost

Individual insignia / rewards when the module is finished

Conducted visit to a case study (groupal)

Visit a case study with "detective game"(groupal)

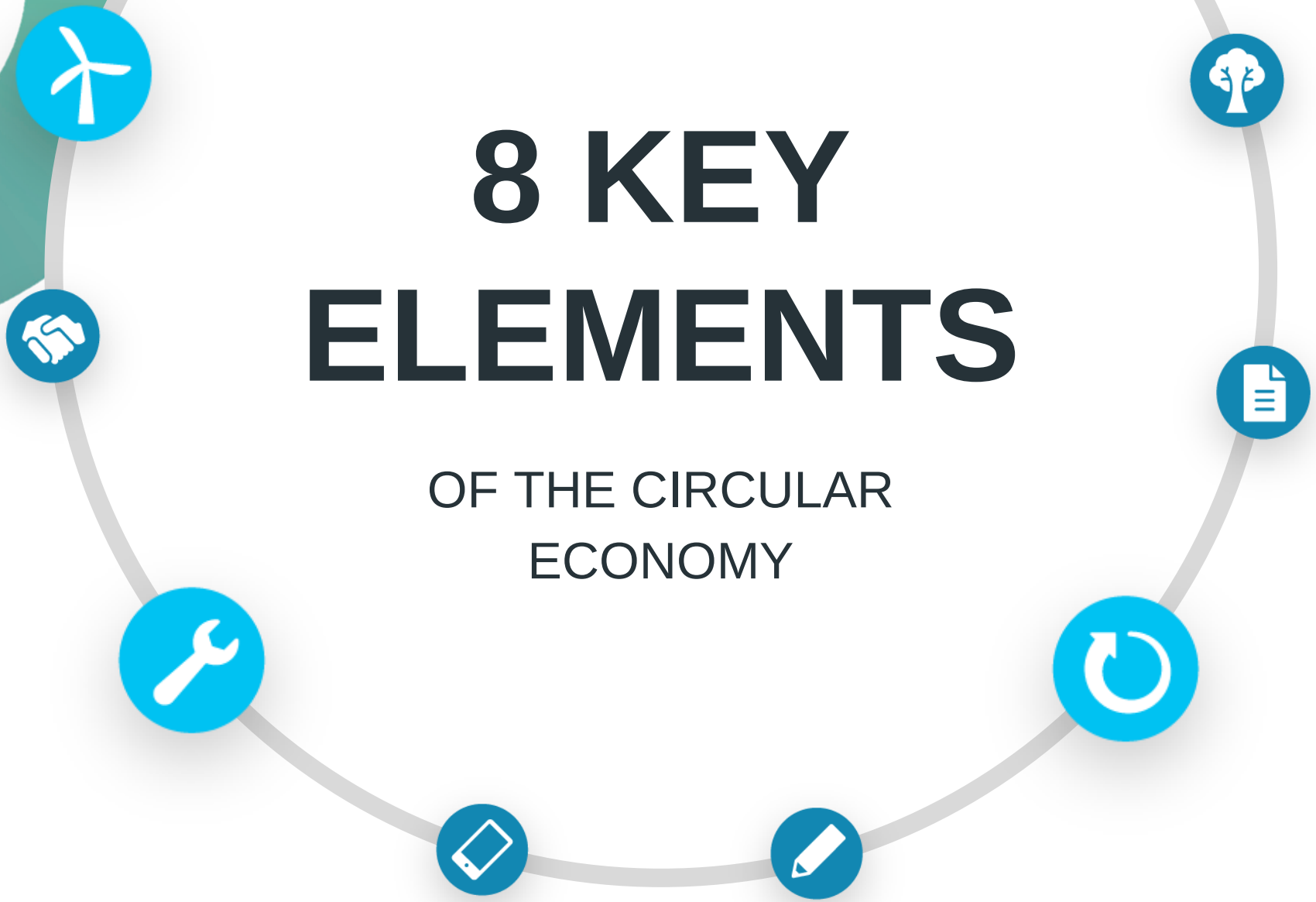
Serious game - trivial quiz

* Optional

↑ Highly Recommended

# 8 KEY ELEMENTS

OF THE CIRCULAR ECONOMY



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CIRCLE ECONOMY'S

# CORE ELEMENTS

**Prioritise Regenerative Resources**

**Stretch the Lifetime**

**Use Waste as a Resource**

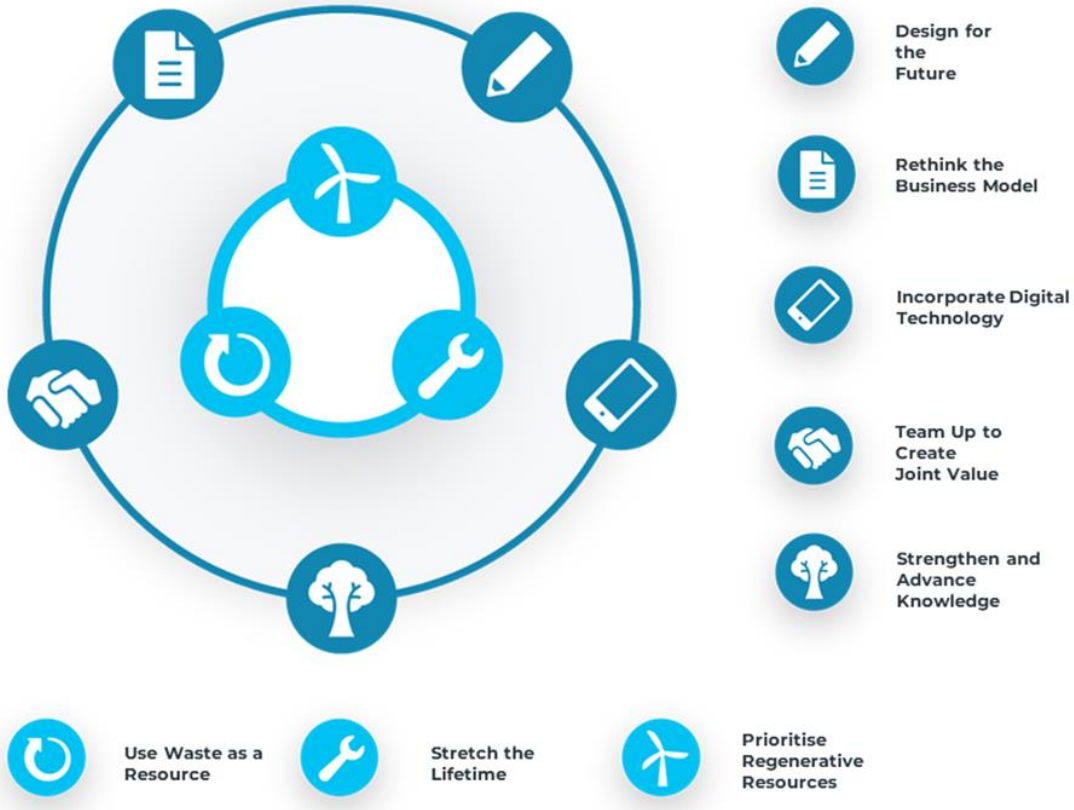
CIRCLE ECONOMY'S

# ENABLING ELEMENTS

- **Design for the Future**
- **Rethink the Business Model**
- **Incorporate Digital Technology**
- **Team Up to Create Joint Value**
- **Strengthen and Advance Knowledge**

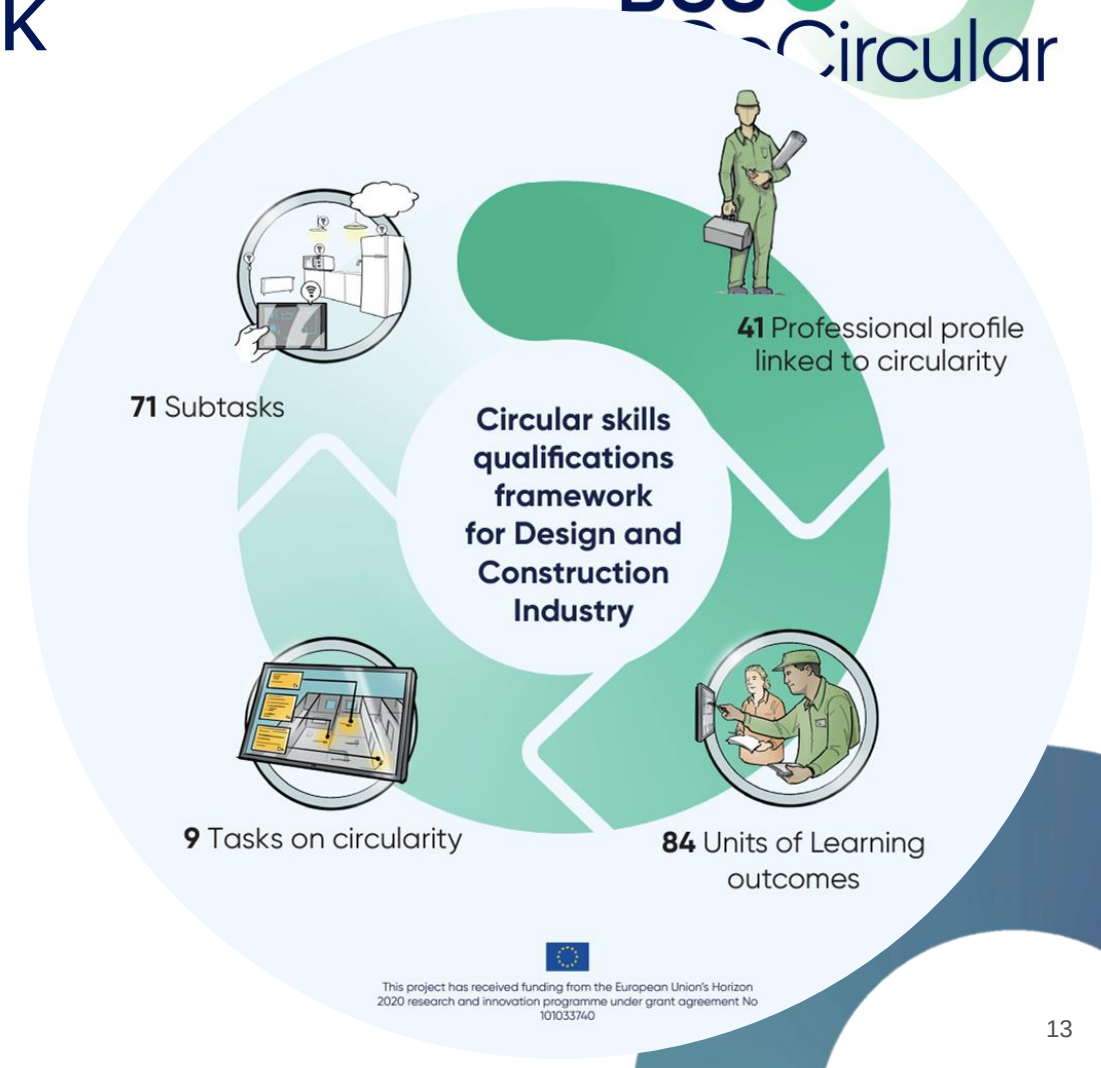
# Circular skills qualification Framework

By using the methodology of developing **task-based qualifications, and employing the Framework for circular interventions** as a main foundation, the **Circular Construction Skills Qualification** framework has been developed.



# Circular skills qualification Framework

- 9 tasks on Circularity
- 71 subtasks
- 84 Units of Learning Outcomes
- 41 Professional profile linked to Circularity



# Task-based qualifications

## Why?

Practical perspective on required skills for circular construction

Increased recognition of learned skills

Learning outcomes for development of training

Circularity applied to different fields in construction

# Scope of circular construction skills qualifications

Included

- **Integrating circular principles** in existing work activities
- Focus on working as a member of the construction **value chain**
- Including **interdisciplinary skills**:
  - Collaboration
  - Research and evaluation
  - Education

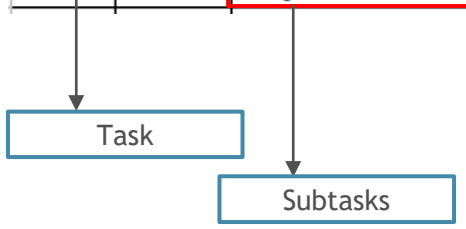
Not included

- Detailed skills and knowledge
- Technology specific (e.g. details of installing heat pumps, specifics of designing pre-fabricated structures)

# Task-based qualifications: How?

## Tasks and subtasks

| | | | | |
|---|---|---|---|---|
| 2 | Design for the future | | 81 | |
| 2.1 | | Design to reduce waste during production and use | 2, 26, 27, 28 | ME, CE, EL, AR |
| 2.2 | | Design with materials that enable multiple uses | 5 | ME, CE, EL, AR, BS, HS |



# Task-based qualifications: How?

## Tasks and subtasks

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Unit of Learning Outcomes (ULOs)

Professions acronyms

**ULOs** are statements regarding what a learner **knows**, **understands** and is **able to do** (including responsibility) on completion of a learning process, which are defined in terms of **knowledge, skills and attitude/responsibility**

# Task-based qualifications: How?

## Unit of Learning Outcomes (ULOs)

| ULO Nr. | Competence | Skills | Knowledge |
|---|---|---|---|
| 1 | Design with bio-based materials as an alternative for conventional construction materials | Select bio-based materials for the construction project at hand<br>Consider the purpose of the building and the context of the entire building solution, as well as construction requirements<br>When biobased materials are not an option, select proper low impact materials<br>Integrate use of the Material Circularity Indicator (make sure it is not higher than X)<br>Ensure use of materials that have little to no volatile organic compounds (VOC) emissions | Types of bio-based materials in construction such as hemp, seaweed, cork, bamboo, sustainably sourced wood, agricultural residues<br>Advantages and disadvantages of biobased materials<br>Seven functional requirements of building walls<br>Alternative forms of concrete |
| 2 | Enact measures that optimise material use to strive for material efficacy | Apply measures that optimise material use to construction projects<br>Combat underutilisation or surplus of materials by sharing products or assets and optimising their use | General knowledge about measures that optimise material use in construction, such as 3D printing or accurate structural design/industrialized prefabricated products |

What competence does one need for performing the subtask?

# Task-based qualifications: How?

## Unit of Learning Outcomes (ULOs)

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What competence does one need for performing the subtask?

What should one be able to **do** in order to gain competence?

# Task-based qualifications: How?

## Unit of Learning Outcomes (ULOs)

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What competence does one need for performing the subtask?

What should one be able to **do** in order to gain competence?

What is prerequisite knowledge to become competent?

# The main Tasks

| | |
|---|---|
| 1 | Prioritise regenerative and efficient use of resources |
| 2 | Design for the future |
| 3 | Assemble/construct for the future |
| 4 | Rethink the business model |
| 5 | Stretch the lifetime |
| 6 | Use secondary resources |
| 7 | Incorporate digital technology |
| 8 | Collaborate to create joint value |
| 9 | Strengthen and advance knowledge |

# Circular construction skills qualification Framework Applied to MGRFIE

## 1. PRIORITISE REGENERATIVE AND EFFICIENT USE OF RESOURCES

### COMPETENCES:

Enact measures that reduce and optimise energy use through solutions on roofs and facades whilst taking into account building purpose and climate

Photo.

### SUBTASK:

Apply suitable energy efficiency measures to roofs and façades (taking into account building purpose and climate)

### SKILLS:

Include energy efficiency measures in design of roofs, façades, and interior elements (e.g. insulation of roofs)
Include passive design techniques in design of roofs, façades, and interior elements (e.g. Solar orientation, skylight windows, shading)

### PROFESSIONS:

Landscape architect
Green roof / green façade designer
Façade design engineer
Architect, Electrical engineer,
Building automation engineer,
Environmental engineer

### KNOWLEDGE:

Smart solutions to spread demand throughout the day
Measures such as draught-proofing, airtightness, insulation, ventilation
Materials with lower thermal conductivity (e.g. sheep's wool, cellulose, earthwool)

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# Fundamental Training Packs SMEs

Ira Ivanova
Project Lead (EnEffect)

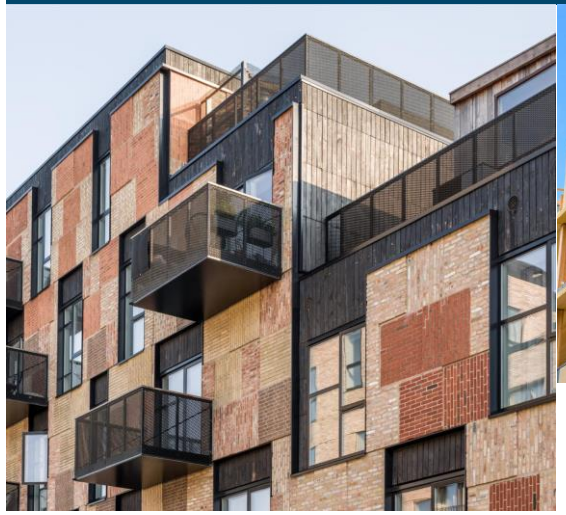
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033740

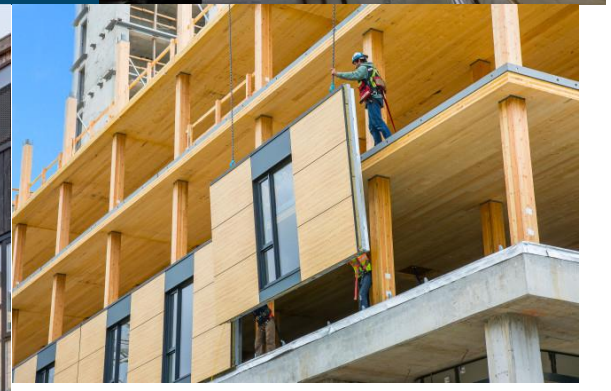
# Approach

1. Identify the principles (key elements) you want to train on
2. Identify the relevant tasks and subtasks
3. Review the ULO’s provided
4. Design the training program for your organization

# The Green Deal and the construction sector

**Fit-for-55: RePower EU: Renovate Europe: EU Taxonomy: EPBD: RED II**



**Framework for circular economy**
**Pact for Skills**

***3 mill construction workforce in the next 5 years***

- To prioritize ecological materials and to **re**create value chains
- To renovate, regenerate, recover, reuse, recycle
- To digitalize
- To manage new construction sites
- To maintain and operate buildings sustainably
- To be local; minimal; optimal
- To interoperate and collaborate
- To innovate and improve workflow

# BUS-GoCircular and the Fundamental Training Packs

**Simple**

**Attractive**

**Easily accessible**

**Not expensive**

**Educating**

**Shareable**

**Open- source**

| | TP TITLE | TP number | | Total duration (hours) | | |
|---|---|---|---|---|---|---|
| Essential profiles | Contents | Format for contents | Training methodology *(from report)* | Minium Time | Cost aprox. | Progress/ evaluation |
| All | **COMMON MODULE** | | | | | |
| All | **Module 1.** INTRODUCTION TO CIRCULAR ECONOMY IN CONSTRUCTION | | | hours | € | |
| | Key principles of circular economy | | | hours | € | |
| | Main strategies and flows in circular construction | | | hours | € | |
| | **STAGE** | | | | | |
| | **MATERIALS & WASTE** | | | hours | € | |
| | **Module 2.** TITLE MODULE | | | hours | € | |
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| G1 | **Module 3.** TITLE MODULE | | | hours | € | |
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| | | | | | | |
| | **ENERGY** | | | hours | € | |
| | **Module 4.** TITLE MODULE | | | hours | € | |
| | | | | | | |
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| | | | | | | |
| | **WATER** | | | hours | € | * |
| G1 | **Module 5.** TITLE MODULE | | | hours | € | |
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**ICONOGRAPHY**

- G1 — Indicator that it is a essential module for a certain profile
- € — Range of expected module cost, with range from €, very low to €€€, higher cost
- Individual insignia / rewards when the module is finished
- Conducted visit to a case study (groupal)
- Visit a case study with "detective game"(groupal)
- Serious game - trivial quiz
- * — Optional
- ↑ — Highly Recommended

**Collaborative**

# BUS-GoCircular and the Fundamental Training Packs

## Involved professions

| PROFILE | | PLAN | PROCURE | CONSTRUCT | OPERATE | EoSL |
|---|---|---|---|---|---|---|
| White-collar | GENERAL | AR, CE, C, AM, FaM | PD, PM | C, BS, SS, PD | FaM | |
| | SPECIALISTS | UP,LA, FDE, EL, ME, EE, DA, BEC, SC | MS | HS, BEC, SC | DA, HS, BEC, CO | DeL, DeA, SC |
| Blue-collar | GENERAL | | | Br | RM | |
| | SPECIALISTS | | | II, FM, FW, R, Gd, WI, BA, P, EI, RESI, RWT, HPI, VI | | DeL, DeA |

# BUS-GoCircular and the Fundamental Training Packs

| TRAINING PLAN PROPOSAL (TP) | | STAGES | PROFILE | |
|---|---|---|---|---|
| TP1 | STARTING CIRCULARITY | Plan and Procure | White-collar | GENERAL |
| TP2 | CONSTRUCTION WORKS IN CIRCULARITY | Construct | Blue-collar | SPECIALISTS |
| TP3 | CIRCULARITY IN INSTALLLATIONS | Construct and Operate | | |
| TP4 | ADVANCING CIRCULARITY | Plan, Procure and EoSL | White-collar & Blue-collar | All |
| Minium module of all TP | INTRODUCTION TO CIRCULAR ECONOMY IN CONSTRUCTION | All | White-collar & Blue-collar | All |

# BUS-GoCircular and the Fundamental Training Packs

**TRAINING PLAN**

| **CONSTRUCTION WORKS IN CIRCULARITY** |
|---|
| **Module 1.** INTRODUCTION TO CIRCULAR ECONOMY IN CONSTRUCTION |
| **Key principles of circular economy** |
| **MATERIALS & WASTE** |
| Main strategies related with materials in circular construction |
| **Module 2.** BUILD TO CLOSE THE LOOP OF MATERIALS |
| Work with regenerative materials: wood, straw, rammed earth bricks, biobased insulation |
| **Module 3.** BUILD TO REDUCE IMPACT: LOCAL, LOW IMPACT, NON-TOXIC AND/OR NON-CRITICAL MATERIALS |
| How to build with low impact materials for coating, selant, adhesive (no VOC emissions, detachable) |
| **Module 4.** BUILD TO REDUCE WASTE IN SITE AND IN EOSL (PART1) |
| Modular construction systems and their procedures for assembly (incl. prefabricated modules); removable joints; demountable techniques |
| **Module 5.** BEST PRACTICES AT THE CONSTRUCTION SITE TO REDUCE WASTE AND PROMOTE RECYCLING & REUSE |
| Observation of local and national regulations for waste management and landfill rules; protection of materials on site |
| **Module 6.** DIGITIZATION |
| BIM for planning and management; Digital material passes; Digital twins |
| **Module 7.** INSTALL ENERGY EFFICIENCY MEASURES IN BUILDINGS |
| Principles of low- energy to nearly- zero energy builidngs (nZEB) & passive houses |
| **Module 8.** STRETCH THE LIFETIME |
| Maintanance and repair |
| **Module 9.** RETHINK THE BUSINESS MODEL |
| Business models of maintenance and repair services (best practices) |

# **Module 1.** INTRODUCTION TO CIRCULAR ECONOMY IN CONSTRUCTION

The 3 core + 5 enabling principles

**Develop** and disseminate knowledge

**Integrate** digital techniques

**Design** for the future

**Develop** the business model

**Work together** to create collective value

**Choose** renewable resources

**Be economical and use it** as long as possible

**Use waste** as raw material

# **Module 1.** INTRODUCTION TO CIRCULAR ECONOMY IN CONSTRUCTION

The 3 core + 5 enabling principles

**Develop** and disseminate knowledge

**Integrate** digital techniques

**Design** for the future

**Develop** the business model

**Work together** to create collective value

**Choose** renewable resources

**Be economical and use it** as long as possible

**Use waste** as raw material

+ 1 Construct and assemble for the future

# **Module 2.** BUILD TO CLOSE THE LOOP OF MATERIALS

Earthen materials

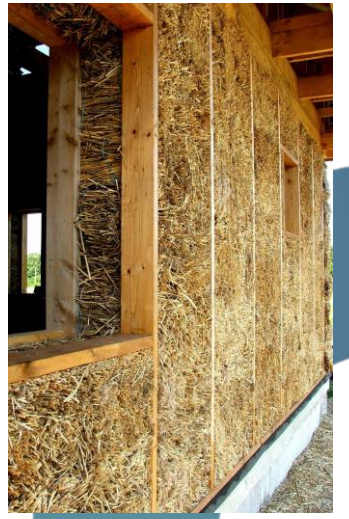
Hemp

Hemp +lime

Material pyramid

Timber

Straw

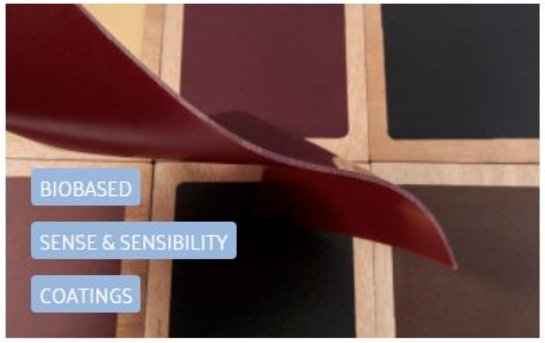


# **Module 3.** BUILD TO REDUCE IMPACT: LOCAL, LOW IMPACT, NON-TOXIC AND/OR NON-CRITICAL MATERIALS

## EN 16785-1 verifies biobased content

| Biobased material type | Ingredients in biobased adhesives and sealants |
|---|---|
| Polymers | Soy protein |
| | Starch esters |
| | Polyamide |
| | Polylactide |
| Tackifiers | Pine rosin |
| | Terpene |
| | Citrus |
| Waxes | Soy |
| | Castor |
| | Dimerized fatty acids |

## EN 13432 evaluates biodegradability

# **Module 4.** BUILD TO REDUCE WASTE IN SITE AND IN EOSL (PART1)

## BUILD WITH MODULAR STRUCTURES

**Use reversible joints**

# **Module 5.** BEST PRACTICES AT THE CONSTRUCTION SITE TO REDUCE WASTE AND PROMOTE RECYCLING

## CDW SORTING, REUSE AND RECYCLE

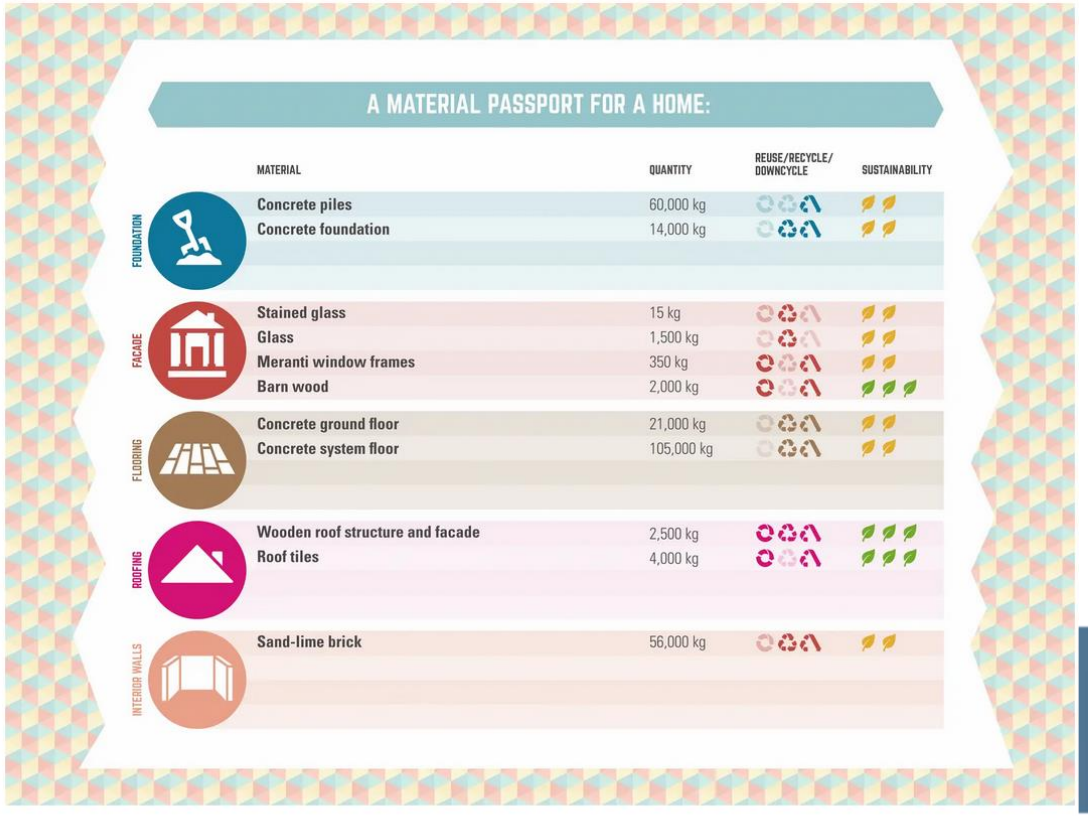
# **Module 6.** DIGITIZATION

## BIM: USE OF MATERIAL PASSPORTS

"…waste is material without identity…"

Thomas Rau

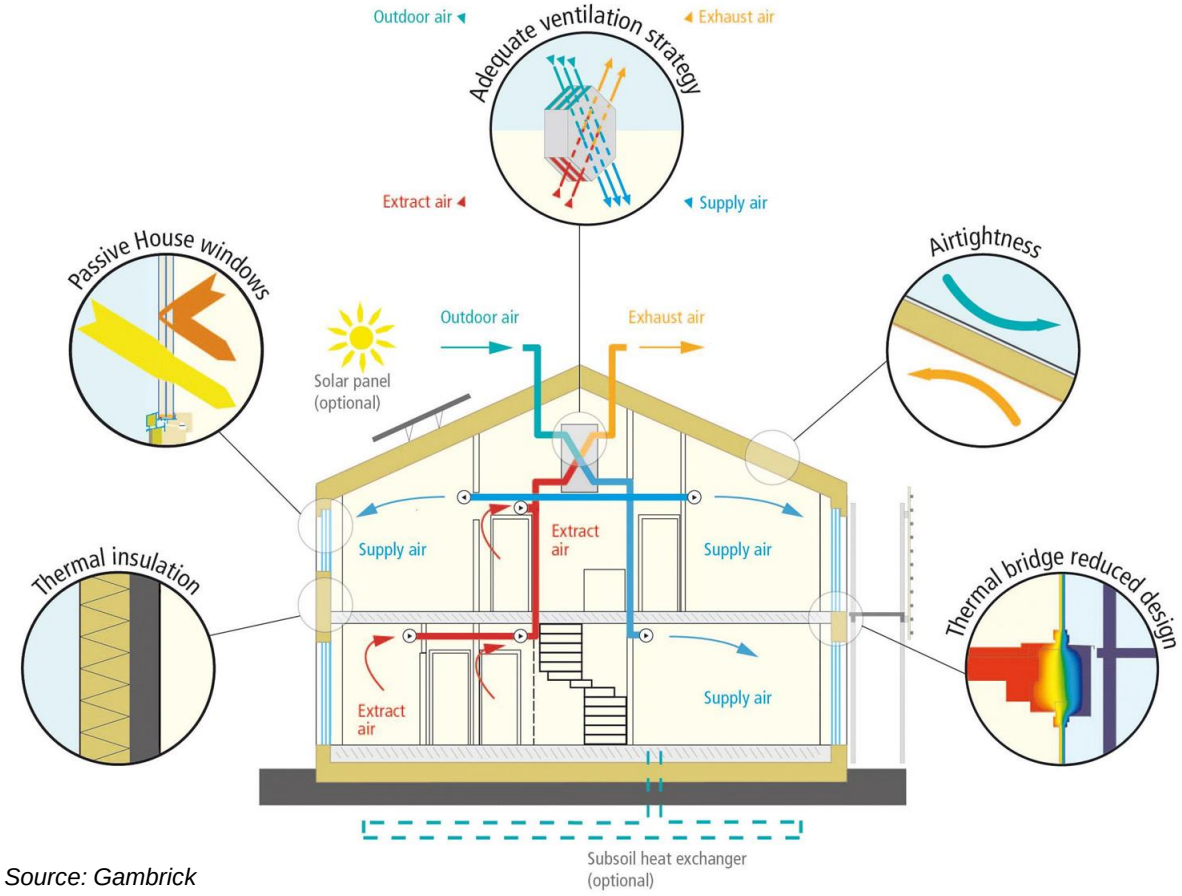

*Building Information Model*




*A simplified example of a material passport developed for a standard Dutch house.*

# **Module 7.** INSTALL ENERGY EFFICIENCY MEASURES IN BUILDINGS

## PASSIVE HOUSE PRINCIPLES




*Source: Gambrick*

Building envelope

Airtightness

Solar gain

Reduced thermal bridges

Ventilation

+ *RES* (nZEB)

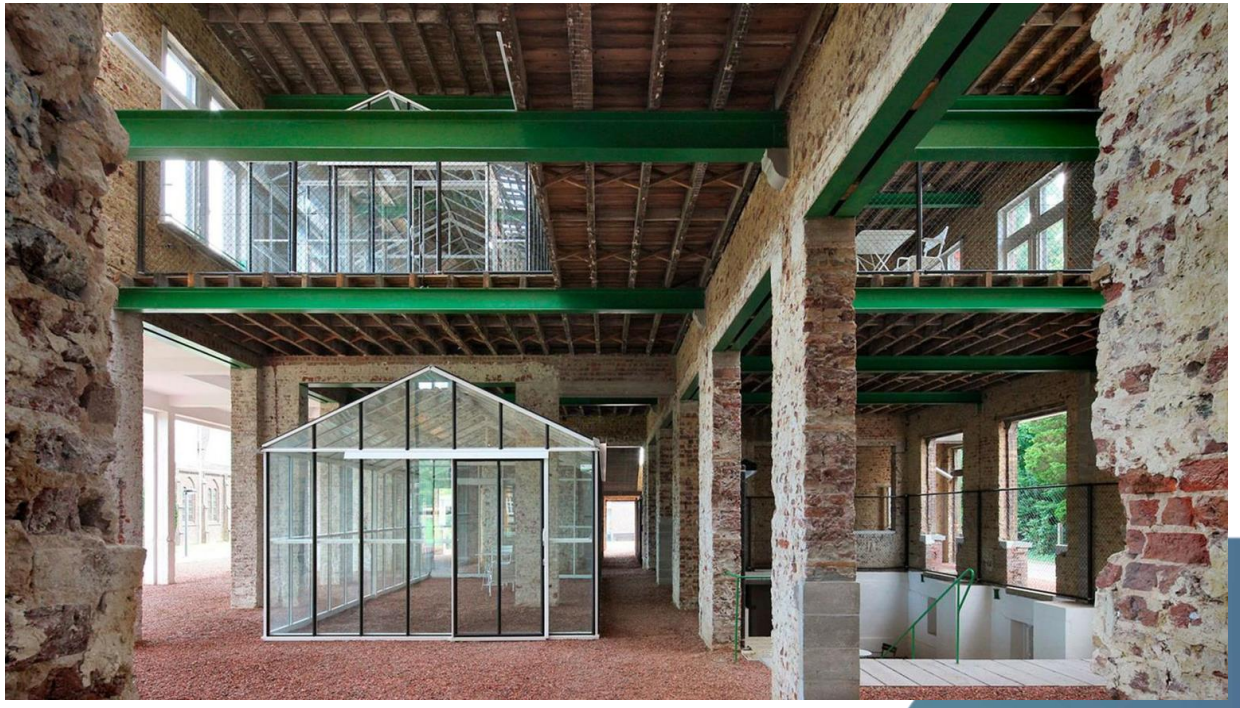
# **Module 8.** STRETCH THE LIFETIME

## EMPLOYING THE “R” STRATEGY

Repair and maintenance

*Source: Rotor*

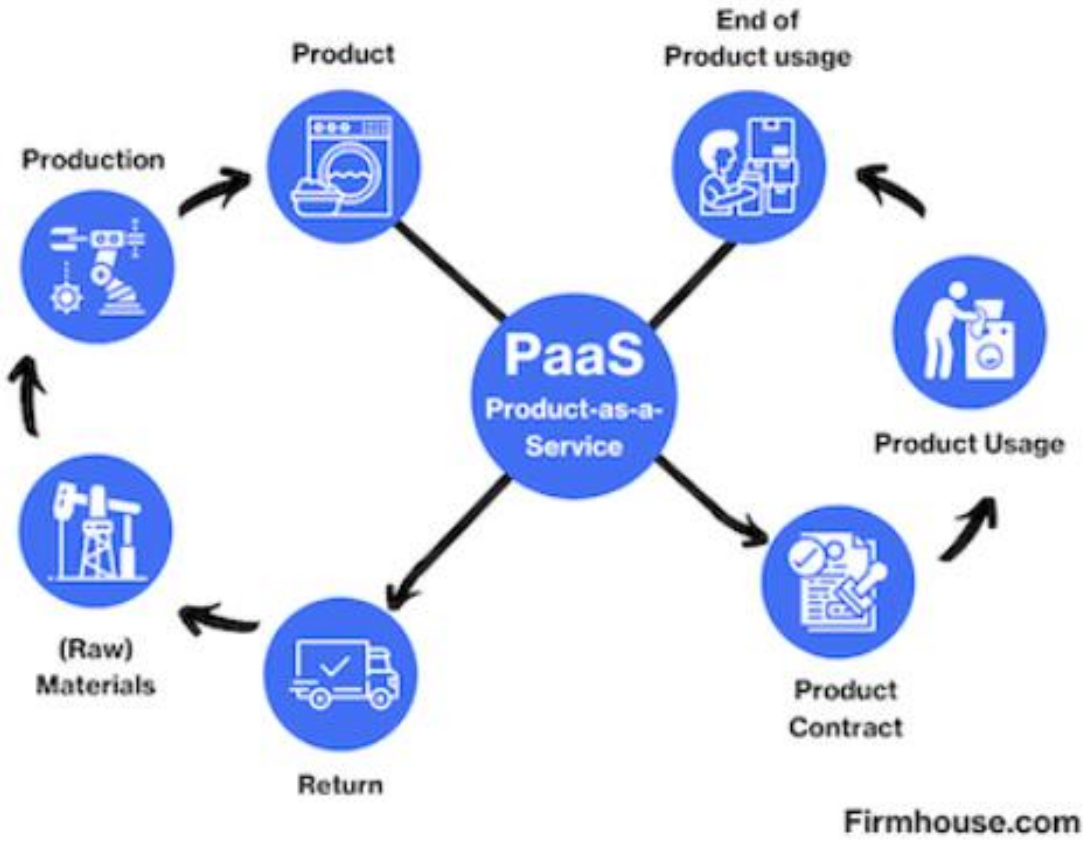
Reuse of buildings



*Source: PC Caritas Melle, Belgium*

# **Module 9.** RETHINK THE BUSINESS MODEL

## PRODUCTS AS SERVICE



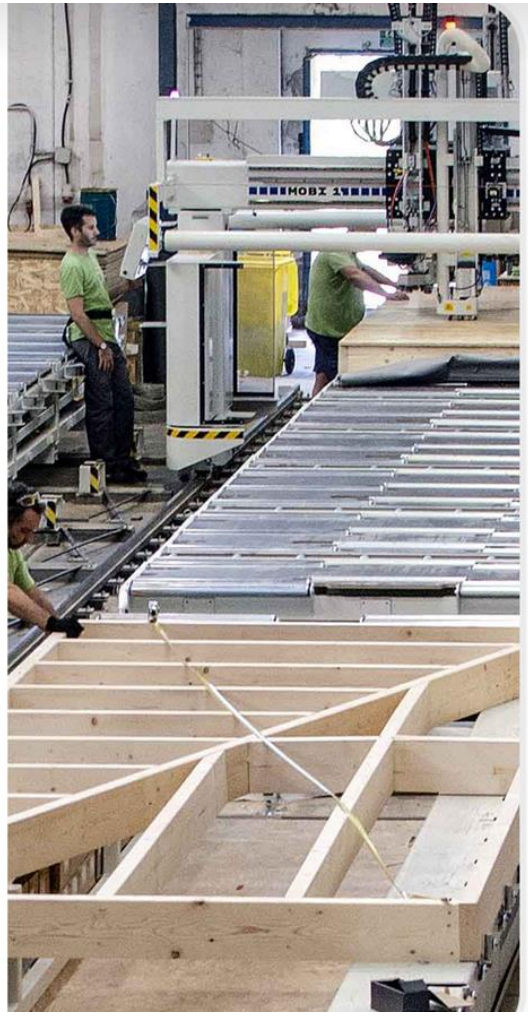

Light as a service: PHILIPS

# Module 1:

## M1-Introduction to Circular Economy in Construction

In this module, we will introduce you to the principles of circular economy in the construction industry: the Circular Key Elements to guide you through the opportunities and challenges of making the built environment sustainable in a circular way, learning from real-life national and European case studies.

Circularity has become an important issue in solving the scarcity of materials and non-biodegradable waste management. Circularity has a wide range of other valuable aspects so the applications can be very diverse. What can circularity mean for your work in the built environment? **This module guides you through what actual and new opportunities exist when applying circularity**.



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# Importance and benefits from training in circularity for SMEs in construction

Silviya Pavlova
MBA CMC Assoc CIPD, Certified Management Consultant in Strategy and International Business Development | Founder, PropTech Bulgaria & CSEE PropTech

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033740

# Speaker Info

**Silviya Pavlova MBA CMC Assoc CIPD**

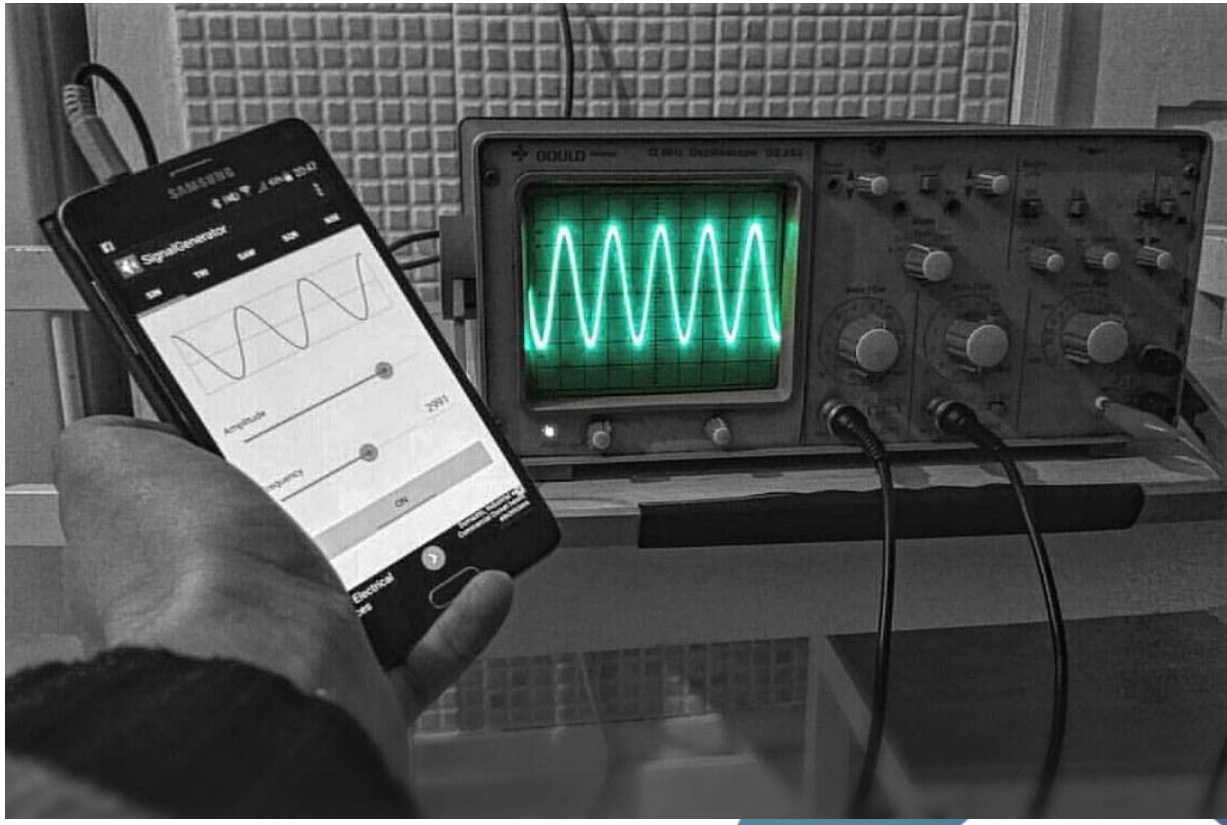
**Internationally Certified Management Consultant in Strategy and International Business Development**

**Founder, PropTech Bulgaria & CSEE PropTech**

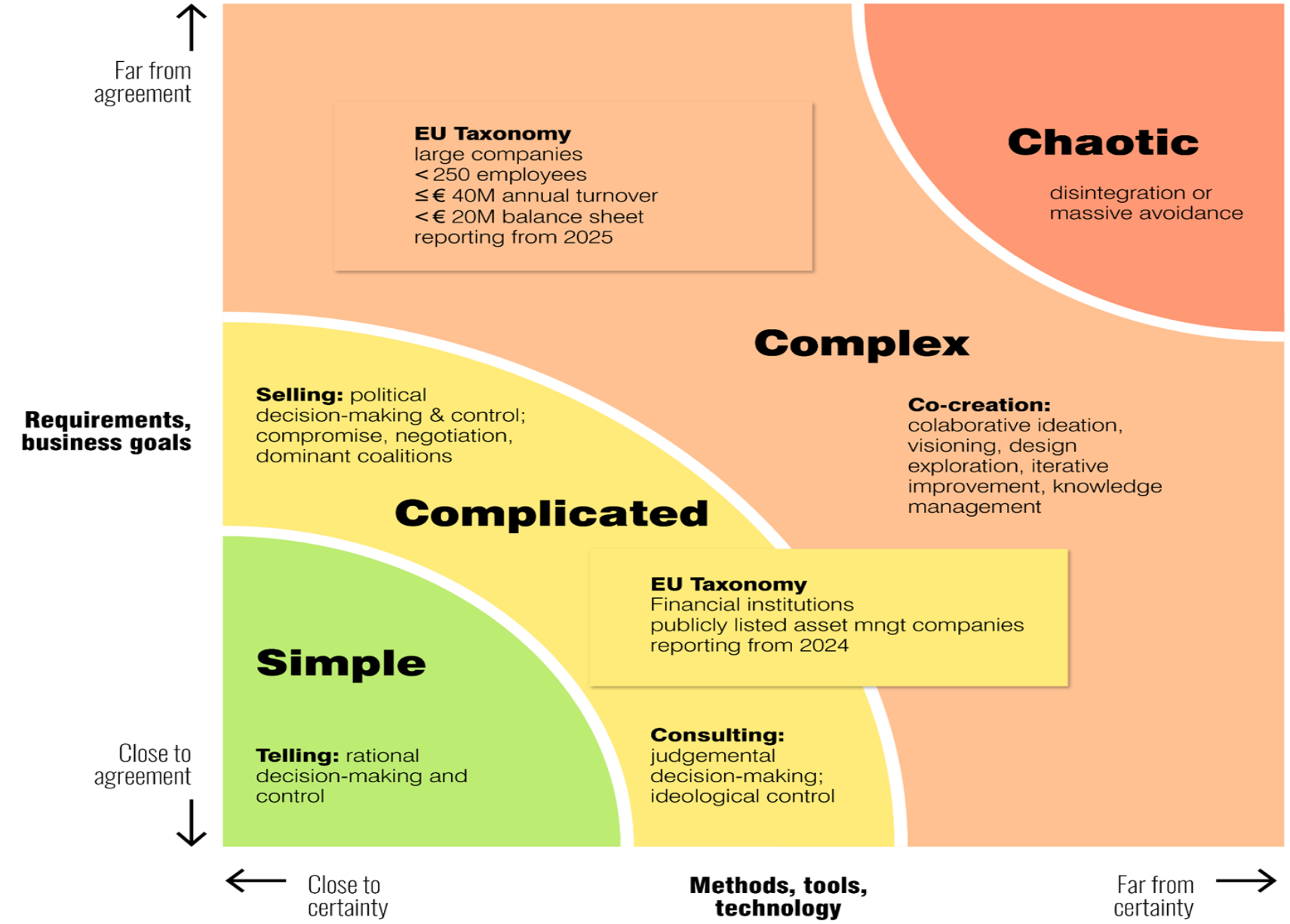
# Importance and benefits from training in circularity for SMEs in construction

- How can SMEs in the construction sector stimulate circular skills within their organisations and why is it important?

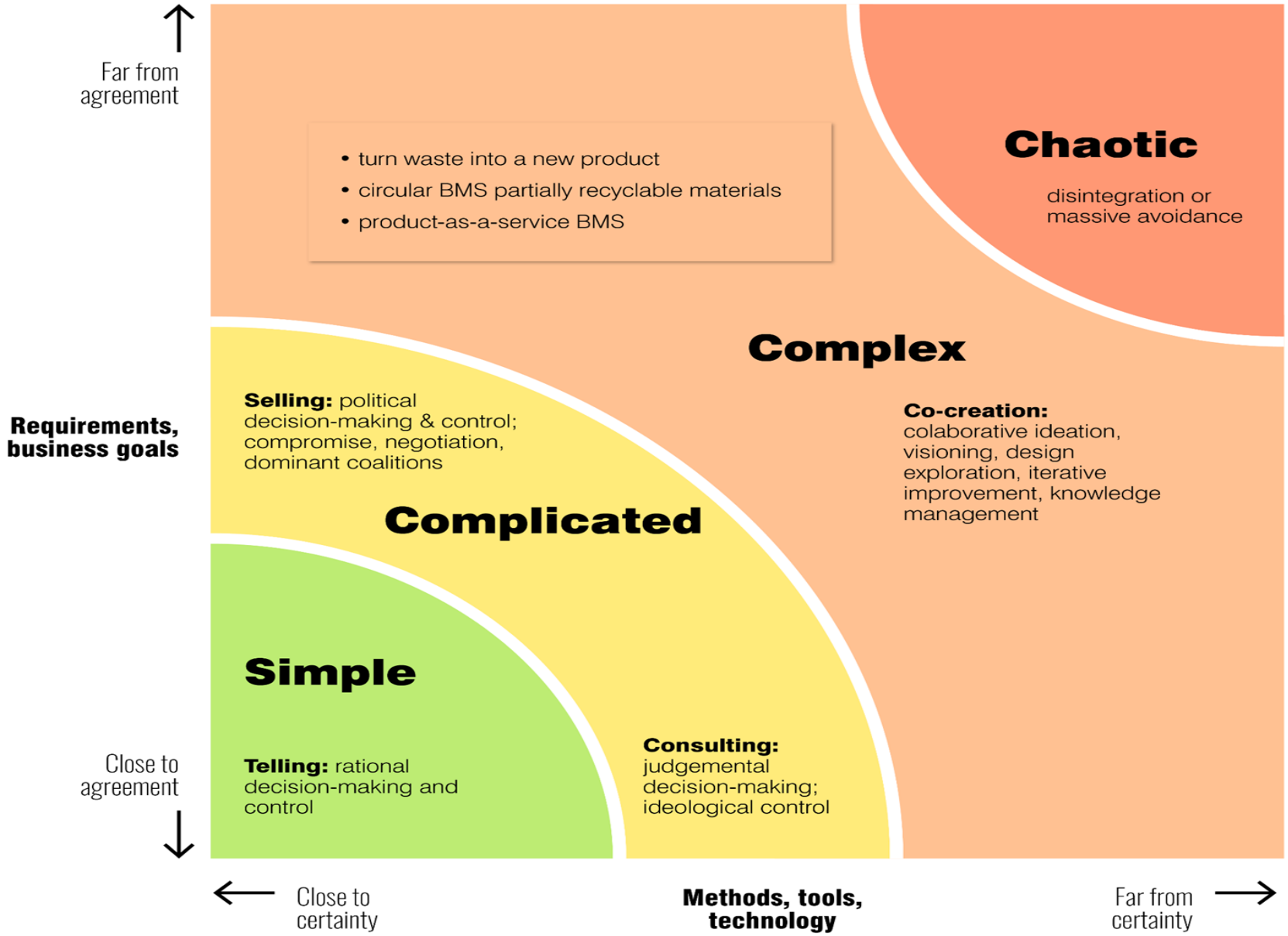
- 4 Success Stories in Circular Tech for the Urban Environment



# STACEY MATRIX:
## TRADITIONAL LARGE CORPORATES



# STACEY MATRIX:
## INNOVATIVE CORPORATES & START-UPS



# 4 Success Stories in Circular Tech for the Urban Environment

Based on the largest database of European-origin PropTech solutions built by PropTech Bulgaria, amounting to 6,000+ tech companies

# Success Stories

wasteful.
MAKING WASTE COOL

https://wasteful.earth/
BULGARIA

# Success Stories

www.biyu.world
NETHERLANDS

carrot.tech
NORWAY

www.compocity.help
HUNGARY

BUS GoCircular

Shaping a Circular Sustainable Future

# Q and A

10 minutes

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101033740

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# Breakout Session

15 minutes

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# Group Division

Group 1  - Ira Ivanova

Group 2 - Otis Schwab

Group 3 - Silviya Pavlova

Group 4 - Sreeja Raghunathan

# BREAKOUT SESSION

- Brainstorm discussion supported by moderators using Miro Board
- 4 Groups
- 2 Questions
- Link to Miro Board

slido

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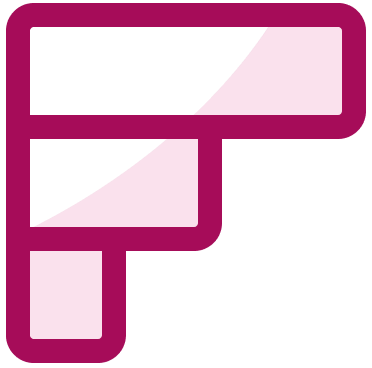

# Which of the presented results from the BUS-GoCircular project do you consider having most potential for successfully supporting SMEs in the integration of circle economy principles?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

slido

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# What is your key takeaway from the session?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

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# Conclusion & Take aways

10 minutes

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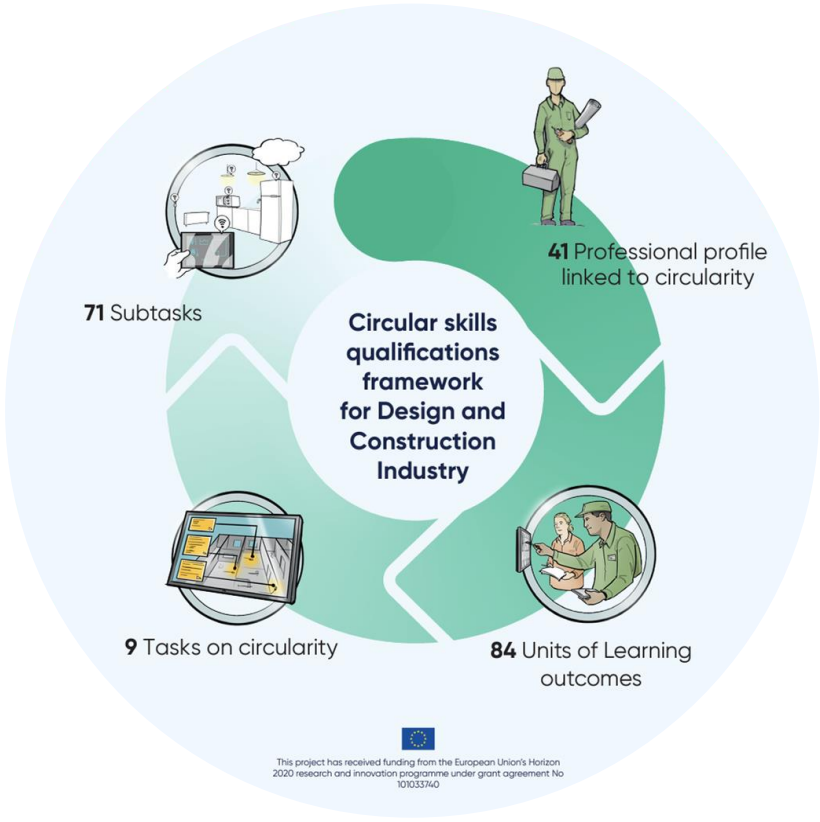
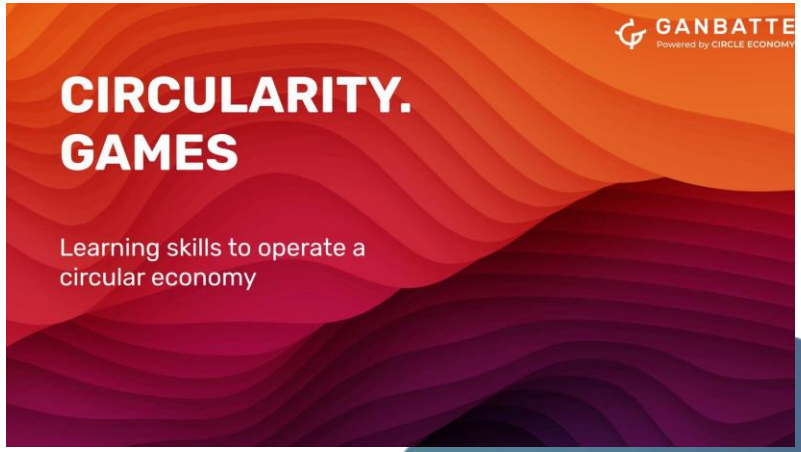
# Find out more..

## Fundamental Training Pack for SMEs


## Construction skills qualification framework




## Upcoming Gamified E-learning Platform



# BUS-Go Circular EU webinar series

| BUS Go Circular's outcomes | Webinar to know more about | Date |
|---|---|---|
| - Training materials for local authorities<br>- Guide for public authorities "Stimulating demand for circular construction skills" | **Local authorities'** policy toolkit to promote circular construction skills | 17th of October (Recording available) |
| - Circular Construction Skills framework<br>- Fundamental training packs for SMEs | Unlocking the potential of **SMEs**: A holistic framework to train SME-workforce in circular construction | 14th of November |
| - Continuous Professional Development framework for Circular Construction Skills<br>- Train the Trainers session | Are **architects** ready for circular transition? Continuous Professional Development tools for Europe | 28th of November |
| - Units Of Learning<br>- Fundamental training packs for SMEs<br>- Circular Construction Skills framework<br>- Train the Trainers session | New Training Materials and Methodologies for Up-Skilling in Circular Economy in Construction for **Training Centres** | 14th of December |

# Register for the upcoming webinars

Link in the Chat

# Thank You!

For more information about the BUS Go-Circular project, visit our website

Share your thoughts about this webinar through our contact form

And check out our other training programmes

https://busgocircular.eu/

Follow us

https://twitter.com/BusGoCircular

https://www.linkedin.com/company/busgocircular

https://www.youtube.com/channel/UCXu4Rjs5WDXBE-yqda5kt5A

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## Colophon



BUS GoCircular

Partners

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# Thank you!


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