



Unit 17A

The Circular Economy in the Construction Sector

Energy, Carbon and Material Use

1 Introduction

Unit 17A provides resources for vocational trainers seeking to incorporate the circular economy into their courses in the Construction sector, focusing on carbon emissions of various building materials. This unit explores the importance of understanding operational and embodied carbon of a building and helps with learning how circular principles can reduce carbon emissions during various life cycle stages of a building, as well as during various stages of the construction process.

2 Learning Outcomes

Knowledge	To gain insight into the interconnection of material resources, carbon and energy use.
Skills	To identify construction materials which have a high embedded energy and carbon emissions impact.
Competencies	To understand the environmental impacts of construction materials and the need to avoid waste.
EQF Level	This material is mainly suited to EQF level 4.



3 Lesson Plan

Method	Description	Suggested duration in minutes (total minutes)
Brainstorming session	Brainstorming where you as a trainer write down definitions, notions and connotations ought to be used for future discussions and references. You can continue the brainstorming session with the following questions if needed: <ul style="list-style-type: none"> • Discuss the different construction stages, as well as a building's life cycle stages and talk about when a lot of carbon is emitted. What building materials will be associated with more embedded emissions than others? 	15
Presentation by trainer using PPT	Overview	30
	Unit Learning Objectives	
	Building materials and carbon emissions	
	Waste on the construction site	
	Discussion Point	
	Building – operational phase carbon emissions	
	Circular economy: Energy Efficiency	
Assessment	Quiz	15

4 Quiz

- 1. The embodied energy in building materials may vary depending on:**
Answer: How materials are sourced and produced
- 2. How can we reduce operational carbon of a building?**
Answer: All the answers are correct:
 - Using renewable resources, like solar heat pumps for heating or electricity coming from renewables
 - Insulating the house well to reduce the need for heating
 - Installing water-efficiency equipment
- 3. What is operational carbon?**
Answer: All the answers are correct:
 - The amount of carbon emitted during the operational phase of a building
 - The use, management, and maintenance of a product or structure
 - The amount of carbon emitted during in-use phase of a building