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Facilitators and drivers of low-carbon and energy residential developments

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Facilitators and drivers of low-carbon and energy residential developments

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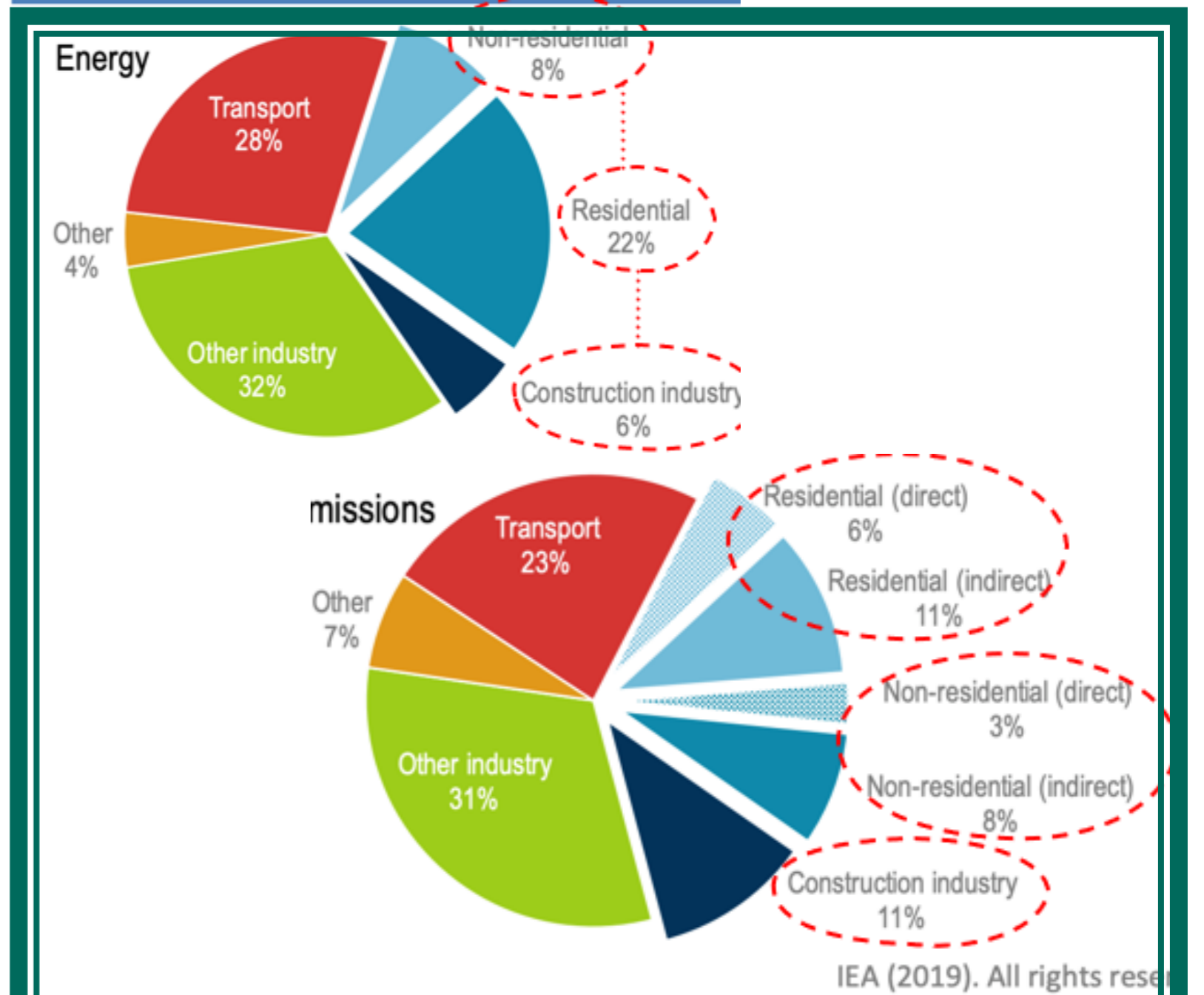
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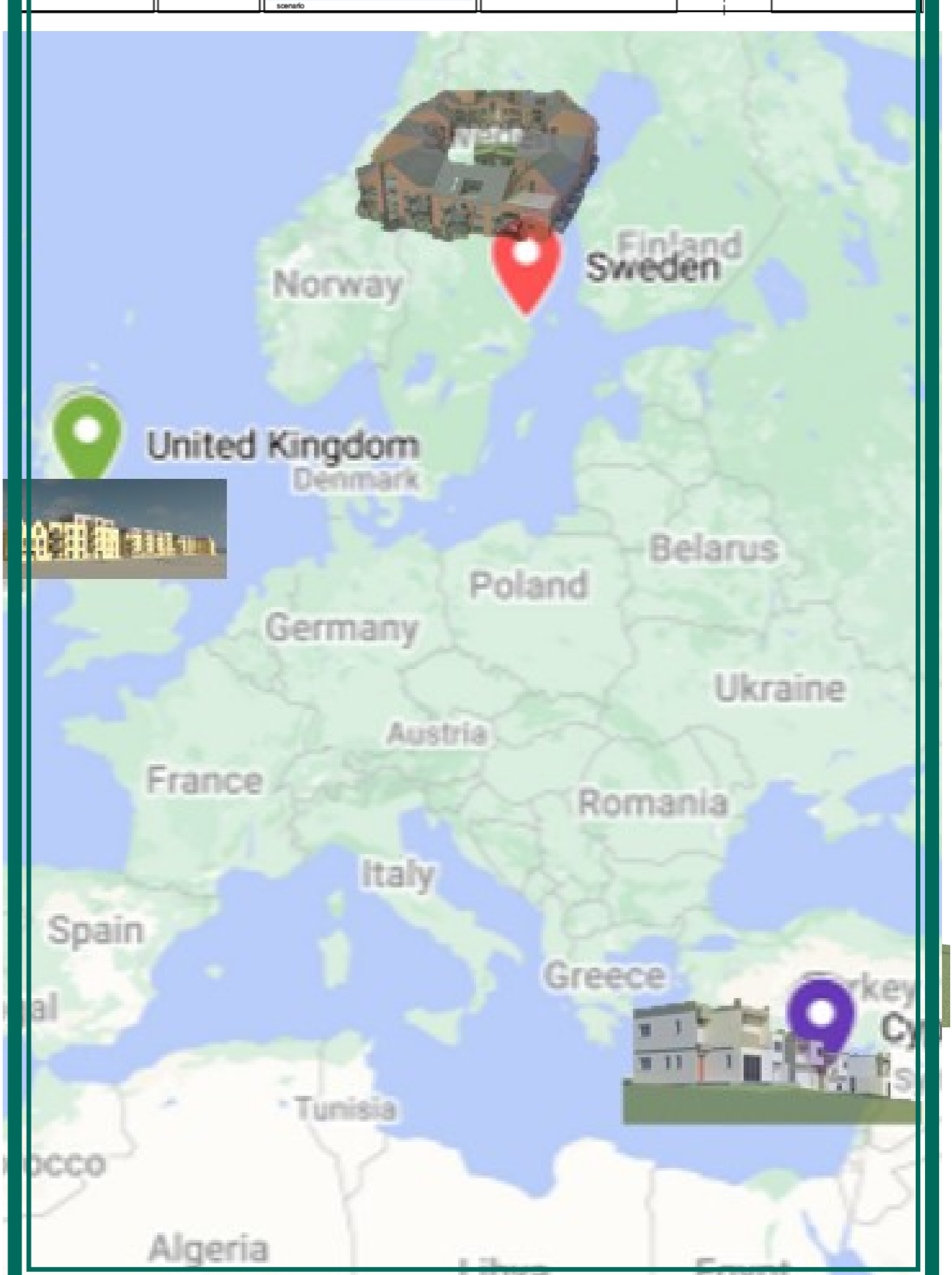
Low Embodied Carbon Buildings: Design Decisions and the role of LCA

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Notes: Construction industry is the largest emitter of embodied carbon, followed by transport, other industry, and residential. Indirect emissions are emissions from power generation for electricity and commercial heat. Sources: Adapted from IEA (2019a), World Energy Statistics and Balances (database), www.iea.org/statistics and IEA (2019b), Energy Technology Perspectives, buildings model, www.iea.org/buildings.

BUILDING LIFE CYCLE INFORMATION		SUPPLEMENTARY INFORMATION	
BUILDING LIFE CYCLE INFORMATION		SUPPLEMENTARY INFORMATION	
PRODUCT	CONSTRUCTION	USE PHASE	END OF LIFE
1	2	3	4
...



INTRODUCTION

- Building design decisions: **vital** in shaping whole life carbon impact.
- Design process - depends on numerous variables and stakeholders
- Social and technical factors influence designer's decisions
- Limited knowledge: what happens in practice?

RESULTS

- Different channels to introduce environmental sustainability among cultures and industry contexts
- Sustainability introduced:
 - ❑ Swedish cases: by rules and regulations, legislation, certification systems
 - ❑ Cypriot cases: by individuals
 - ❑ UK cases: by guidance and regulations and individuals (organizational & personal level)

OBJECTIVE

1. Understand how sustainability is considered in practice
2. Identify main drivers for the introduction of sustainable decisions
3. Identify main influences and limitations on designer's environmental decisions

DISCUSSION

- ❑ **Facilitators:** create the right environment and conditions for sustainability to occur and simplify it
 - ❖ Policy & Strategy (national, regional, local)
 - ❖ Legislation, Regulations
 - ❖ Guidance, artefacts
- ❑ **Drivers:** allow factors or functions direct or control activities and behaviours to cause sustainability to happen.
 - Influences: individuals & interpersonal interactions,
 - organisational strategy
 - Collaboration & consultation
 - Interpretation: requirements & obligations,
 - knowledge & understanding

METHODS

- Qualitative studies: three European contexts
- Interviews with main decision-makers of housing projects in Sweden, UK, and Cyprus
- Documentation analysis



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Facilitators and drivers of low carbon and energy residential developments.

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Abstract

Building design is a very complex process, being dependent on the input of a high number of variables and stakeholders. This is particularly the case when considering large developments. The interaction between various social and technical factors create limitations and influences on the designers' decisions, which directly or indirectly shape the end product, and define the whole life carbon and energy impact. To date, there are few studies that have investigated the association between the building design process and the whole life carbon impact. Little is known about the effect of various stages and stakeholders on the end product as well as the various interdependencies.

Drawing evidence from qualitative studies within the real-world setting of the construction industry in three European contexts including interviews with industry practitioners, this research seeks to identify and understand the various interactions of the building design process and their impact on the sustainability of a project. Participants include the main decision-makers of public housing development projects in Sweden, Cyprus and the UK, initially selected based on previous literature and built up as identified through the data collection and analysis.

The sustainability of a project can be introduced either by facilitating it, i.e. creating the right environments and conditions for it to occur as well as simplifying it, or by driving it i.e. by allowing factors or functions direct or control activities and behaviours to cause sustainability to happen. Understanding the impact of each course of action is not simple, as it is influenced by the cultural and industrial contexts associated. The aim of this article is to present the main facilitators and drivers that enable or motivate the introduction of sustainable decisions in different cultural and industrial contexts and thus support low carbon and energy developments.



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