

# The Circular Economy transition in existing Public Real Estate

An overview of the facts and barriers of the central government's real estate

P5

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Koninkrijksrelaties*

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# 1. Introduction

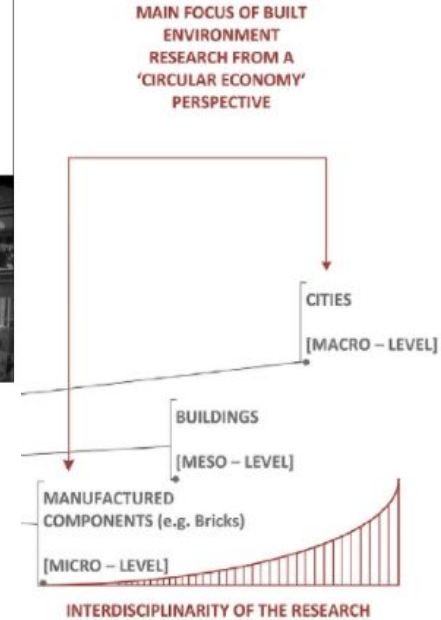
Problem statement, Demarcation, aim, and Research Questions

# Problem Statement

- Scarcity of materials & Environmental pollution  
(OECD, 2018; PBL, 2019; van den Wildenberg, 2018)
- Circular Economy (CE) demand by 2050  
(Rijksvastgoedbedrijf, 2016)
- Responsibility of the construction industry (40%)  
(Ecorys, 2014; Pomponi & Moncaster, 2016; WEF, 2016)
- Existing building stock:
  - 75-90% standing by 2050 and 1% demountable  
(Pomponi & Moncaster, 2016; Kanters, 2018)
  - Public Real Estate (PRE)



(Rijksoverheid, 2016)

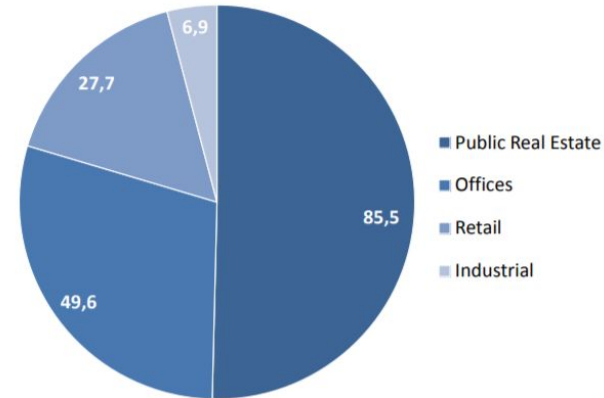


(Pomponi & Moncaster, 2016)

# Demarcation & Aim of the Study



- The CGREA's existing PRE
- 12 million m<sup>2</sup> of the 85.5 m<sup>2</sup> PRE in the NL  
(Rijksvastgoedbedrijf, 2017; Tjeerdsma & Veuger, 2015)
- Aim:
  - Provide overview
  - Current situation
  - Starting point



(Tjeerdsma & Veuger, 2015)

# 2. Review of Scientific Literature

Circular Economy  
Built Environment  
Literature Conclusion

# Review of Previous Scientific Literature

## → Importance of CE transition

(Anastasiades et al., 2020; Ellen MacArthur Foundation, 2013; Geldermans, et al., 2016; Stijn & Gruis, 2019)

## → Emphasis on Building Components and urban areas

(Anastasiades et al., 2020; Pomponi & Moncaster, 2016; Kyro, 2020)

## → Focus on new constructions

(Kanter, 2018; Pomponi & Moncaster, 2017; Kyro, 2020)

## → Neglect of PRE

(Vergara D'Alencon et. al, 2019)

→ **insufficient research has been conducted on what the barriers could be for the CE transition in existing PRE.**

# Research Questions

- Main Research Question:  
**“What are the current barriers to the circular economy transition for existing public real estate?”**
- Sub-Research Questions:
  1. *“How is the CE ambition integrated into CGREA’s existing PRE projects?”*
  2. *“How are CE strategies implemented in existing PRE?”*
  3. *“What challenges arise when implementing CE strategies in existing PRE?”*
  4. *“How are these challenges currently managed in order to realise the CE goal?”*

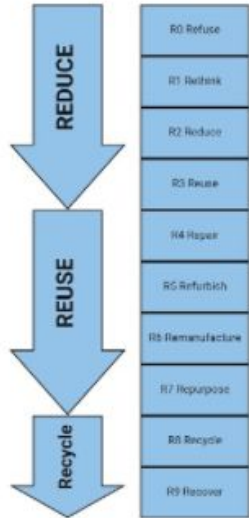


# 3. Theoretical Background

Theory Conclusion  
Theoretical Framework

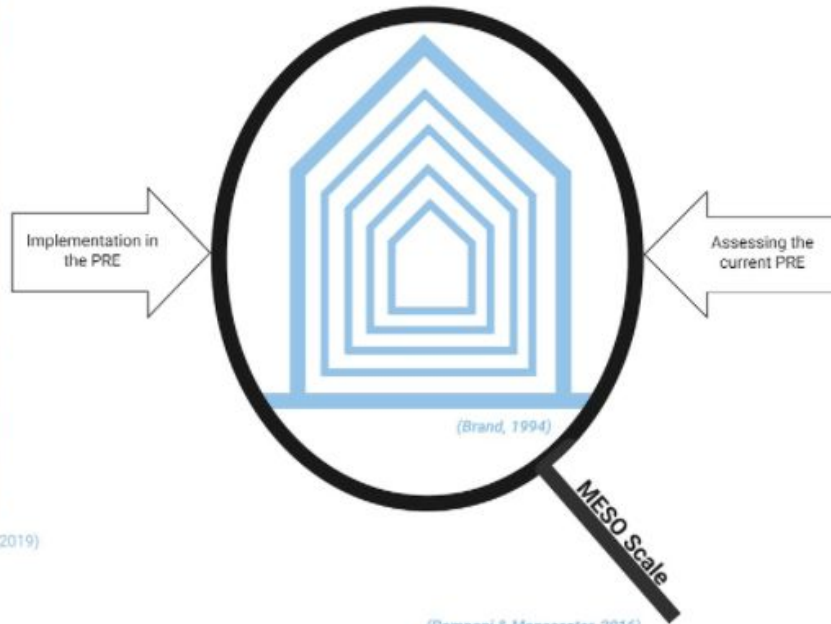
# Theoretical Background

Trias Ecologica + R-Framework



(Rijksvastgoedbedrijf, 2019; Ririassa, 2019)

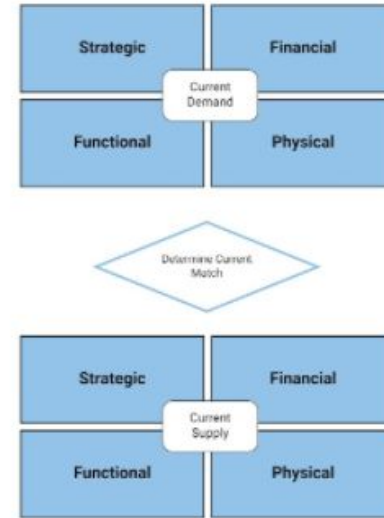
CGREA's PRE



(Brand, 1994)

(Pomponi & Manccaster, 2016)

DAS Framework + C/PREM Perspectives



(Den Heijer, 2011; De Jonge et al., 2009)



# 4. Methodology

Research Design

# Methodology - Research Design

Section:	<b>Theoretical research</b>	<b>Empirical research</b>	<b>Synthesis</b>					
Method:	<b>Literature review</b>	<b>Case Study &amp; Interviews</b>						
Source:	Academic literature	Grey literature	Experts	Exploratory	In-depth	Cross-Case Analysis & Expert panel		
Output:	Scientific knowledge	Theoretical Framework	Field knowledge	Case Analyses	Identifying	Findings	Validation	Conclusion & Discussion

- Three existing PRE cases
- 11 Interviews conducted



# 5. Results

## RQ 1:

# How is the CE ambition integrated into CGREA's existing PRE projects?

- 79 Projects, 20 existing PRE
- Advice days, workshops, tools and roadmaps
- BLOEI-instrument
- Sustainability advisors → adaptable approach → Learning by doing

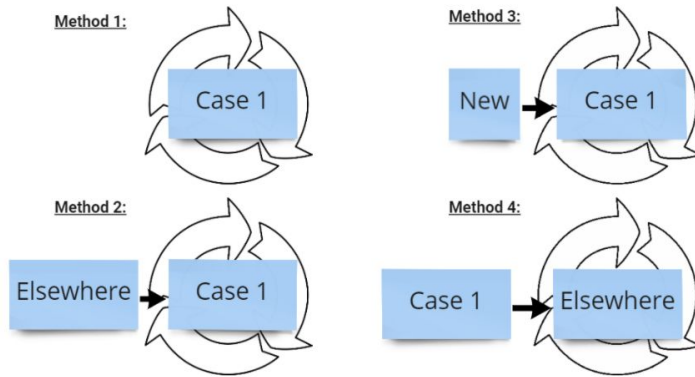


## RQ 1:

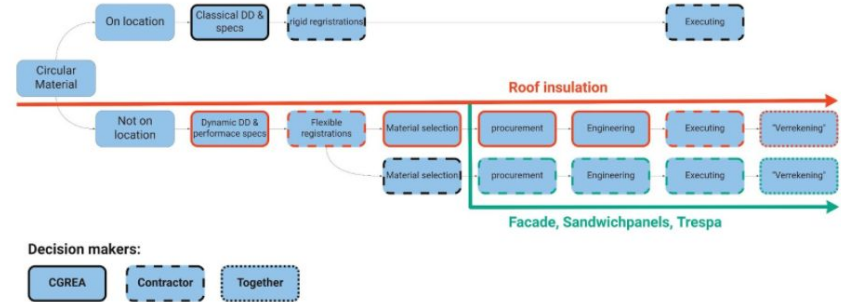
# How is the CE ambition integrated into CGREA's existing PRE projects?

The three approaches observed in practice:

### Case 1:



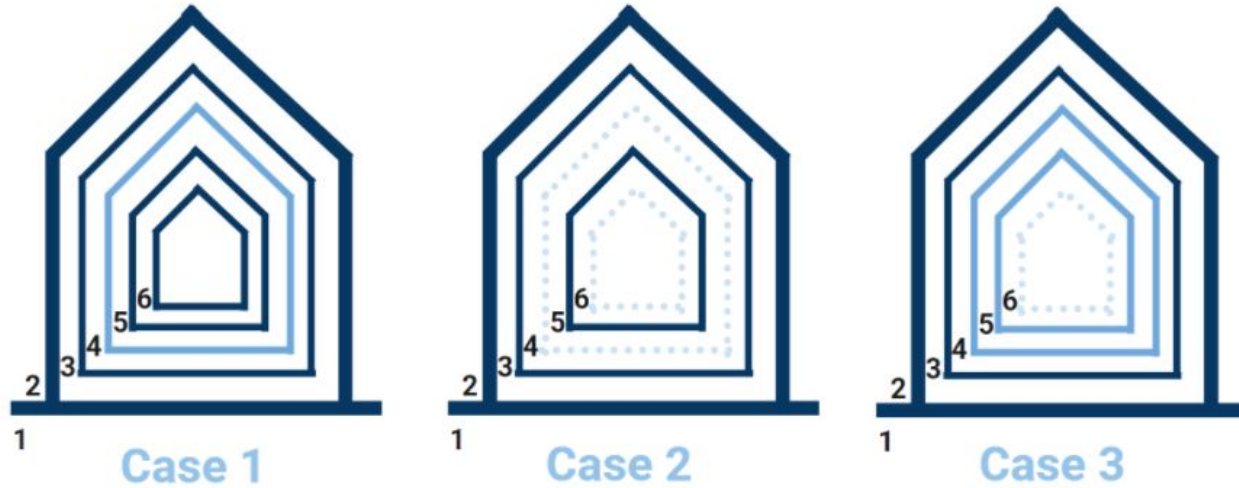
### Case 2:



### Case 3: Circular Requirements

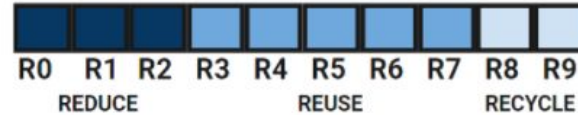
## RQ 2:

How are the CE strategies implemented in existing PRE?



Legend:

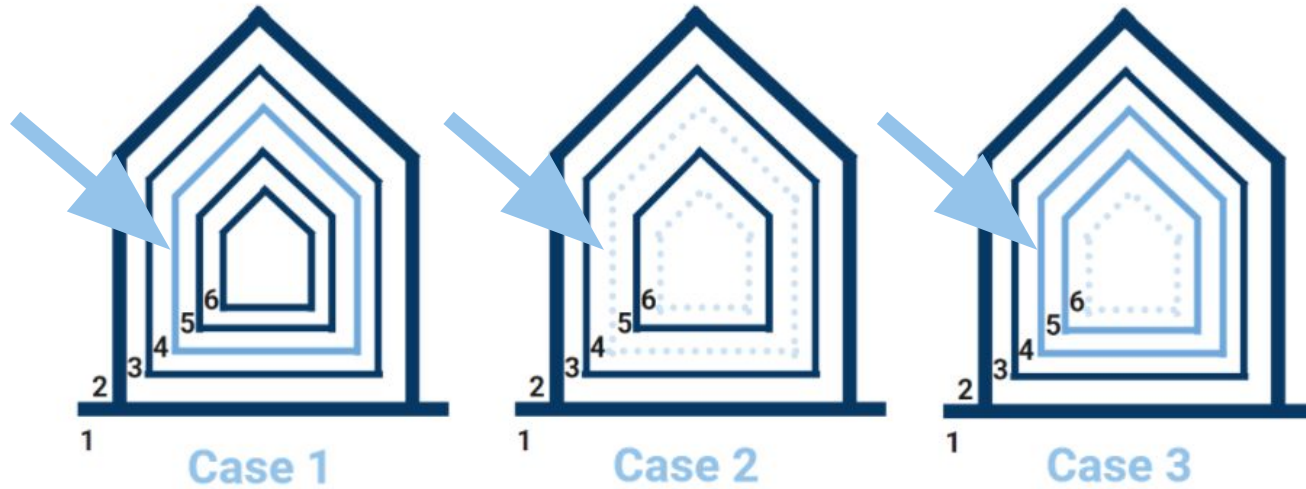
1. Site	4 Services
2. Structure	5.Space Plan
3. Facade	6.Stuff





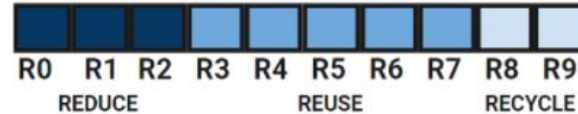
### RQ 3:

What challenges arise when implementing CE strategies in existing PRE?



Legend:

- 1. Site
- 2. Structure
- 3. Facade
- 4. Services
- 5. Space Plan
- 6. Stuff



## RQ 4:

How are these challenges currently managed in order to realise the CE goal?

- Implementing CE strategies that could lead to challenges were discarded
- Circular C's:

Commitment  
Communicate  
Continue  
Conscious  
Concession



# 6. Conclusion

# What are the current barriers to the CE transition for existing PRE?

Strategic:



<b>No CE ambition in the project scope</b>	<b>Unknown resource availability</b>	<b>No assessment framework</b>	<b>Inexperience of the contractor with the CE</b>
Case: 1 & 3	Case: 1 & 2	Case: 1 & 2	Case: 2

# What are the current barriers to the CE transition for existing PRE?

Financial:



<b>Cost and time driven project</b>	<b>No separate budget for CE strategies</b>
Case: 1, 2 & 3	Case: 1, 2 & 3

# What are the current barriers to the CE transition for existing PRE?

Physical:



<b>Finding CE materials</b>	<b>Unknown quality of building materials</b>	<b>Current regulations</b>	<b>No CE award criteria</b>
Case: 1, 2 & 3	Case: 1 & 2	Case: 1 & 2	Case: 3

# What are the current barriers to the CE transition for existing PRE?

Functional:



<b>User satisfaction</b>	<b>Definitive design without CE strategies</b>
Case: 1	Case: 2

# What are the current barriers to the CE transition for existing PRE?



No CE ambition  
in the project  
scope



Cost and time  
driven project



Current  
regulations



Unknown  
resource  
availability



No separate  
budget for CE  
strategies



No CE award  
criteria



No assessment  
framework



Finding CE  
materials



User satisfaction



Inexperience of  
the Contractor  
with the CE



Unknown quality  
of building  
materials



Definitive design  
without CE  
strategies





# 7. Discussion

Interpretations  
Implications  
Limitations

# Discussion

- **Interpretations:**
  - Contribution to a more nuanced view
  - Theoretical data vs. Empirical data

# Discussion

- **Interpretations:**
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- **Implications:**
  - Starting point

# Discussion

- **Interpretations:**
  - Contribution to a more nuanced view
  - Theoretical data vs. Empirical data
- **Implications:**
  - Starting point
- **Limitations:**
  - No indication of complexity over the whole project
  - % of a circular building
  - Non-CE aligned solutions



# 8. Recommendation

# Recommendations

- Dealing with the barriers & assess/validate solutions
- Next step in the DAS framework for designing an accommodation strategy
- Relevance with non-public existing building
- Focus on Service, Space Plan and Stuff building layers



# **The Circular Economy transition in existing Public Real Estate**

An overview of the facts and barriers of the central government's real estate