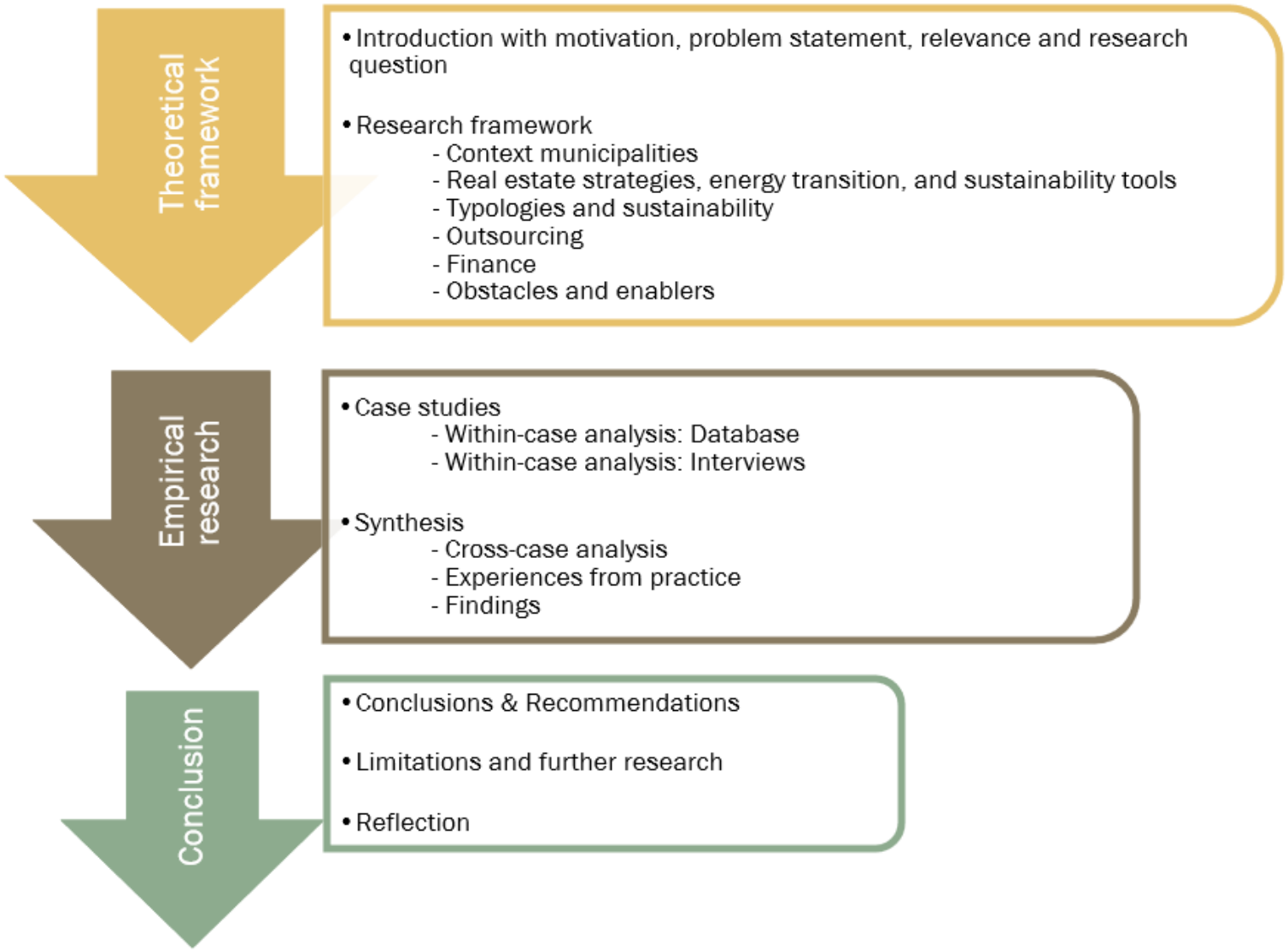
How public real estate sets the stage towards a sustainable future

A research into the facts, possibilities, and challenges of sustainable real estate strategies for municipalities in the Netherlands

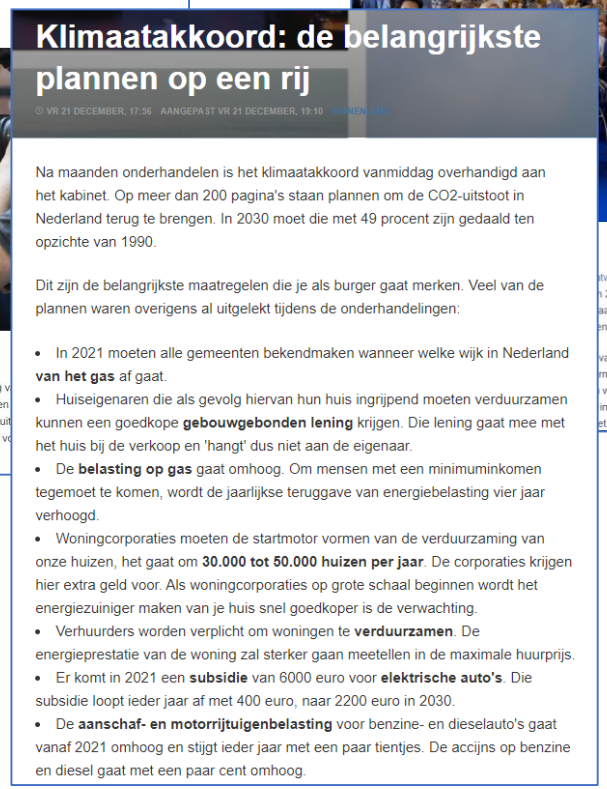
Nienke Hakenberg / 4272218 / P5


Theoretical framework
• Introduction with motivation, problem statement, relevance and research question
• Research framework
- Context municipalities
- Real estate strategies, energy transition, and sustainability tools
- Typologies and sustainability
- Outsourcing
- Finance
- Obstacles and enablers
Empirical research
• Case studies
- Within-case analysis: Database
- Within-case analysis: Interviews
• Synthesis
- Cross-case analysis
- Experiences from practice
- Findings
Conclusion
• Conclusions & Recommendations
• Limitations and further research
• Reflection

Reason for this research

NOS (2019)

NOS (2018)

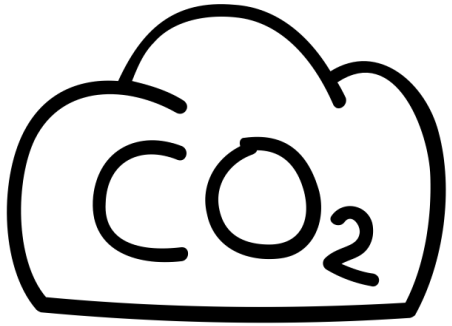


NOS (2018)

+

"Duurzaamheid en het opstellen van beleid (beide **21%**) hebben ook de aandacht van de gemeenten" (Veuger, 2017).

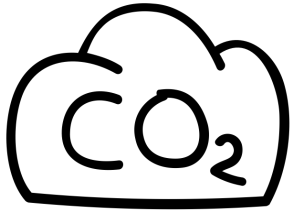
Reason for this research

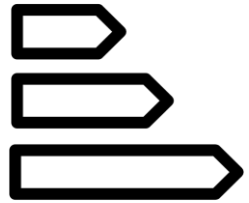


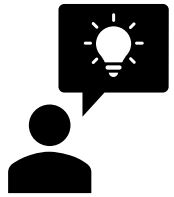
(almost) CO_2 neutral in 2050

Public real estate status

Problem statement



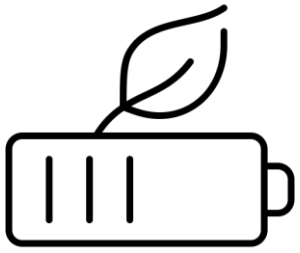


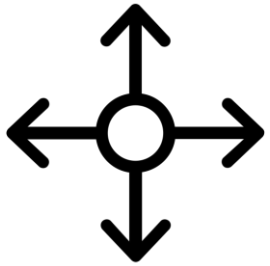


- 83,4 million m^2 public real estate in the Netherlands (estimation of 2011)
- Reduction of 95% CO_2 in 2050 (in comparison to 1990)
- Around 28% of municipal RE is label A, others are B-G
- Municipalities can struggle with having the right (energy) information for portfolio and strategy options

Societal and scientific relevance

- Helps reduce electricity and gas consumption primarily
- Can be an incentive for other building owners
- Better indoor climate
- Research and insight into the change in the decision-making process of municipalities
- Contributes to the body of knowledge of sustainable strategies on a municipal level



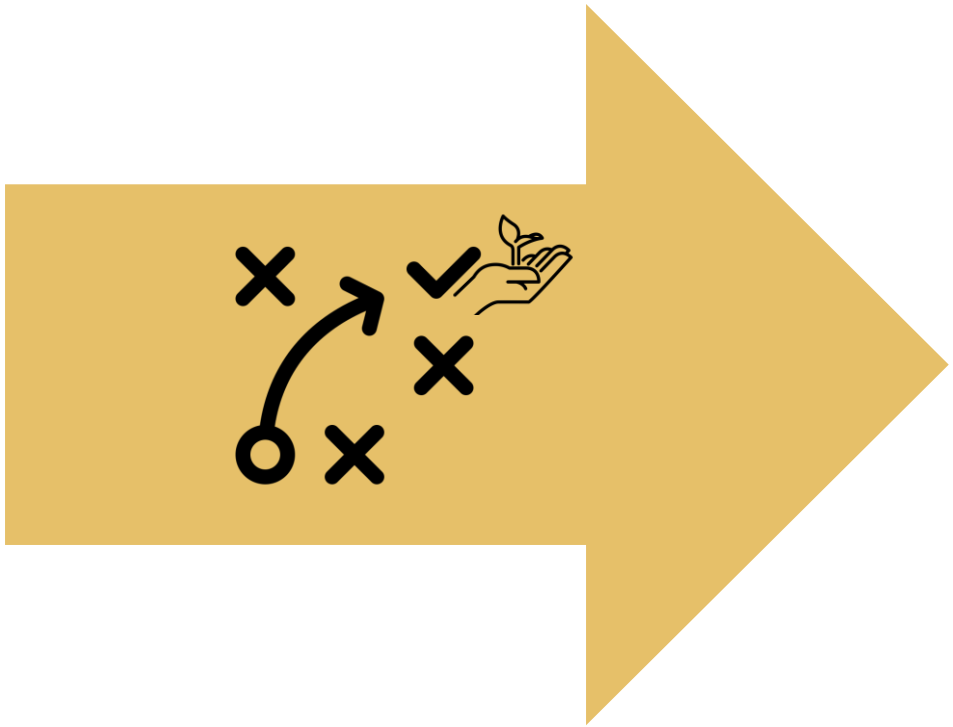



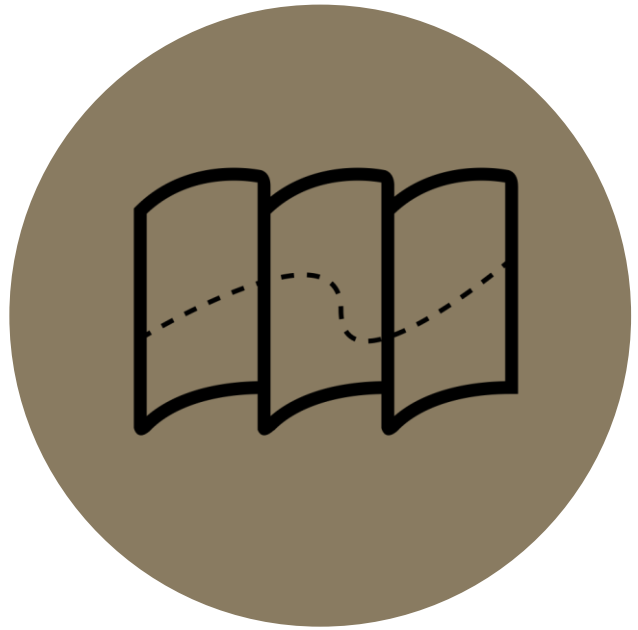

Aim & research questions

Insight

Sustainable strategies

Roadmap





Aim & research questions

Main research question:

What sustainable real estate management strategy tools are available at a municipal level, and how do municipalities need to apply these strategy tools to create a public real estate portfolio that is energy neutral in 2050?

Research sub-questions

Current theories

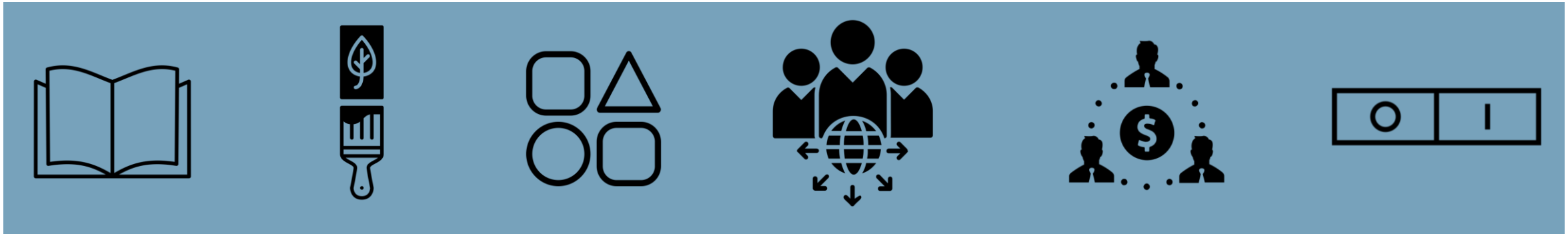
Sustainable strategy tools

Building typology

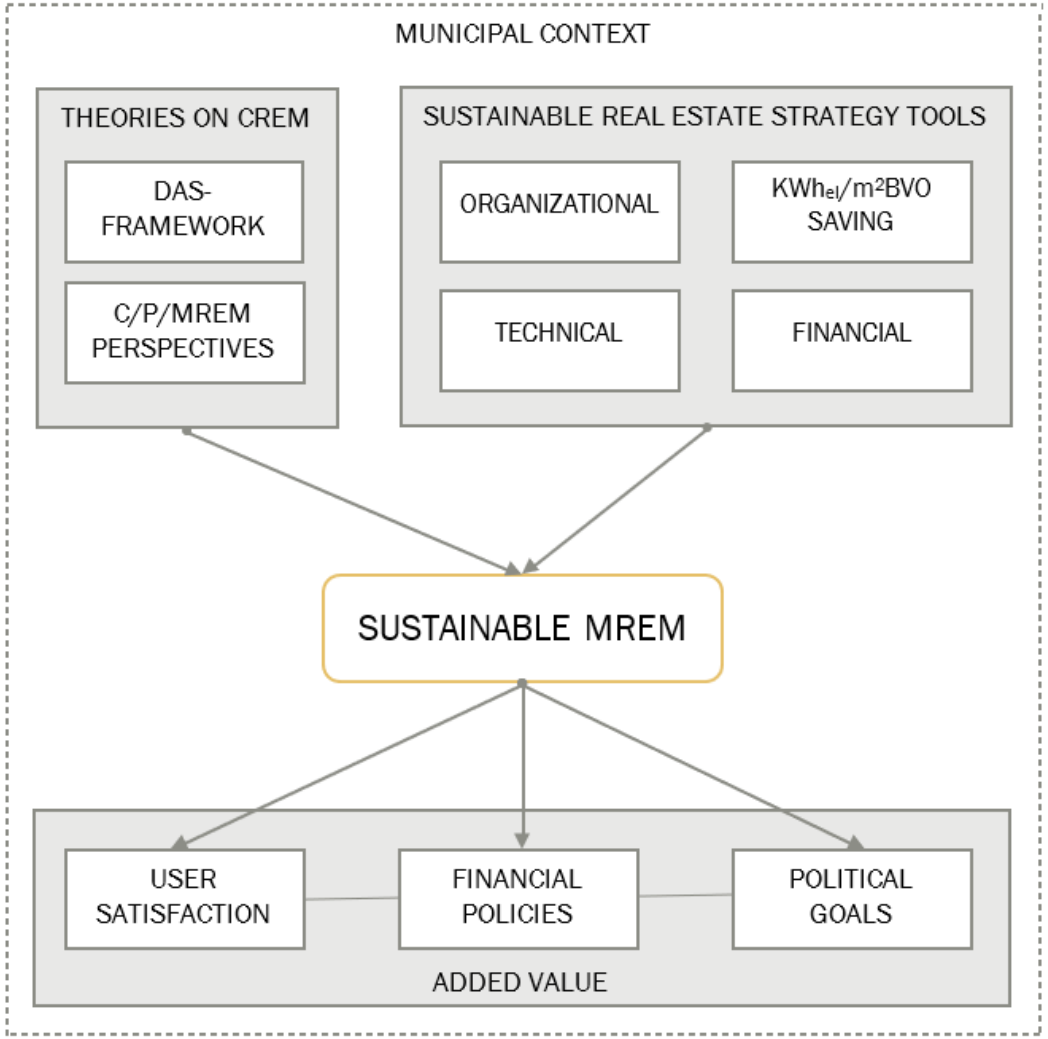
Outsourcing

Financial influences

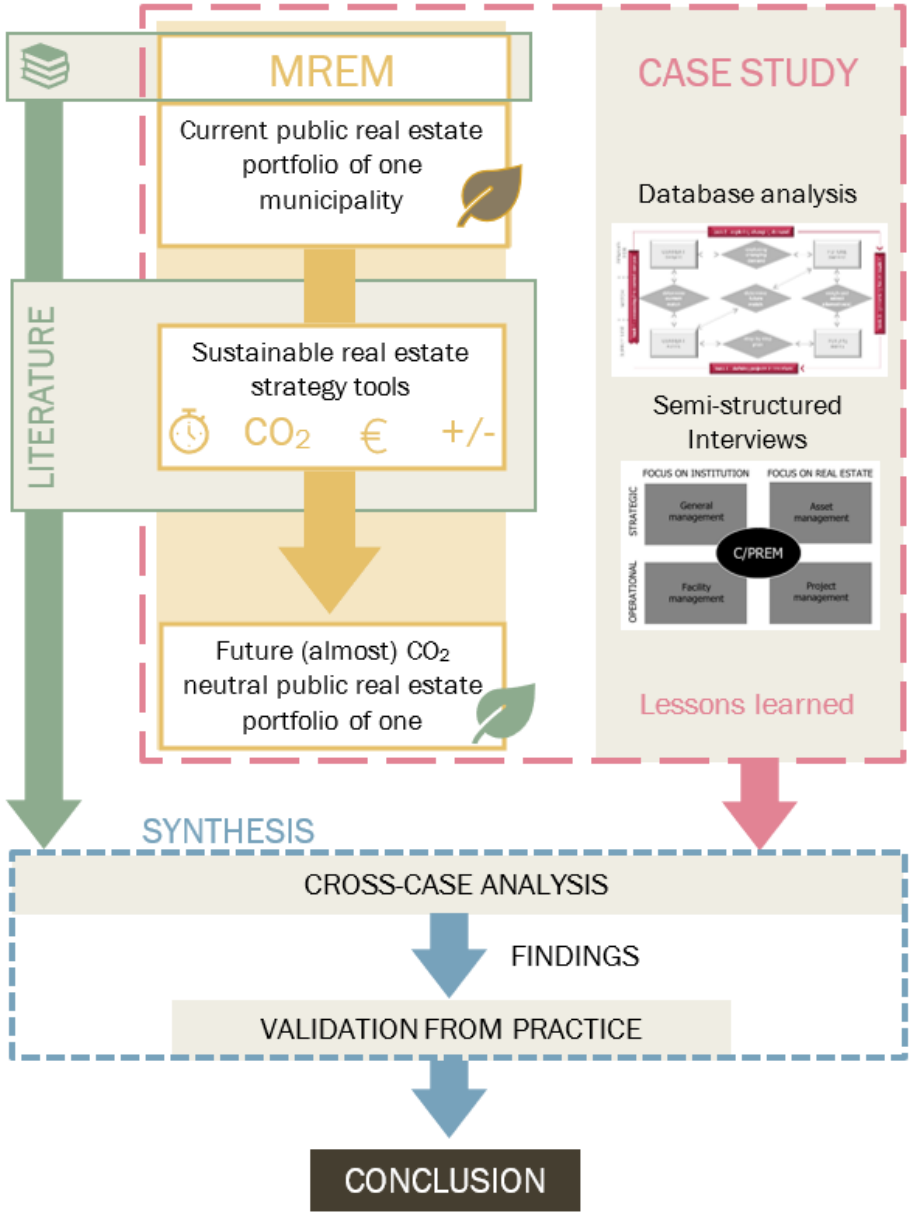
Obstacles & Enablers



Conceptual model



Research design



Context

- Dynamic context in the municipalities
- More responsibility

Real estate department at municipalities

- Real estate management triangle
- New Public Governance

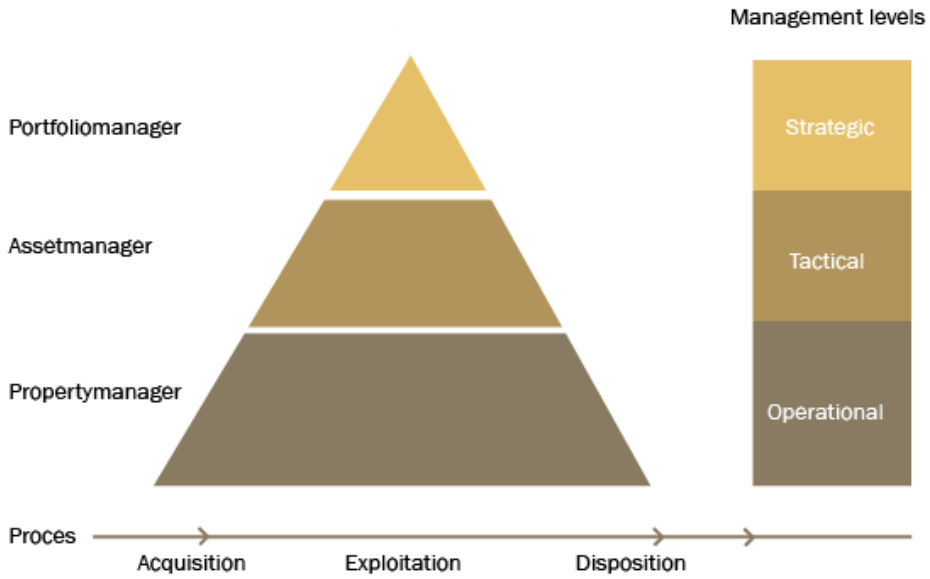
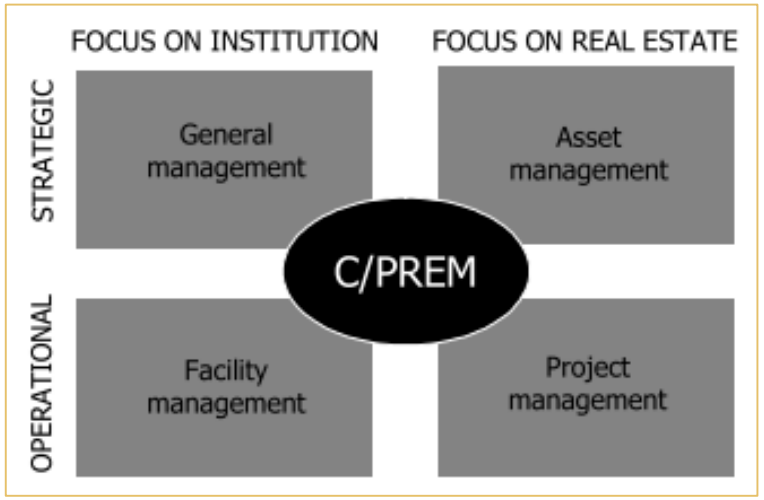
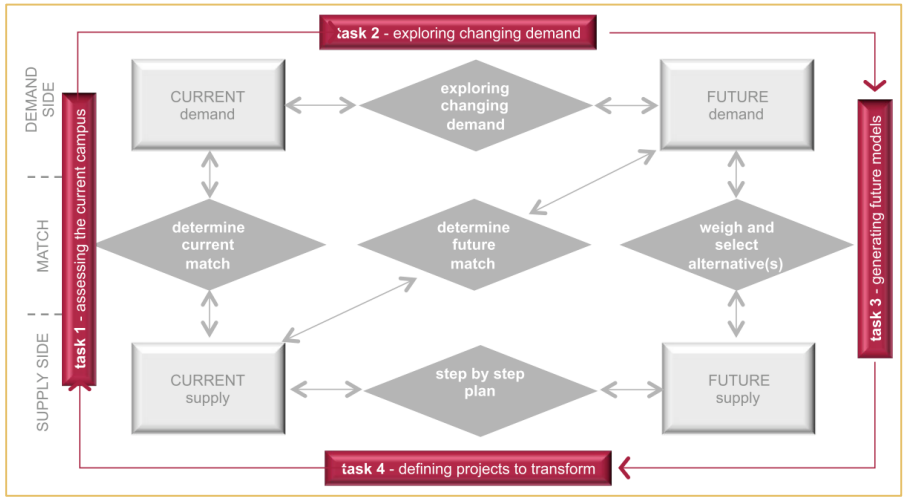


Figure 12: Real estate management triangle. Own image based on Vermeulen & Wieman (2010)

Theories on PREM & MREM



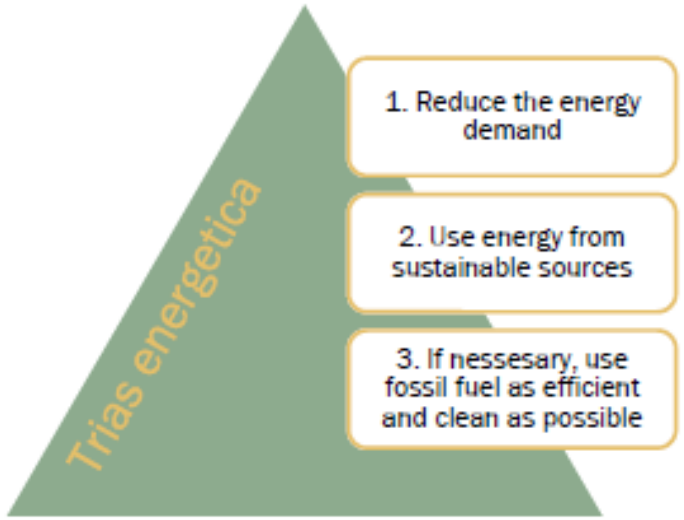
De Jonge et al., (2008)



Den Heijer (2011)

Sustainable strategies, energy transition & tools

- Trias energetica



Trias energetica, own image based on RVO (2015)

- DMOP (Duurzaam meerjarig onderhoudsplan)
- ESCo's (Energy Service Companies)
- Performance-based contracts
- Total outsourcing
- Inhouse & software tools

Conclusion Theoretical framework

Task 1:

Identification through typology, monumental status and energy label.

not always up to date.

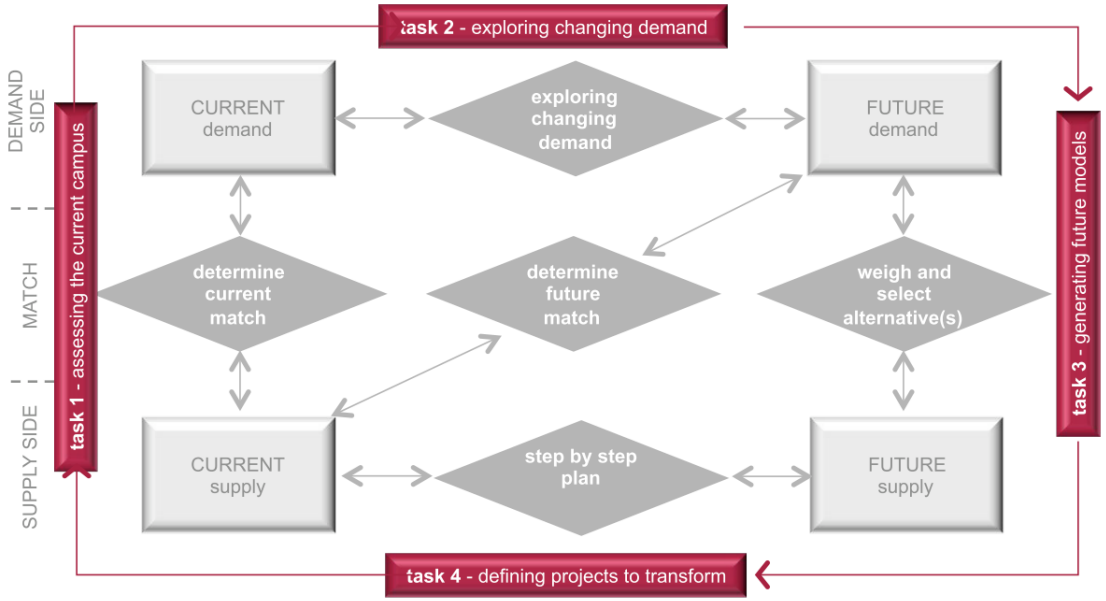
in-house software tools to measure energy performance.

Task 2:

The goal is clear

definition of energy neutral

legislation



Task 3:

Context

Financial policies

Political goals

KPI's, certificate scores, kWh

Task 4:

Projects not explicitly stated

Strategy tools: DMOP, ESCo, performance-based contract, total outsourcing and Inhouse software tools combined with sustainable tendering of external parties.

DAS-Frame with theoretical framework conclusions, own image adapted from (Den Heijer, 2011a)

Case studies

Organizational & managerial processes

Cross-sectional

Purposeful sampling

Zutphen

Enschede

Case study: Zutphen

- General case information

  Province Gelderland
  47.605 inhabitants
  Historic inner city
  2023 use 25% less energy
  2030 Energy neutral
  Coalition more left orientated

Gemeenteraadszetels				
Partij	**2005**	**2010**	**2014**	**2018**
GroenLinks	3	3	3	5
SP	3	1	5	4
PvdA	8	6	3	4
Burgerbelang	-	2	5	4
D66	2	3	4	3
VVD	4	4	3	3
CDA	4	2	2	2
Stadspartij Zutphen-Warnsveld[2]	4	4	3	2
ChristenUnie	1	1	1	1
Bewust Zutphen	-	-	0	1
Totaal	**29**	**29**	**29**	**29**

Case study: Zutphen

Within-case analysis: Interviews

- Aldermen
- Sustainability advisor
- Portfolio manager
- Technical manager

- Strategy
- Energy
- Costs
- Obstacles
- Enablers

Case study: Zutphen

- Lessons learned from interviews and database

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  - Strategy

    Formerly: Many reports made, mostly incidental approach

    Now : Partly outsourced. Data delivers by municipality to create options High/Middle/Low

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    WKO & ESCo's (but light)

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    Not yet clear, most likely an unprofitable peak
    Split incentive towards tenants

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  - Obstacles
    Monuments
    Balance of financial policies and political goals

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    - Not yet clear, most likely an unprofitable peak
    - Split incentive towards tenants
  - Obstacles
    - Monuments
    - Balance of financial policies and political goals
  - Enablers
    - Working with the right people
    - Create synergy

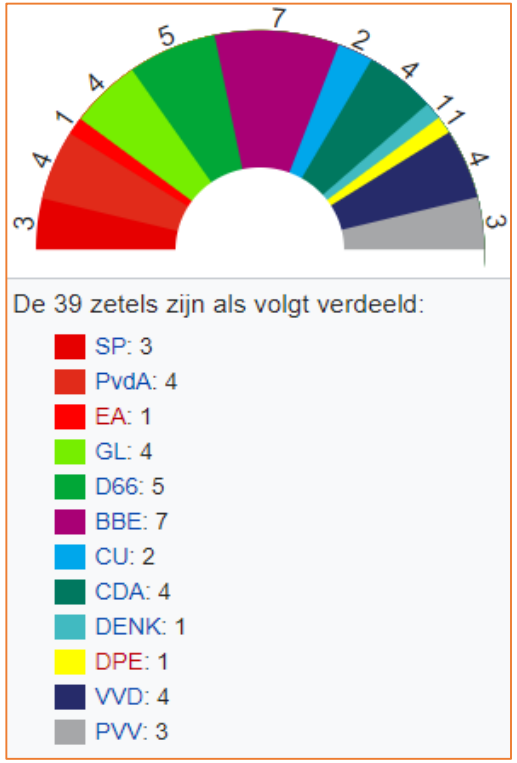
Case study: Enschede

- General case information

  Province Overijssel
  158.961 inhabitants
  Important role for facilities in the area
  2040 Energy neutral
  Coalition left and right orientated

NEN 2767 systematics

Inspection of the technical state of the building and installations. Measured with conditions scores to set up a multiyear maintenance plan.



Case study: Enschede

Within-case analysis: Interviews

- Portfolio manager
- Technical manager

- Strategy
- Energy
- Costs
- Obstacles
- Enablers

Case study: Enschede

- Lessons learned from interviews and database

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- Lessons learned from interviews and database
  - Strategy

    Energy monitoring

    Performance-based contract (with test case)

Case study: Enschede

- Lessons learned from interviews and database
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    Energy monitoring
    Performance-based contract (with test case)
  - Energy
    3% a year
    Creating awareness

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- Lessons learned from interviews and database
  - Strategy
    - Energy monitoring
    - Performance-based contract (with test case)
  - Energy
    - 3% a year
    - Creating awareness
  - Costs
    - Yearly maintenance contract of €400.000
    - Acceptable unprofitable peak for energy neutral

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    - Municipal context

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    - 3% a year
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    - Yearly maintenance contract of €400.000
    - Acceptable unprofitable peak for energy neutral
  - Obstacles
    - Municipal context
  - Enablers
    - Joroff ladder
    - Approach to sustainability

Cross-Case Analysis Findings

- Strategy

	Similarities?
Information identification	✓
Trias Energetica	✓
DMOP	✓
ESCo's	✗
Performance-based contracts	✓
Total outsourcing	✓
In-house software tools	✓
Building typologies	✓

Cross-Case Analysis Findings

Similarities?

- Energy
  - Opinion on certificates 
  - Measuring 
- Costs
  - Total Cost of Ownership (TCO) 
  - Unprofitable peak 
  - Subsidies 
  - Split incentive 

Cross-Case Analysis Findings

- Obstacles
  - Municipal context (physical & organizational)
  - Innovation

Similarities?

- Enablers
  - Using the right external parties
  - Innovation

Validation findings

	Similarities?
• In-house expertise	✓
• Sustainable department	✗
• Subsidies	✓
• BREEAM	✗

Conclusions

- Main conclusion
  - No uniform tool for the total building portfolio
  - Five identified strategy tools
  - Balance between political goals, financial policies and user satisfaction
  - Professionalization of real estate department
  - Amount of (financial) support of council
  - Municipal context
  - DAS-Framework + C/P/MREM model

Road map
Baseline

The professionalized real estate department	Energy information up to date	Decide what are core/non-core and strategic objects	Comply (if necessary*) to the activiteiten besluit wet millieubeheer	Comply (if necessary*) to the EED audit	Have internal support for making real estate energy neutral
Yes →	Yes →	Yes →	Yes →	Yes →	Yes? Go to the road map
NO? Consider if this is necessary for future demand. If so, make a start with the points made in this baseline and start a department with or without consultation of an external party.	NO? Install smart meters (when you have ≈75 or more buildings) Moreover, make an inventory of energy consumption.	NO? Look in policy documents what will be necessary for the coming years and consider the status of the building. This can be measured, for example, in NEN2767.	NO? Make a plan, with or without the help of external parties before the first of July 2019. *For municipalities that consume 50.000 kWh or 25.000 m^3 gas a year.	NO? Make every four years an Energy-audit report to comply with the regulations. *For municipalities with more than 250 FTE's or have yearly revenue of 50 million with assets more than 43 million.	NO? Try to convince other departments, with support of the Aldermen, why this is necessary. Be transparent about the interventions you want to do and let other stakeholders think along to create synergy.

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Road map

DAS-Framework	Political goals	Financial policies	Enablers	Pay attention to
Task 1 Assessing the current portfolio	Comply with the current regulations and have up to date building information, also know what your core and non-core buildings are.	Create support in the municipal organization and know the current energy expenses of the building portfolio.	Have a professionalized real estate department that is operating as strategist.	Buildings such as swimming pools and monumental buildings can be challenging.
Task 2 Exploring the changing demand	Think in trends and upcoming regulation. Envision the future of the organization. Define how you want to be energy neutral.	Know what financial instruments you have at your disposal, such as subsidies and revolving funds.	Explore what can be a possible innovation for your building portfolio.	The political debate can slow the process. As a real estate department, take control of your route in becoming energy neutral.
Task 3 Generating future models	Think in phases, TCO, KPI's and ambitions levels to optimize the portfolio. Test the strategy on a smaller case if needed.	Balance the political goals with the budget and make financial scenario with the right split incentives and subsidies.	Think if the municipality can create synergy with the surrounding.	Be aware of the different stakeholders when weighing and selecting the right projects.
Task 4 Defining projects to transform	Decide what sustainable tool(s) fits best in the portfolio to become energy neutral.	Think in payback time and create a clear overview of the long term expenses.	Have experienced parties to execute the interventions for the buildings.	Try to find the positive in the transition and think in opportunities instead of seeing it as a liability.

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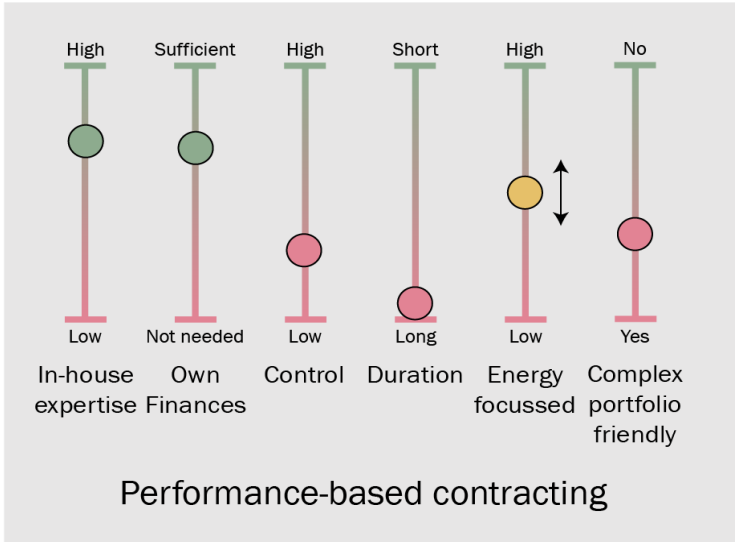
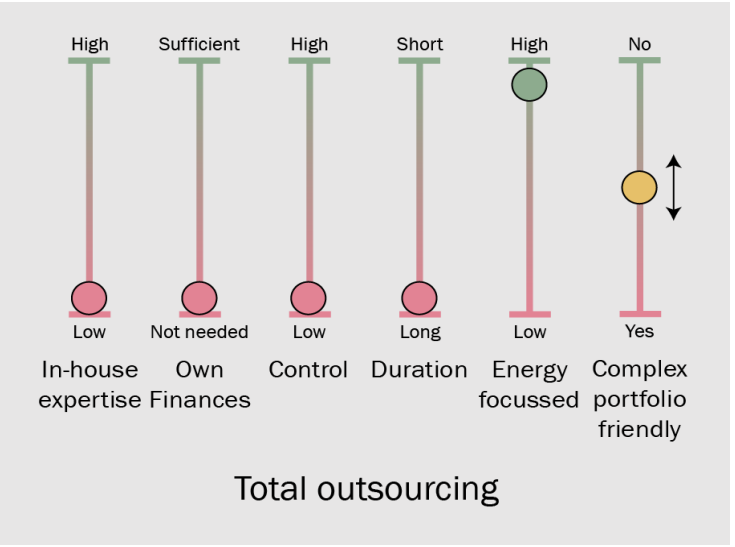
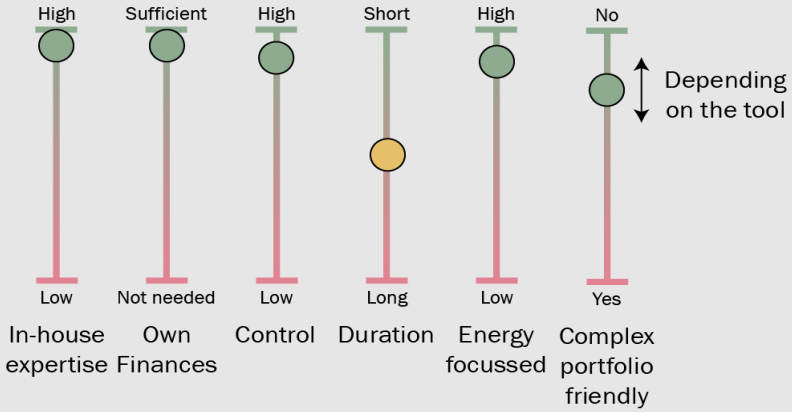
The five Sustainable strategy tools



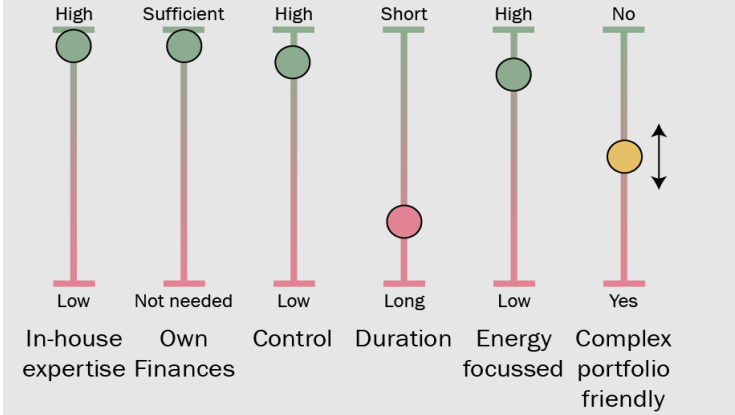
Performance-based contracting



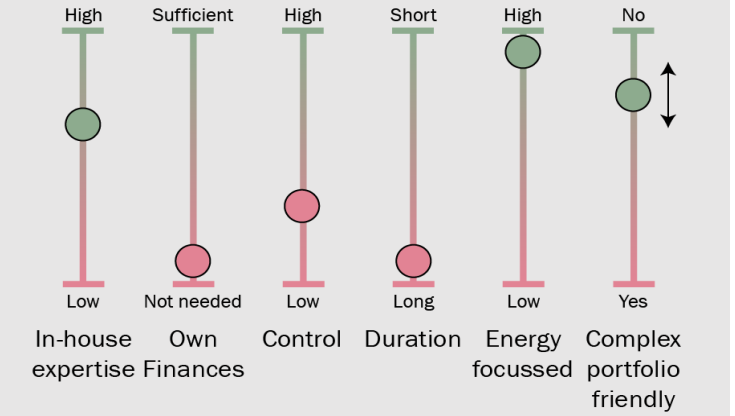
Total outsourcing



In-house (Using software tools) with sustainable tendering



DMOP (sustainable multi-year maintenance plan)



ESCos (With energy performance contracts)

Discussion

- Limitations of this study
  - Academic sources
  - Sample size, longitudinal
  - CO_2 & Circular

- Recommendation for further research
  - Organizational structure
  - DMOP
  - Financial instruments
  - Other public real estate

How public real estate sets the stage towards a sustainable future

A research into the facts, possibilities, and challenges of sustainable real estate strategies for municipalities in the Netherlands

Nienke Hakenberg / 4272218 / P5

Sources

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www.google.maps.nl

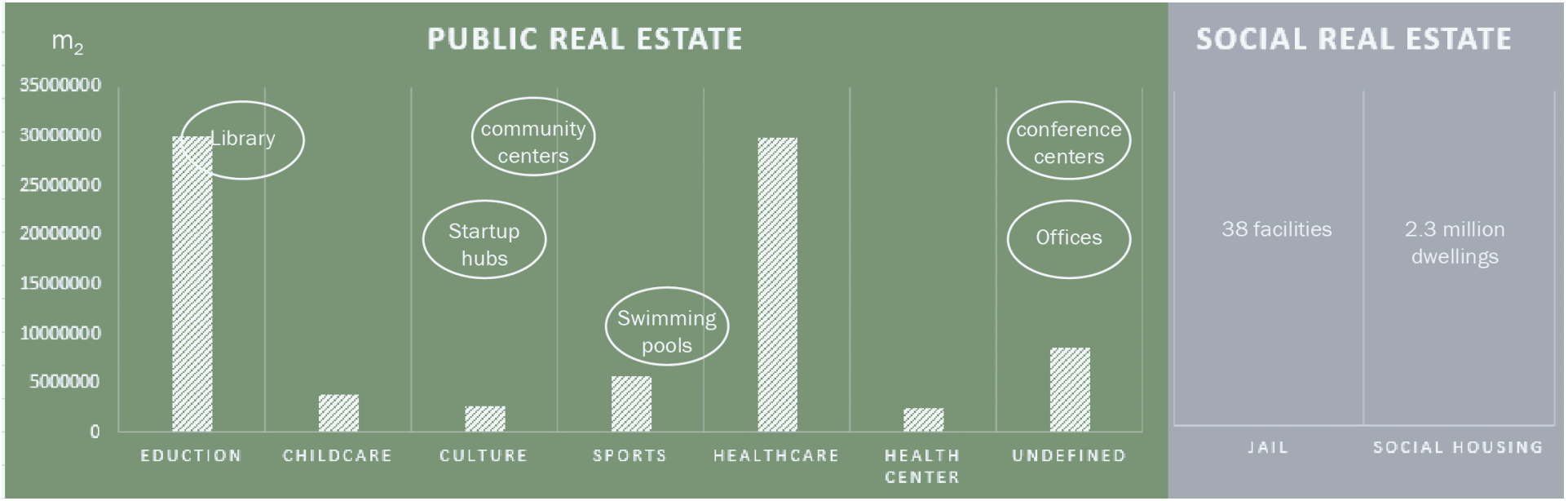
Conclusions

- Main conclusion
  - No uniform tool for total building portfolio
  - Balance made between political goals, financial policies and user satisfaction
  - Professionalization of real estate department
  - Amount of (financial) support of council
  - Municipal context
  - DAS-Framework + C/P/MREM model

Reflection

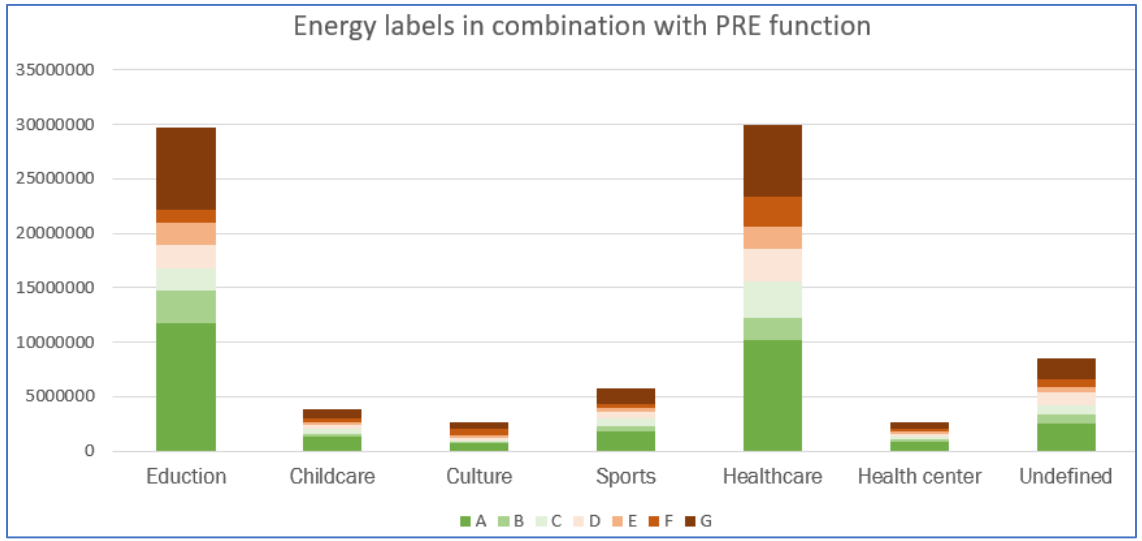
- Research methods
  - Own expertise on subject, technical & organizational problem
  - Preferably longitudinal case study, but time limitation
  - Mendeley & Atlas.ti
- Dissemination
  - Research position
  - Transferability

Problem area

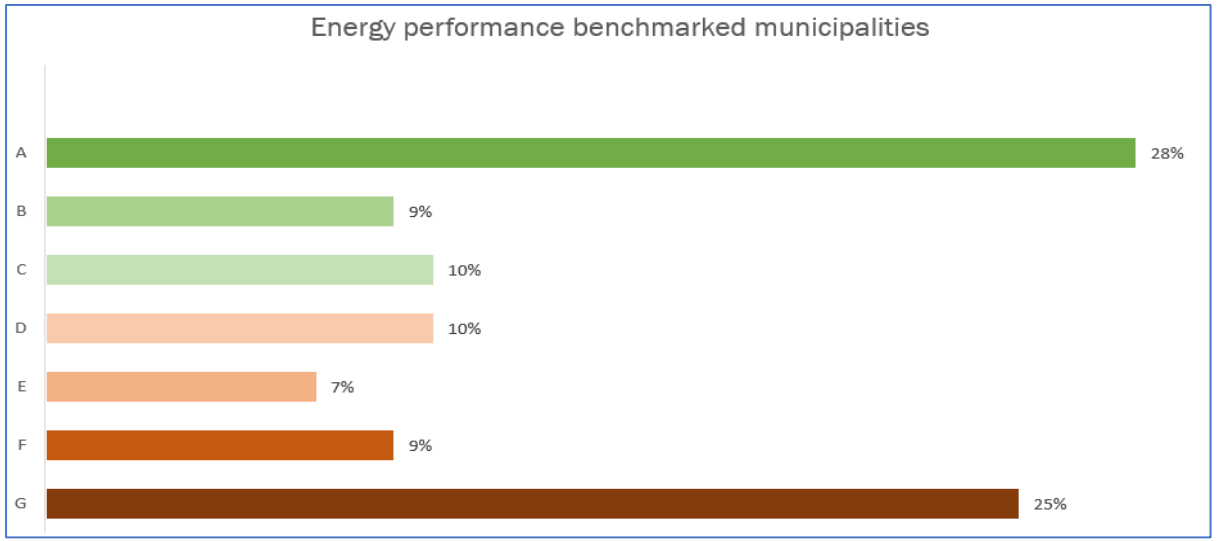


PRE with examples in square meters, own image, adapted from Van Leent (2012), Bouwstenen voor social (2011) and CBS (2018)

Problem area



M2 per function combined with energy labels, own image estimated on benchmark numbers and nominal numbers, own image



Energy labels of benchmarked municipal buildings, own image based on Republic & TIAS (2017)

Legislations

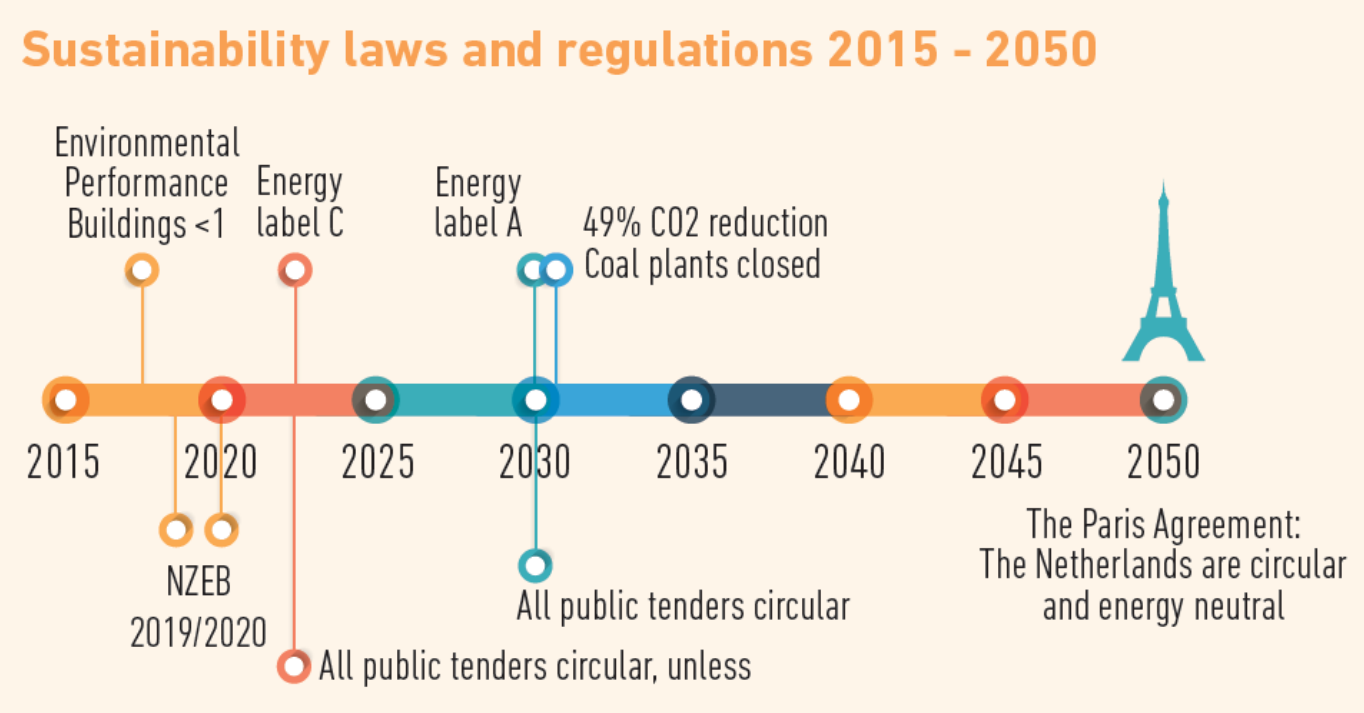


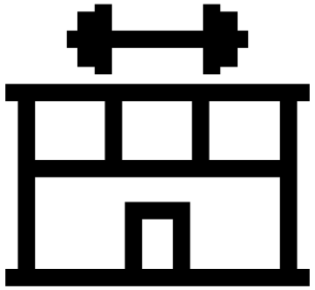
Figure 18: Timeline sustainable legislation, in red are the fixed legislation and in blue upcoming legislation (Twynstra Gudde, 2019)

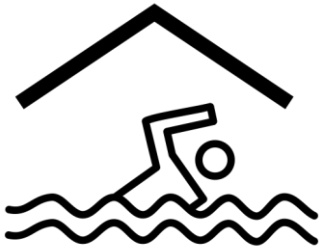
Costs & subsidies

- Costs
  - Own organization (closed system)
  - Rented out buildings
    - Cost-recovering rent
    - Split incentive
  - Revolving fund

- Subsidies
  - Only when the part of the organization pays corporation tax
  - 4 Types

Typologies





- Monument versus non-monumental building
  - Touchability DuMo & GreenCalc+ method
- Specified tools: GPR gebouw Sport/Zwembad

Case study: Zutphen

Within-case analysis: Database

- Task 1: Assessing the current portfolio
  - RE department is classified in the RE triangle
  - Core-non Core portfolio based on policy, energy, EED & renovation
- Task 2: Exploring the changing demand
  - Zutphen energy neutral 2030, opportunity for economy
- Task 3: Generating future models
  - Energy: Sustainable tendering, Smart meters (some present)
  - Costs: Looking at subsidies & revolving fund, not yet determined further
- Task 4: Defining projects to transform
  - A lot of independent project, WKO, ESCo's, 1 project from G to A

Case study: Enschede

Within-case analysis: Database

- Task 1: Assessing the current portfolio
  - RE department is classified in the RE triangle
  - RE value of 128 million euro's, rent of 13 million a year
- Task 2: Exploring the changing demand
  - Energy neutral 2040
  - New ways of working
  - Shrinkage of municipal organization
- Task 3: Generating future models
  - Energy: Works with energy & CO_2 Emission, have smart meters and monitor energy
  - Costs: Split incentive to reduce the subsidy for cost covering rent
- Task 4: Defining projects to transform
  - White roofs, Air treatment systems, high frequent lightning, solar panels, creating awareness