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
Reading guide / Introduction / Method / Research framework / Case studies / Synthesis / Conclusion / Recommendation
Reason for this research

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

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NOS (2019)
Reason for this research

(almost) CO$_2$ neutral in 2050

Public real estate status
Problem statement

• 83.4 million m² public real estate in the Netherlands (estimation of 2011)
• Reduction of 95% CO₂ 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**

1. Introduction, research question and methodology

Reading guide / Introduction / Method / Research framework / Case studies / Synthesis / Conclusion / Recommendation
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

1. Introduction, research question and methodology

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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
- 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
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
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
Case study: Zutphen

- Lessons learned from interviews and database
  - Strategy
    Formerly: Many reports made, mostly incidental approach
    Now: Partly outsourced. Data delivers by municipality to create options High/Middle/Low

- Energy
  Still needs to be defined, BENG, Zero on the meter, Labels WKO & ESCo's (but light)

- Costs
  Not yet clear, most likely an unprofitable top Split incentive towards tenants

- Obstacles
  Monuments
  Balance of financial policies and political goals

- Enablers
  Working with the right people
  Create synergy
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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
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Case study: Enschede

• Lessons learned from interviews and database
Case study: Enschede

- Lessons learned from interviews and database
  - Strategy
    - Energy monitoring
    - Performance-based contract (with test case)

- Costs
  - Yearly maintenance contract of €400,000
  - Acceptable unprofitable top for energy neutral

- Obstacles
  - Municipal context

- Enablers
  - Joroff ladder
  - Approach to sustainability
Case study: Enschede

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    Approach to sustainability
Cross-Case Analysis Findings

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Cross-Case Analysis Findings

• Energy
  - Opinion on certificates
  - Measuring

• Costs
  - Total Cost of Ownership (TCO)
  - Unprofitable peak
  - Subsidies
  - Split incentive

Similarities?
Cross-Case Analysis Findings

• Obstacles
  Municipal context (physical & organizational)
  Innovation

• Enablers
  Using the right external parties
  Innovation

Similarities?
Validation findings

• 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

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<th>The professionalized real estate department</th>
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## 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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**Recommendation**

6. Conclusions & Recommendation
Road map

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The five Sustainable strategy tools

- **In-house (Using software tools) with sustainable tendering**
- **DMOP (sustainable multi-year maintenance plan)**
- **ESCos (With energy performance contracts)**
- **Performance-based contracting**
- **Total outsourcing**

These strategies are evaluated based on various factors including **In-house expertise**, **Own Finances**, **Control**, **Duration**, **Energy focused**, and **Portfolio friendly**.
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

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Sources


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 & CO₂ 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