PBL Netherlands Environmental Assessment Agency

Kickstarting the energy transition

Opportunities, limitations and welfare implications of social landlords' ambitions

July 4th | Schilder, Van der Staak & Van Polen

Policy and goals built environment

General

- 96 PJ reduction building-related energy consumption 2020
- Average energy label A in 2030
- 1.5 mln dwellings gasless in 2030
- Energy neutral in 2050

New construction

- Gasless since July 2018
- Almost energy neutral (BENG) as of July 2020

Social landlords

- Average label B in 2020
- Intended first movers energy transition housing market

Why social landlords?

- Limited agency issues
  - 339 housing associations
  - 2,4 mln dwellings (30% of all dwellings)
  - Social mission (also regulated by law)

- Deep pockets and long investment horizons
  - € 287 bln assets, € 96 bln debt, € 191 bln equity
  - Sell less than 1%/year: invest to rent out
  - Not-for-profit

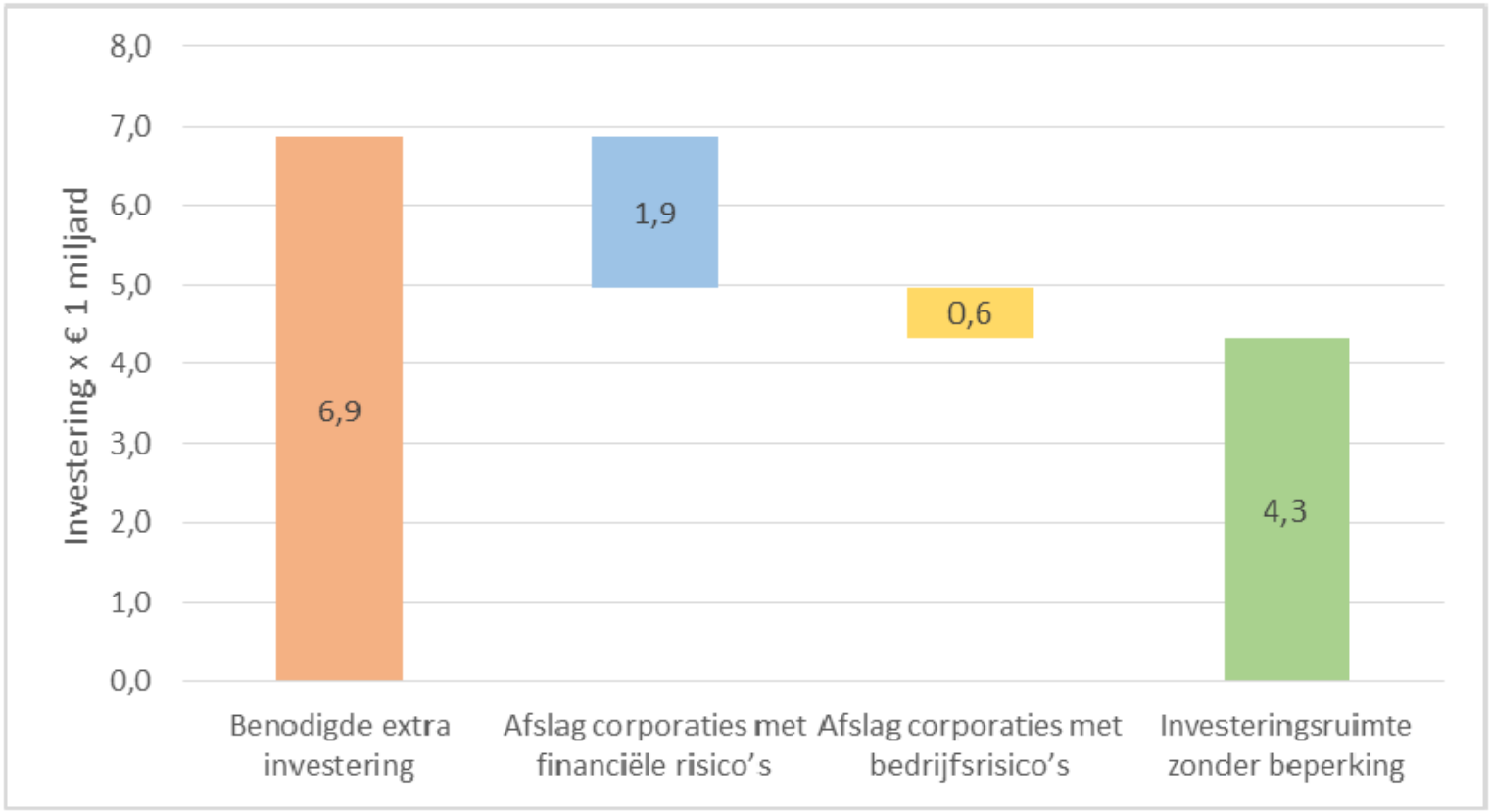
- Law and regulation
  - Housing associations held to contribute to local housing visions
  - Incentivisable through landlord levy

Why not social landlords?

- Efficiency
  - Non-market driven investments
  - Picking winners: current technique vs innovation
- Equity
  - First mover burden of green innovation with low income households
- Feasibility
  - Legally determined social tasks wrt affordability and accessibility
  - Nature of real estate investments and competition over scarce resources
  - Practicalities: required 70% tenant agreement, incomplete ownership etc.

Why not social landlords?

Figuur 2. Beperking bij individuele corporaties in het basisscenario



Source: WSW (2018) Investeren in verduurzaming DAEB-bezit kent grenzen

Kickstarting the energy transition

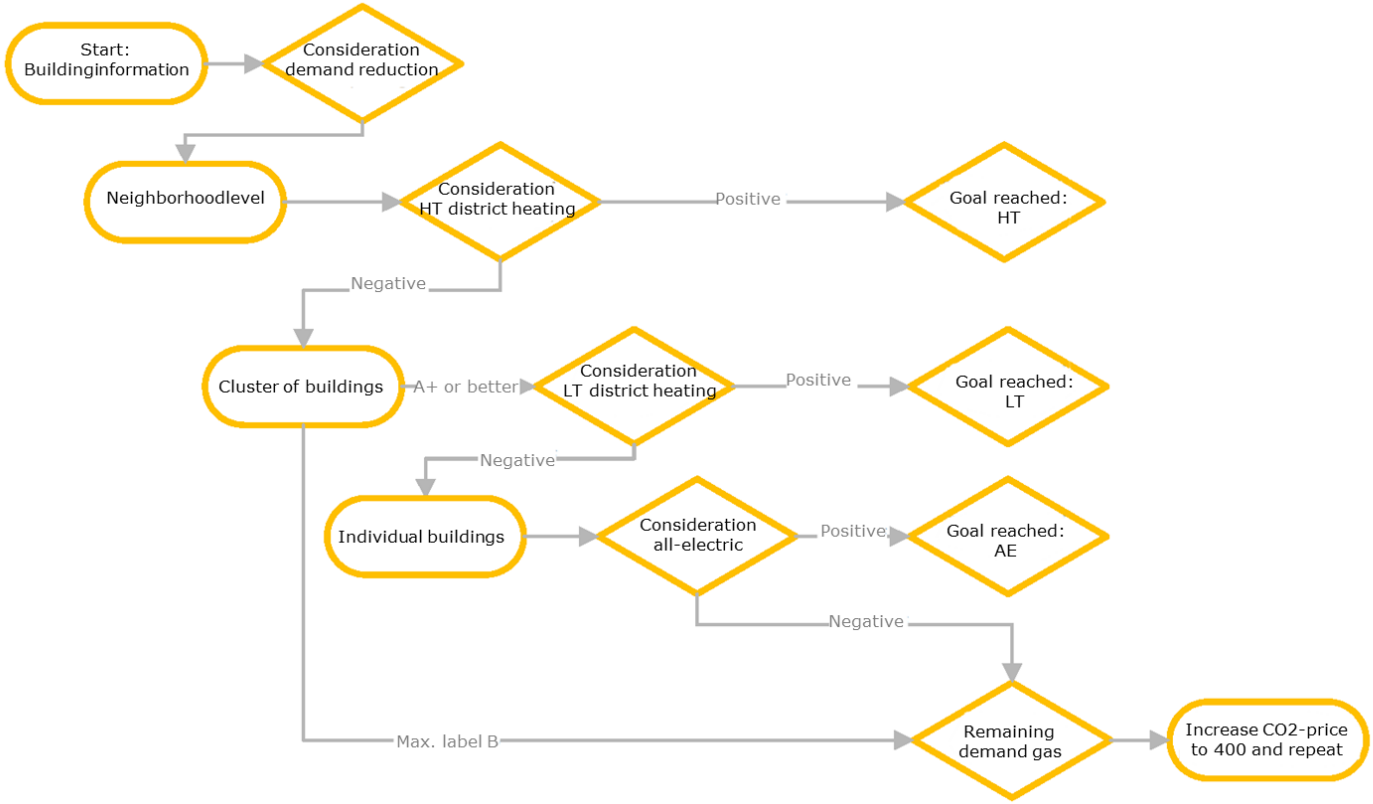
- Mixed-method approach

1. Quantitative exploration of financial possibilities
→ Technical options and investments costs
→ Financial impact of investment strategies
→ Budgetary consequences for households

2. Qualitative exploration of external governance of transition
→ Group discussions with stakeholders

Vesta-MAIS

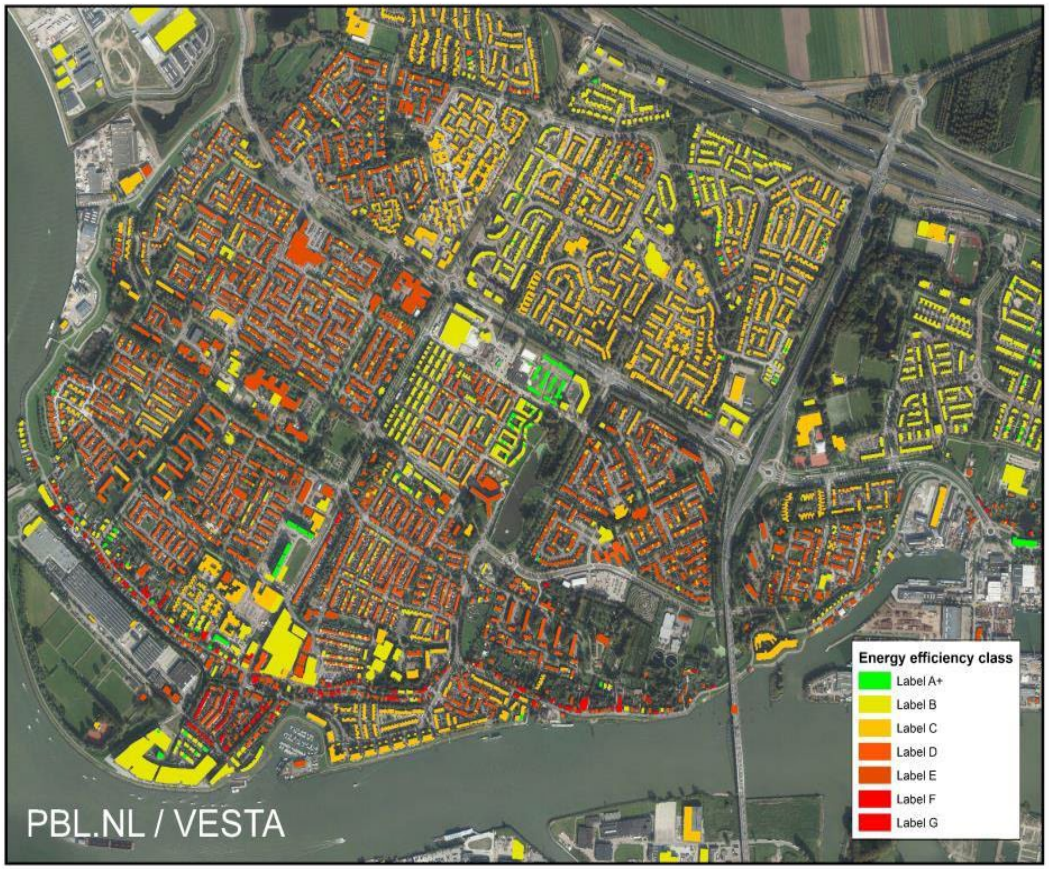
- Spatial techno-economic model



Vesta-MAIS: starting point

- **Existing building stock: demand side**
  - –Input: Type of building
  - –Input: Construction period
  - –Input: Energy efficiency class (label)
  - –Calculated: Energy demand, including costs and emissions
    - Natural gas
    - Electricity (for heating and appliances)
    - Heat
- **Existing and potential heat sources: supply side**
  - –Input: Known heat sources, including emissions
  - –Input: Current use of heat sources, including costs
  - –Input: Potential areas for geothermal heat production
  - –Input: Potential areas for underground thermal storage

Vesta-MAIS: starting point

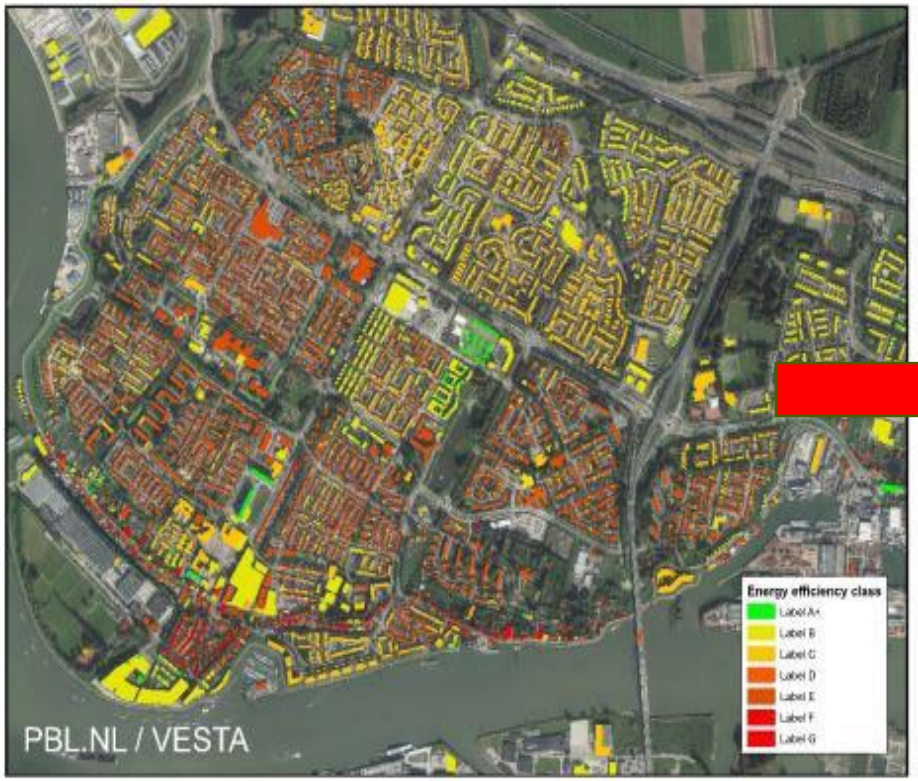


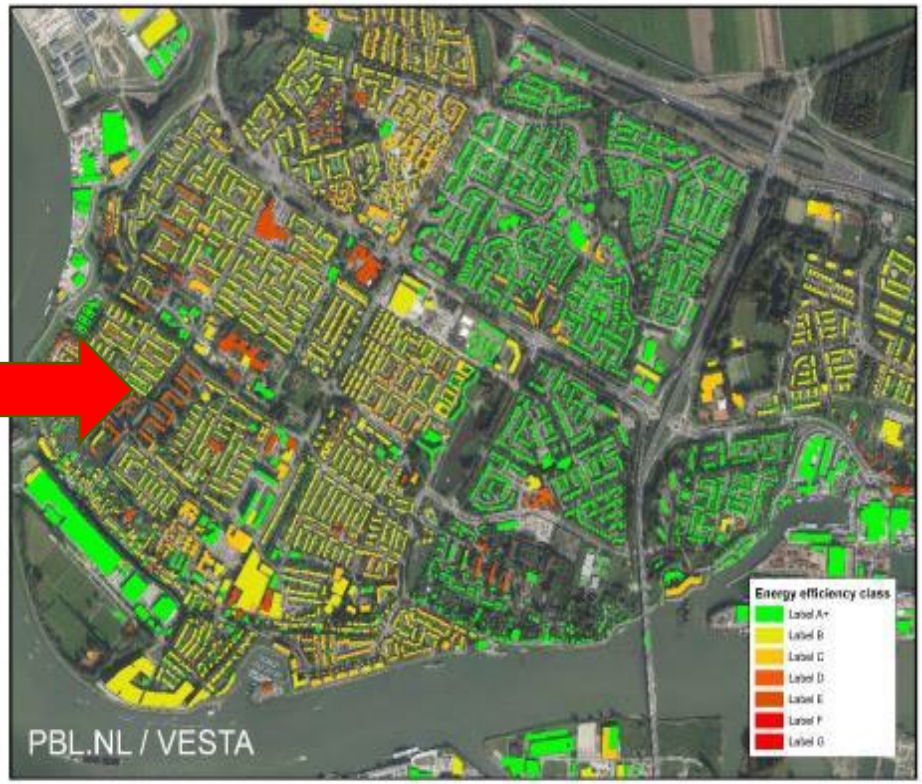
Vesta-MAIS: modeling future developments

- **Autonomous influences up to 2050 (baseline)**
  - –Input: new construction and redevelopment
  - –Input: climate impact on heat demand
  - –Input: curves for investment cost of technical measures
  - –Input: curves for future energy prices

- **Vesta MAIS determines business cases** for a set of potential technical measures and applies them *according to user criteria*.
  - ›Renovations of buildings
  - ›Electrification of individual heating systems
  - ›Heat networks over 70 °C (waste heat, geothermal or biomass)
  - ›Heat networks under 60 °C (e.g. with thermal energy storage)

Vesta-MAIS: output





SVM - Financial model

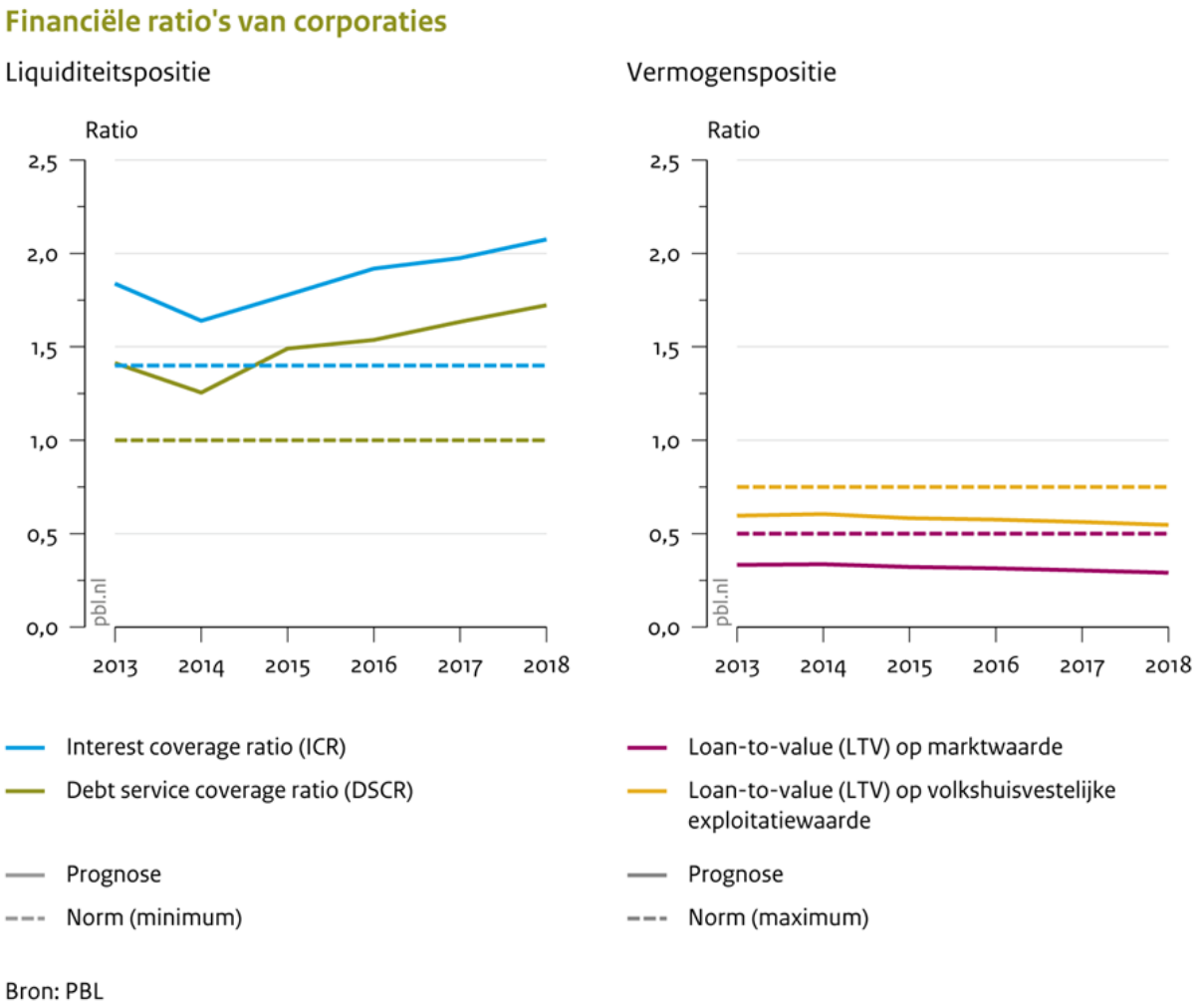
- DCF-model

$$MV_{t=0}^{eq} = R_{t=1}^{eq} \sum_{t=1}^{t=n^{eq}} \frac{(1+r)^{t-1}}{(1+d)^{t-1}} - MT_{t=1}^{eq} \sum_{t=1}^{t=n^{eq}} \frac{(1+mt)^{t-1}}{\left(1+d^{t-1}\right)} \qquad (1)$$

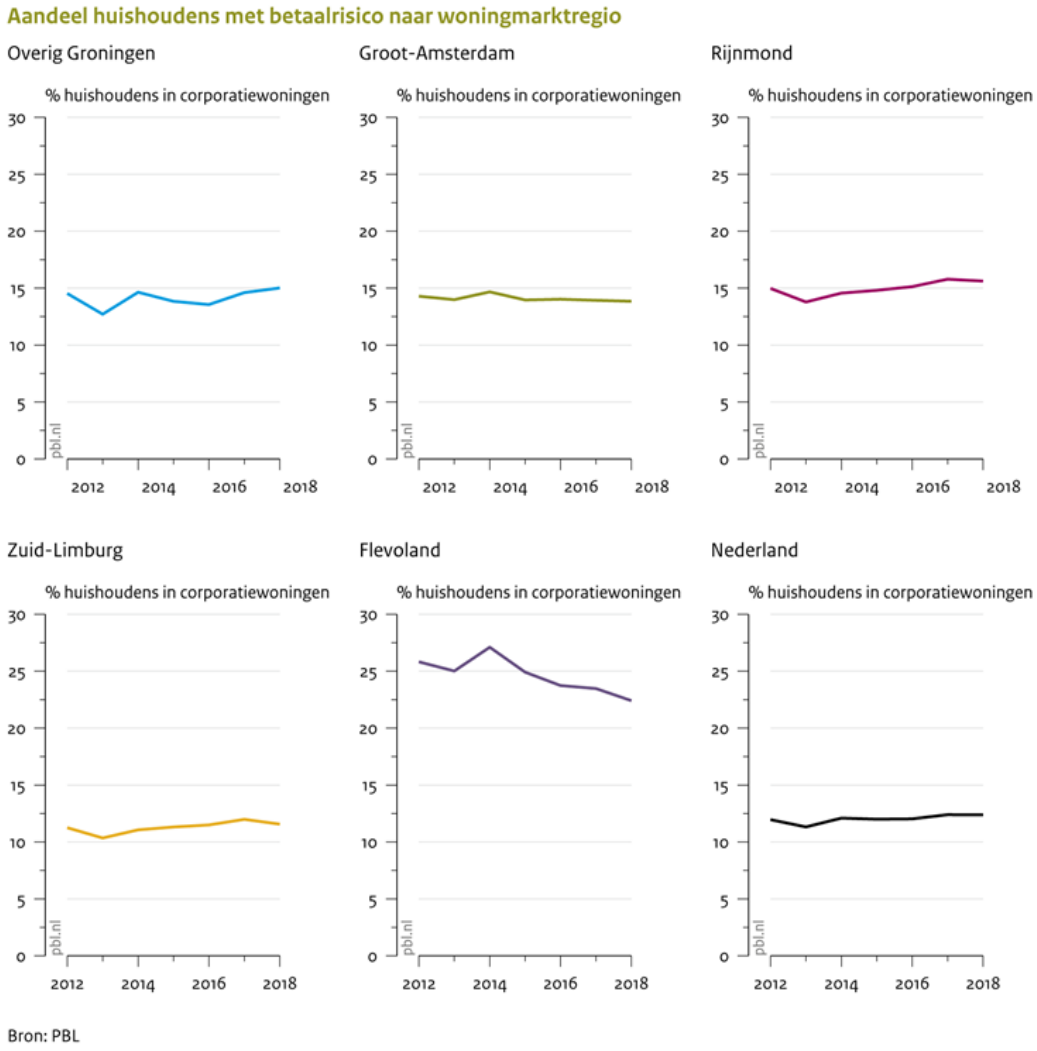
$$MA_{t=1}^{eq} \sum_{t=1}^{t=n^{eq}} \frac{(1+ma)^{t-1}}{\left(1+d^{t-1}\right)} + RV_{t=1}^{eq} \frac{(1+rv)^{n^{eq}-1}}{(1+d)^{n^{eq}-1}}$$

Conijn & Schilder (2011) How housing associations lose their value

SVM - output


Financiële ratio's van corporaties
Liquiditeitspositie
Ratio
2,5
2,0
1,5
1,0
0,5
0,0
pbl.nl
2013
2014
2015
2016
2017
2018
Interest coverage ratio (ICR)
Debt service coverage ratio (DSCR)
Prognose
Norm (minimum)
Vermogenspositie
Ratio
2,5
2,0
1,5
1,0
0,5
0,0
pbl.nl
2013
2014
2015
2016
2017
2018
Loan-to-value (LTV) op marktwaarde
Loan-to-value (LTV) op volkshuisvestelijke exploitatiewaarde
Prognose
Norm (maximum)
Bron: PBL

SVM - output


Aandeel huishoudens met betaalrisico naar woningmarktregio
Overig Groningen
Groot-Amsterdam
Rijnmond
Zuid-Limburg
Flevoland
Nederland
% huishoudens in corporatiewoningen
30
25
20
15
10
5
0
2012
2014
2016
2018
pbl.nl
Bron: PBL

Qualitative study

- Housing Act 2015, article 43 (own translation)

1. The housing association provides an overview of the anticipated activities, out of which the mayor and aldermen of the municipalities in which the housing association is actually active can deduct which activities are to be expected on their territory, and which contribution therewith is intended to the execution of the housing policy within those municipalities. The overview spans the next five calendar years and also includes all to the housing association connected subsidiaries.

2. The housing association discusses the overview with the representative bodies of the tenants of their dwellings as intended in Article 1, section 1, part f respectively g of the Act on Consultation of tenants and landlords […].

3. By governmental decree the contents of the overview intended in section 1 is prescribed.

Qualitative study

- 5 case regions
  - geographic dispersion (urban growth vs decline)
  - including wealthy and poor housing associations

- Group discussion with actual representatives of municipalities, tenant representative bodies and housing associations

- Given results of financial impact of scenarios from quantitative study: What choices wrt sustainability vs affordability vs accessibility? Which players appear dominant in the group decision making process? Which strategy do different actors in the group decision making process use?