XXXVI SALÓN TECNOLÓGICO DE LA CONSTRUCCIÓN EXCO 2022 **INTERNATIONAL EXHIBITION "RESEARCH IN BUILDING ENGINEERING EXCO'22"**

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Speeding up the urban energy transition Reasons, challenges and solutions in the Dutch housing stock

Henk Visscher Delft University of Technology, Faculty of Architecture and the Built Environment

INTRODUCTION

The IPCC reports show with an increasing urgency that there is no time to lose in reducing CO₂ emissions to avoid severe climate change. In 2050 CO₂ emissions should be virtually zero and, according to the EU, by 2030 we should have already achieved a reduction of 55% compared to 1990. The built environment is responsible for about 40% of energy consumption, so a major energy transition must take place there. In the Netherlands and other countries with a comparable climate, most energy is needed to heat buildings. The energy transition in buildings will consist of a combination of reducing the energy demand (e.g. through insulation) and the use of sustainable energy instead of fossil fuels. 70% of the building stock of 2050 is already there. This stock needs to be renovated to a high level. In the Netherlands, this means that approximately 7 million homes and other buildings need to be renovated. That's about 200,000 a day! This is a huge task with many challenges and barriers

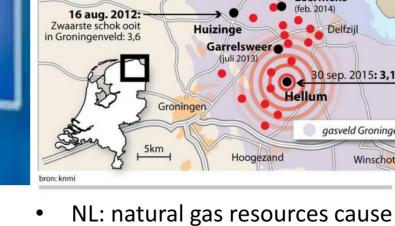


REASONS



2015 COP 21 Paris < 1,5 degrees

EU: 2030: 55% Carbon reduction

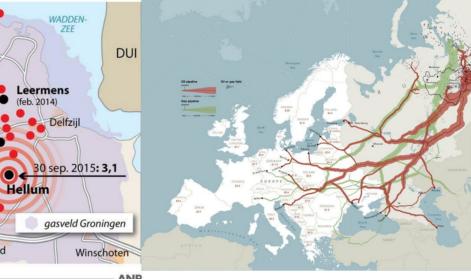


Weer aardschok in Groningen

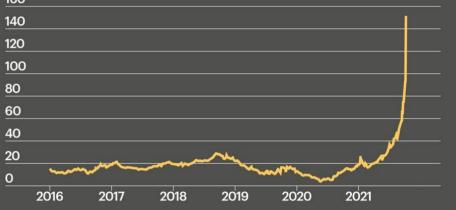
Zwaardere aardbevinger in Groningen sinds 2012

Kracht op schaal van Richte

● ≥2 ● ≥3



Exploderende gasprijzen 160

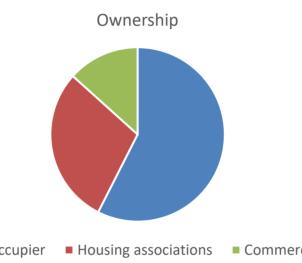


- 2050: nearly zero carbon
- Green Deal, Renovation Wave. nZEB
- earth quakes. Government terminates exploitation
- Ukraine war revises vision on availability of coal, oil and gas
- Steep rising energy prizes

EXISITING HOUSING STOCK IN NL

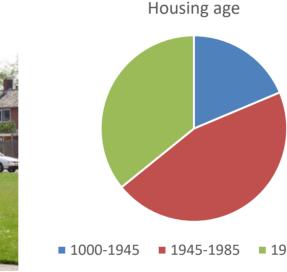


- 75% of the built environment is housing



Owner-occupier

• 40% of the final energy use is in the built environment • Yearly new housing production is 1% of the stock • 70% of the current housing stock still stands in 2050





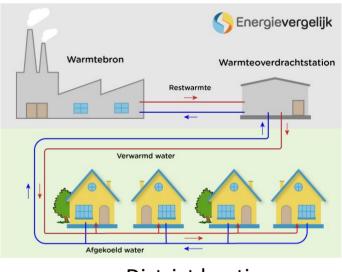
- Deep renovation needed
- until 2050: 7 million dwellings 200.000 per year

SOLUTIONS



Various heating solutions with air, water and ground heat pumps

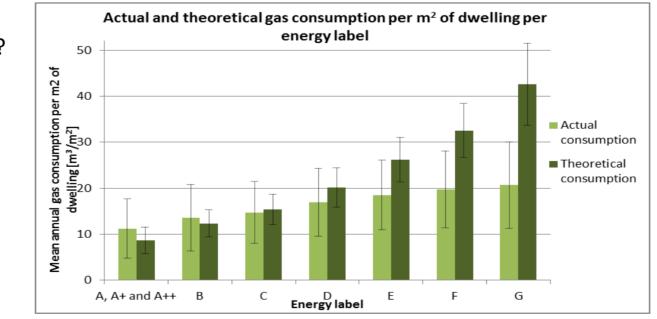
- Reduce energy demand in the use phase: insulation Renewable energy production (PV / solar heat / geothermal heat)
- Efficient heat transfer (Low temprature heating systems)
- District heating systems
- Heat storage
- Reduce embodied carbon in the material use (circular building)
- Reduce emmissions in the building proces



District heating

CHALLENGES

- What are the effective, efficienct and feasible renovation and heating solutions for each building?
- How can costs be reduced and financed for all building owners?
- How to make all building owners participate?
- How to operationalise enough capacity in the construction sector?
- Industrialisation is essential: prefab, automated production



• Insight in occupant behaviour, preferences and comfort is essential

• 2030 – 55% CO₂ reduction; 2050 – 0 CO₂

Housing associations
Commercial rent

- 1000-1945 1945-1985 1985-now

