



Ministry of the Interior and
Kingdom Relations

Understanding the Low-Carbon Smart City Landscape

Practical experiences from The Netherlands

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Envoy Sustainable Building

World Bank - 1 June 2022





The energy transition

EU Green Deal →

EU Climate Law

2030: 55% emissions reduction

2050: climate neutrality

Three goals:

- › Reducing CO2 emissions
- › Switching to renewable energy
- › Improving energy efficiency





Challenges and solutions for Smart Cities

Challenges

- Technical
 - Double renovation speed
 - Labor and materials shortage
- Administrative
 - Heat transition visions, Regional Energy Strategies
 - Government sets a good example
- Social
 - Support for transition starts with the resident
 - Leave no one behind
- Spatial
 - Densification, mobility, living environment
- Linking energy transition to other tasks
 - Adaptation, quality of life, biodiversity, ...

Solutions

- Technical
 - Call for digitization and industrialization
 - Circular economy → materials passports
- Administrative
 - Combining data into digital twins to get a view of what is needed and possible where and when
 - Combining investments and renovations in sectoral portfolios
- Social
 - Big data, but not Big brother: attention for quality of life and privacy
 - Identify people in risk of energy poverty
- Spatial and other challenges
 - Digital twins: combined digital map of the environment helps decision making



Zooming in on the Dutch built environment

- The Netherlands: 17.6 million people, 90% live in an urban environment
- 8 million homes and 0.6 million non-residential buildings (production halls, offices etc.)
- 85-95% of current building stock will still be in use in 2050
- 89.5% of households have individual heating system based on natural gas
- Demand for 0.9 million additional homes by 2030





National Programme on Improving the Sustainability of the Built Environment

Launched 2 April 2022

A five-track plan:

1. District oriented approach
2. Individual approach homes
3. Non-residential buildings
4. Resources and infrastructure
5. Innovation, circularity, adaptation





1. District oriented approach

Municipalities have drafted a **Heat Transition Vision**, indicating per district what the future (fossil-free) heat supply will look like

On average 500 buildings per district

National government supports local authorities with financial support, information, knowledge sharing, rules and regulations

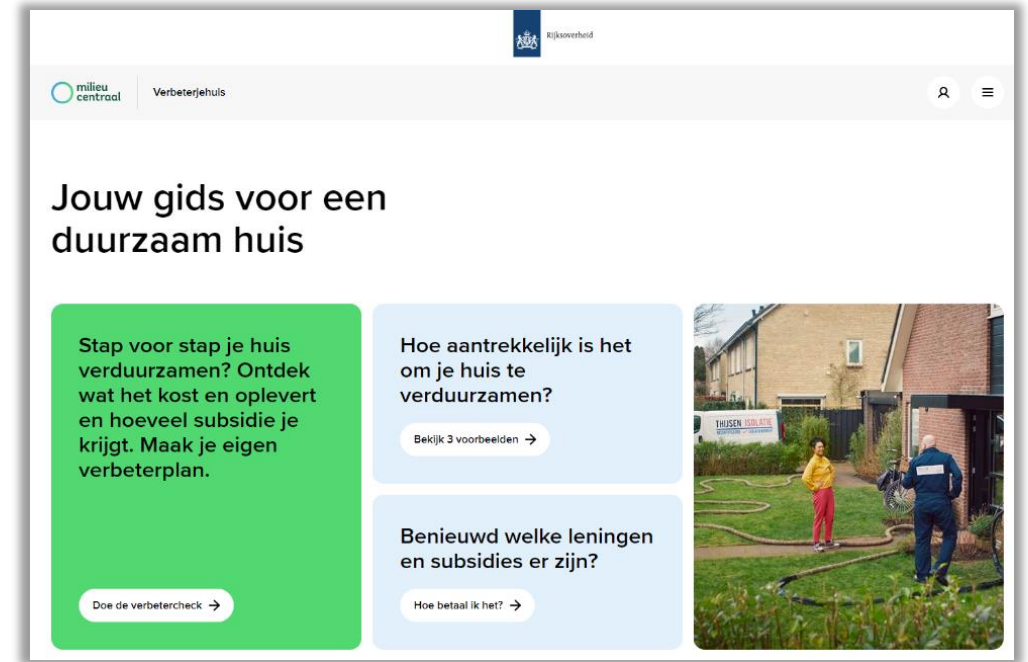
Testing grounds in 64 districts: in order to learn as much as possible, pilot districts are selected to complement each other





2. Individual approach

- **Information**
 - Working together with 20+ organizations
- **Standard for home insulation**
 - Future proof standard, whatever source of renewable heat supply is selected
- **Subsidies**
 - Investment Subsidy for Sustainable Energy and Energy Savings
 - Subsidy for energy savings of your own home
- **Loans**
 - National Heat Fund (mix of public and private credit)
- **Building (renovation) norms and regulations**



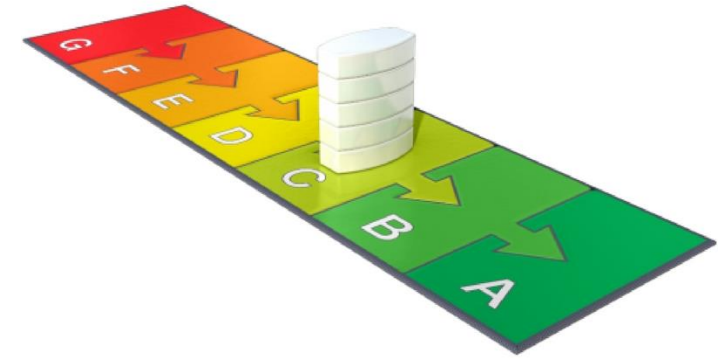
www.verbeterjehuis.nl website: how to improve your home

Specific approach for different types of ownership:

- Owner-occupied homes, including owner's associations
- Housing corporations
- Private landlords



3. Non-residential buildings



Office buildings: Label C requirement (operational in 2023)

- Maximum primary fossil energy use 225 kWh per m² per year
- Offices with worse energy performance may not be used as an office anymore

Social real estate

12 Sectoral road maps at portfolio level

1. National real estate
2. Police
3. Provinces
4. Municipalities
5. Sports facilities
6. Education: primary and secondary
7. Education: vocational
8. Education: higher education
9. Education: universities
10. Cure sector
11. Care sector
12. Monuments



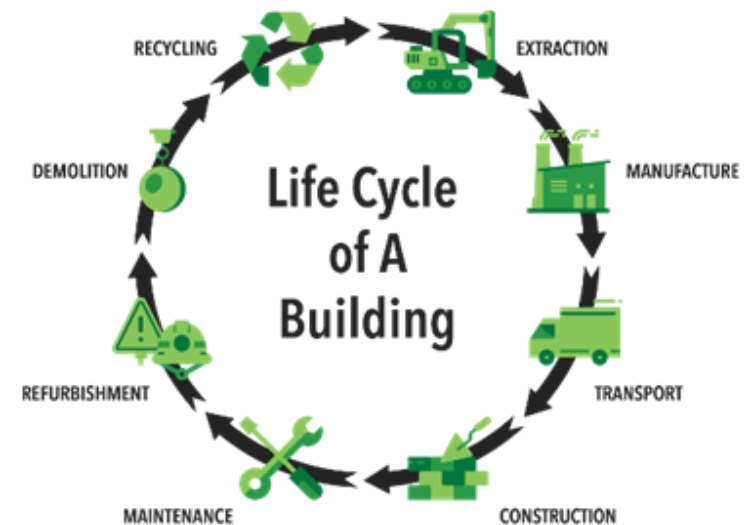
4. Resources and infrastructure

- > Creating a stable investment climate and necessary preconditions for sustainable alternatives for heating (and cooling)
- > All-electric; green gas; aquathermal energy; geothermal energy; residual heat; heat networks



5. Innovation, circularity, adaptation

- > Improve labor productivity in construction sector
- > Attention for circularity and adaptation





Green and smart building: some examples

CIRCULAR BUILDING: TRIODOS BANK



LIGHTING AS A SERVICE: SCHIPHOL AIRPORT





Green and smart building: some examples

USING SURFACE WATER FOR HEATING AND COOLING: THE ROTTERDAM



BIOBASED BUILDING: THE EXPLODED VIEW





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Thank you

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