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Using location data to implement policies on energy performance of buildings: use cases from the Netherlands

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EULF Workshop: Methodologies for energy performance assessment based on location data, 12-14 september 2016, Ispra (Italy).

Agenda

- Introduction
- Climate change policy
- National key registers and location data
- Approach of authorities
- Use cases on national, regional and city level
- Discussion

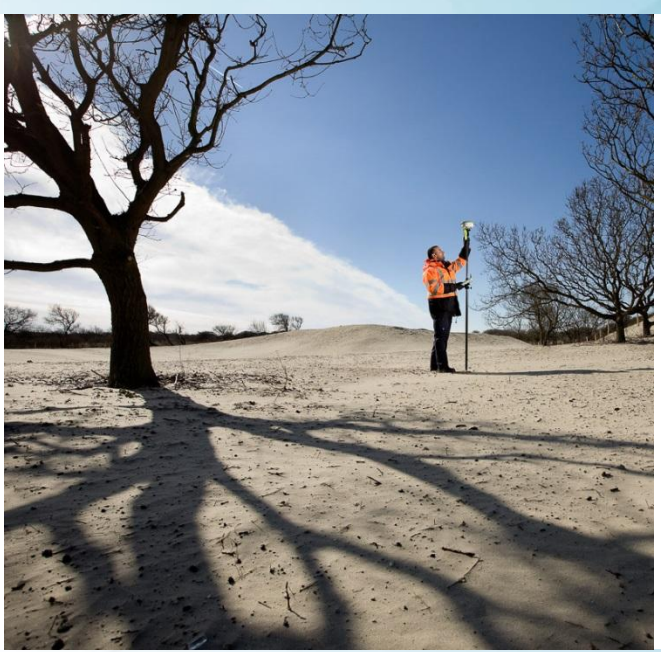
Ambitions

- **Security** in ownership and use of everything above and below ground
- Partner in **geographic information** as a vital link in social issues
- Unlimited access to a **platform** of geographic information

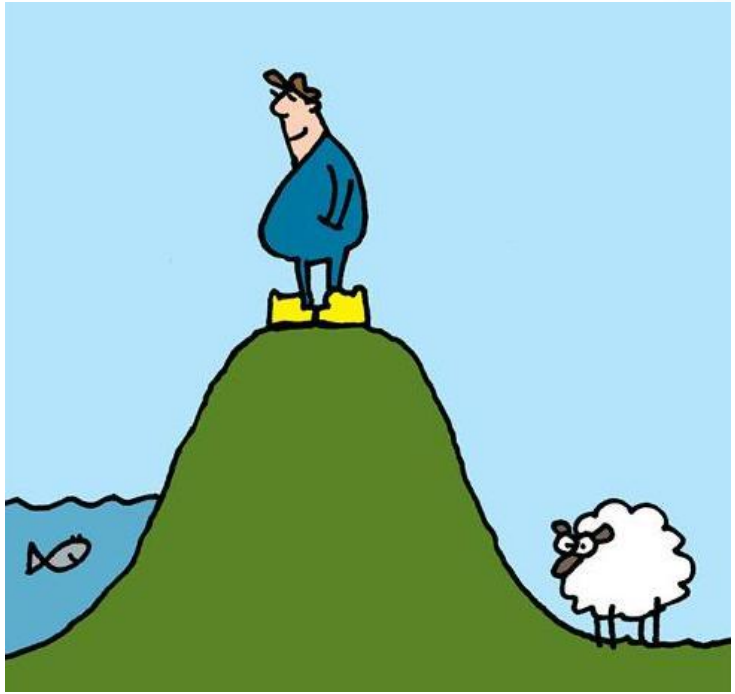
Tasks and duties

- Statutory task:
  secure **legal certainty**

- **Registration** of real estate
  and geographical information



Climate change policy built environment in the Netherlands



55% of the land surface of the Netherlands is vulnarable for the effects of climate change

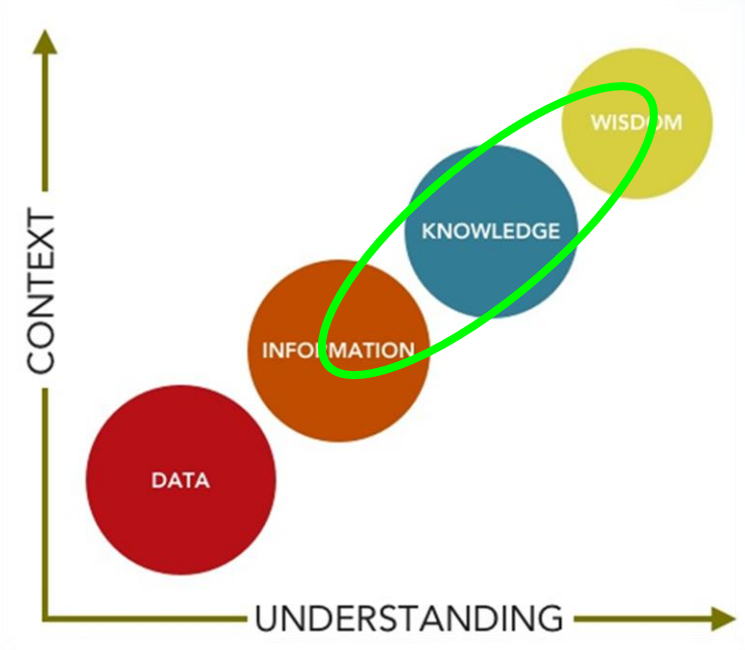
20% reduction of CO2 emission, 20% reduction of energy consumption and 14% renewable energy in 2020

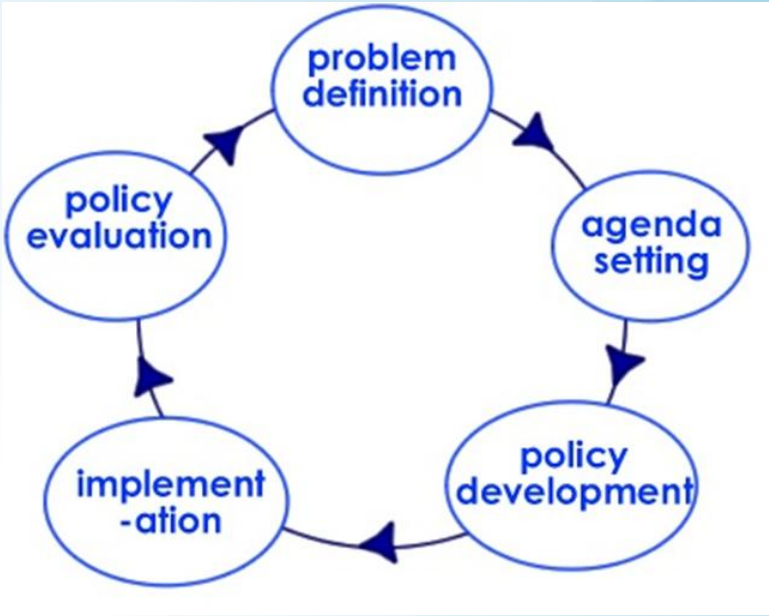
The built environment is accountable for 25% of the total CO2 emissions and 40% of the total energy consumption

Implementing policies for the built environment

- Policies are implemented by a mix of national, regional and municipal authorities
- Authorities have limited budgets and depend on real estate owners to invest in their properties
- Authorities search for investments that are most cost-effective, including
  - communication campaigns
  - giving a good example by renovating the government owned building stock
- The EPBD energy label is used as a communication instrument to encourage owners to improve the energy performance their building.

The need for information and the policy cycle





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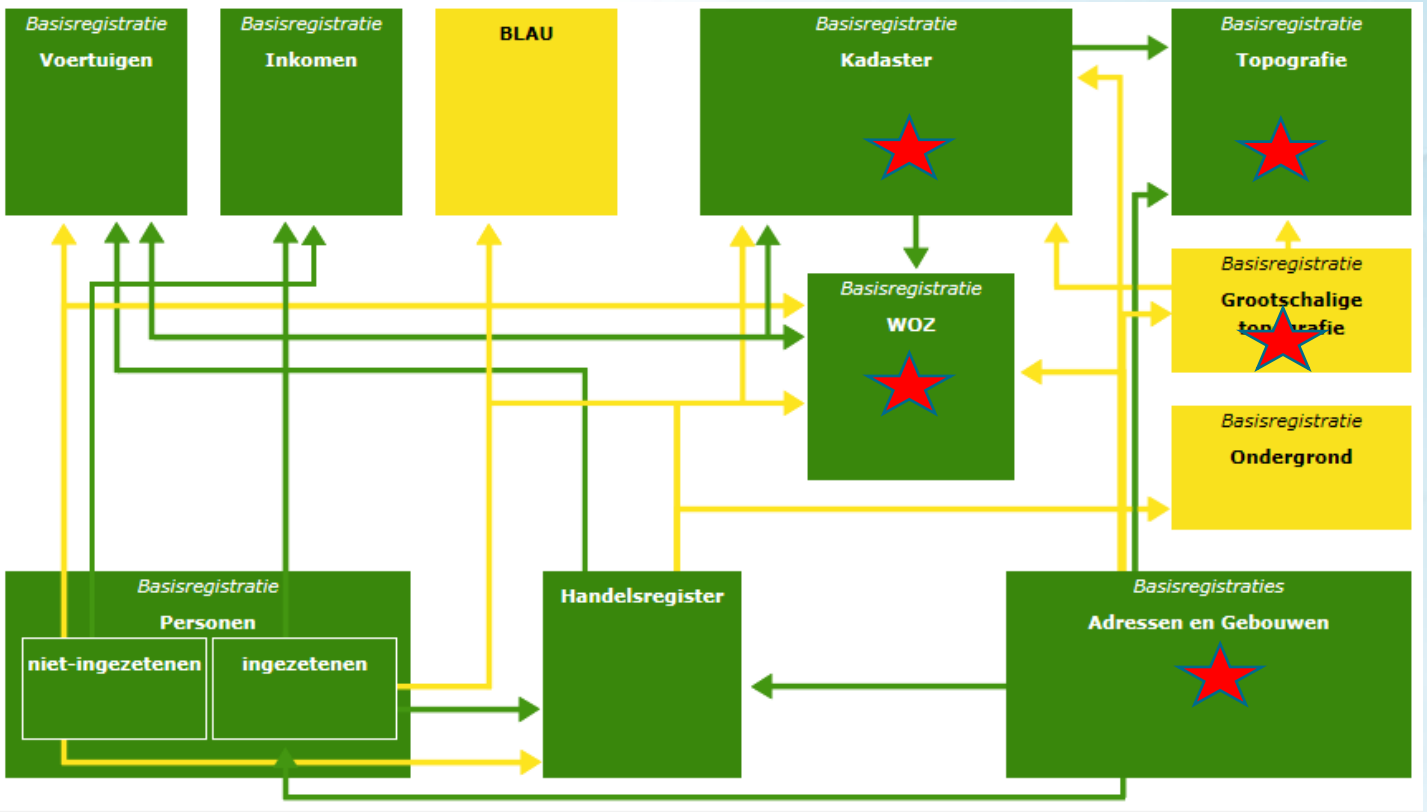
National key registers



Building related

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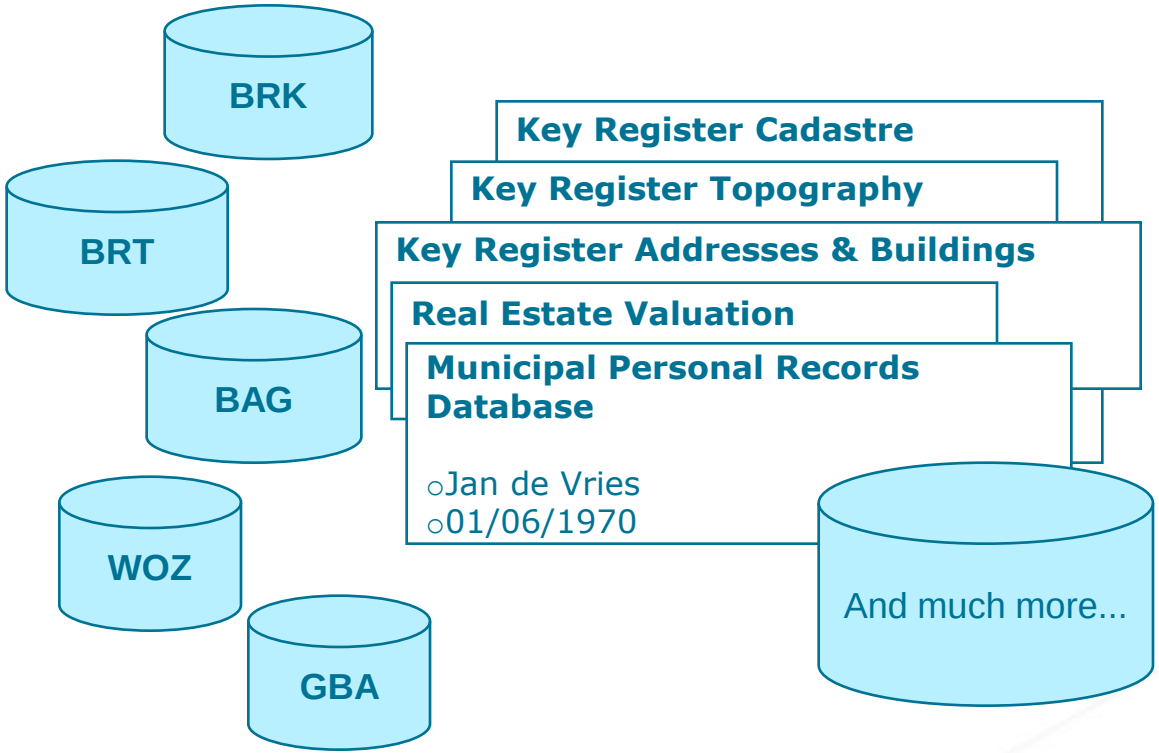

Energy labels of buildings
Spatial plans
Public restrictions
Cable and Pipeline information Centre
Public Services on the MAP

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Use cases

Implementation modified energy label for dwellings

Question (by Netherlands Enterprise Agency and Ministry of Internal Affairs**):**

- Analyse national key registers and location data
- Provide custom fit information for:
  - **National mailing**: a database of non labeled dwellings including owners and a provisional label
  - **Webtool:** a database of all dwellings and owners that is updated monthly
  - **Enforcement:** Monthly delevering transactions of non labeled dwellings
- Consultancy on data interpretation, legal matters and workflow

Approach:

Researching available data, linking of key registers and developing information concepts

Assessment methodology:

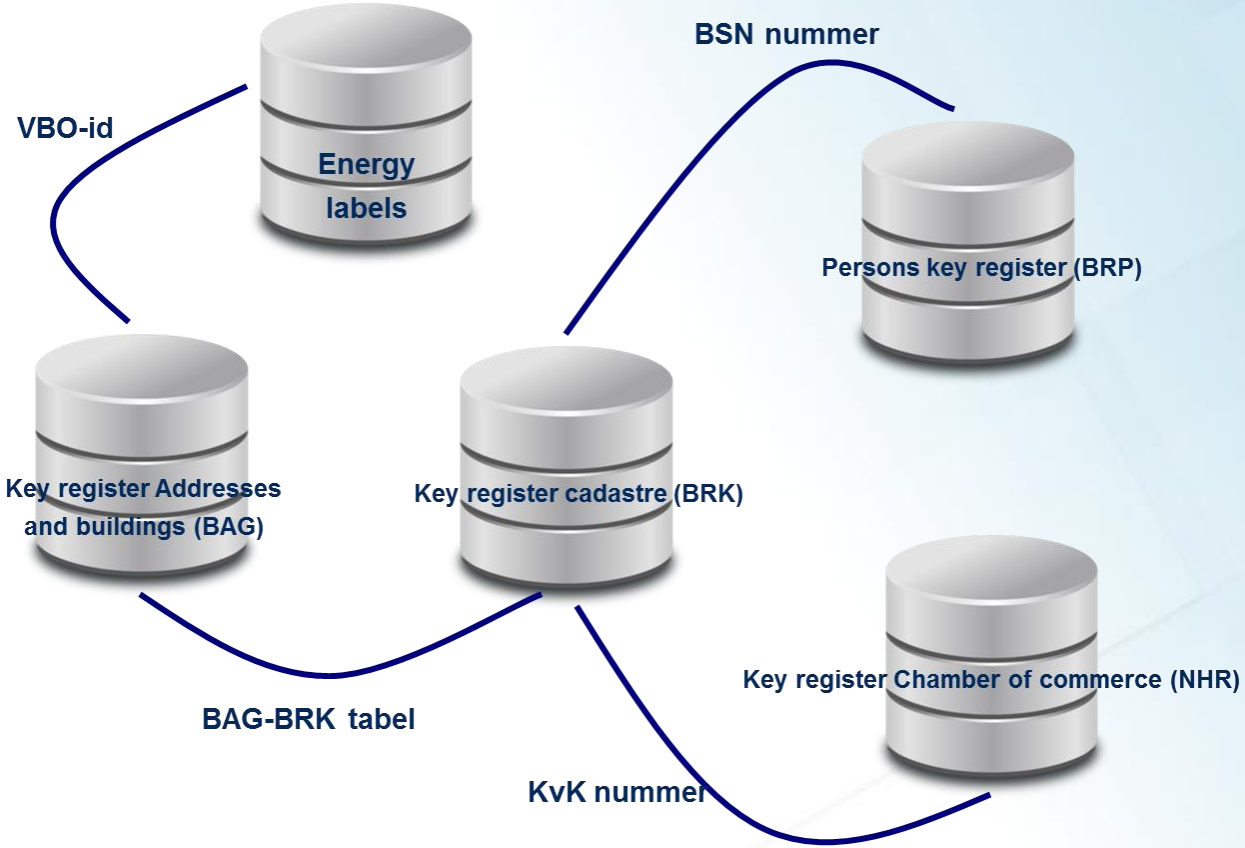
- Provisional energy label based on type of dwelling, year of construction and average indexes

Implementation modified energy label for dwellings

Results:

- 5 million letters
- 655.000 EPBD compliant labels are provided since 2015
- 76% of transacted dwellings haven an EPBD compliant label

Linking key registers



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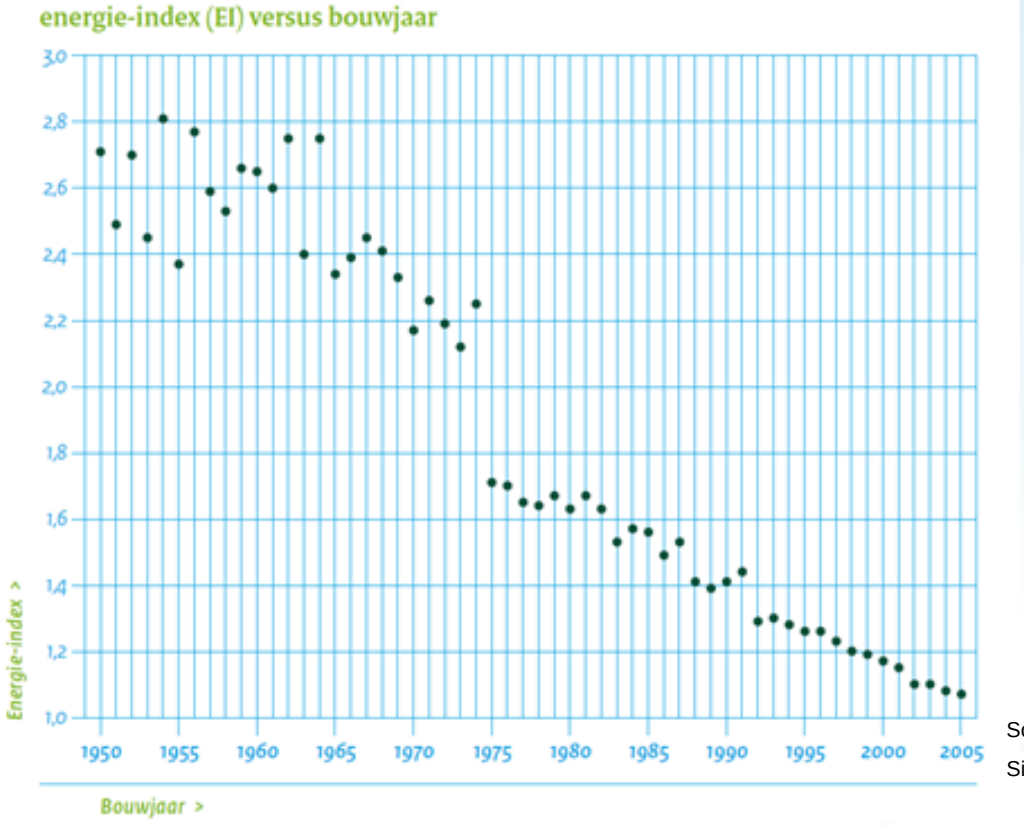
Average energy index Dutch dwellings per year of construction



Source: Voorbeeldwoningen 20011. Onderzoeksverantwoording, AgentschapNL, Sittard, Ministerie van Binnenlandse zaken en koninkrijksrelaties.

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Provisional energy label based on dwelling type and year of construction

Dwelling type	Year of construction (period)									
	untill 1945	1946-1964	1965-1974	1975-1982	1983-1987	1988-1991	1992-1999	2000-2005	2006-2013	2014 and later
Seperate	G	F	D	C	C	B	B	B	A	A
Semi-detached	G	F	D	C	C	C	B	B	A	A
Detached corner	G	F	D	C	C	C	B	B	A	A
Detached	F	E	C	C	C	C	B	A	A	A
Flat / appartment	G	E	E	B	C	C	C	B	A	A

Source: 60 Referenties ten behoeve van voorlopige energielabel v2.0 oktober 2014, RVO 2014

Monitoring energy labels municipality owned buildings

Question (by Netherlands Enterprise Agency and Association of Netherlands Municipalities)**:**

Monitor the energy performance of municipality owned building stock by using the energy label

Approach:

Researching available data, linking of key registers and developing information concepts, zero measurement and yearly follow up

Assessment methodology:

- The energy performance of buildings is assessed by using the EPBD compliant energy label

Energy performance of municipality owned building stock (provisional results)

Energy label	Self-contained units (number)	%	Surface area (million m2)	%
A	1130	3,8%	2,1	10,5%
B	465	1,6%	0,82	4,1%
C	544	1,8%	0,88	4,4%
D	453	1,5%	0,89	4,4%
E	333	1,1%	0,66	3,3%
F	293	1,0%	0,6	3,0%
G	797	2,7%	1,1	5,5%
Unknown	25430	86,4%	13	64,8%
totals	29445	100%	20,05	100%

National Energy Atlas

Question (by National Energy Atlas)**:**

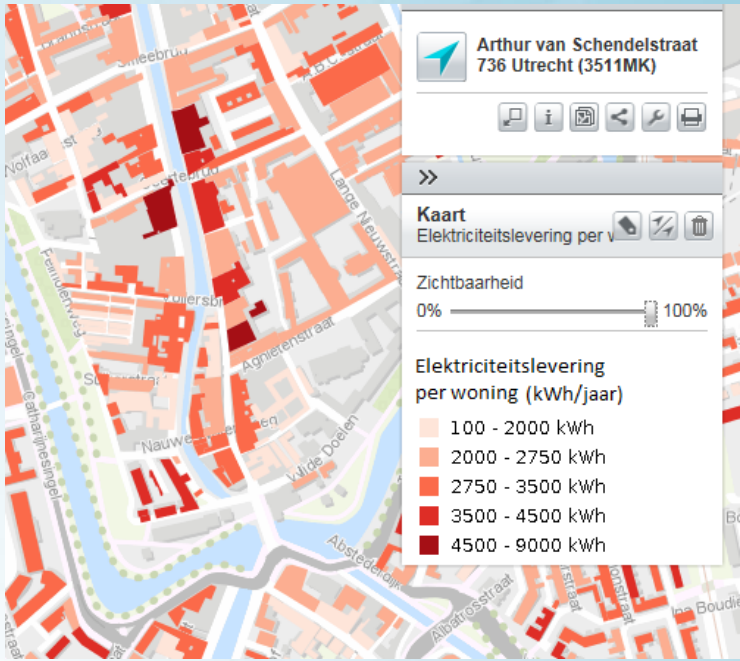
- Provide map layers on national scale including potential zero energy buildings and residential buildings suitable for bulk refurbishment

Approach:

- Researching available data, linking of key registers and GIS analysis

Assessment methodology:

- The potential of nearly zero energy buildings is assessed by combining data on year of construction, dwelling type and type of ownership
- Clusters of residential buildings suitable for bulk approach are identified as at least 5 adjacent dwellings with identical year of construction and dwelling type



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Map layers for National Energy Atlas

- Ownership type of dwellings: private owner/occupant, private letter, housing corporation: % per postal area
- Residential buildings with a potential (nearly) zero energy bill: location
- Government owned buildings: % per postal area
- Clusters of residential buildings suitable for bulk approach: location

Energy performance of office buildings

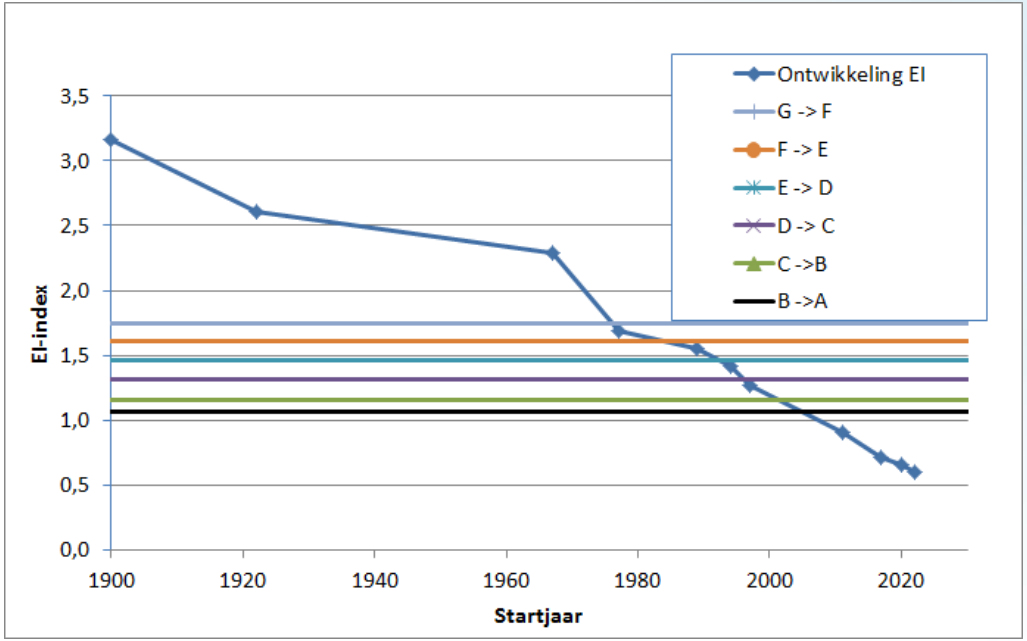
Question (by Platform31)**:**
- Visualise the energy performance of the office building stock in the 4 largest cities

Approach:
- Linking of key registers and extrapolating energy label information

Assessment methodology:
- The energy label of non labeled office buildings was estimated by using year of construction and average energy indexes

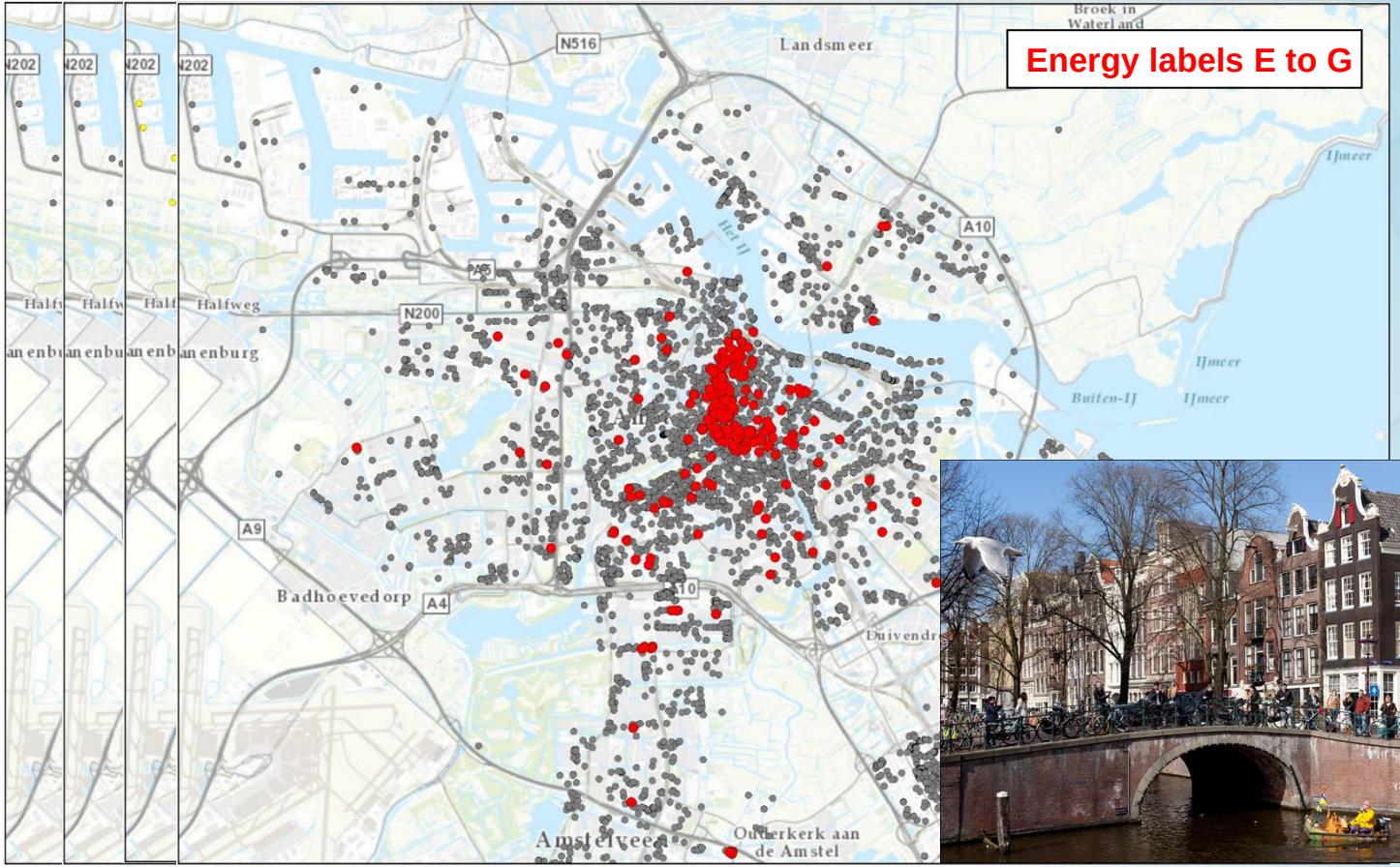
Results:

Average energy index Dutch office buildings per year of construction



Source: Energy research Centre of the Netherlands (ECN)

Energy performance of office buildings in Amsterdam



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Municipality of Apeldoorn

Question (by Apeldoorn)**:**
- Visualise areas with the highest chances of reducing energy consumption of dwellings

Approach:
- Research available data, develop indicators, link key registers and GIS analysis

Assessment methodology:
- The energy performance of dwellings was assessed by using estimated energy labes based on year of construction and dwelling type.

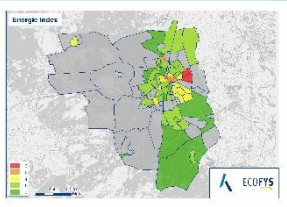
Results:

Geographical distribution of indicators

Physical indicators

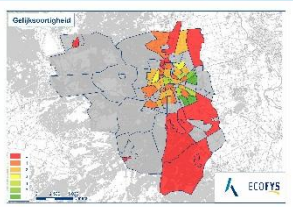
Energie index

Energy index of houses



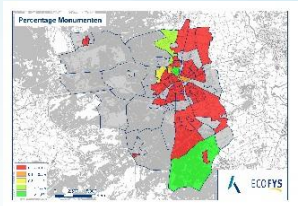
Gelijkvormigheid

Homogeneity of residential buildings



Percentage Monumenten

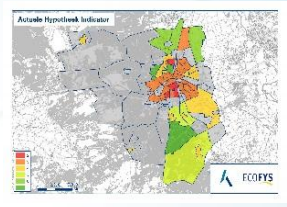
Appearance of monuments



Actuele Hypotheek Indicator

Socio-economic indicator

Estimated income



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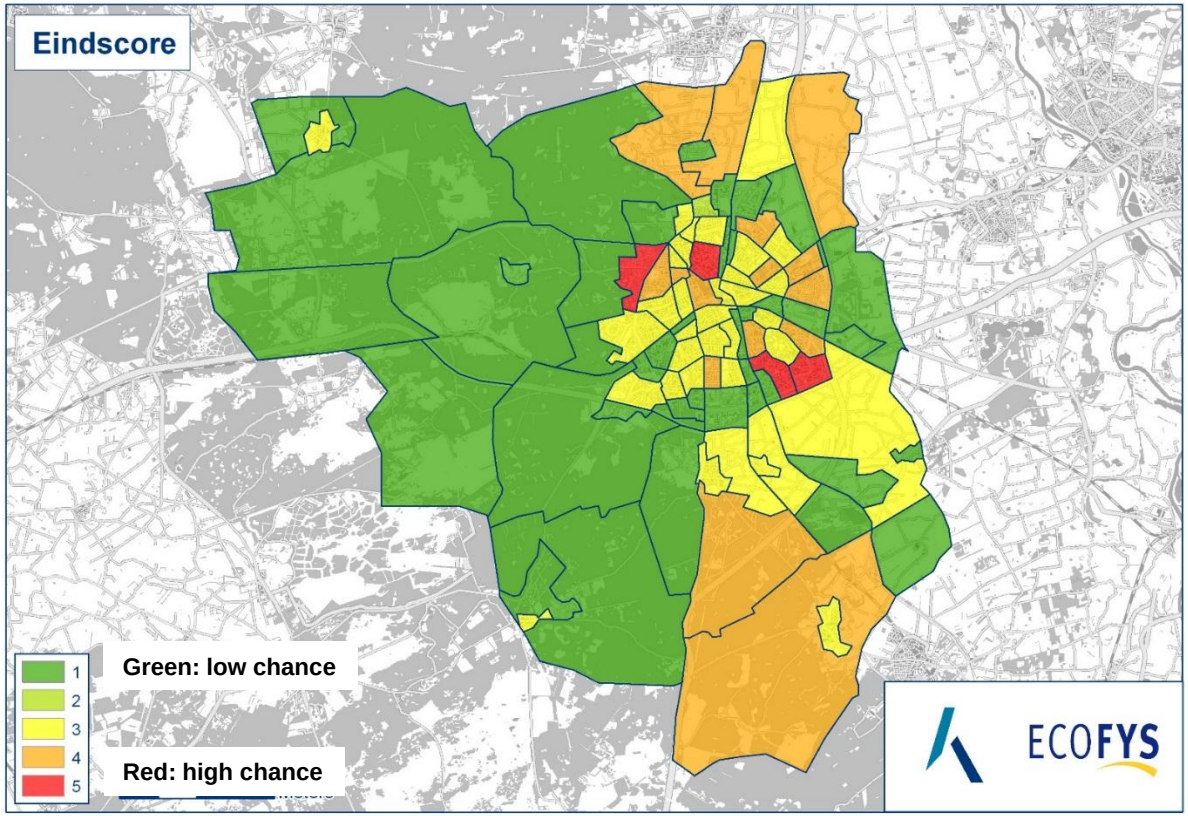
Chances in reducing energy consumption of privately owned dwellings



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Rich Energy The Hague

- City of The Hague and Dutch government have joined forces
- Goal: cost-effective, reliable and sustainable energy supply
- Combined property of national and local government buildings in the city centre consists a 1.000.000 m2
- The energy consumption has an estimated electricity equivalent of 30.000 households

Rich Energy The Hague

Question (by Ministry of Internal Affairs)**:**

- Design and build an information tool to explore possibilities in energy reduction and generation for the combined real estate owned by the municipality and the Dutch government in the city centre of The Hague

Approach:

- Research available data, link key- and other registers and GIS analysis

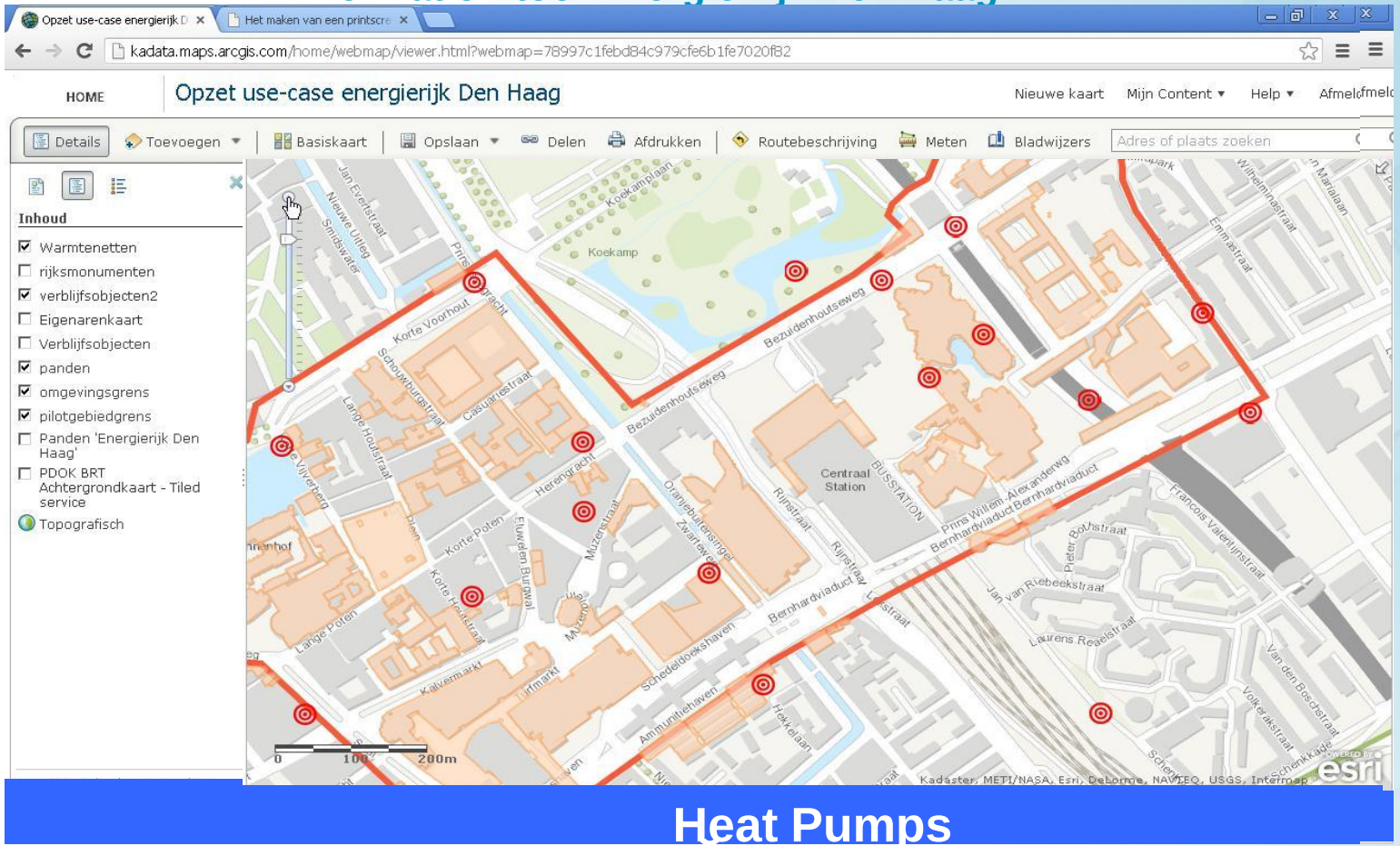
Assessment methodology:

- Potential energy flows were assessed by using data on underground grids for district heating and heat pump facilities

Results:

- used for a business case study

Information tool EnergieRijk Den Haag



Heat Pumps

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Discussion

Which information on energy performance of buildings, and at what level of detail, is needed by the EU to reach the goals of the Paris Agreement of december 2015?

- *keeping the increase in global average temperature to well below 2°C above pre-industrial levels;*
- *to aim to limit the increase to 1.5°C;*
- *to undertake rapid reductions thereafter in accordance with the best available science*.

THANK YOU!

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