Road Map to energy neutrality

City of Apeldoorn
Henk Wijnsma
Apeldoorn

156,000 inhabitants; 85,500 employed
Large area (for NL); 34,000 ha
1 city + 10 villages
Energy Neutral 2020

- All energy used in households and offices should be produced within the boundaries of Apeldoorn
- All energy should be produced in a sustainable way
Activities

- Sustainable building
- Sustainable energy
- Biomass plant(s)
- Wind energy
- Ground source cooling and heating
- Energy efficiency (houses, buildings and administration)
- PV and Solar heating (houses, buildings and administration)
District heating powered by biogas from sewage sludge
(GROUND)WATER CHAIN OF APELDOORN

1. Using sustainable energy from groundwater

2. Brook supply

3. Canal supply

4. Infiltration for drinking water supply

5. Re-infiltration in favour of nature

6. Withdrawal in favour of industrial water-supply

- Groundwater flooding
- Groundwater decontamination
- Drinking water extraction

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Road map to Energie neutrality 2020

Energy consumption vs energy production

- Reference energy demand
- Reference energy production
- More energy saving
- More production sust. energy
- EXTRA energy saving
- Extra production sust. energy


PJ/primary energy: 0, 2, 4, 6, 8, 10, 12

Lines and markers indicate different energy scenarios and years.
Energy savings potential

EXTRA Energy Saving

PJ/primary energy

year

2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

commercial transport
private transport
drainage/pumps
culture and recreation
health care
education
public service
hotel and catering
trade
Existing offices
New offices
Industry
livestock farming
Agriculture
Horticulture
Existing housing
New housing
Public lighting
Biomass crucial

EXTRA production sustainable Energy

- Biomass (regional chicken manure)
- Biomass local chicken manure
- Biomass gasification
- Biomass gasification municipal waste
- Biomass municipal wood
- Geo thermal
- Heat cold storage roads
- Heat cold storage new lay out
- Heat – cold storage large scale
- Groundwater cooling
- Wind turbines mistc
- Wind turbines eco factory 5
- Solar heating
- PV public lighting
- PV new utilities
- PV existing utilities
- PV new housing
- PV existing housing
System

- **Scattering**: sustainable energy and energy saving by stand alone projects.
- **Quick wins**: the market selects the approaches with the highest benefits.
- **Centralistic Thinking** e-companies + government + natural gas interest slows:
  - Transition to sustainable energy;
  - Saving fossil fuels
  - Stimulating pricing sustainable energy
System Change

1. See the abundance of local energy sources as a collective wealth.  
   “United Emirates of Apeldoorn”

2. Energy supply under control of the local community.  
   ‘Power to the People’

3. Energy saving and sustainable energy production need new COalitions, COmmitment, COnnunication and COntinuity. More CO4 means less CO2
structure SEEA

Social partners:
- Municipality
- Housing companies
- Board

Citizens

Values

Confidence

Cooperative Union

Guarantee

Long term purchase security

Local sustainable initiatives
- Wind
- Bio gas
- Sustainability agency

Sustainable financing bodies

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NW Europe Energy Champions Network

- Network of NW Energy Agencies
- IEE programme (Intelligent Energy Europe), october call
Contact

Further contacts

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