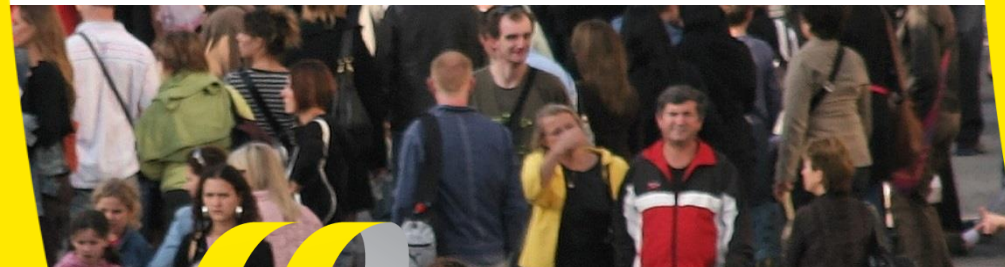




# Engineering for Sustainable Development: Case Texel

Cor Leguijt PhD, December 8, 2014



# Content

NB: my focus is on **energy** (and climate)

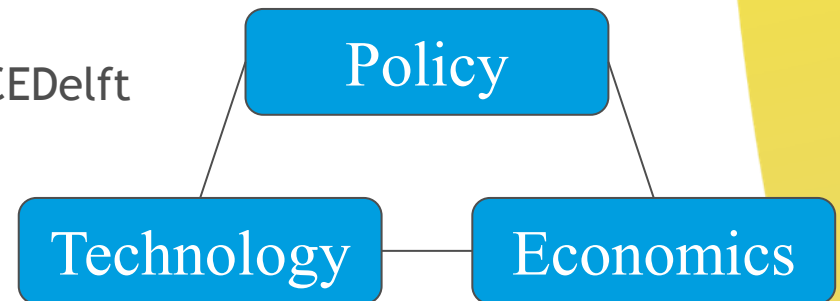
- Short introduction CE Delft
- Texel, some facts
- Texel, energy consumption
- Intermezzo: our lessons learned on climate/energy neutral regions
- The road map for Texel
- Discussion!

# CE Delft

- Independent research and consultancy since 1978
- Transport, energy and resources
- Know-how on economics, technology and policy issues
- 40 Employees, based in Delft, the Netherlands
- Not-for-profit

Clients: European Commission and Parliament, national and regional governments, industries and NGO's

All our publications [www.cedelft.eu](http://www.cedelft.eu) or @CEDelft



# Our studies for sustainable regions

With focus on energy and climate, amongst other:

- Vision and roadmap Amsterdam
- Vision and roadmap Texel (energy neutral)
- Does the energy transition starts in the region? (for Rathenau)
- Roadmap for Metropole Region Amsterdam (energy neutral)
- Roadmap for City Region Rotterdam (climate neutral)
- Backcastingstudy municipality The Hague (climate neutral)
- Backcastingstudy City Region The Hague (climate neutral)
- etc.

## Texel, some facts



Texel is an island

Area 16,100 ha (land)

- 33% National park
- 55% Agriculture
- 12% Other

7 villages

13,400 inhabitants, ca. 6,000 houses

900,000 tourist visits per year

4,500,000 'tourist nights'

1 of every two sleepers on Texel is a tourist (!)



## Texel, some facts (2)

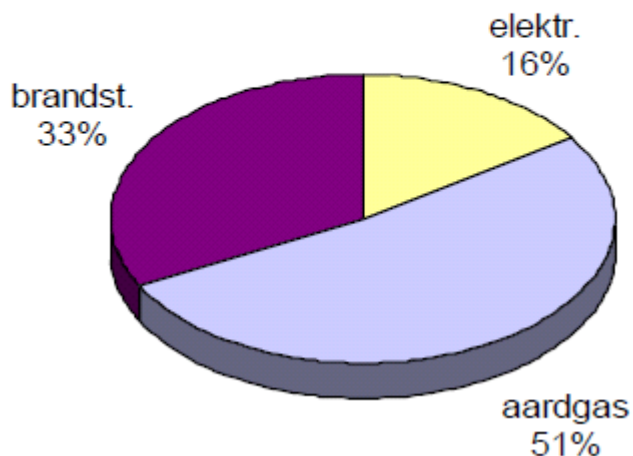
- Texel has strong cultural island roots
- Autarky as desired way of living
- Explains success of local energy cooperation Texel Energie
- Interesting as garden for innovations (Urgenda, Alliander etc)



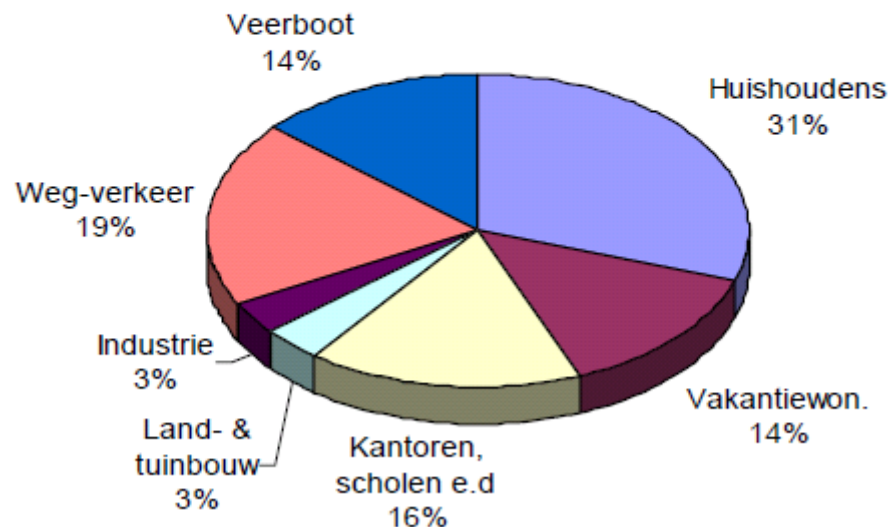
# Energy consumption on Texel (final energy)

Ambition: 100% own renewable energy, in 2020 (NL: 14% in 2020; EU: 20%)

Verdeling energieverbruik Texel over dragers



Verdeling energieverbruik Texel over sectoren



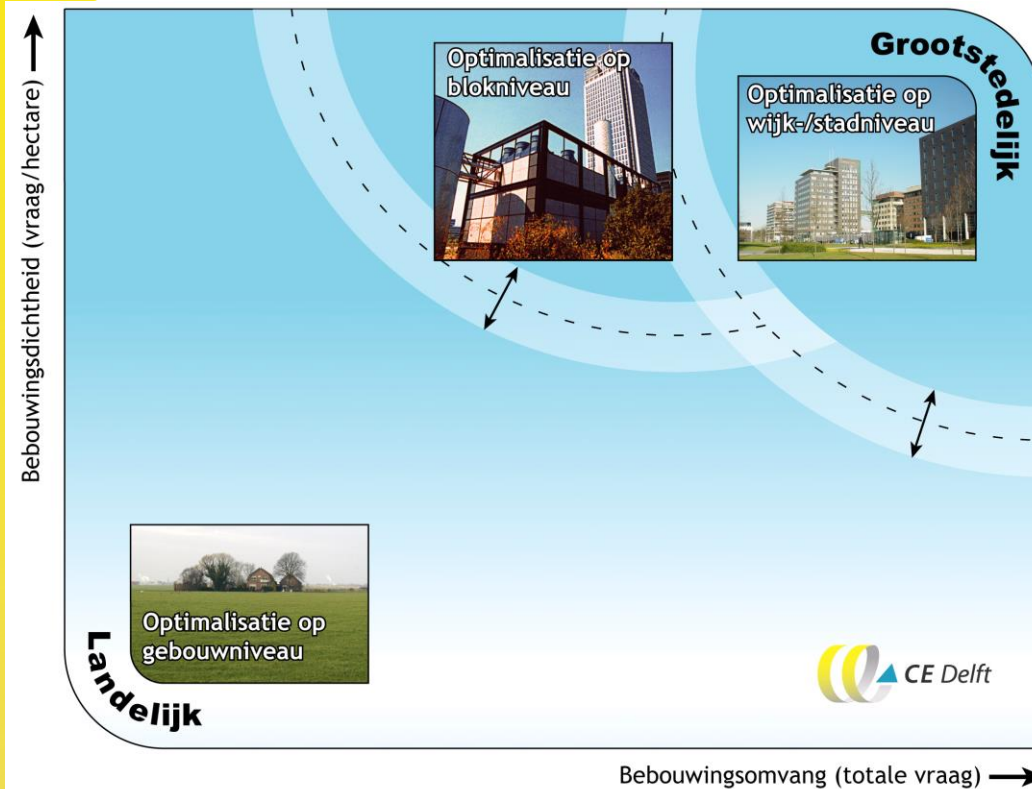
Business as usual 2020: +13% energy use (electricity (buildings) and transport fuel)

# Intermezzo: our lessons learned on climate neutral

1. Challenge is mainly about economy and society ('technically feasible')
2. On the critical path towards energy neutral or climate neutral:
  - Heat demand of *existing* buildings
  - Transport
  - *And industry and greenhouses (depends on specific municipality)*
3. About 50% of ambition climate neutrality by regulations EU & National
  - Regulation of energy performance of new buildings
  - Regulation of CO<sub>2</sub>-emission of electricity production (EU-ETS)
  - Regulation of CO<sub>2</sub>-emission of new cars
4. All stakeholders needed, especially for energy transition of heat demand built environment -> **role for municipality**
  - Transition of demand and of proposition needed
  - Renewable **electricity** is easier issue than renewable heat



# Built environment: difference cities and country side



## Examples

collective	individual
dikes	terps
sewer system	compost pile
water supply	water tank
district heating	stove, heater
metro	car

In case of large volumes and densities of buildings, a collective approach most of the time more effective and more efficient. But needs government initiative in most cases.

# For Texel

## Options:

- **Energy saving (building isolation, LED lighting, ...)**
- Wind turbines most obvious choice. But veto by tourist sector
- **Solar PV on roofs, and ground based**
- Small wind turbines on roofs (innovation needed)
- Biomass digestion (green gas)
- District heating (geothermal): technical possible, but economically???
- Heat and cold storage in underground
- **Solar water heaters**
- Innovation: tidal energy (using water flows of high and low tide)
  
- **Switch to electricity (buildings and transport)**

# Input for discussion (food for thought)

100% renewable energy in 2020?

- To be seen as ambition
- Provides direction and sense of urgency
- Also attracts innovations, Texel is proud on it's front runner ship
- For fast track, 'target regulations' are necessary

'Engineering for sustainable development' on energy:

- Provide transparant facts on current energy use and BaU-scenario
- Provide information on technical options ('what question')
- Show the critical pathways for the transformation process
- Provide information on which stakeholder should take what actions ('how question'): what policies are needed?

Questions???



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