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Source: Citytracking

Landschaft Gestalten Symposium
23rd of October 2014, Frankfurt/Germany





Source: Beeldbank RWS



Flevoland 2.500 km²



Cornelius Lely

MVRDV, 2000

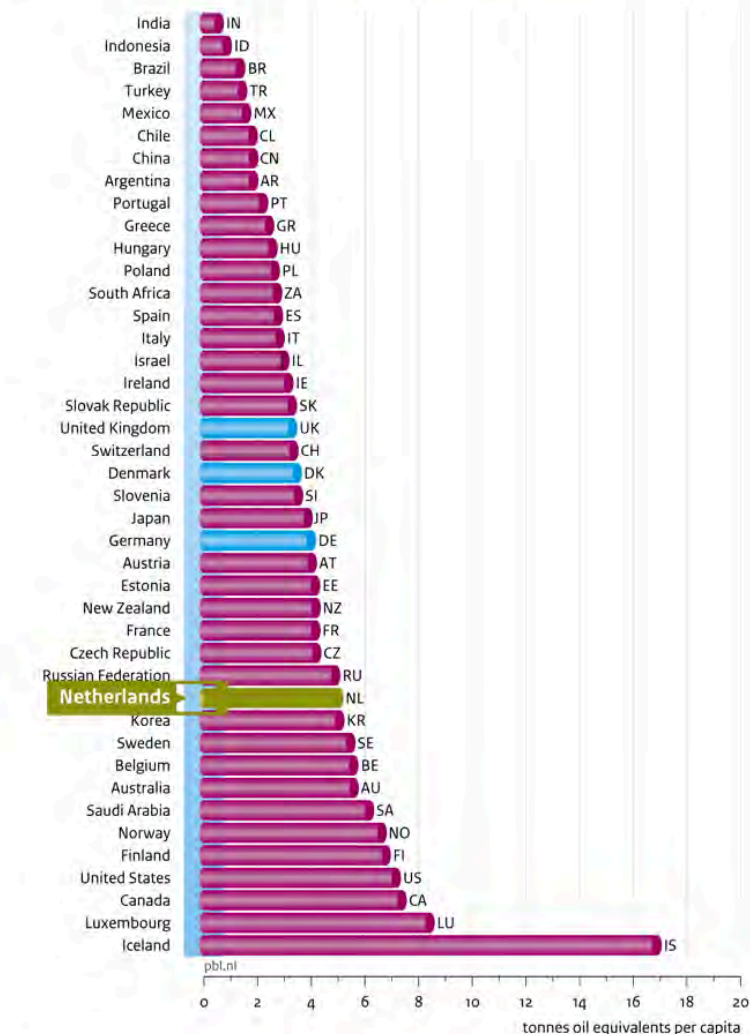


Status-quo energy transition in the Netherlands

- › EU goal 20% RE by 2020
- › NL goal 14% RE by 2020
- › NL 2013 about 4,5% RE (CBS)
- › Ambitious targets by large (urban) regions in the Netherlands
- › E.g. Groningen self-sufficient in 2035 (3.500 inh/km²)
- › Most targets without any study of potentials and stakeholders

Position of the Netherlands, compared to that of other countries

Energy use per capita, 2010



Source: OECD, 2013

Research question

How to define a target for energy transition that is evidence-based, spatially explicit and well supported by regional stakeholders?

< gestalten



Parkstad Limburg: 1 180 inh/km² (Reference NL 406 and DE 226 inh/km²)

RENEWABLE ENERGY SOURCE (RES)



SOLAR



WIND



HEAT-COLD STORAGE



HYDROPOWER



BIOMASS

RENEWABLE ENERGY TECHNOLOGY (RET)

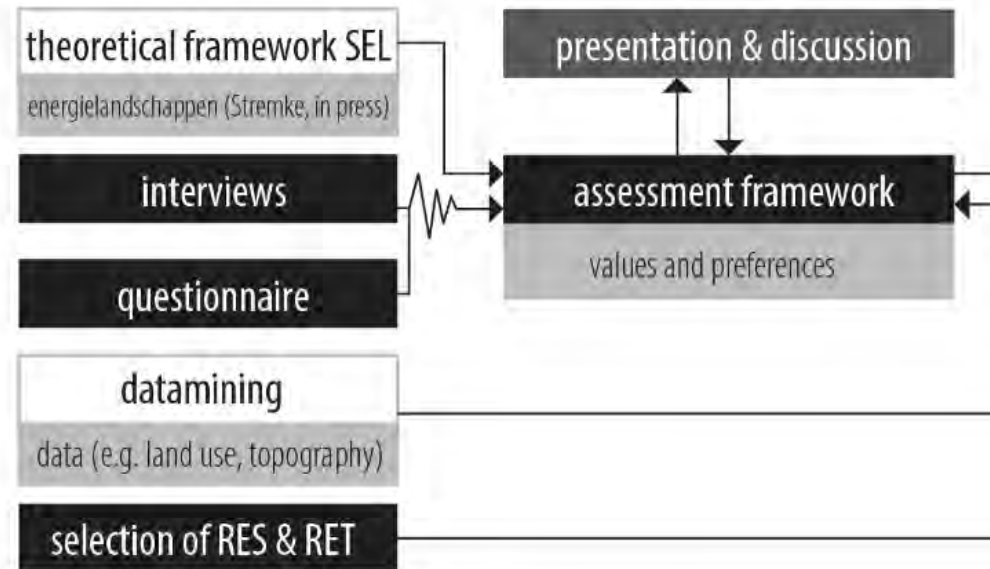
Photovoltaic system
Solar boiler
Tarmac solar boiler

Windturbine
Small building-
integrated windturbine

Open system
Closed system
Mijnwater 2.0
(heat-cold exchange
by means of local old
mine shafts)

Small hydropower
system

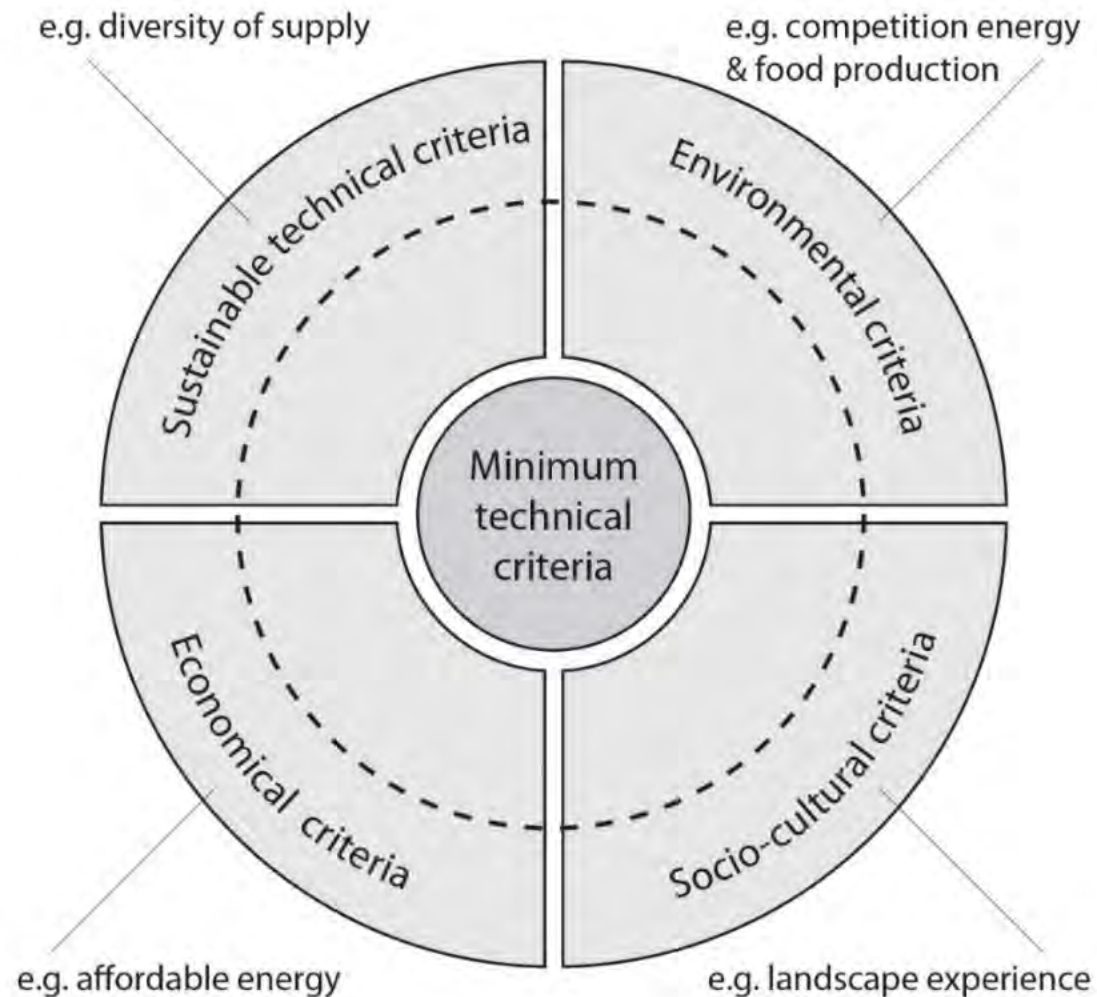
Energy carrier
Waste gas
Manure
Verge clippings
Woody biomass
Straw
Energy crop



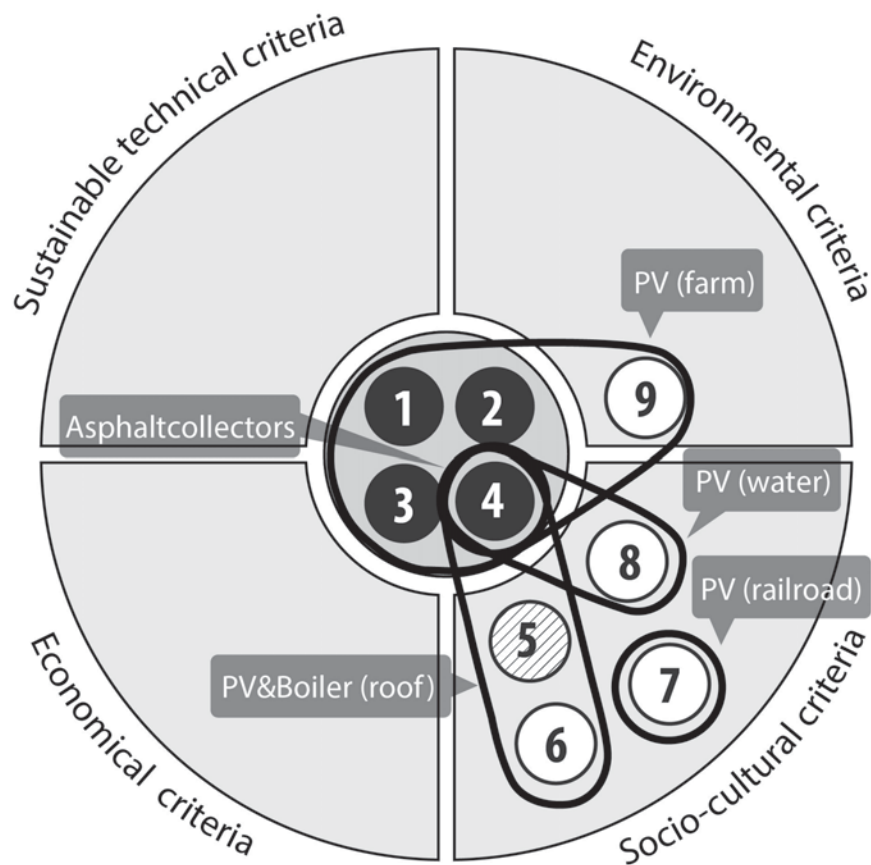
LEGEND



Theoretical framework: Sustainable energy landscape (not renewable energy landscape)



Qualitative framework: Landscape and stakeholder specific conditions



CONSTRAINTS OF SOLAR POWER

- **physical constraint**
 1. Exclude sites with unfit (roof/soundwall/road) surface
 2. Exclude irregular shape of parcels
 3. No sites with north orientation for solarfarms
 4. Exclude sites with steep slope for solarfarms ($> 10^\circ$)
- ◐ **endogenous constraint**
 5. Exclude 50% of protected heritage site
- **normative constraint**
 6. Exclude all cultural heritage (e.g. castle)
 7. No solarfarms on agricultural land for food production
 8. No solarfarms/PV above railroad within protected landscape (Heuvelland)
 9. Exclude ponds/lakes used for leisure

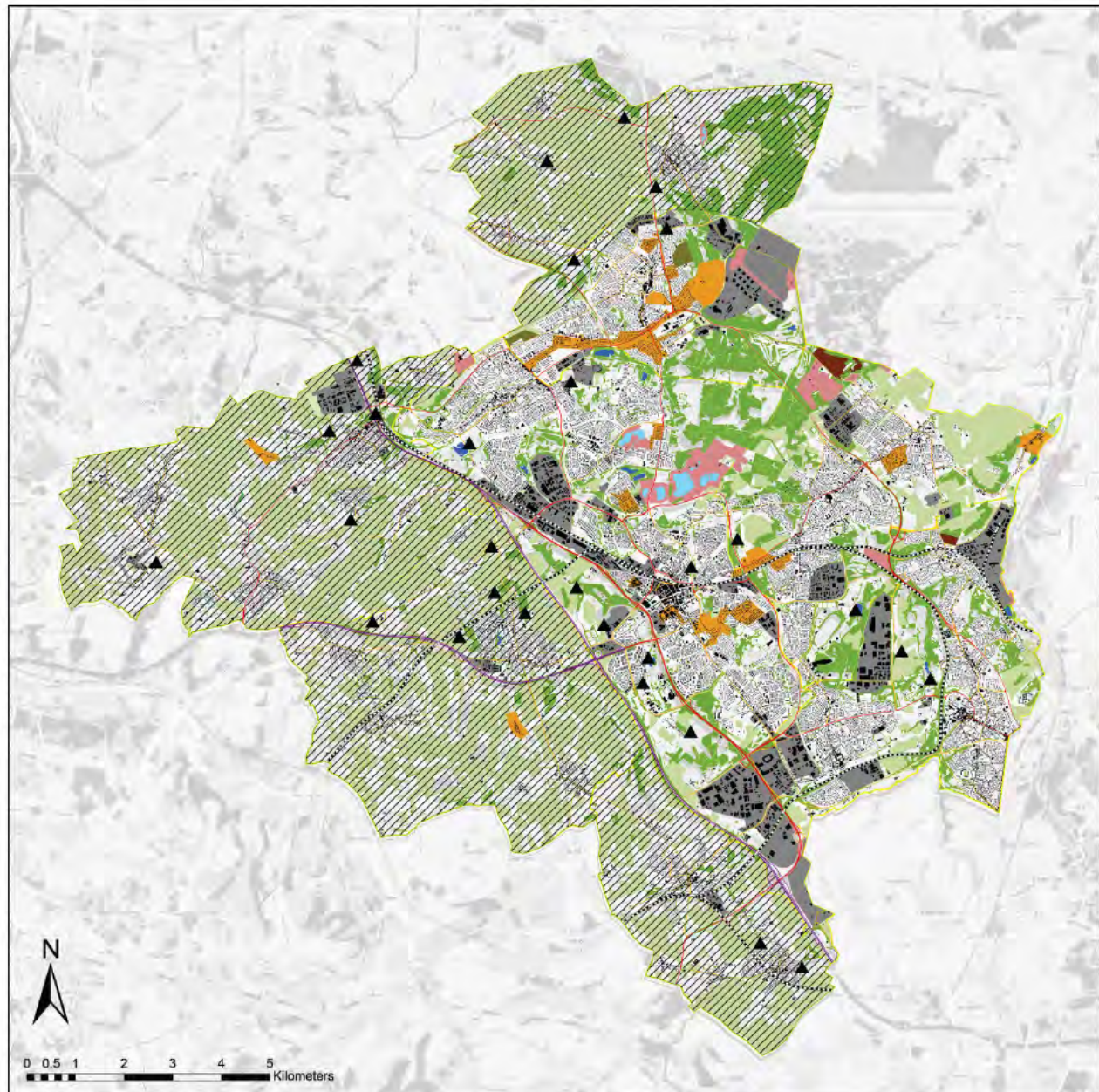
EPM Solar energy

Potenties

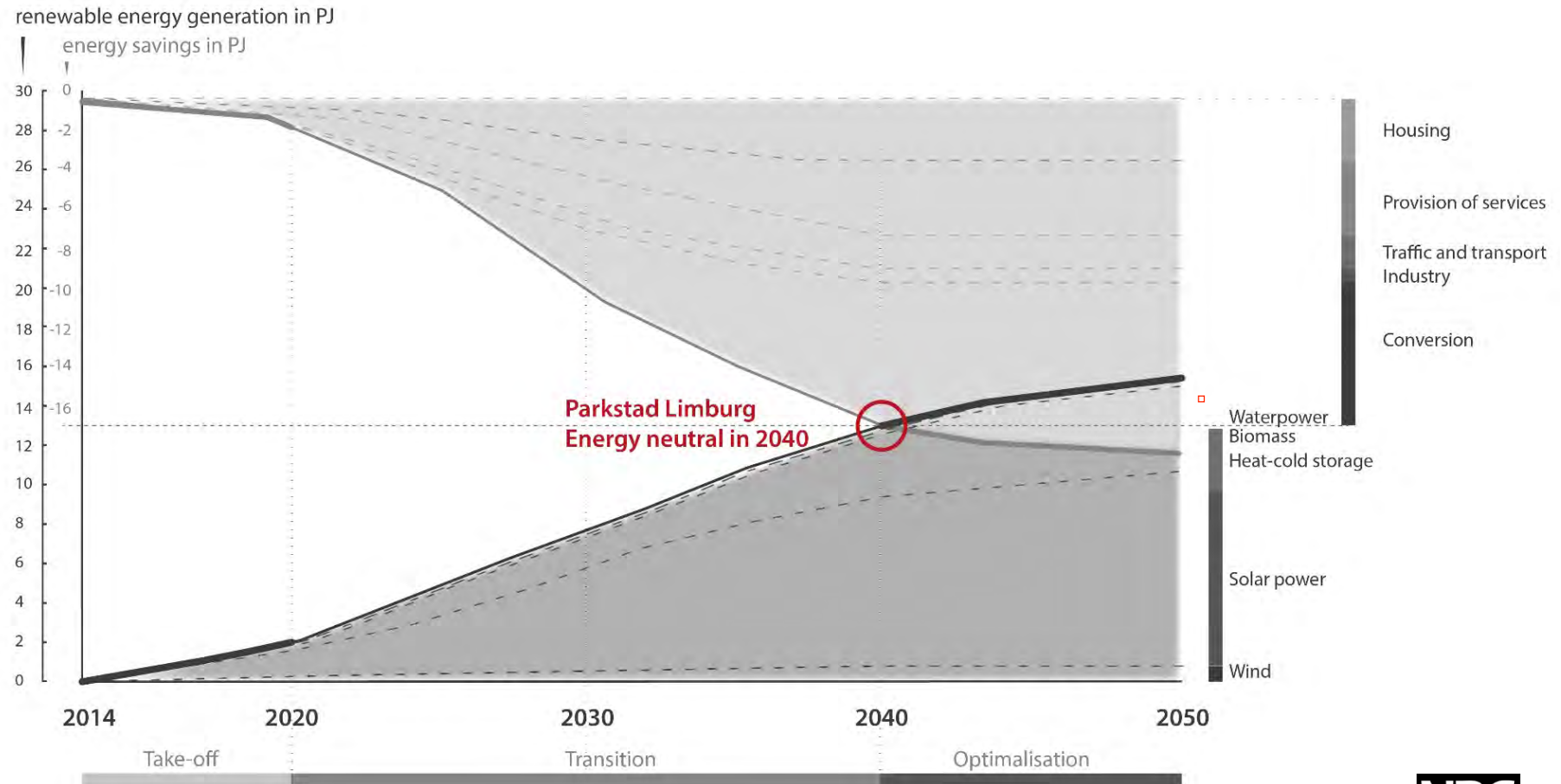
- Uren zon: 1450-1500 per jaar (36 TJ/ha/jaar)
- Gebouw
- Woongebied
- Bedrijventerrein
- Akkerland
- Delfstofwinplaats
- Oppervlaktewater
- Stortplaats
- Braakliggende terreinen
- Spoorlijn
- Autosnelweg
- Hoofdweg
- Regionale wegen

Beperkingen

- Beschermd stads en dorpsgezicht
- Bos
- Nationaal landschap
- Water recreatief
- Kasteel



Energy transition is realistic by 2040 under the conditions determined by local stakeholders





NRGlab stands for energy landscapes and beyond. The NRGlab is a laboratory on energy landscapes initiated by Sven Stremke and Renée de Waal. The NRGlab is based in the Netherlands and linked to the Landscape Architecture Group of Wageningen University. We can be contacted and work in English, German and Dutch. This text in Dutch.

As landscape architects, we focus on the future, that is giving shape and helping to realize Sustainable Energy Landscapes. Yet, we are aware of the necessity to join forces with other disciplines if we want to make a difference. This website is our online platform where we collect knowledge, share experiences and bring together people who work on the subject of Sustainable Energy Landscapes. Last but not least the NRGlab should help forming coalitions for future research, design and teaching projects on energy landscapes. *Please note that we are still in the process of getting approval of all the people mentioned, and for the publications and illustrations included here!*

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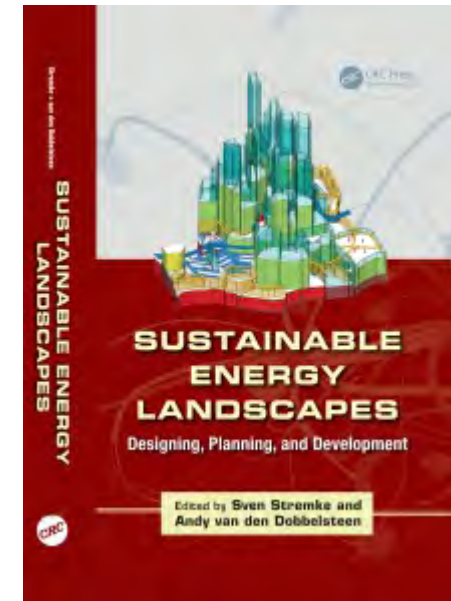
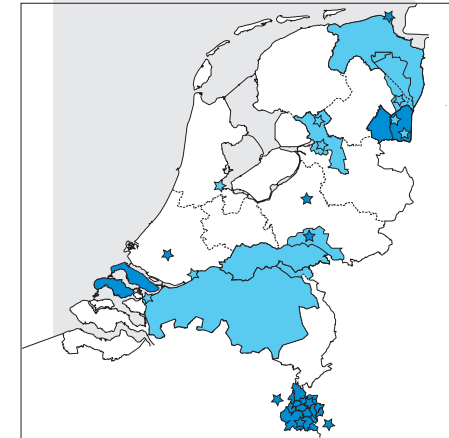
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