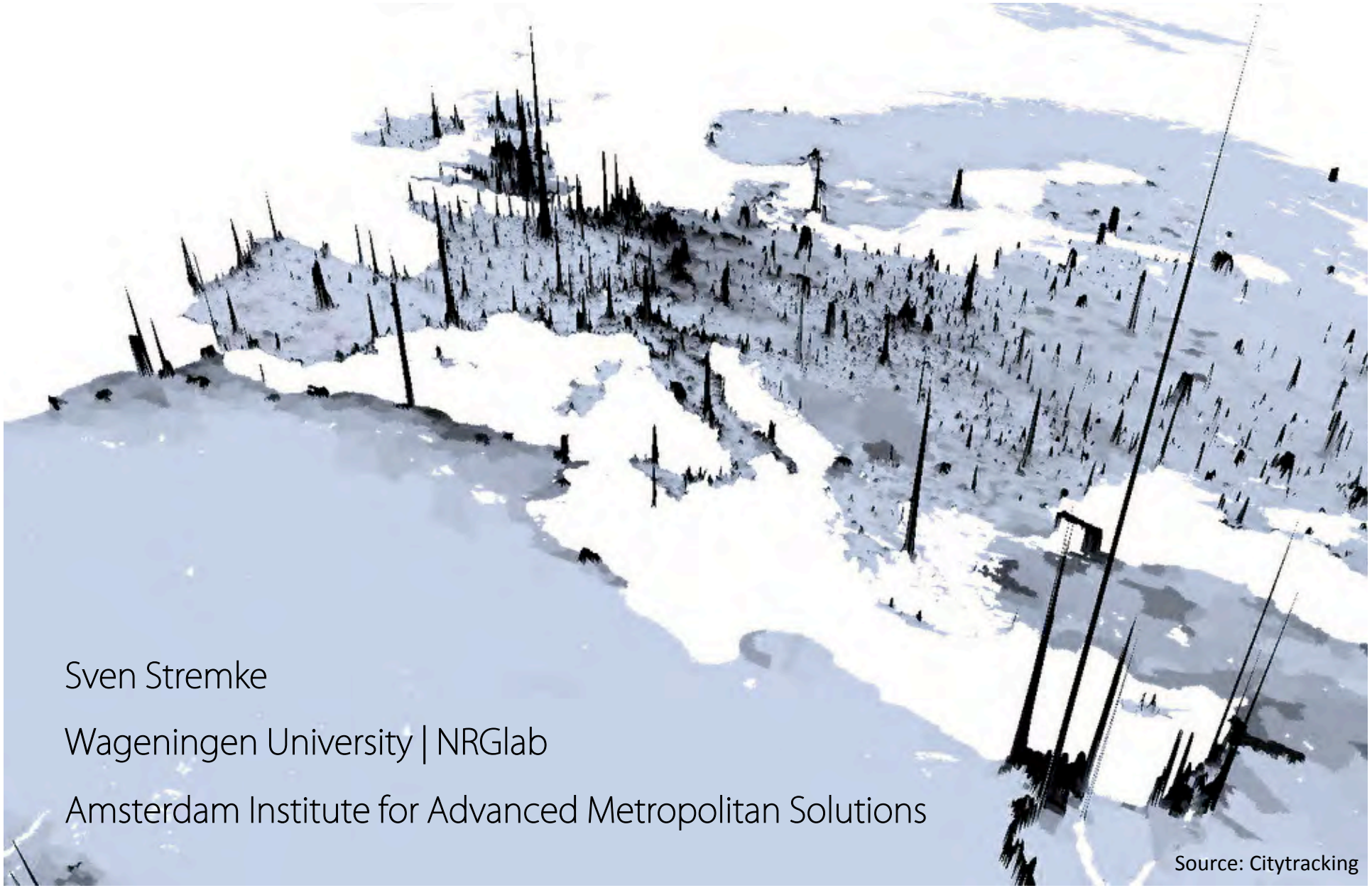


Sven Stremke

Wageningen University | NRGlab

Amsterdam Institute for Advanced Metropolitan Solutions

Source: Citytracking

Landschaft Gestalten Symposium

23rd of October 2014, Frankfurt/Germany

WAGENINGEN UNIVERSITY
WAGENINGEN UR

NRG LAB


Source: Beeldbank RWS

Flevoland 2.500 km2

Cornelius Lely


MVRDV, 2000
EXPO-
Shop

Status-quo energy transition in the Netherlands

› EU goal 20% RE by 2020

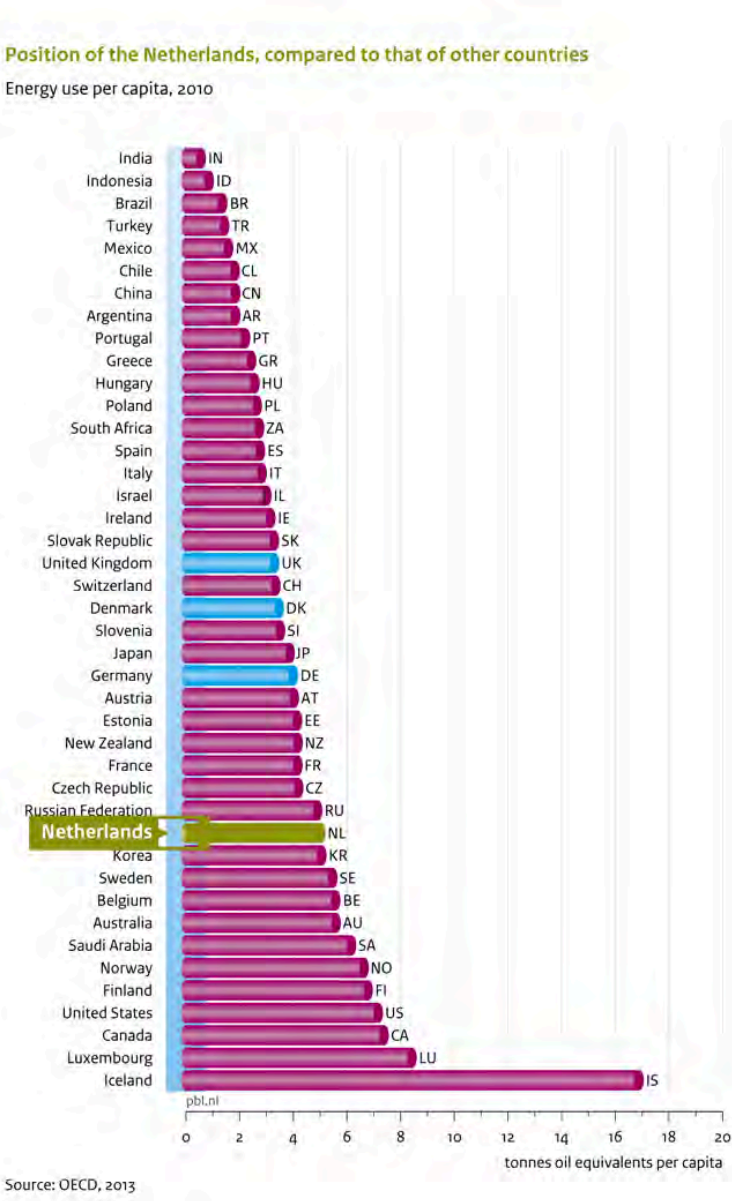
› NL goal 14% RE by 2020

› 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)

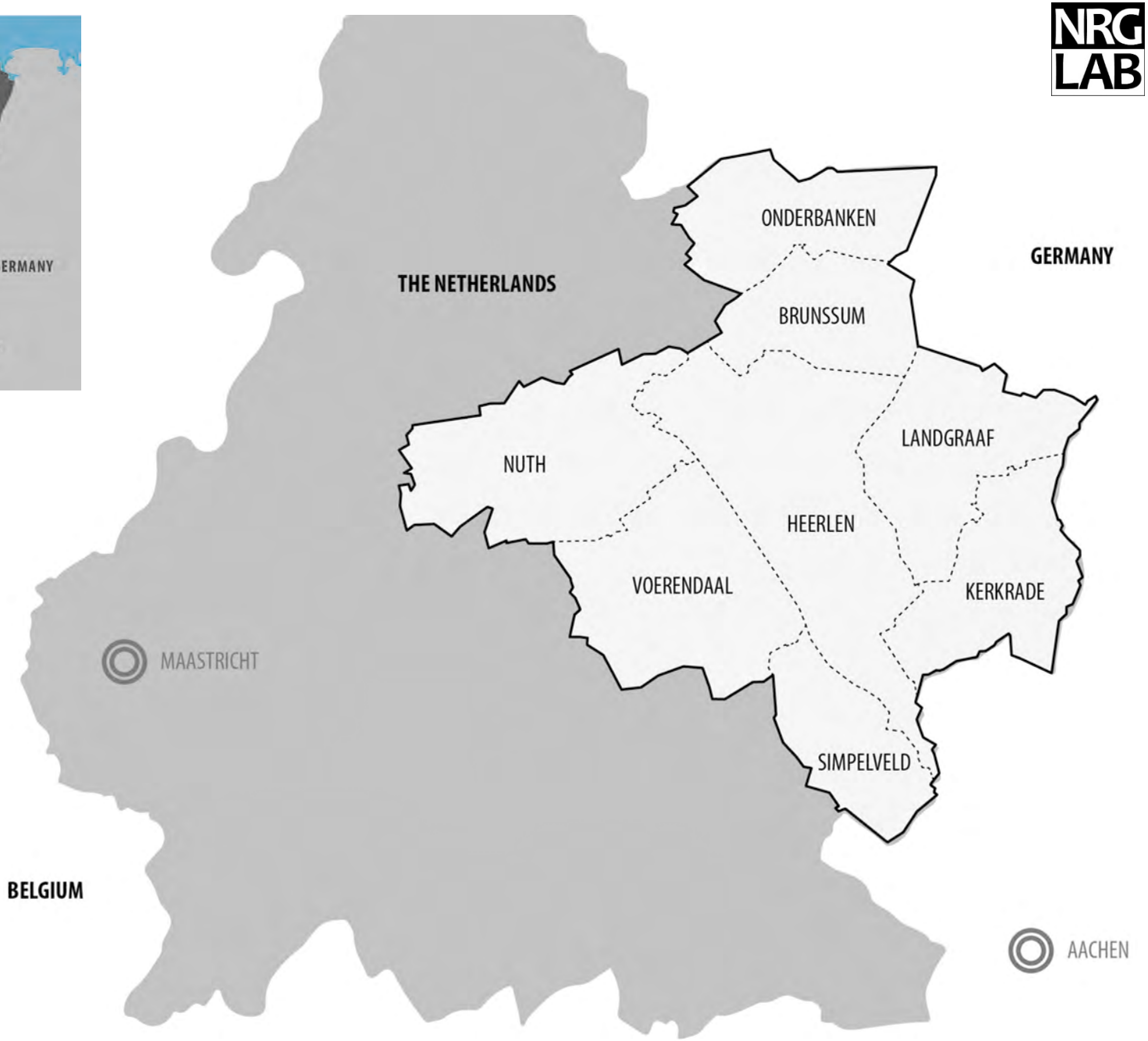
› Most targets without any study of potentials and stakeholders



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: 1180 inh/km^2 (Reference NL 406 and DE 226 inh/km^2)

RENEWABLE ENERGY SOURCE (RES)

SOLAR

WIND

HEAT-COLD STORAGE

HYDROPOWER

BIOMASS

RENEWABLE ENERGY TECHNOLOGY (RET)

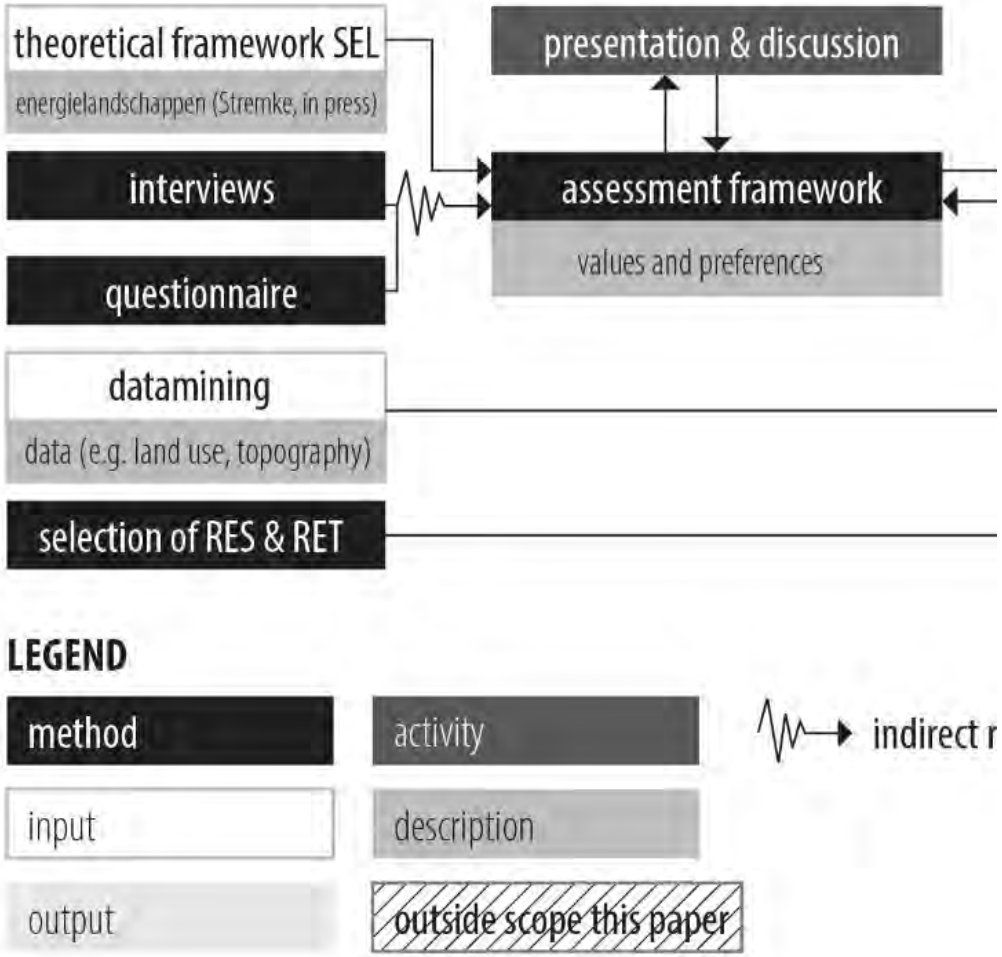
Photovoltaic system
Solar boiler
Tarmac solar boiler

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


theoretical framework SEL
energielandschappen (Stremke, in press)
interviews
questionnaire
datamining
data (e.g. land use, topography)
selection of RES & RET
presentation & discussion
assessment framework
values and preferences
LEGEND
method
activity
indirect r
input
description
output
outside scope this paper

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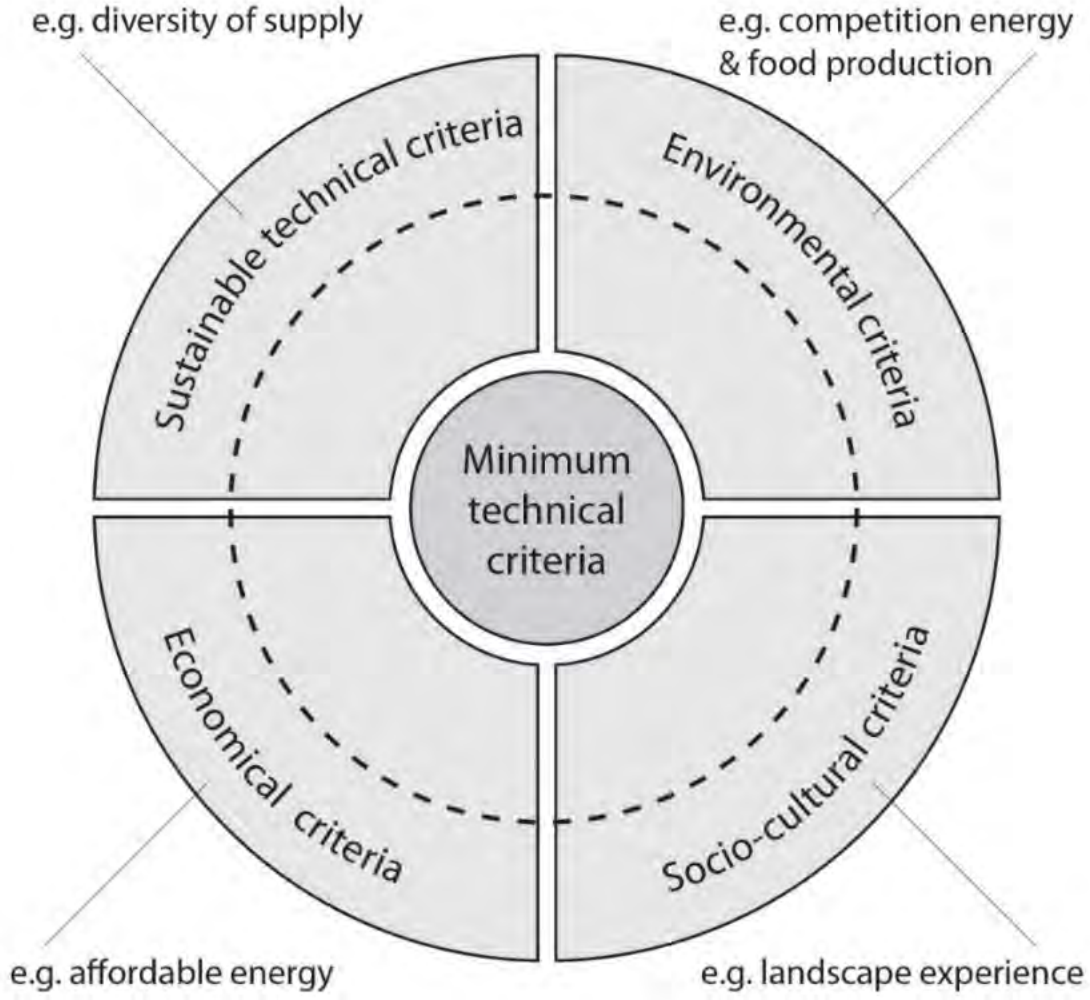
Theoretical framework: Sustainable energy landscape (not renewable energy landscape)



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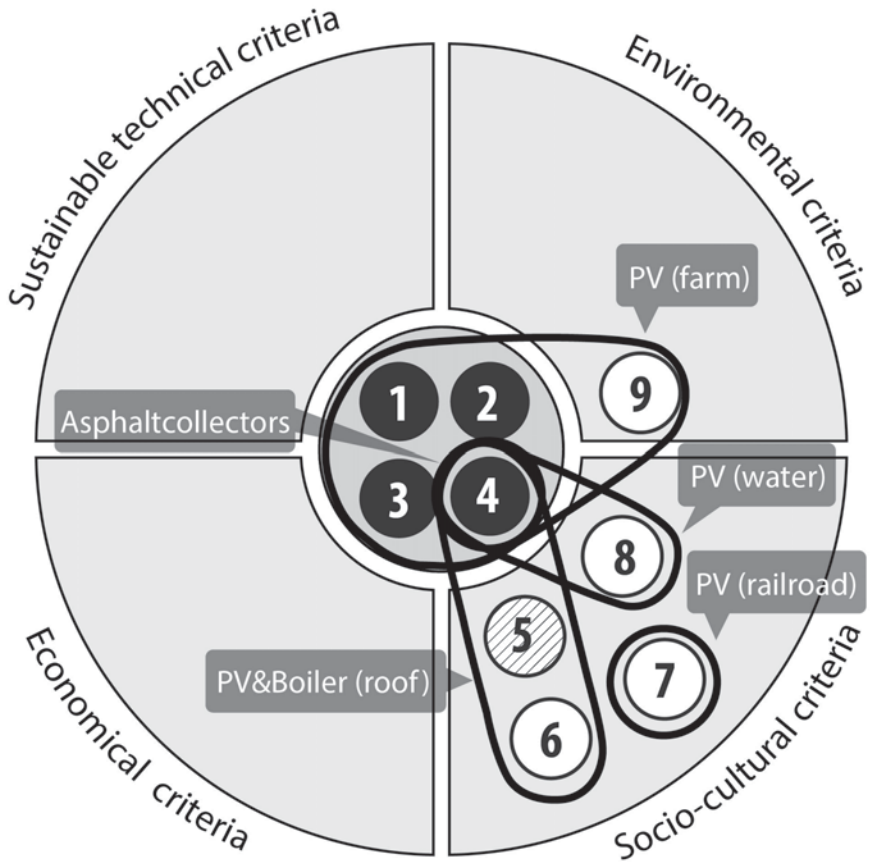
Qualitative framework: Landscape and stakeholder specific conditions



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. Exlude sites with steep slope for solarfarms (> 10^0)

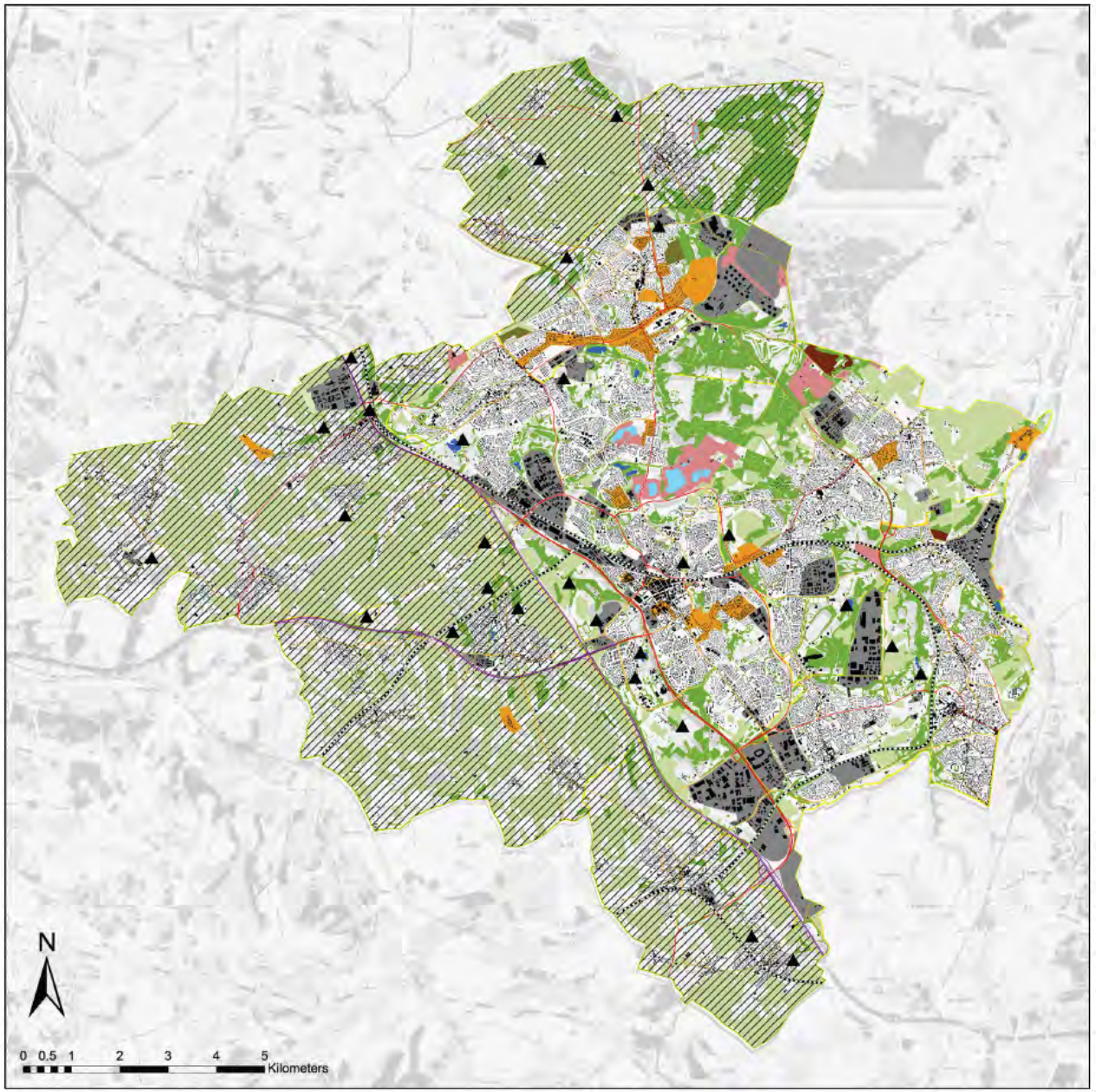
endogenous constraint

5. Exclude 50% of protected heritage site

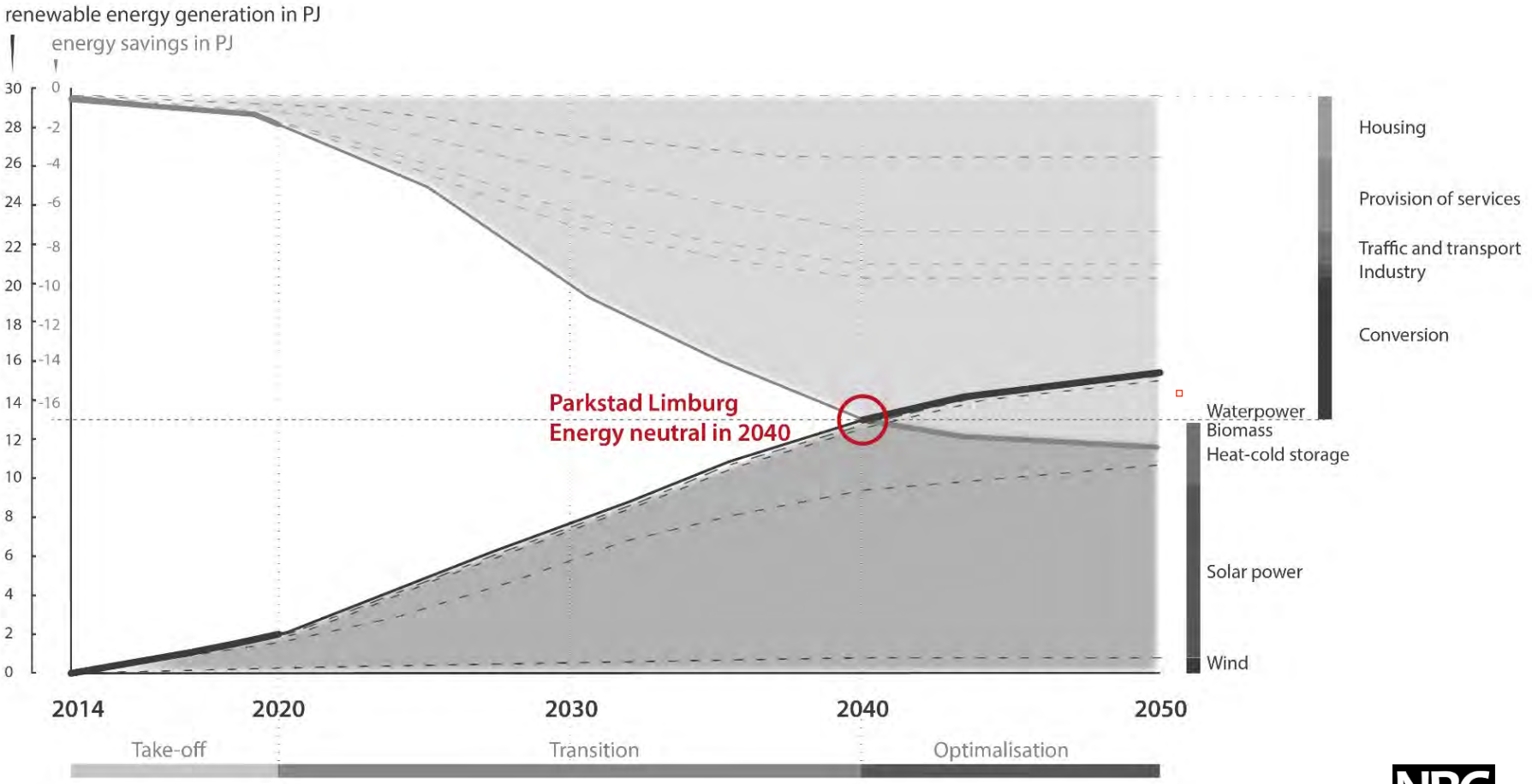
normative constraint

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



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



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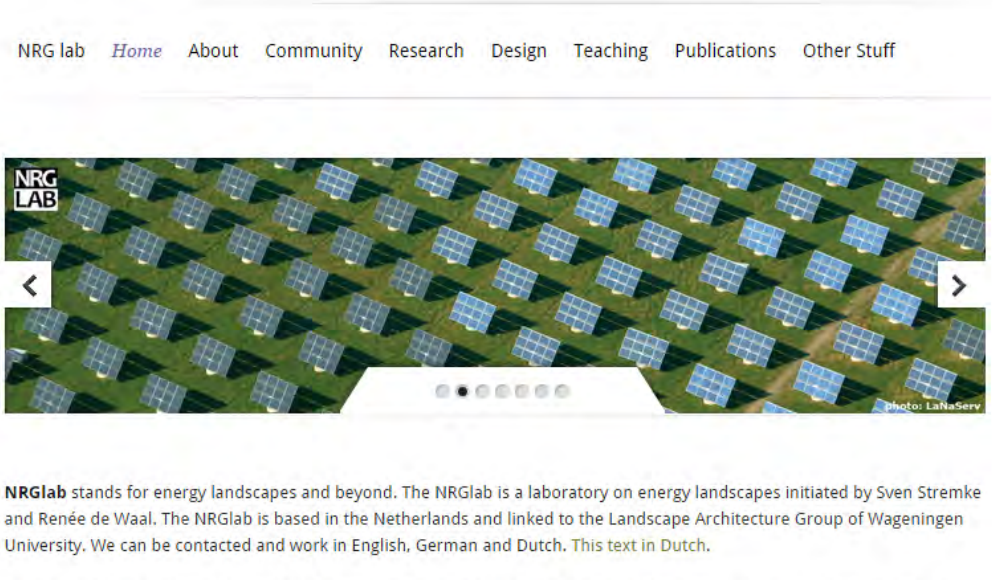
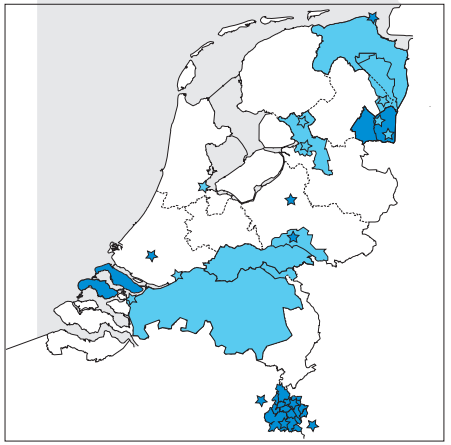
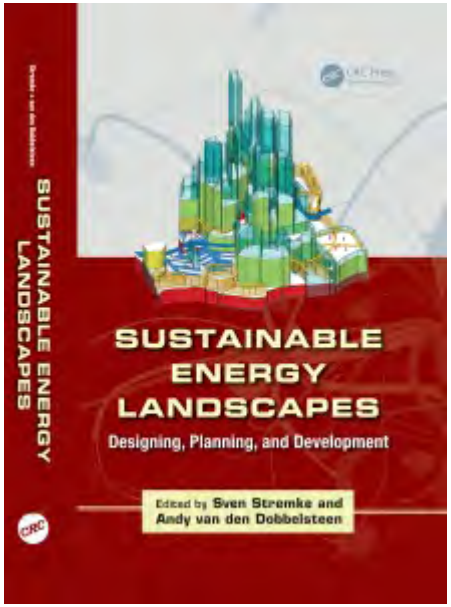


www.NRGlab.net

Projects NL





Publications