BETUWE+

BSc-thesis 6th period 2012-2013

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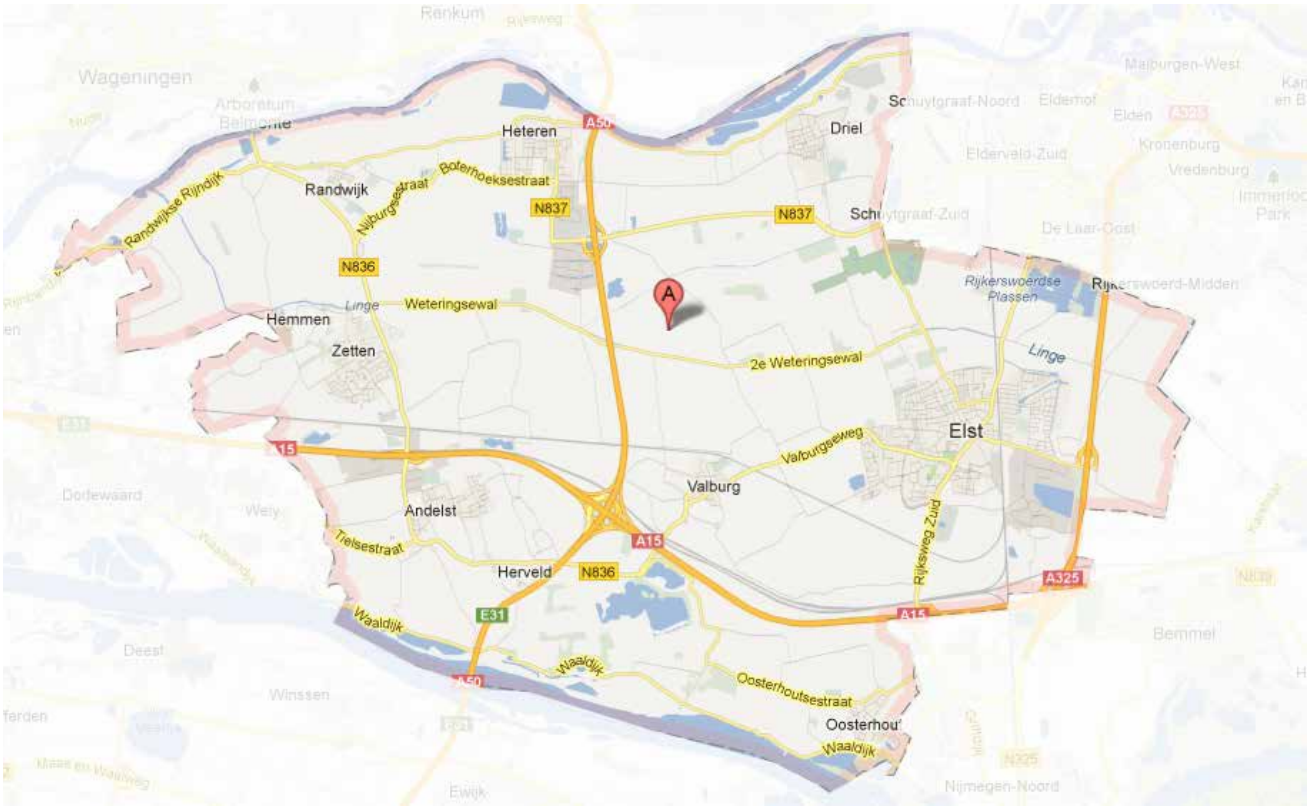
THE *WHY*

The natural gas supply of the Netherlands is depleting, sea water levels are rising and weather patterns have begun to change. Renewable energy and sustainable transport cannot only mitigate climate change but also hold potentials for local economies, inhabitants and landscapes. How can landscape architects contribute to the development of advanced transportation and energy landscapes while considering other land uses such as housing, agriculture, nature and recreation? The BETUWE+ BSc-thesis will explore this question in the municipality of Overbetuwe, to the South of Wageningen (see fig.1).

THE *WHERE*

In early 2013, the NRGlab (LAR) was asked to assist envisioning a sustainable transport corridor in the Betuwe region bordered by the rivers Waal, Nederrijn and Lek. The Betuwe region is long known for its fertile soils, particular landscapes, and entrepreneurship.
Overbetuwe is one of the most ambitious municipalities in the Betuwe: they strive to reach climate neutrality (no emission of greenhouse gases) by the year 2030.*
The municipality is about 115 km2 in size and has a population density of 425 inh/km2. Three freeways and several highways transect Overbetuwe. Two train lines and two rivers add to the linear infrastructure so typical for the Betuwe. Apart from that, we find settlements, tree nurseries, agricultural land, business parks, Park Lingezegen, natural floodplains, a golf course and greenhouses (see fig.2).
The municipality is bordering Arnhem to the East and Nijmegen in the South. It represents an important recreation and leisure area for city dwellers. Overbetuwe has many characteristics of Dutch rural municipalities and a population density that is equal to that of the Netherlands, which makes it a perfect study area for the BSc-thesis.

* Reports Overbetuwe naar klimaatneutraal (2009) and Milieubeleidsplan 2011-2014 (2010)



> **Figure 1:** Map of the study area: The municipality of Overbetuwe, to the South of Wageningen (scale approx. 1:100.000, map oriented North, source Google Maps).

THE *WHAT*

By now, you probably ask yourself what exactly is the challenge in the BETUWE+ BSc-thesis? The acronym itself can help answer part of that question. BETUWE stands for:

Bewustwording (verhogen)
Energie (opwekken & besparen)
Transport (verduurzamen)
Uniciteit (versterken)
Welvaart (consolideren)
Evenwicht (zoeken)

Energy and *transport* are the two issues that will receive special attention throughout the BSc-thesis. The assignment is to design landscapes that can facilitate sustainable transport, renewable energy provision and energy savings. Reinforcing the *uniqueness* of the Betuwe and consolidating *prosperity* are the conditions under which you must engage with the assignment. Generic design solutions and economically detrimental proposals, to put it in other words, will be dismissed. Excellent students will it find easy, help raising *awareness* for sustainable development by means of design interventions. Some of you may even succeed in exploring means for a better *balance* between people, economy and planet, all from the perspective of a landscape architect.

The scale of inquiry may range from the entire municipality (e.g. inventory and analysis) to details as small as a piece of furniture. What is important to remember is that you are required to design at (min.) three different spatial scales. The time horizon for your inquiry is 2030 as by then, Overbetuwe wants to be climate neutral. That is why we will divide the total energy use in the municipality by the number of students in the BETUWE+ team. By adding up all your proposals, the municipality could become climate neutral. Please note that energy transition is not limited to energy provision but also entails the reduction of energy demand. Energy-conscious design can help reducing demand. If you manage, to put it simply, less wind turbines need to be constructed and consequently pressure on the landscape is reduced too. Finally, we like to stress while the scope of BETUWE+ lies on *energy* and *transport*, your research and design should by no means be limited to these two issues. Rather, we like to encourage refreshing, unique and innovative proposals that turn threats and potentials into real-world opportunities (see, for example, fig. 3, p3).

> **Figure 2:** Impressions from the study area with highly diverse landscapes (creative commons licence).

THE *HOW*

- Weekly meetings with tutoring/presentations/ discussions/excursion
- Introduction lectures Sven Stremke and René van Seumeren (both LAR)
- Guest lecture renewable energy and landscape aesthetics by Sören Schöbel, TU Munich
- Guest lecture hidden power by Tim Snippert, LAR graduate and winner of the Eo Wijers Jonge Vakgenoten award 2012
- Guest lecture conceptual frameworks by Silvia Minichino, Florence University
- Bicycle field trip to the study area: We decide together where we ride!
- Optional excursion to reference case(s) in the Netherlands: You choose where we drive!

* Note that this list only contains BETUWE+ activities in addition to the regular BSc meetings.

THE *READ*

ETTEGER, RUDI VAN AND STREMKE, SVEN (eds.) (2007) ReEnergize South Limburg: Designing Sustainable Energy Landscapes (Wageningen: Wageningen University, Landscape Architecture Chair Group). DROPBOX

FERRY, ROBERT AND MONOIAN, ELISABETH (2012), A Field Guide to Renewable Energy Technologies (PDF online: Creative Commons). DROPBOX

MACKAY, DAVID (2008), Sustainable Energy: Without the Hot Air (Cambridge: Uit Cambridge Ltd.).

SIJMONS, DIRK, ET AL. (2008), Kleine Energieatlas, VROM (Utrecht: Ministerie van VROM). DROPBOX

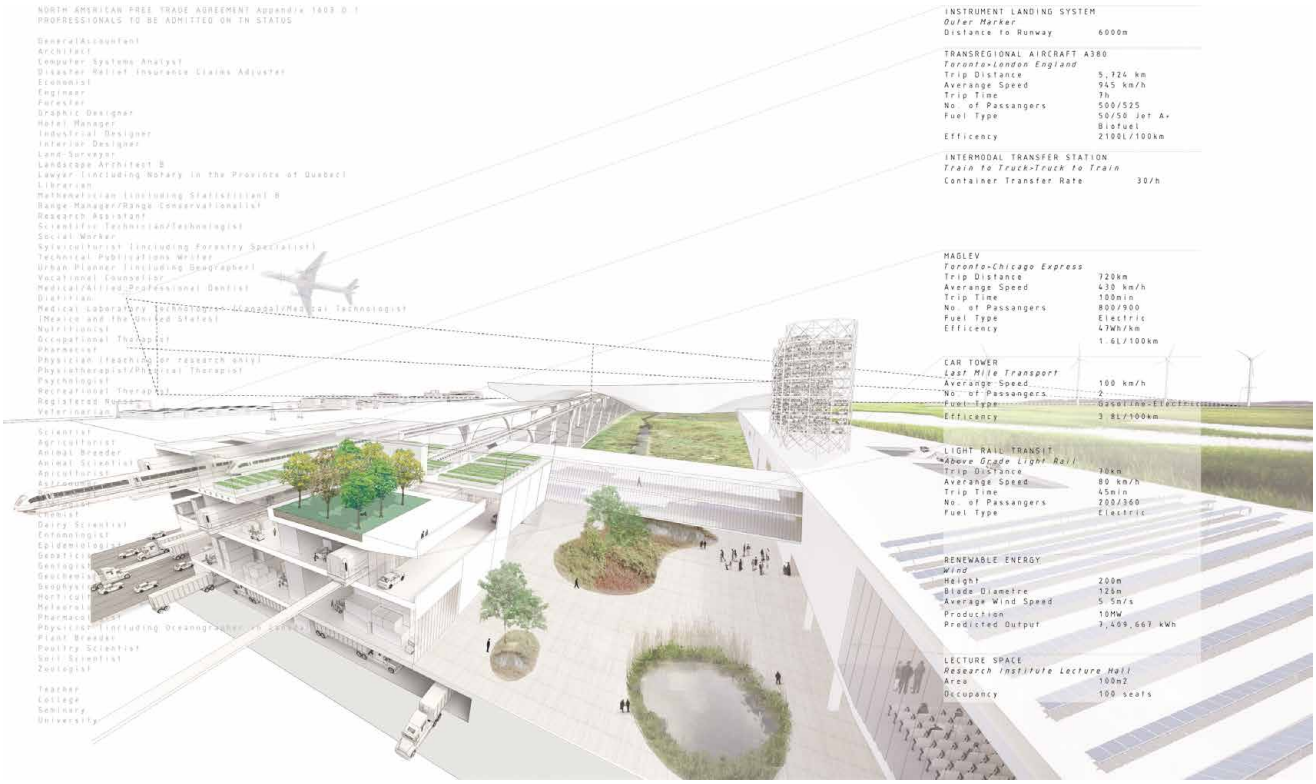
STREMKE, S. AND DOBBELSTEEN, A. VAN DEN (eds.) (2013), Sustainable Energy Landscapes: Designing, Planning and Development, Boca Raton: CRC (Taylor & Francis Group). LIBRARY

STREMKE, SVEN AND KOH, JUSUCK (2011), Integration of ecological and thermodynamic concepts in the design of sustainable energy landscapes, Landscape Journal, 30 (2), 194-213. DROPBOX

STREMKE, SVEN, DOBBELSTEEN, ANDY VAN DEN, AND KOH, JUSUCK (2011), Exergy landscapes: Exploration of second-law thinking towards sustainable landscape design, International Journal of Exergy, 8 (2), 148–74. DROPBOX

STREMKE, SVEN, ET AL. (2011) Beyond fossils: Envisioning desired futures for two sustainable energy islands in the Dutch delta region (Wageningen: Wageningen University, Landscape Architecture Chair Group). DROPBOX

* This list contains selected reading material only. Visit us at **www.NRGlab.net** for more inspiration!



> **Figure 3:** Proposal for a 21st century energy and transport node that allows for integration of historically separated functions such as shopping, living and working (Thun and Velikov in Stremke and Dobbelsteen, 2013).