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MITIGATION/ADAPTATION
LANDSCAPE ARCHITECTURE MEETS SUSTAINABLE ENERGY TRANSITION

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NEW ROLE OF LANDSCAPE (ARCHITECTURE)

Mitigation of climate change and adaptation to renewable energy sources are among the emerging fields of activity in landscape architecture. If landscape architects recognize the need for sustainable development on the basis of renewable energy sources, then how can we contribute to sustainable and aesthetic transformation of the human environment? The United Nations have outlined four fields of activity concerning sustainable energy: (I) promoting energy transition; (II) increasing energy efficiency; (III) promoting renewable energy sources, and (IV) sustainable transport systems. So far, landscape architects have contributed to the utilization of renewable energy sources. Increasing energy efficiency, another field of activity, is somehow limited to the "traditional toolbox" of landscape architects - that is plant selection and allocation. Transition to a sustainable energy regime, however, goes beyond allocation of wind turbines and plant material. "The whole concept of human settlements needs to be rethought… including the broader issues of land use and urban planning (Strong, 1992, p.493). This paper intends to reveal how landscape architects can "explore innovative means to increase regional self-reliance and massive increase in energy efficiency" (Rees, 1996, p.1).

NEW CHALLENGES

For many reasons, energy appears a rather complex issue; transition between energy regimes may require centuries and thus necessitates innovative approaches to strategic spatial planning and design. Engineers, architects and urban planner have designed energy-neutral dwellings, greenhouses and constructed highly effective industrial parks (e.g. Kalundborg, Denmark) as well as urban districts with optimized material cycles and energy flows (e.g. Malmö-Västra Hamnen, Sweden). Innovation has resulted in the formation of entire new (sub)disciplines such as sustainable architecture and industrial ecology. Korevaar (2007), however, reminds us that evolution towards a sustainable world commenced with product innovation, followed by function innovation and must eventually lead to innovation of entire systems - that is, for instance, energy-neutral regions. Despite some efforts, a methodological framework to energy-conscious regional design remains lacking. We propose an advanced approach to energy-conscious regional design which integrates strategic regional design, scenario approaches and long-term transition management.

NEW APPROACH

At Wageningen University, we have articulated a five-step approach that can assist identifying robust strategies for energy-conscious transformation of entire regions. Similar to conventional landscape design, the process begins with (1) inventory and analysis of the

case-study region. Then, (2) already planned developments need to be investigated in order to compose a base-map for long-term regional design. Studying existing context scenario studies allows landscape architects (3) to map possible future developments in a case-study region. Consequently, (4) visions for a sustainable energy landscape can be composed under the conditions provided by context scenarios. Finally, (5) robust strategies for energy-conscious transformation can be identified through comparative analysis of all visions. This five-step approach to what we refer to as "integrated energy vision" can assist in rendering pathways to increase regional self-reliance and energy efficiency. It prepares the ground for socio-economic benefits (of a sustainable energy system) and preservation of natural resources.

NEW PERSPECTIVES

This method for integrated energy visions has been tested and advanced in student ateliers, masters' thesis projects and two commissioned case-studies at the regional scale. The results suggest that, depending on regional characteristics, approximately one half of the energy demand in 2040 can be provided internally without compromising food production or biodiversity. Moreover, sustainable energy transition may support realization of added values such as preservation of cultural landscapes and climate change adaptation (Etteger and Stremke, 2007). Integrated visions are capable of initiating and guiding long-term transitions in general, and energy-conscious adaptation of landscapes in particular.

REFERENCES

Korevaar G, 2007,"What is industrial ecology?" in *Contribution to the Asia-link class "Industrial Ecology: Learning from the biosphere to develop sustainable technospheres"*, online presentation

Rees W E, 1996,"Revisiting Carrying Capacity: Area-Based Indicators of Sustainability", *Population and Environment: A Journal of Interdisciplinary Studies*, 17, 195-215

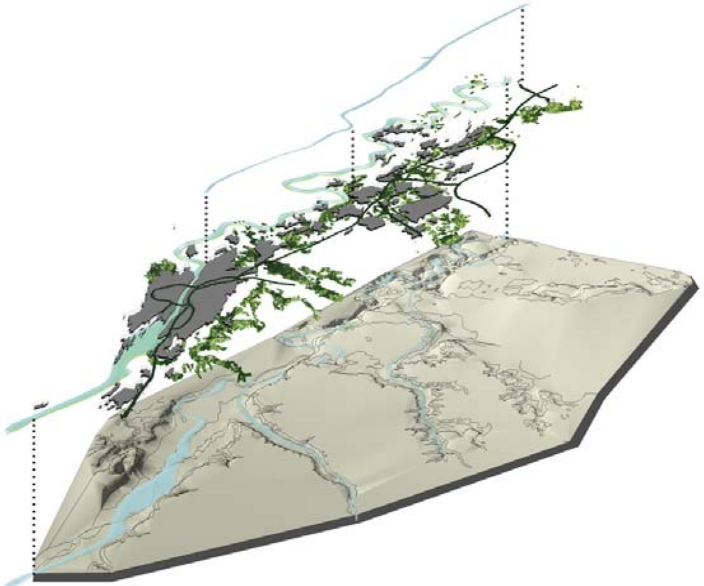
Stremke S, Koh J, 2009,"Ecological concepts and strategies with relevance to energy-conscious spatial planning and design", *Environment and Planning B, forthcoming*

Stremke S, Koh J, 2008,"Energy-conscious Regional Design: Synergy between Ecosystem Thinking and Spatial Planning" in *PLEA conference proceedings*, Eds. P Kenny, J O Lewis and V Brophy (University College Dublin, Ireland) pp. 227-233

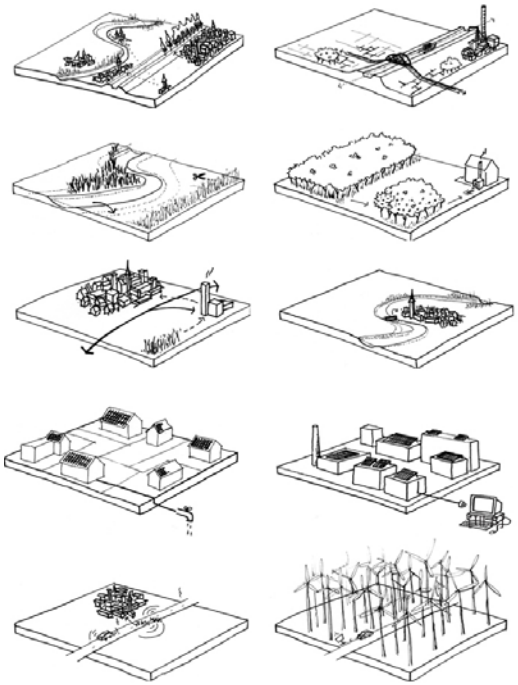
Etteger R v, Stremke S, 2007, "ReEnergize South Limburg: Designing sustainable energy landscapes", Landscape Architecture Chairgroup, Wageningen, 6700AA, The Netherlands), 127 pages

Strong M F, 1992, "Energy, environment and development", *Energy policy*, 20, 490-494

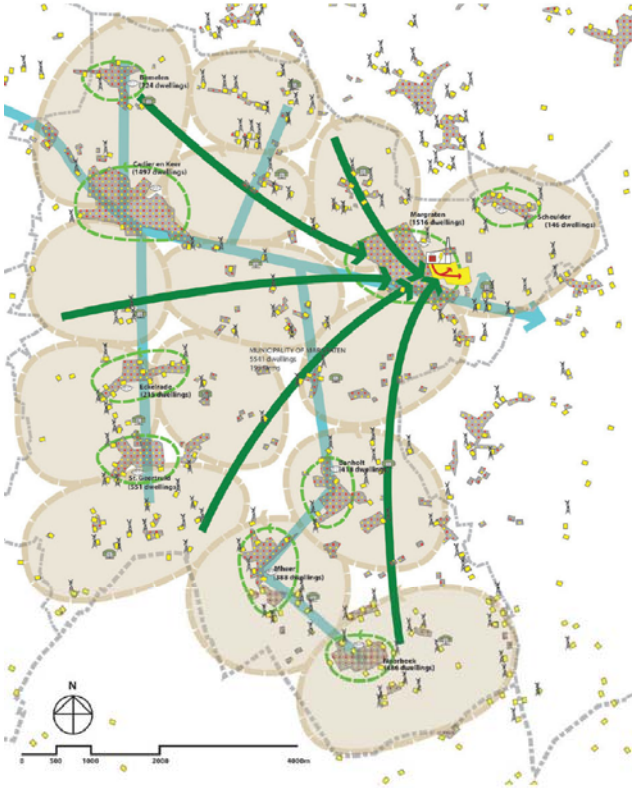
Step 1: Inventory and analysis, Maasvalley South Limburg (NL)



Step 5: Strategies for change, Maasvalley (NL)



Step 3: Energy vision, strategic plan, Heuvelland (NL)



Step 3: Energy vision, visualization, Maasvalley (NL)