

Track 1 - The bioresource transition in regions

Title of the proposed paper

MODELING BIOGAS TRANSITION DYNAMICS: The Biogas Sector in the East of the Netherlands

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Text abstract (max. 300 words)

The Achterhoek, located in the middle east of the Netherlands, with its large agricultural sector and an accompanying 75% share of grass- and farmland, is a fertile region for the development of a biogas sector. Local entrepreneurs, educators and administrators, collaborating in a roundtable platform to increase the sustainability of the region, acknowledge this potential. In close consultation with the roundtable, a Local Action Plan (LAP) has been developed. This plan contains guidelines for the development of a biogas sector and sets targets based on the maximum production potential of the region for 2020 and 2030.

Since the production potential is linearly derived from the availability of biomass, the targets do not incorporate the effects of social, technological and economic factors and their interactions. This paper will specifically investigate how these factors affect the transition to biogas production and consumption, and what approach should be taken in order to appreciate the systemic relationships in strategy formation. In collaboration with local biogas experts, a System Dynamics (SD) model is developed to capture the complexity and to study the dynamics of the sector over time.

By analyzing the structure of the model, several mechanisms are revealed that might cause the transition to slow down over time and therefore need to be addressed in a transition strategy. Furthermore, simulating the model shows that the development of a biogas distribution network requires significant investments from external parties given the projected scale of the individual production facilities. Organic growth of the network from within the system is hard to achieve. The model can be further quantified and calibrated to serve as a decision support tool for entrepreneurs and policymakers.