Renewable Energy Villages and Regions: How Universities may Support Sustainable Communities

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IZNE

The way from the vision to projects

Sustainability science: the Göttingen approach

Examples for sustainable communities

- The bioenergy community
- The solar heat community
- The satellite heat community
- The agroforest community
- The permaculture community
- Sustainable cities

- **Conclusion: Universities as incubators for regional sustainability transformation**

The process: Vision -> Project -> Transfer

Formulating the own vision

forming an initiative group at university

formulating the project

ensuring political and financial support

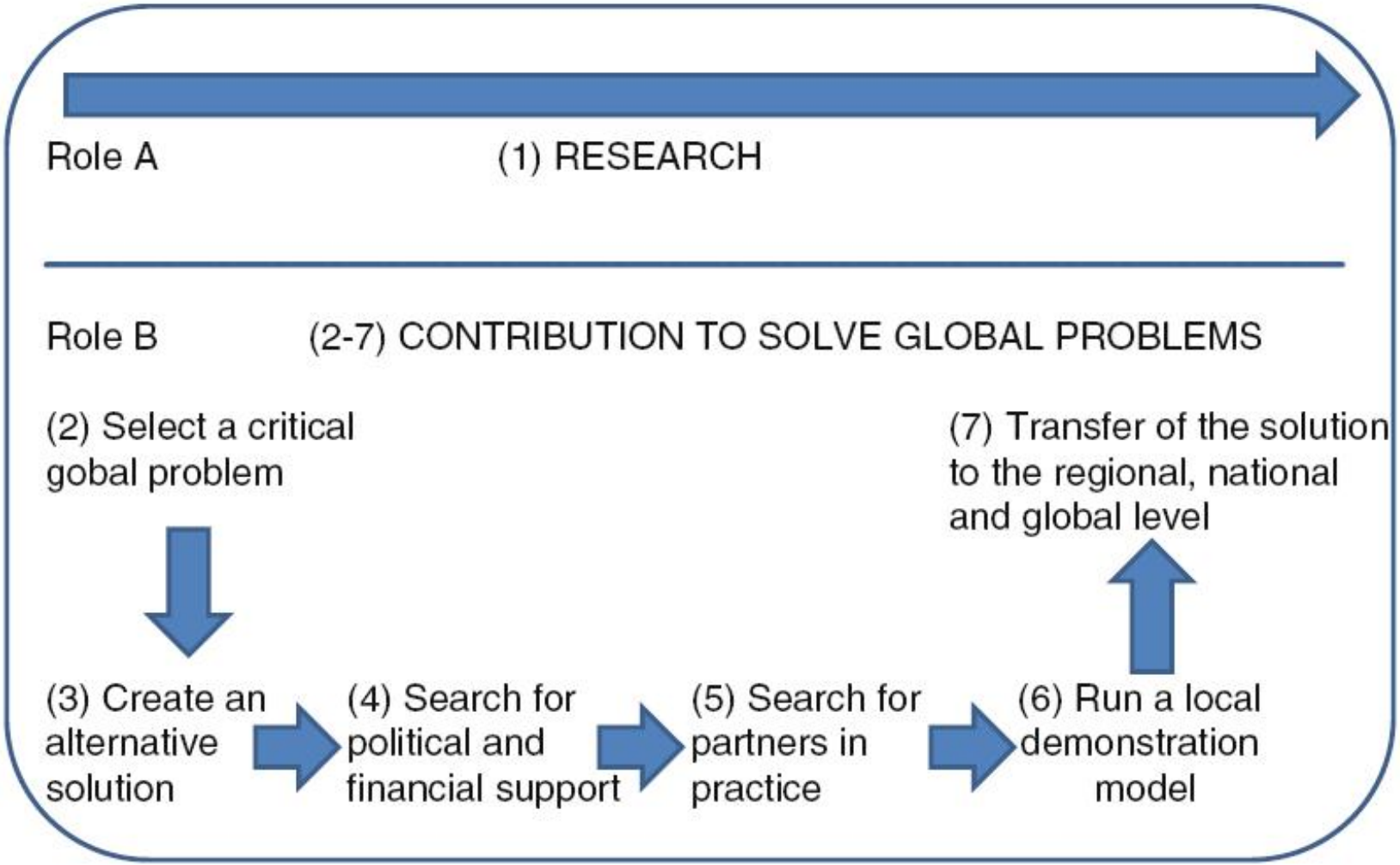
find partners in communities

perform best-practice studies

realization

transfer

The Göttingen approach of sustainability science



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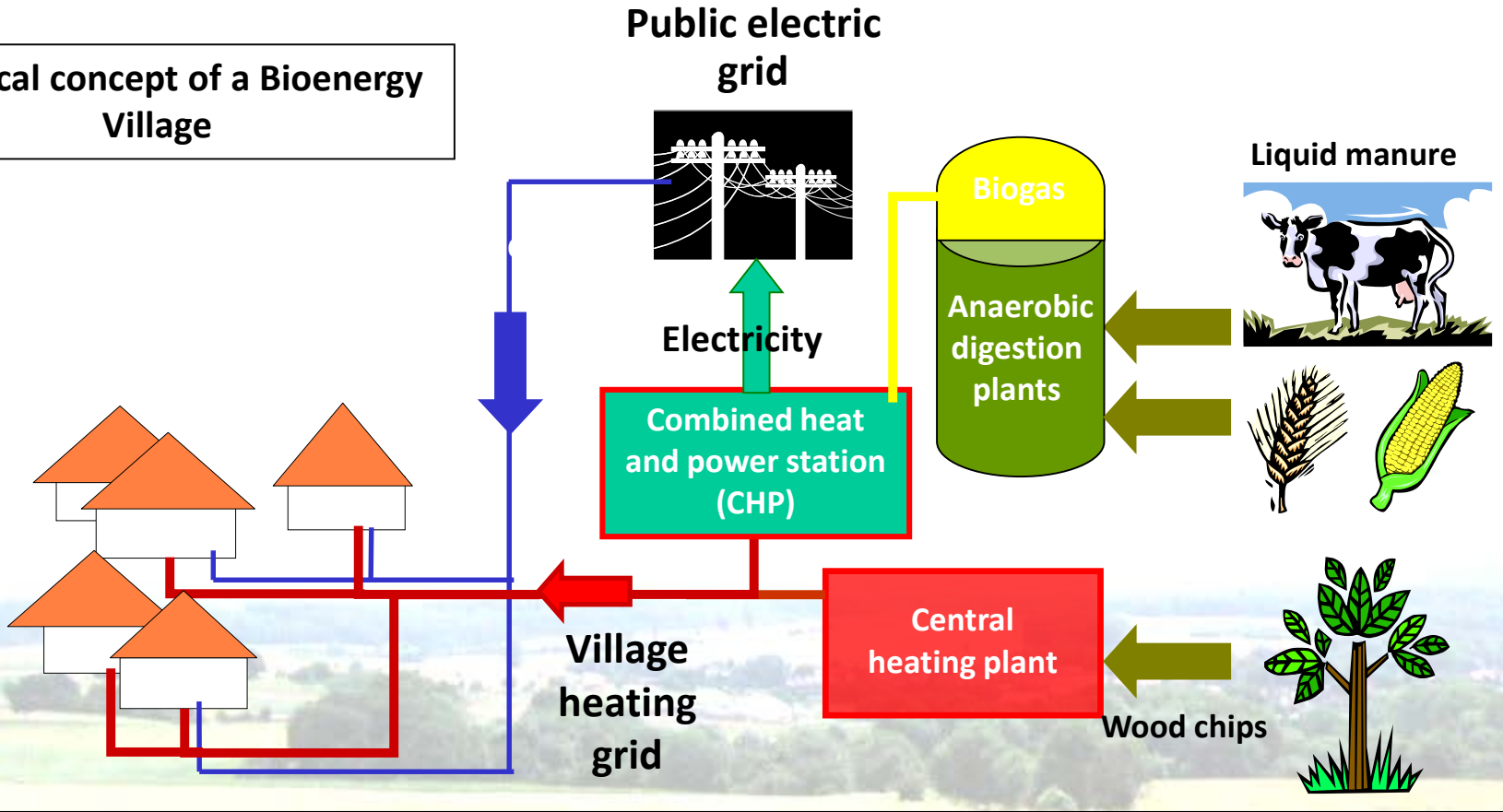
Bioenergy villages as examples for integrated projects

Definition:

A village/region that covers its own heat and electricity demand with locally available biomass (combined with other renewable energy sources)

Technical concept of a Bioenergy Village



Bioenergy Village (BEV) Jühnde

Göttingen

Complex problems need complex solutions!
We need an interdisciplinary approach!

Universities Goettingen and Kassel in Germany

Involved Disciplines:

Agronomy & Crop Science
Soil Sciences
Geosciences
Economy
Sociology
Psychology
Political Sciences

Planning process / operating company

Social implementation in the village through motivation and participation of individuals and groups

The project´s psychological part: Main goals & results

* Foster motivation for the transformation

  Method

  - interviews in comparable best practice projects
  - applying the success factors in the own project

  Result: the majority of the village people cooperated

* Test of long term changes in psychological variables:
  sense of community, self efficacy, well-being

  Method:

  - longitudinal study with control group based on a questionnaire
  - interviews with the most engaged people of the village

  Result: the people profited psychologically from the change

Climate relevant results:

CO2 emissions per capita and year

Average in Germany: **10 tons**

In Jühnde after the conversion to renewable energy: **4 tons**

Other results:

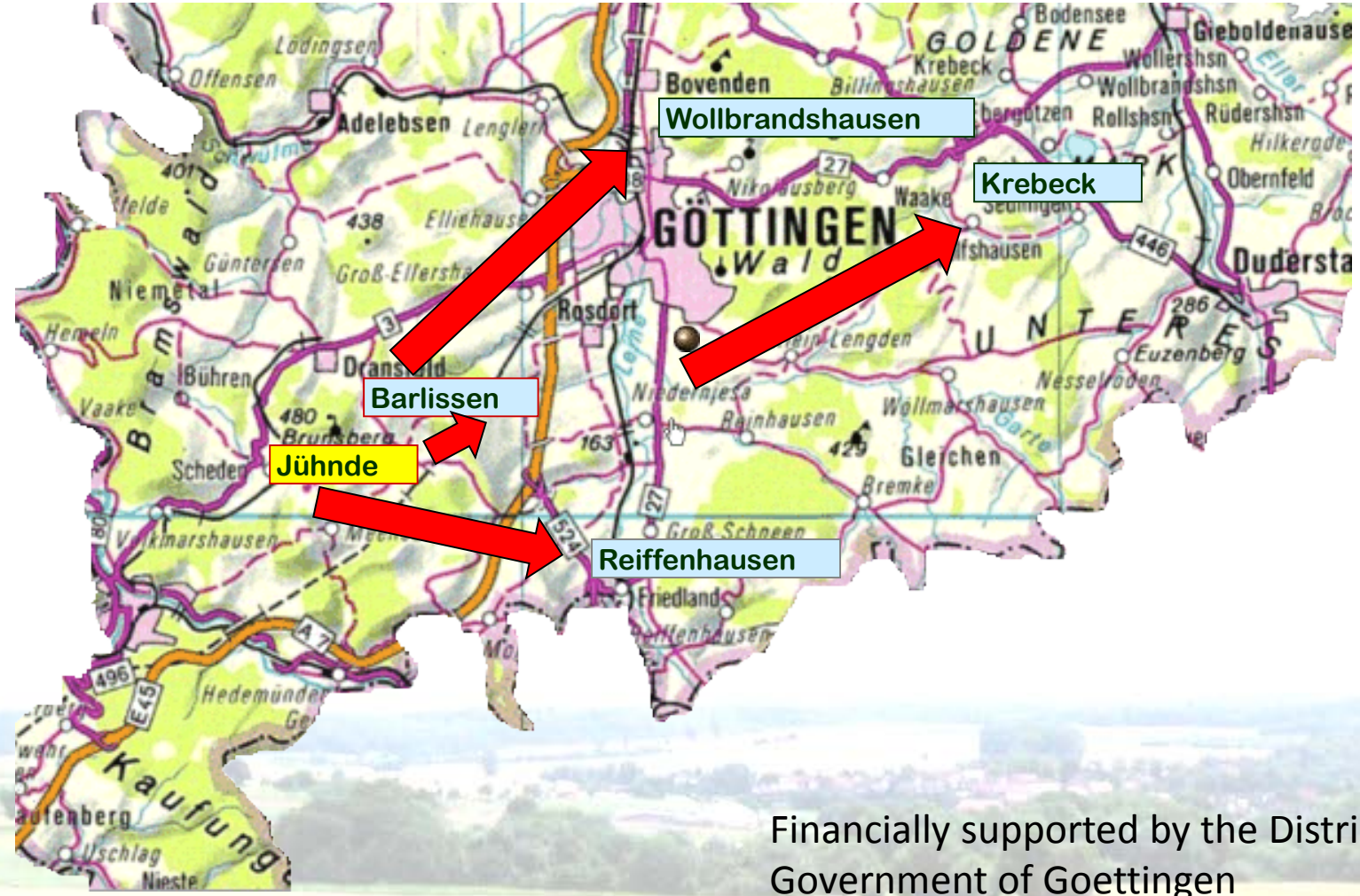
Schmuck, P. Eigner-Thiel, S., Karpenstein-Machan, M., Sauer, B., Roland, F. & Ruppert, H. (2013). Bioenergy villages in Germany: The history of promoting sustainable bioenergy projects within the "Göttingen Approach of Sustainability Science". In M. Kappas & H. Ruppert (Eds.), Sustainable bioenergy production: An integrated approach. Heidelberg: Springer.

Transfer:

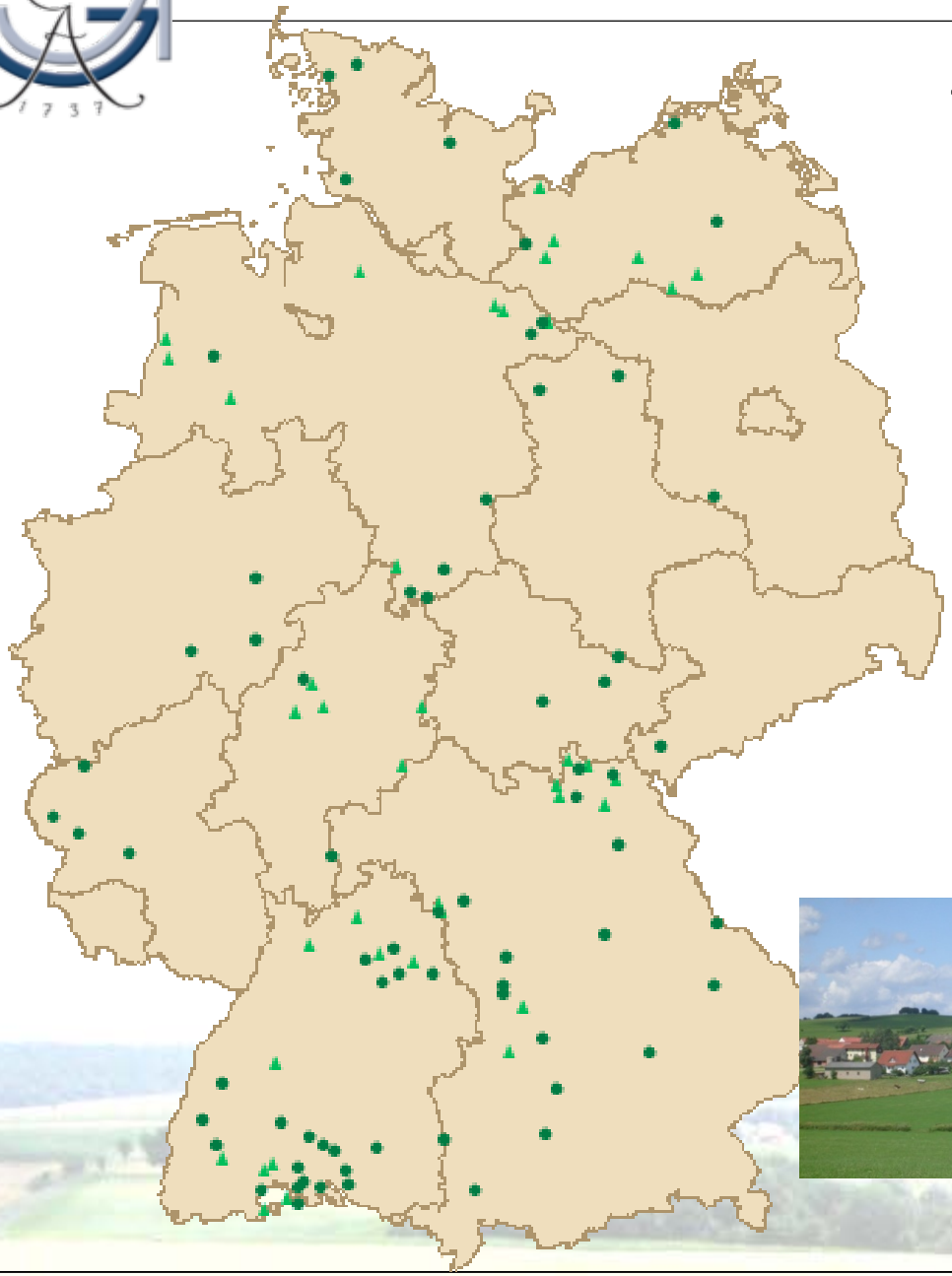
Thousands of visitors come every year to Jühnde

“Cook book” Publication: Wege zum Bioenergiedorf

Transfer results: Four further bioenergy villages (BEV) were established between 2006 and 2009



Financially supported by the District Government of Goettingen



Transfer results:
Bioenergy villages in Germany 2016

- approximately 150 bioenergy villages in Germany

- See www.wege-zum-bioenergiedorf.de

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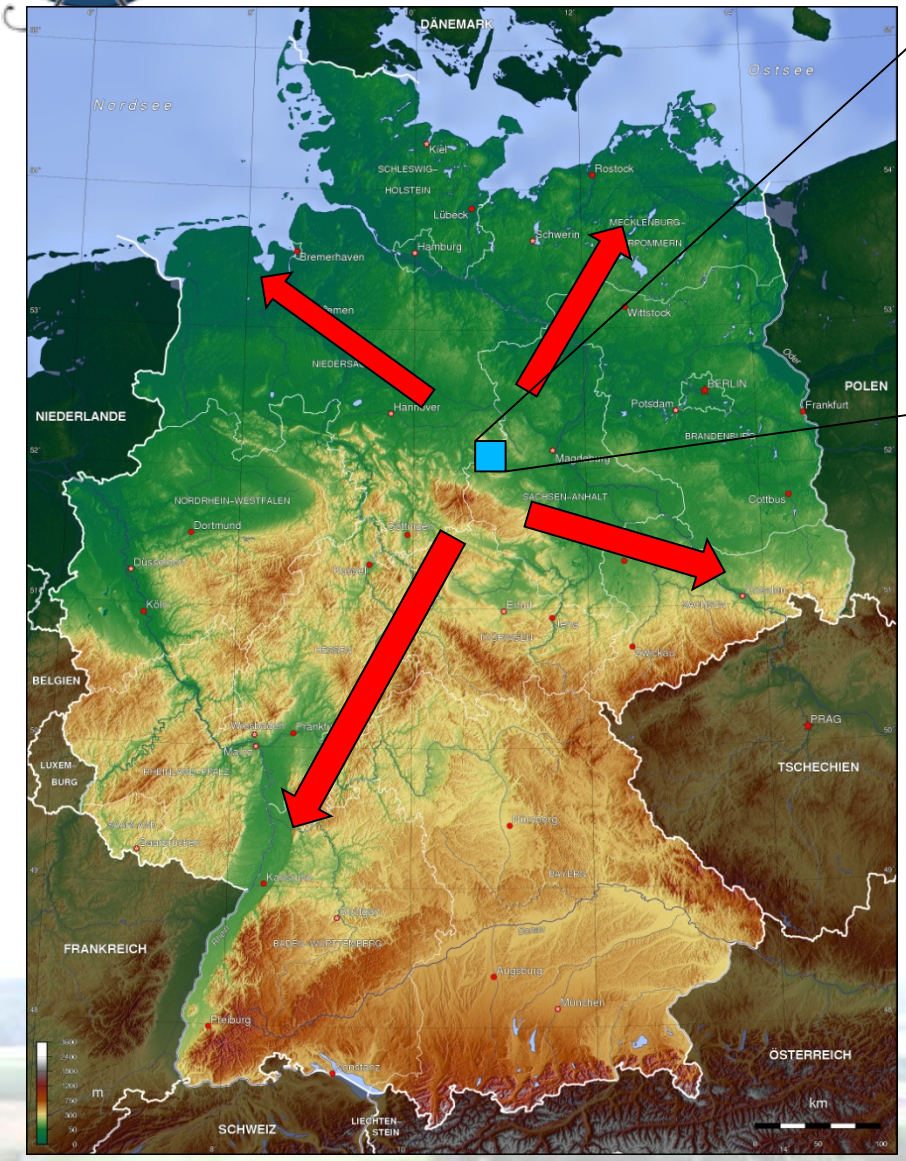

Heat energy is completely won by solartherm installation with a seasonal heat storage system.
Feasibility study is finished.

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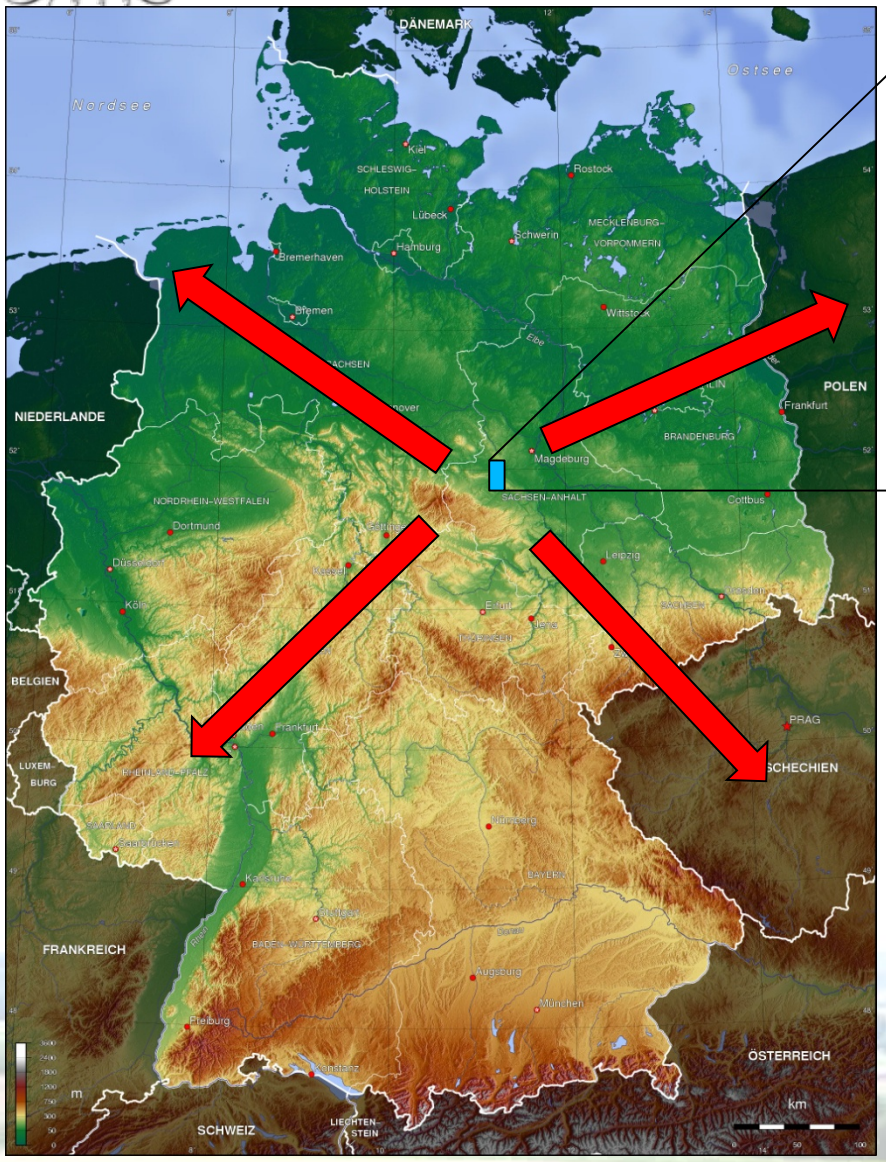

Village with fossile heatings

Hot water tube connection !!!

Combined heat and power engine not using the heat

Intended project:
A satellite-heat community uses the heat of one of the appr. 4000 biogas plants in Germany which actually do not use the heat of the CHP

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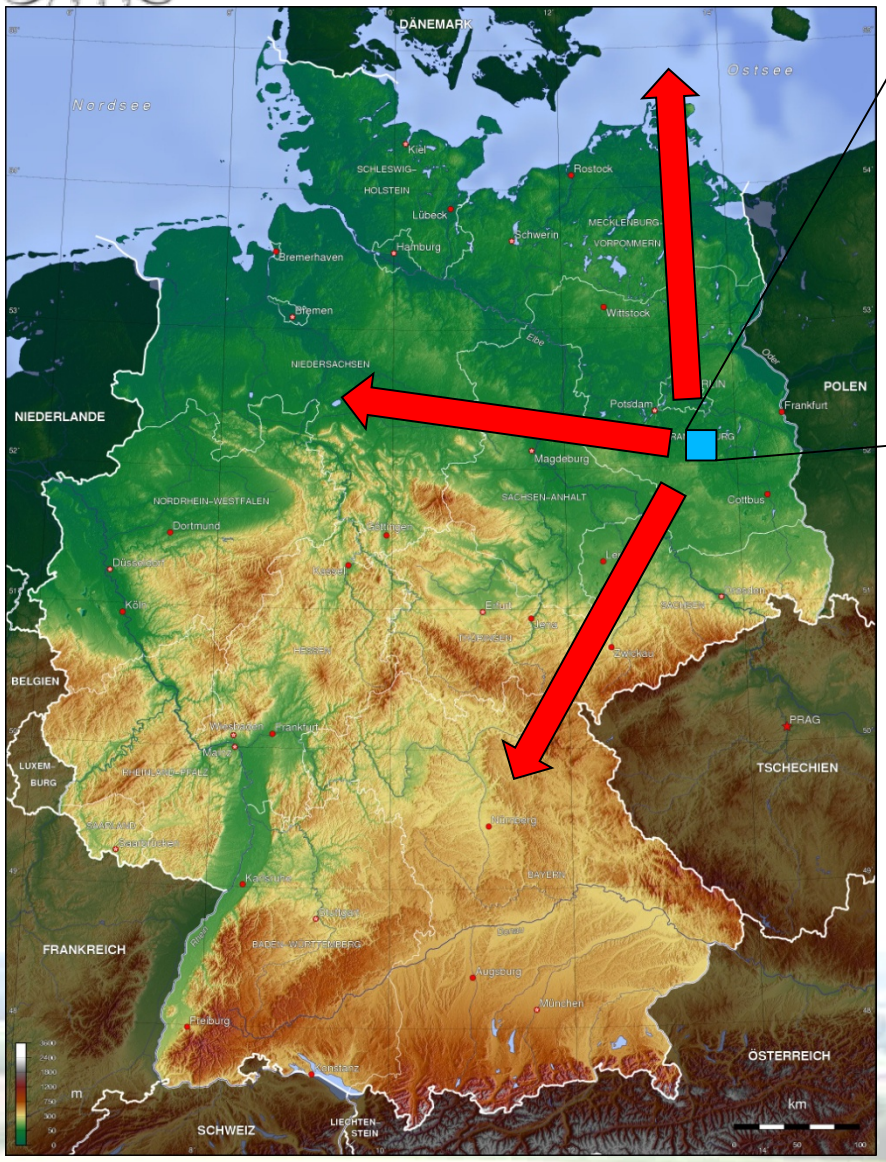

Intended project:

The agroforest community combines agriculture and forestry to get a local supply of food and energy – and to prevent erosion on big (monoculture) agricultural areas.

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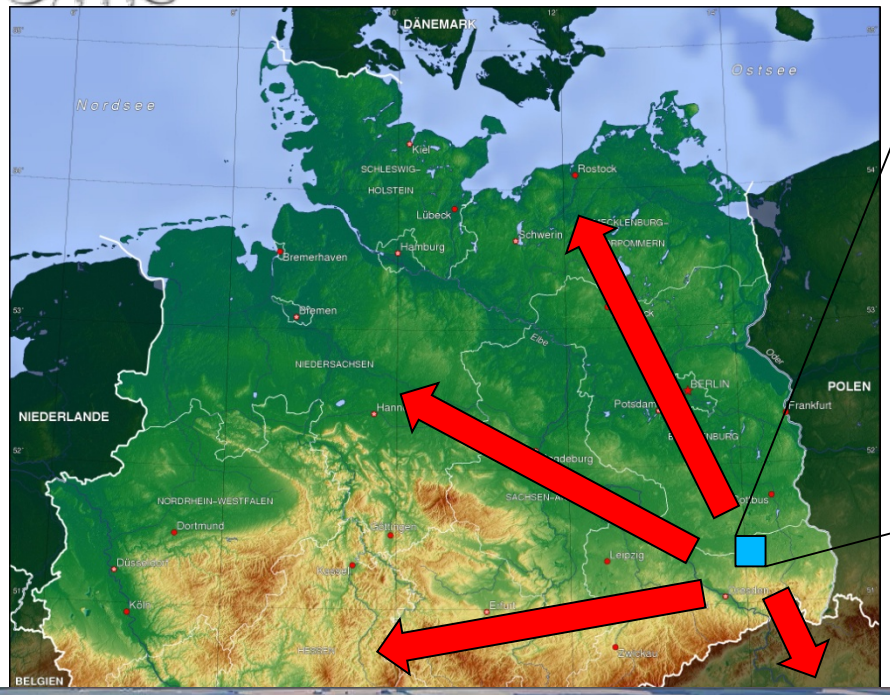

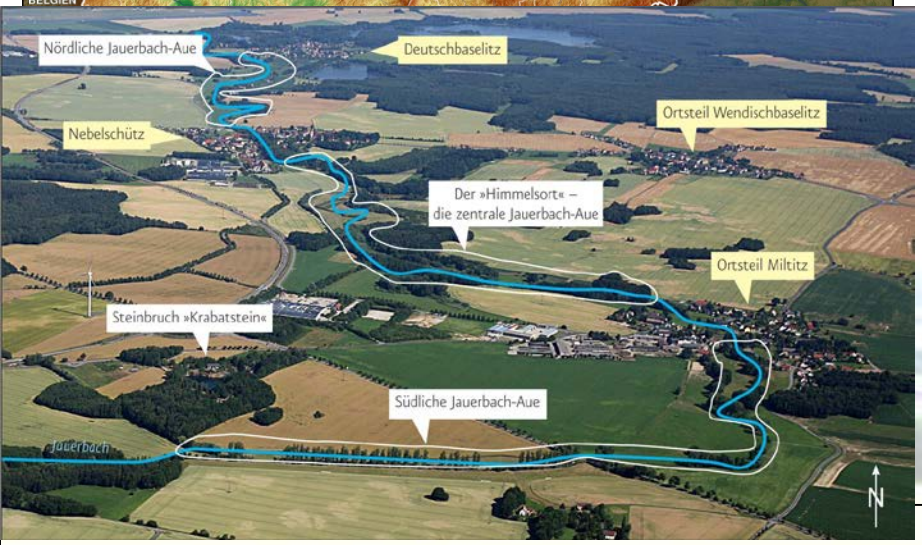

Intended project:
Permaculture is the conscious design and maintenance of agriculturally productive systems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integratio of the landscape with people providing their food, energy, shelter and other material and non-material needs in a sustainable way.

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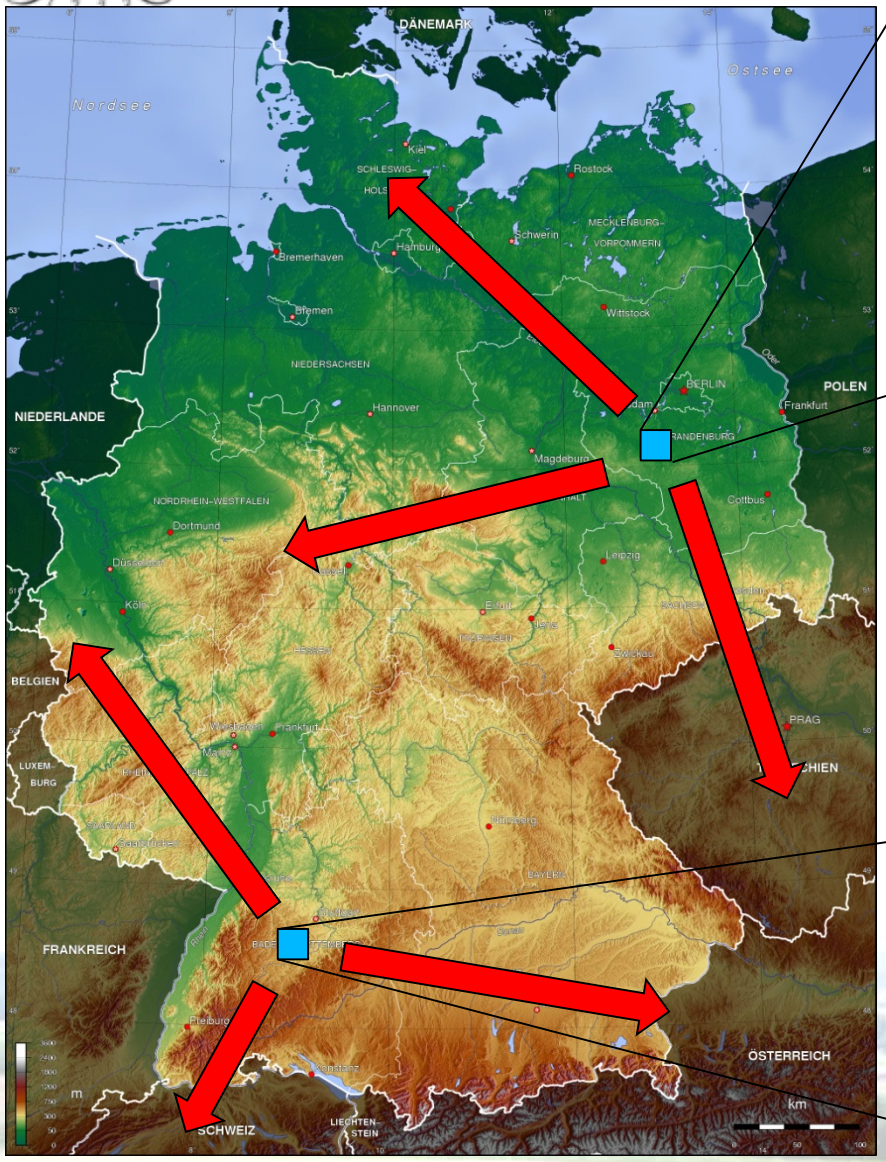
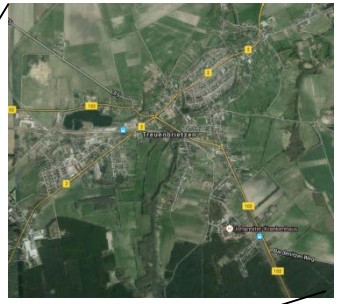
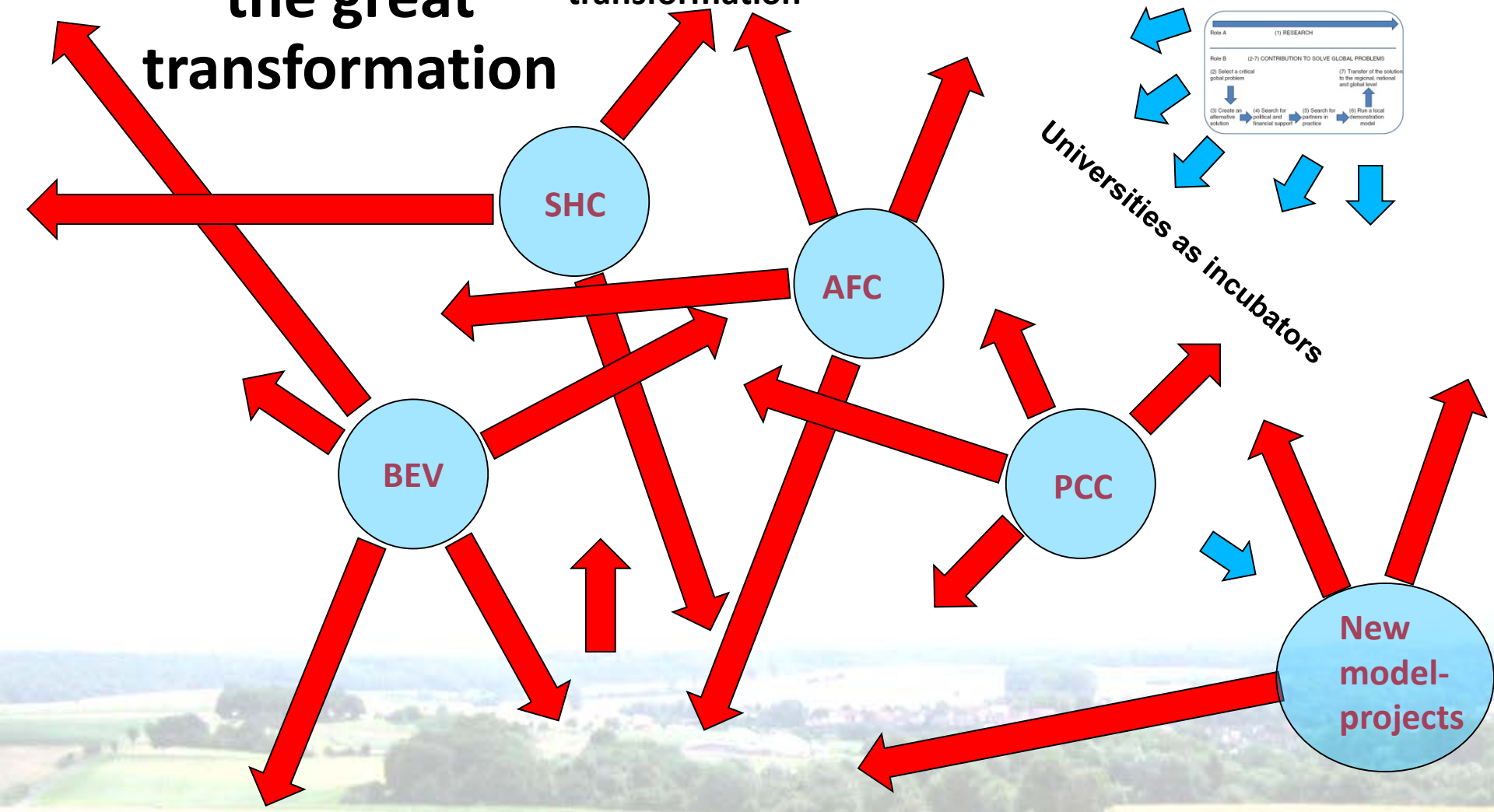




In the cities Treuenbrietzen and Münsingen are planned sustainability transformations regarding energy, food and transport aspects. The transfer of success factors to other interested cities will be enabled by an interactive internet platform.
Planned start: June 2016

Our vision of the great transformation

Development of prototypes/models of sustainable life patterns and their diffusion as one motor of great transformation



Thank you for the attention

Contact

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www.peterschmuck.de

I can send you articles as:

Schmuck, P. (2013). The Göttingen Approach of Sustainability Science: Creating Renewable Energy Communities in Germany and Testing a Psychological Hypothesis. *Umweltpsychologie, 17,* 119-135.

Schmuck, P., Wueste, A. & Karpenstein-Machan, M. (2012). Initiating and Analyzing Renewable Energy Transitions in Germany. In Stremke, S. & Dobbelsteen, A. (Eds.), Sustainable Energy Landscapes: Designing, Planning, and Development (pp. 335-354). Taylor & Francis.

Wilkens, I. & Schmuck, P. (2012) Transdisciplinary Evaluation of Energy Scenarios for a German Village Using Multi-Criteria Decision Analysis Sustainability 2012, 4, 604-629.

Wüste, A. & Schmuck, P. (2012). Bioenergy Villages and Regions in Germany: An Interview Study with Initiators of Communal Bioenergy Projects on the Success Factors for Restructuring the Energy Supply of the Community. Sustainability 2012, 4, 244-256.