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First UFZ Energy Days 2012 | Book of Abstracts

Uwe-Jens Görke, Daniela Thrän, Frank Messner, Olaf Kolditz (Eds.)

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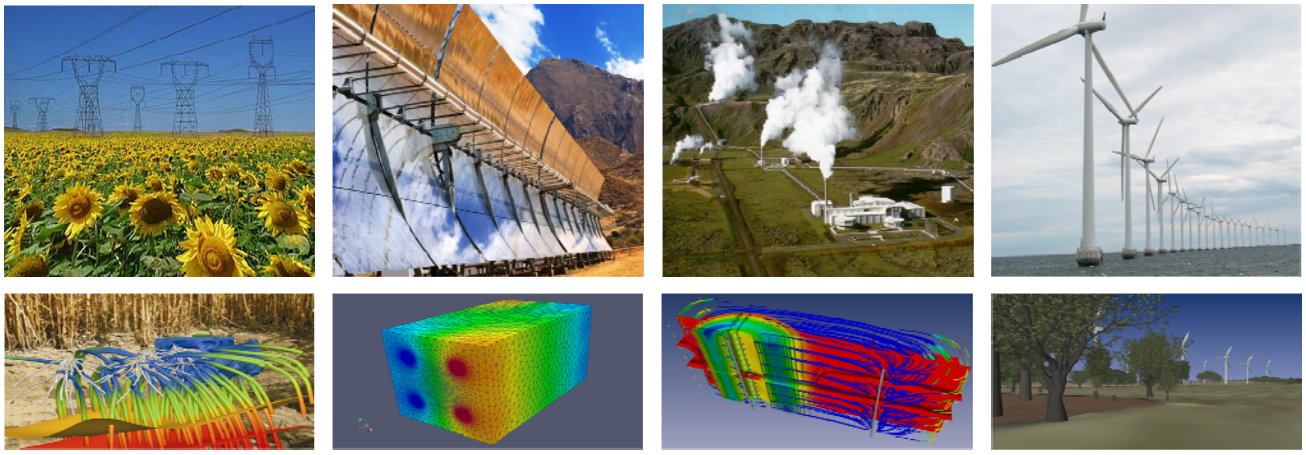
1st UFZ Energy Days 2012



4-5 April 2012, Leipziger KUBUS

Book of Abstracts

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EnergyEFFAIR – Efficient and fair allocation of renewable energy production at the national level

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Abstract

As a major measure of its climate policy the Federal Government of Germany intends to increase the share of renewables in gross electricity consumption to at least 30 per cent by 2020, followed by a continuous increase thereafter. At the same time, various studies indicate that both renewables and grid extensions can cause significant externalities. Such externalities comprise non-market effects on humans and the environment (e.g., bird fatalities caused by wind turbines). Failing to consider externalities has been shown to reduce social welfare, or in other words, an efficient allocation of renewables and power transmission lines needs to consider externalities. In addition, externalities indicate to which extent an extension of renewables is acceptable: the larger the externalities the lower the acceptance of renewables by the people.

The overall objective of the project EnergyEFFAIR (2011-2014, funded by BMBF) is to optimise the spatial allocation of renewable energy production activities (REPA) and power lines in Germany, taking into account costs and negative externalities as well as attitudes and fairness considerations regarding the distribution of these costs and externalities over the German population. The project considers three renewables: wind power, solar power and bioenergy. It consists of five work packages.

The objective of the first work package WP 1 is to assess in a spatially explicit manner the *energy potential* and the impacts that can be expected on humans and the environment. The analysis will be carried out on a geographical information system (GIS) considering a spatial resolution of 0.25 km^2.

The main task of work package WP 2 is to calculate the requirements of *additional grid infrastructure* resulting from an increase in the use of electricity from renewable sources, calculated in WP 1. In particular, the costs of the additional grid infrastructure as well as different models of how these costs are distributed will be assessed.

The objective of WP 3 is to assess both *production and opportunity costs* of REPA as well as *externalities* from grid extension and REPA in monetary terms. The production costs include investment and operating costs of the individual REPA and transport of biomass to the next biogas plant. In order to monetise the externalities of REPA a choice experiment (CE) will be used. In a CE, respondents rank different options of how renewable energy can be produced, which allows calculation of a price of the externalities.

The objective of WP 4 is to reveal individuals' *attitudes*, *fairness concerns*, and *willingness to accept financial compensation* for negative externalities from REPA and grid extension as well as to analyse *arguments and attitudes of stakeholders*. Fairness concerns include the acceptance of different principles of distributive justice concerning REPA at the level of households and Federal States. It will be assessed if and to what extent people are willing to accept financial compensation for exposure to REPA and grid extension.

The objective of WP 5 is to *integrate* the results of the work packages 1-4 to determine an *efficient and/or fair spatial allocation* of REPA and network infrastructure. This is done through spatial optimisation of REPA and grid extension. Trade-offs between efficiency and fairness will be evaluated.