

# Turning over a new leaf for future energy supplies

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A global energy supply based on biomass grown to generate electricity and produce fuel is a real possibility. According to Prof. Jürgen O. Metzger from Carl von Ossietzky University of Oldenburg in Germany and Prof. Aloys Huettermann from the University of Goettingen in Germany, it is both a sustainable and economical scenario, contrary to current thinking which suggests it is unrealistic. Their findings are published online this week in Springer's journal, *Naturwissenschaften*.

Fossil fuels including oil, natural gas and coal - which provide almost all of our global energy needs - will be completely exhausted in the next 75 years based on our current consumption levels, and most likely before then bearing in mind the increasing energy demand worldwide. What's then? It is commonly assumed that the amount of biomass that can be grown on available land in competition to food is so limited that a scenario based on biomass as the major source of energy is unrealistic.

Metzger and Huettermann show that enough biomass can be grown on land previously degraded by human activities in historical times to meet the global energy demand predicted by the International Energy Agency in the Reference Scenario for 2030 – and what's more, this energy can be produced both sustainably and economically.

The solution is to plant fast-growing trees on degraded areas, and harvest the biomass for energy usage. This afforestation would not compete with the need for arable land for food production. The authors argue that the investment required for afforestation and transformation of the biomass

to electrical energy, heat, fuels and chemical feedstock is actually sustainable and not more, probably even less, than what would need to be invested in infrastructure for non-sustainable fossil energy. The continuous use of biomass as an energy source is also carbon neutral which means that the energetic usage produces not more CO<sub>2</sub> as used for the growth of the respective biomass, thus slowing down and stopping the build-up of CO<sub>2</sub> and even slowly reducing the CO<sub>2</sub> content in the atmosphere. Their scenario would also have a number of additional advantages, including a convenient way of storing energy, regenerating the global water and especially drinking water resources and controlling soil degradation.

Other renewable energies, including solar, tidal and wind power will contribute to the energy mix, making the biomass scenario even more realistic. The authors do concede that new technologies will be required to convert the chemical energy stored in biomass to electrical energy more efficiently.

They add that "the scenario of afforestation for energy use will be an important step to realize the United Nations programs to combat desertification and deforestation, without additional costs."

More info: Metzger JO & Huettermann A (2008). Sustainable global energy supply based on lignocellulosic biomass from afforestation of degraded areas. *Naturwissenschaften*; DOI 10.1007/s00114-008-0479-4

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