

EARTH OBSERVATION SYMPOSIUM (B1)  
Earth Observation Applications and Economic Benefits (5)

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EARTH OBSERVATION FOR MONITORING AND ASSESSMENT OF THE ENVIRONMENTAL  
IMPACT OF ENERGY USE - THE EU-FP7 'ENERGEO' PROJECT

**Abstract**

The main objective of EnerGEO is to develop a strategy for the assessment of the current and future impact of the exploitation of energy resources on the environment and to demonstrate this strategy for a variety of energy resources worldwide. Satellite data play an essential role in EnerGEO as they are used to assess energy potentials from biomass (agriculture and forestry), solar plants as well as off-shore wind parks.

In practice, the satellite data are fed into models that model vegetation growth, solar irradiance or meteorology to obtain the region wide distributions for these potentials. The potentials are used by energy models that assess the optimal mix of energy sources to fulfill the energy demand, e.g. DLR-REMIX or IIASA-MESSAGE. The energy models are connected to environmental impact models, e.g. IIASA-GAINS or TNO-LOTOS-EUROS to assess air pollution levels and health and ecosystem impacts for different scenarios. Hence, multiple indicators (health, biodiversity, cost etc.) are used within the analysis.

Another application of the potential maps is the development for optimal siting applications. These were developed for solar energy systems and off-shore wind parks. LCA provides a good means to also include costs of energy exploitation into these siting applications. Besides the impact assessment, satellite data are also used to develop a monitoring strategy for air pollutant emissions. For instance, nitrogen dioxide is an important air pollutant emitted with fossil fuel combustion. By using data from the Ozone Measuring Instrument (OMI) on NASA's Eos-AURA satellite, a strategy was developed to independently determine emission trends.

Results and applications of EnerGEO are made available through a dedicated GEO-portal, compliant with GEO-ADC recommendations and fully linked into GEOSS. In this paper we will present an overview

of the EnerGEO project, its rationale, the model cluster, the role of satellite data, and the major results of the project thus far.