## Institute of Technical Thermodynamics

# High Resolution Inventory of Renewable Electricity Generation Potentials in Europe

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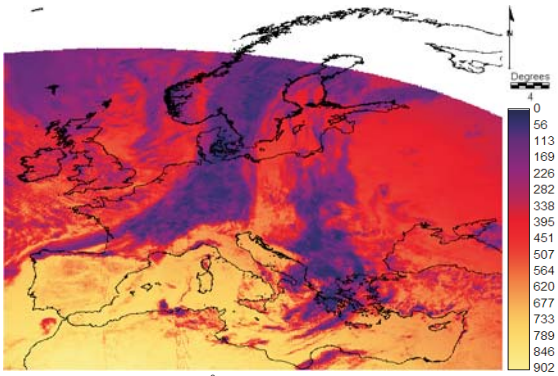
Efficient integration of fluctuating renewable energy resources into electricity supply systems requires information about temporal and spatial availability of all renewable energy sources. A geographic information system is used at the German Aerospace Center DLR for developing a high spatial and temporal resolution inventory of renewable electricity generation potentials in Europe. The inventory consists of maps which are generated in three steps: resource analysis, area analysis, and technology simulation. It will be linked to a model which balances renewable electricity generation with demand, aggregates regional deficits and surpluses on user defined nodes and calculates balancing energy fluxes.

### Resource Assessment

#### Solar Energy

Irradiation maps from METEOSAT imagery processing based on the HELIOSAT method at DLR

- Resolution: 1 h, 10 km * 10 km




Example: irradiation [Wh/m$^2$], 01/10/05, 12:00 - 13:00

- Usable areas: roofs, facades, noise barriers, undeveloped area
- Allocation to land cover types
- PV power plant model

↳ Electricity generation potential

#### Biomass

Biomass for energy potentials from literature

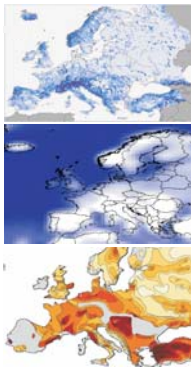
- Disaggregation with land cover maps / maps of net primary productivity (model BETHY/DLR)
- Resolution: 1 a, 10 km * 10 km


Example: forest wood for energy [t/ha] in 2000

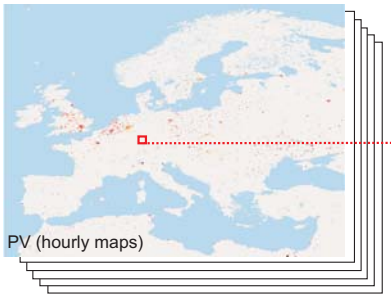
- Restrictions for forest, industrial residue and old wood, energy plants, agricultural residue straw and manure
- Biomass power plant models

↳ Electricity generation potential

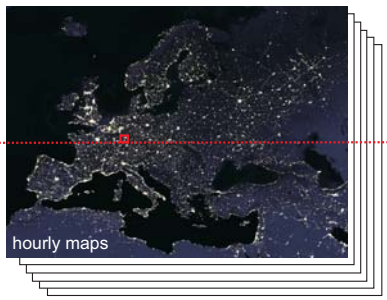
#### also: Hydro, Wind and Geothermal Energy



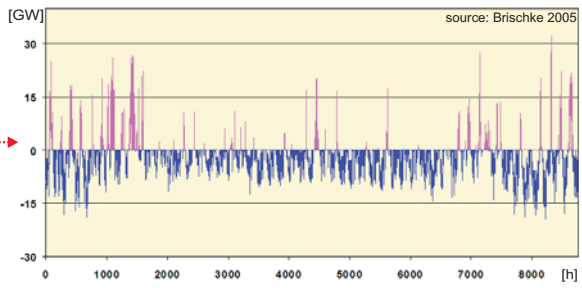
### Electricity Generation




### Load




### Deficits and Surpluses




- **Demand for electricity transport, storage and for load management**
- **Information for long term transport network planning**
- **Strategies for future energy supply**

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