



WP 6020 Example Application: Solar Thermal Power Plants

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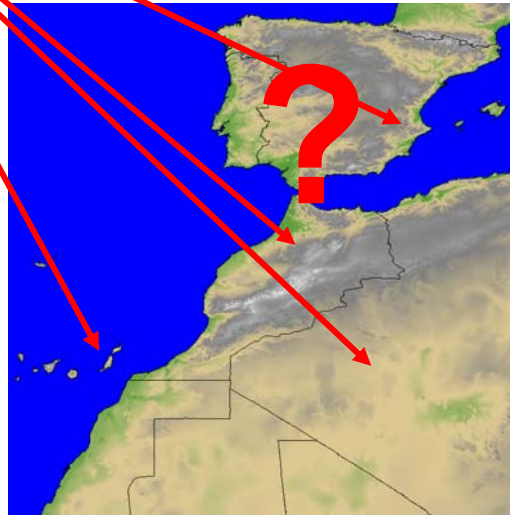
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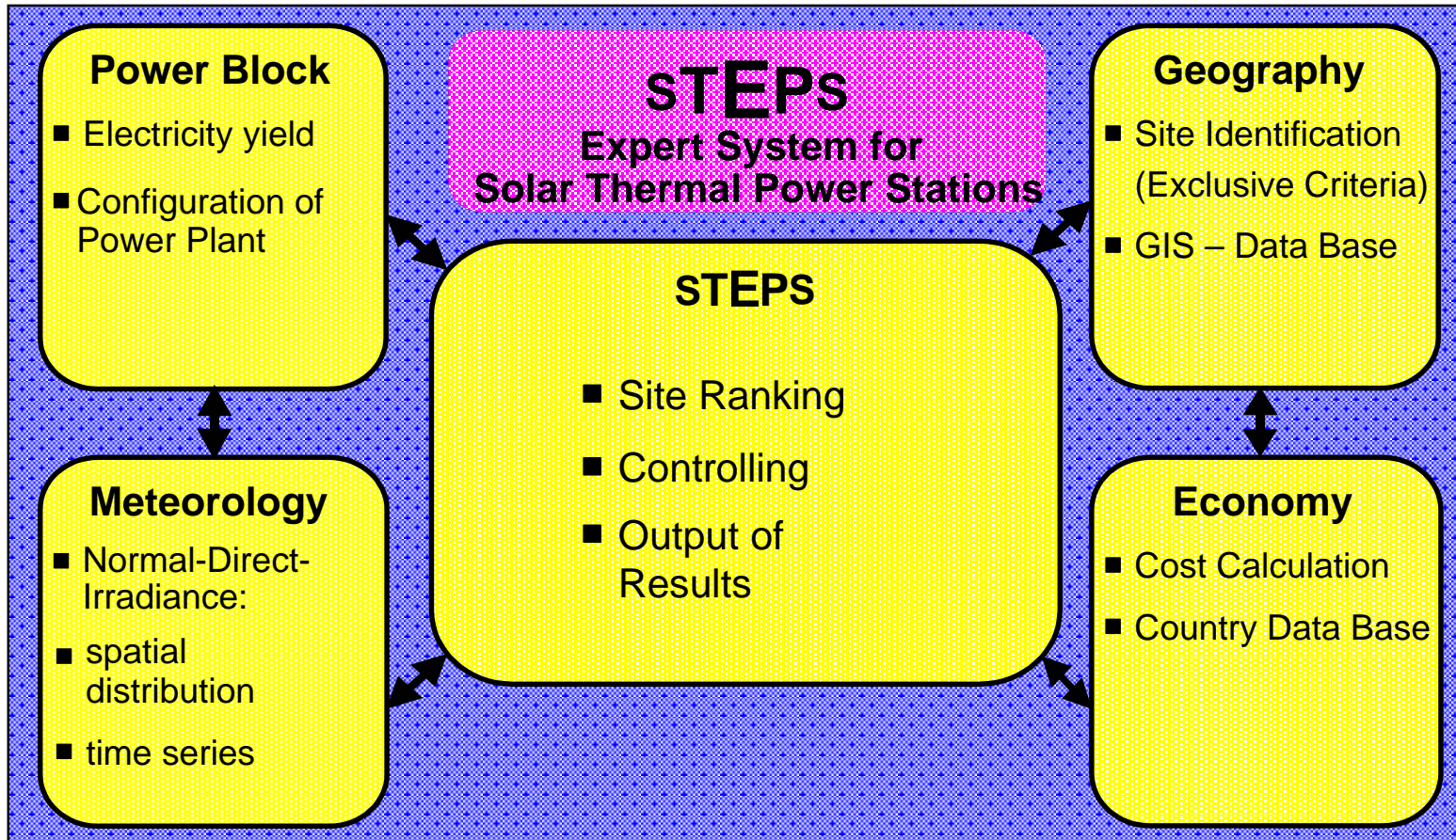
Investment Decisions: Solar Thermal Power Plants

► Background Questions



- **Project planning:**
Where is the best site for my solar power plant?
Highest electricity yield with lowest investment cost.
- **Policy advice:**
Which potential do I have for solar energy use in a defined region?
How many sites below a certain electricity price level.

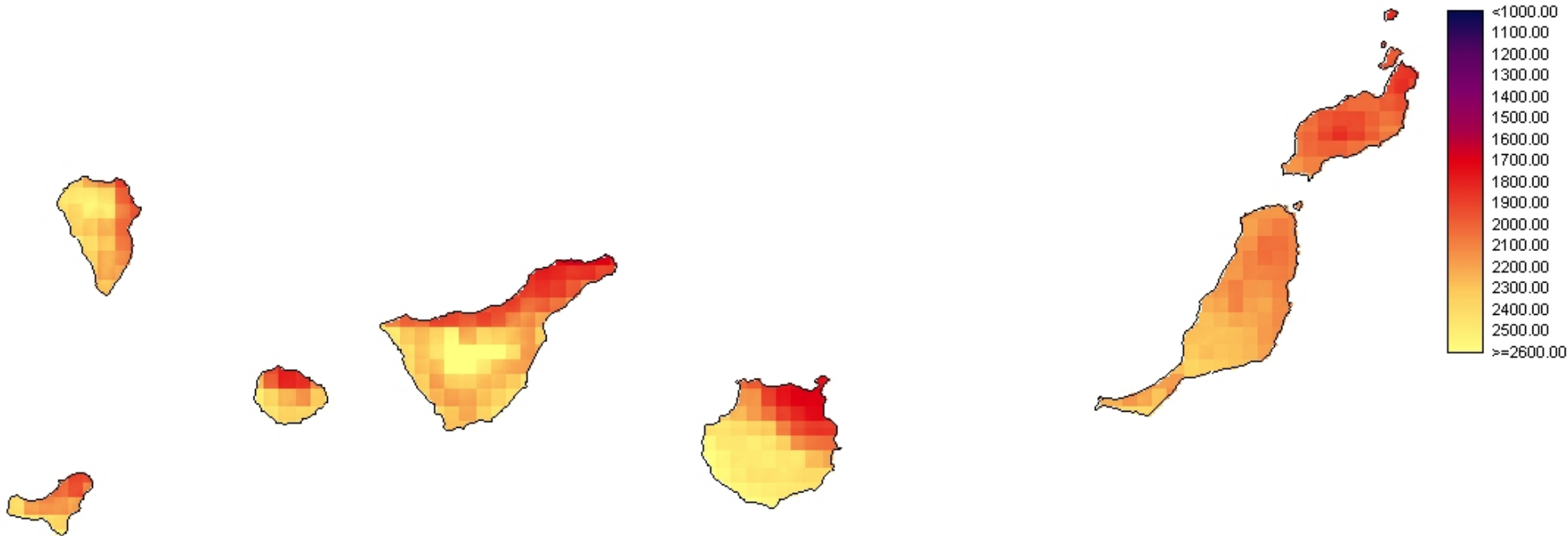
STEPS Organization



Meteorology: Available resources

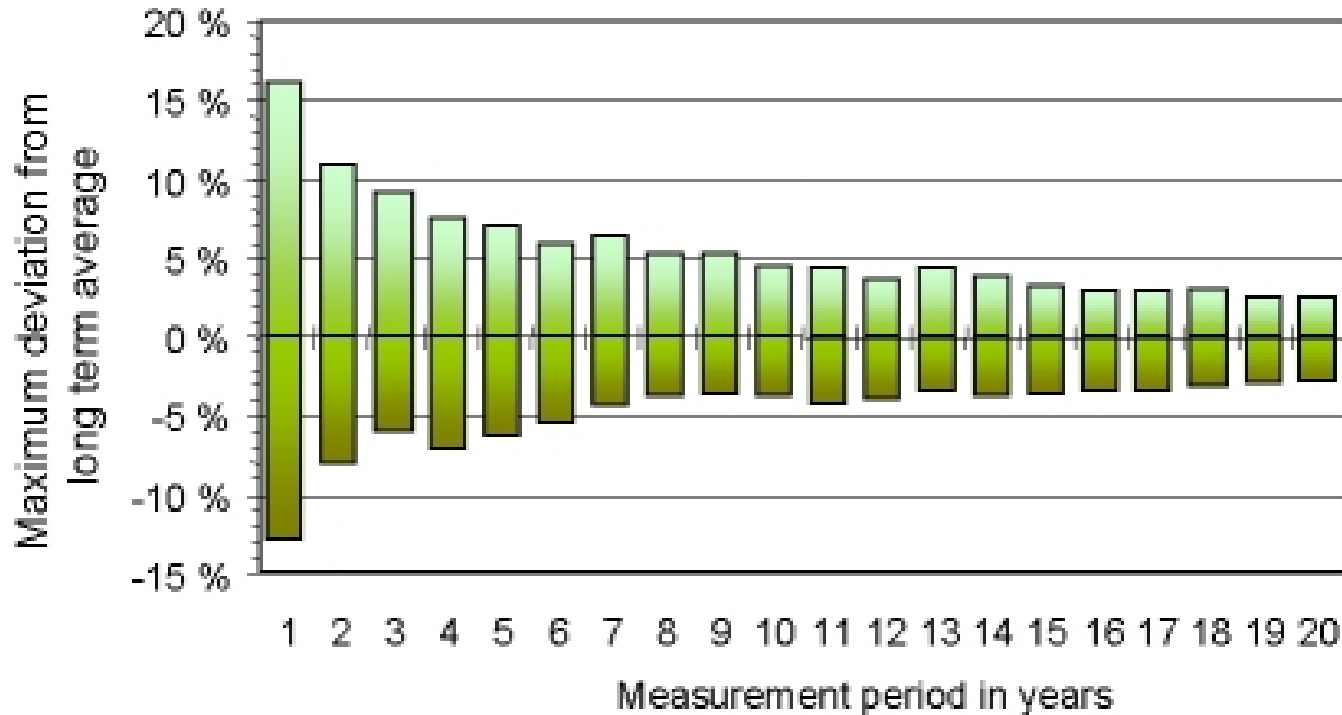
Important Qualities

- ▶ High accuracy
- ▶ Long time series

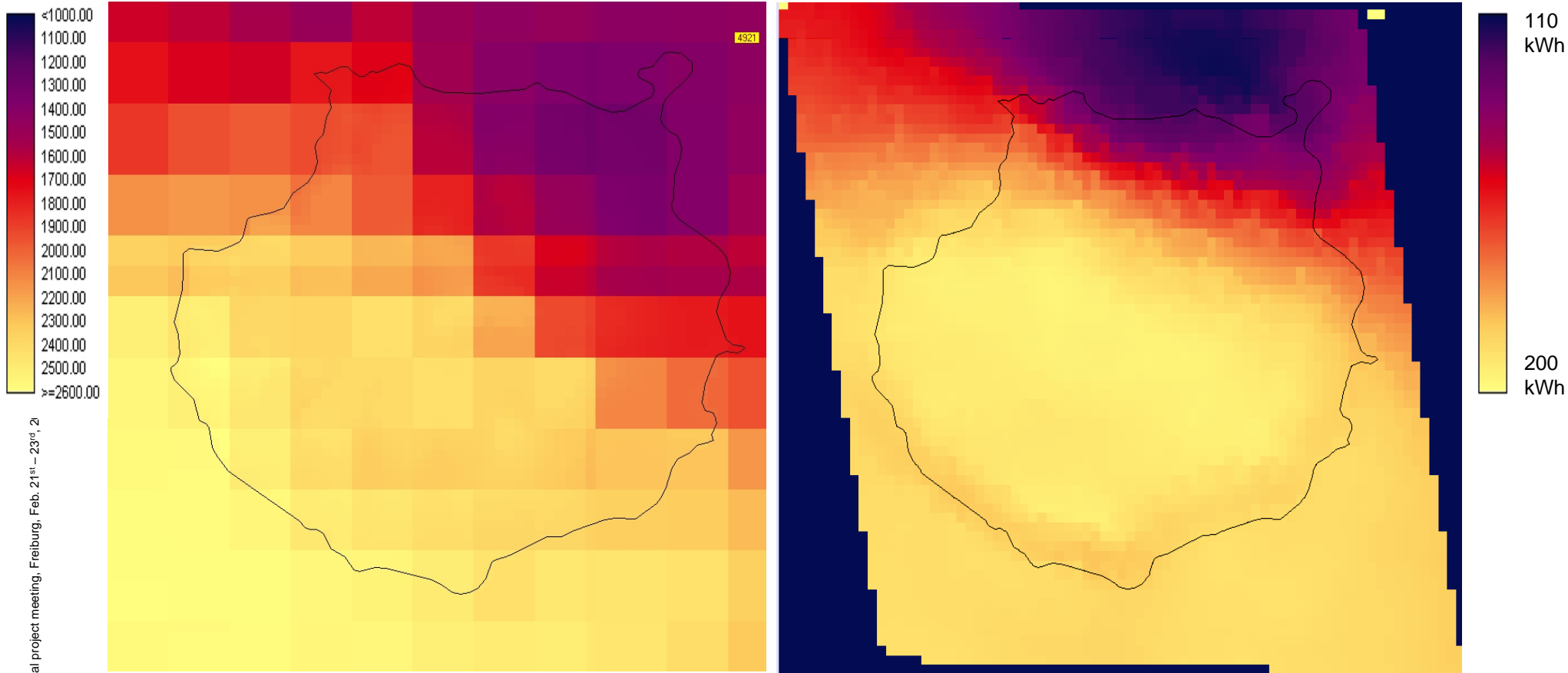


Meteorology: Long Term Variability

- ▶ Data based on 70 years of global irradiance measured by the DWD at Potsdam
- ▶ Approximately 10 years of data are necessary to stay below 5% Deviation



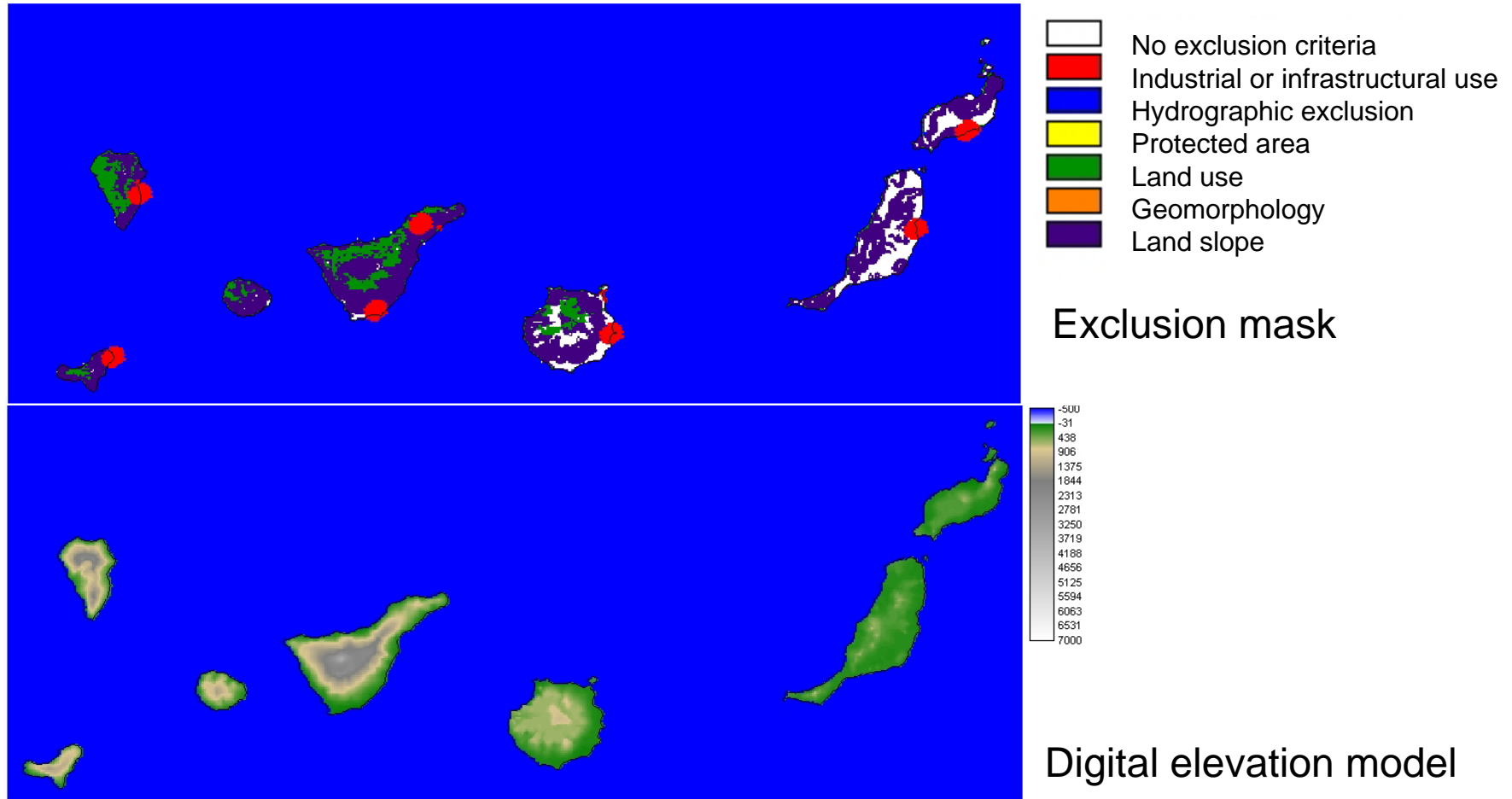
Resources DLR vs. Heliosat-3



Annual Average 2002, 5x5 km Meteosat

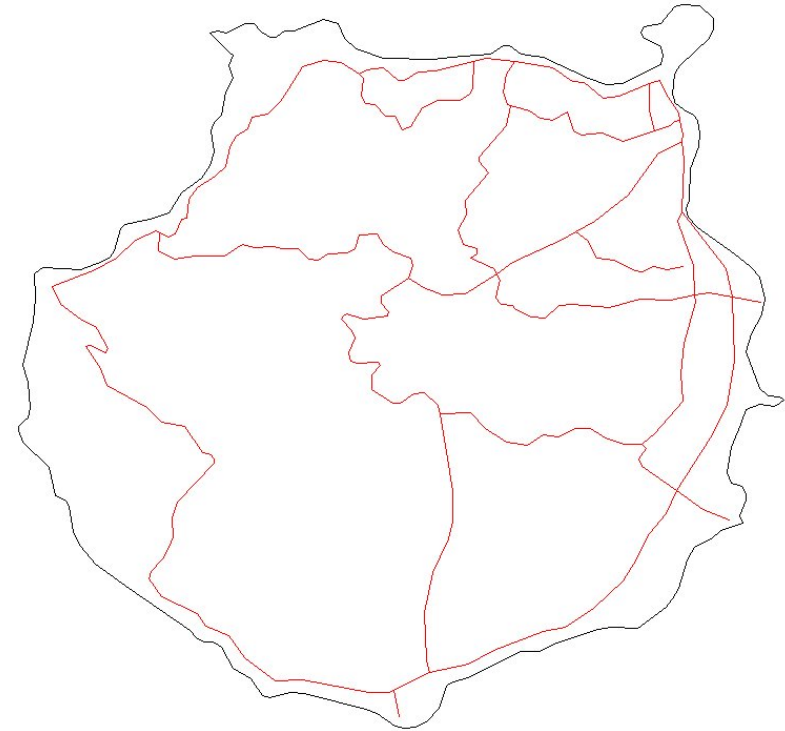
July 2004, MSG, Heliosat-3

Geography: Exclusion of Unsuitable Sites



Economy: Investment cost

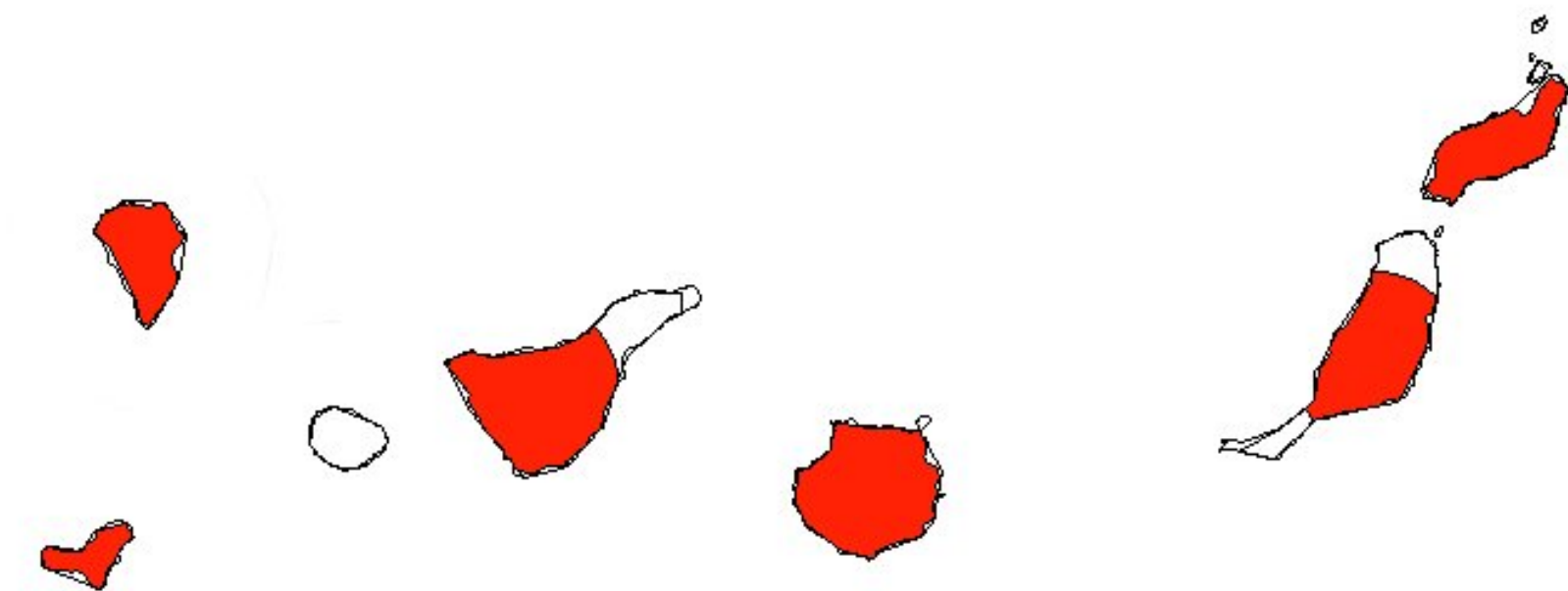
Streets and Transmission Lines



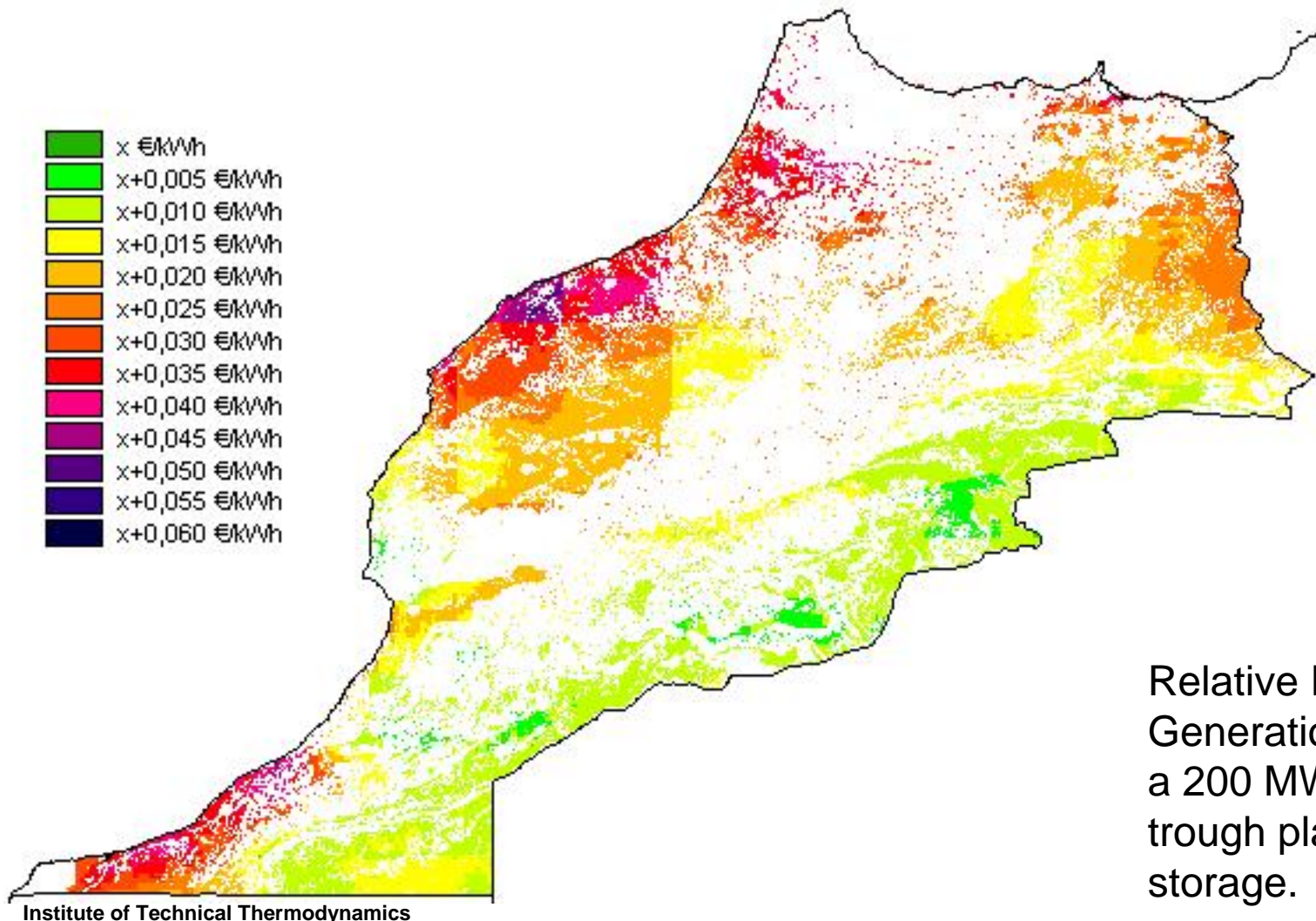
Major Streets

Economy: Investment cost

Insurance cost: Danger of Volcano eruptions



Example Results for Morocco



Relative Power
Generation Costs for
a 200 MW parabolic
trough plant without
storage.

Outlook: Grid Integration

- ▶ Added Layer for Transmission and Distribution Grid
- ▶ For every node the sources and the demand can be balanced showing the available and necessary resources
- ▶ Goal: Minimizing regulatory power demand and excess installed power in energy system design and operation

