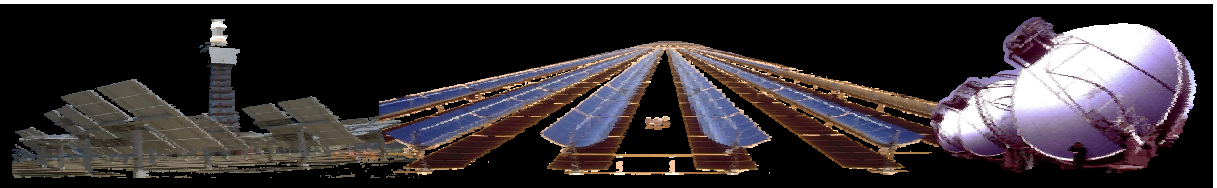

greenius

A New Simulation Environment for Technical and Economical Analysis of Renewable Independent Power Projects

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The German Aerospace Center (DLR)
Division Plataforma Solar de Almería (PSA)

Arguments for Developing a New Simulation Tool

No user-friendly computer tool exists to simulate various types of renewable energy systems; especially solar troughs

If you are developing your own tool you have the possibilities to implement all you want

You increase you competence when developing new algorithms and computer tools

You drink too much coffee when getting into and using of existing tools

Finding a Name for a New Computer Tool

green = green energy · clean energy · renewable energy

genius = innovative · new · fast · interesting

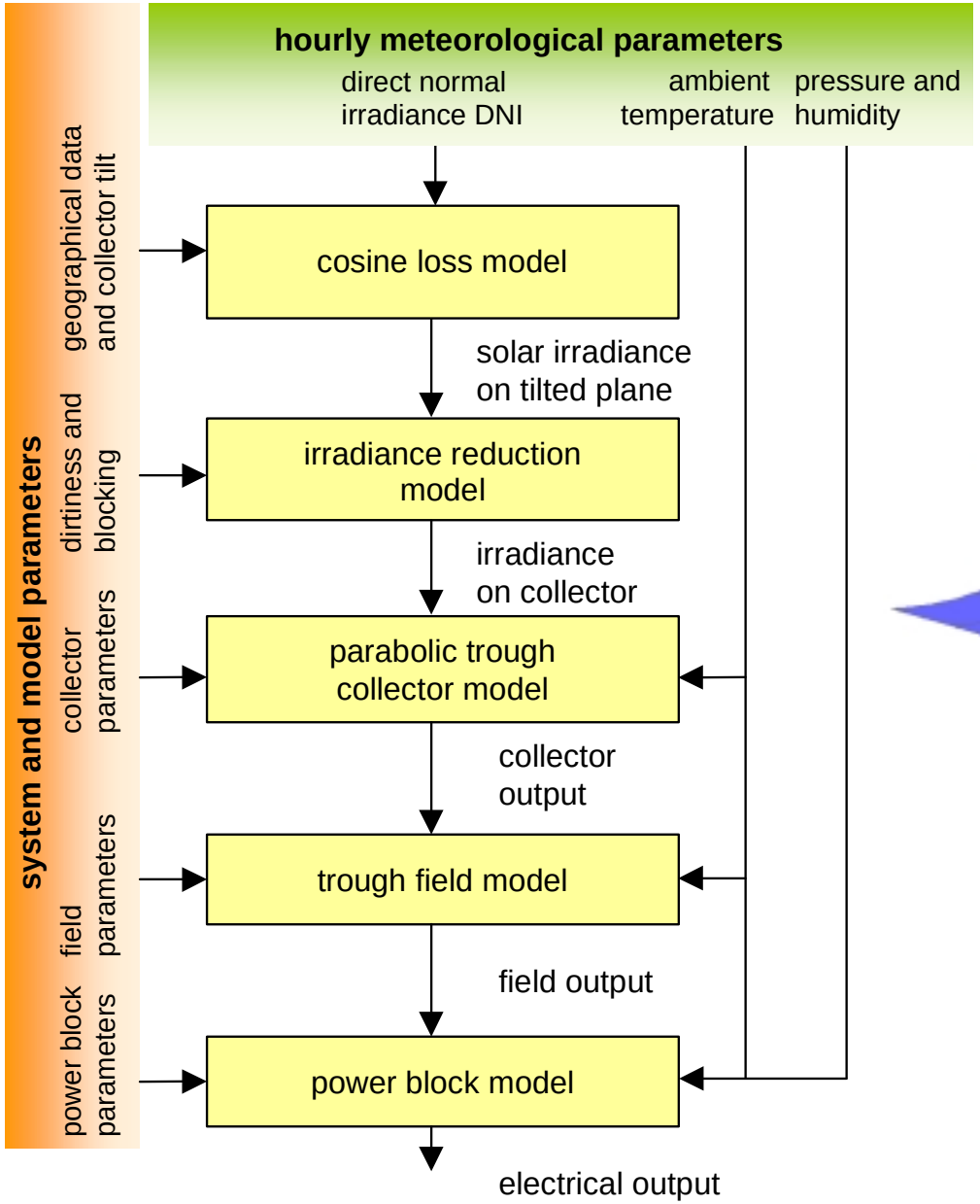
greenius

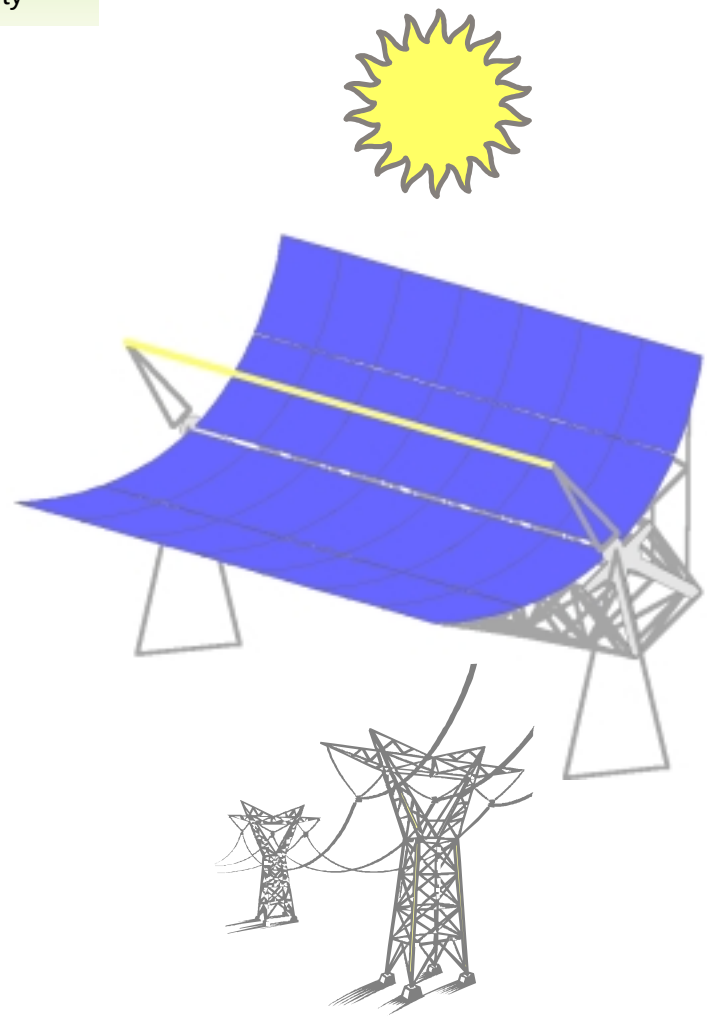
THE GREEN ENERGY SYSTEM ANALYSIS TOOL

Defining Requirements for the New Software

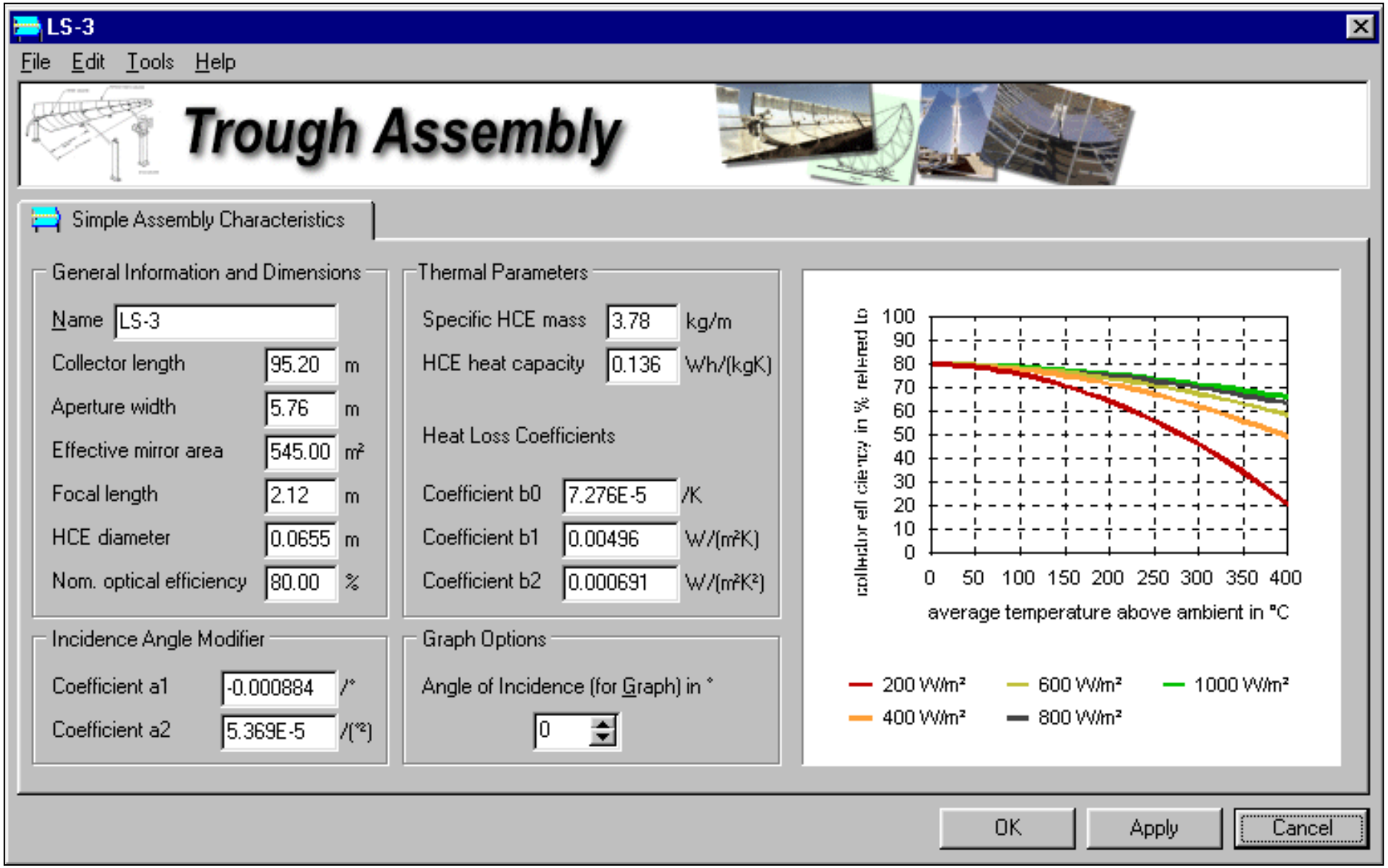
- ✓ Extensive technical and economical analysis
- ✓ High accurate simulation algorithms
- ✓ Extremely low calculation times
- ✓ User-friendly interfaces
- ✓ Comfortable data import and export modules
- ✓ High flexibility of input parameters

Modeling of Solar Trough Power Plants

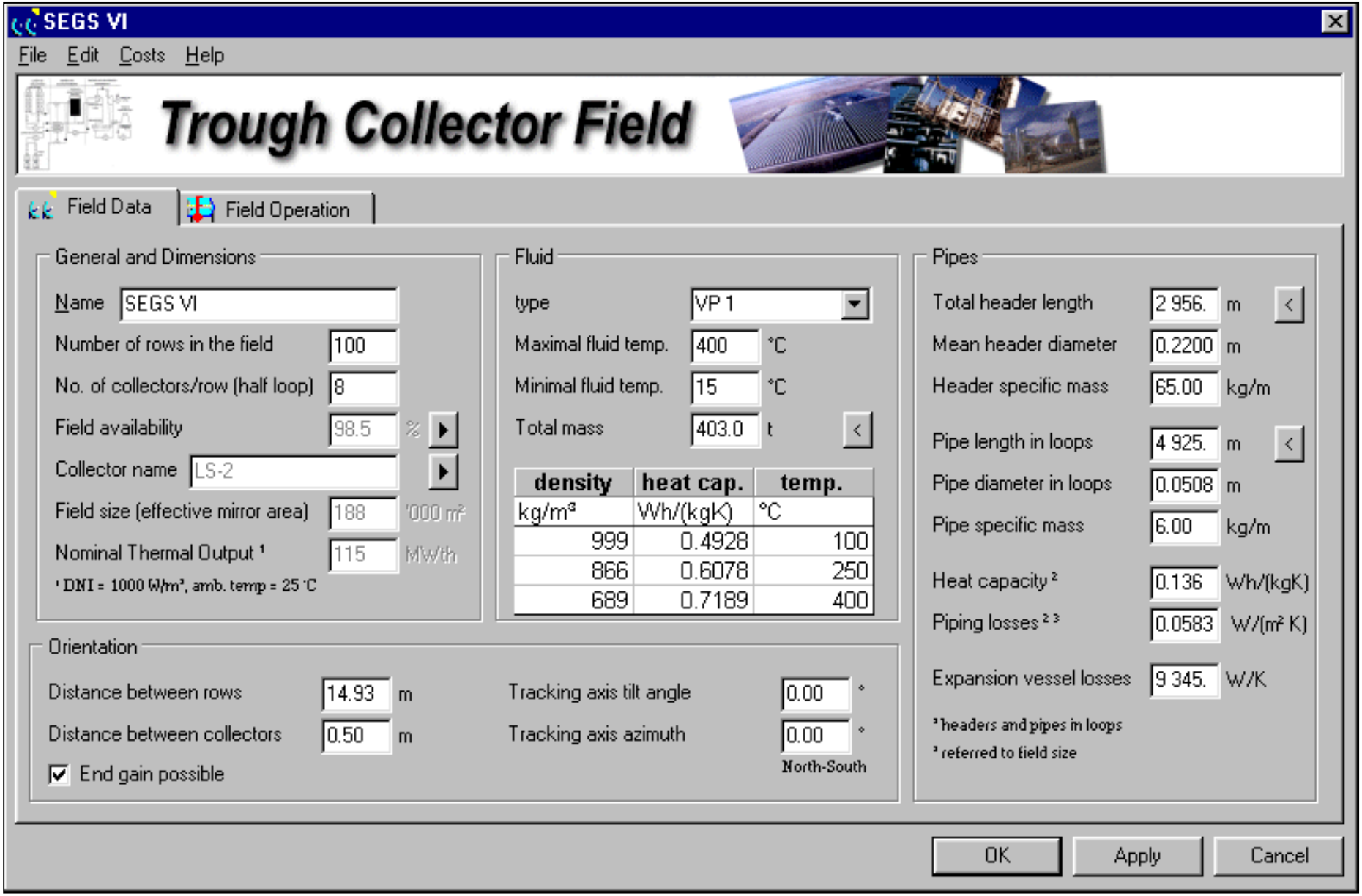




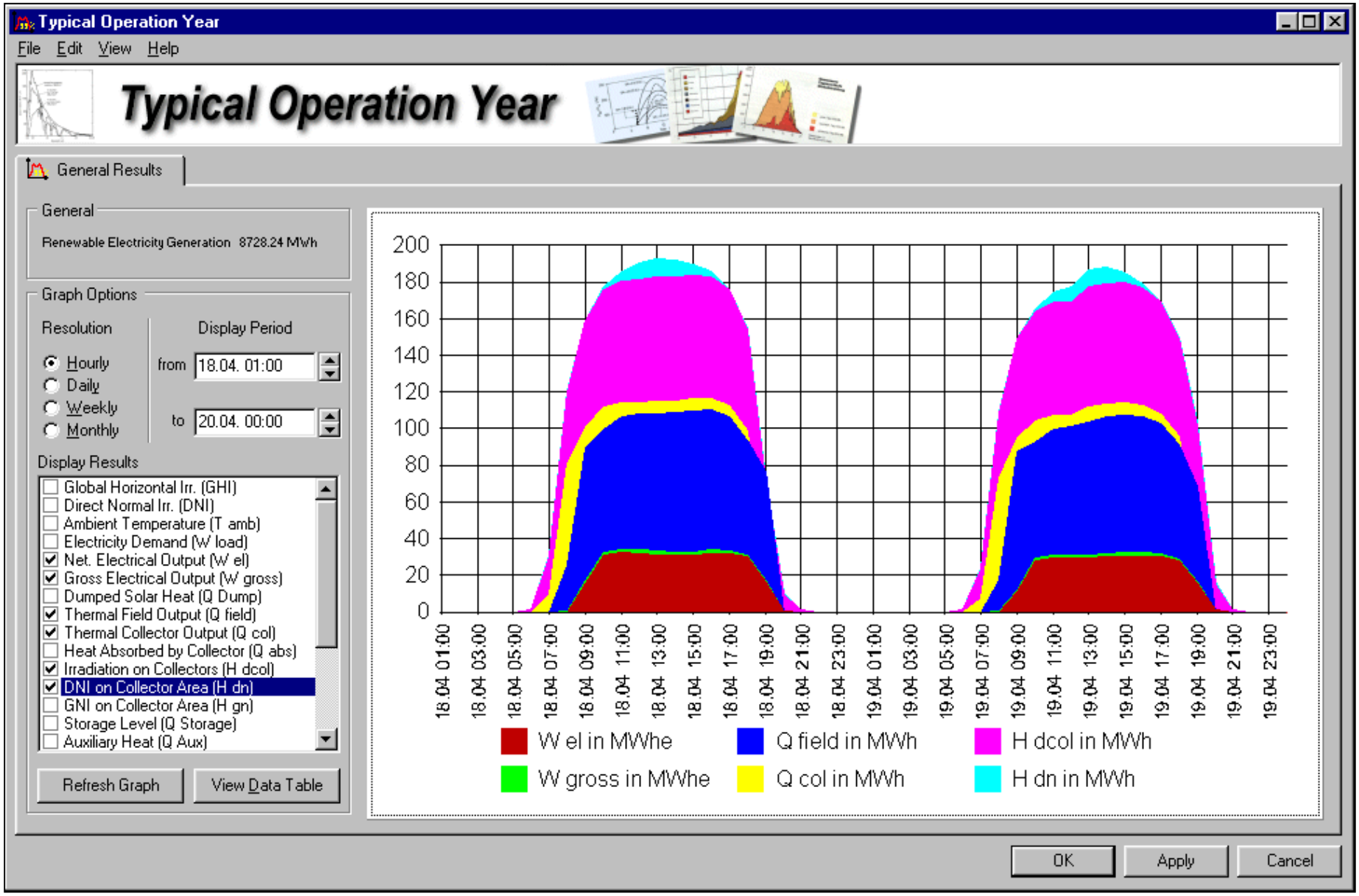
Modeling Trough Collectors



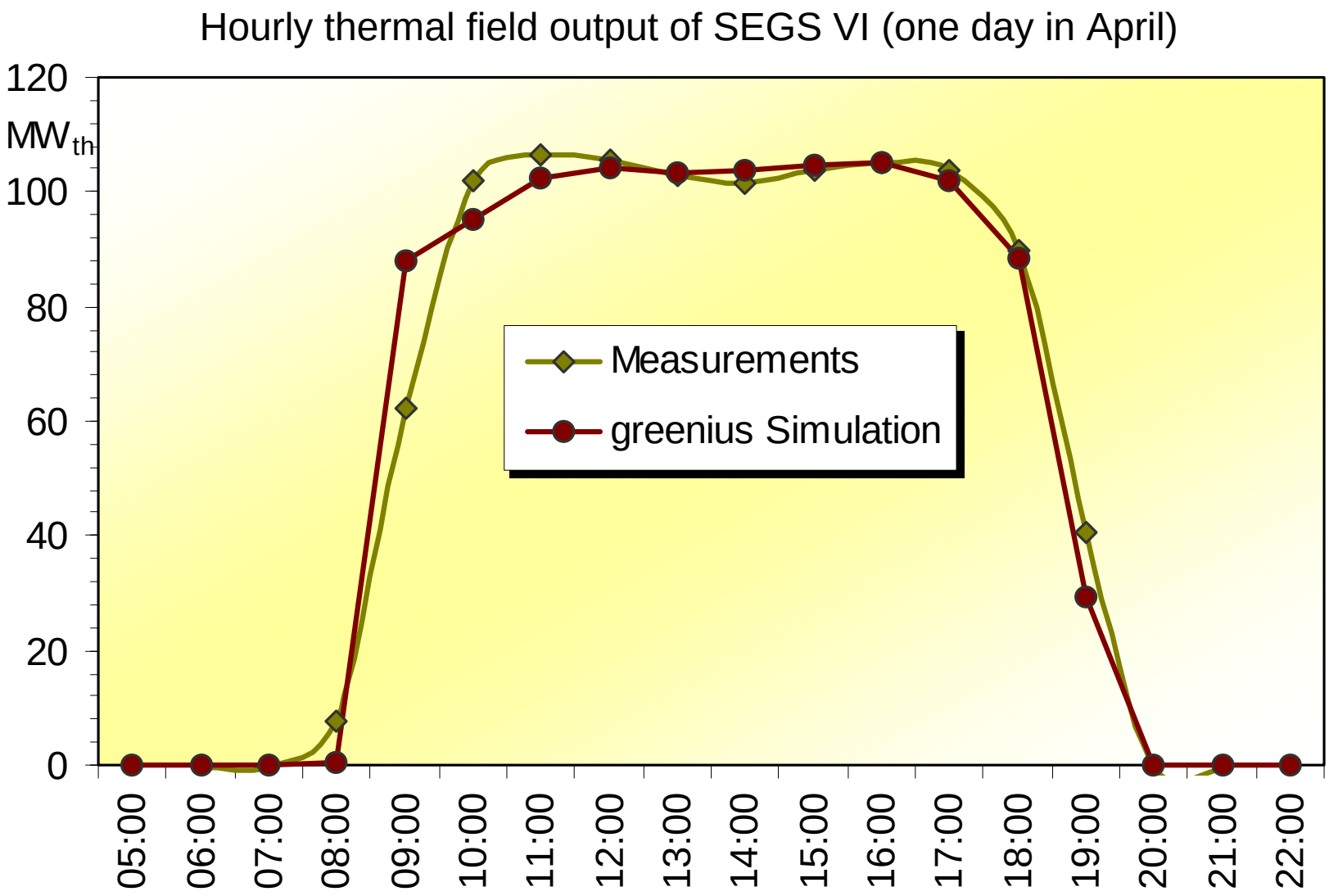
Modeling Trough Fields



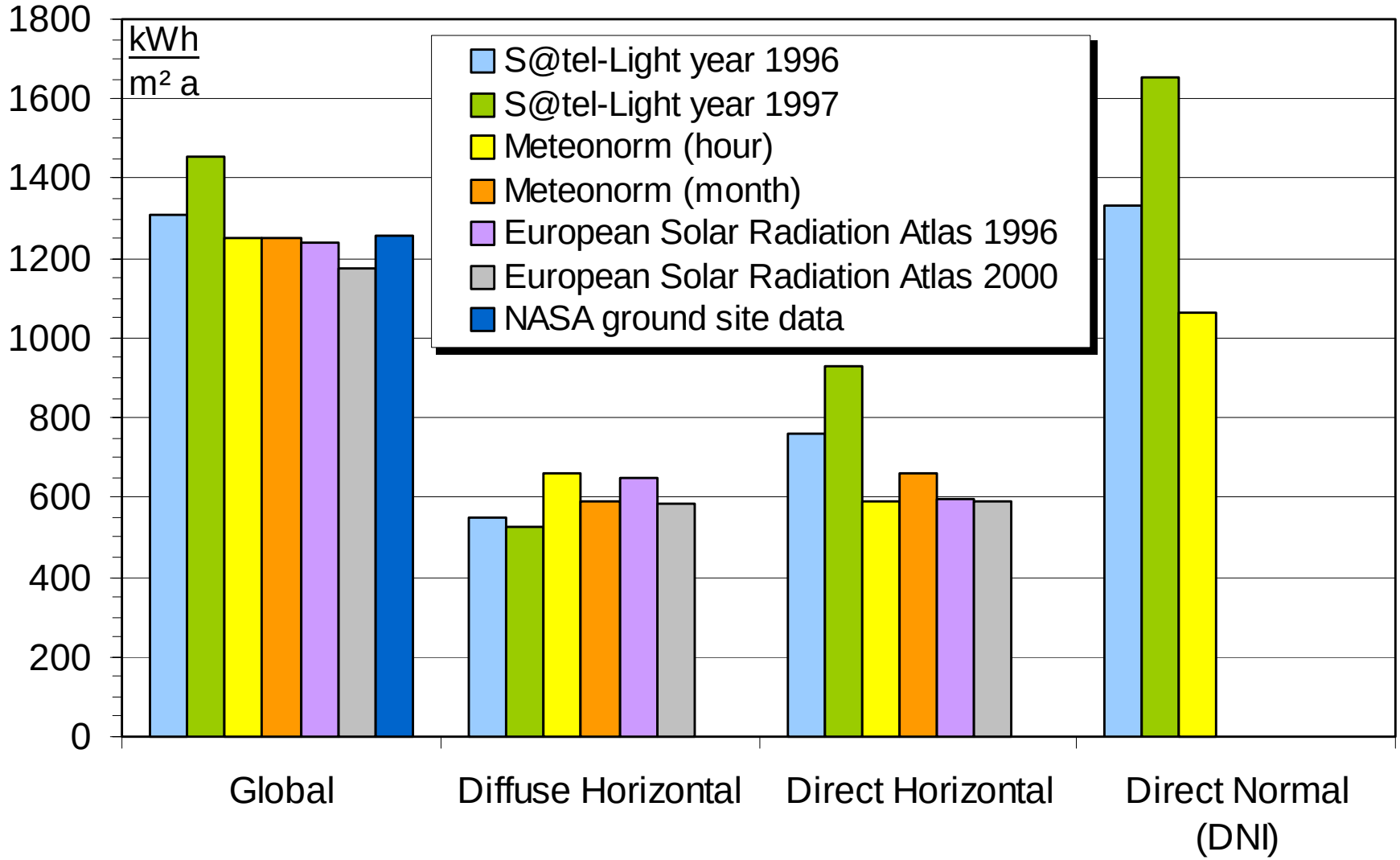
Simulation Results



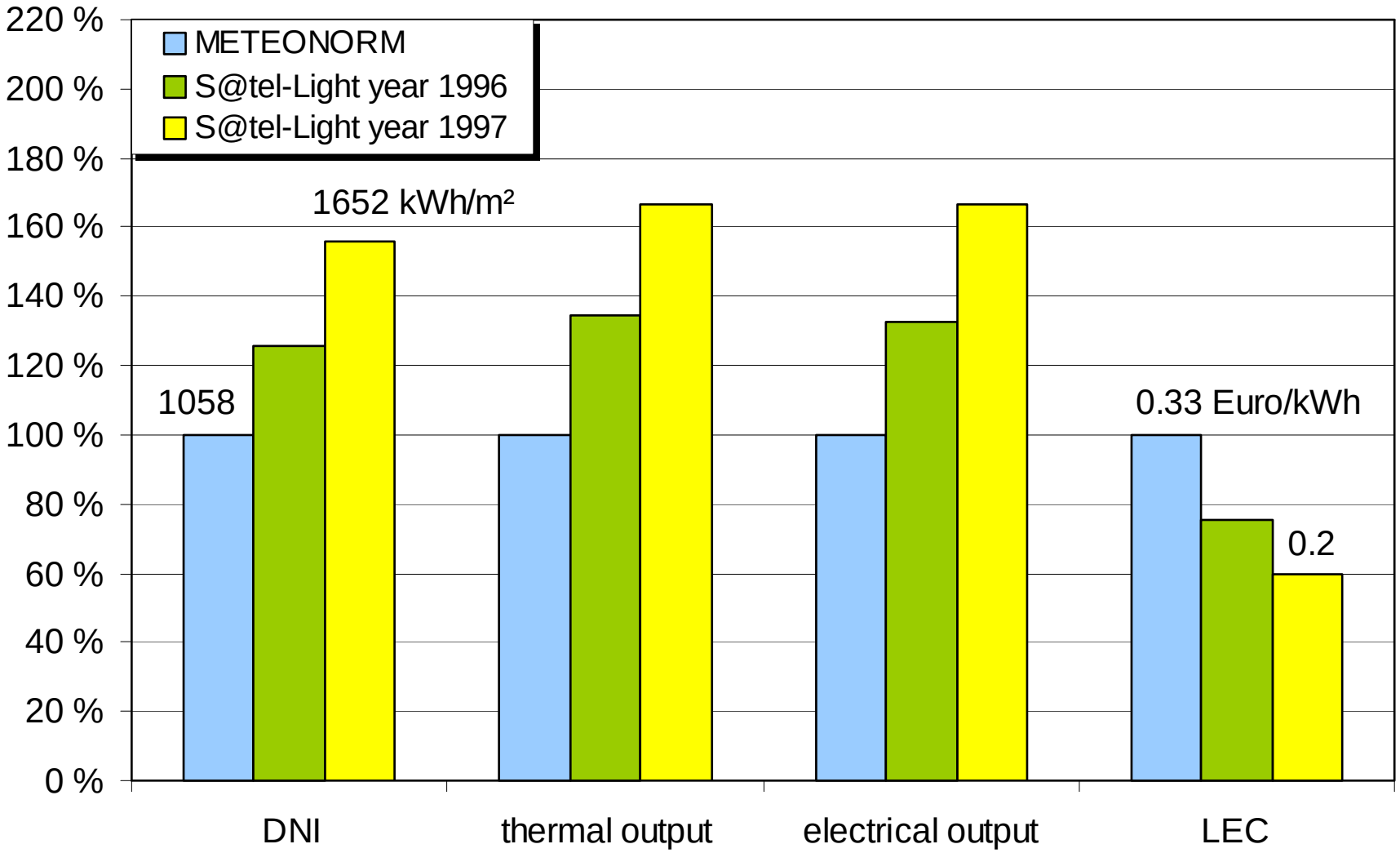
Verification of the Simulation Algorithms



Choosing Solar Radiation - e.g. Sources for Milan (Italy)



Results for Different Irradiation Sources



Other Implemented Renewable Technologies

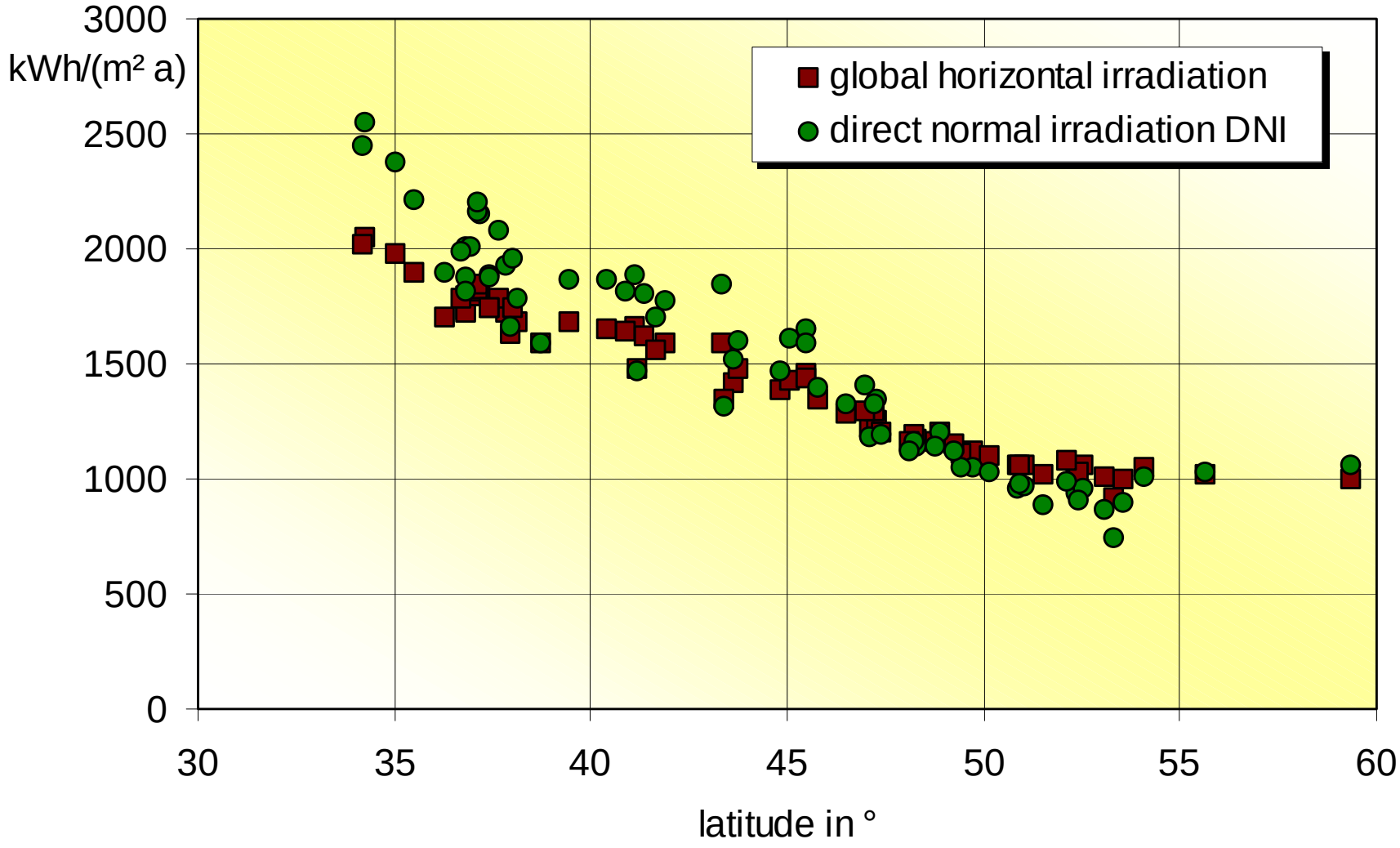
Dish/Stirling Systems

Photovoltaic Systems

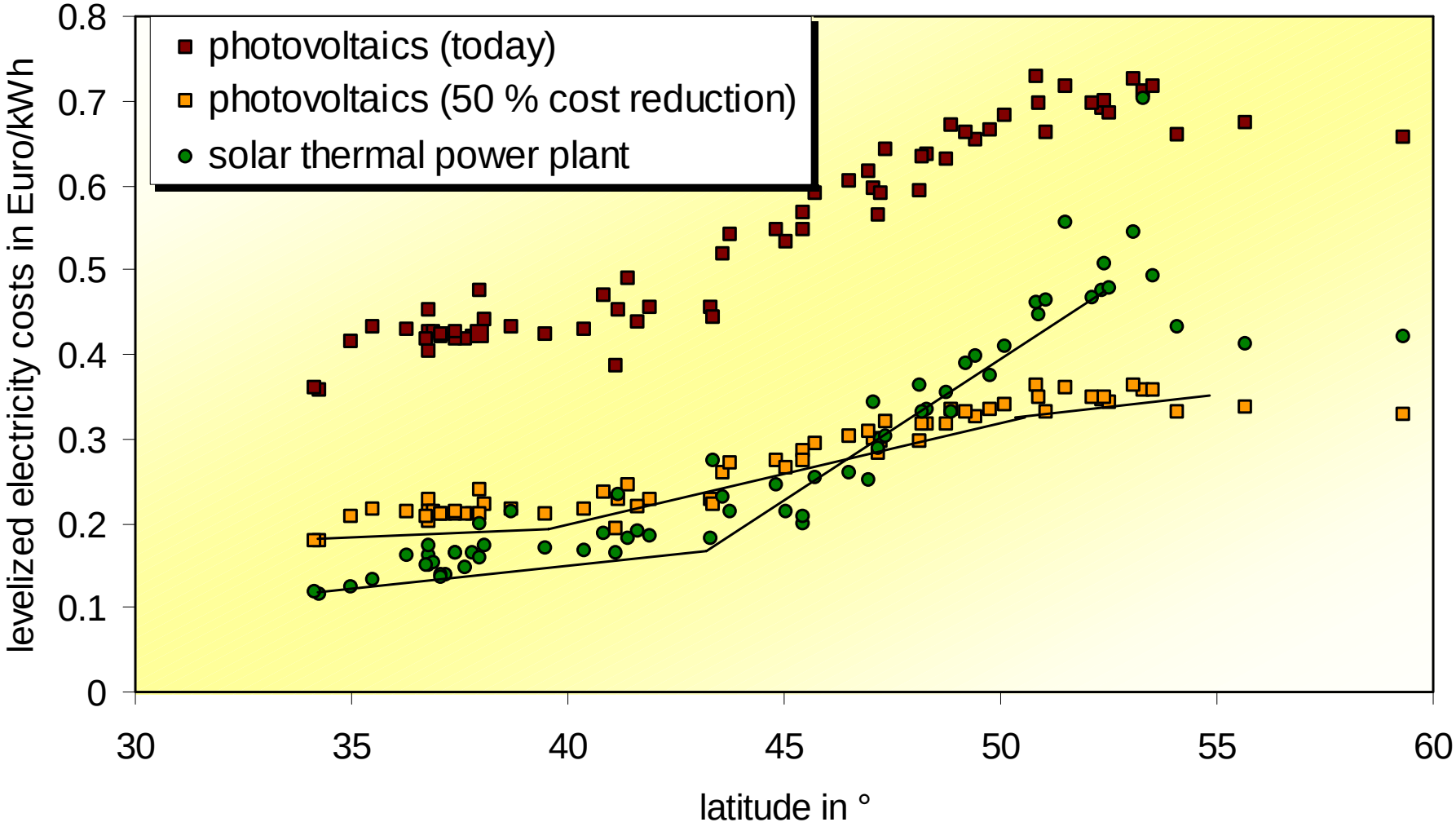
Wind Power Plants

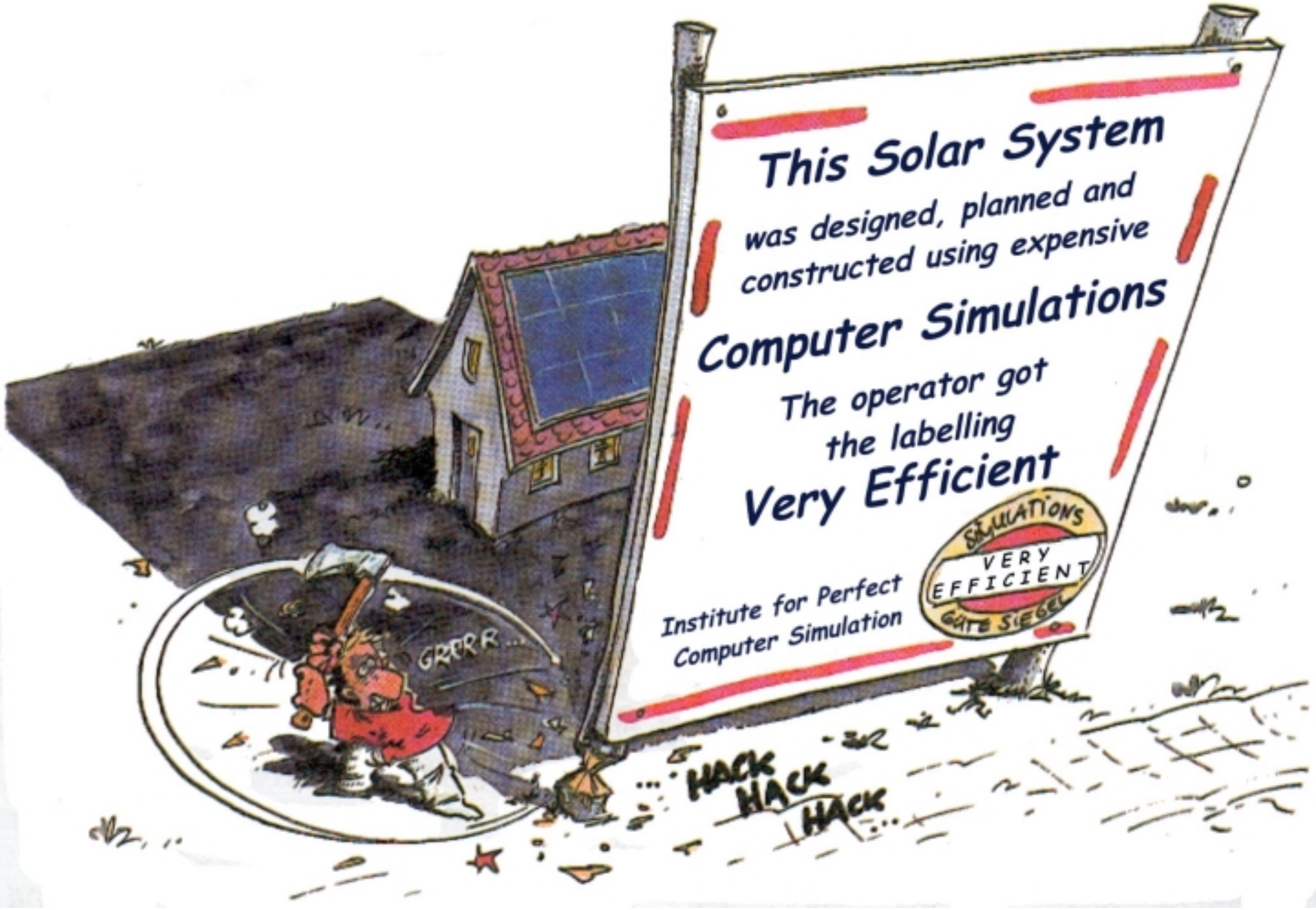
Photovoltaics vs. Trough Power Plants

Irradiation in Europe and Northern Africa



Cost Comparison of PV and CSTP




This Solar System
was designed, planned and
constructed using expensive
Computer Simulations
The operator got
the labelling
Very Efficient
Institute for Perfect
Computer Simulation
SIMULATIONS
VERY
EFFICIENT
GRRR...
HACK
HACK
HACK