greenius User Day

30. October 2014

Simulation Example for a PV Power Plant

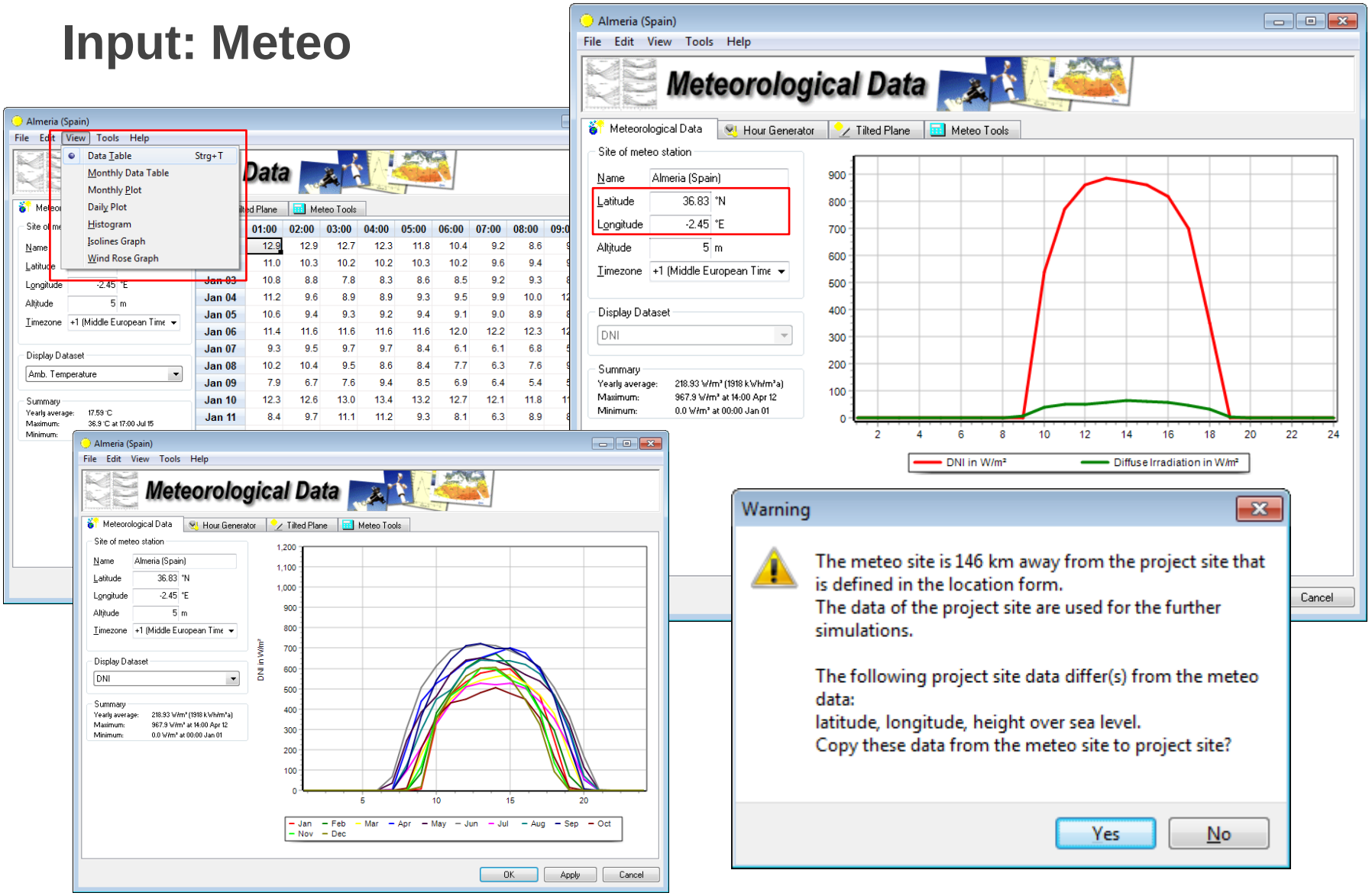
DLR

http://freegreenius.dlr.de

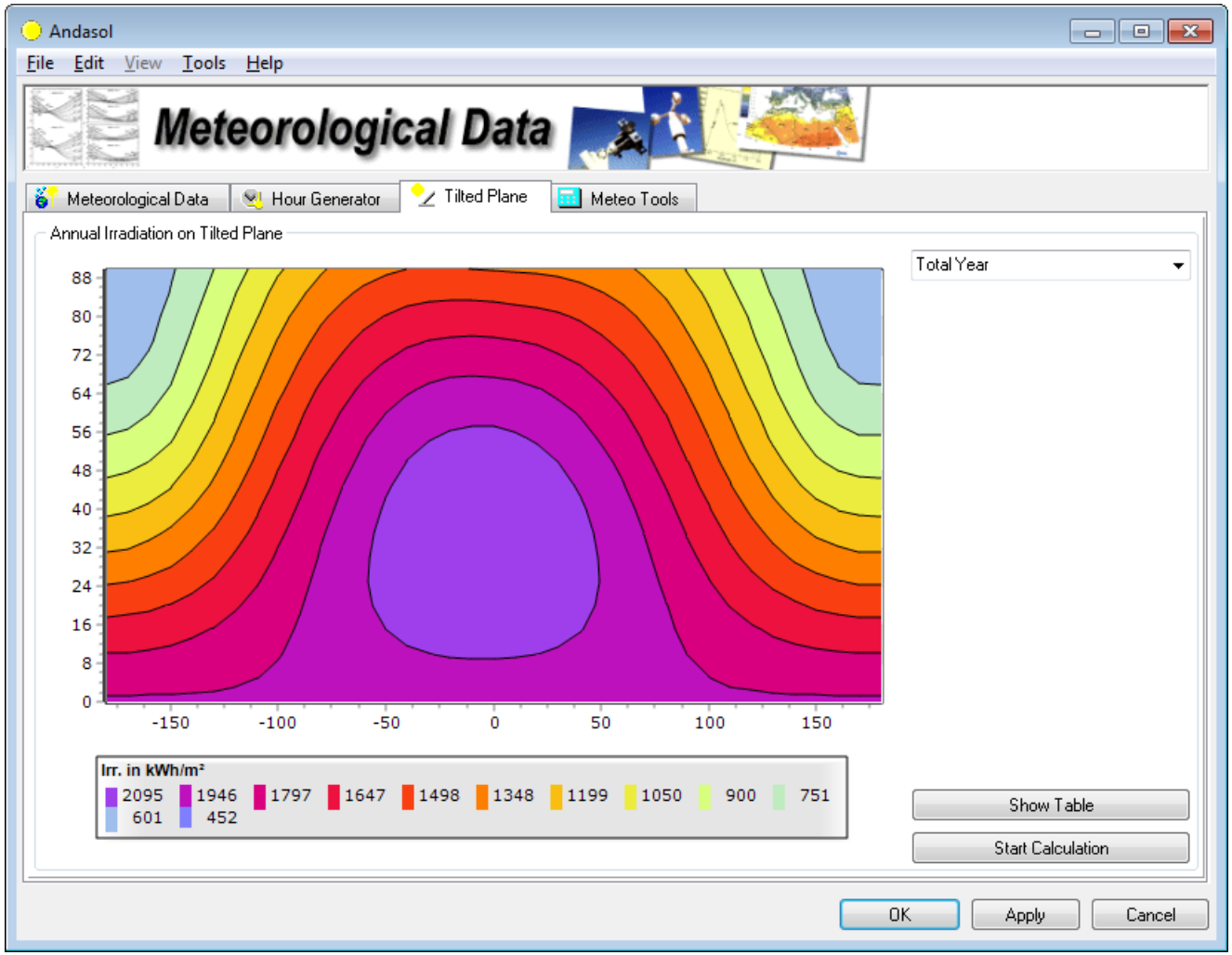
Objectives

- Setup of small grid connected PV system
- PV system optimizer
- Add new PV module
- Shading Editor
- MeteoTool: Tilted Plane
- Economics in greenius

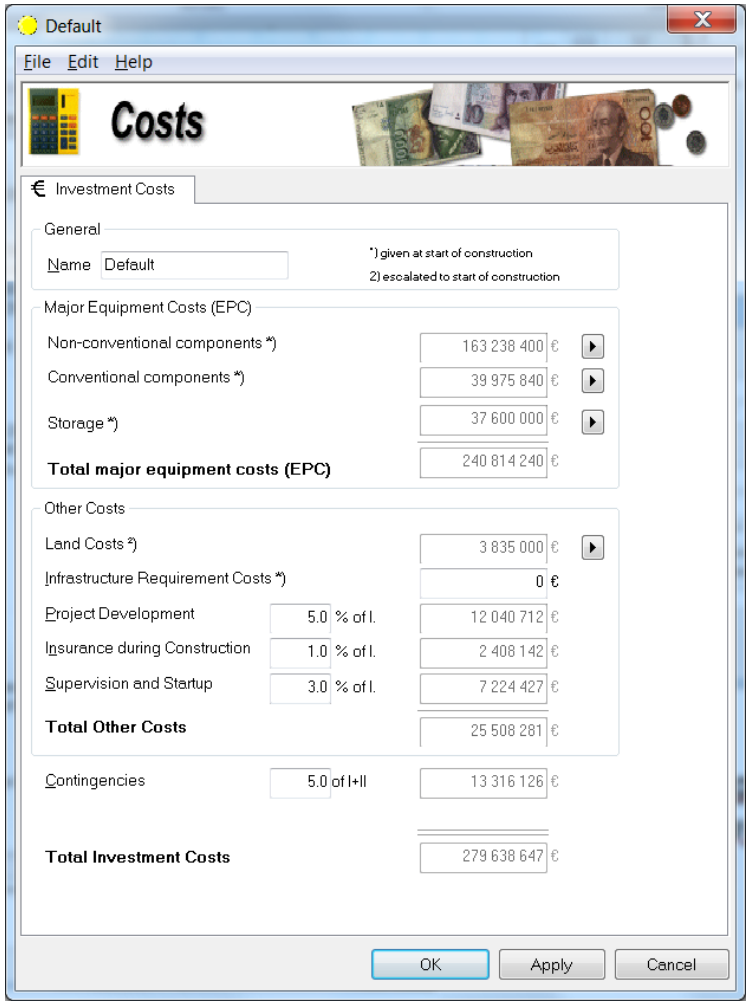
Input: Meteo

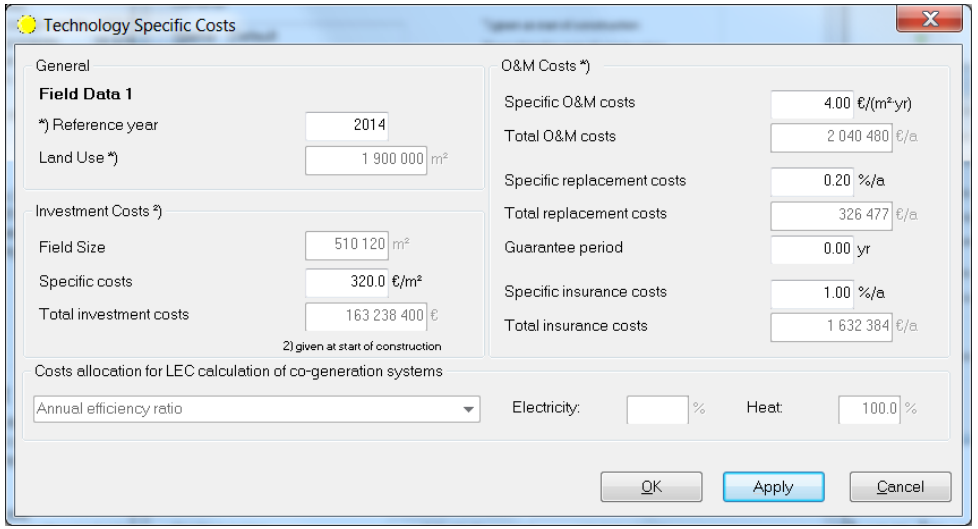

Almeria (Spain)
File Edit View Tools Help
Meteorological Data
Meteorological Data
Hour Generator
Tilted Plane
Meteo Tools
Site of meteo station
Name Almeria (Spain)
Latitude 36.83 °N
Longitude -2.45 °E
Altitude 5 m
Timezone +1 (Middle European Time
Display Dataset
DNI
Summary
Yearly average: 218.93 W/m² (1918 kWh/m²a)
Maximum: 967.9 W/m² at 14:00 Apr 12
Minimum: 0.0 W/m² at 00:00 Jan 01
DNI in W/m²
Diffuse Irradiation in W/m²
Data Table Strg+T
Monthly Data Table
Monthly Plot
Daily Plot
Histogram
Isolines Graph
Wind Rose Graph
Amb. Temperature
OK
Apply
Cancel
Warning
The meteo site is 146 km away from the project site that is defined in the location form.
The data of the project site are used for the further simulations.
The following project site data differ(s) from the meteo data:
latitude, longitude, height over sea level.
Copy these data from the meteo site to project site?
Yes
No

Meteo Tool: Tilted Plane



About Costs





- All specific costs given in greenius are just estimates and may considerably differ from project to project!
- Component costs belong to the component
- Only surcharges are saved to cost structure

System specifications

- Site: Spain, Andasol
- PV module: Yingli Solar 250Wp
- Inverter: SMA Sunny Mini Central 6000A, 6.3kW

- Cell degradation **not** included in the model
- Small and large scale

New PV module: Yingli Solar Panda YL250P-29b

YGE 60 CELL SERIES 2

ELECTRICAL PERFORMANCE

Electrical parameters at Standard Test Conditions (STC)							
Module type			YLxxxP-29b (xxx=P_{max})				
Power output	P_{max}	W	260	255	250	245	240
Power output tolerances	ΔP_{max}	W			0 / + 5		
Module efficiency	η_m	%	16.0	15.7	15.4	15.1	14.8
Voltage at P_{max}	V_{mpp}	V	30.3	30.0	29.8	29.6	29.3
Current at P_{max}	I_{mpp}	A	8.59	8.49	8.39	8.28	8.18
Open-circuit voltage	V_{oc}	V	37.7	37.7	37.6	37.5	37.5
Short-circuit current	I_{sc}	A	9.09	9.01	8.92	8.83	8.75

STC: 1000W/m² irradiance, 25°C cell temperature, AM1.5g spectrum according to EN 60904-3.
Average relative efficiency reduction of 3.3% at 200W/m² according to EN 60904-1.

THERMAL CHARACTERISTICS

Nominal operating cell temperature	NOCT	°C	46 +/- 2
Temperature coefficient of P_{max}	γ	%/°C	-0.42
Temperature coefficient of V_{oc}	β_{Voc}	%/°C	-0.32
Temperature coefficient of I_{sc}	α_{Isc}	%/°C	0.05
Temperature coefficient of V_{mpp}	β_{Vmpp}	%/°C	-0.42

GENERAL CHARACTERISTICS

Dimensions (L / W / H)	1640mm / 990mm / 35mm
Weight	18.5kg

Source: Yingli Solar