

# **Introduction to Renewable Energy Generation Analysis**

## **Objective:**

The objective of the course is to provide users of PowerFactory with the relevant knowledge to effectively analyse renewable energy generation sources and the integration of such sources into the electrical network.

NOTE: The course does NOT cover detailed modelling aspects of RE generators, their associated controllers and dynamic analysis of such generation.

## **Pre-requisites:**

- **MUST have attended the PowerFactory Basic course**
- A good working knowledge of the basic techniques used in PowerFactory.

**No of participants:** Minimum: 6; Maximum: 12.

**Cost:** see [www.digsilent.co.za](http://www.digsilent.co.za) for latest course fees, which includes a set of course notes, lunch and refreshments.  
Computers and PowerFactory licences are also supplied.

Please note the booking clauses on the registration form.

**CPD Points:** 2

**Duration:** 2 days

## **Topics to be covered:**

- Theoretical concepts of wind energy:
  - Historical development of wind power
  - Physic of wind energy conversion
  - Wind generators: modelling concepts for the various types of generators ( DFIG, induction generator, fully rated)
- Theoretical concepts of solar energy:
  - Historical development of solar power
  - Physic of solar energy conversion
  - Modelling solar farms (CSP, PV)
- Modelling other RE generation sources (Hydro, biomass, fuel cells, geothermal, gas turbine)
- Reactive power compliance
  - Generator reactive limits
  - Grid code requirements
- Compliance Studies
  - Loadflow (assessing voltage and thermal limits)
  - Contingency Analysis
  - Losses
  - Voltage Flicker (Rapid Voltage Change)
  - Fault Levels / Short Circuit contribution
  - Power Quality : harmonics and flicker
  - Loadflow analysis: wind farm impact studies