



Renewable energy generators grid integration challenges

During these training you'll learn to perform calculations related to wind and solar PV integration into electrical grid, understand related risks and mitigate integration mistakes.

It's a practical workshop during which you will do calculations yourself with a supervision of an experienced lector and will have an opportunity to implement gathered knowledge on your project.

Calculations will be performed with a power system modelling software EA-PSM Electric.

Benefits:

During the trainings participants will solve solar and wind power plants integration problems and analyse related international standards' requirements (IEC and IEEE). In most cases same problems will have to be solved during the pre-design stage by request from the electrical system operator. After the training you'll get **60 days FREE UNLIMITED EA-PSM Electric** software and **CONSULTING** for your project.

Topics:

Impact of reactive power adjustment. Calculations of maximum and minimum voltage levels, voltage control in the grid, voltage fluctuations and flickers. Short circuit calculations. Higher harmonics. Medium and high voltage cables selection. Capacitive currents calculation. Medium and high voltage networks protection coordination.

Participants:

Designers who are responsible for renewable energy power plants integration.

Schedule:

Duration 2 days, 16 hours.

Electrical grid modelling with the EA-PSM Electric software:

- ❖ EA-PSM Electric will be installed into Your computer;
- ❖ You will learn how to create electrical grid single line diagram with EA-PSM Electric software;
- ❖ Review of electrical network elements equivalent circuits and parameters.

Theory classes:

- ❖ Legal requirements for distributed generation integration;
- ❖ Short circuits from generators;
- ❖ AC network (isolated and grounded neutral) protection coordination;
- ❖ Minimum and maximum voltage levels;
- ❖ Voltage flickers due to intermittent generation;
- ❖ Reactive power regulation;
- ❖ Higher harmonics and harmonic resonances;
- ❖ Impact of higher harmonics on grid elements.

Practical course:

- ❖ Analysis of Short Circuit currents from generators;
- ❖ Medium and high voltage networks protection coordination;
- ❖ Voltage coordination;
- ❖ Reactive power regulation;
- ❖ Higher harmonics calculation and mitigation.

Participants will be able to:

- ❖ Assess possible risks of solar and wind power plant integration;
- ❖ Make power flows calculations in AC network;
- ❖ Calculate short circuits;
- ❖ Coordinate medium and high voltage protection coordination;
- ❖ Calculate higher harmonics and asses their influence on electrical equipment;
- ❖ Calculate electrical energy quality parameters.

Dates and pricing:

Date: 21st and 22nd of February.

Duration: 2 days (16 hours).

Register until: 12 of February.

Price: 490 EUR, register till 23rd of January and get 15% discount. Second booking charged at full published rate minus 50%.

Location: Krakow, more information you'll get after registration.

Additional information:

- ❖ During the trainings EA-PSM Electric is installed into Your computer. After the event, participants will be able to **use the software for 2 months** and consult with Energy Advice team without any additional charges.
- ❖ We will work in small groups (up to eight people).
- ❖ Every participant must bring his PC.
- ❖ More information on EA-PSM Electric <http://www.energyadvice.com.pl/>

Contact us:

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