



Technical Short Course  
**Renewable Generation & Grid Integration**





## Learning targets are aimed on:

- The most common renewable energy technologies: **wind energy, solar & hydro power, and biomass** (technical design, market, and economic situation)
- The **integration of (fluctuating) renewables into power systems**: grid connection aspects & power system balancing

Participants will...

- ✓ be able to understand the design of different renewable generation technologies.
- ✓ gain knowledge about economic & regulatory aspects of renewable generation.
- ✓ be able to evaluate various solutions for the design of renewable production systems.
- ✓ gain competence to understand grid integration aspects of renewable generation.
- ✓ be able to apply knowledge in certain case studies.



# 3-day Seminar: Compact Scheduling

	First Day	Second Day	Third Day
8:00			
8:00 – 9:30			
9:45 – 11:15	<b>Lecture</b> Wind Energy	<b>Lecture</b> Solar, Hydro, Geothermal & Biomass	<b>Lecture</b> Grid Integration
11:30 – 13:00			
Lunch Break			
14:00 – 15:30	<b>Lecture &amp; Case Study</b> Wind Energy	<b>Lecture &amp; Case Study</b> Solar, Hydro, Geothermal & Biomass	<b>Lecture</b> Grid Integration
15:45 – 17:15			<b>Field Trip</b>
17:15			<b>Exam</b> (optional)

# Course Agenda



## Day 1: Wind Energy

Historical development of wind power & current status; design of wind turbines; special applications: offshore wind & hybrid systems; Homer and/or RETScreen (Case Study)



## Day 2: Solar, Hydro, Geothermal, and Biomass

Solar Power; Hydropower; Geothermal; Biomass – Lecture; Solar PV System Design (Case Study)



## Day 3: Grid Integration

Basics on grid integration of renewable generation; distribution/ transmission issues; Power system stability; Energy systems; Field Trip to the “Energieberg”





## Demonstration of Practical Implementations

- Excursion to the so-called “**Energieberg**” (Energy Mountain) in Karlsruhe:
- A former dumpsite where now renewable energy is produced by wind power plants, a photovoltaic system, and a thermal power station



## Course Instructor Expertise

### **Dr. Dipl.-Ing. Thomas Ackermann:**

- Founder and CEO of Energynautics GmbH
- Extensive global experience in industry
- Research Focus: Renewable Energy
- Lecturer e.g. for Renewable Energies & Wind Energy at the Technical University Darmstadt, the Royal Institute of Technology in Sweden

### **Dr. Eckehardt Tröster:**

- Senior Engineer and Consultant at Energynautics GmbH
- Research Focus: Renewable Energy, Modeling of Combined Heat and Power Plants, Electrical Engineering
- Lecturer at the International Department of the Karlsruhe Institute of Technology (KIT)

**Dr. Dipl.-Ing. Thomas Ackermann**



**Dr. Eckehardt Tröster**



## Questions? Get in touch with us.



### Program Consulting @ HECTOR School

Martina Waldner                      Senior Program Consultant  
Phone:                                    +49 721 608 47878  
E-Mail:                                    [martina.waldner@kit.edu](mailto:martina.waldner@kit.edu)

Gian Pietro Solinas                    Program Consultant  
Phone:                                    +49 721 608 47902  
E-Mail:                                    [gian.solinas@kit.edu](mailto:gian.solinas@kit.edu)

Yaxian Liu                                Program Consultant  
Phone:                                    +49 721 608 47841  
E-Mail:                                    [yaxian.liu@kit.edu](mailto:yaxian.liu@kit.edu)

