

HITEC Theme Day

- Title:** Energy Technologies: Power Plants/CCS
- Date:** 25.06.2012
- Time:** 9:30 – 16:45 o'clock
afterwards *get together* with snacks and drinks
- Location:** ► **RWTH Aachen University, Großes Senatssitzungszimmer,**
Templergraben 55

Increasing operating temperatures are a key issue to increase efficiency of fossil fuel fired power plants which will – at least for the next decades – remain essential to provide reliable electricity supply. A prerequisite for this optimization approach is the application of improved high temperature materials including thermal barrier coatings in combination with advanced cooling techniques. To further reduce CO₂ emission of power plants fired by hydrocarbons or coal, CO₂ capture and storage is a promising approach. In this context, processes employing gas separation membranes promise significantly smaller efficiency losses compared to state-of-the-art CO₂ separation by wet chemical processes.

You will learn:

- Which approaches can be used to increase efficiency of fossil fuel fired power plants
- Which high temperature materials are actually applied for high efficiency gas turbines and steam power plants
- How ceramic thermal barrier coatings are produced and how they contribute to excellent efficiency of gas turbines
- Which advanced, membrane based technologies are currently developed for CO₂ capture and storage (CCS)

You will gain basic understanding how gas- and steam power plants work and how their efficiency can be increased using advanced high temperature materials. Furthermore you will learn which power plant processes can be used for CCS and how they can be designed to gain high efficiency. After the lectures a lab visit will give you some highlights of actual research on these topics.

Contents:

1. Introduction to power plant technology; approaches to increase efficiency, Prof. V. Scherer, Uni Bochum
2. Introduction to high temperature materials for modern gas and steam turbine powerplants, PD Dr. T. Markus, Forschungszentrum Jülich, IEK-2, and RWTH Aachen University
3. Thermal barrier layers for gas turbines, Dr. M. Jarligo, Forschungszentrum Jülich, IEK-1; Prof. T. Beck, Forschungszentrum Jülich, IEK-2, and RWTH Aachen University
4. Efficient gas separation in fossil power plants with inorganic membranes for Carbon Capture and Storage, Dr. W. Meulenber, Forschungszentrum Jülich, IEK-1
5. Lab Tour: Institute of Heat and Mass Transfer (www.wsa.rwth-aachen.de)

Who should attend:

HITEC Ph.D.-fellows;
Postgraduate-, Ph.D. and postdoctoral fellows from the fields of energy and climate research

HITEC Days

HITEC Days are an inherent part of the graduate school Helmholtz Interdisciplinary Doctoral Training in Energy and Climate Research (HITEC). They devote a whole day to a method or a scientific topic with lectures and discussions. The methodological days serve to encourage scientific interdisciplinarity and will enable the PhD students to extend their range of methods with respect to their own scientific work. HITEC Days always end with a 'Get together', some snacks and drinks. HITEC Days are open for HITEC Ph.D. students and other interested young scientists.