

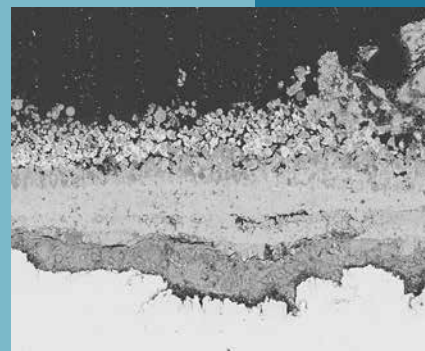
CONSORTIUM MATERIALS TECHNOLOGY
for thermal energy processes



SOLVING MATERIALS' TECHNOLOGY PROBLEMS FOR TOMORROW'S ENERGY SUPPLY

KME, Konsortium Materialteknik för Termiska Energiprocesser, is at the forefront of developing material technology to create maximum efficiency for energy conversion of renewable fuels and waste. KME has its sights firmly set on continuing to raise the efficiency of long-term sustainable energy as well as ensuring international industrial competitiveness.

Because the challenge of implementing environmentally sustainable energy is both complex and vital, KME consortium is financed by the Swedish Energy Agency together with stakeholders from the energy industry, manufacturers of systems and components for energy conversion and material producers. The programme is operated and managed by Energiforsk.



RESEARCH AREAS AND GOALS

The overall goal of the programme is to participate in the transition to a sustainable energy system in the long term. Thanks to research already conducted by KME, previous problems of severe corrosion and fouling in boilers caused by biomass and waste fuel combustion have been largely solved. KME research successes have also led to the implementation of new corrosion resistant steel in high temperature steam turbines and the development of materials and new coatings for gas turbines.

However, as greater efficiency in electricity production is required and fuel flexibility increases, new challenges continually arise. More corrosion resistant materials are needed and a deeper knowledge of corrosion processes, and mechanical properties and characteristics is essential for the production and approval of new materials and processes.

KME's research programme is designed to achieve increased electricity production, improve fuel flexibility and enhance operating flexibility. KME aims to implement the results within five to ten years. To achieve this KME focuses on both process and technology solutions, as well as materials development in boiler systems and processes, and steam and gas turbine system and processes.

KME's research includes exposure and application tests of various materials in boilers, the evaluation of mechanical properties, corrosion resistance and service life of materials, and the development and test of measures to reduce corrosion and erosion. KME also concentrates on developing performance enhancing materials for gas turbines.

The research also focuses on fuel flexibility, availability and efficiency, as well as testing and validating materials for cyclic operations in gas turbines, thermal plant processes, and the processability of advanced materials.



RESULTS AND EXAMPLES OF ONGOING RESEARCH

The KME programme is unique because, through close cooperation of the many participants, fundamental knowledge from universities and institutes is utilised to solve both real and industry relevant problems and more applied problems in boiler systems and steam and gas turbine processes.

KME's research is an excellent example of combining a spectrum of perspectives toward a common goal.

Continual independent assessment has shown that KME's research programme has contributed to a significant progress in materials technology development employing the highest level of scientific and academic methodology. In association with its partners, KME's ongoing achievements have touched a wide variety of research areas, from the design and development of corrosion resistant materials and coatings, to the development of corrosion reducing additives. Additionally, KME's research has demonstrated various possibilities involved in constructing biofuel power plants and has contributed to the development of advanced calculation models.

PROJECTS

There are currently 20 research projects within KME's 2014-2018 programme. The projects cover a wide range of research areas, such as the mechanical behaviour and corrosion of various materials, in a high temperature environment. Other research includes investigating and understanding chemical and composite materials and redesigning components. Total programme budget amounts to 13,5 MEUR.



BENEFITS

The long and short term benefits created by coming closer to climate neutral power production are important for the environment, as well as for energy companies, energy customers and society in general.

Benefits resulting from KME's research programme are passed all the way along the entire energy production chain, from energy companies to component and material producers, to contractors, consultants and researchers, right up to energy consumers who gain from greater efficiency and cost effectiveness.



www.kme-energiforsk.se

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STAKEHOLDERS PARTICIPATING IN 2014 – 2018 PROGRAMME STAGE

Here is a presentation of the programme's participants.

Andritz
Amec Foster Wheeler
Babcock & Wilcox Vølund
GKN Aerospace Sweden
MH Engineering
Sandvik Heating Technology
Sandvik Materials Technology
Siemens Industrial Turbomachinery



ENERGY COMPANIES VIA ENERGIFORSK

DONG Energy
E.ON Sverige (representing E.ON Värme Sverige)
Fortum Värme samägt med Stockholm stad
Gävle Energi
Göteborg Energi
Jämtkraft
Karlstads Energi
Kraftringen
Mälarenergi
Swedish District Heating Association
Söderenergi
Tekniska verken i Linköping
Vattenfall
Öresundskraft

PARTICIPATING UNIVERSITIES AND INSTITUTES

Chalmers University of Technology
KTH Royal Institute of Technology
Linköping University
Lund University
Swerea KIMAB

The KME research programme is operated and managed by the Swedish Energy Research Center, Energiforsk.