KME

Consortium Materials technology for thermal energy processes

KME
CONSORTIUM MATERIALS TECHNOLOGY
for thermal energy processes

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- Consortium Materials technology for thermal energy processes - KME
- KME 20 years!
- Programme period: april 2014 – april 2018
- Budget for research 115 MSEK in 4 years
  - 69 MSEK from industry as in-kind or cash (60 %)
  - 46 MSEK from Swedish Energy Agency (40 %)
- 20 KME projects
  - Performed as a close cooperation between industries and institutes/universities.
- Programme is operated and managed by Energiforsk

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Stakeholders

Sandvik Materials Technology
Sandvik Heating Technology
Andritz
Amec Foster Wheeler
B&W Vølund (incl Götaverken miljö)
Siemens Industrial Turbomachinery
GKN Aerospace
MH Engineering

Energy companies via Energiforsk:

Fortum Värme Stockholm stad
Dong Energy
E.ON Sweden (E.ON Värme Sverige)
Vattenfall
Göteborg Energi
Mälarenergi
Kraftringen
Söderenergi
Tekniska verken i Linköping
Jämtkraft
Öresundskraft
Gävle Energi
Karlstads Energi
Svensk fjärrvärme

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

The Swedish Energy Agency

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Boilers and CHP plants

KME-701 Influence of high-temperature environments on the mechanical behaviours of austeniti

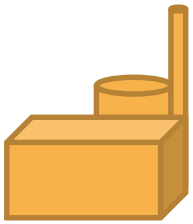
Materials mech. properties/creep

KME-710 generation of 12% chromium steels

KME-707 Design for Reduced C eam Turbine fficiency and hip

ST design

Increased
- power production
- fuel flexibility
- (operational flexibility)



KME-709 Increased steam temperature in grate fired boilers - Steamboost

KME-708/718 High temperature and furnace wall corros boiler

Furnace wall corrosion/ additives/coatings

KME-711 Combating superl mater

New SH materials/ design/corrosion memory

KME-715 Composite Metal Polymer (CMP) for non-stick impro

KME-717 Intermediate temperature corrosion b Zn & chlorides

KME-714 Sulf improved material selection for high corrosion abatement n memory effects

KME-720 Waterwall and SH corrosion with increasing fraction of recycled wood

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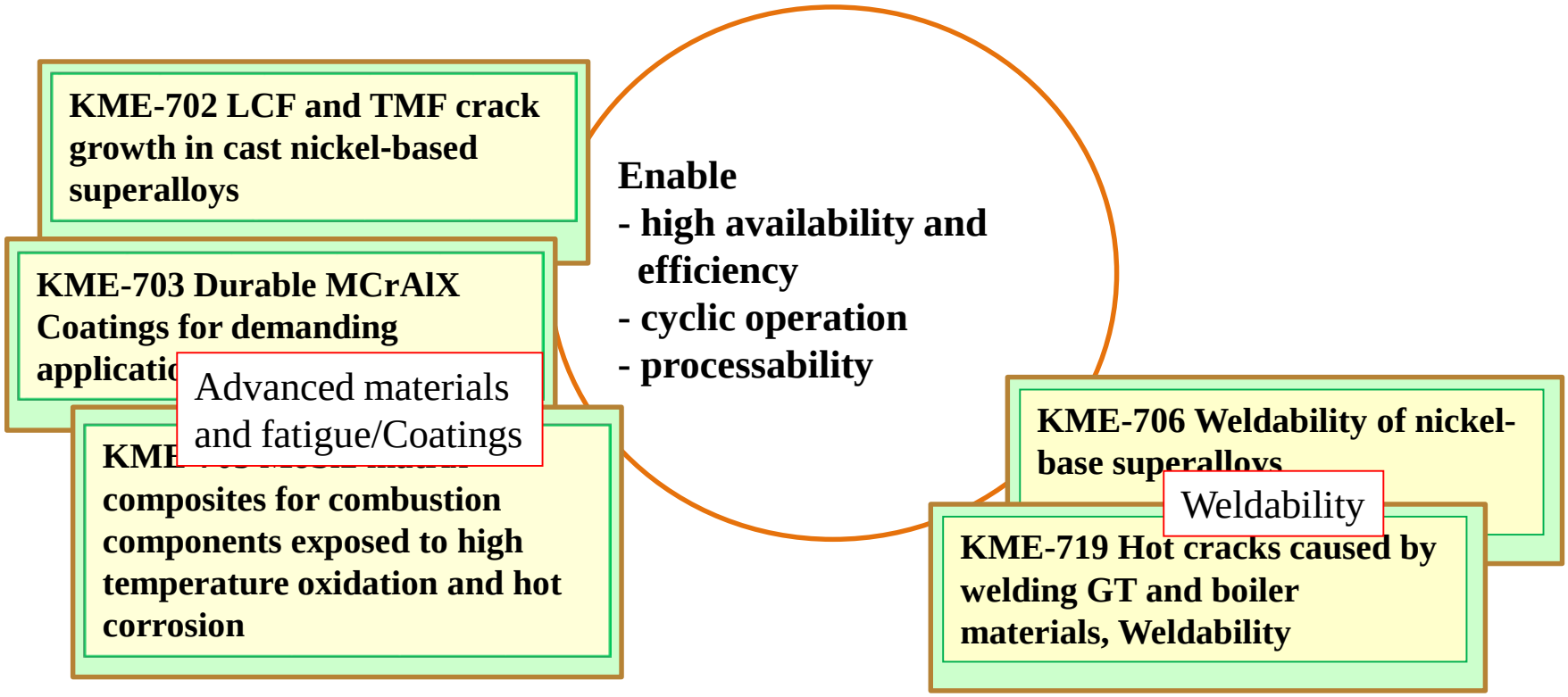
Gas turbines and aero engines



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Future

- One year left

- Planning of next period is ongoing
  - Current research forms the basis
  - Identify future needs of research. New areas?
  - KME future group
  - Workshop with energy utilities

- KME encourage all initiatives and ideas
  - Research areas
  - Structure and set up
  - New stakeholders

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Future - goals

- **Cost effective solutions**
- Increased **power production**
- Improved **availability**
- Improved **fuel flexibility**
- Improved **operating flexibility** and **part-load characteristics**

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Future – some possible new features

- Possibility for a wider and a more comprehensive KME-programme, materials main focus but also relating topics:
  - Combustion and environment in boiler/turbine
  - Process technology solutions
  - Low temperature issues
  - …

- Projects could perhaps have different integrated parts:
  - Part with fundamental research, 100 % financed from Energy agency
  - **Part with applied research, like "normal KME" 40/60 (core of project)**
  - Part with more applied development, 20/80, consultants work

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Future - topics

- Steam
  - Cost effective materials (loop seal SH, convection SH, nozzles…)
  - Coatings
  - Ceramic materials
  - Service life assessment
  - New material groups
  - Interplay environment – materials (equlibrium calc)
  - Cyclic operations

- Gas turbine
  - New materials
  - Coatings
  - AM

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