IEA Bioenergy

Session 3: Large scale utilisation

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IEA Bioenergy Task 32: Biomass Combustion and Cofiring

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- Combustion expertise network, part of the IEA Bioenergy Technology Collaboration Programme
- Experts from 13 countries:
  - Austria, Belgium, Canada, Denmark, Germany, Ireland, Italy, Japan, Netherlands, Norway, South Africa, Sweden, Switzerland
- Working together in:
  - Cooperative projects
  - Meetings, Workshops, Conferences, Excursions
  - Cooperation with other Networks
- Reports etc. can be found on:
  - www.ieabioenergytask32.com

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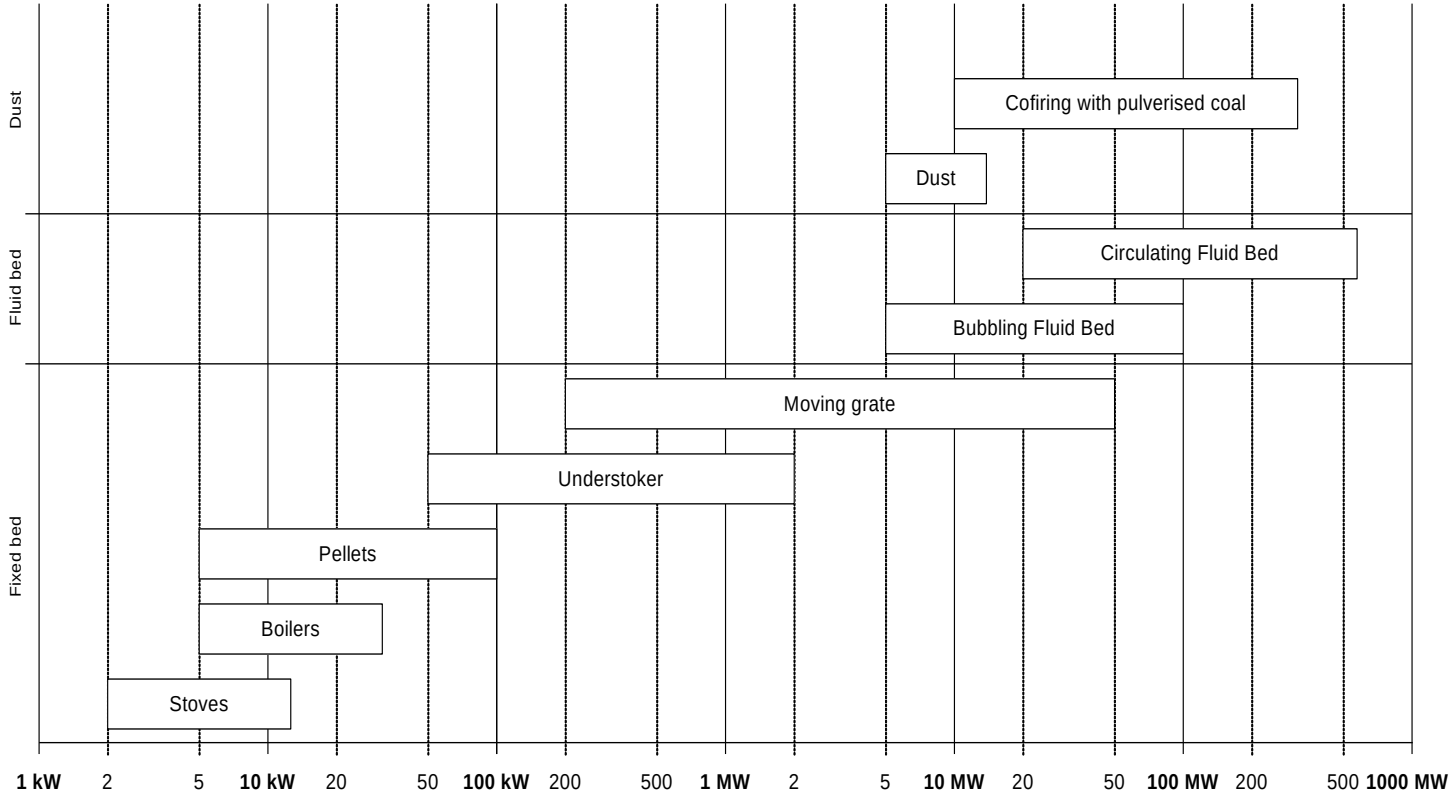
www.ieabioenergy.com

Combustion technologies are proven and here to stay



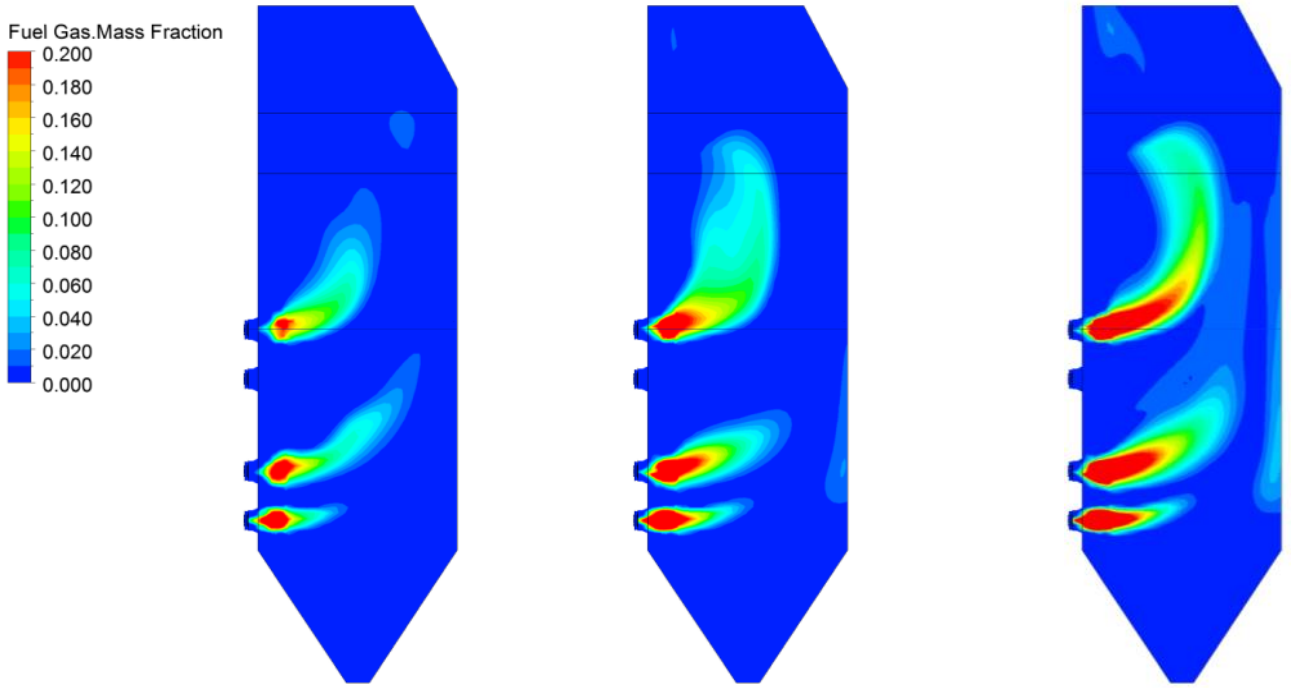
Role of Task 32: Generate and exchange key information for further market deployment

- Cost reduction (CAPEX + OPEX)
- Efficiency increase
- Increased fuel flexibility
- Better environmental performance

Some relevant recent studies

- Status overview of Torrefaction Technologies - A review of the **commercialisation status of biomass torrefaction**, Cremers, Koppejan, 2015
- **The status of large scale biomass firing** - The milling and combustion of biomass materials in large pulverised coal boilers. W.R. Livingston, J. Middelkamp, W. Willeboer, S. Tosney, B. Sander, S. Madrali, M.T. Hansen, J. Koppejan and M.F.G. Cremers, 2016
- **Techno-economic evaluation of selected decentralised CHP applications** based on biomass combustion with steam turbine and ORC processes, Hammerschmid, 2016
- **Status of PM emission measurement methods and new developments**, Schön, Hartmann, 2018
- **Policy paper with background report on the health impact of combustion aerosols**, Nussbaumer, 2017
- **Strategic study on renewable heat**, SP, 2018
- **Best practise report of biomass combustion based CHP**, Schmidl, 2018
- **Real life emissions from boilers and stoves**, Hartmann, Schmidl, 2018
- **Review on options for better ash utilization**, Cremers, 2018

Impact on flame shape in pulverised coal boilers



100% coal 50% coal/50% TWP 100% TWP

The status of large scale biomass firing - The milling and combustion of biomass materials in large pulverised coal boilers. W.R. Livingston, J. Middelkamp, W. Willeboer, S. Tosney, B. Sander, S. Madrali, M.T. Hansen, J. Koppejan and M.F.G. Cremers, 2016

- Globally over 250 combustion plants originally designed for coal have been converted to use biomass
- Low capital investments, high efficiency, high reliability and high CO_2 impact in ton CO_2/GJ biomass
- From 5-10% cofiring in 90's to full conversion today
- Various detailed case studies and country overviews
- Differences in combustion behaviour manageable
- Main challenges related to safety in fuel handling and storage (separate T32 report available)

Large scale utilisation session

- Overview of global experience with different cofiring configurations, fly ash utilisation options (Jan Middelkamp, DNVGL, Netherlands)
- Commercial experiences on full conversions to white and black pellets (Brian Mori, Ontario Power Generation)
- Co-firing and biomass utilization of Japan's coal power plants (Dr. Kinya Sakanishi, Fukushima Renewable Energy Institute, AIST(FREA)