



**COFIRING 8 COPENHAGEN**  
WORKSHOP 11-13 SEPTEMBER 2018

**- PROGRAMME -**

# **COFIRING BIOMASS WITH COAL**



IEA  
**CLEAN COAL CENTRE**

SPONSORED BY  
**COWI**



**DAY 1** 11 SEPTEMBER 2018

**12.30 - 13.00** REGISTRATION FOR SITE VISIT AND WORKSHOP AT ADMIRAL HOTEL LOBBY

**13.00 - 17.00** SITE VISIT TO AMAGERVÆRKET



**18.30 - 19.00** WORKSHOP REGISTRATION

**19.00 - 21.00** WELCOME DRINK RECEPTION

**DAY 2** 12 SEPTEMBER 2018

**08.30 - 09.00** WORKSHOP REGISTRATION

**09:00** — **WELCOME TO COPENHAGEN** - CHAIR ANDREW MINCHENER

**09:00** Welcome and introduction

ANDREW MINCHENER, GENERAL MANAGER, IEA CLEAN COAL CENTRE, UK

**09:15** Welcome and introduction

BRIAN SEEBERG LARSEN, SENIOR VICE PRESIDENT, INDUSTRY AND ENERGY,  
COWI, DENMARK

**09:30** Denmark energy situation

JANE GLINDVAD KRISTENSEN, HEAD OF DIVISION, DANISH ENERGY AGENCY,  
DENMARK

**09:45** — **SESSION 1 - INTERNATIONAL COFIRING ACTIVITIES** - CHAIR ANDREW MINCHENER

**09:45** Status quo and development prospects of cofiring biomass with coal in China

RUI SUN, ELECTRIC POWER PLANNING & ENGINEERING INSTITUTE, CHINA

**10:10** Global trends in biomass to energy

MARIUS NOER AND SIMON L BAGER, COWI, DENMARK

**10:35** Status of cofiring for selected countries

XING ZHANG, IEA CLEAN COAL CENTRE, UK

**11:00 - 11:15** COFFEE BREAK

**11:15** — **SESSION 2 - CASE STUDIES AND DEMONSTRATIONS** CHAIR KEES VAN WINGERDEN

**11:15** Ørsted experience. Utilisation of biomass for combined heat and power production

JØRGEN P JENSEN, ØRSTED, DENMARK

**11:40** Aspects of biomass cofiring for utility-sized CFB boilers

FRANK LEUSCHKE, DOOSAN LENTJES, GERMANY

**12:05** Cofiring of refined pellets on Nordjylland Unit 3

JEPPE GRUE, COWI, DENMARK

**12:30** Coal to wood pellets biomass conversions

RAPHAEL HAN, MITSUBISHI HITACHI POWER SYSTEMS EUROPE, GERMANY

**12:55 - 13:45** LUNCH AND NETWORKING

**13:45** — **SESSION 3 - FIRE PREVENTION** - CHAIR PREBEN MESSERSCHMIDT

- 13:45** Fire and explosion hazards related to bulk material handling and storage of coal and biomass  
KEES VAN WINGERDEN, GEXCON, NORWAY
- 14:10** Prevention of fires and dust explosions when handling biomass  
ANDERS BERGSTRÖM, FIREFLY, SWEDEN
- 14:35** Fire and explosion control measures for biomass storage and handling at Lynemouth Power Station  
DAVEY WHARRIER, LYNEMOUTH POWER, UK
- 15:00** Best practice for biomass store fire protection  
RICHARD FARNISH, THE WOLFSON CENTRE FOR BULK SOLIDS HANDLING TECHNOLOGY, GREENWICH UNIVERSITY, UK
- 15:25** Safety issues in relation to storage and handling of biomass: research and standardisation  
ANDERS LÖNNERMARK, RISE RESEARCH INSTITUTES OF SWEDEN

**15:50 - 16:05** **COFFEE BREAK**

**16:05** — **SESSION 4 - BIOMASS PRE-TREATMENT** - CHAIR JEPPE GRUE

- 16:05** Economic torrefied pellets from herbaceous biomass  
JAVIER GIL, NATIONAL RENEWABLE ENERGY CENTRE, SPAIN
- 16:30** Co-grinding of waste pellets in a vertical roller mill with coal  
ROLAND AECKERSBERG, LOESCHE GMBH, DÜSSELDORF, GERMANY
- 16:55** Self-steam explosion pretreatment technology for milling application of wet biomass  
DEDY EKA PRIYANTO, IHI CORPORATION, JAPAN

**19:00** **DINNER AT SALT RESTAURANT ADMIRAL HOTEL**

**DAY 3** **13 SEPTEMBER 2018**

**09:00** — **SESSION 5 - INDUSTRY DEVELOPMENT** - CHAIR JØRGEN JENSEN

- 09:00** Optimising wood pellet transportation by CFD simulation  
PREBEN V. MESSERSCHMIDT, RAMBOLL, DENMARK
- 09:25** Diffusion coatings for corrosion protection of ferritic-martensitic steels for cofiring biomass with coal  
TOBIAS MEISSNER, DECHEMA-FORSCHUNGSINSTITUT, GERMANY
- 09:50** Field experience in biomass cofiring on SCR catalyst technology  
TERESA HITZKE, JOHNSON MATTHEY CATALYSTS, GERMANY
- 10:15** High value utilisation of biomass gasification coupled coal-fired unit power generation technology  
SHOUJUN ZHANG, HEFEI DEBO BIOENERGY SCIENCE & TECHNOLOGY CO, CHINA

**10:40 - 11:00** **COFFEE BREAK**

**11:00** — **SESSION 6 - RESEARCH AND INDUSTRY DEVELOPMENT** CHAIR PATRICK MASON

- 11:00** Management of ashes from cofiring biomass with coal  
ANGELO SARABÈR, VLIEGASUNIE, THE NETHERLANDS
- 11:25** Air monitoring devices for co-combustion of biomass with coal  
DARIO DIMAGGIO, KURZ INSTRUMENTS, USA
- 11:50** Managing fuel and air distribution to improve combustion and reduce NO<sub>x</sub> when cofiring coal with biomass  
GUISU LIU, AMMEGEN LTD USA - PART OF GREENBANK GROUP UK
- 12:15** Ecological fuel from biomass residues and mineral coal rejections  
LUIZ H ALEXANDRE, 1C2C BIOCOMBUSTÍVEL DE CARBONO RECICLADO, BRAZIL

**12:40 - 13:50** **LUNCH AND POSTER VIEWING**

- 13:50 - 14:00** Best poster prize presentation

**14:00** — **SESSION 7 - RESEARCH AND DEVELOPMENT** - CHAIR FRANK LEUSCHKE

- 14:00** Supply chain costs of biomass cofiring  
PATRICK E MASON, AYUP, UK
- 14:25** Oxyfuel cofiring of Miscanthus char and coal in a 300 kW furnace with integrated carbon fixation  
MING-HSUN WU, NATIONAL CHENG KUNG UNIVERSITY, TAIWAN
- 14:50** Experience of cofiring non-woody fuel in a pilot scale (500 kW) pulverised test facility  
MANOJ PANERU, UNIVERSITY OF STUTTGART, GERMANY
- 15:15** The biomass combustion and preparation technology development in anthracite coal fired boiler units  
NATALIYA I DUNAYEVSKA, COAL ENERGY TECHNOLOGY INSTITUTE OF THE NATIONAL ACADEMY OF SCIENCES OF UKRAINE
- 15:40** Workshop summary and closing remarks  
ANDREW MINCHENER, IEA CLEAN COAL CENTRE, UK

**16:00 - 16:30** **TEA/COFFEE AND NETWORKING**

**POSTERS**

**Improvement of combustion stability of a fluidised bed boiler for solid refuse fuel**

DAL-HEE BAE AND OTHERS, KOREA INSTITUTE OF ENERGY RESEARCH

**How ATP's CRBBP process produces cost-advantaged bio-coal**

JOSEPH J JAMES, AGRI-TECH PRODUCERS, LLC (ATP)

**Combustion behaviour of raw and pelletised wood at suspension-fired conditions**

MARVIN MASCHKE, PETER A JENSEN, PETER GLARBORG  
DEPARTMENT OF CHEMICAL AND BIOCHEMICAL ENGINEERING, DTU

**High temperature corrosion in a waste-fired combustion boiler**

DOYEON LEE AND OTHERS, KOREA INSTITUTE OF ENERGY RESEARCH

**Co-firing of HTC bio-coals and coal in pulverised coal plant: the potential for HTC to overcome inherent biofuel limitations and utilise lower value biomass**

AIDAN M SMITH, AARHUS UNIVERSITY

**The impact of biomass ash as an additive on the nitrogen partitioning of coals and NOx emissions**

R.I BIRLEY AND OTHERS, UNIVERSITY OF LEEDS

**Opportunities and challenges for cofiring biomass with coal for the UK low-carbon energy transition**

C. CHARALAMBOUS AND OTHERS, UNIVERSITY OF EDINBURGH

**Modeling biomass behavior during combustion: A thermochemical approach to predict slagging**

IBAI FUNCIA MUGUERZA AND OTHERS, NATIONAL RENEWABLE ENERGY CENTRE

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COWI is a leading consulting group that creates value for customers, people and society through our unique 360° approach. Based on our world-class competencies within engineering, economics and environmental science, we tackle challenges from many vantage points to create coherent solutions for our customers - and thereby sustainable and coherent societies in the world.

**In the area of Bioenergy and Thermal Power COWI focuses on four business areas:**

- Coal and biomass fired power plants – including partly or full conversion from coal to biomass and power plant flexibility
- Biomass power plants, Combined Heat and Power plants (CHP) and District Heating Plants
- Waste-to-Energy plants based on MSW or RDF
- Specialist services for operation, maintenance and optimisation

