



Conference Program for Impacts of Fuel Quality, September 19th – 23rd, 2022, Åre, Sweden

Sunday 18th September	
4:00-6:00 PM	Welcome get together/Registration Dinner open 6:pm – 8:pm

Monday 19th September (Day One)		
07:00-08:00 AM	Breakfast	
Session 1: Fuel Quality and Combustion Performance I Chair: TBD		
8:00 am	Welcome & information	Stan & Markus
8:05 am	Keynote: Combustion technology development – How has academic research contributed?	Mikko Hupa
8:45 am	Full-scale investigations of initial deposits formation in a cement plant co-fired with coal and SRF	Anne Juul Damø
9:10 am	The influence of sulfur recirculation on deposit formation in a waste-to-energy plant	Wenhan Cao
9:35 am	Effect of contribution of lignite in blend with hard coal on kinetics co-pyrolysis and co-combustion	Michal Ostrycharczyk
10:00 am	Tea Break until 10:30 am	
Session 2: Ash Utilization & Valorization Chair: TBD		
10:30 am	Keynote: Recent advances in our understanding of phosphorus reactions in high-temperature processes	Nils Skoglund
11:00 am	Release of phosphorus and alkali species from agricultural waste during gasification	Daniel Schmid
11:25 am	Thermochemical equilibrium study of ash transformation during entrained flow combustion and gasification of agricultural residues focusing on the potential extraction of valuable Si, K – P compounds	Samarthkumar Pachchigar
11:50 am	Characterisation of ash particles from co-combustion of bark and sludges from pulp and paper industry	Anna Strandberg
12:15 – 1:30pm	Lunch	
	Ad-hoc meetings/Networking	
6:00 – 7:30 pm	Dinner	

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Session 3: Fuel Quality and Combustion Performance II Chair: TBD		
7:30 pm	Oxy-fuel combustion of wooden and non-wooden biomass in a pilot-scale bubbling fluidized bed combustor	Matěj Vodička
7:55 pm	Sewage sludge gasification in batch induction reactor – work in progress	Michal Ostrycharczyk
8:20pm	Determination of the fuel composition during operation to optimise the combustion behavior	Antje David
8:45 pm	Happy Hour	

Tuesday 20 th September (Day Two)		
07:00-08:00 AM	Breakfast	
Session 4: Modeling and beyond: Chair: TBD		
8:00 am	Keynote: The Atikokan digital twin: Bayesian physics-based machine learning for low-load firing in the Atikokan biomass utility boiler	Philip Smith
8:40 am	A deep learning approach to classification and evaluation of particulate matter (PM) emissions during co-firing of coal	Yoshihiko Ninomiya
9:05 am	On the use of global equilibrium analysis to interpret ash and trace element chemistry	Flemming J. Frandsen
9:30 am	Assessing the melting behavior of the K-Ca-Mg-P-Si-O system in biomass ashes - A thermodynamic study with practical validation	Thomas Karl Hannl
10:00 am	Tea Break until 10:30 am	
Session 5: Fuel Quality and Combustion Performance III Chair: TBD		
10:30 am	Firing blends of biomass and coal in a coal-fired utility boiler without hardware modifications	Andrew Fry
10:55 am	Upgrading low rank coals using the integrated SynCoal process	Harry Bonner
11:20 am	Pre-combustion quality issues related to thermally upgraded biomass fuels	Stan Harding
11:45 am	Effect of residual char and atmospheric gases on clinker formation from woody/ herbaceous biomass ashes	Kenji Koido
12:10 – 1:30 pm	Lunch	
	Ad-hoc meeting/Networking/Excursion	
1:30 pm	Excursion bus leaving Holiday Club	
4:00 pm	Excursion bus returning to Holiday Club	
6:00 – 7:30 pm	Dinner	

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Session 6: Corrosion I Chair: TBD		
7:30 pm	Experiences from eight years of firing demolition wood using ammonium sulphate to mitigate superheater corrosion	Håkan Kassman
7:55 pm	Changes in chlorine content over time – probe deposit sampling in a Finnish kraft recovery boiler	Roland Balint
8:20 pm	Aggressive cold-end corrosion caused by ammonium chloride in biomass boilers utilizing additives	Emil Vainio
8:45 pm	Happy Hour	

Wednesday 21 st September (Day Three)		
07:00-08:00 AM	Breakfast	
Session 7: Corrosion II Chair: TBD		
8:30 am	Corrosion of superheater materials by alkali chloride salt mixtures – The role of presence of molten phase	Emil Vainio
9:55 am	Low temperature corrosion caused by CaCl ₂	Alessandro Ruozzi
9:20 am	The effect of Cl, Br, and F on high-temperature corrosion of heat-transfer alloys	Juho Lehmusto
9:45 am	Tea Break until 10:30 am	
Session 8: Aerosols and Deposits Chair: TBD		
10:30 am	On the ash deposition behavior and fine particle formation when utilizing biomass together with coal fly ash in pilot- and full-scale	Flemming J. Frandsen
10:55 am	Utilising thermodynamic equilibrium calculations to model potassium capture by additives in biomass combustion plants	Thorben de Riese
11:20 am	Comparison of coal fly ash injection techniques on combustion aerosols in a full-scale boiler firing wood	Richard Nowak Delgado
11:45 am	Towards prediction of ash deposition rates from combustion of a wide variety of fossil and biomass solid fuels	Jost O.L. Wendt
12:10 – 1:30pm	Lunch	
Session 9: Ash Transformation Chair: TBD		
1:30 pm	Impact of fuel blends in co-firing on biomass ash deposition characteristic in pulverized fuel combustion	Abdou Suso
1:55 pm	Release of phosphorus from thermal conversion of biomass - evidence for carbothermic reduction of phosphates in wheat bran	Emil O. Lidman Olsson

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2:20 pm	Kaolin as fuel additive in grate combustion of biomass to mitigate ash related problems and particle emissions	Eleonora Borén
2:45-3:15 pm	Tea Break until 3:15 pm	
3:15 pm	Use of bamboo as biomass CHP fuel in Japan	Kenichi Sasauchi
3:40 pm	Pyrolysis of municipal sewage sludge (MSS) in a rotary pyrolyser- analysis of the char chemistry and heavy metal mobilization-Modelling and experiments	Naeimeh Vali
4:05 pm	Ad-hoc meeting/Networking Executive & Scientific committee meeting	
6:00 – x:00 pm	Conference Dinner	

Thursday 22 nd September (Day Four)		
07:00-08:00 AM	Breakfast	
Session 10: Diagnostics Chair: TBD		
8:30 am	Real-time in situ quantification of gaseous K, KOH and KCl in biomass combustion and gasification	Florian Schmidt
8:55 am	Detection of alkali path in a pilot-scale combustor using laser spectroscopy and surface ionization – from flame to particles	Jan Viljanen
9:20 am	Quantitative imaging of K species in biomass combustion	Emil Thorin
9:45 am	Tea Break until 10:30	
Session 11. Non-Power Processes I Chair: TBD		
10:30 am	Characterization of biocarbon produced from woody biomass for metallurgical applications	Liang Wang
10:55 am	Impact of solid alternative fuels on cement kiln operation	José Aguirre
11:20 am	Interaction of olive pomace ash and coal ash with magnesium oxide-based refractories	Naresh Kumar Wagri
11:45 am	Experimental evaluation of different alternative fuel combustion under oxyfuel conditions for cement production	Cynthia Kroumian
12:10 – 1:30pm	Lunch	
	Ad-hoc meeting/Networking	
6:00 – 7:30 pm	Dinner	
Session 12. Bed Agglomeration Chair: TBD		
7:30 pm	Recent experiences from fluidized combustion tests with bed materials of varying quartz content	Jaakko Tamminen

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7:55 pm	Bed layer formation characteristics in quartz and feldspar bed particles during fluidized bed combustion of woody biomass: A comparative study using x-ray microtomography	Ali Valizadeh
8:20 pm	Bed particle layers characteristics and formation process during fast pyrolysis of grass	Fanfan Xu
8:45 pm	Happy Hour	

Friday 23rd September (Day Five)		
07:00-08:00 AM	Breakfast	
Session 13: Fuel Quality and Combustion Performance IV Chair: TBD		
8:30 am	Keynote: Accumulation and communication of ash research	Flemming Frandsen
9:10 am	Expanding the utility of laboratory fuels testing	David R. Wagner
9:35 am	Image-based biomass characterization comparison of conventional image processing and a deep learning approach	Johannes Lukas
10:00am	Tea Break until 10:30	
Session 14. Non-Power Processes II Chair: TBD		
10:30am	Investigation of the properties and reactivity of biocarbons at high temperature in a mixture of CO/CO ₂	Liang Wang
10:55am	An experimental study on mineral particle deposit formation and sintering in cement calciner	Hao Wu
11:20am	High-temperature sintering behavior of clays during calcination – a preliminary study	Yifan Du
11:45am	Ash-limestone interactions in quicklime production	Markus Broström
12:15 – 13:00	Prize Distribution & Good Bye	
13:00	Lunch	